VERSION 12.0

SCOR

SUPPLY CHAIN OPERATIONS REFERENCE MODEL

APICS

APICS
Supply Chain Operations Reference Model
SCOR

Version 12.0

Visit **apics.org/scor** for more information regarding the SCOR framework. The SCOR v12 framework is available via free digital download to all APICS members on the APICS website at **apics.org/myapics**.

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Introduction

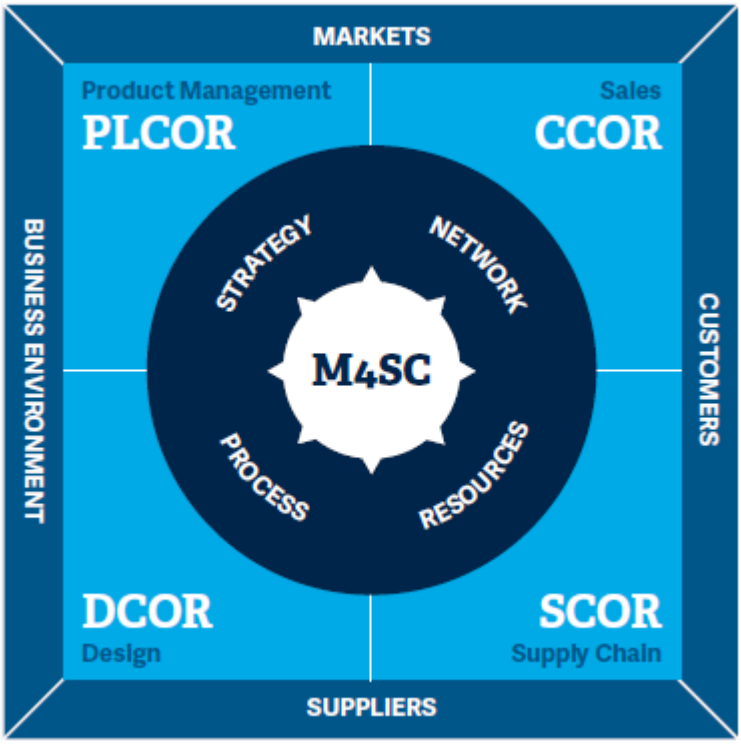
Introduction to SCOR

The Supply Chain Operations Reference model (SCOR) provides methodology, diagnostic and benchmarking tools that help organizations make dramatic and rapid improvements in supply chain processes. The world of supply chain management never stops advancing, and nor do supply chain professionals and their organizations. Supply chains require savvy operators, supervisors and leaders with the knowledge and know-how on the global standards and practices that move the needle on supply chain performance. APICS is the industry authority that develops supply chain talent and elevates end-to-end supply chain performance. From education and certification, to benchmarking and best practices, APICS sets the industry standard.

SCOR is a part of the APICS body of knowledge used to foster the advancement of end-to-end supply chain management.

APICS Frameworks

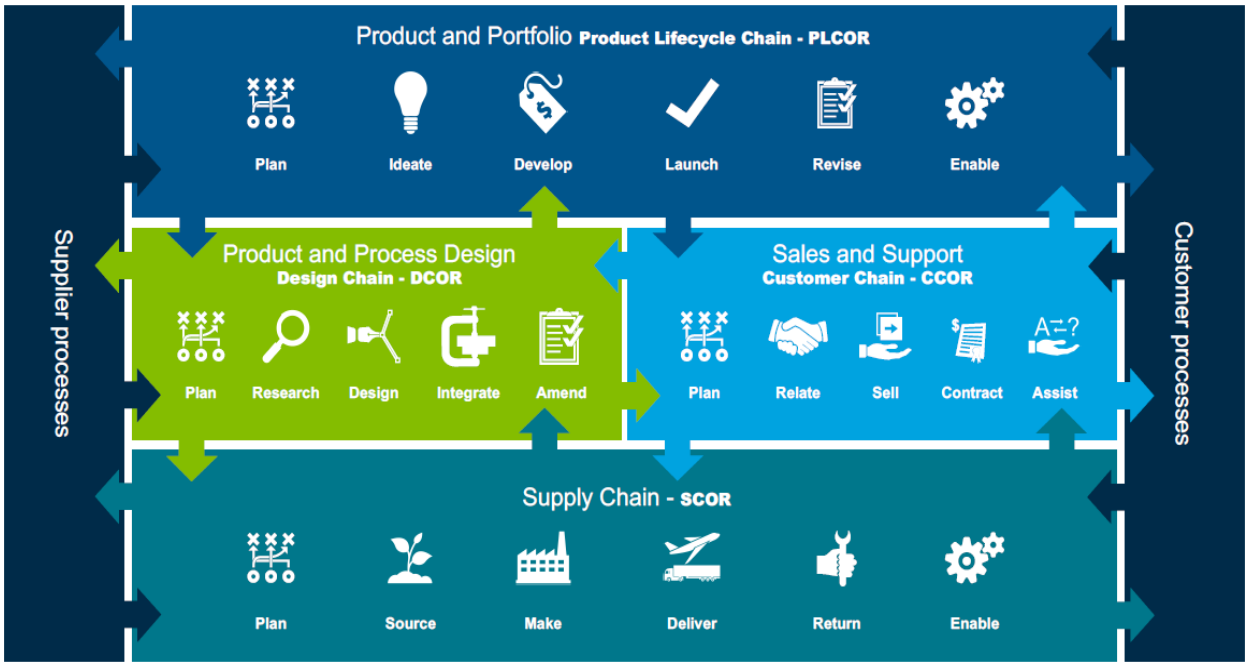
The SCOR model is part of an enterprise portfolio describing the critical elements in a value chain. Including SCOR, the APICS framework portfolio consists of the Product Life Cycle Operations Reference model (PLCOR), Customer Chain Operations Reference model (CCOR), Design Chain Operations Reference model (DCOR), and Managing for Supply Chain Performance (M4SC). For more information, services, and training related to these frameworks, please contact APICS Corporate Development at corporatedevelopment@apics.org.



Graphic 1: APICS Frameworks and relationships; credit: Ericsson, Lars Magnusson

The key focus of the APICS frameworks are:

- Product Life Cycle Operations Reference model – **PLCOR**
  - Manages the activities for product innovation and product & portfolio management – idea-to-portfolio
  - Key capabilities: Plan, Enable, Ideate, Develop, Launch, Revise
- Customer Chain Operations Reference model – **CCOR**
  - Manages the customer interaction process – lead-to-contract
  - Key capabilities: Plan, Relate, Sell, Contract, Assist
- Design Chain Operations Reference model - **DCOR**
  - Manages the product and service development process – portfolio-to-solution
  - Key capabilities: Plan, Research, Design, Integrate, Amend
- Supply Chain Operations Reference model - **SCOR**
  - Manages the business activities associated with all phases of satisfying a customer's demand – opportunity-to-payment
  - Key capabilities: Plan, Source, Make, Deliver, Return, Enable
- Managing for Supply Chain Performance – **M4SC**
  - The process that translates business strategies into supply chain execution plans and policies – strategies-to-plans and procedures
  - Key capabilities: Align Strategy, Networks, Processes, Resources



Graphic 2: This graphic illustrates the Level 1 processes for APICS frameworks

SCOR Summary

The Supply Chain Operations Reference model (SCOR) is the product of APICS following the merger between Supply Chain Council and APICS in 2014. The SCOR model was established in 1996 and updated regularly to adapt to changes in supply chain business practices. SCOR remains a powerful tool for evaluating and comparing supply chain activities and performance. SCOR captures a consensus view of supply chain management. It provides a unique framework that links business process, metrics, best practices and technology into a unified structure to support communication among supply chain partners and to improve the effectiveness of supply chain management and related supply chain improvement activities.

The APICS member base represents a broad cross-section of industries, including manufacturers, distributors, and retailers. The vast APICS network is also comprised of technology suppliers and implementers, academics, and government organizations that participate in APICS activities and the development and maintenance of the SCOR model.

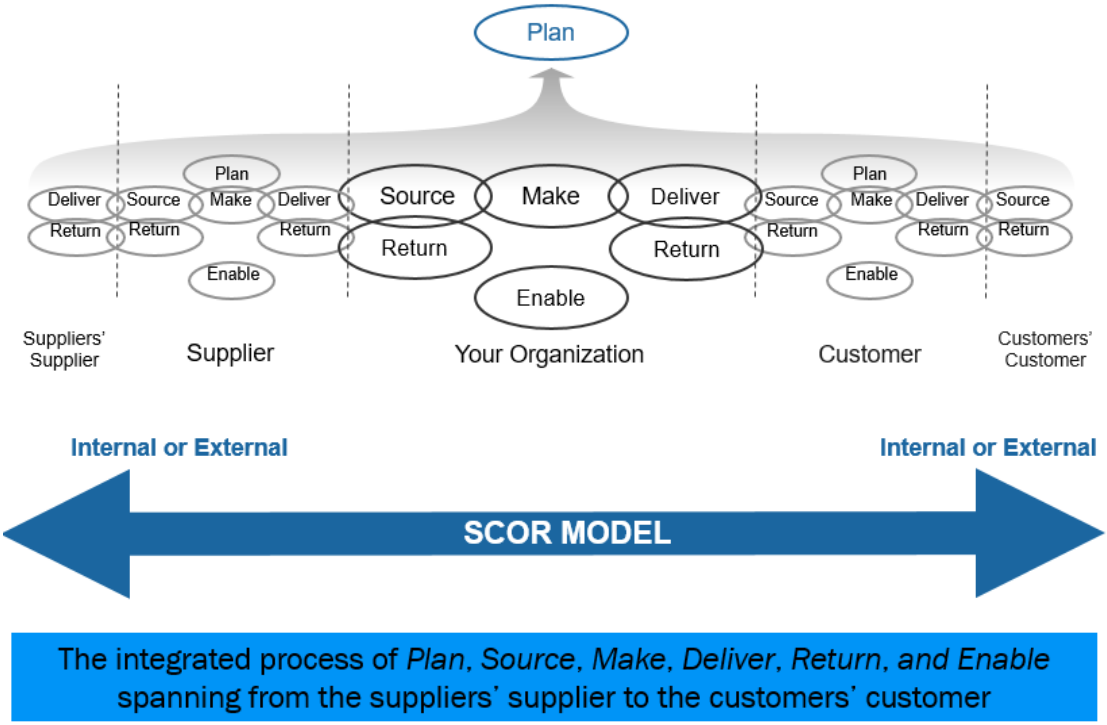
APICS is interested in providing the widest possible dissemination of SCOR, as the wide-spread use of the model enables communication using common definitions and measurements, results in better customer-supplier relationships, software systems that better support members through the use of common measurements and terms, and the ability to rapidly adopt common practices.

Specific changes in Version 12.0 from 11.0 are outlined later in this Introduction.

Scope of SCOR

The SCOR model has been developed to describe the business activities associated with all phases of satisfying customer demand. The model itself contains multiple tabbed sections and is organized around the six primary management processes of Plan, Source, Make, Deliver, Return and Enable (shown in Graphic 3). By describing supply chains using these process building blocks, the model can be used to describe supply chains that are very simple or very complex using a common set of definitions. As a result, disparate industries can be linked to describe the depth and breadth of nearly any supply chain. The model has been able to successfully describe and provide a basis for supply chain improvement for global projects as well as site-specific projects.

SCOR Process

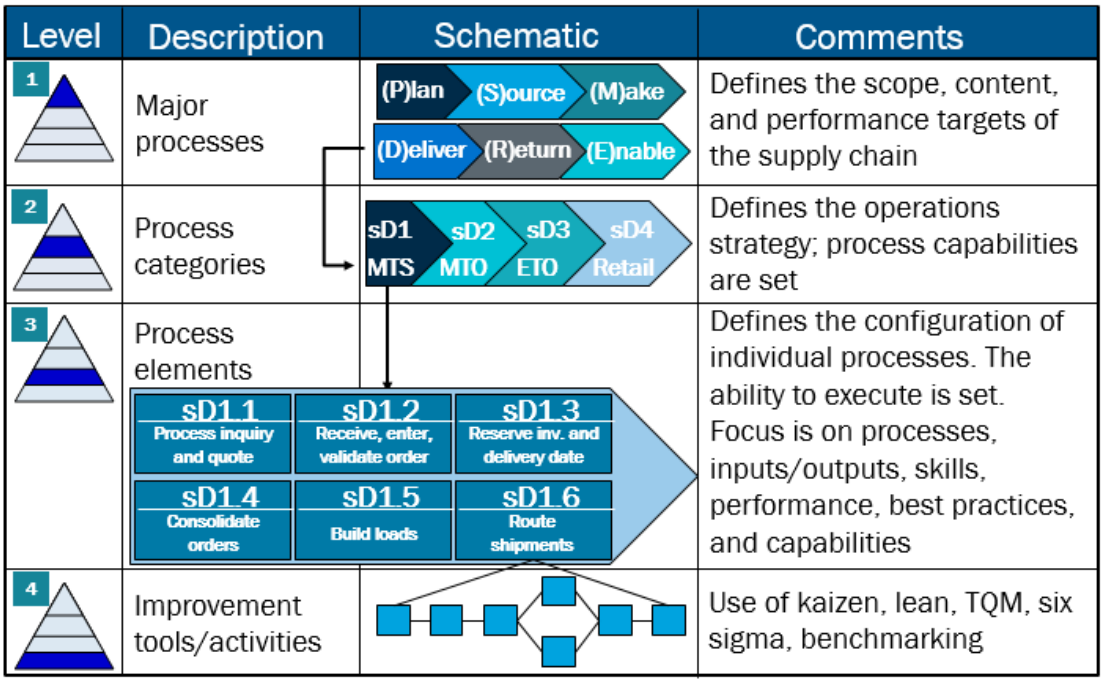


Graphic 3 - SCOR is organized around six major management processes

SCOR spans: all customer interactions (order entry through paid invoice), all physical material transactions (supplier's supplier to customer's customer, including equipment, supplies, spare parts, bulk product, software, etc.) and all market interactions (from the understanding of aggregate demand to the fulfillment of each order). It does not attempt to describe every business process or activity. Specifically, SCOR does not address: sales and marketing (demand generation), product development, research and development, however, these areas are covered in detail in the other APICS frameworks.

As shown in Graphic 4, the model is designed to support supply chain analysis at multiple levels. APICS has focused on the top three process levels, which are industry neutral. SCOR does not attempt to prescribe how an organization should conduct its business or tailor its systems/information flow. Every organization that implements supply chain improvements using SCOR will need to extend the model, at least to Level-4, using industry, organization, and/or location-specific processes, systems, and practices.

SCOR Process Hierarchy



Graphic 4 - SCOR is a hierarchical process model

It is important to note that this model describes processes not functions. In other words, the model focuses on the activity involved; not the person or organizational element that performs the activity.

SCOR Structure

SCOR is a process reference model. The purpose of a process reference model, or business process framework, is to define process architecture in a way that aligns with key business functions and goals. Architecture here references how processes interact and perform, how these processes are configured, and the requirements (skills) on staff operating the processes.
The SCOR reference model consists of 4 major sections:

- Performance: Standard metrics to describe process performance and define strategic goals
- Processes: Standard descriptions of management processes and process relationships
- Practices: Management practices that produce significant better process performance
- People: Standard definitions for skills required to perform supply chain processes.

The SCOR model also contains a section for special applications. Section 5, Special Applications, is used for suggested SCOR additions that have not yet been tested thoroughly for integration into the model, but that APICS believes would be beneficial for SCOR users.

Performance

The performance section of SCOR focuses on the measurement and assessment of the outcomes of supply chain process execution. A comprehensive approach to understanding, evaluating, and diagnosing supply chain performance consists of three elements: Performance Attributes, Metrics, and Process / Practice Maturity. Elements, as distinct from the Levels in the Process and Metrics hierarchies, describe different aspects or dimensions of performance:

- **Performance Attributes:** Strategic characteristics of supply chain performance used to prioritize and align the supply chain's performance with the business strategy
- **Metrics:** Discrete performance measures, themselves comprised of levels of connected hierarchy
- **Process/Practice Maturity:** Objective, specific descriptions used a reference tool to evaluate how well supply chain processes and practices incorporate and execute accepted best-practice process models and leading practices.

Performance Attribute	Definition
Reliability	The ability to perform tasks as expected. Reliability focuses on the predictability of the outcome of a process. Typical metrics for the reliability attribute include: On-time, the right quantity, the right quality.
Responsiveness	The speed at which tasks are performed. The speed at which a supply chain provides products to the customer. Examples include cycle-time metrics.
Agility	The ability to respond to external influences, the ability to respond to marketplace changes to gain or maintain competitive advantage. SCOR Agility metrics include Adaptability and Overall Value at Risk
Costs	The cost of operating the supply chain processes. This includes labor costs, material costs, and management and transportation costs. A typical cost metric is Cost of Goods Sold.
Asset Management Efficiency (Assets)	The ability to efficiently utilize assets. Asset management strategies in a supply chain include inventory reduction and in-sourcing vs. outsourcing. Metrics include: Inventory days of supply and capacity utilization.

Table 1 - The SCOR Performance Attributes

Reliability, Responsiveness, and Agility are considered customer-focused. Cost and Asset Management Efficiency are considered internal-focused. All SCOR metrics are grouped within one of the performance attributes.

Each Performance Attribute has one or more level-1/strategic metrics. These level-1 metrics are the calculations by which an organization can measure how successful it is in achieving its desired positioning within the competitive market space.

Performance Attribute	Level-1 Strategic Metric
Reliability	• Perfect Order Fulfillment (RL.1.1)
Responsiveness	• Order Fulfillment Cycle Time (RS.1.1)
Agility	• Upside Supply Chain Adaptability (AG.1.1) • Downside Supply Chain Adaptability (AG.1.2) • Overall Value at Risk (AG.1.3)
Cost	• Total Supply Chain Management Costs (CO.1.1) • Cost of Goods Sold (COGS) (CO.1.2)
Asset Management Efficiency	• Cash-to-Cash Cycle Time (AM.1.1) • Return on Supply Chain Fixed Assets (AM.1.2) • Return on Working Capital (AM.1.3)

Table 2 - The SCOR Level-1 Metrics

The SCOR metrics are organized in a hierarchical structure. SCOR describes level-1, level-2 and level-3 metrics. The relationships between these levels is diagnostic. Level-2 metrics serve as diagnostics for level-1 metrics. This means that by looking at the performances of the level-2 metrics; performance gaps or improvements for level-1 metrics can be explained. This type of analysis of the performance of a supply chain is referred to as metric decomposition or root-causing. Similarly, level-3 metrics serve as diagnostics for level-2 metrics. The level of a metric is included in the codification of the metric itself.

Metrics codification starts with the performance attributes: Reliability - RL, Responsiveness - RS, Agility - AG, Cost - CO, and Asset Management - AM. Each metric starts with this two-letter code, followed by a number to indicate the level, followed by a unique identifier. For example: Perfect Order Fulfillment is RL.1.1 - a level-1 metric within the Reliability attribute. Perfect Condition is RL.2.4, a Reliability metric at level-2.

Process / Practice Maturity provides a qualitative comparison of supply chain processes and practices to descriptive representations of different levels of process and practice adoption and implementation. This evaluation measurement of supply chain process and practice effectiveness typically follows widely used models for Practice Maturity (sometimes referred to as Capability Maturity Models). Numerous maturity models exist for supply chain management, which typically follow a “Stages of Maturity” scale where “High Maturity” processes employ, and often extend, best practice and are implemented with a high degree of discipline and compliance, while “Low Maturity” processes are characterized by outdated practices and/or lack of discipline and consistency. SCOR does not currently embed a prescribed maturity model framework and content directly into the SCOR model document. The Performance section provides an overview of this important element of Supply Chain Performance, and the SCOR user is encouraged to draw upon existing maturity models to develop and tailor the content to their industry and company.

Processes

The Process section in SCOR provides a set of pre-defined descriptions for activities most companies perform to effectively execute their supply chains. The six macro-level SCOR processes Plan, Source, Make, Deliver, Return and Enable are well-known and widely adopted. SCOR identifies 2 more levels of process. Level here indicates the span of the process: A level-3 process is focused on a more detailed activity. A level-1 process spans multiple level-3 processes. Graphic 4 shows the levels within the SCOR model processes.

Level-2 process categories determine the capabilities within the level-1 processes. The key level-2 processes are Make-to-Stock vs. Make-to-Order vs. Engineer-to-Order for Source, Make and Deliver processes and Defective vs. MRO vs. Excess for the Return process. Level-3 processes are process steps that are performed in a certain sequence in order to plan supply chain activities, source materials, make products, deliver goods and services and handle product returns.

Companies may develop standard process descriptions of activities within the level-3 processes -- so called level-4 processes. Level-4 processes are generally industry, product, location and/ or technology specific. For example: Most if not all companies need to perform a task known as "receive, enter and validate a customer order". This is a level-3 process (for example sD1.2). The level-4 processes would describe the steps how the order was received. Examples would be EDI, fax, telephone, and walk-in. Each of these may require a unique level-4 process description. Another step you would describe how the order was entered. EDI maybe automatically loaded by certain software, fax and phone orders are entered by the order desk, walk-ins are processed at the checkout counter. And so on.

The level at which processes need to be described depends on the project. For most projects level-2 process diagrams help identify structural issues in the supply chain: "Why do we have a warehouse feeding a warehouse, feeding a warehouse?" or "Lead-time are long due to where we source some of these materials". Level-3 process diagrams help identify decision points, triggers and process disconnects. For example: A sourcing model where I only take inventory ownership after I shipped it to my customer -- a.k.a. "consignment inventory" -- is described at level-3. Another sourcing alternative vendor managed inventory is also defined at level-3. Both need the standard level-3 processes, but the way these processes are sequenced and who performs them is the differentiator.

Process codification differs by level. Level-1 processes are represented by a capital letter preceded by the letter “s” (stands for SCOR): sP for Plan, sS for Source, sM for Make, sD for Deliver and sR for Return. Level-2 processes add a number for most level-2 processes: sD1 for Deliver Stocked Products, sP3 for Plan Make. Level-3 processes add a period followed by a unique number: sD1.1 for Process Inquiry and Quote, sD1.2 for Receive, Enter and Validate Order. Exceptions exist for Return processes: Level-2 Return processes are split into Source Return (sSRx) and Deliver Return (sDRx) processes to acknowledge the difference between returning something yourself or receiving a return from your customer. The level-3 processes are aligned with these codes: sDR1.1 is Authorize Defective Product Return.

Practices

The practices section, formerly known as 'best practices', provides a collection of industry-neutral practices companies have recognized for their value. A practice is a unique way to configure a process or a set of processes. The uniqueness can be related to the automation of the process, a technology applied in the process, special skills applied to the process, a unique sequence for performing the process, or a unique method for distributing and connecting processes between organizations.

SCOR recognizes that several different qualifications of practices exist within any organization (SCOR ID):

- Emerging practices (BP.E)
- Best practices (BP.B)
- Standard practices (BP.S)

SCOR recognizes the qualification of a practice may vary by industry or geography. For some industries a practice may be standard, whereas the same practice may be considered an emerging or best practice in another industry. The SCOR classification of practices has been established based on input from practitioners and experts from a diverse range of industries. All SCOR practices have been mapped to one or more classifications. SCOR 12 recognizes 21 classifications. Classifications help identify practices by focus area, for example: inventory management or new product introduction.

People

The People section of SCOR was introduced in SCOR 10 and provides a standard for describing skills required to perform tasks and manage processes. Generally, these skills are supply chain specific. Some skills identified may be applicable outside the supply chain process domain.

Skills are described by a standard definition and association to other People aspects: Experiences, Trainings and Competency level. Competency level is not included in the framework descriptions. SCOR recognizes 5 commonly accepted competency levels:

- Novice: Untrained beginner, no experience, requires and follows detailed documentation
- Beginner: Performs the work, with limited situational perception.
- Competent: Understands the work and can determine priorities to reach goals.
- Proficient: Oversees all aspects of the work and can prioritize based on situational aspects.
- Expert: Intuitive understanding. Experts can apply experience patterns to new situations.

These competency levels are used similarly as process or practice maturity levels. The person or job specification is evaluated on the found (person) or desired (job specification) level of competency.

Codification within the People section consists of coding of the Skills as well as the Experiences and Training that define the Skills. All People elements start with a capital letter H followed by a capital letter representing the element: S for Skills, E for Experiences and T for Trainings. These are followed by a period and a four-digit number. For example, HS.0046 is the code for “ERP Systems” skill, HT.0007 is the code for APICS CSCP training.

SCOR Improvement Program and SCOR Racetrack

The SCOR Racetrack model describes how to organize a SCOR improvement program using the SCOR process and supporting methodologies

The methodology is described in 5 distinct steps:

- **Pre-SCOR Program Steps:** Prepare the organization for the mission critical SCOR improvement program
- **Set the Scope:** Understand the business environment and define the scope of the supply chain for a SCOR improvement program
- **Configure the Supply Chain:** Determine the performance metrics and processes of the SCOR improvement program
- **Optimize Projects:** Establish the project portfolio including process scope, priority, and anticipated benefits.
- **Ready for Implementation:** Implement projects in the portfolio and commence benefits realization.

Please see Graphic 5 on the next page to see the SCOR Racetrack model in detail. The SCOR Improvement methodology is currently described in full in the SCOR-P Training material.

Graphic 5 - SCOR Racetrack

SCOR v12 Updates

The SCOR model is developed and maintained by the voluntary efforts of APICS members and supply chain industry subject matter experts. APICS depends on the contributions of its members to actively advance the state of knowledge in supply chain by identifying required model changes, researching and validating those changes, and developing the consensus regarding the proposed changes. Similar to the Job Task Analysis (JTA) process that is used to update APICS certification content, a research survey was distributed to nearly 60,000 supply chain professionals worldwide to gauge wide-spread industry acceptance and/or adoption for new business process methodologies and their associated activities. All SCOR framework updates were determined as a direct result of the field's importance ratings and the combined efforts of the subject matter expert task force.

The following updates were included in this revision of the SCOR framework.

Performance

Reliability

- Perfect Order Fulfillment, RL.1.1, was definitionally updated to align with APICS Dictionary

Responsiveness

- Return Cycle Time, RS.2.5, was added as a Level 2 metric

Agility

The SCOR Agility Attribute hierarchy was updated due to duplicative nature in measuring agility as a percentage as well as in a time frame.

- Upside Supply Chain Flexibility and supporting Level 2 metrics were omitted
- New Agility hierarchy now consists of:
  - AG.1.1 Upside Supply Chain Adaptability
  - AG.1.2 Downside Supply Chain Adaptability
  - AG.1.3 Overall Value at Risk
- Time to Recovery, AG.2.15 was added as a Level 2 metric under Overall Value at Risk (VaR), AG.1.3

Cost

The SCOR Cost Attribute hierarchy was updated due to the complexity of accurately measuring Total Cost to Serve and its elements in a consistent fashion as cost allocations can significantly differ by company.

- Total Cost to Serve was replaced with Total Supply Chain Management Costs
- New Cost hierarchy now consists of:
  - CO.1.1 Total Supply Chain Management Costs
  - CO.1.2 Costs of Goods Sold (COGS)

Process

All SCOR processes now have process workflows developed by the SCOR BPM Accelerator, powered by ARIS and Visual Enterprise Architecture (VEA). This ensures all inputs, outputs, and objects are accurately mapped. These new workflows will also now be included in the BPM Accelerator. For more information on the BPM Accelerator, please contact APICS Corporate Development at corporatedevelopment@apics.org.

sM - Make

- Section definitions were updated to better align with the service industry and digital environment

sD - Deliver

- New Best Practice, Omni-channel – BP.176, was aligned with all Deliver Process activities under the associated Process hierarchy tables

sE – Enable

- Manage Supply Chain Network, sE7, was updated to include suppliers as a network element
- Enable Supply Chain Procurement, sE10, was developed in in conjunction with procurement standards outlined by the Chartered Institute of Procurement & Supply (CIPS). For more information on globally recognized procurement and supply practices please visit the CIPS website at www.cips.org
- Enable Supply Chain Technology, sE11, was developed to define, deploy, and manage technology enablement in the supply chain.

Practices

All practices listed in v11 were carefully reviewed and rearranged into the appropriate section – Emerging, Best, or Standard. Some practices were determined to be "declining" and were deleted for the SCOR v12 update. All changes were validated by fielding supply chain subject matter experts.

The following new practices were introduced in this version update:

Emerging Practice
BP.176 Omni-channel
BP.177 Additive Manufacturing
BP.178 Block Chain
BP.179 Demand Driven MRP
BP.180 Demand Driven S&OP
BP.181 Digital Supply Chain
BP.182 Internet of Things
BP.183 Integrated Business Planning
BP.184 Scenario Planning
BP.188 SCM Object Synchronization – "3/4-way Match"

Best Practice
BP.173 Supply Chain Risk Monitoring
BP.174 Supply Chain Risk Assessment
BP.175 Metadata
BP.185 Cost of Quality
BP.186 Data / Analytics
BP.187 Supply Chain Finance

People

Major updates in the SCOR People section include:

- Removal of Aptitudes
- Numerological lists were created for Experiences and Trainings
- Skills associated with the APICS CLTD body of knowledge adopted
- Additional APICS Certifications and Trainings adopted:
    - APICS CLTD – Certified in Logistic, Transportation and Distribution
    - APICS Principles trainings
        - Distribution and Logistics
        - Inventory Management
        - Managing Operations
        - Manufacturing Management
        - Operations Planning

Special Application Update

GreenSCOR replaced by SustainableSCOR

SustainableSCOR is based upon The Global Reporting Initiative's (GRI) Sustainability Reporting Standards (GRI Standards) that are within scope of the SCOR model. The GRI Standards were chosen as a reference because GRI has created a common language for organizations and stakeholders, with which the economic, environmental, and social impacts of organizations can be communicated and understood. The GRI Standards are designed to enhance the global comparability and quality of information on these impacts, thereby enabling greater transparency and accountability of organizations. GRI Standards are free to use and are available to the public at - www.globalreporting.org/standards.

SustainableSCOR uses the GRI definitions and measures when dealing with the sustainability environmental topics (GRI 300 series topic-specific Standards). This approach is being used to help supply chain professionals gain visibility of the environmental topics that are in their supply chain network and value chain network, and enable them to model and manage these impacts. A value chain covers the full range of an organization's upstream and downstream activities, which encompass the full life cycle of a product or service, from its conception to its end use.

Only GRI metrics that are within the realm of supply chain management, sourcing, and managing the risk related to supply chain operations will be included in the scope of the SCOR model.

When the SCOR model uses an element that aligns with a GRI disclosure, the specific GRI disclosure number will be cross-referenced. Please note that the GRI reporting guidelines shall be followed when making any reporting claims by organizations.

SCOR 12.0 replaces GreenSCOR with an updated and expanded environmental accounting framework (SustainableSCOR) that is based upon the GRI Standards. Care should be taken when transitioning from GreenSCOR to SustainableSCOR.

The only metric that directly links from one framework to the other is Total Air Emissions. However, GreenSCOR's definition was not as precise as the SustainableSCOR definition for Total Air Emissions.

Other metrics to pay close attention to are as follows:

The Carbon footprint metric from the GreenSCOR model is similar to GHG emissions, but not completely the same. SustainableSCOR, following the GRI Standards, has scope 1, 2 and 3 GHG emissions. Additionally, there are also emissions of ozone-depleting substances (ODS).

GreenSCOR uses a % recycled metric. Recycled and reclaimed definitions that are used in SustainableSCOR are very different than GreenSCOR and follow the GRI Standards.

GreenSCOR has liquid emissions. SustainableSCOR, following GRI, liquid emissions can be in the form of water discharge, hazardous or non-hazardous emissions.

GreenSCOR measures solid emissions. SustainableSCOR, following the GRI Standards, measures hazardous or non-hazardous emissions.

Contributors to SCOR v12.0

The development of SCOR depends on the support and input from SCOR practitioners, subject matter experts, and APICS members. The following individuals have devoted time and effort to the development of SCOR v12. Thank you!

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Performance

Introduction to Performance

The performance section of SCOR focuses on the measurement and assessment of the outcomes of supply chain process execution. A comprehensive approach to understanding, evaluating, and diagnosing supply chain performance consists of three elements: Performance Attributes, Metrics, and Process / Practice Maturity. Elements, as distinct from the Levels in the Process and Metrics hierarchies, describe different aspects or dimensions of performance:

- **Performance Attributes:** Strategic characteristics of supply chain performance used to prioritize and align the supply chain's performance with the business strategy
- **Metrics:** Discrete performance measures, themselves comprised of levels of connected hierarchy
- **Process/Practice Maturity:** Objective, specific descriptions used a reference tool to evaluate how well supply chain processes and practices incorporate and execute accepted best-practice process models and leading practices.

Performance Attribute

A performance attribute is a grouping or categorization of metrics used to express a specific strategy. An attribute itself cannot be measured; it is used to set strategic direction. For example: "The LX product needs to be leading the competition in reliability" and "The xy-market requires us to be among the top 10 agile manufacturers". Metrics measure the ability to achieve these strategic directions. SCOR recognizes 5 performance attributes:

Reliability

The Reliability attribute addresses the ability to perform tasks as required. Reliability focuses on the predictability of the outcome of a process. Metrics for the Reliability attribute include: On-time, the right quantity, and with the right documentation. The SCOR key performance indicator (level-1 metric) is Perfect Order Fulfillment. Reliability is a customer focused attribute.

Responsiveness

The Responsiveness attribute describes the speed at which tasks are performed. Responsiveness addresses repeated speed of doing business. Examples of Responsiveness metrics are cycle time metrics related to speed to source, to make, and to deliver. The SCOR key performance indicator for Responsiveness is Order Fulfillment Cycle Time. Responsiveness is a customer focused attribute.

Agility

The Agility attribute describes the ability to respond to external influences; the capability and speed of change. External influences include: Non-forecastable increases or decreases in demand, suppliers or partners going out of business, natural disasters, acts of (cyber) terrorism,availability of financial resources (the economy), labor issues. The SCOR key performance indicators include Adaptability and Value-at-Risk. Agility is a customer focused attribute.

Cost

The Cost attribute describes the cost of operating the supply chain process. Typical costs include labor, materials, systems, and transportation costs. The SCOR key performance indicators for Cost are Total Supply Chain Management Cost and Cost of Goods Sold (COGS).

Asset Management Efficiency

The Asset Management Efficiency ("Assets") attribute describes the ability to efficiently utilize assets. Asset management strategies in supply chain include inventory reduction and in-source vs. outsource. Example metrics include: Inventory days of supply, capacity utilization. The SCOR key performance indicators include: Cash-to-Cash Cycle Time, Return on Fixed Assets. Asset Management Efficiency is an internal focused attribute.

Metric

A metric is a standard for measurement of the performance of a supply chain or process. SCOR metrics are diagnostic metrics (compare to how a diagnosis is used in a medical office). SCOR recognizes three levels of pre-defined metrics:

- Level-1 metrics are diagnostics for the overall health of the supply chain. These metrics are also known as strategic metrics and key performance indicators (KPI). Benchmarking level-1 metrics helps establishing realistic targets to support the strategic directions.
- Level-2 metrics serve as diagnostics for the level-1 metrics. The diagnostic relationship helps to identify the root cause or causes of a performance gap for a level-1 metric.
- Level-3 metrics serve as diagnostics for level-2 metrics.

The analysis of performance of metrics from level-1 through 3 is referred to as metrics decomposition, performance diagnosis or metrics root cause analysis. Metrics decomposition is a first step in identifying the processes that need further investigation. (Processes are linked to level-1, level-2 and level-3 metrics).

SCOR recognizes 10 strategic metrics (level-1 metrics):

Attribute	Level-1 Metric	
Reliability	RL.1.1	Perfect Order Fulfillment
Responsiveness	RS.1.1	Order Fulfillment Cycle Time
Agility	AG.1.1	Upside Supply Chain Adaptability
	AG.1.2	Downside Supply Chain Adaptability
	AG.1.3	Overall Value-at-Risk (VaR)
Cost	CO.1.1	Total SC Management Cost
	CO.1.2	Cost of Goods Sold (COGS)
Asset Management Efficiency	AM.1.1	Cash to Cash Cycle Time
	AM.1.2	Return on Fixed Assets
	AM.1.3	Return on Working Capital

APICS recommends supply chain scorecards to contain at least one (1) metric for each performance attribute to ensure balanced decision making and governance.

Process/Practice Maturity

Research on supply chain performance has repeatedly shown strong correlation between metrics performance and the effectiveness of supply chain processes, including the use of recognized best practices. The measurement of supply chain process and practice effectiveness follows widely used models for Practice Maturity (sometimes referred to as Capability Maturity Models), which compare actual practice to descriptive representations of different levels of process and practice adoption and implementation. “High Maturity” processes employ, and often extend, best practice and are implemented with a high degree of discipline and compliance, whereas “Low Maturity” processes are characterized by outdated practices and/or lack of discipline and consistency. Numerous maturity models exist for supply chain management, but they typically follow a “Stages of Maturity” scale of five levels, e.g.:

Stage 1: Initial; Little or no process structure or consistency, ad hoc.

Stage 2: Managed; Basic functional capabilities with limited cross-functional alignment and integration.

Stage 3: Defined; Some integration across supply chain functions, but limited integration with other functions and with supply chain partners.

Stage 4: Quantitatively Managed; Highly integrated supply chain processes across the enterprise, with selective integration with supply chain partners. General alignment to business strategy and goals. High use of IT and Digital enablement.

Stage 5: Optimizing; Highly integrated supply chain processes across the enterprise and with supply chain partners. Closely aligned to business strategy and goals. Extensive use of IT and Digital enablement and related best practices.

Reliability

RL.1.1 Perfect Order Fulfillment

The percentage of orders meeting delivery performance with complete and accurate documentation and no delivery damage. Components include all items and quantities on-time using the customer's definition of on-time, and documentation - packing slips, bills of lading, invoices, etc. The APICS Dictionary defines Perfect Order as an order in which the "seven Rs" are satisfied: the right product, the right quantity, the right condition, the right place, the right time, the right customer, and the right cost. The SCOR model addresses the "seven R's" through a single strategic metric called Perfect Order Fulfillment (POF) which groups right product and right quantity into one level 2 metric called % of Orders Delivered in Full, right time and right location (and right customer implicit) are grouped into one level 2 metric called Delivery Performance to Customer Commit Date, right condition is measured in level 2 Perfect Condition metric and right cost is measured with the overall Cost strategic attribute.

Calculation

[Total Perfect Orders] / [Total Number of Orders] x 100%

Note: an Order is Perfect if the individual line items making up that order are all perfect.

The Perfect Order Fulfillment calculation is based on the performance of each Level 2 component of the order line to be calculated (product & quantity, date & time & Customer, documentation and condition). For an order line to be perfect, all of the individual components must be perfect.

- An order is considered perfect if the products ordered are the products provided and the quantities ordered match the quantities provided (% In Full).
- A delivery is considered perfect if the location, specified customer entity and delivery time ordered is met upon receipt (Delivery Performance to Customer Commit Date).
- Documentation supporting the order line is considered perfect if it is all accurate, complete, and on time (Accurate Documentation).
- The product condition is considered perfect if the product is delivered/faultlessly installed (as applicable) on specification, with the correct configuration, with no damage, customer ready, and is accepted by the customer (Perfect Condition)

The calculation of line item perfect order line fulfillment is based on the Level 2 components:

- Each component receives a score of 1 if it is judged to be perfect.
- It receives a score of 0 if not perfect.

If the sum of the scores equal the number of components (in this case, 4) the order line is perfectly fulfilled.

Data collection

Data for the components that are used to drive the calculation of supply chain performance are primarily taken from Deliver and impact Deliver Enable process elements. These are primarily associated with the original commitment (Customer Order Processing – D1.2, D 2.2, D3.3) and the satisfaction of that commitment (Receipt and Installation (as appropriate) – D1.11, D1.13, D1.14, D1.15, D2.11, D2.13, D2.14, D2.15, D3.11, D3.13, D3.14, D3.15). In addition, the documents necessary for support of the supply chain process should be scored across the set of Deliver process elements. The Enable Deliver Process Element - Assess Delivery Performance (ED.2) should be updated from metrics derived.

Discussion

The performance of the supply chain is considered “perfect” if the original commitment made to a customer is met through the supply chain.

An order is defined as a collection of one or more order lines representing a request to deliver specified quantities of goods or to render specific services. The order can further be defined as a request (with a specific identifier as a reference) to deliver specified items or to render specific services with specific prices, dates, and quantities. Commitments are made to a customer at the order line level, where an order line is defined as a line representing a commitment on a sales order. An order line always references a product or service.

For an order to be considered perfect the following standards must be met:

- Delivered complete; all items on the order line are delivered in the quantities specified
- Delivered on time to the initial commitment date, using the customer’s definition of on-time delivery
- Documentation supporting the order including packing slips, bills of lading, invoices, quality certifications, etc., is complete and accurate
- Faultlessly installed (as applicable), correct configuration, customer-ready and accepted, no damage, on specification

Orders canceled by the customer are excluded from the metric. Order changes initiated by the customer and agreed to by the supplier supersede initial commitments and form a new comparative basis for the metric.

Often for date and quantity issues (and occasionally product), a range rather than a strict value is used. This is acknowledged as a standard practice; in those situations, the standard measured is considered to be met perfectly if the range specified is satisfied.

The term “customer-ready” for the perfect condition standard may imply a subjective component based on the customer’s satisfaction. Although condition may not be as rigorously measured as time or quantity it should be considered as a component if available, especially since this attribute measures performance of the supply chain which is, of course, ultimately measured by its customers.

It should also be noted that a corresponding evaluation of suppliers’ performances could be determined by extending these standards to each supplier’s ability to source products.

Hierarchy	
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
RL.2.3	Documentation Accuracy
RL.2.4	Perfect Condition

Processes	
SCOR	Supply Chain
sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product
sM2	Make-to-Order
sM3	Engineer-to-Order
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product

RL.1.1

Perfect Order Fulfillment

Practices	
BP.159	Electronic Data Interchange (EDI)
BP.014	Demand Planning & Forecasting
BP.019	Demand Planning
BP.020	Demand Management
BP.021	Sales and Operations Planning
BP.027	Pull-Based Inventory Replenishment
BP.028	Inventory Optimization
BP.035	Business Rule Review
BP.040	MTO Order Fulfillment Strategy
BP.117	Embed Specialized Services
BP.119	Generation of Dynamic Bills of Materials
BP.120	3D Print / Rapid Prototyping
BP.121	Digital Packaging on Demand
BP.153	Bar coding/RFID
BP.165	Convergence of SCOR with Lean and Six Sigma
BP.183	Integrated Business Planning (IBP)
BP.184	Scenario Planning

RL.2.1 % of Orders Delivered In Full

Percentage of orders which all of the items are received by customer in the quantities committed. The number of orders that are received by the customer in the quantities committed divided by the total orders.

Calculation

[Total number of orders delivered in full] / [Total number of orders delivered] x 100%

An order is considered delivered "in full" if:

- All items ordered are the items actually provided, and no extra items are provided
- All quantities received by the customer match the order quantities (within mutually agreed tolerances)

Data Collection

Data for the components that are used to drive the calculation of % In Full are primarily associated with the original order processing step of 'Reserve inventory and Determine Delivery Date' (sD1.3, sD2.3, sD3.3), inventory availability (sM1.1, sM2.1, sM3.1) including inventory location accuracy (sE2), and the satisfaction of that commitment through the shipment and customer receiving processes (sD1.12, sD1.13, sD2.12, sD.2.13, sD3.12, sD3.13).

Discussion

Order quantities are based on item / quantity original commitments agreed to by the customer. Orders canceled by the customer are excluded from the metric. Order changes initiated by the customer and agreed to by the supplier supersede original commitments and form a new comparative basis for the metric. This metric has no "timing" element, such that orders deliberately split by the supplier should still be considered “in full” so long as all metric criteria are met. In some cases, such as for supplying bulk materials, committed quantities refer to a range that is acceptable to the customer rather than a strict value.

Several SCOR diagnostic metrics exist that can be used to focus "% In Full" improvement efforts. Some of these include:

- % Orders Scheduled to Requested Quantity
- Schedule Achievement
- Yield variability
- Planned Shipment Fill Rate (not yet defined)
- % Stock Outs (not yet defined)
- Inventory Cycle Count Accuracy (not yet defined)

Orders may not be filled completely to the customer’s original request quantity due to the inability to schedule to the initial request. Breakdown may also occur from the inventory availability (including stock outs for Make-to-Stock and schedule achievement for Make-to-Order and Engineer-to-Order processes) and inventory location accuracy. Lastly, a deviation from the shipment plan may lead to inability to fulfill an order completely.

Hierarchy	
RL.3.33	Delivery Item Accuracy
RL.3.35	Delivery Quantity Accuracy

RL.2.1 % of Orders Delivered In Full

Processes	
sD1.3	Reserve Inventory and Determine Delivery Date
sD1.12	Ship Product
sD1.13	Receive and verify Product by Customer
sD2.3	Reserve Inventory and Determine Delivery Date
sD2.12	Ship Product
sD3.3	Enter Order, Commit Resources & Launch Program
sD3.12	Ship Product
sD3.13	Receive and verify Product by Customer

Practices	
BP.017	Distribution Planning
BP.019	Demand Planning
BP.022	MRP I
BP.144	Purchase Order Management
BP.145	Vendor Collaboration

RL.2.2 Delivery Performance to Customer Commit Date

The percentage of orders that are fulfilled on the customer's originally committed date.

Calculation

[Total number of orders delivered on the original commitment date] / [Total number of orders delivered] x 100%

An order is considered delivered to the original Customer commitment date if:

- The order is received on time as defined by the customer
- The delivery is made to the correct location and Customer entity

Data Collection

Data for the components that are used to drive the calculation of Delivery Performance to Customer Commit Date are primarily associated with the original order processing step of 'Reserve inventory and Determine Delivery date' (D1.3, D2.3 & D3.3), and the satisfaction of that commitment through the shipment and customer receiving processes (D 1.12, D1.13, D2.12, D2.13, D3.12, D3.13).

Discussion

Order delivery performance from a timing perspective is based on original commitments agreed to by the customer. The acceptable window for delivering on time should be defined in the customer' service level agreement. Orders canceled by the customer are excluded from the metric.

Order changes impacting the timing of a delivery that are initiated by the customer and agreed to by the supplier supersede original commitments and form a new comparative basis for the metric. The original commitment date can refer to a range, rather than a strict date and time, which is acceptable to the customer (e.g. advanced shipments). This metric has no "In Full" element, such that partial deliveries can still be considered as meeting the Customer Commit Date so long as all metric criteria are met. Measuring the frequency of accepting the customer's original request date, vs. commit date, can be an important measure of customer satisfaction.
Several SCOR diagnostic metrics exist that can be used to focus delivery performance improvement efforts. Some of these include:

- % Orders Scheduled to Request
- % Orders Shipped on time (not yet defined)
- Carrier Performance Reliability (not yet defined)

Orders may not be delivered to the Customer Commit Date due to breakdowns in the order fulfillment and shipment process (e.g. Transportation availability). Orders may also be delivered late due to carrier delivery performance / issues.

Hierarchy	
RL.3.32	Customer Commit Date Achievement Time Customer Receiving
RL.3.34	Delivery Location Accuracy

RL.2.2 Delivery Performance to Customer Commit Date

Processes	
sD1.3	Reserve Inventory and Determine Delivery Date
sD1.11	Load Vehicle and Generate Shipping Documents
sD1.11	Load Vehicle and Generate Shipping Documents
sD1.12	Ship Product
sD1.13	Receive and verify Product by Customer
sD2.3	Reserve Inventory and Determine Delivery Date
sD2.11	Load Product & Generate Shipping Docs
sD2.12	Ship Product
sD2.13	Receive and verify Product by Customer
sD3.3	Enter Order, Commit Resources & Launch Program
sD3.12	Ship Product
sD3.13	Receive and verify Product by Customer

Practices	
BP.017	Distribution Planning
BP.018	ABC Inventory Classification System
BP.019	Demand Planning
BP.024	Supply Chain Optimization (SCO)
BP.026	Improve S&OP process
BP.115	Transportation Management System
BP.116	Expedited Logistics
BP.118	Transportation Management Outsourcing
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool

RL.2.3 Documentation Accuracy

Percentage of orders with on time and accurate documentation supporting the order, including packing slips, bills of lading, invoices, etc.

Calculation

[Total number of orders delivered with accurate documentation] / [Total number of orders delivered] x 100%

An order is considered to have accurate documentation when the following are accepted by the customer:

Documentation supporting the order includes:

- Shipping documentation:
  - Packing slips (Customers)
  - Bill of lading (Carriers)
  - Government or Customs documentation / forms
- Payment Documentation:
  - Invoice
  - Contractual outline agreement
- Compliance documentation
  - Material Safety Data Sheets
- Other required documentation
  - Quality certification

All documentation must be complete, correct, and readily available when and how expected by the customer, Government and other supply chain regulatory entities.

Data Collection

Data for the components that are used to drive the calculation of Accurate Documentation are primarily associated with the Deliver processing step of 'Load Product & Generate Shipping Documentation' (D1.11, D2.11, D3.11), and 'Invoice' (D1.15, D2.15, D3.15).
The data collection step is part of Assess Delivery Performance (ED2) and Manage Deliver Information (ED3)

Discussion

This metric is calculated at the order level. The timeliness and quality of the documentation is measured from the perspective of the customer, Government, and other regulatory entities. Documentation may be late or incomplete due to the inability to prepare/process the correct documentation on time. Inaccurate or late shipping documentation may prevent the product to be loaded or shipped, increase the customs delay, and delay the customer's acceptance of the order. Inaccurate or late invoices may also lead to the inability to fulfill the customer request.
The definition encompasses on time and accurate documentation. However, on-time documentation implies a scheduled ship date and scheduled invoice date.
Accurate documentation metrics are similar to what exists for SOURCE process metrics
Possible diagnostic metrics that can be used to focus Accurate Documentation improvement efforts include:

- % orders documentation (shipping and invoice) processed on time
- % faultless invoices

RL.2.3 Documentation Accuracy

Hierarchy	
RL.3.31	Compliance Documentation Accuracy
RL.3.43	Other Required Documentation Accuracy
RL.3.45	Payment Documentation Accuracy
RL.3.50	Shipping Documentation Accuracy

Processes	
sD1.11	Load Vehicle and Generate Shipping Documents
sD1.15	Invoice
sD2.11	Load Product & Generate Shipping Docs
sD2.15	Invoice
sD3.11	Load Product & Generate Shipping Docs
sD3.15	Invoice

Practices	
BP.012	Lot Tracking
BP.030	Inventory Record Accuracy
BP.062	Master Data Accuracy
BP.147	Receiving Goods Inspection
BP.148	3-Way Delivery Verification

RL.2.4 Perfect Condition

Percentage of orders delivered in an undamaged state that meet specification, have the correct configuration, are faultlessly installed (as applicable) and accepted by the customer.

Calculation

[Number of orders delivered in Perfect Condition] / [Number of orders delivered] x 100%

An order is considered to be delivered in perfect condition if all items meet the following criteria:

- Undamaged
- Meet specification and has correct configuration (as applicable)
- Faultlessly installed (as applicable) and accepted by the customer
- Not returned for repair or replacement (within the warranty period)

Data Collection

Data for the components that are used to drive the calculation of "Perfect Condition" are primarily associated with the receipt, installation (as applicable) and satisfaction of the order commitment (D1.13, D1.14, D2.13, D2.14, D3.13, D3.14). The Enable Deliver Process Element - Assess Delivery Performance (ED.2) should be updated to reflect this metric and its components. This data is typically available from a complaints, claims, or warranty/returns database.

Discussion

This metric, calculated at the order level, assesses the quality of products delivered through the supply chain from the customer's perspective. Justified and non-justified product quality issues, claims and returns within the warranty period are included and count against this metric. Improving this metric lowers the supply chain cost associated with claims and returns.
Several SCOR diagnostic metrics exist that can be used to focus Perfect Condition improvement efforts. Some of these include:

- Cost of Noncompliance
- Damage and Shrinkage
- Scrap Expense
- Warranty Costs
- Yield Variability

Hierarchy	
RL.3.12	% of Faultless Installations
RL.3.24	% Orders/lines received damage free
RL.3.41	Orders Delivered Damage Free Conformance
RL.3.42	Orders Delivered Defect Free Conformance
RL.3.55	Warranty and Returns

Processes	
sD1.13	Receive and verify Product by Customer
sD1.14	Install Product
sD2.13	Receive and verify Product by Customer

RL.2.4 Perfect Condition

sD2.14	Install Product
sD3.13	Receive and verify Product by Customer
sD3.14	Install Product

Practices	
BP.089	Perfect Pick Put away
BP.147	Receiving Goods Inspection

RL

Level-3 Metrics		
RL.3.1	# of complaints regarding missing environmental documentation The number of products released without proper environmental documentation as a percent of total products released	• sM1.6 Release Product to Deliver
RL.3.2	# of recordkeeping related NOVs The number of recordkeeping related regulatory violations received per year	• sM1.6 Release Product to Deliver
RL.3.4	% correct material documentation The percent of total shipments that include the correct environmental documentation	• sD1.10 Pack Product • sD2.9 Pick Product • sD3.8 Receive Product from Source or Make
RL.3.5	% Error-free Returns Shipped % Error-free Returns Shipped	• sSR1.5 Return Defective Product • sSR2.5 Return MRO Product • sSR3.5 Return Excess Product
RL.3.6	% Identified MRO Products Returned To Service % Identified MRO Products Returned To Service	• sSR2.2 Disposition MRO Product
RL.3.7	% Item Location Accuracy % Item Location Accuracy	• sD4.5 Fill Shopping Cart
RL.3.10	% of Excess Product Returns Delivered Complete to the Designated Return Center Correct destination, according to the schedule, with the correct part and documentation	• sSR3 Source Return Excess Product • sDR3 Deliver Return Excess Product
RL.3.11	% of Faultless Invoices The number of invoices processed without issues and or errors divided by the total number of invoices. Examples of potential invoice defects are: Change from customer purchase order without proper customer involvement Wrong Customer Information (e.g., name, address, telephone number) Wrong Product Information (e.g., part number, product description) Wrong Price (e.g., discounts not applied) Wrong Quantity or Wrong Terms or Wrong Date	• sD1.15 Invoice • sD2.15 Invoice • sD3.15 Invoice
RL.3.12	% of Faultless Installations Number of Faultless Installations divided by Total Number of Units Installed.	• sD1.14 Install Product
RL.3.13	% of MRO returns delivered to the correct service provider location	• sDR2 Deliver Return MRO Product

	% of MRO returns delivered to the correct service provider location, within schedule, with the correct part and documentation	
RL.3.14	% of products meeting specified environmental performance requirements The number of products that meet desired environmental performance specifications as a per cent of total products produced	• sM2.6 Release Finished Product to Deliver
RL.3.15	% of products with proper environmental labeling (if required) The number of products with proper environmental labels in place as a per cent of total products produced	• sM2.6 Release Finished Product to Deliver
RL.3.16	% of suppliers meeting environmental metrics/ criteria Number of suppliers that completely meet agreement environmental criteria divided by the total number of suppliers used.	• sD1.7 Select Carriers and Rate Shipments • sD2.7 Select Carriers and Rate Shipments
RL.3.17	% of suppliers with an EMS or ISO 14001 certification Percent of suppliers used that have a validated Environmental Management System or ISO 14000 certification	• sS3.2 Select Final Supplier and Negotiate
RL.3.18	% Orders/ Lines Processed Complete The number of orders / lines that are processed complete divided by the total orders / lines processed within the measurement period	• sS1.2 Receive Product • sS2.2 Receive Product • sS3.4 Receive Product
RL.3.19	% Orders/ Lines Received Defect Free The number of orders / lines that are received defect free divided by the total orders / lines processed in the measurement period.	• sS1.3 Verify Product • sS2.3 Verify Product • sS3.5 Verify Product
RL.3.20	% Orders/ Lines Received On-Time to Demand Requirement The number of orders / lines that are received on- time to the demand requirements divided by the total orders / lines for the demand requirements in the measurement period	• sS1.2 Receive Product • sS2.2 Receive Product • sS3.4 Receive Product
RL.3.21	% Orders/ lines received with correct content Percent of orders or lines received that have the correct material content as specified in the product design specs and supplier agreements.	• sS1.3 Verify Product • sS2.3 Verify Product • sS3.5 Verify Product
RL.3.22	% Orders/ lines received with correct packaging Percent of orders or lines received that are packaged correctly with the right type and quantity of packaging material.	• sS1.2 Receive Product • sS2.2 Receive Product • sS3.4 Receive Product

RL.3.23	% Orders/ Lines Received with Correct Shipping Documents The number of orders / lines that are received on- time with correct shipping documents divided by the total orders / lines processed in the measurement period	• sS1.2 Receive Product • sS2.2 Receive Product • sS3.4 Receive Product
RL.3.24	% Orders/lines received damage free The number of orders / lines that are processed damage free divided by the total orders /lines processed in the measurement period	• sS1.3 Verify Product • sS2.3 Verify Product • sS3.5 Verify Product
RL.3.25	% Product Transferred On-Time to Demand Requirement The number of product orders / lines that are transferred on-time to demand requirements divided by the total orders / lines transferred in the measurement period	• sS1.4 Transfer Product • sS2.4 Transfer Product • sS3.6 Transfer Product
RL.3.26	% Product Transferred without Transaction Errors The number of transactions processed without error divided by the total transactions processed in the measurement period.	• sS1.4 Transfer Product • sS2.4 Transfer Product • sS3.6 Transfer Product
RL.3.27	% Schedules Changed within Supplier's Lead Time The number of schedules that are changed within the suppliers lead-time divided by the total number of schedules generated within the measurement period	• sS1.1 Schedule Product Deliveries • sS2.1 Schedule Product Deliveries
RL.3.28	% Shipping Schedules that Support Customer Required Return by Date % Shipping Schedules that Support Customer Required Return by Date	• sS3.3 Schedule Product Deliveries • sSR1.4 Schedule Defective Product Shipment • sSR2.4 Schedule MRO Shipment
RL.3.31	Compliance Documentation Accuracy Percentage of compliance documentations are complete, correct, and readily available when and how expected by customer, Government and other supply chain regulatory entities. Compliance documentation includes material safety data sheets.	• sSR3.4 Schedule Excess Product Shipment • sM1.4 Package • sM2.4 Package • sM3.5 Package • sD1.11 Load Vehicle and Generate Shipping Documents
RL.3.32	Customer Commit Date Achievement Time Customer Receiving Percentage of orders which is received on time as defined by the customer	• sD2.11 Load Product & Generate Shipping Docs • sD3.11 Load Product & Generate Shipping Docs • sD1.13 Receive and verify Product by Customer • sD2.13 Receive and verify Product by Customer

		• sD3.13 Receive and verify Product by Customer
RL.3.33	Delivery Item Accuracy Percentage of orders in which all items ordered are the items actually provided, and no extra items are provided	• sD1.2 Receive, Enter, and Validate Order • sD1.4 Consolidate Orders • sD1.11 Load Vehicle and Generate Shipping Documents • sD1.12 Ship Product • sD1.13 Receive and verify Product by Customer • sD2.2 Receive, Configure, Enter and Validate Order • sD2.4 Consolidate Orders • sD2.11 Load Product & Generate Shipping Docs • sD2.12 Ship Product • sD2.13 Receive and verify Product by Customer • sD3.3 Enter Order, Commit Resources & Launch Program • sD3.6 Route Shipments • sD3.11 Load Product & Generate Shipping Docs • sD3.12 Ship Product • sD3.13 Receive and verify Product by Customer
RL.3.34	Delivery Location Accuracy Percentage of orders which is delivered to the correct location and customer entity	• sD1.2 Receive, Enter, and Validate Order • sD1.4 Consolidate Orders • sD1.11 Load Vehicle and Generate Shipping Documents • sD1.12 Ship Product • sD1.13 Receive and verify Product by Customer • sD2.2 Receive, Configure, Enter and Validate Order • sD2.4 Consolidate Orders • sD2.11 Load Product & Generate Shipping Docs • sD2.12 Ship Product • sD2.13 Receive and verify Product by Customer

		• sD3.3 Enter Order, Commit Resources & Launch Program • sD3.6 Route Shipments • sD3.11 Load Product & Generate Shipping Docs • sD3.12 Ship Product • sD3.13 Receive and verify Product by Customer
RL.3.35	Delivery Quantity Accuracy Percentage of orders in which all quantities received by the customer match the order quantities (within mutually agreed tolerances)	• sD1.2 Receive, Enter, and Validate Order • sD1.4 Consolidate Orders • sD1.11 Load Vehicle and Generate Shipping Documents • sD1.12 Ship Product • sD1.13 Receive and verify Product by Customer • sD2.2 Receive, Configure, Enter and Validate Order • sD2.4 Consolidate Orders • sD2.11 Load Product & Generate Shipping Docs • sD2.12 Ship Product • sD2.13 Receive and verify Product by Customer • sD3.3 Enter Order, Commit Resources & Launch Program • sD3.6 Route Shipments • sD3.11 Load Product & Generate Shipping Docs • sD3.12 Ship Product • sD3.13 Receive and verify Product by Customer
RL.3.36	Fill Rate The percentage of ship-from-stock orders shipped within 24 hours of order receipt. For services, this metric is the proportion for services that are filled so that the service is completed within 24 hours	• sP1.3 Balance Supply Chain Resources with SC Requirements • sP4.4 Establish Delivery Plans • sM1.3 Produce and Test • sD1.3 Reserve Inventory and Determine Delivery Date • sD1.9 Pick Product

RL.3.37	Forecast Accuracy Forecast accuracy is calculated for products and/or families for markets/distribution channels, in unit measurement. Common calculation (Sum Actuals - Sum of Variance) / Sum Actuals to determine percentage error. *monitoring the delta of Forecast Accuracy over measured time periods can determine success rates.	• sP1.1 Identify, Prioritize and Aggregate Supply Chain Requirements • sP2.1 Identify, Prioritize and Aggregate Product Requirements • sP3.1 Identify, Prioritize and Aggregate Production Requirements • sP4.1 Identify, Prioritize and Aggregate Delivery Requirements • sP4.2 Identify, Assess and Aggregate Delivery Resources • sE4 Manage Supply Chain Human Resources • sE5 Manage Supply Chain Assets • sE6 Manage Supply Chain Contracts • sE7 Manage Supply Chain Network
RL.3.39	Number of occurrences of incorrect designated return center Number of occurrences of incorrect designated return center	• sSR3.2 Disposition Excess Product
RL.3.40	Number of occurrences where excessive inventory is returned and followed Number of occurrences where excessive inventory is returned and followed	• sSR3.1 Identify Excess Product Condition
RL.3.41	Orders Delivered Damage Free Conformance Percentage of orders which is delivered without damage.	• sD1.13 Receive and verify Product by Customer • sD2.13 Receive and verify Product by Customer • sD3.13 Receive and verify Product by Customer
RL.3.42	Orders Delivered Defect Free Conformance Percentage of orders which is delivered without defect	• sD1.13 Receive and verify Product by Customer • sD2.13 Receive and verify Product by Customer • sD3.13 Receive and verify Product by Customer
RL.3.43	Other Required Documentation Accuracy Percentage of other required documentations (besides of compliance documentation, payment documentation and shipping documentation) are	• sD1.11 Load Vehicle and Generate Shipping Documents

	complete, correct, and readily available when and how expected by customer, Government and other supply chain regulatory entities. This kind of documentations includes quality certification	• sD2.11 Load Product & Generate Shipping Docs • sD3.11 Load Product & Generate Shipping Docs
RL.3.45	Payment Documentation Accuracy Percentage of payment documentations are complete, correct, and readily available when and how expected by customer, Government and other supply chain regulatory entities. Payment documentations includes invoice, contractual outline agreement	• sD1.11 Load Vehicle and Generate Shipping Documents • sD2.11 Load Product & Generate Shipping Docs • sD3.11 Load Product & Generate Shipping Docs
RL.3.47	Return Shipments Shipped on Time	• sSR1.5 Return Defective Product • sSR2.5 Return MRO Product • sSR3.5 Return Excess Product
RL.3.49	Schedule Achievement The percentage of time that a plant achieves its production schedule. This calculation is based on the number of scheduled end-items or total volume for a specific period. Note: over-shipments do not make up for under-shipments.	• sM1.1 Schedule Production Activities • sM2.1 Schedule Production Activities • sM3.2 Schedule Production Activities
RL.3.50	Shipping Documentation Accuracy Percentage of shipping documentations are complete, correct, and readily available when and how expected by customer, Government and other supply chain regulatory entities. Shipping documentations includes packing slips (customers), bill of lading (carriers) and government or customs documentation/forms	• sD1.11 Load Vehicle and Generate Shipping Documents • sD2.11 Load Product & Generate Shipping Docs • sD3.11 Load Product & Generate Shipping Docs
RL.3.55	Warranty and Returns Number of returns within the warranty period. Warranty is a commitment, either expressed or implied that a certain fact regarding the subject matter of a contract is presently true or will be true.	• sM1.3 Produce and Test • sM1.4 Package
RL.3.56	Warranty Costs Warranty costs include materials, labor and problem diagnosis for product defects.	• sM1.3 Produce and Test • sM1.4 Package • sM2.3 Produce and Test • sM2.4 Package • sM3.4 Produce and Test • sM3.5 Package
RL.3.57	Waste Processing Errors Number of errors in waste transactions as a percent of total waste transactions	• sM1.7 Waste Disposal • sM2.7 Waste Disposal • sM3.8 Waste Disposal

RL.3.58	Yield The ratio of usable output from a process to its input.	• sM1 Make-to-Stock • sM1.3 Produce and Test • sM1.4 Package • sM2 Make-to-Order • sM2.3 Produce and Test • sM2.4 Package • sM3 Engineer-to-Order • sM3.4 Produce and Test • sM3.5 Package
RL.3.59	Yield Variability The condition that occurs when the output of a process is not consistently repeatable either in quantity, quality, or combination of these.	• sM1.3 Produce and Test • sM2.3 Produce and Test • sM3.4 Produce and Test

Responsiveness

RS.1.1 Order Fulfillment Cycle Time

The average actual cycle time consistently achieved to fulfill customer orders. For each individual order, this cycle time starts from the order receipt and ends with customer acceptance of the order.

Calculation

[Sum Actual Cycle Times for All Orders Delivered] / [Total Number of Orders Delivered] in days

Data collection

Data for the components that are used to drive the calculation of responsiveness are taken from the Source, Make and Deliver process elements.

Discussion

The order fulfillment cycle time as captured from the moment a customer places the order to the moment the order is fulfilled is considered to be a 'gross' cycle time. It represents all the time passed between these two events, regardless of whether this represented cycle time for the activities performed by the organization to fulfill the order (both value-add and non-value-add) or dwell time because the order was placed well in advance by the customer. As such, this gross order fulfillment cycle time does not truly reflect the responsiveness of the organization. Take for example an organization that needs six days to fulfill a certain customer order. If the customer places the order one day in advance, the gross order fulfillment cycle time will be seven days. If the customer places the order 3 months ahead (pre-ordering), the gross fulfillment cycle time will be 96 days. However, the fact that the customer pre-orders does not reduce the responsiveness of the organization. On the contrary, one can argue that it may increase the ability of the organization to meet that order as it allows the organization to plan ahead and fulfill the order in a more optimal way.

The responsiveness of the organization is determined by the cumulative cycle time for all activities that are required to fulfill the order, but should exclude any dwell time where no activity takes place.

Therefore, the definition of Order Fulfillment Cycle Time consists of a 'gross' component and a 'net' component named Order Fulfillment Process Time, according to the following formula Order Fulfillment Cycle Time = Order Fulfillment Process Time + Order Fulfillment Dwell Time. Note that dwell time will equal O for companies who do not utilize this metric, so Order Fulfillment Cycle Time will equal Order Fulfillment Process Time.

Order fulfillment dwell time is defined as 'any lead time during the order fulfillment process where no activity takes place, which is imposed by customer requirements'. Note that this dwell time is different from 'idle time' or 'non-value-add lead time', which is caused by inefficiencies in the organization's processes and therefore ultimately under responsibility of the organization. This kind of idle time should not be deducted from the gross order fulfillment cycle time.

Dwell time is mostly associated with the ordering process, where a customer may place an order in advance to reserve capacity/materials etc., but where the actual steps in the order fulfillment process take place later on. It is also common in the delivery process where the organization may be in principle ready to ship the product/service, but is requested by the customer to wait (for example to follow a certain shipment schedule).

Note: that for those organizations where dwell time does not play a role, the dwell time can be taken as zero days which results in the net order fulfillment cycle time to be equal to the gross order fulfillment cycle time.

For benchmarking purposes, it is recommended to use the Order Fulfillment Process Time, as this is the cycle time reflecting most accurately the responsiveness of the organization. It will also ensure that those organizations in industries where dwell time is a factor can be benchmarked against organizations in industries where dwell time does not play a role.

The concept of dwell time applies not only to the level 1 metric, but also to all lower level metrics. This means that each lower level metric can have a gross component, consisting of the net component and dwell time. Because the lower level metrics are hierarchical (the cumulative sum of cycle times at level 2 or 3 should be equal to the cycle time at level 1.) The cumulative sum of dwell times at level 2 or 3 should total up to the dwell time at level 1.

Hierarchy	
RS.2.1	Source Cycle Time
RS.2.2	Make Cycle Time
RS.2.3	Deliver Cycle Time
RS.2.4	Delivery Retail Cycle Time

Processes	
SCOR	Supply Chain
sP1	Plan Supply Chain
sP2	Plan Source
sP3	Plan Make
sP4	Plan Deliver
sP5	Plan Return
sS1	Source Stocked Product
sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product
sM1	Make-to-Stock
sM3	Engineer-to-Order
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
sD4	Deliver Retail Product
sSR1	Source Return Defective Product
sDR1	Deliver Return Defective Product
sSR2	Return MRO Product
sDR2	Deliver Return MRO Product
sSR3	Source Return Excess Product
sDR3	Deliver Return Excess Product

RS.1.1 Order Fulfillment Cycle Time

Practices	
BP.138	Theory of Constraints
BP.016	Supply Network Planning
BP.021	Sales and Operations Planning
BP.035	Business Rule Review
BP.086	Supply Network Planning
BP.153	Bar coding/RFID
BP.165	Convergence of SCOR with Lean and Six Sigma
BP.168	Rotable Spares Pool
BP.183	Integrated Business Planning (IBP)
BP.184	Scenario Planning

RS.2.1 Source Cycle Time

The average time associated with Source Processes. (Processes: sS1, sS2, sS3)

Calculation

Source Cycle Time – (Identify Sources of Supply Cycle Time + Select Supplier and Negotiate Cycle Time) + Schedule Product Deliveries Cycle Time + Receive Product Cycle Time + Verify Product Cycle Time + Transfer Product Cycle Time + Authorize Supplier Payment Cycle Time

Discussion

Metrics in Level-3 that are used to drive the calculation of 'Source Cycle time' are taken from the Source process elements, depending on the possible strategies deployed by companies to fulfill orders such as make-to-stock, make-to-order or engineer-to-order. When make-to-stock or make-to order strategy is deployed, the dashed optional metrics 'Identify Sources of Supply Cycle Time' and 'Select Supplier and Negotiate Cycle Time' are not used in the calculation.

Hierarchy	
RS.3.8	Authorize Supplier Payment Cycle Time
RS.3.35	Identify Sources of Supply Cycle Time
RS.3.107	Receive Product Cycle Time
RS.3.122	Schedule Product Deliveries Cycle Time
RS.3.125	Select Supplier and Negotiate Cycle Time
RS.3.139	Transfer Product Cycle Time
RS.3.140	Verify Product Cycle Time

Processes	
sS1	Source Stocked Product
sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product

Practices	
BP.158	Make-to-Stock Goods Receipt
BP.162	Long Term Supplier Agreement/Partnership
BP.029	Inventory Management Using Supply Chain Network Optimization
BP.055	Freight Carrier Delivery Performance Evaluation
BP.144	Purchase Order Management
BP.161	Enterprise Level Spend Analysis
BP.037	Manufacturing Direct/Drop Shipment
BP.041	Transportation Optimization
BP.045	Delay Inbound Supplier Shipments
BP.046	Expedite Outbound Customer Shipments

RS.2.2 Make Cycle Time

The average time associated with Make Processes

Calculation

Make Cycle Time – (Finalize Production Engineering Cycle Time) + Schedule Production Activities Cycle Time + Issue Material/Product Cycle Time + Produce and Test Cycle Time + Package Cycle Time + Stage Finished Product Cycle Time + Release Finished Product to Deliver Cycle Time

Discussion

Metrics in Level 3 that are used to drive the calculation of 'Make Cycle time' are taken from the Make process elements, depending on the possible strategies deployed by companies to fulfill orders such as make-to-stock, make-to-order or engineer-to-order. When make-to-stock or make-to-order strategy is deployed, the dashed optional metric 'Finalize Production Engineering Cycle Time' is not used in the calculation. And also, the data for the calculation of Level 3 metrics may also depends on different make strategies, e.g., when make-to-stock strategy is deployed, the metric 'Issue Material/Product Cycle Time' means the time for issuing material; while when make-to-order or engineer-to-order is deployed, it will be a measure for calculating the cycle time for issuing sourced or in-process product.

In Make Cycle Time, there may be overlaps in the processes, so the "least amount of time" should be applied rather than the total sum.

Hierarchy	
RS.3.33	Finalize Production Engineering Cycle Time
RS.3.49	Issue Material Cycle Time
RS.3.101	Produce and Test Cycle Time
RS.3.114	Release Finished Product to Deliver Cycle Time
RS.3.123	Schedule Production Activities Cycle Time
RS.3.128	Stage Finished Product Cycle Time
RS.3.142	Package Cycle Time

Processes	
sM1	Make-to-Stock
sM2	Make-to-Order
sM3	Engineer-to-Order

Practices	
BP.159	Electronic Data Interchange (EDI)
BP.003	Single-Minute Exchange of Die (SMED)
BP.038	Batch Size Reduction
BP.039	Right Size Frequency of Production Wheel

RS.2.3 Deliver Cycle Time

The average time associated with Deliver Processes

Calculation

Delivery Cycle Time = MAX {[Reserve Resources & Determine Delivery Date Cycle Time + (Consolidate Orders Cycle Time + Schedule Installation Cycle Time) + Build Loads Cycle Time + Route Shipments Cycle Time + Select Carriers and Rate Shipments Cycle Time], + Receive Product from Make/Source Cycle Time} + Pick Product Cycle Time + Pack Product Cycle Time + Load Vehicle & Generate Shipping Documentation Cycle Time + Ship Product Cycle Time + (Receive & Verify Product Cycle Time) + (Install Product Cycle Time)

*The MAX function above is to indicate that sDx.3-sDx.7 may be in parallel with sDx.8 and whichever takes longer should determine the cycle time.

Discussion

Metrics in Level 3 that are used to drive the calculation of 'Deliver Cycle time' are taken from the Deliver process elements, depending on the possible strategies deployed by companies to fulfill orders such as make-to-stock, make-to-order or engineer-to-order. When make-to-stock or make-to-order strategy is deployed, the optional metric 'Schedule Installation Cycle Time' is not used in the calculation, otherwise the metric 'Consolidate Orders Cycle Time' will not be used.

And also, the data for the calculation of Level-3 metrics may also depends on different make strategies, e.g., when make-to-stock strategy is deployed, the metric 'Receive, Configure, Enter and Validate Order Cycle Time' may not include the Configure process.

Hierarchy	
RS.3.16	Build Loads Cycle Time
RS.3.18	Consolidate Orders Cycle Time
RS.3.46	Install Product Cycle Time
RS.3.51	Load Product & Generate Shipping Documentation Cycle Time
RS.3.95	Pack Product Cycle Time
RS.3.96	Pick Product Cycle Time
RS.3.102	Receive & Verify Product by Customer Cycle Time
RS.3.110	Receive Product from Source or Make Cycle Time
RS.3.111	Receive, Configure, Enter & Validate Order Cycle Time
RS.3.116	Reserve Resources and Determine Delivery Date Cycle Time
RS.3.117	Route Shipments Cycle Time
RS.3.120	Schedule Installation Cycle Time
RS.3.124	Select Carriers & Rate Shipments Cycle Time
RS.3.126	Ship Product Cycle Time

RS.2.3 Deliver Cycle Time

Processes	
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
sD4	Deliver Retail Product

Practices	
BP.089	Perfect Pick Put away
BP.115	Transportation Management System
BP.168	Rotable Spares Pool

RS.2.4 Delivery Retail Cycle Time

The average cycle time of the processes used to acquire, merchandise, and sell finished goods at a retail store.

Calculation

Delivery Retail Cycle Time = Generate Stocking Schedule Cycle Time + Receive Product Cycle Time + Pick Product Cycle Time + Stock Shelf Cycle Time + Fill Shopping Cart Cycle Time + Checkout Cycle Time + Install Cycle Time.

Hierarchy	
RS.3.17	Checkout Cycle Time
RS.3.32	Fill Shopping Cart Cycle Time
RS.3.34	Generate Stocking Schedule Cycle Time
RS.3.97	Pick Product from Backroom Cycle Time
RS.3.109	Receive Product at Store Cycle Time
RS.3.129	Stock Shelf Cycle Time

Processes	
sD4	Deliver Retail Product

RS.2.5 Return Cycle Time

The average time associated with Return Processes.

Calculation

Return Cycle Time = (Identify need for Return + Coordinate and Schedule Return + Return Transit time + Receive Return Product Time + Verify and Transfer Return Product Time).

Processes	
sSR1	Source Return Defective Product
sSR2	Source Return MRO Product
sSR3	Source Return Excess Product
sDR1	Deliver Return Defective Product
sDR2	Deliver Return MRO Product
sDR3	Deliver Return Excess Product

Practices	
BP.025	Self-Service Warranty Claim Submittal
BP.072	Inbound RMA-enabled Processing
BP.073	Return Tracking
BP.075	Web-based Return Material Authorization (RMA)
BP.077	Prepaid Return Shipping Label
BP.108	Return Policy Conformance Integration
BP.109	Carcass Prepositioning
BP.129	Return Policy included with Shipping Document
BP.135	Return Authorization
BP.141	Proactive Return Authorization
BP.142	Remote Return Authorization
BP.167	Electronic Returns Tracking
BP.169	Beyond Economic Repair (BER) Management

RS

Level-3 Metrics		
RS.3.2	Assess Delivery Performance Cycle Time The average time associated with assessing the performance of deliver processes.	• sE2 Manage Performance
RS.3.3	Assess Supplier Performance Cycle Time The average time associated with assessing the performance of supplier processes.	• sE2 Manage Performance
RS.3.4	Asset Turns Total gross product revenue/Total net assets	• sM1.3 Produce and Test • sM1.4 Package • sM2.3 Produce and Test • sM2.4 Package • sM3.4 Produce and Test • sM3.5 Package
RS.3.5	Authorize Defective Product Return Cycle Time The average time associated with authorizing the return of defective product.	• sDR1.1 Authorize Defective Product Return
RS.3.6	Authorize Excess Product Return Cycle Time The average time associated with authorizing the return of excess product.	• sDR3.1 Authorize Excess Product Return
RS.3.7	Authorize MRO Product Return Cycle Time The average time associated with authorizing the return of MRO product.	• sDR2.1 Authorize MRO Product Return
RS.3.8	Authorize Supplier Payment Cycle Time The average time associated with authorizing payment to suppliers.	• sS1.5 Authorize Supplier Payment • sS2.5 Authorize Supplier Payment • sS3.7 Authorize Supplier Payment
RS.3.9	Average Days per Engineering Change # of days each engineering change impacts the delivery date divided by the total # of changes.	• sS1.1 Schedule Product Deliveries • sS2.1 Schedule Product Deliveries • sS3.3 Schedule Product Deliveries
RS.3.10	Average Days per Schedule Change # of days each schedule change impacts the delivery date divided by the total # of changes.	• sS1.1 Schedule Product Deliveries • sS2.1 Schedule Product Deliveries • sS3.3 Schedule Product Deliveries
RS.3.11	Average Release Cycle of Changes Cycle time for implementing change notices divided by total number of changes.	• sS1.1 Schedule Product Deliveries • sS2.1 Schedule Product Deliveries

		• sS3.3 Schedule Product Deliveries
RS.3.12	Balance Product Resources with Product Requirements Cycle Time The average time associated with balancing product resources and product requirements.	• sP2.3 Balance Product Resources with Product Requirements
RS.3.13	Balance Production Resources with Production Requirements Cycle Time The average time associated with the identifying, prioritizing, and aggregating product requirements.	• sP3.3 Balance Production Resources with Production Requirements
RS.3.14	Balance Return Resources with Return Requirements Cycle Time The average time associated with balancing return resources and return requirements.	• sP5.3 Balance Return Resources with Return Requirements
RS.3.15	Balance Supply Chain Resources with Supply Chain Requirements Cycle Time The average time associated with balancing supply chain resources and supply chain requirements.	• sP1.3 Balance Supply Chain Resources with SC Requirements
RS.3.16	Build Loads Cycle Time The average time associated with building shipment loads.	• sD1.5 Build Loads • sD2.5 Build Loads • sD3.5 Build Loads
RS.3.17	Checkout Cycle Time The average time required for customer checkout.	• sD4.6 Checkout
RS.3.18	Consolidate Orders Cycle Time The average time required for customer order consolidation.	• sD1.4 Consolidate Orders
RS.3.19	Current customer return order cycle time Current return order cycle time, including customer return order processing cycle time, transit time, return processing and disposition cycle time, etc.	• sDR1 Deliver Return Defective Product • sDR2 Deliver Return MRO Product • sDR3 Deliver Return Excess Product
RS.3.20	Current logistics order cycle time Current logistics order cycle time, including customer order processing cycle time, dock-to- stock cycle time, pick-to-ship cycle, transit time, etc.	• sD1 Deliver Stocked Product • sD2 Deliver Make-to-Order Product • sD3 Deliver Engineer-to-Order Product
RS.3.21	Current manufacturing order cycle time Current manufacturing cycle time	• sM1 Make-to-Stock • sM2 Make-to-Order • sM3 Engineer-to-Order
RS.3.22	Current supplier return order cycle time Current supplier return order cycle time, including supplier return order processing cycle time, pick- to-ship cycle time, transit time etc.	• sSR1 Source Return Defective Product

RS.3.24	Deliver and/or Install Cycle Time The average time required to deliver and install product.	• sD4.7 Deliver and/or install
RS.3.25	Enter Order, Commit Resources & Launch Program Cycle Time The average time associated with entering an order, committing resources and program launch	• sD3.3 Enter Order, Commit Resources & Launch Program
RS.3.26	Establish and Communicate Return Plans Cycle Time The average time associated with establishing and communicating return plans	• sP5.4 Establish and Communicate Return Plans
RS.3.27	Establish Delivery Plans Cycle Time The average time associated with establishing and communicating deliver plans	• sP4.4 Establish Delivery Plans
RS.3.28	Establish Production Plans Cycle Time The average time associated with establishing and communicating production plans	• sP3.4 Establish Production Plans
RS.3.29	Establish Sourcing Plans Cycle Time The average time associated with establishing and communicating source plans	• sP2.4 Establish Sourcing Plans
RS.3.30	Establish Supply Chain Plans Cycle Time Five point annual average of the sum of all gross inventories (raw materials & WIP, plant FG, field FG, field samples, other) I (COGS I 365). Total gross value of inventory at standard cost before reserves for excess and obsolescence. Only includes inventory on company books, future liabilities should not be included.	• sP1.4 Establish and Communicate Supply Chain Plans
RS.3.32	Fill Shopping Cart Cycle Time The average time associated with 'filling the shopping cart'	• sD4.5 Fill Shopping Cart
RS.3.33	Finalize Production Engineering Cycle Time The average time associated with the finalization of production engineering	• sM3.1 Finalize Production Engineering
RS.3.34	Generate Stocking Schedule Cycle Time The average time associated with the generating a stocking schedule	• sD4.1 Generate Stocking Schedule
RS.3.35	Identify Sources of Supply Cycle Time The average time associated with the identification of sources of supply	• sS3.1 Identify Sources of Supply
RS.3.36	Identify, Assess and Aggregate Production Resources Cycle Time The average time associated with the identifying, prioritizing, and aggregating product requirements.	• sP3.2 Identify, Assess and Aggregate Production Resources

RS.3.37	Identify, Assess, and Aggregate Delivery Resources Cycle Time The average time associated with the identifying, assessing, and aggregating delivery resource availability	• sP4.2 Identify, Assess and Aggregate Delivery Resources
RS.3.38	Identify, Assess, and Aggregate Product Resources Cycle Time The average time associated with the identifying, assessing, and aggregating product resource availability	• sP2.2 Identify, Assess and Aggregate Product Resources
RS.3.39	Identify, Assess, and Aggregate Supply Chain Resources Cycle Time The average time associated with the identifying, assessing, and aggregating supply chain resource availability	• sP1.2 Identify, Prioritize and Aggregate Supply Chain Resources
RS.3.40	Identify, Prioritize, and Aggregate Delivery Requirements Cycle Time The average time associated with the identifying, prioritizing, and aggregating delivery requirements	• sP4.1 Identify, Prioritize and Aggregate Delivery Requirements
RS.3.41	Identify, Prioritize, and Aggregate Product Requirements Cycle Time The average time associated with the identifying, prioritizing, and aggregating product requirements	• sP2.1 Identify, Prioritize and Aggregate Product Requirements
RS.3.42	Identify, Prioritize, and Aggregate Production Requirements Cycle Time The average time associated with the identifying, prioritizing, and aggregating production requirements	• sP3.1 Identify, Prioritize and Aggregate Production Requirements
RS.3.43	Identify, Prioritize, and Aggregate Return Requirements Cycle Time The average time associated with the identifying, prioritizing, and aggregating return requirements	• sP5.1 Assess and Aggregate Return Requirements
RS.3.44	Identify, Prioritize, and Aggregate Supply Chain Requirements Cycle Time The average time associated with the identifying, prioritizing, and aggregating supply chain requirements	• sP1.1 Identify, Prioritize and Aggregate Supply Chain Requirements
RS.3.46	Install Product Cycle Time The average time associated with product installation	• sD1.14 Install Product • sD2.14 Install Product • sD3.14 Install Product
RS.3.47	In-stock % Percentage of materials, components, or finished goods that are there when needed.	• sD4.4 Stock Shelf

RS.3.48	Invoice Cycle Time The average time associated with the generation and issuance of an invoice	• sD1.15 Invoice
RS.3.49	Issue Material Cycle Time The average time associated with the issuance of material to production	• sM1.2 Issue Material
RS.3.50	Issue Sourced/In-Process Product Cycle Time The average time associated with the issuance of material to production	• sM2.2 Issue Sourced/In-Process Product
RS.3.51	Load Product & Generate Shipping Documentation Cycle Time The average time associated with product loading and the generation of shipping documentation	• sD1.11 Load Vehicle and Generate Shipping Documents • sD2.11 Load Product & Generate Shipping Docs • sD3.11 Load Product & Generate Shipping Docs
RS.3.53	Maintain Source Data Cycle Time The average time associated with maintaining source data	• sE3 Manage Data and Information
RS.3.54	Manage Business Rules for PLAN Processes Cycle Time The average time associated with managing plan business rules	• sE1 Manage Supply Chain Business Rules
RS.3.55	Manage Business Rules for Return Processes Cycle Time The average time associated with managing rules for returns	• sE1 Manage Supply Chain Business Rules
RS.3.56	Manage Capital Assets Cycle Time The average time associated with managing capital assets	• sE5.1 Schedule Asset Management Activities • sE5.2 Take Asset Off-line • sE5.3 Inspect and Troubleshoot • sE5.4 Install and Configure • sE5.5 Clean, Maintain and Repair • sE5.7 Inspect Maintenance • sE5.8 Reinstate Asset
RS.3.57	Manage Deliver Business Rules Cycle Time The average time associated with managing deliver business rules	• sE1 Manage Supply Chain Business Rules
RS.3.58	Manage Deliver Capital Assets Cycle Time The average time associated with managing deliver capital assets	• sE5.1 Schedule Asset Management Activities • sE5.2 Take Asset Off-line • sE5.3 Inspect and Troubleshoot

		• sE5.4 Install and Configure • sE5.5 Clean, Maintain and Repair • sE5.7 Inspect Maintenance • sE5.8 Reinstate Asset
RS.3.59	Manage Deliver Information Cycle Time The average time associated with managing deliver information	• sE3 Manage Data and Information
RS.3.61	Manage Import/Export Requirements Cycle Time The average time associated with managing import/export requirements	• sE8 Manage Regulatory Compliance
RS.3.64	Manage Integrated Supply Chain Capital Assets Cycle Time The average time associated with managing integrated supply chain capital assets	• sE5 Manage Supply Chain Assets • sE5.1 Schedule Asset Management Activities • sE5.2 Take Asset Off-line • sE5.3 Inspect and Troubleshoot • sE5.4 Install and Configure • sE5.5 Clean, Maintain and Repair • sE5.7 Inspect Maintenance • sE5.8 Reinstate Asset
RS.3.65	Manage Integrated Supply Chain Inventory Cycle Time The average time associated with managing integrated supply chain inventory	• sE2 Manage Performance
RS.3.66	Manage Integrated Supply Chain Transportation Cycle Time The average time associated with managing integrated supply chain transportation	• sE7 Manage Supply Chain Network
RS.3.67	Manage MAKE Equipment and Facilities Cycle Time The average time associated with managing production equipment and facilities	• sE5.1 Schedule Asset Management Activities • sE5.2 Take Asset Off-line • sE5.3 Inspect and Troubleshoot • sE5.4 Install and Configure • sE5.5 Clean, Maintain and Repair • sE5.7 Inspect Maintenance • sE5.8 Reinstate Asset
RS.3.68	Manage MAKE Information Cycle Time The average time associated with managing production information	• sE3 Manage Data and Information
RS.3.70	Manage Performance of Return Processes Cycle Time	• sE2 Manage Performance

	The average time associated with managing the performance of supply chain activities	
RS.3.71	Manage Performance of Supply Chain Cycle Time The average time associated with managing the performance of return activities	• sE2 Manage Performance
RS.3.72	Manage PLAN Data Collection Cycle Time The average time associated with collecting plan data	• sE3 Manage Data and Information
RS.3.74	Manage Planning Configuration Cycle Time The average time associated with managing the planning of the supply chain configuration	• sE7 Manage Supply Chain Network
RS.3.77	Manage Production Network Cycle Time The average time associated with managing the production network	• sE7 Manage Supply Chain Network
RS.3.78	Manage Production Performance Cycle Time The average time associated with managing production performance	• sE2 Manage Performance
RS.3.79	Manage Production Rules Cycle Time The average time associated with managing production rules	• sE1 Manage Supply Chain Business Rules
RS.3.80	Manage Return Capital Assets Cycle Time The average time associated with managing return capital assets	• sE5.1 Schedule Asset Management Activities • sE5.2 Take Asset Off-line • sE5.3 Inspect and Troubleshoot • sE5.4 Install and Configure • sE5.5 Clean, Maintain and Repair • sE5.7 Inspect Maintenance • sE5.8 Reinstate Asset
RS.3.81	Manage Return Data Collection Cycle Time The average time associated with managing return data collection	• sE3 Manage Data and Information
RS.3.83	Manage Return Network Configuration Cycle Time The average time associated with managing the return network configuration	• sE7 Manage Supply Chain Network
RS.3.85	Manage Return Transportation Cycle Time The average time associated with managing return transportation	• sE7 Manage Supply Chain Network
RS.3.86	Manage Sourcing Business Rules Cycle Time The average time associated with managing source business rules	• sE1 Manage Supply Chain Business Rules

RS.3.87	Manage Supplier Agreements Cycle Time The average time associated with managing supplier agreements	• sE6 Manage Supply Chain Contracts
RS.3.88	Manage Supplier Network Cycle Time The average time associated with managing the supplier network	• sE7 Manage Supply Chain Network
RS.3.89	Manage Transportation (WIP) Cycle Time The average time associated with managing (WIP) transportation	• sE7 Manage Supply Chain Network
RS.3.90	Manage Transportation Cycle Time The average time associated with managing transportation	• sE7 Manage Supply Chain Network
RS.3.92	Negotiate & Receive Contract Cycle Time The average time associated with negotiating and receiving a contract	• sD3.2 Negotiate and Receive Contract
RS.3.93	Obtain & Respond to Request for Quote (RFQ) / Request for Proposal (RFP) Cycle Time The average time associated with obtaining and responding to RFQs/RFPs	• sD3.1 Obtain and Respond to RFP/RFQ
RS.3.94	Order Fulfillment Dwell Time Any lead time during the order fulfillment process where no activity takes place, which is imposed by customer requirements. Note that this dwell time is different from idle time or non-value-add lead time, which is caused by inefficiencies in the organization's processes and therefore ultimately under responsibility of the organization. This kind of idle time should not be deducted from Order Fulfillment Cycle Time.	• sD1.2 Receive, Enter, and Validate Order • sD1.3 Reserve Inventory and Determine Delivery Date • sD2.2 Receive, Configure, Enter and Validate Order • sD2.3 Reserve Inventory and Determine Delivery Date • sD3.3 Enter Order, Commit Resources & Launch Program
RS.3.95	Pack Product Cycle Time The average time associated with packing a product for shipment.	• sD1.10 Pack Product • sD2.10 Pack Product • sD3.10 Pack Product
RS.3.96	Pick Product Cycle Time The average time associated with product pick	• sD1.9 Pick Product • sD2.9 Pick Product • sD3.9 Pick Product
RS.3.97	Pick Product from Backroom Cycle Time The average time associated with product pick from backroom	• sD4.3 Pick Product from backroom
RS.3.98	Plan Cycle Time The average time associated with Plan Processes	• sP1 Plan Supply Chain

RS

RS.3.99	Plan Source Cycle Time The average time associated with planning source activities	• sP2 Plan Source
RS.3.100	Process Inquiry & Quote Cycle Time The average time associated with processing inquiries and quotes	• sD1.1 Process Inquiry and Quote
RS.3.101	Produce and Test Cycle Time The average time associated with production and test	• sM1.3 Produce and Test • sM2.3 Produce and Test • sM3.4 Produce and Test
RS.3102	Receive & Verify by Customer Cycle time The average time associated with receiving and verifying an order at the customer site	• sD1.13 Receive and verify Product by Customer • sD2.13 Receive and verify Product by Customer • sD3.13 Receive and verify Product by Customer
RS.3.103	Receive and Verify Product Cycle Time The average time associated with receiving and verifying an order at the customer site	• sD1.13 Receive and verify Product by Customer • sD2.13 Receive and verify Product by Customer • sD3.13 Receive and verify Product by Customer
RS.3.104	Receive Defective Product Cycle Time The average time associated with receiving defective product returns from the customer	• sDR1.3 Receive Defective Product (includes verify)
RS.3.105	Receive Excess Product Cycle Time The average time associated with receiving excess product returns from the customer	• sDR3.3 Receive Excess Product
RS.3.106	Receive MRO Product Cycle Time The average time associated with receiving MRO product returns from the customer	• sDR2.3 Receive MRO Product • sD4.2 Receive Product at Store
RS.3.107	Receive Product Cycle Time The average time associated with receiving product	• sD1.8 Receive Product from Source or Make
RS.3.108	Receive Product from Make/Source Cycle Time The average time associated with receiving product from Make/Source	• sD2.8 Receive Product from Source or Make • sD3.8 Receive Product from Source or Make • sD4.2 Receive Product at Store
RS.3.109	Receive Product at Store Cycle Time The average time associated with receiving product at the customer store	• sD1.8 Receive Product from Source or Make
RS.3.110	Receive Product from Source or Make Cycle Time The average time associated with receiving a	

	transfer of product to deliver processes from source or make	• sD2.8 Receive Product from Source or Make • sD3.8 Receive Product from Source or Make
RS.3.111	Receive, Configure, Enter & Validate Order Cycle Time The average time associated with receiving and verifying an order at the customer site	• sD2.2 Receive, Configure, Enter and Validate Order
RS.3.112	Receive, Enter & Validate Order Cycle Time The average time associated with receiving and verifying an order at the customer site	• sD1.2 Receive, Enter, and Validate Order
RS.3.113	Receiving Product Cycle Time Total elapsed time from time product is received to time it is passed to next process	• sS1.2 Receive Product • sS2.2 Receive Product • sS3.4 Receive Product
RS.3.114	Release Finished Product to Deliver Cycle Time The average time associated with releasing finished product to deliver	• sM1.6 Release Product to Deliver • sM2.6 Release Finished Product to Deliver • sM3.7 Release Product to Deliver
RS.3.115	Reserve Inventory & Determine Delivery Date Cycle Time The average time associated with reserving inventory and determining a delivery date	• sD2.3 Reserve Inventory and Determine Delivery Date
RS.3.116	Reserve Resources and Determine Delivery Date Cycle Time The average time associated with reserving resources and determining a delivery date	• sD1.3 Reserve Inventory and Determine Delivery Date
RS.3.117	Route Shipments Cycle Time The average time associated with routing shipments	• sD1.6 Route Shipments • sD2.6 Route Shipments • sD3.6 Route Shipments
RS.3.118	Schedule Defective Return Receipt Cycle Time The average time associated with scheduling the receipt of the return of defective product	• sDR1.2 Schedule Defective Return Receipt
RS.3.119	Schedule Excess Return Receipt Cycle Time The average time associated with scheduling the receipt of the return of excess product	• sDR3.2 Schedule Excess Return Receipt
RS.3.120	Schedule Installation Cycle Time The average time associated with scheduling the installation of product	• sD3.4 Schedule Installation
RS.3.121	Schedule MRO Return Receipt Cycle Time The average time associated with scheduling the receipt of the return of MRO product	• sDR2.2 Schedule MRO Return Receipt

RS.3.122	Schedule Product Deliveries Cycle Time The average time associated with scheduling the shipment of the return of MRO product	• sS1.1 Schedule Product Deliveries • sS2.1 Schedule Product Deliveries • sS3.3 Schedule Product Deliveries
RS.3.123	Schedule Production Activities Cycle Time The average time associated with scheduling production activities	• sM1.1 Schedule Production Activities • sM2.1 Schedule Production Activities • sM3.2 Schedule Production Activities
RS.3.124	Select Carriers & Rate Shipments Cycle Time The average time associated with selecting carriers and rating shipments	• sD3.7 Select Carriers & Rate Shipments
RS.3.125	Select Supplier and Negotiate Cycle Time The average time associated with selecting a supplier and negotiating	• sS3.2 Select Final Supplier and Negotiate
RS.3.126	Ship Product Cycle Time The average time associated with shipping product	• sD1.12 Ship Product • sD2.12 Ship Product • sD3.12 Ship Product
RS.3.127	Source Return Cycle Time Average time associated with Sourcing Return	• sSR1 Source Return Defective Product • sSR3 Source Return Excess Product
RS.3.128	Stage Finished Product Cycle Time The average time associated with staging finished product	• sM1.5 Stage Product • sM2.5 Stage Finished Product • sM3.6 Stage Finished Product
RS.3.129	Stock Shelf Cycle Time The average time associate with stocking shelves	• sD4.4 Stock Shelf
RS.3.136	Transfer Defective Product Cycle Time The average time associated transfer until product is moved to the next process.	• sDR1.4 Transfer Defective Product
RS.3.137	Transfer Excess Product Cycle Time The average time associated transfer until product is moved to the next process.	• sDR3.4 Transfer Excess Product
RS.3.138	Transfer MRO Product Cycle Time The average time associated transfer until product is moved to the next process.	• sDR2.4 Transfer MRO Product
RS.3.139	Transfer Product Cycle Time The average time associated transfer until product is moved to the next process.	• sS1.4 Transfer Product • sS2.4 Transfer Product • sS3.6 Transfer Product

RS.3.140	Verify Product Cycle Time The average time associated with verifying raw material product	• sS1.3 Verify Product • sS2.3 Verify Product • sS3.5 Verify Product
RS.3.141	Waste accumulation time The time required to collect and properly store production waste	• sM1.7 Waste Disposal • sM2.7 Waste Disposal • sM3.8 Waste Disposal
RS.3.142	Package Cycle Time The average time associated with packaging the product in the Make process.	• sM1.4 Package • sM2.4 Package • sM3.5 Package

Agility

AG.1.1 Upside Supply Chain Adaptability

The maximum sustainable percentage increase in quantity delivered that can be achieved in 30 days.

Note: 30 days is an arbitrary number provided for benchmarking purposes. For some industries and some organizations 30 days may be in some cases unobtainable or in others too conservative. Note: Component metrics (Upside Source Adaptability, Upside Make Adaptability, etc.) can be improved in parallel and as a result, this calculation requires the result to be the least increase in quantity sustainable in 30 days. The new operating level needs to be achieved without a significant increase of cost per unit.

Calculation

Supply chain adaptability is the least quantity sustainable when considering Source, Make, Deliver and Return components.

Data collection

Adaptability measures are assumption based or based on historic events. Some elements can be measured and taken as a basis for further considerations. Adaptability measures are based on the actual number of returns compared to the maximum number of returns which can be achieved within 30 days. The weakest component determines the overall volume.

Discussion

The calculation of Supply Chain Adaptability requires the calculation to be the least quantity sustainable when considering Source, Make, Deliver and Return components.

- Profit & Loss (Income Statement) Impact
- Revenue
- COGS
- SGA
- Balance Sheet Impact
- Inventory

Hierarchy	
AG.2.1	Upside Adaptability (Source)
AG.2.2	Upside Adaptability (Make)
AG.2.3	Upside Adaptability (Deliver)
AG.2.4	Upside Return Adaptability (Source)
AG.2.5	Upside Return Adaptability (Deliver)

Processes	
SCOR	Supply Chain

Practices	
BP.035	Business Rule Review
BP.153	Bar coding/RFID
BP.162	Long Term Supplier Agreement/Partnership
BP.165	Convergence of SCOR with Lean and Six Sigma
BP.183	Integrated Business Planning
BP.184	Scenario Planning

AG.2.1 Upside Adaptability (Source)

The maximum sustainable percentage increase in raw material quantities that can be acquired/ received in 30 days.

Discussion

Source: Input

Current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question "How much of an increase in quantities sourced (expressed as a percentage) can the company sustain, given 30 days?" These elements are mainly output metrics from other attributes... responsiveness, reliability, cost, asset management.

Demand

- Current source volumes
  - Amount of each item purchased

Staffing

- Staff needed to meet current demand
  - Productivity-purchase orders per FTE
  - Needed, but may be underutilized

Capital

- Current capital requirements
  - Credit line
  - Cash on hand
  - Accounting procedures

Materials

- All else equal in make, deliver, return, current inventory on hand (raw material and purchased finished goods), including safety stock required to sustain current order fulfillment.
  - Assuming optimized inventory practices (no excess inventory)
- Current sourcing/supplier constraints
  - Current contract terms.
  - Nature of items; commodity/sole source.

Cycle Time

- Current procurement cycle time
  - Time to place a purchase order
  - Supplier lead time

Source: Resource Availability Assessment & Ramp-up/Lead Time

Elements needed to establish delta in resources and what can be ramped up and sustained within 30 days based on the question "How much of an increase in quantities sourced (expressed as a percentage) can the company sustain, given 30 days?"

Demand

- Additional source volume to be determined given ramped up resources below

Staffing

- Staff availability in procurement (underutilized FTE's)
- How much staff can be recruited/hired and trained fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities sourced given 30 days

AG.2.1 Upside Adaptability (Source)

Capital

- Current capital availability
- Credit line
- Cash on hand
- Accounting procedures
- How much capital can be obtained to increase quantities sourced given 30 days

Materials

- Sourcing Constraints
- Time required in negotiating new source/volume contracts/terms
- Time required to find/obtain additional sources
- All else equal in make, deliver, return, how much inventory (raw material and purchased finished goods) can be obtained, delivered and phased in and sustained for order fulfillment, including safety stock given 30 days.

Cycle Time

- Procurement order cycle time reestablished and sustained for increased quantities sourced given 30 days.
- Time to place a purchase order
- Supplier lead time

AG.2.2 Upside Adaptability (Make)

The maximum sustainable percentage increase in production that can be achieved in 30 days with the assumption of no raw material constraints.

Discussion

Make: Input

Current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question "How much of an increase in quantities produced (expressed as a percentage) can the company sustain, given 30 days?" These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current make volumes
  - Amount of each item manufactured

Labor

- Labor needed to meet current demand
  - Productivity-units/orders per FTE
  - Needed, but may be underutilized

Capital/Assets

- Internal and External (outsourced) capacity needed for current demand throughput
  - Facilities, space
  - Manufacturing equipment, materials handling and packaging equipment, etc.
  - Needed, but may be underutilized
- Current capital requirements
  - Credit line
  - Cash on hand
  - Accounting procedures
  - Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase)

Materials

- All else equal in source, deliver and return, current inventory on hand (WIP and finished goods), including safety stock required to sustain current order fulfillment.
  - Assuming optimized inventory practices (no excess inventory)

Cycle Time

- Current manufacturing cycle time (all else equal including procurement order cycle time and supplier lead time)

Make: Resource Availability Assessment & Ramp-up/Lead Time

Elements needed to establish delta in resources and what can be ramped up and sustained within

30 days based on the question "How much of an increase in quantities produced (expressed as a percentage) can the company sustain, given 30 days?"

Demand

- Additional make volume to be determined given increased resources below

AG.2.2 Upside Adaptability (Make)

Labor

- Direct labor availability and percent of labor used in manufacturing, not used in direct activity (underutilized FTE's)
- How much labor can be recruited/hired and trained fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities produced given 30 days

Capital/Assets

- Current Internal Capacity utilization
  - Facilities, space
  - Manufacturing equipment, materials handling and packaging equipment, etc.
- Current capital availability
  - Credit line
  - Cash on hand
  - Accounting procedures
  - Finance Procedures (outsource vs. in-source, lease vs. purchase)
- How much capital can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities produced given 30 days
- How much assets/capacity can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities produced given 30 days
  - Facilities, space
  - Manufacturing equipment, materials handling and packaging equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
  - Facilities, lease building, etc.
  - Lease manufacturing equipment, materials handling and packaging equipment, etc.
  - Co-packers
- How much supplemental outsourced or leased resources or facilities can be obtained to increase and sustain quantities produced given 30 days

Materials

- All else equal in source, deliver and return, how much raw material inventory can be received and phased into manufacturing and produced into WIP and FG inventory, and sustained for order fulfillment, including safety stock given 30 days.

Cycle Time

- Manufacturing cycle time reestablished and sustained for increased quantities produced given 30 days.

Processes	
sM1	Make-to-Stock
sM2	Make-to-Order
sM3	Engineer-to-Order

AG.2.3 Upside Adaptability (Deliver)

The maximum sustainable percentage increase in quantities delivered that can be achieved in 30 days with the assumption of unconstrained finished good availability.

Discussion

Deliver: Input

Current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question "How much of an increase in quantities delivered (expressed as a percentage) can the company sustain, given 30 days?" These elements are mainly output metrics from other attributes ... Responsiveness, reliability, cost, asset management.

Demand

- Current delivery volume
    - Number of orders shipped

Labor

- Labor needed to meet current demand
    - Productivity-orders per FTE
    - Needed, but may be underutilized

Capital/Assets

- Internal and External (3PL) capacity needed for current demand throughput
    - Facilities, space
    - Fleet equipment, outside carrier loads, materials handling equipment, etc.
    - Needed, but may be underutilized
- Current capital requirements
    - Credit line
    - Cash on hand
    - Accounting procedures
    - Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase)

Materials

- All else equal in source, make, return, current finished goods inventory on hand (including safety stock required to sustain current order fulfillment)
    - Assuming optimized inventory practices (no excess inventory)

Cycle Time

- Current logistics order cycle time (all else equal including procurement order cycle time, supplier lead time, manufacturing cycle time, etc.)
    - Customer order processing cycle time (logistics only)
    - Dock-to-stock cycle time
    - Pick-to-ship cycle time
    - Transit time

Deliver: Resource Availability Assessment & Ramp-up/Lead Time

Elements needed to establish delta in resources and what can be ramped up and sustained within 30 days based on the question "How much of an increase in quantities delivered (expressed as a percentage) can the company sustain, given 30 days?"

Demand

- Additional delivery volume to be determined given increased resources below

AG.2.3 Upside Adaptability (Deliver)

Labor

- Direct labor availability and percent of labor used in logistics, not used in direct activity (underutilized FTE's)
- How much labor can be recruited/hired and trained fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities delivered given 30 days

Capital/Assets

- Current Internal Capacity utilization
  - Facilities, space
  - Fleet equipment, materials handling equipment, etc.
- Current capital availability
  - Credit line
  - Cash on hand
  - Accounting procedures
  - Finance Procedures (outsource vs. in-source, lease vs. purchase)
- How much capital can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities delivered given 30 days
- How much assets/capacity can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities delivered given 30 days
  - Facilities, space
  - Fleet equipment, materials handling equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
  - 3PL facilities, lease building, etc.
  - Full service lease fleet, materials handling, etc. equipment
  - Outside carriers
- How much supplemental outsourced or leased resources or facilities can be obtained to increase and sustain quantities delivered given 30 days

Materials

- All else equal in source, make, return, amount of how much finished goods inventory can be received/stocked, including safety stock to sustain quantities delivered given 30 days

Cycle Time

- Logistics cycle time reestablished and sustained for increased quantities delivered given 30 days (all else equal including procurement order cycle time, supplier lead time, manufacturing cycle time, etc.)
  - Customer order processing cycle time (logistics only)
  - Dock-to-stock cycle time
  - Pick-to-ship cycle time
  - Transit time

Processes	
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
sD4	Deliver Retail Product

AG.2.4 Upside Return Adaptability (Source)

The maximum sustainable percentage increase in returns of raw materials to suppliers that can be achieved in 30 days.

Discussion

Source Return: Input

Assuming no supplier constraints, current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question "How much of an increase in quantities returned to suppliers (expressed as a percentage) can the company sustain, given 30 days?" These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current return volume
  - Number of orders returned

Staff / Labor

- Procurement Staff / Logistics Labor needed to meet current returned volume
  - Productivity-orders returned per FTE
  - Needed, but may be underutilized

Capital/Assets

- Internal and External (3PL) capacity needed for current return throughput
  - Facilities, space
  - Fleet equipment, outside carrier loads, materials handling equipment, etc.
  - Needed, but may be underutilized
- Current capital requirements
  - Credit line
  - Cash on hand
  - Accounting procedures
  - Finance Procedures (outsource vs. in-source, lease vs. purchase)

Cycle Time

- Current supplier return order cycle time
  - Supplier return order processing cycle time (procurement and logistics)
  - Pick-to-ship cycle time
  - Transit time

Source Return: Resource Availability Assessment & Ramp-up/Lead Time

Assuming no supplier constraints, elements needed to establish delta in resources and what can be ramped up and sustained within 30 days based on the question "How much of an increase in quantities returned to suppliers (expressed as a percentage) can the company sustain, given 30 days"

Demand

- Additional supplier return volume to be determined given increased resources below

AG.2.4 Upside Return Adaptability (Source)

Staff / Labor

- Procurement staff / Logistics labor availability (underutilized FTE's)
- How much procurement staff/logistics labor can be recruited/hired and trained fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities returned to suppliers given 30 days

Capital/Assets

- Current Internal Capacity utilization
  - Facilities, space
  - Fleet equipment, materials handling equipment, etc.
- Current capital availability
  - Credit line
  - Cash on hand
  - Accounting procedures
  - Finance Procedures (outsource vs. in-source, lease vs. purchase)
- How much capital can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities returned to suppliers given 30 days
- How much assets/capacity can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities returned to suppliers given 30 days
  - Facilities, space
  - Fleet equipment, materials handling equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
  - 3PL facilities, lease building, etc.
  - Full service lease fleet, materials handling, etc. equipment
  - Outside carriers
- How much supplemental outsourced or leased resources or facilities can be obtained to increase and sustain quantities returned to suppliers given 30 days

Cycle Time

- Source return cycle time reestablished and sustained for increased quantities returned to suppliers given 30 days
  - Supplier return order processing cycle time (procurement and logistics)
  - Pick-to-ship

Practices	
BP.126	Supply Chain Visibility System

AG.2.5 Upside Return Adaptability (Deliver)

The maximum sustainable percentage increase in returns of finished goods from customers that can be achieved in 30 days.

Discussion

Deliver Return: Input

Assuming no customer constraints, current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question "How much of an increase in quantities returned from customers (expressed as a percentage) can the company sustain, given 30 days?" These elements are mainly output metrics from other attributes, responsiveness, reliability, cost, asset management.

Demand

- Current return volume
  - Number of orders returned

Staff / Labor

- Customer Service Staff / Logistics Labor needed to meet current returned volume
  - Productivity-orders returned per FTE
  - Needed, but may be underutilized

Capital/Assets

- Internal and External (3PL) capacity needed for current return throughput
  - Facilities, space
  - Fleet equipment, outside carrier loads, materials handling equipment, etc.
  - Needed, but may be underutilized
- Current capital requirements
  - Credit line
  - Cash on hand
  - Accounting procedures
  - Finance Procedures (outsource vs. in-source, lease vs. purchase)

Cycle Time

- Current customer return order cycle time
  - Customer return order processing cycle time (customer service and logistics)
  - Transit time
  - Return processing and disposition cycle time

Deliver Return: Resource Availability Assessment & Ramp-up/Lead Time

Assuming no customer constraints, elements needed to establish delta in resources and what can be ramped up and sustained within 30 days based on the question "How much of an increase in quantities returned from customers (expressed as a percentage) can the company sustain, given 30 days"

Demand

- Additional customer return volume to be determined given increased resources below

AG.2.5 Upside Return Adaptability (Deliver)

Staff / Labor

- Customer Service staff / Logistics labor availability (underutilized FTE's)
- How much customer service staff/logistics labor can be recruited/hired and trained fill gab between underutilized FTE's and FTE's needed to increase and sustain quantities returned from customers given 30 days

Capital/Assets

- Current Internal Capacity utilization
  - Facilities, space
  - Fleet equipment, materials handling equipment, etc.
- Current capital availability
  - Credit line
  - Cash on hand
  - Accounting procedures
  - Finance Procedures (outsource vs. in-source, lease vs. purchase)
- How much capital can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities returned from customers given 30 days
- How much assets/capacity can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities returned from customers given 30 days
  - Facilities, space
  - Fleet equipment, materials handling equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
  - 3PL facilities, lease building, etc.
  - Full service lease fleet, materials handling, etc. equipment
  - Outside carriers
- How much supplemental outsourced or leased resources or facilities can be obtained to increase and sustain quantities returned from customers given 30 days

Cycle Time

- Deliver return cycle time reestablished and sustained for increased quantities returned to suppliers given 30 days
- Customer return order processing cycle time (customer service and logistics)
  - Transit time
  - Return processing and disposition cycle time

Processes	
sDR2	Deliver Return MRO Product
sDR3	Deliver Return Excess Product

Practices	
BP.126	Supply Chain Visibility System

AG.1.2 Downside Supply Chain Adaptability

The reduction in quantities ordered sustainable at 30 days prior to delivery with no inventory or cost penalties.

Note: 30 days is an arbitrary number provided for benchmarking purposes. For some industries and some organizations 30 days may be in some cases unobtainable or in others too conservative.

Calculation

Downside Source Adaptability + Downside Make Adaptability + Downside Deliver Adaptability
Downside Supply Chain Adaptability is the least reduction sustainable when considering Source, Make, Deliver and Return components.

Data collection

Adaptability measures are assumption based on historic events. Some elements can be measured and taken as a basis for further considerations.

Discussion

The calculation of Supply Chain Adaptability requires the calculation to be the least quantity sustainable when considering Source, Make, Deliver and Return components.

- Profit & Loss (Income Statement) Impact
  - Revenue
  - COGS
  - SGA
- Balance Sheet Impact
  - Inventory

Hierarchy	
AG.2.6	Downside Adaptability (Source)
AG.2.7	Downside Adaptability (Make)
AG.2.8	Downside Adaptability (Deliver)

Processes	
SCOR	Supply Chain

Practices	
BP.035	Business Rule Review
BP.153	Bar coding/RFID
BP.165	Convergence of SCOR with Lean and Six Sigma
BP.183	Bar coding/RFID
BP.184	Convergence of SCOR with Lean and Six Sigma

AG.2.6 Downside Adaptability (Source)

The raw material quantity reduction sustainable at 30 days prior to delivery with no inventory or cost penalties.

Discussion

Source:Input

Current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question "How much of a reduction in quantities sourced (expressed as a percentage) can the company sustain, given 30 days?" These elements are mainly output metrics from other attributes ... responsiveness, reliability, cost, asset management.

Demand

- Current source volumes
    - Amount of each item purchased

Staffing

- Staff needed to meet current demand
    - Productivity-purchase orders per FTE
    - Needed, but may be underutilized

Capital

- Current capital requirements
    - Accounting procedures

Materials

- All else equal in make, deliver, return, current inventory on hand (raw material and purchased finished goods), including safety stock required to sustain current order fulfillment.
    - Assuming optimized inventory practices (no excess inventory)
- Current sourcing/supplier constraints
    - Current contract terms.
    - Nature of items; commodity/sole source.

Cycle Time

- Current procurement cycle time
    - Time to place a purchase order
    - ! Supplier lead time

Source: Resource Availability Assessment & Ramp-down/Lead Time

Elements needed to establish delta in resources and what can be ramped down and sustained at 30 days prior to delivery based on the question "How much of a decrease in quantities sourced (expressed as a percentage) can the company sustain without inventory or cost penalties, given 30 days' notice prior to delivery"

Demand

- Reduced source volume to be determined given ramped down resources below

Staffing

- Staff availability in procurement (underutilized FTE's)
- How much staff can be laid-off or diverted to other activities, without cost penalty, to ramp down to decreased quantities delivered given 30 days' notice

AG.2.6 Downside Adaptability (Source)

Capital

- Current capital requirements
- Accounting procedures for selling/diverting/recycling assets

Materials

- Sourcing Constraints
  - Time required in negotiating new source/volume contracts/terms
  - Time required to ramp down supplier inventory
- How much inventory (raw material and purchased finished goods) can be returned, sold or diverted without cost penalty to ramp down to decreased quantities delivered given 30 days' notice

Cycle Time

- Procurement order cycle time reestablished and sustained for decreased quantities sourced given 30 days.
  - Time to place a purchase order
  - Supplier lead time

AG.2.7 Downside Adaptability (Make)

The production reduction sustainable at 30 days prior to delivery with no inventory or cost penalties.

Discussion

Make: Input

Current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question "How much of a reduction in quantities produced (expressed as a percentage) can the company sustain, given 30 days?" These elements are mainly output metrics from other attributes ... responsiveness, reliability, cost, asset management.

Demand

- Current make volumes
    - Amount of each item manufactured

Labor

- Labor needed to meet current demand
    - Productivity-units/orders per FTE
    - Needed, but may be underutilized

Capital/Assets

- Internal and External (outsourced) capacity needed for current demand throughput
    - Facilities, space
    - Manufacturing equipment, materials handling and packaging equipment, etc.
    - Needed, but may be underutilized
- Current capital requirements
    - Accounting procedures
    - Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase)

Materials

- All else equal in source, deliver and return, current inventory on hand (WIP and finished goods), including safety stock required to sustain current order fulfillment.
    - Assuming optimized inventory practices (no excess inventory)

Cycle Time

- Current manufacturing cycle time (all else equal including procurement order cycle time and supplier lead time)

Make: Resource Availability Assessment & Ramp-down/Lead Time

Elements needed to establish delta in resources and what can be ramped down and sustained at 30 days prior to delivery based on the question "How much of a decrease in quantities produced (expressed as a percentage) can the company sustain without inventory or cost penalties, given 30 days' notice prior to delivery"

Demand

- Reduced make volume to be determined given ramped down resources below

Labor

- Direct labor availability and percent of labor used in manufacturing, not used in direct activity (underutilized FTE's)
- How much labor can be laid-off or diverted to other activities, without cost penalty, to ramp down to decreased quantities delivered given 30 days' notice

AG.2.7 Downside Adaptability (Make)

Capital/Assets

- Current Internal Capacity utilization
  - Facilities, space
  - Manufacturing equipment, materials handling and packaging equipment, etc.
- Current capital requirements
  - Accounting procedures for selling/diverting/recycling assets
  - Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase) and effect upon ability to terminate leases or sell capital equipment assets.
- How many capital equipment assets can be recycled, diverted or sold or subleased without cost penalty, to ramp down to decreased quantities delivered given 30 days' notice
  - Facilities, space
  - Manufacturing equipment, materials handling and packaging equipment, etc.

Outsourcing Alternatives tocapital

- Supplemental Outsource/lease availability
  - Facilities, lease building, etc.
  - Lease manufacturing equipment, materials handling and packaging equipment, etc.
  - Co-packers
- How much supplemental outsourced or leased resources or facilities can be terminated to ramp down to decreased quantities delivered given 30 days' notice

Materials

- All else equal in source, deliver and return, how much manufacturing quantities (WIP and FG inventory), including safety stock can be ramped down to decreased order fulfillment quantities given 30 days' notice.

Cycle Time

- Manufacturing cycle time reestablished and sustained for decreased quantities produced given 30 days.

Processes	
sM1	Make-to-Stock
sM2	Make-to-Order
sM3	Engineer-to-Order

AG.2.8 Downside Adaptability (Deliver)

Downside Deliver Adaptability = The reduction in delivered quantities sustainable at 30 days prior to delivery with no inventory or cost penalties.

Discussion

Deliver: Input Elements

Current elements needed to fully understand future requirements, to establish what can be ramped down and sustained at 30 days prior to delivery, based on the question "How much of a decrease in quantities delivered (expressed as a percentage) can the company sustain without inventory or cost penalties, given 30 days' notice prior to delivery?" These elements are mainly output metrics from other attributes ... responsiveness, reliability, cost, asset management.

Demand

- Current delivery volume
    - Number of orders shipped

Labor

- Labor needed to meet current demand
    - Productivity-orders per FTE
    - Needed, but may be underutilized

Capital/Assets

- Internal and External (3PL) capacity needed for current demand throughput
    - Facilities, space
    - Fleet equipment, outside carrier loads, materials handling equipment, etc.
    - Needed, but may be underutilized
- Current capital requirements
    - Accounting procedures
    - Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase)

Materials

- All else equal in source, make, return, current finished goods inventory on hand (including safety stock required to sustain current order fulfillment)
- Assuming optimized inventory practices (no excess inventory)

Cycle Time

- Current logistics order cycle time (all else equal including procurement order cycle time, supplier lead time, manufacturing cycle time, etc.)
    - Customer order processing cycle time (logistics only)
    - Dock-to-stock cycle time
    - Pick-to-ship cycle time
    - Transit time

Deliver: Availability Assessment & Ramp-down/Lead Time

Elements needed to establish delta in resources and what can be ramped down and sustained at 30 days prior to delivery based on the question "How much of a decrease in quantities delivered (expressed as a percentage) can the company sustain without inventory or cost penalties, given 30 days' notice prior to delivery"

Demand

- Reduced delivery volume to be determined given ramped down resources below

AG.2.8 Downside Adaptability (Deliver)

Labor

- Direct labor availability and percent of labor used in logistics, not used in direct activity (underutilized FTE's)
- How much labor can be laid-off or diverted to other activities, without cost penalty, to ramp down to decreased quantities delivered given 30 days' notice

Capital/Assets

- Current Internal Capacity utilization
- Facilities, space
    - Fleet equipment, materials handling equipment, etc.
- Current capital requirements
    - Accounting procedures for selling/diverting/recycling assets
    - Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase) and their effect upon ability to terminate leases or sell capital equipment assets.
- How many capital equipment assets can be recycled, diverted or sold without cost penalty, to ramp down to decreased quantities delivered given 30 days' notice
    - Facilities, space
    - Fleet equipment, materials handling equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
    - 3PL facilities, lease building, etc.
    - Full service lease fleet, materials handling, etc. equipment
    - Outside carriers
    - How much supplemental outsourced or leased resources or facilities agreements can be terminated to ramp down to decreased quantities delivered given 30 days' notice

Materials

- All else equal in source, make, return, how much inventory can be shipped or diverted without cost penalty to ramp down to decreased quantities delivered given 30 days' notice (all else equal in source and make, includes safety stock)
- Transit time

Cycle Time

- Logistics cycle time reestablished and sustained for decreased quantities delivered given 30 days (all else equal including procurement order cycle time, supplier lead time, manufacturing cycle time, etc.)
    - Customer order processing cycle time (logistics only)
    - Dock-to-stock cycle time
    - Pick-to-ship cycle time

Processes	
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
sD4	Deliver Retail Product

AG.1.3 Overall Value at Risk (VaR)

Risk management in organizations traditionally resides within the finance function, due to its inherent focus on financial impact on the organization. However, most organizations do not assess the supply chain risk separately. In recent years, supply chain risk management (SCRM) has become the focus area for finance executives responsible for Enterprise Risk Management. Hence, there is a need to establish a common language to monetize the supply chain risk. Value at Risk (VaR) is a popular risk metric widely used by the finance industry to understand the risk exposure of a trading portfolio based on historic volatility.

Qualitative Relationship Description

The supply chain risk definition extends from supplier's supplier to customer's customer and the global environment they operate in. Hence, any event with a potential to disrupt linkages across the entire supply chain is considered as a Risk Event. Supply Chain Value at Risk – the sum of the probability of risk events times the monetary impact of the events which can impact any core supply chain functions (e.g. Plan, Source, Make, Deliver and Return) or key dependencies.

Simple VaR calculation:

VaR = Probability of Risk Event (P) x Monetized Impact of Risk Event (I)

Advanced VaR calculation:

More accurate measures of VaR can be attained by applying more complex calculations, use of distributions and confidence intervals (see best practices section).

Since VaR is an estimate, traditional estimating techniques of describing accuracy can also be used i.e. + or – 5% (see best practices section).

The use of VaR allows organizations to look at all potential supply chain risks through one metric and helps prioritize mitigation efforts. All the risk events across supply chain functions Plan, Source, Make, Deliver, and Return can be rolled up to an overall VaR for the entire supply chain creating a financial lever to help integrate SCRM into the organization's overall risk management initiative.

Calculation

Supply Chain Risk VAR ($) = VAR $ (Plan) + VAR $ (Source) + VAR $ (Make) + VAR $ (Deliver) + VAR $ (Return)

Data Collection

A risk event is categorized as any process failure (below target KPI) or disruption which can adversely impact supply chain cost & performance. Following data are required for the simple VaR calculation:

- Probability of process failure – This should be calculated using historical data. Historical data of the specific process metrics (on time delivery, quality failures, supply delays, machine failures, etc.) to calculate the number of times the event may perform below the target (probability). Also, the extent to which it is below the target when it fails.
- Probability of external risk event – Probability of disruptions like hurricane, earthquake can be derived through research data or expert opinions
- Risk Impact – This is a monetary estimate provided by the experts or business function specialist who can assess the repercussions of the risk event until normalcy is restored

AG.1.3 Overall Value at Risk (VaR)

More accurate measures of VaR can be attained by applying the more complex VaR calculation with the use of distributions and confidence intervals (see best practice section).

Discussion

VaR is a measure of an organization's exposure to supply chain risk events. The effort in measuring VaR on a periodic basis can provide organizations with an ability to mitigate or respond effectively to external and internal disruption events. Hence, VaR is a measure of Supply Chain Agility.

Suppliers can be evaluated based upon the VaR and ranked according to the risk of poor performance. Supply chain risk to customers can also be measured based upon performance measures (profitability, volume growth, returns, and complaints) as well as products (warranty claims, etc.). VaR can also be applied to internal supply chain entities such as manufacturing, distribution or sales locations. Since VaR is a monetized view of the cost of performance below target, it can be rolled up and examined by any demographic or data cut (by region, by customer, by supplier, etc.). Many of the mitigation costs captured in a risk management effort are already included in the Total Supply Chain Management Cost. For this reason, VaR cannot roll up to TSCMC Level 1 and is used as a diagnostic metric at Level 2 and 3.

Caveats in using VaR:

- VaR calculates the probability of non-adherence to metrics value (expected value) based on historical data or research data.
- Data accuracy and inherent prediction errors will also impact VaR accuracy.
- VaR is a retrospective and probabilistic derivation of an event risk, which is applied to predict the possible cumulative loss in the future due to similar risk events.
- VaR is a downside Risk Metric. It calculates the estimated loss for each level of probability for an event. There is no credit given for gains (early arrivals, etc.) for an event therefore it will differ from the average VaR of an event.
- Calculating VaR from historical data requires a large database of events and metrics, and it could be computationally intensive.

Hierarchy	
AG.2.9	Supplier's/Customer's/Product's Risk Rating
AG.2.10	Value at Risk (Plan)
AG.2.11	Value at Risk (Source)
AG.2.12	Value at Risk (Make)
AG.2.13	Value at Risk (Deliver)
AG.2.14	Value at Risk (Return)
AG.2.15	Time to Recovery

Processes	
SCOR	Supply Chain
sE9	Manage Supply Chain Risk

AG.1.3 Overall Value at Risk (VaR)

Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.002	Risk Management Strategies
BP.081	Bowtie Risk Management
BP.035	Business Rule Review
BP.143	Preventive Returns
BP.161	Enterprise Level Spend Analysis
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.150	Maintain Supply Chain Risk Register
BP.173	Supply Chain Risk Monitoring
BP.183	Integrated Business Planning
BP.184	Scenario Planning

AG.2.9 Supplier / Customer / Product Risk Rating

The numerical risk rating for supplier, customer or product. Normalized and used for comparison purposes.

Practices	
BP.004	Network Prioritization for Risk Identification
BP.150	Maintain Supply Chain Risk Register

AG.2.10 Value at Risk (Plan)

The sum of probability of risk events times the monetary impact of the events in all Plan activities. Risk event here could be defined as the deviation from expected metrics value for the process.

AG.2.11 Value at Risk (Source)

The sum of probability of risk events times the monetary impact of the events in all Source activities. Risk event here could be defined as the deviation from expected metrics value for the process.

AG.2.12 Value at Risk (Make)

The sum of probability of risk events times the monetary impact of the events in all Make activities. Risk event here could be defined as the deviation from expected metrics value for the process.

AG.2.13 Value at Risk (Deliver)

The sum of probability of risk events times the monetary impact of the events in all Deliver activities. Risk event here could be defined as the deviation from expected metrics value for the process.

AG.2.14 Value at Risk (Return)

The sum of probability of risk events times the monetary impact of the events in all Return activities. Risk event here could be defined as the deviation from expected metrics value for the process.

AG.2.15 Time to Recovery (TTR)

Time to Recovery (TTR) is the aggregate time it would take a network point to become fully functional after a disruption. This would include the total time to recover, including suppliers' TTR information combined with the organization's own data to identify risk exposure for each of the network sites.

Hierarchy

Processes	
SCOR	Supply Chain
sE9	Manage Supply Chain Risk
Practices	
BP.0149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.001	Supply Chain Risk Management (SCRM)
BP.002	Risk Management Strategies
BP.081	Bowtie Risk Management
BP.035	Business Rule Review
BP.143	Preventive Returns
BP.161	Enterprise Level Spend Analysis
BP.150	Maintain Supply Chain Risk Register
BP.173	Supply Chain Risk Monitoring

AG

Level-3 Metrics		
AG.3.1	% of labor used in logistics, not used in direct activity Percent of labor used in logistics, not used in direct activity	• sD1 Deliver Stocked Product • sD2 Deliver Make-to-Order Product • sD3 Deliver Engineer-to-Order Product
AG.3.2	% of labor used in manufacturing, not used in direct activity Percent of labor used in manufacturing, not used in direct activity	• sM1 Make-to-Stock • sM2 Make-to-Order • sM3 Engineer-to-Order
AG.3.3	Additional deliver return volume Additional customer return volume	• sDR1 Deliver Return Defective Product • sDR2 Deliver Return MRO Product • sDR3 Deliver Return Excess Product
AG.3.4	Additional Delivery volume Additional delivery volume	• sD1 Deliver Stocked Product • sD2 Deliver Make-to-Order Product • sD3 Deliver Engineer-to-Order Product
AG.3.9	Additional source volumes obtained in 30 days Additional source volume to be determined given ramped up resources	• sS1 Source Stocked Product • sS2 Source Make-to-Order Product • sS3 Source Engineer-to-Order Product
AG.3.31	Current Deliver Return Volume Current return volume, number of orders returned	• sDR1 Deliver Return Defective Product • sDR2 Deliver Return MRO Product • sDR3 Deliver Return Excess Product
AG.3.32	Current Delivery Volume Number of orders shipped	• sD1 Deliver Stocked Product • sD2 Deliver Make-to-Order Product • sD3 Deliver Engineer-to-Order Product • sD4 Deliver Retail Product
AG.3.38	Current Make Volume Amount of each item which are manufactured	• sM1 Make-to-Stock • sM2 Make-to-Order • sM3 Engineer-to-Order

AG

AG.3.40	Current Purchase Order Cycle Times Sum of time to place a purchase order and supplier lead time	• sS1 Source Stocked Product • sS2 Source Make-to-Order Product • sS3 Source Engineer-to-Order Product
AG.3.41	Current source return volume Current return volume, number of orders returned	• sSR1 Source Return Defective Product
AG.3.42	Current Source Volume Amount of each item which are purchased	• sS1 Source Stocked Product • sS2 Source Make-to-Order Product • sS3 Source Engineer-to-Order Product
AG.3.44	Customer return order cycle time reestablished and sustained in 30 days Customer return order cycle time reestablished and sustained for increased quantities returned from customer given 30 days, including customer return order processing cycle time, transit time, return processing and disposition cycle time, etc.	• sDR1 Deliver Return Defective Product • sDR2 Deliver Return MRO Product • sDR3 Deliver Return Excess Product
AG.3.46	Demand sourcing-supplier constraints Percentage of orders with on time and accurate documentation supporting the order, including packing slips, bills of lading, invoices, etc. [Total number of orders delivered with correct and timely documentation] / [Total number of orders delivered] x 100%	• sS1 Source Stocked Product • sS2 Source Make-to-Order Product • sS3 Source Engineer-to-Order Product

Cost

CO.1.1 Total Supply Chain Management Cost (TSCMC)

The sum of the costs associated with the SCOR Level 2 processes to Plan, Source, Deliver, and Return.

Note: Cost of Raw Material and Make Costs are generally accounted for in COGS. It is recognized that there is likely to be overlap / redundancy between supply chain management costs and COGS.

Calculation:

TSCMC = Cost to Plan + Cost to Source + Cost to Make + Cost to Deliver + Cost to Return + Mitigation Costs

Data Collection:

Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization's general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations "horizontal" core processes based employee time and non-wage related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) employee time collection systems (or % split estimates), and (2) operational systems (e.g., enterprise resource planning [ERP] systems).

Unit of Measure: Total Supply Chain Management Cost is measured in monetary units.

Discussion Note:

Collecting transactional information, primarily resource expenses and operational "drivers", is now commonplace. The challenging task is to logically transform these expenses into calculated costs of the "horizontal" processes based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.

Hierarchy	
CO.2.1	Cost to Plan
CO.2.2	Cost to Source
CO.2.3	Cost to Make
CO.2.4	Cost to Deliver
CO.2.5	Cost to Return
CO.2.6	Mitigation Cost (Cost to mitigate supply chain)

Processes	
SCOR	Supply Chain
sP	Plan
sS	Source
sM	Make
sD	Deliver
sR	Return
sE	Enable

CO.1.1 Total Supply Chain Management Cost (TSCMC)

Practices	
BP.002	Risk Management Strategies
BP.081	Bowtie Risk Management
BP.086	Supply Network Planning
BP.161	Enterprise Level Spend Analysis
BP.165	Convergence of SCOR with Lean and Six Sigma
BP.183	Integrated Business Planning
BP.184	Scenario Planning

CO.2.1 Cost to Plan

The sum of the costs associated with Plan.

Calculation:

Cost to Plan = Sum of Cost to Plan (Plan + Source + Make + Deliver + Return)

Data collection:

Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization's general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations "horizontal" core processes based employee time and non-wage-related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) employee time collection systems (or % split estimates), and (2) operational systems (e.g., enterprise resource planning [ERP] systems).

Discussion Note:

Collecting transactional information, primarily resource expenses and operational "drivers", is now commonplace. The challenging task is to logically transform these expenses into calculated costs of the "horizontal" processes based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.

Hierarchy	
CO.3.1	Cost to Plan Supply Chain
CO.3.2	Cost to Plan Source
CO.3.3	Cost to Plan Make
CO.3.4	Cost to Plan Deliver
CO.3.5	Cost to Plan Return

Processes	
sP	Plan
sP1	Plan Supply Chain
sP2	Plan Source
sP3	Plan Make
sP4	Plan Deliver
sP5	Plan Return
sE	Enable

Practices	
BP.139	Vendor Managed Inventory (VMI)
BP.093	Publish Production Plan
BP.086	Supply Network Planning
BP.094	Characteristics-based Forecasting
BP.161	Enterprise Level Spend Analysis

CO.2.2 Cost to Source

The sum of the costs associated with Source.

Calculation:
Cost to Source = Sum of Cost for (Supplier Management + Material Acquisition Management)

- Supplier Management = material planning + planning procurement staff + supplier negotiation and qualification + etc.
- Material Acquisition Management = bidding and quotations + ordering + receiving + incoming material inspection + material storage + payment authorization + sourcing business rules and rqmts. + inbound freight and duties + etc.

Data collection:
Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization's general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations "horizontal" core processes based employee time and non-wage-related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) employee time collection systems (or % split estimates), and (2) operational systems (e.g., enterprise resource planning [ERP] systems).

Discussion Note:
Collecting transactional information, primarily resource expenses and operational "drivers", is now commonplace. The challenging task is to logically transform these expenses into calculated costs of the "horizontal" processes based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.

Hierarchy	
CO.3.6	Cost to Authorize Supplier Payment
CO.3.7	Cost to Receive Product
CO.3.8	Cost to Schedule Product Deliveries
CO.3.9	Cost to Transfer Product
CO.3.10	Cost to Verify Product
Processes	
sS1	Source Stocked Product
sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product

CO.2.3 Cost to Make

The sum of the costs associated with Make.

Note: Cost of Raw Material and Make Costs are generally accounted for in COGS. It is recognized that there is likely to be overlap/ redundancy between supply chain management costs and COGS.

Calculation:

Cost to Make = Sum of Direct Material, Direct Labor, and Direct non-Material Product-related Cost (equipment) and Indirect Product-related Cost (NOT part of CO.1.2 Cost of Goods Sold.)

Data collection:

Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization's general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations "horizontal" core processes based employee time and non wage-related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) Employee time collection systems (or % split estimates), and (2) Operational systems (e.g., enterprise resource planning [ERP] systems). In some cases, (1) direct material data is maintained at the "unit level" in bills of material (BOMs) or recipe formulas; and (2) direct labor and direct non-material product (equipment) data is maintained at the "unit level" in labor/machine routings or process sheets.

Discussion Note:

Cost to Make includes all Make related costs NOT included in CO.1.2, Cost of Goods Sold. In SCOR v12, Cost of Goods Sold and Cost to Make have been clearly separated to avoid confusion. Total Supply Chain Management costs or CO.1.1 should not include any of the cost included in CO.1.2, Cost of Goods Sold.

Collecting transactional information, primarily resource expenses and operational "drivers", is now commonplace. The challenging task is to logically transform these expenses into calculated costs of (1) the "horizontal" processes (referenced in Lean environments as "value-stream mapping"), and (2) products (or intermediate outputs) – with both types of calculations based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.

Hierarchy	
CO.3.11	Direct Material Cost (Does not include data from COGS)
CO.3.12	Indirect Cost Related to Production (Does not include data from COGS)
CO.3.13	Direct Labor Cost (Does not include data from COGS)
Processes	
sM1	Make-to-Stock
sM2	Make-to-Order
sM3	Engineer-to-Order

CO.2.4 Cost to Deliver and / or Install

The sum of the costs associated with Deliver and/or Install.

Calculation:

Cost to Deliver = Sum of Cost of (Sales order management + Customer Management)

- Sales order management = inquiry & quotations + order entry & maintenance + channel management + order fulfillment + distribution + transportation + outbound freight and duties + installation + customer invoicing / accounting + new product release / phase-in + etc.
- Customer Management = financing + post-sales customer service + handling disputes + field repairs + enabling technologies + etc.

Data collection:

Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization's general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations "horizontal" core processes based employee time and non wage-related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) employee time collection systems (or % split estimates), and (2) operational systems (e.g., enterprise resource planning [ERP] systems).

Discussion Note:

Collecting transactional information, primarily resource expenses and operational "drivers", is now commonplace. The challenging task is to logically transform these expenses into calculated costs of the "horizontal" processes based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.

Hierarchy	
CO.3.14	Order Management Costs
CO.3.15	Order Delivery Costs
Processes	
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
Practices	
BP.159	Electronic Data Interchange (EDI)
BP.099	Data Warehousing/Business Intelligence
BP.139	Vendor Managed Inventory (VMI)

CO.2.5 Cost to Return

Cost to Return Defective Product - The sum of the costs associated with returning a defective product to the supplier. (Processes: sSR1, sDR1) Cost to Return Excess Product - The sum of the costs associated with returning excess product to the supplier. (Processes: sSR3, sDR3) Cost to Return MRO Product - The sum of the costs associated with returning MRO product to the supplier.

Calculation:

Cost to Return = Sum of Cost to Return (to Sources + from Customers)

- Cost to Return to Source (sSRx) = Verify Defective Product Costs + Disposition of Defective Product Costs + Identify MRO Condition Costs + Request MRO Return Authorization Costs + Schedule MRO Shipment Costs + Return MRO Product Costs + etc.
- Cost to Return From Customer (sDRx) = Authorization Costs + Schedule Return Costs + Receive Costs + Authorize MRO Return Costs + Schedule MRO Return Costs + Receive MRO Return Costs + Transfer MRO Product Costs + etc.

Data collection:

Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization's general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations "horizontal" core processes based employee time and non-wage related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) employee time collection systems (or % split estimates), and (2) operational systems (e.g., enterprise resource planning [ERP] systems).

Discussion Note:

Collecting transactional information, primarily resource expenses and operational "drivers", is now commonplace. The challenging task is to logically transform these expenses into calculated costs of the "horizontal" processes based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.

Hierarchy	
CO.3.16	Cost to Source Return
CO.3.17	Cost to Deliver Return
Processes	
sSR2	Source Return MRO Product
sDR2	Deliver Return MRO Product

CO.2.6 Mitigation Cost (Costs to Mitigate Supply Chain Risk)

Mitigation Cost ($) is a diagnostic metric for CO.1.1: Supply Chain Management Cost (total). The sum of the costs associated with managing non-systemic risks that arise from special cause variations within the supply chain (defined as variations which are not predictable; have an assignable cause; and it's pattern of occurrence are not inherent to the system's behavior; rather are un-natural) (see Discussion section below for more information).

Calculation:

Mitigation Costs (Cost to Mitigate Supply Chain Risk) = Sum of Supply Chain Risk Mitigation Costs (Plan + Source + Make + Deliver + Return)

Data collection:

The total supply chain risk mitigation cost of all mitigation actions for non-systemic risks in a specific area, supplier, product, etc. ($)

Discussion Note:

Sourced from the book "Risk Management Essentials - What Every Business Professional Should Know" by Rai Chowdhary "Determining the costs for risk mitigation can be confusing – since one could argue much of what gets done in business is to manage risks of one form or another. How is one to decide between the normal cost of doing business, and the "extra" cost incurred for risk mitigation?

To address this question, we will draw upon the terms used by Deming and Shewhart to describe Variation. Two distinct types of variation were defined - Common cause variation, and Special cause variation.

Common cause variation is that which is inherent to the system, and is predictable via probabilistic analysis. There are not clear assignable causes – but a multitude of causes might exist to give rise to such variation. To control common cause variation one needs to work on improving the system at large.

Special cause variation is that which is not predictable, and has an assignable cause. Its pattern of occurrence is not inherent to the system's behavior; rather it is un-natural.

Based on the above, we can say that risks can be categorized into two types – those that are inherent to the way the system is setup – these we will call Systemic Risks and the costs associated with the mitigation of these shall be treated as the normal cost of doing business. The other risks – those that arise out of assignable causes / events and are unpredictable shall be referred to as Non-Systemic Risks. The costs associated with the management of these risks should be captured separately - under mitigation costs. Doing so enables the organization to "see" the costs of such risks, and determine where additional controls and / or vigilance will be helpful".

Hierarchy	
CO.3.18	Risk Mitigation Costs (Deliver)
CO.3.19	Risk Mitigation Costs (Make)
CO.3.20	Risk Mitigation Costs (Plan)
CO.3.21	Risk Mitigation Costs (Return)
CO.3.22	Risk Mitigation Costs (Source)

CO.2.6 Mitigation Cost (Costs to Mitigate Supply Chain Risk)

Processes	
sE6	Manage Supply Chain Contracts
sE8	Manage Supply Chain Regulatory Compliance
sE9	Manage Supply Chain Risk

Practices	
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.001	Supply Chain Risk Management (SCRM)
BP.002	Risk Management Strategies
BP.004	Network Prioritization for Risk Identification
BP.081	Bowtie Risk Management
BP.035	Business Rule Review
BP.174	Supply Chain Risk Assessment

CO.1.2 Cost of Goods Sold

The cost associated with buying raw materials and producing finished goods. This cost includes direct costs (labor, materials) and indirect costs (overhead).

Note: Cost of Raw Material and Make Costs are generally accounted for in COGS. It is recognized that there is likely to be overlap/ redundancy between supply chain management costs and COGS.

Calculation:

Cost of Goods Sold (COGS) = Cost to Make

COGS = direct material costs + direct labor costs + indirect costs related to making product

Data collection:

Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization's general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations "horizontal" core processes based employee time and non-wage-related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) employee time collection systems (or % split estimates), and (2) operational systems (e.g., enterprise resource planning [ERP] systems).

Discussion Note:

Collecting transactional information, primarily resource expenses and operational "drivers", is now commonplace. The challenging task is to logically transform these expenses into calculated costs of the "horizontal" processes based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.

Hierarchy	
CO.2.7	Direct Labor Cost
CO.2.8	Direct Material Cost
CO.2.9	Indirect Cost Related to Production

CO.2.7 Direct Material Cost

Direct cost spent on material for production.

CO.2.8 Direct Labor Cost

Direct cost spent on production labor.

CO.2.9 Indirect Cost Related to Production

Indirect cost spent incurred in production indirectly.

Level 3 Cost Metrics

ID	Metric Name	Definition	Process
CO.3.1	Cost to Plan Supply Chain	The sum of the costs associated with planning supply chain activities	sP1: Plan Supply Chain
CO.3.2	Cost to Plan Source	The sum of the costs associated with planning Source activities	sP2: Plan Source
CO.3.3	Cost to Plan Make	The sum of the costs associated with planning the making of product	sP3: Plan Make
CO.3.4	Cost to Plan Deliver	The sum of the costs associated with planning the delivery of product	sP4: Plan Deliver
CO.3.5	Cost to Plan Return	The sum of the costs associated with planning the returning of product	sP5: Plan Return
CO.3.6	Cost to Authorize Supplier Payment	The sum of the costs associated with authorizing supplier payment	sS1.5; sS2.5, sS3.7: Authorize Supplier Payment
CO.3.7	Cost to Receive Product	The sum of the costs associated with receiving product	sS1.2; sS2.2; sS3.4: Receive Product
CO.3.8	Cost to Schedule Product Deliveries	The sum of the costs associated with scheduling product deliveries	sS1.1; sS2.1; sS3.3: Schedule Product Deliveries
CO.3.9	Cost to Transfer Product	The sum of the costs associated with transferring product to Make or Deliver processes	sS1.4; sS2.4; sS3.6: Transfer Product
CO.3.10	Cost to Verify Product	The sum of the costs associated with raw material verification	sS1.3; sS2.3; sS3.5: Verify Product
CO.3.11	Direct Material Cost	Direct cost spent on material for production (Does not include COGS)	sEM.2: Manage Production Performance
CO.3.12	Indirect Cost Related to Production	Indirect costs incurred in production indirectly (Does not include COGS)	sEM.2: Manage Production Performance
CO.3.13	Direct Labor Cost	Direct cost spent on production labor (Does not include COGS)	sEM.2: Manage Production Performance

CO.3.14	Order Management Costs	The aggregation of the following cost elements: (contained in this glossary)	sD1: Deliver Stocked Products; sD3: Deliver Engineer-to-Order Products
CO.3.15	Order Delivery and / or Install Costs	The sum of the costs associated with deliver and / or install	sD4.7: Deliver and / or Install
CO.3.16	Cost to Source Return	The sum of the costs associated with Source Return	sSR1: Source Return Defective Product; sSR3 Source Return Excess Product
CO.3.17	Cost to Deliver Return	Cost to Return From Customer (DRx) = Authorization Costs + Schedule Return Costs + Receive Costs + Authorize MRO Return Costs + Schedule MRO Return Costs + Receive MRO Return Costs + Transfer MRO Product Costs + etc.	sDR1: Deliver Return Defective Product; sDR2: Deliver Return MRO Product
CO.3.18	Risk Mitigation Costs (Plan)	The total supply chain risk mitigation cost of all PLAN mitigation actions for a specific area, supplier, product, etc. ($)	sEP.9: Manage Supply Chain Plan Risk
CO.3.19	Risk Mitigation Costs (Source)	The total supply chain risk mitigation cost of all PLAN mitigation actions for a specific area, supplier, product, etc. ($)	sES.9 Manage Supply Chain Source Risk
CO.3.20	Risk Mitigation Costs (Make)	The total supply chain risk mitigation cost of all MAKE mitigation actions for a specific area, supplier, product, etc. ($)	sEM.9: Manage Supply Chain Make Risk
CO.3.21	Risk Mitigation Costs (Deliver)	The total supply chain risk mitigation cost of all DELIVER mitigation actions for a specific area, supplier, product, etc. ($)	sED.9: Manage Supply Chain Deliver Risk

CO.3.22	Risk Mitigation Costs (Return)	The total supply chain risk mitigation cost of all RETURN mitigation actions for a specific area, supplier, product, etc. ($)	sER.9: Manage Supply Chain Return Risk

Asset Management Efficiency

AM.1.1 Cash-To-Cash Cycle Time

The time it takes for an investment made to flow back into a company after it has been spent for raw materials. For services, this represents the time from the point where a company pays for the resources consumed in the performance of a service to the time that the company received payment from the customer for those services.

Calculation

Cash-To-Cash Cycle Time = [Inventory Days of Supply] + [Days Sales Outstanding] - [Days Payable Outstanding] in days.

Data collection

Unlike other SCOR metrics, where data requirements are specified, typically all of the cash-to-cash cycle time source data is already captured by business operating systems:

- general ledger system
- accounts receivable system
- accounts payable system
- purchasing system
- production reporting system
- customer relationship management system

As a result, information is 'calculated' by importing data from these systems and transforming them into the prescribed analytics/information. The transformation is accomplished using business rules.

Discussion

Cash-to-cash Cycle Time is a value metric used to measure how efficiently a company manages its working capital assets. This metric is a generally accepted Supply Chain metric within many industries and is used to benchmark supply chain asset management performance. The Cash-to-Cash Cycle time is measured by converting into days the supply of inventory in stock and the number of days outstanding for accounts receivable and accounts payable. The inventory days of supply is added to the days outstanding for accounts receivable. The accounts payable days outstanding is subtracted from this total to determine the cash-to-cash cycle time. The longer the cash-to-cash cycle, the more current assets needed (relative to current liabilities) since it takes longer to convert inventories and receivables into cash. In other words, the longer the cash-to-cash cycle, the more net working capital required.

Hierarchy	
AM.2.1	Days Sales Outstanding
AM.2.2	Inventory Days of Supply
AM.2.3	Days Payable Outstanding

Processes	
SCOR	Supply Chain
sP1	Plan Supply Chain
sP2	Plan Source
sP3	Plan Make
sP4	Plan Deliver

AM.1.1 Cash-To-Cash Cycle Time

sM1	Make-to-Stock
sM2	Make-to-Order
sM3	Engineer-to-Order
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
sD4	Deliver Retail Product
sSR1	Source Return Defective Product

Practices	
BP.146	Cross-Docking
BP.006	Consignment Inventory
BP.009	Kanban
BP.010	Min-Max Replenishment
BP.086	Supply Network Planning
BP.087	ABC Inventory Classification
BP.163	Optimized Supplier Count
BP.164	Consignment Inventory Management
BP.165	Convergence of SCOR with Lean and Six Sigma
BP.183	Integrated Business Planning
BP.184	Scenario Planning

AM.2.1 Days Sales Outstanding

The length of time from when a sale is made until cash for it is received from customers. The amount of sales outstanding expressed in days.

Calculation

5 point annual average of gross accounts receivable / (total gross annual sales / 365) in days.

Processes	
sD2.15	Invoice
sE6	Manage Supply Chain Contracts

AM.2.2 Inventory Days of Supply

The amount of inventory (stock) expressed in days of sales.

Calculation

[5 point rolling average of gross value of inventory at standard cost] / [Annual Cost of Goods Sold (COGS)] / 365 in days

Example: If 2 items a day are sold and 20 items are held in inventory, this represents 10 days (20/2) sales in inventory. (Other names: Days cost-of-sales in inventory, Days sales in inventory). Compare to inverse: Inventory Turns.

Hierarchy	
AM.3.16	Inventory Days of Supply - Raw Material
AM.3.17	Inventory Days of Supply - WIP
AM.3.23	Recycle Days of Supply
AM.3.28	Percentage Defective Inventory
AM.3.37	Percentage Excess Inventory
AM.3.44	Percentage Unserviceable MRO Inventory
AM.3.45	Inventory Days of Supply - Finished Goods

Processes	
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP1.3	Balance Supply Chain Resources with SC Requirements
sP1.4	Establish and Communicate Supply Chain Plans
sS1.4	Transfer Product
sS2.4	Transfer Product
sS3.6	Transfer Product
sE7	Manage Supply Chain Network

Practices	
BP.127	Automated Alerts for Material Management
BP.161	Enterprise Level Spend Analysis
BP.006	Consignment Inventory
BP.138	Theory of Constraints
BP.007	Baseline Inventory Monitoring
BP.008	Slow-moving Inventory Monitoring
BP.009	Kanban
BP.010	Min-Max Replenishment
BP.013	Item Rationalization

AM.2.2 Inventory Days of Supply

BP.086	Supply Network Planning
BP.087	ABC Inventory Classification
BP.156	Collaborative Planning, Forecasting and Replenishment (CPFR)
BP.162	Long Term Supplier Agreement/Partnership
BP.164	Consignment Inventory Management

AM.2.3 Days Payable Outstanding

The length of time from purchasing materials, labor and/or conversion resources until cash payments must be made expressed in days. (Other names: Average payment period for materials, Days purchases in accounts payable, Days outstanding in accounts payable)

Calculation
[5 point rolling average of gross accounts payable (AP)] / [total gross annual material purchases / 365].

The '5 point rolling average' calculation uses a combination of both historical and forward-looking data. This means that the rolling average value has to be calculated based on the average over the four previous quarters and the projection for the current or next quarter.

Processes	
sS1	Source Stocked Product
sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product
sE6	Manage Supply Chain Contracts

Practices	
BP.005	Self-Invoicing
BP.148	3-Way Delivery Verification

AM.1.2 Return on Supply Chain Fixed Assets

Return on Supply Chain Fixed Assets measures the return an organization receives on its invested capital in supply chain fixed assets. This includes the fixed assets used in Plan, Source, Make, Deliver, and Return.

Calculation
Return on Supply Chain Fixed Assets = ([Supply Chain Revenue] – [Total Cost to Serve]) / [Supply- Chain Fixed Assets]

Data collection
Unlike other SCOR metrics, where data requirements are specified, typically all of the required source data is already captured by business operating systems:

- general ledger system
- accounts receivable system
- accounts payable system
- purchasing system
- production reporting system
- customer relationship management system

As a result, information is 'calculated' by importing data from these systems and transforming them into the prescribed analytics/information. The transformation is accomplished using business rules. In order to measure Return on Supply Chain Fixed Assets, the investment in supply chain capital assets needs to be known. This requires a clear understanding of what is a "supply chain fixed asset". The SCOR sE5 process element is used since it is focused on managing supply chain capital assets. The value of these assets is the denominator of the metric.

Discussion
The return on supply chain fixed assets is measured by monetizing the supply chain revenue, cost of goods sold and supply chain management costs to determine the profit from the respective supply chain. This amount is divided by the supply chain fixed assets to determine the return generated from the respective supply chain. "Supply Chain Revenue" is used in the metric rather than just Net Revenue. There is a need for a more specific "revenue" number than "Net Revenue" for use in the "Supply Chain Revenue" level-2 metric. Net Revenue could include revenue from sources other than the supply chain, such as investments, leasing real estate, court settlements, etc.

Supply Chain Revenue will be used and will be only the portion of Net Revenue that is generated by the specific supply chain being measured and analyzed. Range of fixed assets used in an organization that have the character of permanency rather than being rapidly replaced (or expensed); examples include land, warehouse, trucks, buildings, investments, and plant and machinery. Fixed assets used to operate the Supply Chain in each of the categories (sP, sS, sM, sD, sR) are managed by the sE5 process. A Revised Capital Plan is an output of the Manage Supply Chain Fixed Assets (sE5) process and would contain supply chain capital asset information that could be used in measuring the Supply Chain Fixed Asset Value.

Hierarchy	
AM.2.4	Supply Chain Revenue
AM.2.5	Supply Chain Fixed Assets

AM.1.2 Return on Supply Chai\n Fixed Assets

Processes	
SCOR	Supply Chain
sP1	Plan Supply Chain
sP2	Plan Source
sP3	Plan Make
sP4	Plan Deliver
sS1	Source Stocked Product
sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product
sM1	Make-to-Stock
sM2	Make-to-Order
sM3	Engineer-to-Order
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
sD4	Deliver Retail Product
sSR1	Source Return Defective Product
sDR1	Deliver Return Defective Product
sSR2	Return MRO Product
sDR2	Deliver Return MRO Product
sSR3	Source Return Excess Product
sDR3	Deliver Return Excess Product

Practices	
BP.086	Supply Network Planning
BP.087	ABC Inventory Classification
BP.117	Embed Specialized Services
BP.165	Convergence of SCOR with Lean and Six Sigma
BP.183	Integrated Business Planning
BP.184	Scenario Planning

AM.2.4 Supply Chain Revenue

Operating revenue generated from a supply chain. This does not include non-operating revenue, such as leasing real estate, investments, court settlements, sale of office buildings, etc.

Practices	
BP.050	Customer Incentives / Promotions for Large Inventory Purchases
BP.056	Supplier Raw Material Quality Improvement
BP.058	Inventory Management Training
BP.026	Improve S&OP process
BP.027	Pull-Based Inventory Replenishment
BP.028	Inventory Optimization
BP.029	Inventory Management Using Supply Chain Network Optimization
BP.030	Inventory Record Accuracy
BP.031	Stock keeping Unit (SKU) Rationalization/Cost of Sales Analysis
BP.032	Reduce / Write-off Slow Moving Inventory
BP.033	Traditional Demand Forecasting Improvement
BP.034	Extend Inventory Planning using Collaboration (Key Suppliers)
BP.036	Consignment Inventory with Key Suppliers
BP.037	Manufacturing Direct/Drop Shipment
BP.038	Batch Size Reduction
BP.039	Right Size Frequency of Production Wheel
BP.040	MTO Order Fulfillment Strategy
BP.041	Transportation Optimization
BP.042	Regular Review of Procurement Terms and Conditions
BP.043	Consignment Inventory Reduction
BP.044	Inventory Financing Evaluation
BP.045	Delay Inbound Supplier Shipments
BP.046	Expedite Outbound Customer Shipments
BP.047	Finished Goods Inventory Postponement
BP.048	Inventory incentives / promotions for customers
BP.051	Embed Inventory Management Goals
BP.052	Design for Logistics (DFL) Management
BP.053	Manufacturing Reliability Improvement
BP.054	Manufacturing Quality Improvements for Return Reduction
BP.055	Freight Carrier Delivery Performance Evaluation
BP.059	Employee Incentives for Effective Inventory Management

AM.2.4 Supply Chain Revenue

BP.060	Order Lead Time Corrective Action
BP.061	Reduce Non-Strategic Inventory Level
BP.062	Master Data Accuracy
BP.063	Optimize Sourcing Decisions to Local Source Point
BP.064	Safety Stock Reduction
BP.065	Seasonal Packaging Reduction/Removal
BP.066	Returns Policy to Reduce Returns Inventory
BP.067	Returns Inventory Reduction
BP.069	Raw Materials Receiving Process
BP.070	Planning/scheduling inventory training
BP.071	Freight Costs and Inventory Stocking Optimization

AM.2.5 Supply Chain Fixed Assets

The sum of the costs associated with Plan, Source, Make, Deliver, and Return Fixed Assets

Hierarchy	
AM.3.11	Deliver Fixed Asset Value
AM.3.18	Make Fixed Asset Value
AM.3.20	Plan Fixed Asset Value
AM.3.24	Return Fixed Asset Value
AM.3.27	Source Fixed Asset Value

Practices	
BP.130	Identification of Obsolete Capital Assets

AM.1.3 Return on Working Capital

Return on working capital is a measurement which assesses the magnitude of investment relative to a company's working capital position versus the revenue generated from a supply chain. Components include accounts receivable, accounts payable, inventory, supply chain revenue, cost of goods sold and supply chain management costs.

Calculation

Return on Working Capital = ([Supply Chain Revenue] – [Total Cost to Serve]) / ([Inventory] + [Accounts Receivable] – [Accounts Payable])

Data collection

Unlike other SCOR metrics, where data requirements are specified, typically all of the required source data is already captured by business operating systems:

- general ledger system
- accounts receivable system
- accounts payable system
- purchasing system
- production reporting system
- customer relationship management system

As a result, information is 'calculated' by importing data from these systems and transforming them into the prescribed analytics/information. The transformation is accomplished using business rules.

Discussion

The return on working capital is measured by monetizing the supply chain profit and dividing into the calculated amount the supply chain working capital position. "Supply Chain Revenue" is used in the metric rather than just Net Revenue. There is a need for a more specific "revenue" number than "Net Revenue" for use in the "Supply Chain Revenue" level-2 metric. Net Revenue could include revenue from sources other than the supply chain, such as investments, leasing real estate, court settlements, etc... Supply Chain Revenue will be used and will be only the portion of Net Revenue that is generated by the specific supply chain being measured and analyzed.

Hierarchy	
AM.2.6	Accounts Payable (Payables Outstanding)
AM.2.7	Accounts Receivable (Sales Outstanding)
AM.2.8	Inventory

Processes	
SCOR	Supply Chain
sP1	Plan Supply Chain
sP2	Plan Source
sP3	Plan Make
sP4	Plan Deliver
sS1	Source Stocked Product

AM.1.3 Return on Working Capital

sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product
sM1	Make-to-Stock
sM2	Make-to-Order
sM3	Engineer-to-Order
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
sD4	Deliver Retail Product
sSR1	Source Return Defective Product
sDR1	Deliver Return Defective Product
sSR2	Return MRO Product
sDR2	Deliver Return MRO Product
sSR3	Source Return Excess Product
sDR3	Deliver Return Excess Product

Practices	
BP.059	Employee Incentives for Effective Inventory Management
BP.050	Customer Incentives / Promotions for Large Inventory Purchases
BP.056	Supplier Raw Material Quality Improvement
BP.058	Inventory Management Training
BP.065	Seasonal Packaging Reduction/Removal
BP.026	Improve S&OP process
BP.027	Pull-Based Inventory Replenishment
BP.028	Inventory Optimization
BP.029	Inventory Management Using Supply Chain Network Optimization
BP.030	Inventory Record Accuracy
BP.031	Stock keeping Unit (SKU) Rationalization/Cost of Sales Analysis
BP.032	Reduce / Write-off Slow Moving Inventory
BP.033	Traditional Demand Forecasting Improvement
BP.034	Extend Inventory Planning using Collaboration (Key Suppliers)
BP.036	Consignment Inventory with Key Suppliers
BP.037	Manufacturing Direct/Drop Shipment
BP.038	Batch Size Reduction
BP.039	Right Size Frequency of Production Wheel

AM.1.3 Return on Working Capital

BP.040	MTO Order Fulfillment Strategy
BP.041	Transportation Optimization
BP.042	Regular Review of Procurement Terms and Conditions
BP.043	Consignment Inventory Reduction
BP.044	Inventory Financing Evaluation
BP.045	Delay Inbound Supplier Shipments
BP.046	Expedite Outbound Customer Shipments
BP.047	Finished Goods Inventory Postponement
BP.048	Inventory incentives / promotions for customers
BP.051	Embed Inventory Management Goals
BP.052	Design for Logistics (DFL) Management
BP.053	Manufacturing Reliability Improvement
BP.054	Manufacturing Quality Improvements for Return Reduction
BP.055	Freight Carrier Delivery Performance Evaluation
BP.060	Order Lead Time Corrective Action
BP.061	Reduce Non-Strategic Inventory Level
BP.062	Master Data Accuracy
BP.063	Optimize Sourcing Decisions to Local Source Point
BP.064	Safety Stock Reduction
BP.066	Returns Policy to Reduce Returns Inventory
BP.067	Returns Inventory Reduction
BP.068	Supplier Delivery Performance Analysis
BP.069	Raw Materials Receiving Process
BP.070	Planning/scheduling inventory training
BP.071	Freight Costs and Inventory Stocking Optimization
BP.086	Supply Network Planning
BP.087	ABC Inventory Classification
BP.165	Convergence of SCOR with Lean and Six Sigma
BP.183	Integrated Business Planning
BP.184	Scenario Planning

AM.2.6 Accounts Payable (Payables Outstanding)

The amount of purchased materials, labor and/or conversion resources that are to be paid (accounts payable).

Calculation

The [5 point rolling average of gross accounts payable (A/P)] in $.

Notes

The '5 point rolling average' calculation uses a combination of both historical and forward-looking data. This means that the rolling average value has to be calculated based on the average over the four previous quarters and the projection for the current or next quarter. The 5 point rolling average calculation is: [Sum of the 4 previous quarters + projection for next quarter) / 5]

Practices	
BP.161	Enterprise Level Spend Analysis
BP.148	3-Way Delivery Verification

AM.2.7 Accounts Receivable (Sales Outstanding)

The amount of accounts receivable outstanding expressed in dollars.

Calculation

The [5 point rolling average of gross accounts receivable (AR)] in $.

AM.2.8 Inventory

The amount of inventory (stock) expressed in dollars.

Calculation

The [5 point rolling average of gross value of inventory at standard cost] in $.

Practices	
BP.055	Freight Carrier Delivery Performance Evaluation
BP.161	Enterprise Level Spend Analysis
BP.050	Customer Incentives / Promotions for Large Inventory Purchases
BP.056	Supplier Raw Material Quality Improvement
BP.058	Inventory Management Training
BP.026	Improve S&OP process
BP.027	Pull-Based Inventory Replenishment
BP.028	Inventory Optimization
BP.029	Inventory Management Using Supply Chain Network Optimization
BP.030	Inventory Record Accuracy
BP.031	Stock keeping Unit (SKU) Rationalization/Cost of Sales Analysis
BP.032	Reduce / Write-off Slow Moving Inventory
BP.033	Traditional Demand Forecasting Improvement
BP.034	Extend Inventory Planning using Collaboration (Key Suppliers)
BP.036	Consignment Inventory with Key Suppliers
BP.037	Manufacturing Direct/Drop Shipment
BP.038	Batch Size Reduction
BP.039	Right Size Frequency of Production Wheel
BP.040	MTO Order Fulfillment Strategy
BP.041	Transportation Optimization
BP.042	Regular Review of Procurement Terms and Conditions
BP.043	Consignment Inventory Reduction
BP.044	Inventory Financing Evaluation
BP.045	Delay Inbound Supplier Shipments
BP.046	Expedite Outbound Customer Shipments
BP.047	Finished Goods Inventory Postponement
BP.048	Inventory incentives / promotions for customers
BP.051	Embed Inventory Management Goals
BP.052	Design for Logistics (DFL) Management
BP.053	Manufacturing Reliability Improvement
BP.054	Manufacturing Quality Improvements for Return Reduction

AM.2.8 Inventory

BP.059	Employee Incentives for Effective Inventory Management
BP.060	Order Lead Time Corrective Action
BP.061	Reduce Non-Strategic Inventory Level
BP.062	Master Data Accuracy
BP.063	Optimize Sourcing Decisions to Local Source Point
BP.064	Safety Stock Reduction
BP.065	Seasonal Packaging Reduction/Removal
BP.066	Returns Policy to Reduce Returns Inventory
BP.067	Returns Inventory Reduction
BP.068	Supplier Delivery Performance Analysis
BP.069	Raw Materials Receiving Process
BP.070	Planning/scheduling inventory training
BP.071	Freight Costs and Inventory Stocking Optimization
BP.130	Identification of Obsolete Capital Assets

AM

Level-3 Metrics		
AM.3.2	% of the product content that has a supplier take- back program for recycling or reuse.	• sS3.1 Identify Sources of Supply
AM.3.3	% of materials that are recyclable/reusable % of the product content that is recyclable or reusable	• sS3.1 Identify Sources of Supply
AM.3.4	% of packaging/shipping materials reused internally The percent of scrap from packaging that is immediately reused in the packaging process	• sM2.4 Package
AM.3.5	% of production materials reused The percent of scrap from production that is immediately reused in the production process	• sM1.3 Produce and Test • sM2.3 Produce and Test • sM3.4 Produce and Test
AM.3.6	% of products consisting of previously used components The weight of recycled material in the product as a percent of total product weight	• sM1.3 Produce and Test • sM2.3 Produce and Test • sM3.4 Produce and Test
AM.3.8	Average age of Excess Inventory Average age of Excess Inventory in days	• sSR3 Source Return Excess Product
AM.3.9	Capacity Utilization A measure of how intensively a resource is being used to produce a good or service. Some factors that should be considered are internal manufacturing capacity, constraining processes, direct labor availability and key components/ materials availability.	• sM1.1 Schedule Production Activities • sM1.3 Produce and Test • sM1.4 Package • sM2.1 Schedule Production Activities • sM2.3 Produce and Test • sM2.4 Package • sM3.2 Schedule Production Activities • sM3.4 Produce and Test • sM3.5 Package • sE4 Manage Supply Chain Human Resources • sE5 Manage Supply Chain Assets
AM.3.12	Deliver Return Cycle Time The average time associated with returns.	• sDR1 Deliver Return Defective Product • sDR2 Deliver Return MRO Product
AM.3.14	Hazardous materials used during production process as a % of all materials	• sM1.3 Produce and Test • sM2.3 Produce and Test • sM3.4 Produce and Test

	The % of material (by weight) issued for production that is classified as hazardous material	
AM.3.15	Hazardous waste as % of total waste The % of waste (by weight) generated from production that is classified as hazardous material	• sM1.7 Waste Disposal • sM2.7 Waste Disposal • sM3.8 Waste Disposal
AM.3.16	Inventory Days of Supply - Raw Material Value of raw materials / (COGS / 365) in days.	• sS1 Source Stocked Product • sS2 Source Make-to-Order Product • sS3 Source Engineer-to-Order Product
AM.3.17	Inventory Days of Supply - WIP Total value of Work in Process / (COGS / 365) in days. WIP = Work In Process.	• sM2 Make-to-Order • sM3 Engineer-to-Order • sD1 Deliver Stocked Product • sD2 Deliver Make-to-Order Product • sD3 Deliver Engineer-to-Order Product
AM.3.19	Packaging as % of total material The % by weight of packaging material to total raw material weight	• sM1.2 Issue Material • sM2.2 Issue Sourced/In-Process Product • sM3.3 Issue Sourced/In-Process Product
AM.3.21	Rebuild or recycle rate Number of returned products that are rebuilt or recycled as a percent of the total number of products returned	• sSR1 Source Return Defective Product • sSR1.5 Return Defective Product
AM.3.22	Recyclable waste as % of total waste. The % of waste (by weight) generated from production that is recyclable	• sSR2 Return MRO Product • sM1 Make-to-Stock • sM2 Make-to-Order • sM3 Engineer-to-Order
AM.3.25	Return for Recycle Rate Number of returns that are for recycling or re use as a percent of the total number of products returned	• sDR3 Deliver Return Excess Product
AM.3.26	Return Rate Weight of products returned divided by the weight of product shipped	• sDR1 Deliver Return Defective Product
AM.3.28	Percentage Defective Inventory The value of defective product inventory as a percentage of the value of total inventory (%) Calculation [Total Defective Product Inventory Value] / [Total Inventory Value] x 100%	• sSR1 Source Return Defective Product • sDR1 Deliver Return Defective Product

AM.3.29	Percentage Defective Inventory in Disposition The value of defective product awaiting a disposition decision as a percentage of the value of the total defective product inventory (%) Calculation [Value of Defective Inventory in Disposition Stage] / [Total Inventory Value] x 100%	• sSR1.1 Identify Defective Product Condition • sSR1.2 Disposition Defective Product • sSR2.2 Disposition MRO Product
AM.3.30	Percentage Defective Inventory in Return Authorization The value of defective product awaiting return authorization as a percentage of the total defective product inventory value (%) Calculation [Value of Defective Product Inventory in Request Return Authorization Stage] / [Total Defective Product Inventory Value] x 100%	• sSR1.3 Request Defective Product Return Authorization
AM.3.31	Percentage Defective Product Inventory in Transportation The value of defective product inventory in transportation as a percentage of total defective product inventory (%) Calculation [Value of Defective Product Inventory in Physical Return and Transportation Stage] / [Total Defective Product Inventory Value] x 100%	• sSR1.5 Return Defective Product
AM.3.32	Percentage Defective Product Inventory in Scheduling The value of defective product inventory awaiting scheduling as a percentage of the total defective product inventory value (%) Calculation [Value of Defective Product in Scheduling Stage] / [Total Defective Product Inventory Value] x 100%	• sSR1.4 Schedule Defective Product Shipment
AM.3.33	Percentage Excess Inventory in Disposition Inventory Awaiting Return in the disposition decision stage. Calculation [Excess Inventory in Disposition Stage] / [Total Inventory Value] x 100%	• sSR3.2 Disposition Excess Product
AM.3.34	Percentage Excess Inventory in Transportation Excess process in physical return and transportation stage as a percentage of total excess product inventory (%) Calculation [Value of excess product inventory in physical return and transportation stage] / [Total excess inventory value] x 100%	• sSR3.5 Return Excess Product
AM.3.35	Percentage Excess Inventory in Request Return Authorization Inventory Awaiting Return Authorization (%) Calculation [Value of excess product in request return authorization stage] / [Value of total excess inventory] x 100%	• sSR3.3 Request Excess Product Return Authorization

AM.3.36	Percentage Excess Inventory in Identification Inventory awaiting return in the identification stage as a percentage of total excess inventory (%) Calculation [Value of Excess Inventory in Identification Stage] / [Total Inventory Value] x 100%	• sSR3.1 Identify Excess Product Condition
AM.3.37	Percentage Excess Inventory The value of excess inventory as a percentage of the value of total inventory (%) Calculation [Value of Excess Inventory] / [Total Inventory Value] x 100%	• sSR3 Source Return Excess Product • sDR3 Deliver Return Excess Product
AM.3.38	Percentage Excess Inventory in Scheduling Percentage of excess inventory awaiting scheduling the return (%) Calculation [Value of Excess Product Inventory in Scheduling Stage]/ [Total Excess Product Inventory Value] x 100%	• sSR3.4 Schedule Excess Product Shipment
AM.3.39	Percentage Unserviceable MRO Inventory in Disposition The value of unserviceable MRO Inventory in disposition stage as a percentage of total MRO inventory value (%) Calculation [Value of Unserviceable MRO Inventory in Disposition Stage] / [Total MRO Inventory Value] x 100%	• sSR2.2 Disposition MRO Product • sDR2 Deliver Return MRO Product
AM.3.40	Percentage Unserviceable MRO Inventory in Transportation The value of unserviceable MRO inventory in transportation as a percentage of the total MRO inventory value (%) Calculation [Value of Unserviceable MRO Inventory in Physical Return and Transportation Stage] / [Total MRO Inventory Value] x 100%	• sSR2.5 Return MRO Product
AM.3.41	Percentage Unserviceable MRO Inventory in Return Authorization The value of unserviceable MRO inventory awaiting return authorization as a percentage of the total MRO inventory value (%) Calculation [Value of Unserviceable MRO Inventory in Request Return Authorization Stage] / Total MRO Inventory Value] x 100%	• sSR2.3 Request MRO Return Authorization
AM.3.42	Percentage Unserviceable MRO Inventory in Identification The value of unserviceable MRO Inventory awaiting identification as a percentage of total MRO inventory value (%) Calculation [Value of Unserviceable MRO Inventory in Identification Stage] / [Total MRO Inventory Value] x 100%	• sSR2.1 Identify MRO Product Condition

AM

AM.3.43	Percentage Unserviceable MRO Inventory in Scheduling The value of unserviceable MRO inventory awaiting scheduling as a percentage of the total MRO inventory value (%) Calculation [Value of Unserviceable MRO inventory in Scheduling Stage] / [Total MRO Inventory Value] x 100%	• sSR2.4 Schedule MRO Shipment
AM.3.45	Inventory Days of Supply - Finished Goods Finished goods inventory days of supply are calculated as gross finished goods inventory / (value of transfers / 365 days) in days.	• sD1 Deliver Stocked Product • sD2 Deliver Make-to-Order Product • sD3 Deliver Engineer-to-Order Product

Processes

Introduction to Processes

A process is a unique activity performed to meet pre-defined outcomes. The processes in SCOR have been identified as unique processes a supply chain requires to execute in order to support its primary objective to fulfill customer orders. For each unique process, SCOR only has one representation †.

SCOR recognizes 6 major processes (level-1 processes):

Plan
The Plan processes describe the activities associated with developing plans to operate the supply chain. The Plan processes include the gathering of requirements, gathering of information on available resources, balancing requirements and resources to determine planned capabilities and gaps in demand or resources and identify actions to correct these gaps.

Source
The Source processes describe the ordering (or scheduling of deliveries) and receipt of goods and services. The Source process embodies the issuance of purchase orders or scheduling deliveries, receiving, validation and storage of goods and accepting the invoice from the supplier. With the exception for Sourcing Engineer-to-Order goods or services, all supplier identification, qualification and contract negotiation processes are not described using Source process elements. See APICS DCOR.

Make
The Make processes describe the activities associated with the conversion of materials or creation of the content for services. Conversion of materials is used rather than 'production' or 'manufacturing' as Make represents all types of material conversions: Assembly, Chemical processing, Maintenance, Repair, Overhaul, Recycling, Refurbishment, Remanufacturing and other common names for material conversion processes. As a general guideline: These processes are recognized by the fact that 1 or more item numbers go in and 1 or more different item numbers come out of this process.

Deliver
The Deliver processes describe the activities associated with the creation, maintenance and fulfillment of customer orders. The Deliver process embodies the receipt, validation and creation of customer orders, scheduling order delivery, pick, pack and shipment and invoicing the customer. The sD4 Deliver Retail process provides a simplified view of Source and Deliver processes operated in a Make-to-Stock retail operation.

Return
The Return processes describe the activities associated with the reverse flow of goods. The Return process embodies the identification of the need to return, the disposition decision making, the scheduling of the return and the shipment and receipt of the returned goods. Repair, recycling, refurbishment and remanufacturing processes are not described using Return process elements. See Make.

Enable

The Enable processes describe the activities associated with the management of the supply chain. Enable processes include management of business rules, performance management, data management, resource management, facilities management, contract management, supply chain network management, managing regulatory compliance, risk management, and supply chain procurement.

For each level-1 process 3 or more differentiating level-2 process categorizations exist. Each level-2 process contains level-3 process elements. These hierarchical relationships provide classification of processes.

It is recognized that some lower level processes, such as those involving sourcing, delivery, and procurement may be accurately placed and mapped in different locations throughout the Process sections. Please note, if moving processes to different sections of the model, be cautious to not duplicate processes. SCOR can serve as a flexible and customizable model that can be applied to multiple industries and situations, so the framework process locations as published are not rigid.

SCOR Process Workflows

All SCOR processes now have process workflows developed by the SCOR BPM Accelerator, powered by ARIS and Visual Enterprise Architecture (VEA). This ensures all inputs, outputs, and objects are accurately mapped. These new workflows will also now be included in the BPM Accelerator. For more information on the BPM Accelerator, please contact APICS Corporate Development at corporatedevelopment@apics.org.

Plan

sP Plan

The processes associated with determining requirements and corrective actions to achieve supply chain objectives.

Hierarchy	
sP1	Plan Supply Chain
sP2	Plan Source
sP3	Plan Make
sP4	Plan Deliver
sP5	Plan Return

Metrics	
AG.1.1	Upside Supply Chain Adaptability
AG.1.2	Downside Supply Chain Adaptability
AG.1.3	Overall Value at Risk (VAR)
AM.1.1	Cash-to-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
CO.1.1	Total Supply Chain Management Costs
CO.1.2	Costs of Goods Sold
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time

sP1 Plan Supply Chain

The development and establishment of courses of action over specified time periods that represent a projected appropriation of supply chain resources to meet supply chain requirements for the longest time fence constraints of supply resources.

Hierarchy	
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP1.3	Balance Supply Chain Resources with SC Requirements
sP1.4	Establish and Communicate Supply Chain Plans

Metrics	
RS.1.1	Order Fulfillment Cycle Time
RS.3.98	Plan Cycle Time
CO.2.1	Cost to Plan
CO.3.1	Cost to Plan Supply Chain
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital

Practices	
BP.018	ABC Inventory Classification System
BP.013	Item Rationalization
BP.016	Supply Network Planning
BP.019	Demand Planning
BP.020	Demand Management
BP.021	Sales and Operations Planning
BP.024	Supply Chain Optimization (SCO)
BP.026	Improve S&OP process
BP.027	Pull-Based Inventory Replenishment
BP.028	Inventory Optimization
BP.029	Inventory Management Using Supply Chain Network Optimization
BP.030	Inventory Record Accuracy
BP.031	Stock keeping Unit (SKU) Rationalization/Cost of Sales Analysis
BP.032	Reduce / Write-off Slow Moving Inventory

sP1 Plan Supply Chain

BP.033	Traditional Demand Forecasting Improvement
BP.034	Extend Inventory Planning using Collaboration (Key Suppliers)
BP.035	Business Rule Review
BP.036	Consignment Inventory with Key Suppliers
BP.037	Manufacturing Direct/Drop Shipment
BP.038	Batch Size Reduction
BP.039	Right Size Frequency of Production Wheel
BP.040	MTO Order Fulfillment Strategy
BP.041	Transportation Optimization
BP.042	Regular Review of Procurement Terms and Conditions
BP.043	Consignment Inventory Reduction
BP.044	Inventory Financing Evaluation
BP.045	Delay Inbound Supplier Shipments
BP.046	Expedite Outbound Customer Shipments
BP.047	Finished Goods Inventory Postponement
BP.048	Inventory incentives / promotions for customers
BP.050	Customer Incentives / Promotions for Large Inventory Purchases
BP.051	Embed Inventory Management Goals
BP.052	Design for Logistics (DFL) Management
BP.053	Manufacturing Reliability Improvement
BP.054	Manufacturing Quality Improvements for Return Reduction
BP.055	Freight Carrier Delivery Performance Evaluation
BP.056	Supplier Raw Material Quality Improvement
BP.058	Inventory Management Training
BP.059	Employee Incentives for Effective Inventory Management
BP.060	Order Lead Time Corrective Action
BP.061	Reduce Non-Strategic Inventory Level
BP.062	Master Data Accuracy
BP.063	Optimize Sourcing Decisions to Local Source Point
BP.064	Safety Stock Reduction
BP.065	Seasonal Packaging Reduction/Removal
BP.066	Returns Policy to Reduce Returns Inventory
BP.070	Planning/scheduling inventory training
BP.071	Freight Costs and Inventory Stocking Optimization

sP1 Plan Supply Chain

BP.086	Supply Network Planning
BP.087	ABC Inventory Classification
BP.098	Mobile Access of Information
BP.102	Pick List Generation
BP.105	Task Management
BP.115	Transportation Management System
BP.116	Expedited Logistics
BP.122	Vendor Managed Inventory (VMI)
BP.145	Vendor Collaboration
BP.153	Bar coding/RFID
BP.183	Integrated Business Planning (IBP)

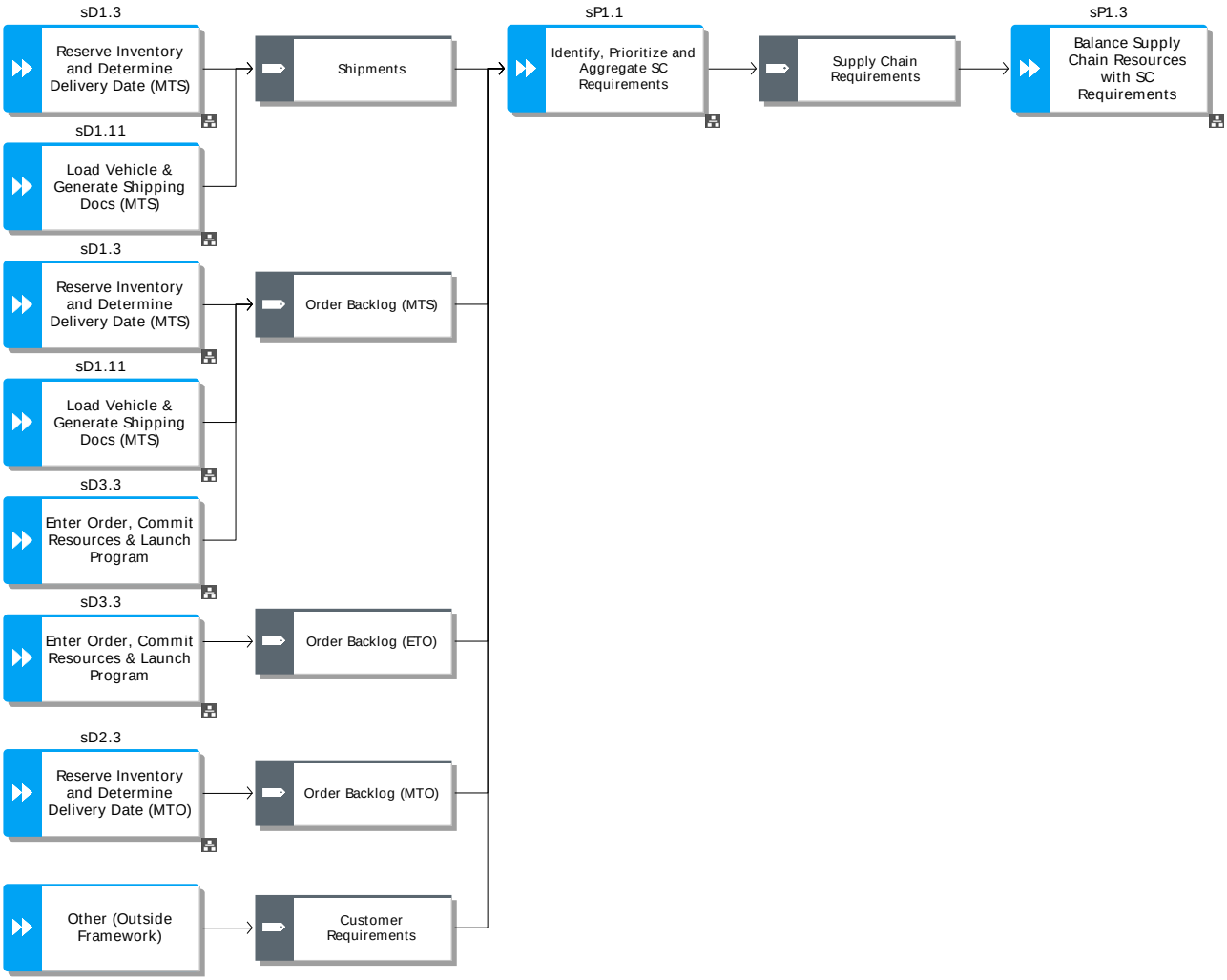
sP1.1 Identify, Prioritize & Aggregate Supply Chain Requirements

The process of identifying, aggregating, and prioritizing, all sources of demand for the integrated supply chain of a product or service at the appropriate level, horizon and interval. The sales forecast is comprised of the following concepts: sales forecasting level, time horizon, and time interval. The sales forecasting level is the focal point in the corporate hierarchy where the forecast is needed at the most generic level. i.e. Corporate forecast, Divisional forecast, Product Line forecast, SKU, SKU by Location. The sales forecasting time horizon generally coincides with the time frame of the plan for which it was developed i.e. Annual, 1-5 years, 1- 6 months, Daily, Weekly, Monthly. The sales forecasting time interval generally coincides with how often the plan is updated, i.e. Daily, Weekly, Monthly, and Quarterly.

Metrics	
RL.3.37	Forecast Accuracy
RS.3.44	Identify, Prioritize, and Aggregate Supply Chain Requirements Cycle Time
Practices	
BP.013	Item Rationalization
BP.014	Demand Planning & Forecasting
BP.019	Demand Planning
BP.020	Demand Management
BP.021	Sales and Operations Planning
BP.024	Supply Chain Optimization (SCO)
BP.086	Supply Network Planning
BP.090	Days of Supply Based MRP Proposal Management
BP.094	Characteristics-based Forecasting
BP.145	Vendor Collaboration
BP.183	Integrated Business Planning (IBP)
BP.184	Scenario Planning
People	
HS.0029	Customer Relationship Management (CRM)
HS.0037	Demand Management

sP1.1 Identify, Prioritize & Aggregate Supply Chain Requirements

Workflow



sP1.2 Identify, Prioritize & Aggregate Supply Chain Resources

The process of identifying, prioritizing, and aggregating, as a whole with constituent parts, all sources of supply that are required and add value in the supply chain of a product or service at the appropriate level, horizon and interval.

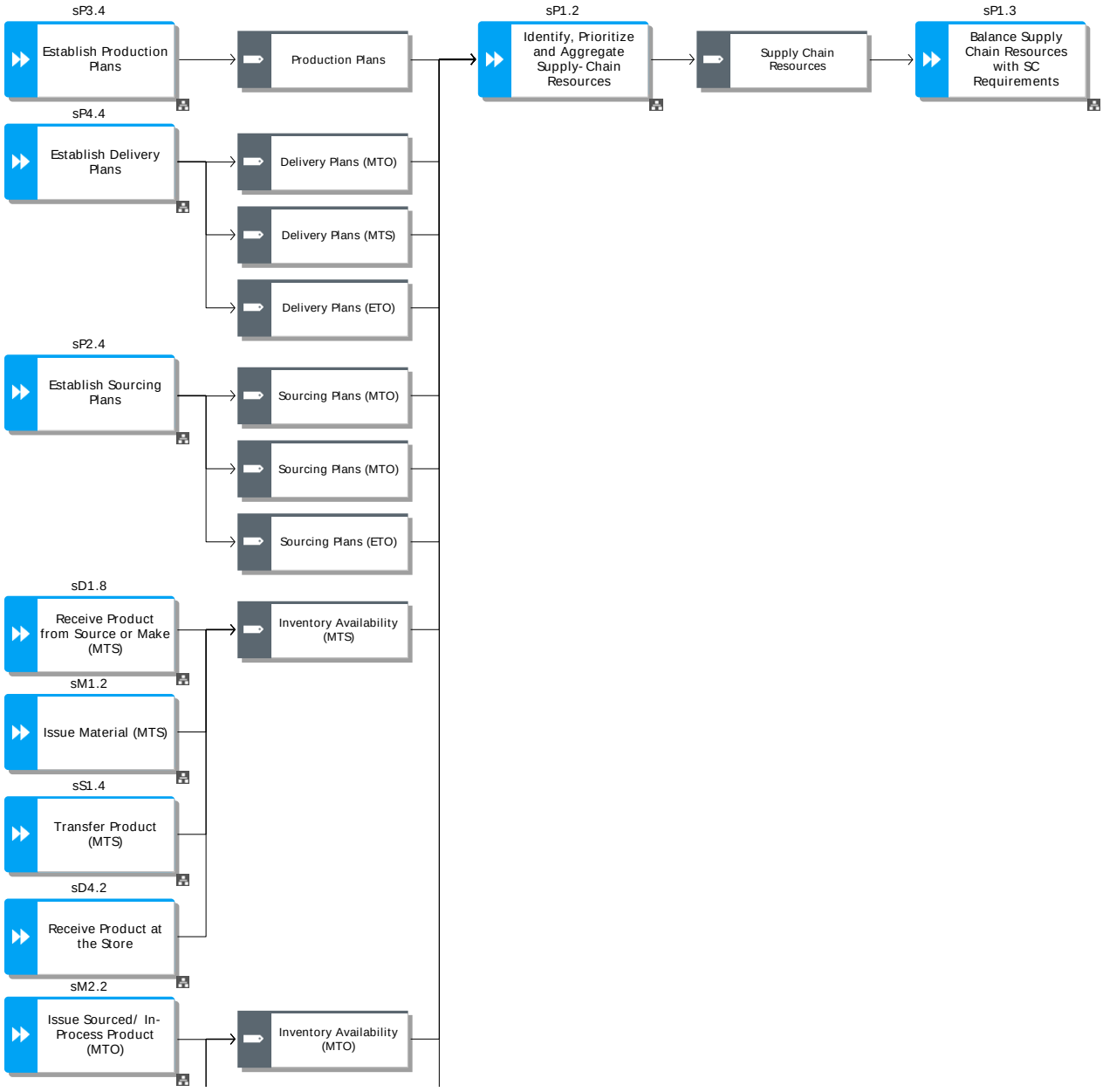
Metrics	
RS.3.39	Identify, Assess, and Aggregate Supply Chain Resources Cycle Time
AM.2.2	Inventory Days of Supply

Practices	
BP.013	Item Rationalization
BP.015	Safety Stock Planning
BP.021	Sales and Operations Planning
BP.024	Supply Chain Optimization (SCO)
BP.085	Safety Stock Planning
BP.086	Supply Network Planning
BP.087	ABC Inventory Classification
BP.091	Work Center Load Evaluation
BP.158	Make-to-Stock Goods Receipt
BP.159	Electronic Data Interchange (EDI)
BP.183	Integrated Business Planning (IBP)

People	
HS.0058	Inventory Management
HS.0077	MPS Methodologies and Techniques
HS.0145	Supply Planning

sP1.2 Identify, Prioritize & Aggregate Supply Chain Resources

Workflow



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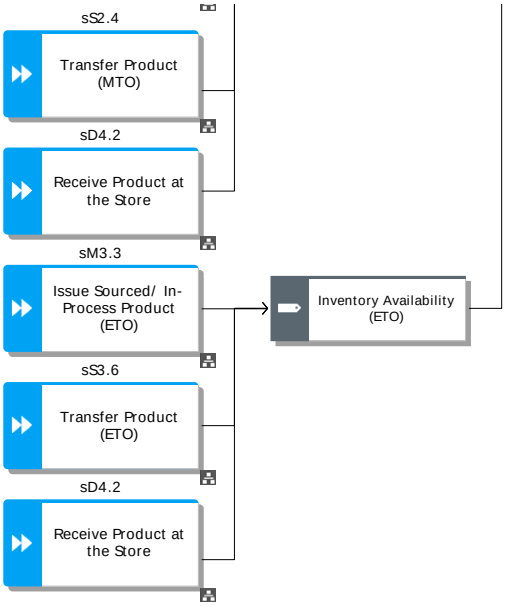


sP1.3 Balance Supply Chain Resources with Supply Chain Requirements

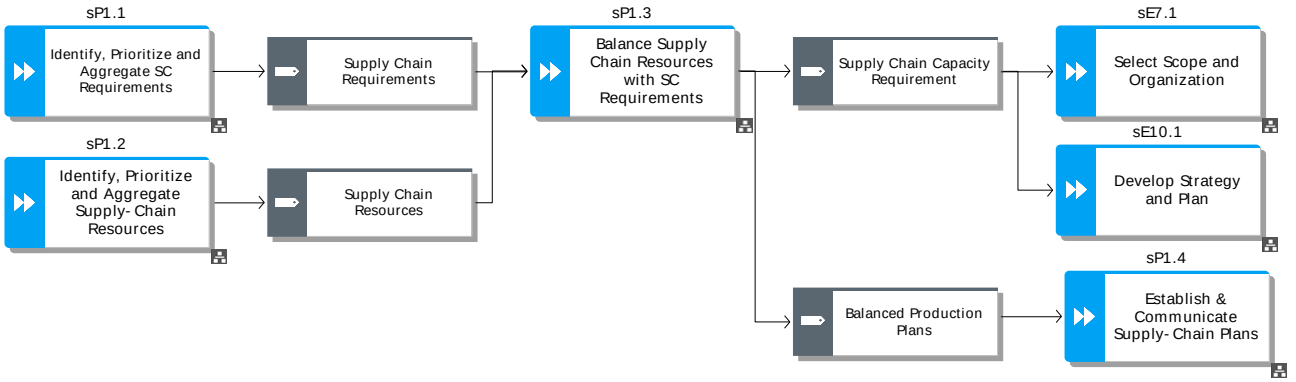
The process of identifying and measuring the gaps and imbalances between demand and resources in order to determine how to best resolve the variances through marketing, pricing, packaging, warehousing, outsource plans or some other action that will optimize service, flexibility, costs, assets, (or other supply chain inconsistencies) in an iterative and collaborative environment. The process of developing a time-phased course of action that commits supply-chain resources to meet supply-chain requirements.

Metrics	
RL.3.36	Fill Rate
RS.3.15	Balance Supply Chain Resources with Supply Chain Requirements Cycle Time
AM.2.2	Inventory Days of Supply

Practices	
BP.007	Baseline Inventory Monitoring
BP.008	Slow-moving Inventory Monitoring
BP.013	Item Rationalization
BP.015	Safety Stock Planning
BP.021	Sales and Operations Planning
BP.049	Lean Planning
BP.085	Safety Stock Planning
BP.086	Supply Network Planning
BP.087	ABC Inventory Classification
BP.092	Balance and firm within horizon
BP.183	Integrated Business Planning (IBP)

People	
HS.0037	Demand Management

Workflow



sP1.4 Establish and Communicate Supply Chain Plans

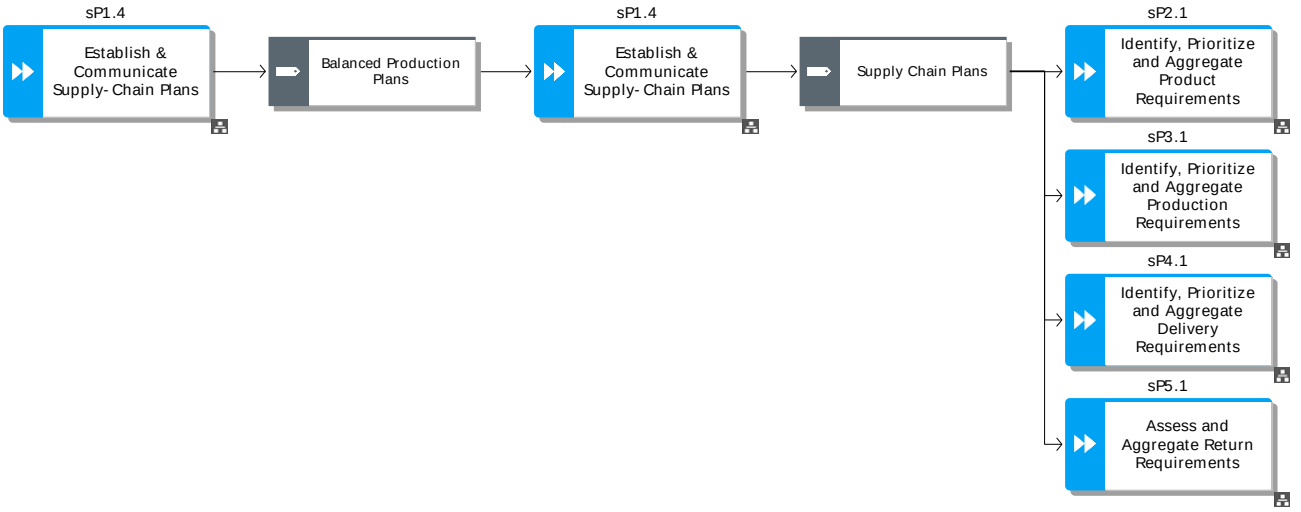
The establishment and communication of courses of action over the appropriate time-defined (long-term, annual, monthly, weekly) planning horizon and interval, representing a projected appropriation of supply-chain resources to meet supply chain requirements.

Metrics	
RS.3.30	Establish Supply Chain Plans Cycle Time
AM.2.2	Inventory Days of Supply

Practices	
BP.016	Supply Network Planning
BP.021	Sales and Operations Planning
BP.093	Publish Production Plan
BP.115	Transportation Management System
BP.145	Vendor Collaboration
BP.183	Integrated Business Planning (IBP)

People	
HS.0130	S & OP Plan Communication

Workflow



sP2 Plan Source

The development and establishment of courses of action over specified time periods that represent a projected appropriation of material resources to meet supply chain requirements.

Hierarchy	
sP2.1	Identify, Prioritize and Aggregate Product Requirements
sP2.2	Identify, Assess and Aggregate Product Resources
sP2.3	Balance Product Resources with Product Requirements
sP2.4	Establish Sourcing Plans

Metrics	
RS.1.1	Order Fulfillment Cycle Time
RS.3.99	Plan Source Cycle Time
CO.2.1	Cost to Plan
CO.3.2	Cost to Plan Source
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital

Practices	
BP.024	Supply Chain Optimization (SCO)
BP.026	Improve S&OP process
BP.027	Pull-Based Inventory Replenishment
BP.028	Inventory Optimization
BP.029	Inventory Management Using Supply Chain Network Optimization
BP.035	Business Rule Review
BP.037	Manufacturing Direct/Drop Shipment
BP.041	Transportation Optimization
BP.042	Regular Review of Procurement Terms and Conditions
BP.044	Inventory Financing Evaluation
BP.055	Freight Carrier Delivery Performance Evaluation
BP.087	ABC Inventory Classification
BP.095	Bill of Material Audit/Control
BP.096	Logistics & Warehouse Planning
BP.097	Supplier Research
BP.122	Vendor Managed Inventory (VMI)

sP2 Plan Source

BP.146	Cross-Docking
BP.161	Enterprise Level Spend Analysis
BP.162	Long Term Supplier Agreement/Partnership
BP.163	Optimized Supplier Count

sP2.1 Identify, Prioritize & Aggregate Product Requirements

The process of identifying, prioritizing, and considering, as a whole with constituent parts, all sources of demand for a product or service in the supply chain.

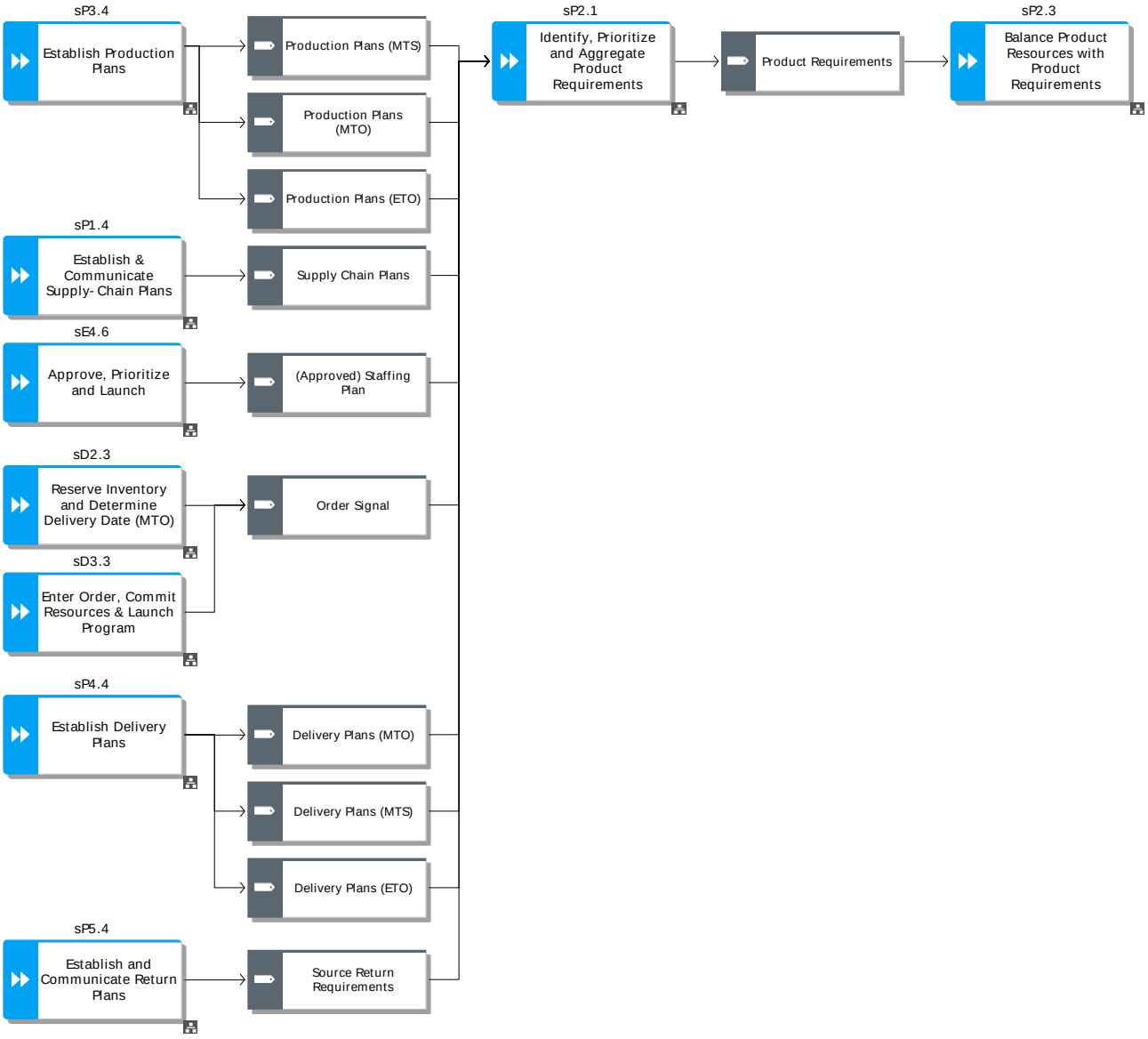
Metrics	
RL.3.37	Forecast Accuracy
RS.3.41	Identify, Prioritize, and Aggregate Product Requirements Cycle Time

Practices	
BP.024	Supply Chain Optimization (SCO)
BP.090	Days of Supply Based MRP Proposal Management
BP.095	Bill of Material Audit/Control
BP.159	Electronic Data Interchange (EDI)

People	
HS.0011	Basic Transportation Management
HS.0037	Demand Management
HS.0044	Enterprise Business Process
HS.0050	Import/Export Regulations
HS.0058	Inventory Management
HS.0102	Production Planning Capacity Utilization
HS.0124	Risk and exception management
HS.0139	Supplier Relationship Management (SRM)

sP2.1 Identify, Prioritize & Aggregate Product Requirements

Workflow



sP2.2 Identify, Assess & Aggregate Product Resources

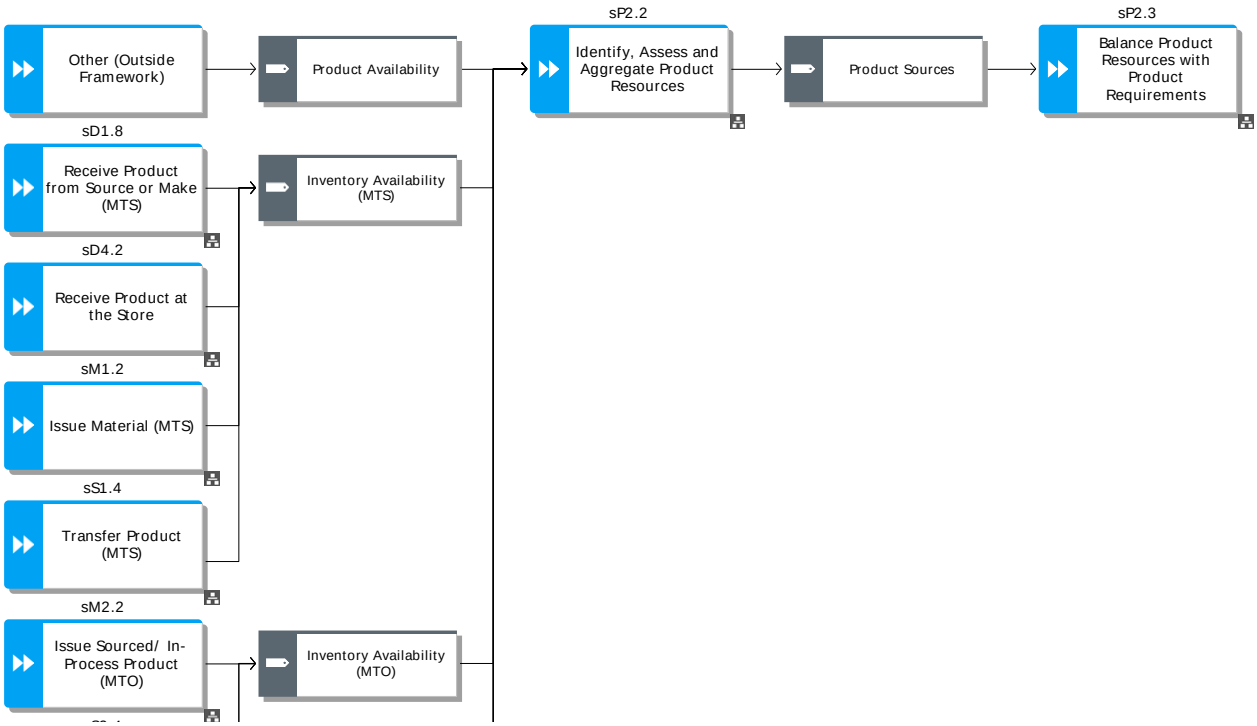
The process of identifying, evaluating, and considering, as a whole with constituent parts, all material and other resources used to add value in the supply chain for a product or services.

Metrics	
RS.3.38	Identify, Assess, and Aggregate Product Resources Cycle Time

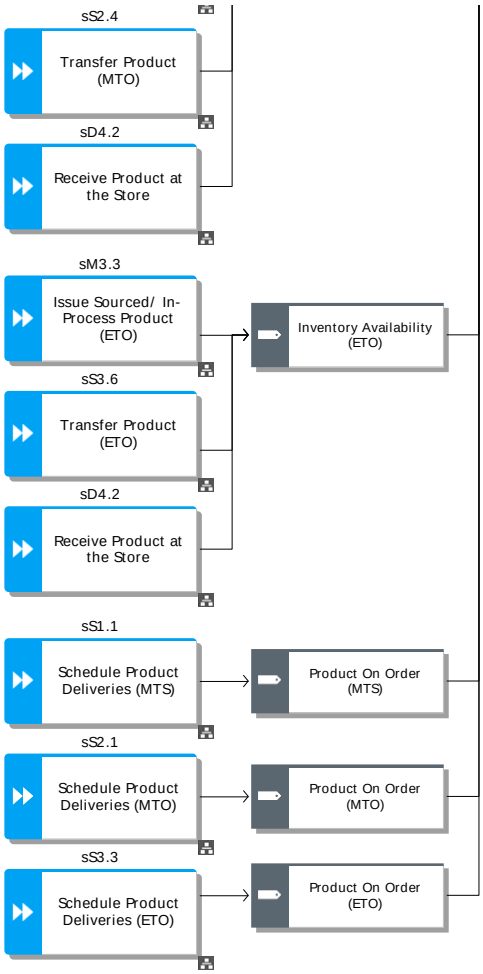
Practices	
BP.024	Supply Chain Optimization (SCO)
BP.087	ABC Inventory Classification
BP.096	Logistics & Warehouse Planning

People	
HS.0011	Basic Transportation Management
HS.0050	Import/Export Regulations
HS.0058	Inventory Management
HS.0102	Production Planning Capacity Utilization
HS.0124	Risk and exception management
HS.0139	Supplier Relationship Management (SRM)

Workflow



Workflow Continued



sP2.3 Balance Product Resources with Product Requirements

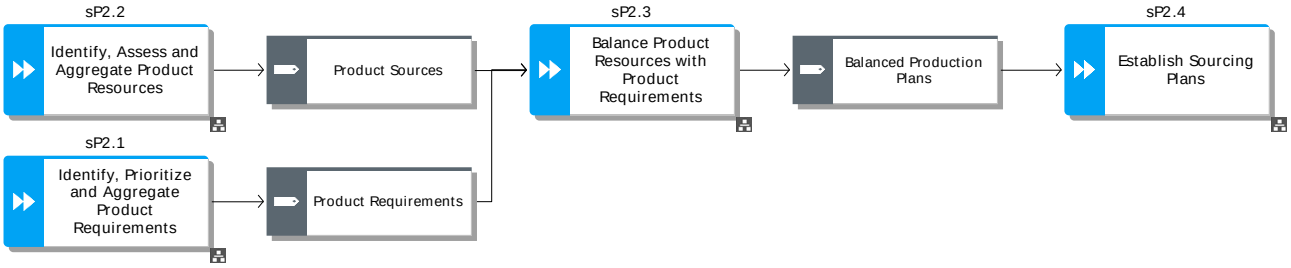
The process of developing a time-phased course of action that commits resources to meet requirements.

Metrics	
RS.3.12	Balance Product Resources with Product Requirements Cycle Time

Practices	
BP.010	Min-Max Replenishment
BP.013	Item Rationalization
BP.024	Supply Chain Optimization (SCO)
BP.087	ABC Inventory Classification
BP.096	Logistics & Warehouse Planning
BP.097	Supplier Research

People	
HS.0010	Basic Finance
HS.0011	Basic Transportation Management
HS.0050	Import/Export Regulations
HS.0058	Inventory Management
HS.0102	Production Planning Capacity Utilization
HS.0124	Risk and exception management
HS.0132	Sales and Operations Planning (S&OP)
HS.0139	Supplier Relationship Management (SRM)

Workflow



sP2.4 Establish Sourcing Plans

The establishment of courses of action over specified time periods that represent a projected appropriation of supply resources to meet sourcing plan requirements.

Metrics	
RS.3.29	Establish Sourcing Plans Cycle Time
Practices	
BP.010	Min-Max Replenishment
BP.013	Item Rationalization
BP.093	Publish Production Plan
BP.096	Logistics & Warehouse Planning
BP.097	Supplier Research
BP.100	Strategic Sourcing
BP.145	Vendor Collaboration
People	
HS.0011	Basic Transportation Management
HS.0050	Import/Export Regulations
HS.0058	Inventory Management
HS.0102	Production Planning Capacity Utilization
HS.0124	Risk and exception management
HS.0139	Supplier Relationship Management (SRM)

sP2.4 Establish Sourcing Plans

Workflow

sP3 Plan Make

The development and establishment of courses of action over specified time periods that represent a projected appropriation of production resources to meet production requirements.

Hierarchy	
sP3.1	Identify, Prioritize and Aggregate Production Requirements
sP3.2	Identify, Assess and Aggregate Production Resources
sP3.3	Balance Production Resources with Production Requirements
sP3.4	Establish Production Plans

Metrics	
RS.1.1	Order Fulfillment Cycle Time
CO.2.1	Cost to Plan
CO.3.3	Cost to Plan Make
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital

Practices	
BP.022	MRP I
BP.026	Improve S&OP process
BP.027	Pull-Based Inventory Replenishment
BP.028	Inventory Optimization
BP.029	Inventory Management Using Supply Chain Network Optimization
BP.035	Business Rule Review
BP.038	Batch Size Reduction
BP.039	Right Size Frequency of Production Wheel
BP.053	Manufacturing Reliability Improvement
BP.054	Manufacturing Quality Improvements for Return Reduction

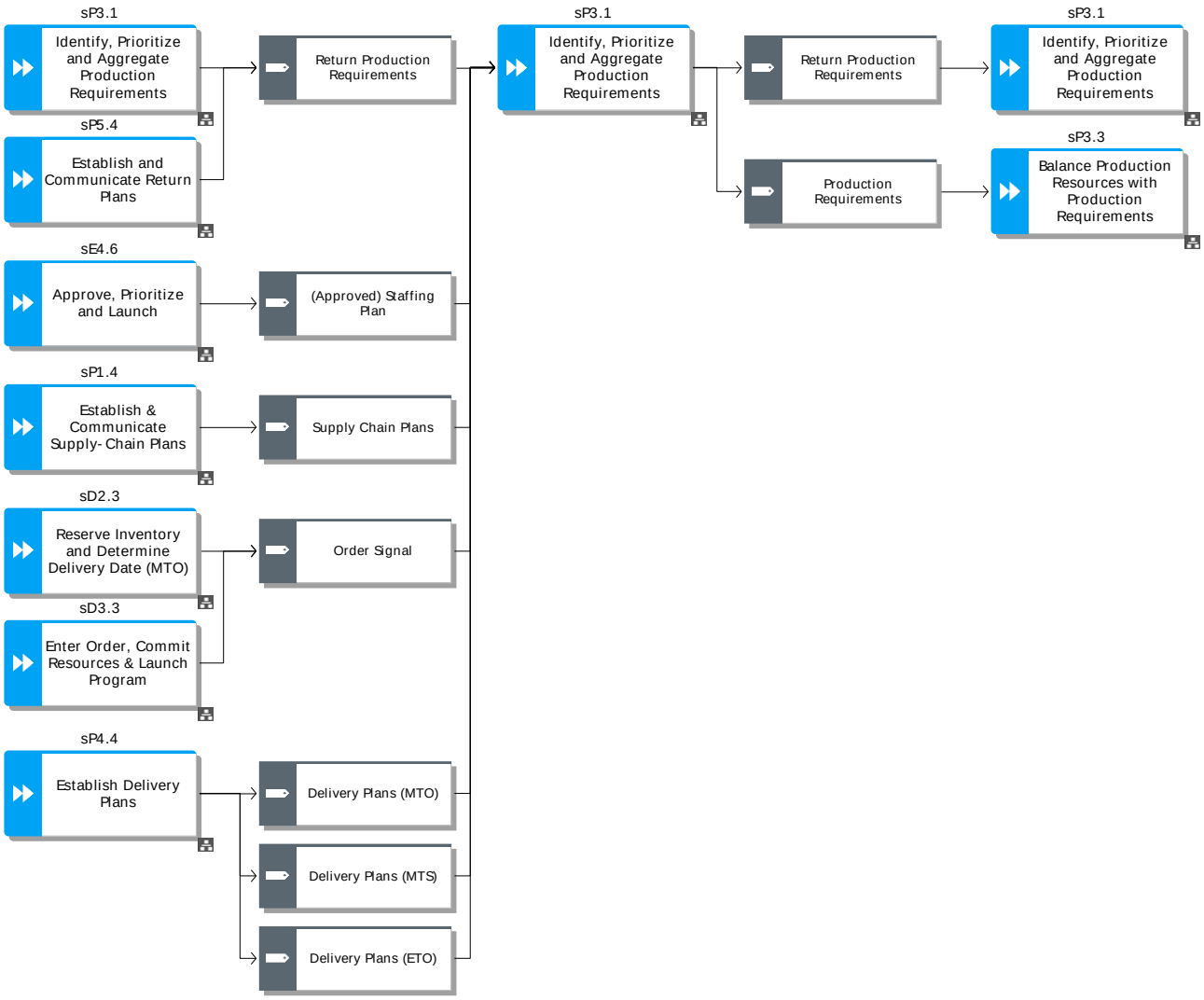
sP3.1 Identify, Prioritize and Aggregate Production Requirements

The process of identifying, prioritizing, and considering as a whole with constituent parts, all sources of demand in the creation of a product or service.

Metrics	
RL.3.37	Forecast Accuracy
RS.3.42	Identify, Prioritize, and Aggregate Production Requirements Cycle Time
Practices	
BP.090	Days of Supply Based MRP Proposal Management
BP.159	Electronic Data Interchange (EDI)
BP.088	360 Degree Closure
People	
HS.0058	Inventory Management
HS.0077	MPS Methodologies and Techniques
HS.0102	Production Planning Capacity Utilization

sP3.1 Identify, Prioritize and Aggregate Production Requirements

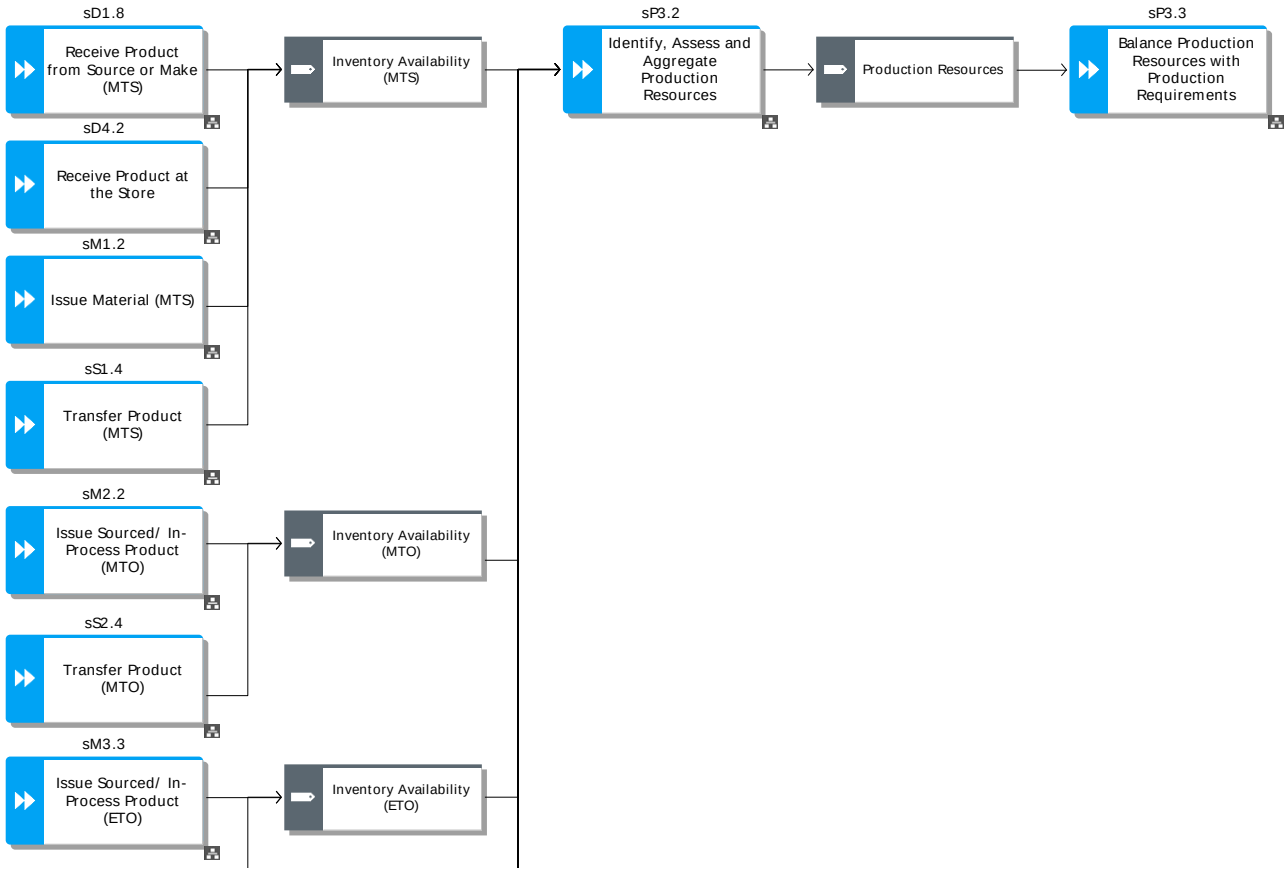
Workflow



sP3.2 Identify, Assess and Aggregate Production Resources

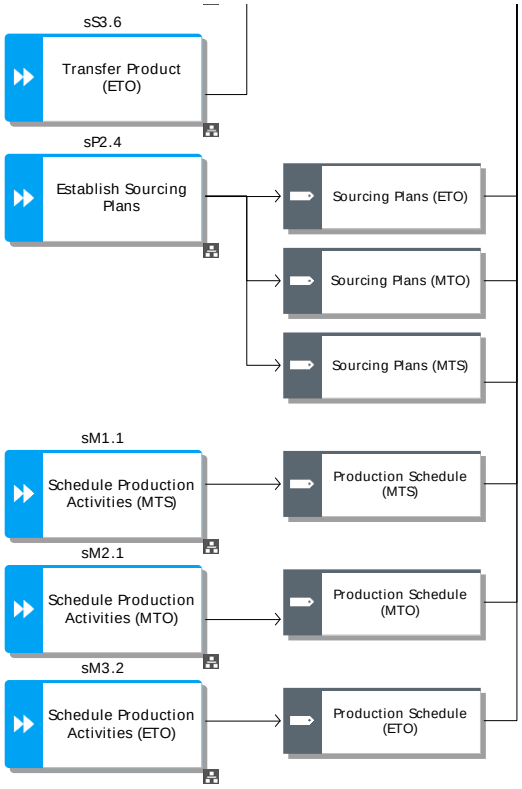
The process of identifying, evaluating, and considering, as a whole with constituent parts, all things that add value in the creation of a product or performance of a service.

Metrics	
RS.3.36	Identify, Assess and Aggregate Production Resources Cycle Time
Practices	
BP.091	Work Center Load Evaluation
BP.159	Electronic Data Interchange (EDI)
People	
HS.0102	Production Planning Capacity Utilization
Workflow	



sP3.2 Identify, Assess and Aggregate Production Resources

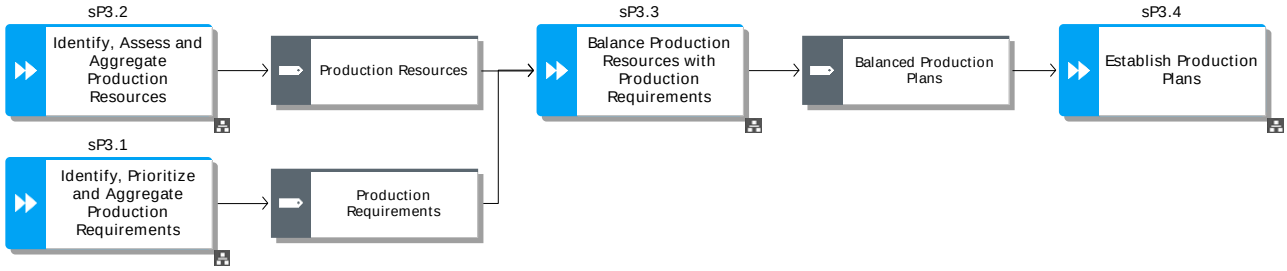
Workflow Continued



sP3.3 Balance Production Resources with Production Requirements

The process of developing a time-phased course of action that commits creation and operation resources to meet creation and operation requirements.

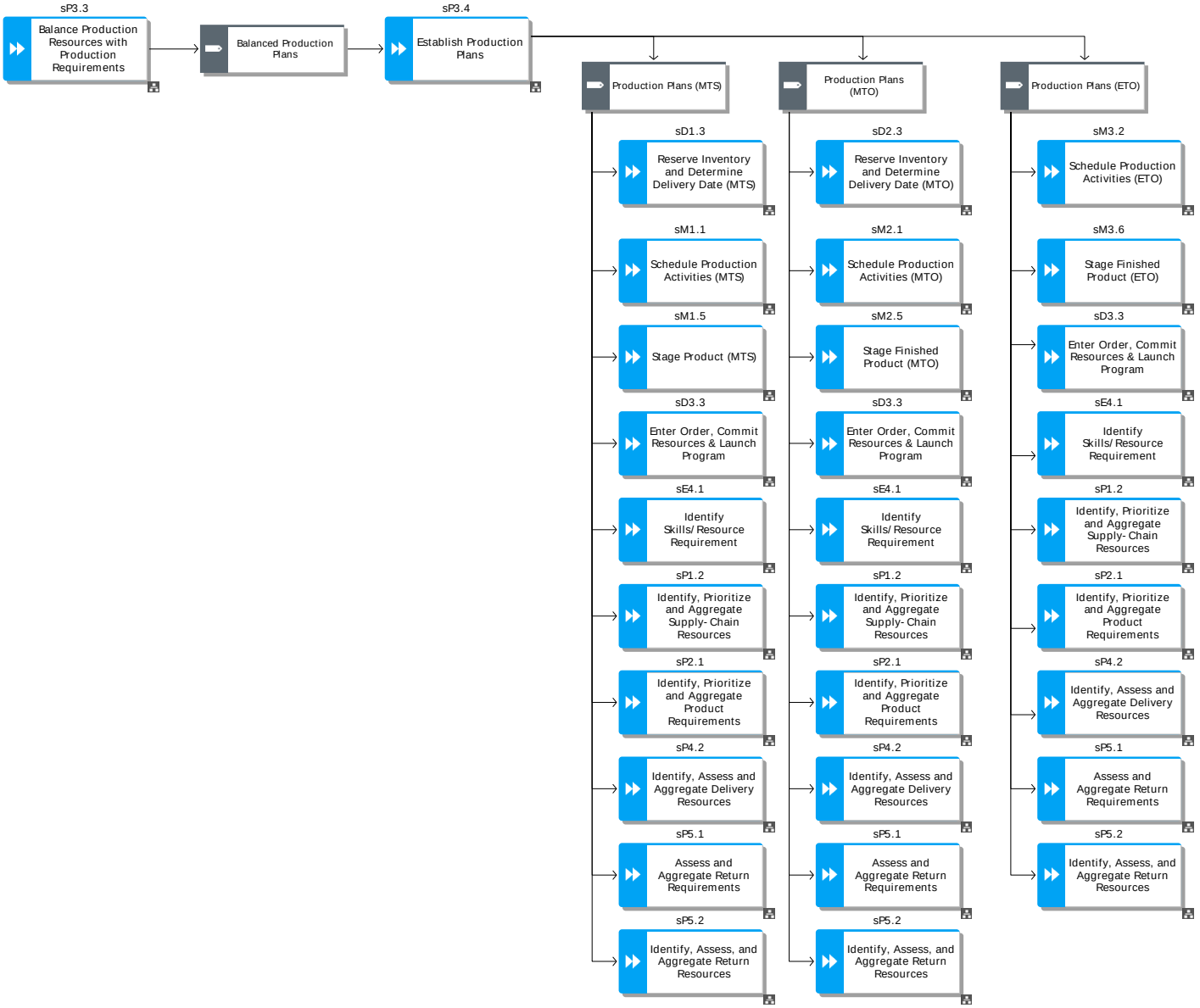
Metrics	
RS.3.13	Balance Production Resources with Production Requirements Cycle Time
Practices	
BP.013	Item Rationalization
BP.092	Balance and firm within horizon
BP.159	Electronic Data Interchange (EDI)
People	
HS.0102	Production Planning Capacity Utilization
Workflow	



sP3.4 Establish Production Plans

The establishment of courses of action over specified time periods that represent a projected appropriation of supply resources to meet production and operating plan requirements.

Metrics	
RS.3.28	Establish Production Plans Cycle Time
Practices	
BP.013	Item Rationalization
BP.093	Publish Production Plan
People	
HS.0102	Production Planning Capacity Utilization
Workflow	



sP4 Plan Deliver

The development and establishment of courses of action over specified time periods that represent a projected appropriation of delivery resources to meet delivery requirements.

Hierarchy	
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sP4.2	Identify, Assess and Aggregate Delivery Resources
sP4.3	Balance Delivery Resources and Capabilities with Delivery Requirements
sP4.4	Establish Delivery Plans

Metrics	
RS.1.1	Order Fulfillment Cycle Time
CO.2.1	Cost to Plan
CO.3.4	Cost to Plan Deliver
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital

Practices	
BP.017	Distribution Planning
BP.024	Supply Chain Optimization (SCO)
BP.035	Business Rule Review
BP.105	Task Management
BP.107	Distributed Order Management
BP.116	Expedited Logistics
BP.118	Transportation Management Outsourcing
BP.122	Vendor Managed Inventory (VMI)
BP.146	Cross-Docking

sP4.1 Identify, Prioritize and Aggregate Delivery Requirements

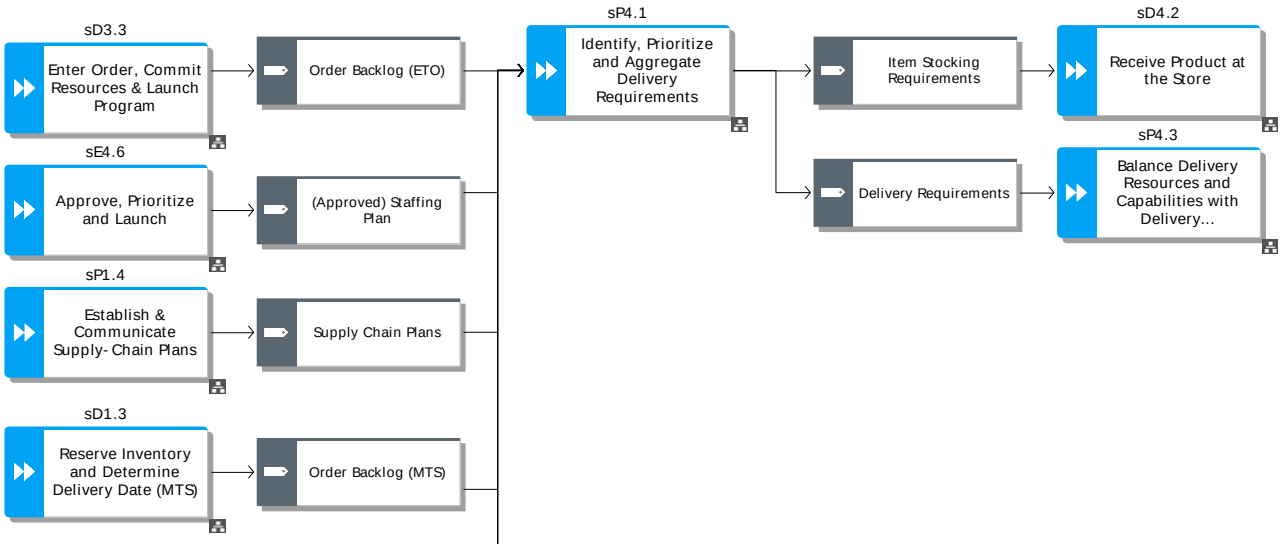
The process of identifying, prioritizing, and considering, as a whole with constituent parts, all sources of demand in the delivery of a product or service.

Metrics	
RL.3.37	Forecast Accuracy
RS.3.40	Identify, Prioritize, and Aggregate Delivery Requirements Cycle Time

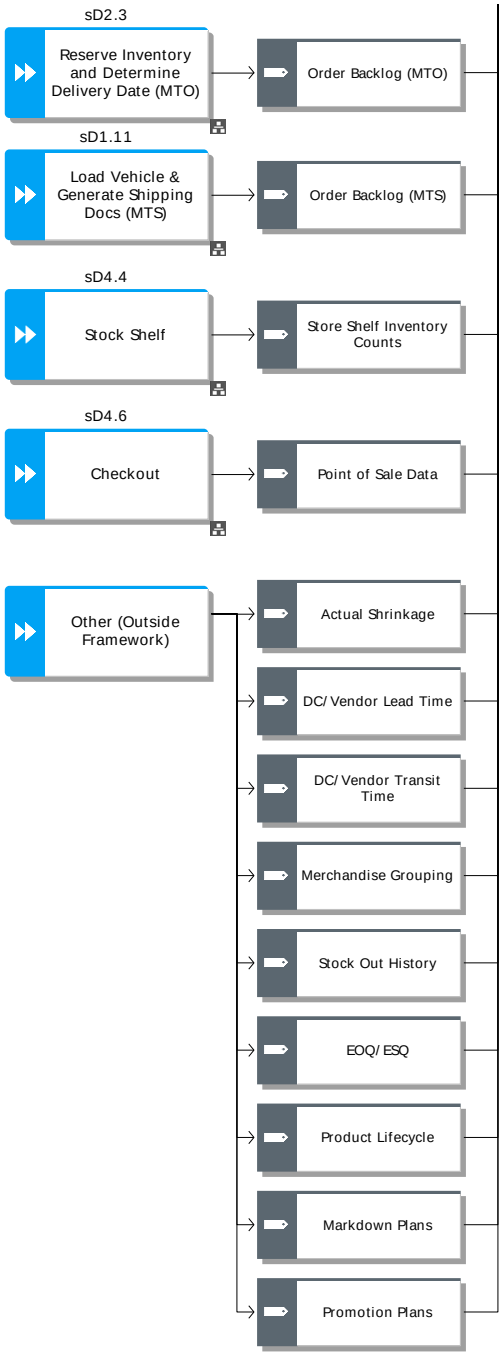
Practices	
BP.024	Supply Chain Optimization (SCO)
BP.090	Days of Supply Based MRP Proposal Management
BP.102	Pick List Generation
BP.115	Transportation Management System
BP.118	Transportation Management Outsourcing

People	
HS.0009	Bar Code Handling/RFID (if available)
HS.0048	Forecasting
HS.0050	Import/Export Regulations
HS.0058	Inventory Management
HS.0070	Logistics network modeling
HS.0091	Planogram usage and strategies
HS.0144	Supply Chain Security
HS.0156	VMI planning and management

Workflow



Workflow Continued



sP4.2 Identify, Assess and Aggregate Delivery Resources

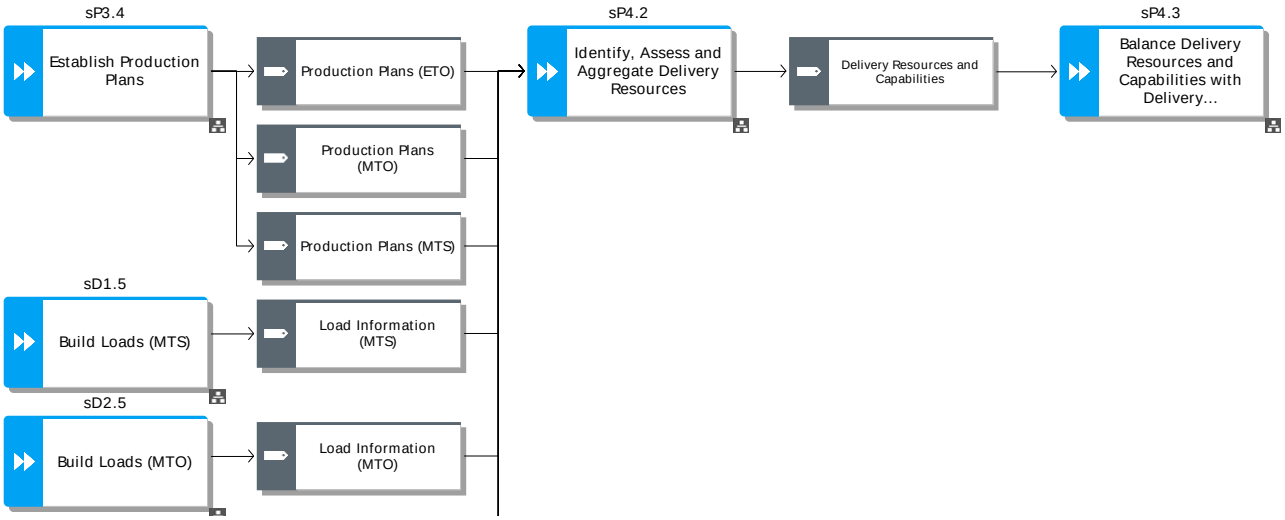
The process of identifying, evaluating, and considering, as a whole with constituent parts, all things that add value in the delivery of a product or service.

Metrics	
RL.3.37	Forecast Accuracy
RS.3.37	Identify, Assess, and Aggregate Delivery Resources Cycle Time

Practices	
BP.024	Supply Chain Optimization (SCO)
BP.089	Perfect Pick Put away
BP.107	Distributed Order Management
BP.115	Transportation Management System
BP.118	Transportation Management Outsourcing

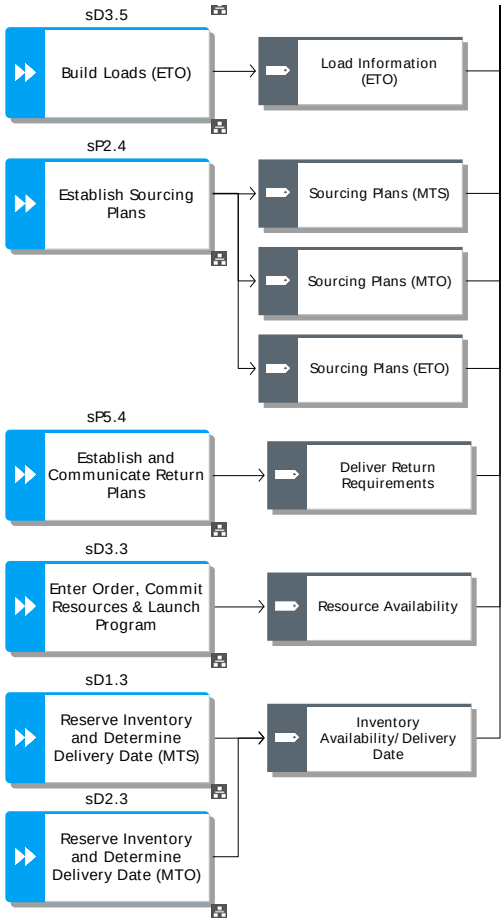
People	
HS.0009	Bar Code Handling/RFID (if available)
HS.0048	Forecasting
HS.0050	Import/Export Regulations
HS.0058	Inventory Management
HS.0070	Logistics network modeling
HS.0144	Supply Chain Security

Workflow



sP4.2 Identify, Assess and Aggregate Delivery Resources

Workflow Continued



sP4.3 Balance Delivery Resources and Capabilities with Delivery Requirements

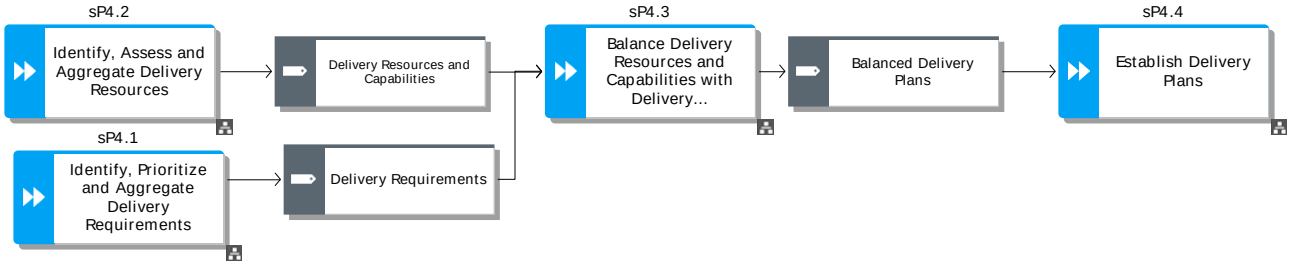
The process of developing a time-phased course of action that commits delivery resources to meet delivery requirements.

Metrics	
RL.3.37	Forecast Accuracy

Practices	
BP.105	Task Management
BP.118	Transportation Management Outsourcing

People	
HS.0048	Forecasting
HS.0058	Inventory Management
HS.0070	Logistics network modeling
HS.0144	Supply Chain Security

Workflow



sP4.4 Establish Delivery Plans

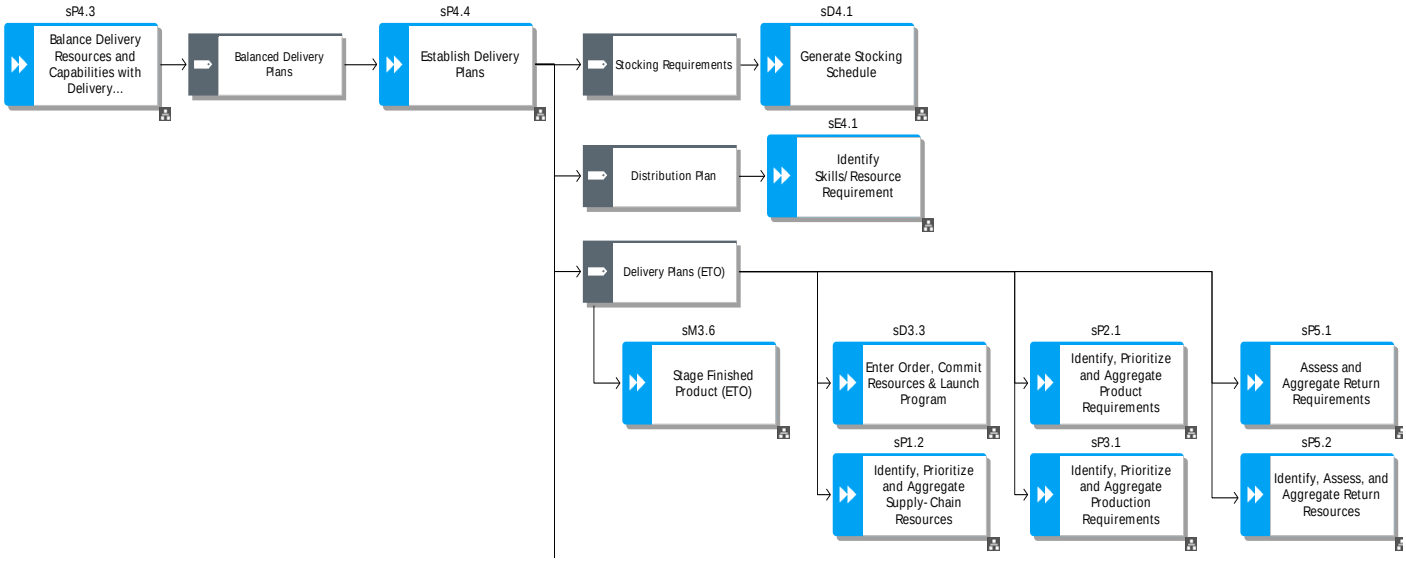
The establishment of courses of action over specified time periods that represent a projected appropriation of delivery resources to meet delivery requirements.

Metrics	
RL.3.36	Fill Rate
RS.3.27	Establish Delivery Plans Cycle Time

Practices	
BP.089	Perfect Pick Put away
BP.093	Publish Production Plan
BP.107	Distributed Order Management
BP.115	Transportation Management System
BP.116	Expedited Logistics
BP.118	Transportation Management Outsourcing

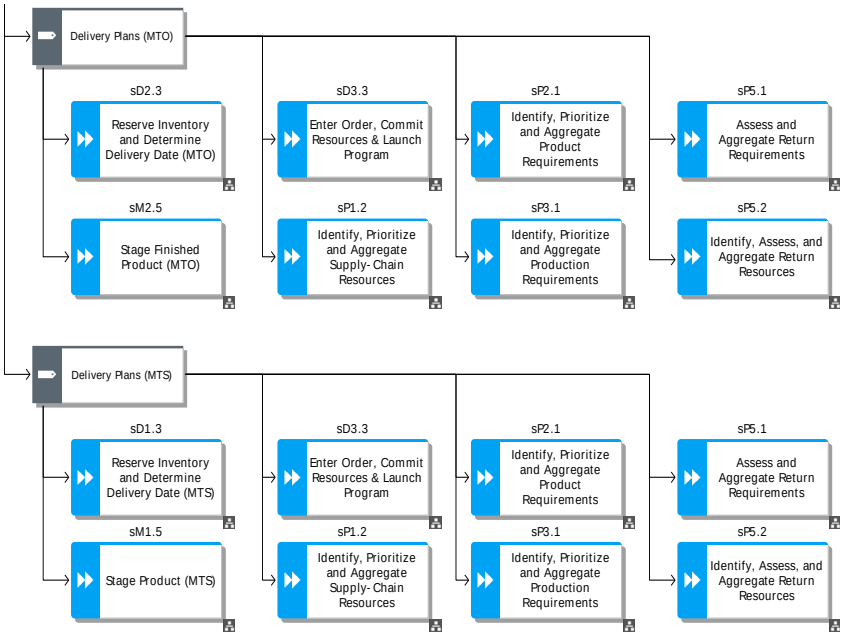
People	
HS.0009	Bar Code Handling/RFID (if available)
HS.0048	Forecasting
HS.0058	Inventory Management
HS.0070	Logistics network modeling
HS.0156	VMI planning and management

Workflow



sP4.4 Establish Delivery Plans

Workflow Continued



sP5 Plan Return

A strategic or tactical process to establish and adjust courses of action or tasks over specified time periods that represent a projected appropriation of return resources and assets to meet anticipated as well as unanticipated return requirements. The scope includes unplanned returns of sold merchandise as well as planned returns of rotable products that are refurbished for reissue to customers.

Hierarchy	
sP5.1	Assess and Aggregate Return Requirements
sP5.2	Identify, Assess and Aggregate Return Resources
sP5.3	Balance Return Resources with Return Requirements
sP5.4	Establish and Communicate Return Plans

Metrics	
RS.1.1	Order Fulfillment Cycle Time
CO.2.1	Cost to Plan
CO.3.5	Cost to Plan Return

Practices	
BP.017	Distribution Planning
BP.024	Supply Chain Optimization (SCO)
BP.035	Business Rule Review
BP.118	Transportation Management Outsourcing
BP.127	Automated Alerts for Material Management
BP.135	Return Authorization
BP.136	Outsourced Reverse Logistics

sP5.1 Assess and Aggregate Return Requirements

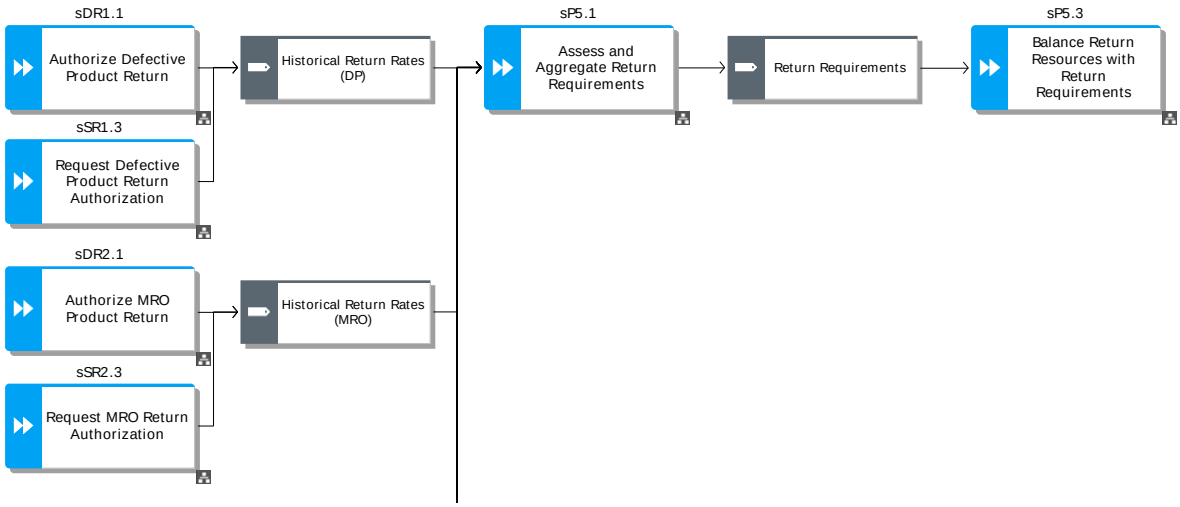
The process of identifying, evaluating, and considering, as a whole with constituent parts, all sources of demand for the return of a product.

Metrics	
RS.3.43	Identify, Prioritize, and Aggregate Return Requirements Cycle Time

Practices	
BP.024	Supply Chain Optimization (SCO)
BP.090	Days of Supply Based MRP Proposal Management
BP.115	Transportation Management System
BP.118	Transportation Management Outsourcing
BP.127	Automated Alerts for Material Management
BP.135	Return Authorization
BP.136	Outsourced Reverse Logistics

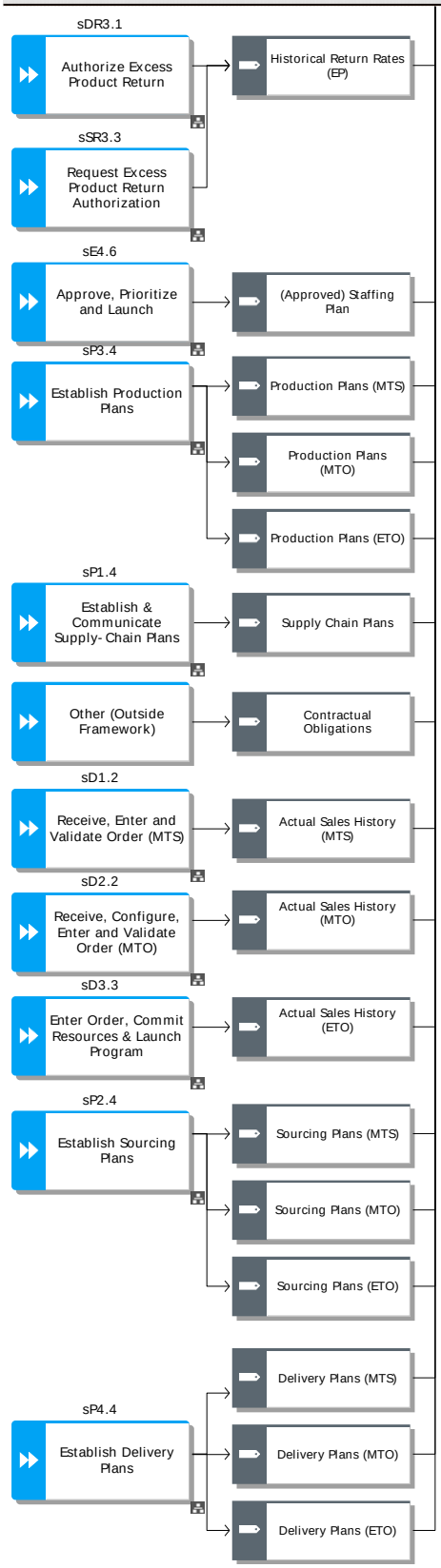
People	
HS.0009	Bar Code Handling/RFID (if available)
HS.0048	Forecasting
HS.0050	Import/Export Regulations
HS.0058	Inventory Management
HS.0070	Logistics network modeling
HS.0133	Six Sigma
HS.0144	Supply Chain Security
HS.0156	VMI planning and management

Workflow



sP5.1 Assess and Aggregate Return Requirements

Workflow



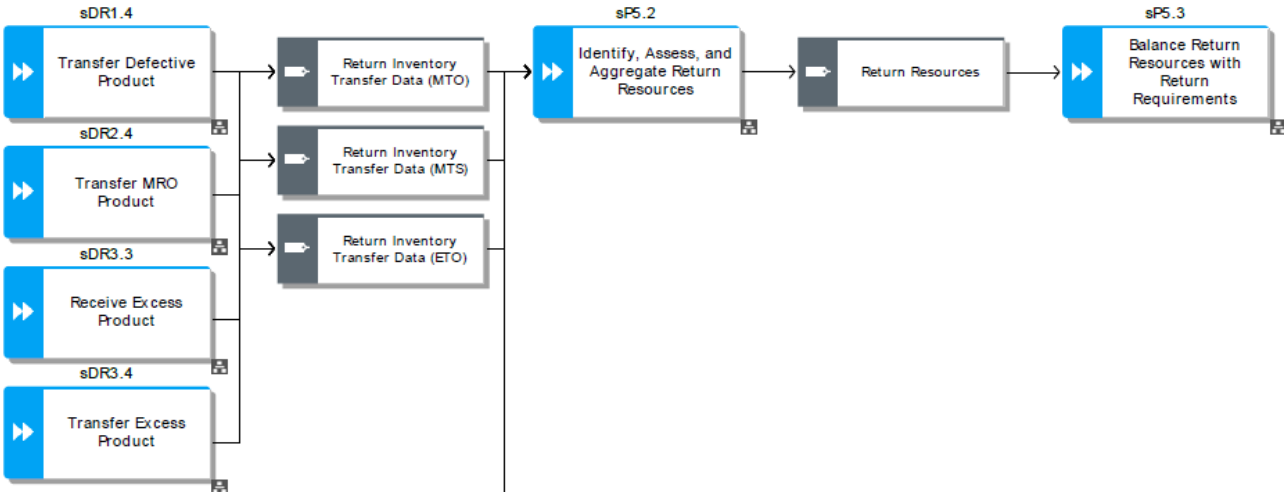
sP5.2 Identify, Assess and Aggregate Return Resources

The process of identifying, evaluating, and consideration for all resources that add value to, execute, or constrain the processes for the return of a product.

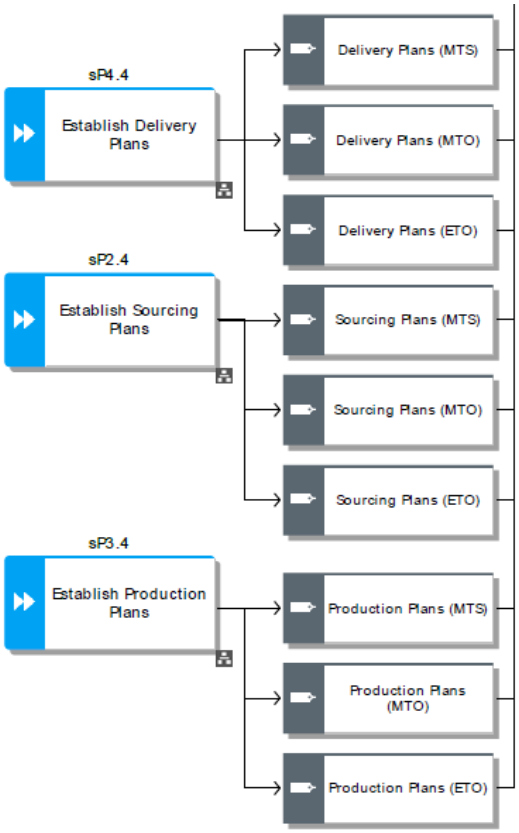
Practices	
BP.024	Supply Chain Optimization (SCO)
BP.025	Self-Service Warranty Claim Submittal
BP.115	Transportation Management System
BP.127	Automated Alerts for Material Management
BP.136	Outsourced Reverse Logistics

People	
HS.0016	Capacity Planning/Management
HS.0048	Forecasting
HS.0050	Import/Export Regulations
HS.0058	Inventory Management
HS.0065	Lean Manufacturing
HS.0070	Logistics network modeling
HS.0133	Six Sigma
HS.0144	Supply Chain Security

Workflow



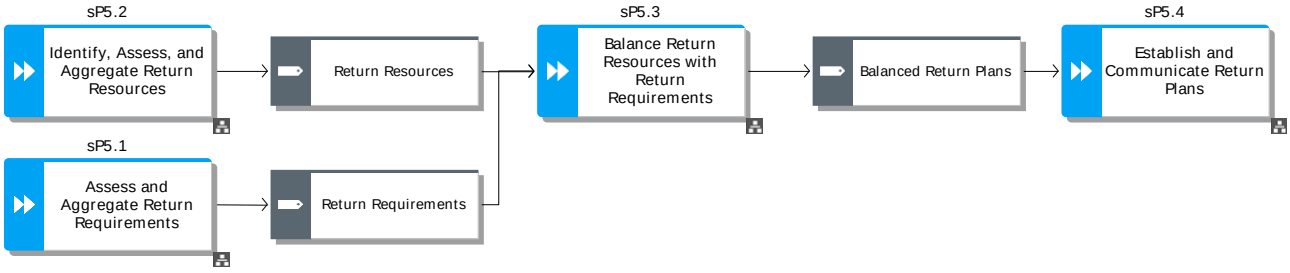
Workflow Continued



sP5.3 Balance Return Resources with Return Requirements

The process of developing courses of action that make feasible the commitment the appropriate return resources and or assets to satisfy return requirements.

Metrics	
RS.3.14	Balance Return Resources with Return Requirements Cycle Time
Practices	
BP.135	Return Authorization
BP.136	Outsourced Reverse Logistics
People	
HS.0058	Inventory Management
HS.0065	Lean Manufacturing
HS.0067	Linear programming
HS.0121	Returns strategy development
HS.0133	Six Sigma
HS.0144	Supply Chain Security
Workflow	



sP5.4 Establish and Communicate Return Plans

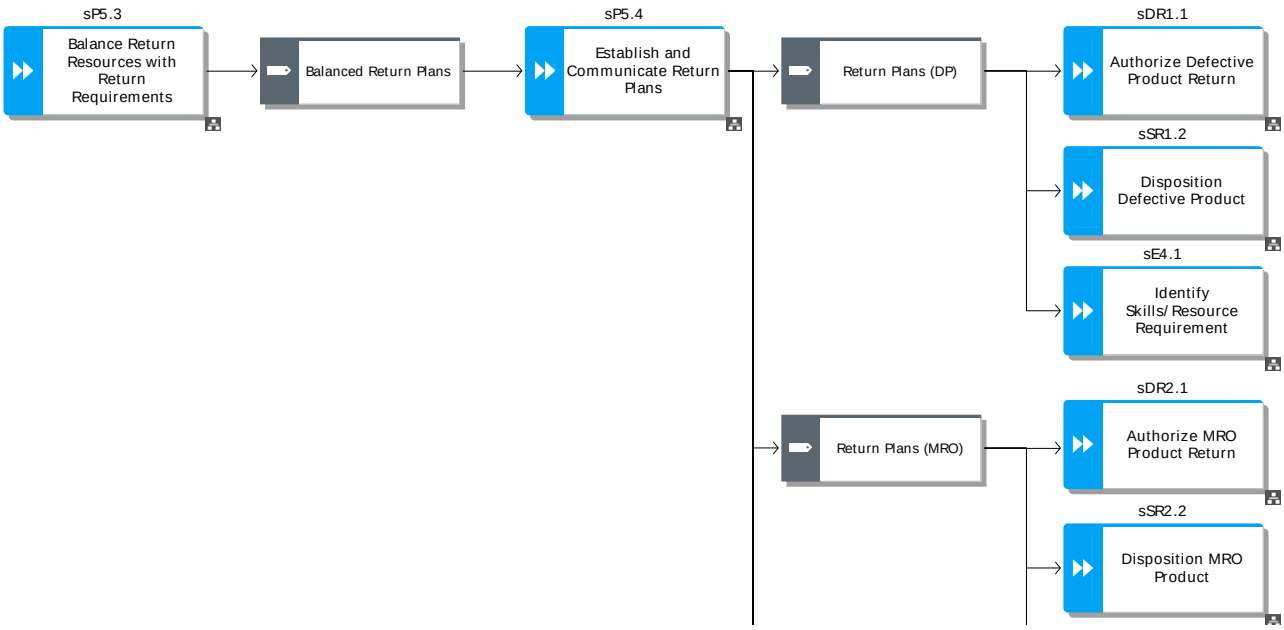
The establishment and communication of courses of action over specified time periods that represent a projected appropriation of required return resources and or assets to meet return process requirements.

Metrics	
RS.3.26	Establish and Communicate Return Plans Cycle Time

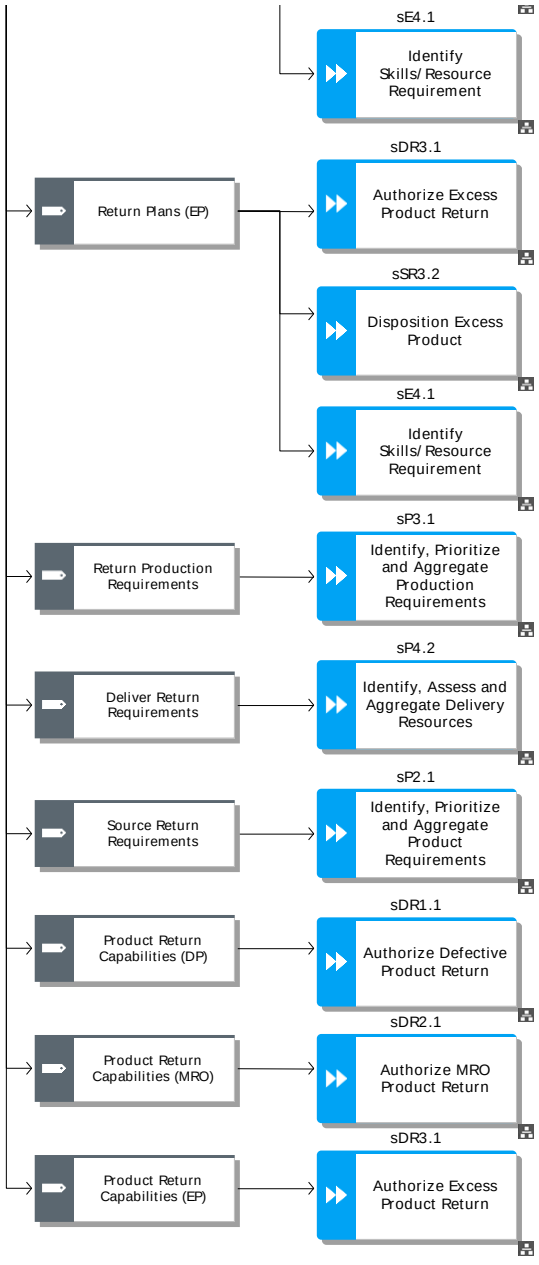
Practices	
BP.025	Self-Service Warranty Claim Submittal
BP.093	Publish Production Plan
BP.115	Transportation Management System
BP.135	Return Authorization
BP.136	Outsourced Reverse Logistics

People	
HS.0065	Lean Manufacturing
HS.0069	Logistics Management
HS.0120	Return Plan Aggregation
HS.0133	Six Sigma

Workflow



Workflow Continued



Source

sS Source

The processes associated with ordering, delivery, receipt and transfer of raw material items, subassemblies, product and/or services.

Hierarchy	
sS1	Source Stocked Product
sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product

Metrics	
AG.1.1	Upside Supply Chain Adaptability
AG.1.2	Downside Supply Chain Adaptability
AG.1.3	Overall Value at Risk
AM.1.1	Cash-to-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
CO.1.1	Total Supply Chain Management Costs
CO.1.2	Costs of Goods Sold
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time

sS1 Source Stocked Product

The process of ordering, receiving and transferring raw material items, sub-assemblies, product and or services based on aggregated demand requirements. The intention of Source-to-Stock is to maintain a pre-determined level of inventory for these materials, sub-assemblies or products. No customer reference or customer order detail is exchanged with the supplier, attached to or marked on the product, or recorded in the warehousing or ERP system for Source-to-Stock products.

Examples of alternative or related names for Source-to-Stock are: replenishment inventory, drip parts, kan-ban, andon, and bulk or generic stock.

Hierarchy	
sS1.1	Schedule Product Deliveries
sS1.2	Receive Product
sS1.3	Verify Product
sS1.4	Transfer Product
sS1.5	Authorize Supplier Payment

Metrics	
RS.1.1	Order Fulfillment Cycle Time
RS.2.1	Source Cycle Time
AG.3.9	Additional source volumes obtained in 30 days
AG.3.40	Current Purchase Order Cycle Times
AG.3.42	Current Source Volume
AG.3.46	Demand sourcing-supplier constraints
CO.2.2	Cost to Source
CO.3.6	Cost to Authorize Supplier Payment
CO.3.7	Cost to Receive Product
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.2.3	Days Payable Outstanding
AM.3.16	Inventory Days of Supply - Raw Material

sS1 Source Stocked Product

Practices	
BP.006	Consignment Inventory
BP.035	Business Rule Review
BP.056	Supplier Raw Material Quality Improvement
BP.131	Alternative Supplier Benchmarking
BP.132	Issue Invitation to Tender (Quote)
BP.134	Supplier Evaluation using Robust Evaluation Tool.
BP.144	Purchase Order Management
BP.145	Vendor Collaboration
BP.147	Receiving Goods Inspection
BP.148	3-Way Delivery Verification
BP.161	Enterprise Level Spend Analysis
BP.163	Optimized Supplier Count

sS1.1 Schedule Product Deliveries

Scheduling and managing the execution of the individual deliveries of product against an existing contract or purchase order. The requirements for product releases are determined based on the detailed sourcing plan or other types of product pull signals.

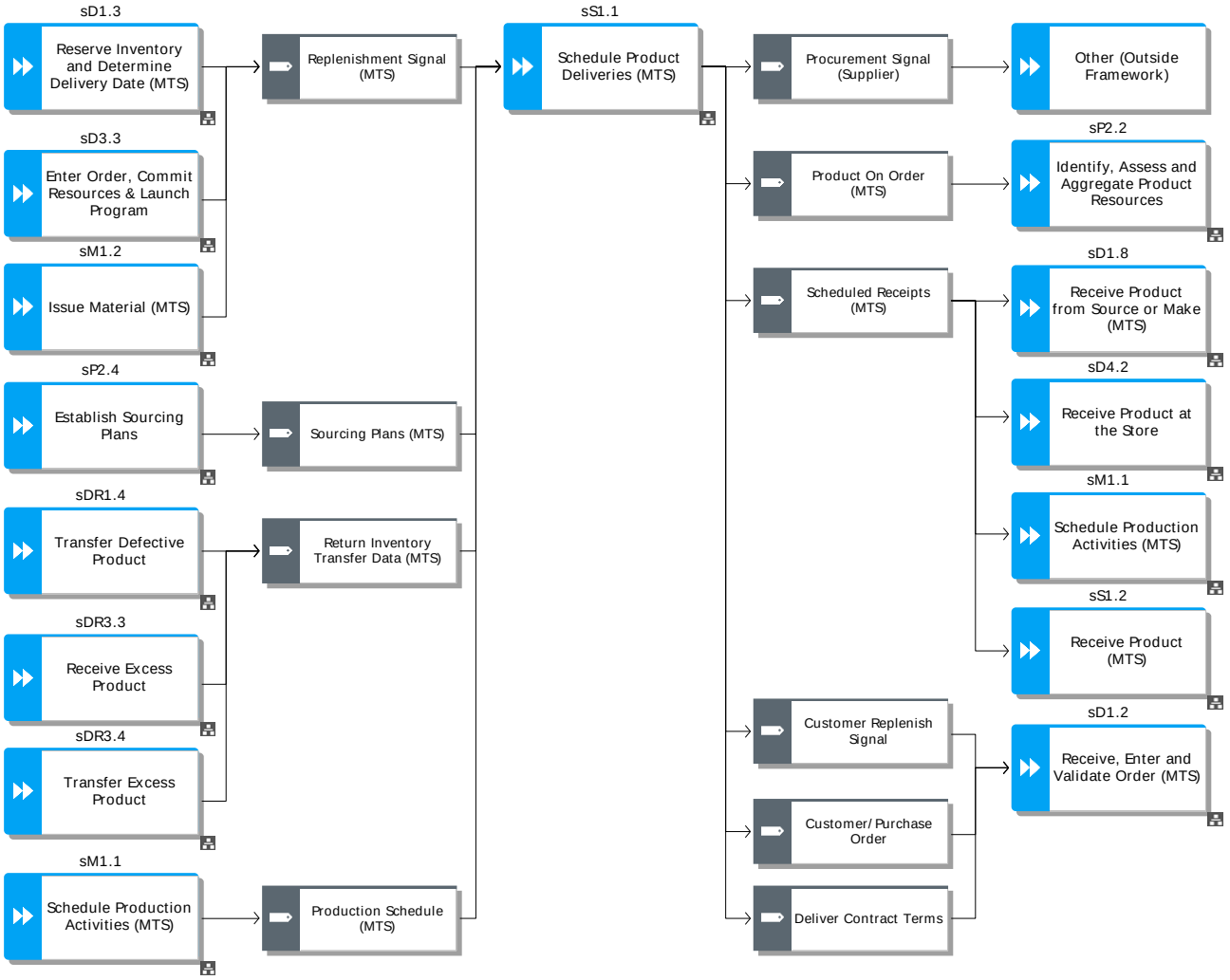
Metrics	
RL.3.27	% Schedules Changed within Supplier's Lead Time
RS.3.9	Average Days per Engineering Change
RS.3.10	Average Days per Schedule Change
RS.3.11	Average Release Cycle of Changes
RS.3.122	Schedule Product Deliveries Cycle Time

Practices	
BP.009	Kanban
BP.010	Min-Max Replenishment
BP.041	Transportation Optimization
BP.043	Consignment Inventory Reduction
BP.122	Vendor Managed Inventory (VMI)
BP.139	Vendor Managed Inventory (VMI)
BP.144	Purchase Order Management
BP.145	Vendor Collaboration

People	
HS.0012	Benchmarking
HS.0035	Delivery Balancing
HS.0048	Forecasting
HS.0069	Logistics Management
HS.0074	Master Scheduling
HS.0080	MSDS/CoC/BoL/Environmental Interpretation
HS.0083	Order Management
HS.0093	Prioritization
HS.0094	Procurement
HS.0103	Production Scheduling
HS.0135	Solicitation/Competitive Bidding Process
HS.0139	Supplier Relationship Management (SRM)

sS1.1 Schedule Product Deliveries

Workflow



sS1.2 Receive Product

The process and associated activities of receiving product to contract requirements.

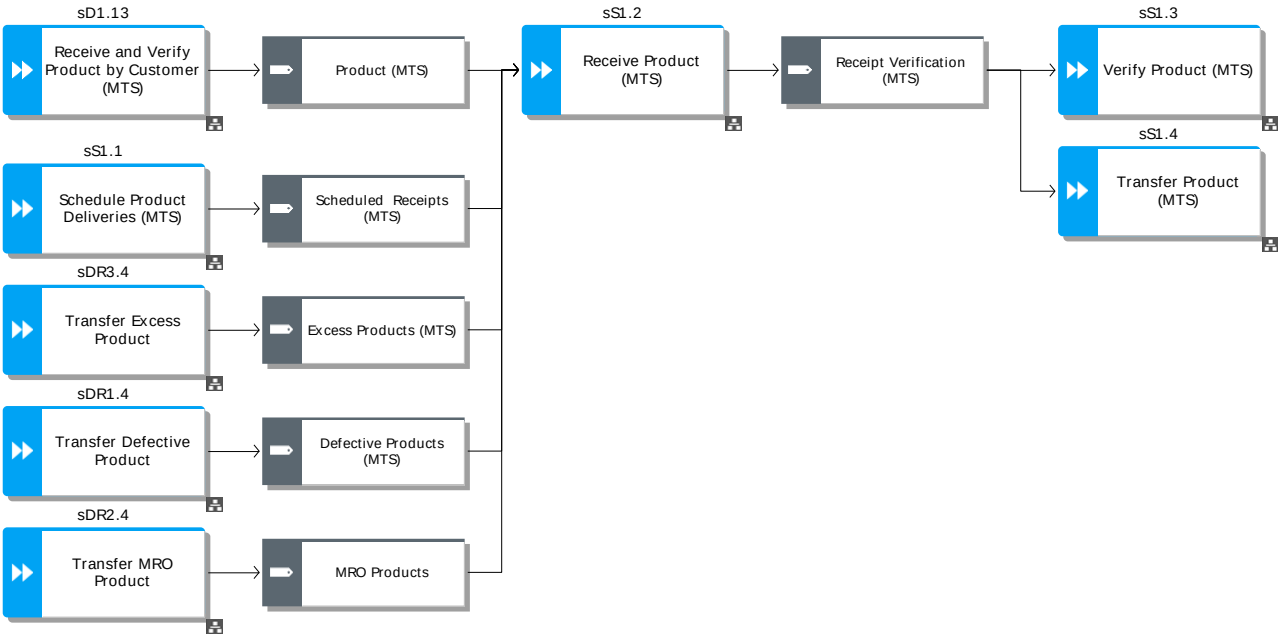
Metrics	
RL.3.18	% Orders/ Lines Processed Complete
RL.3.20	% Orders/ Lines Received On-Time To Demand Requirement
RL.3.22	% Orders/ lines received with correct packaging
RL.3.23	% Orders/ Lines Received with Correct Shipping Documents
RS.3.113	Receiving Product Cycle Time

Practices	
BP.006	Consignment Inventory
BP.012	Lot Tracking
BP.068	Supplier Delivery Performance Analysis
BP.069	Raw Materials Receiving Process
BP.164	Consignment Inventory Management

People	
HS.0001	3-way Receiving Match
HS.0009	Bar Code Handling/RFID (if available)
HS.0027	Cross Docking
HS.0033	Data management
HS.0034	Discrepancy Reporting and Resolution
HS.0046	ERP Systems
HS.0049	ID & Damage Inspection
HS.0058	Inventory Management
HS.0066	Legislation and Standards
HS.0069	Logistics Management
HS.0071	Logistics/Freight
HS.0080	MSDS/CoC/BoL/Environmental Interpretation
HS.0106	Property Control and Disposition
HS.0119	Return Management
HS.0139	Supplier Relationship Management (SRM)

sS1.2 Receive Product

Workflow



sS1.3 Verify Product

The process and actions required determining product conformance to requirements and criteria.

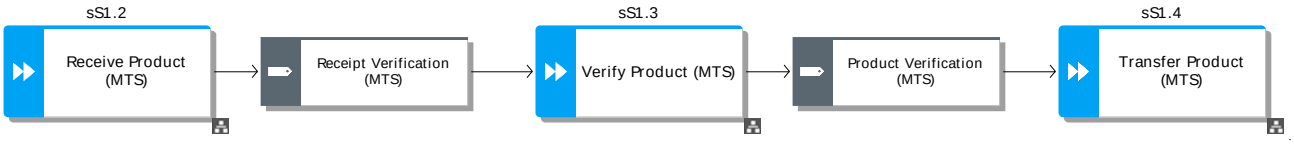
Metrics	
RL.3.19	% Orders/ Lines Received Defect Free
RL.3.21	% Orders/ lines received with correct content
RL.3.24	% Orders/lines received damage free
RS.3.140	Verify Product Cycle Time

Practices	
BP.006	Consignment Inventory
BP.069	Raw Materials Receiving Process
BP.147	Receiving Goods Inspection
BP.164	Consignment Inventory Management

People	
HS.0002	Acceptance testing
HS.0009	Bar Code Handling/RFID (if available)
HS.0033	Data management
HS.0034	Discrepancy Reporting and Resolution
HS.0049	ID & Damage Inspection
HS.0080	MSDS/CoC/BoL/Environmental Interpretation
HS.0081	Office automation tools
HS.0106	Property Control and Disposition
HS.0108	Quality Management
HS.0112	Requirements acceptance criteria
HS.0113	Requirements allocation
HS.0114	Requirements change control & change notification
HS.0115	Requirements criteria, verification methods & tools
HS.0116	Requirements defect notification
HS.0117	Requirements justification / rationale
HS.0118	Requirements syntax, attributes, & baselines
HS.0119	Return Management
HS.0155	Verification Strategies

sS1.3 Verify Product

Workflow



sS1.4 Transfer Product

The transfer of accepted product to the appropriate stocking location within the supply chain. This includes all of the activities associated with repackaging, staging, transferring and stocking product. For service this is the transfer or application of service to the final customer or end user.

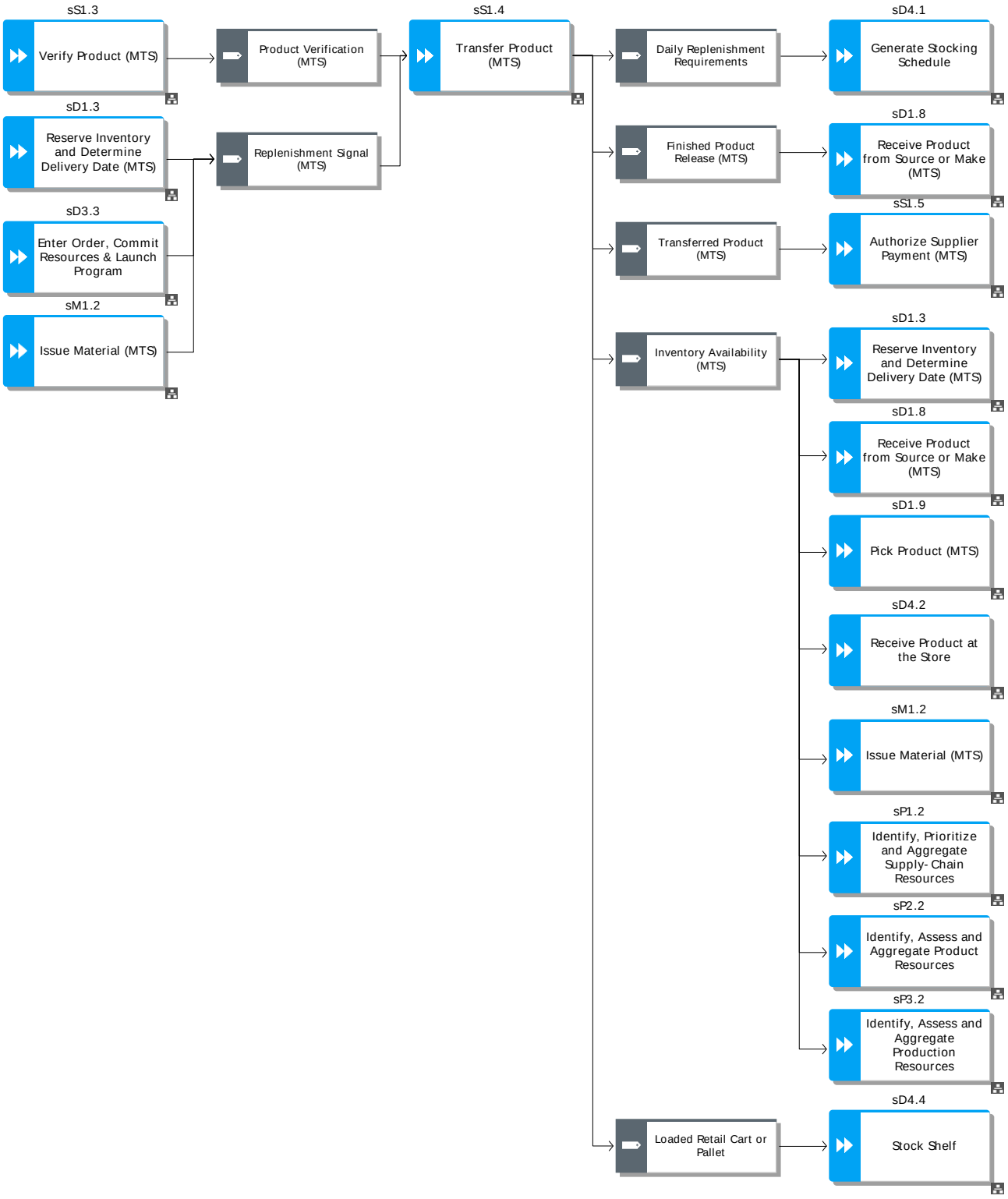
Metrics	
RL.3.25	% Product Transferred On-Time to Demand Requirement
RL.3.26	% Product Transferred without Transaction Errors
RS.3.139	Transfer Product Cycle Time
AM.2.2	Inventory Days of Supply

Practices	
BP.006	Consignment Inventory
BP.011	Production Line Sequencing
BP.069	Raw Materials Receiving Process
BP.164	Consignment Inventory Management

People	
HS.0009	Bar Code Handling/RFID (if available)
HS.0033	Data management
HS.0034	Discrepancy Reporting and Resolution
HS.0046	ERP Systems
HS.0058	Inventory Management
HS.0065	Lean Manufacturing
HS.0066	Legislation and Standards
HS.0069	Logistics Management
HS.0079	MRP Systems
HS.0080	MSDS/CoC/BoL/Environmental Interpretation
HS.0086	Packaging
HS.0106	Property Control and Disposition
HS.0108	Quality Management
HS.0119	Return Management
HS.0139	Supplier Relationship Management (SRM)

sS1.4 Transfer Product

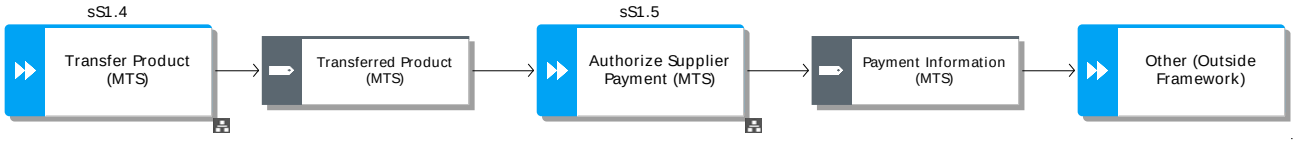
Workflow



sS1.5 Authorize Supplier Payment

The process of authorizing payments and paying suppliers for product or services. This process includes invoice collection, invoice matching and the issuance of checks.

Metrics	
RS.3.8	Authorize Supplier Payment Cycle Time
Practices	
BP.006	Consignment Inventory
BP.148	3-Way Delivery Verification
BP.164	Consignment Inventory Management
People	
HS.0019	Change Notice Development
HS.0022	Contract Management
HS.0024	Cost/Price Analysis
HS.0034	Discrepancy Reporting and Resolution
HS.0074	Master Scheduling
HS.0139	Supplier Relationship Management (SRM)
Workflow	



sS2 Source Make-to-Order Product

The processes of ordering and receiving product or material that is ordered (and may be configured) only when required by a specific customer order. The intention of Source-to-Order is to maintain inventory ordered (and/or configured) specifically for customer orders only. The product is ordered, received and identified in stock using this customer order reference (order designated inventory).

The product is typically identifiable throughout the sourcing process, by the reference to the customer order attached to or marked on the product or packaging and in the warehouse management or ERP system. Examples of alternative or related names for Source-to-Order are: purchase-to-order, special ordering (retail industry), kitting and line sequencing (manufacturing industries).

Hierarchy	
sS2.1	Schedule Product Deliveries
sS2.2	Receive Product
sS2.3	Verify Product
sS2.4	Transfer Product
sS2.5	Authorize Supplier Payment

Metrics	
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time
RS.2.1	Source Cycle Time
AG.3.9	Additional source volumes obtained in 30 days
AG.3.40	Current Purchase Order Cycle Times
AG.3.42	Current Source Volume
AG.3.46	Demand sourcing-supplier constraints
CO.2.2	Cost to Source
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.2.3	Days Payable Outstanding
AM.3.16	Inventory Days of Supply - Raw Material

sS2 Source Make-to-Order Product

Practices	
BP.013	Item Rationalization
BP.035	Business Rule Review
BP.131	Alternative Supplier Benchmarking
BP.132	Issue Invitation to Tender (Quote)
BP.136	Outsourced Reverse Logistics
BP.144	Purchase Order Management
BP.145	Vendor Collaboration
BP.148	3-Way Delivery Verification
BP.161	Enterprise Level Spend Analysis
BP.163	Optimized Supplier Count

sS2.1 Schedule Product Deliveries

Scheduling and managing the execution of the individual deliveries of product against the contract. The requirements for product deliveries are determined based on the detailed sourcing plan. This includes all aspects of managing the contract schedule including prototypes, qualifications or service deployment.

Metrics	
RL.3.27	% Schedules Changed within Supplier's Lead Time
RS.3.9	Average Days per Engineering Change
RS.3.10	Average Days per Schedule Change
RS.3.11	Average Release Cycle of Changes
RS.3.122	Schedule Product Deliveries Cycle Time

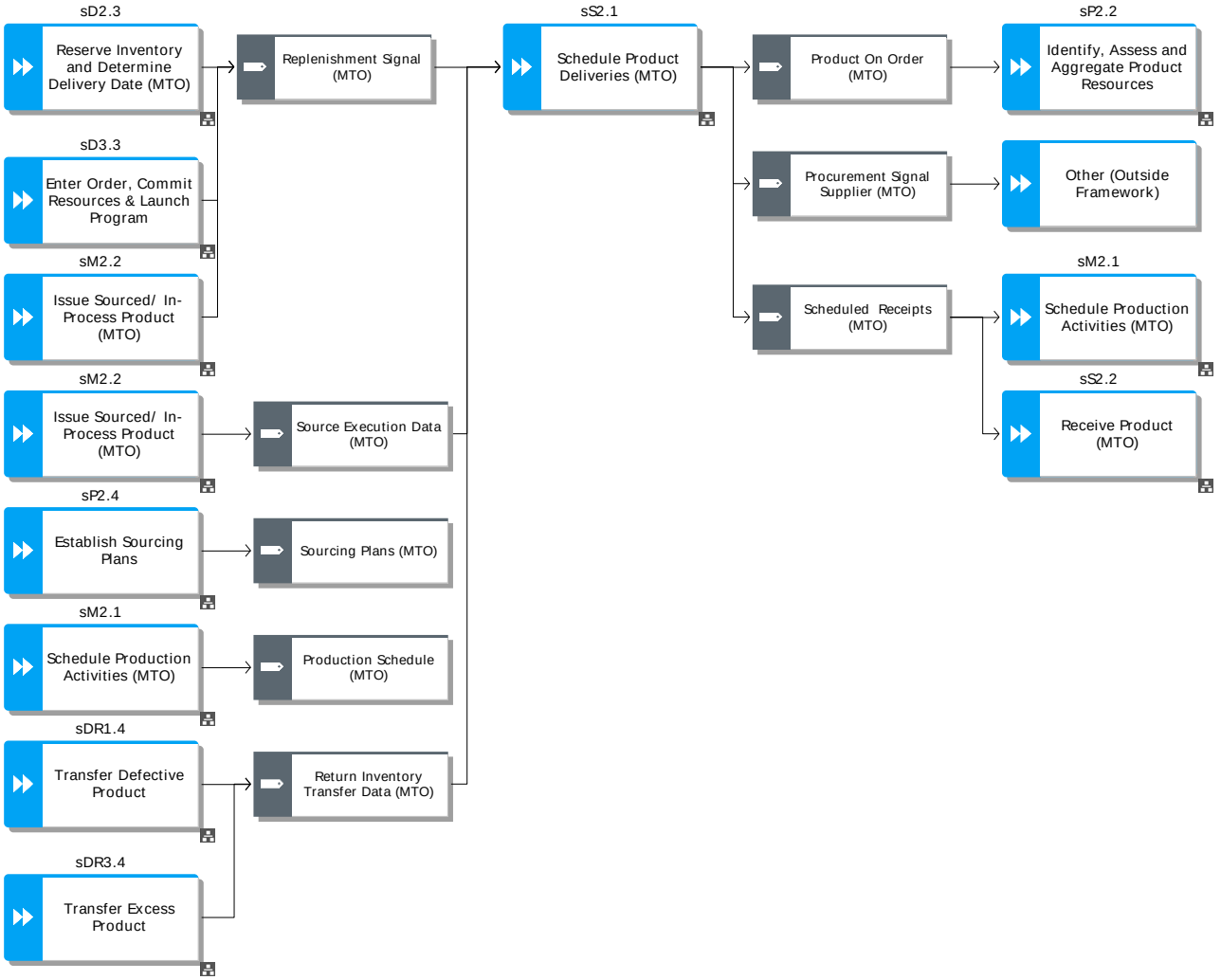
Practices	
BP.011	Production Line Sequencing
BP.041	Transportation Optimization
BP.043	Consignment Inventory Reduction
BP.122	Vendor Managed Inventory (VMI)
BP.144	Purchase Order Management
BP.145	Vendor Collaboration

People	
HS.0001	3-way Receiving Match
HS.0012	Benchmarking
HS.0021	Consignment Agreement Development
HS.0022	Contract Management
HS.0034	Discrepancy Reporting and Resolution
HS.0035	Delivery Balancing
HS.0048	Forecasting
HS.0056	Interpreting Specifications
HS.0063	Labor Costs Verification
HS.0065	Lean Manufacturing
HS.0069	Logistics Management
HS.0074	Master Scheduling
HS.0080	MSDS/CoC/BoL/Environmental Interpretation
HS.0083	Order Management
HS.0087	Payment Processing
HS.0093	Prioritization
HS.0094	Procurement

sS2.1 Schedule Product Deliveries

HS.0103	Production Scheduling
HS.0108	Quality Management
HS.0125	Risk Assessment
HS.0138	Subcontracting Types (FFP, CP, CPAF, Performance Based)
HS.0139	Supplier Relationship Management (SRM)
HS.0154	Vendor Managed Inventory
HS.0158	Warranty Return and Repair

Workflow



sS2.2 Receive Product

The process and associated activities of receiving product to contract requirements.

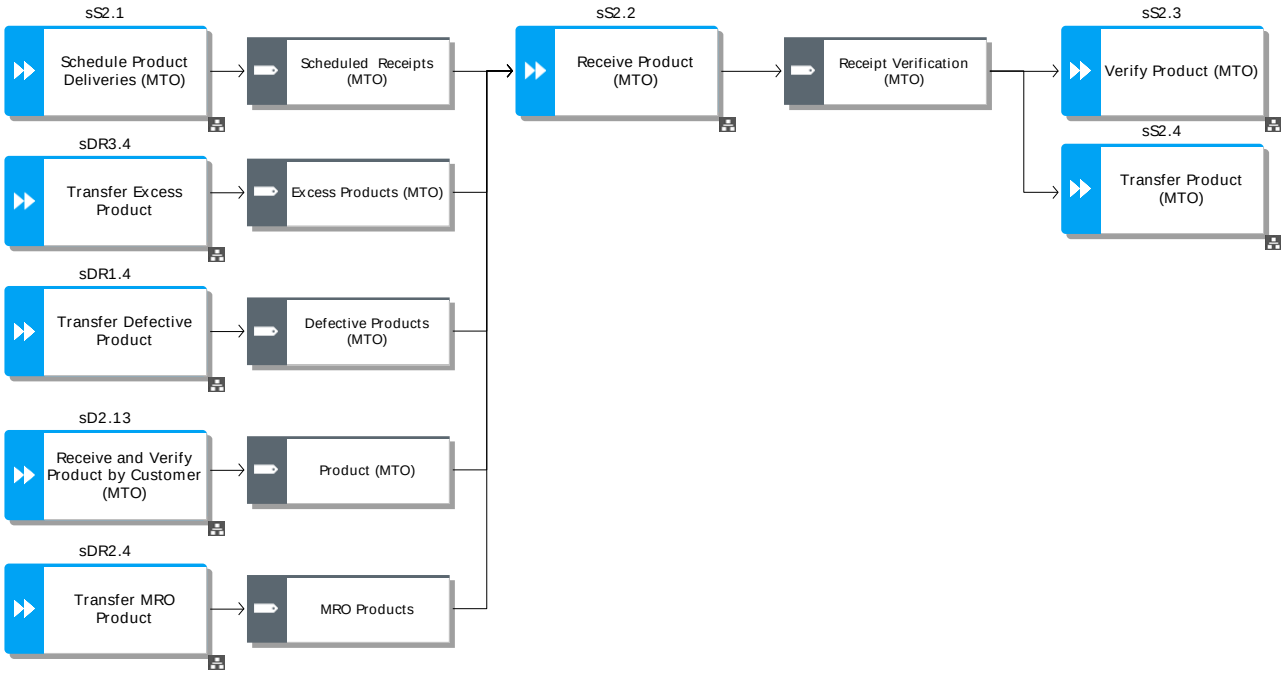
Metrics	
RL.3.18	% Orders/ Lines Processed Complete
RL.3.20	% Orders/ Lines Received On-Time To Demand Requirement
RL.3.22	% Orders/ lines received with correct packaging
RL.3.23	% Orders/ Lines Received with Correct Shipping Documents
RS.3.113	Receiving Product Cycle Time

Practices	
BP.011	Production Line Sequencing
BP.012	Lot Tracking
BP.068	Supplier Delivery Performance Analysis
BP.069	Raw Materials Receiving Process
BP.147	Receiving Goods Inspection

People	
HS.0001	3-way Receiving Match
HS.0009	Bar Code Handling/RFID (if available)
HS.0013	Blanket purchase order process
HS.0020	Competitive Bidding
HS.0027	Cross Docking
HS.0033	Data management
HS.0034	Discrepancy Reporting and Resolution
HS.0046	ERP Systems
HS.0049	ID & Damage Inspection
HS.0058	Inventory Management
HS.0066	Legislation and Standards
HS.0069	Logistics Management
HS.0071	Logistics/Freight
HS.0080	MSDS/CoC/BoL/Environmental Interpretation
HS.0083	Order Management
HS.0106	Property Control and Disposition
HS.0119	Return Management
HS.0139	Supplier Relationship Management (SRM)

sS2.2 Receive Product

Workflow



sS2.3 Verify Product

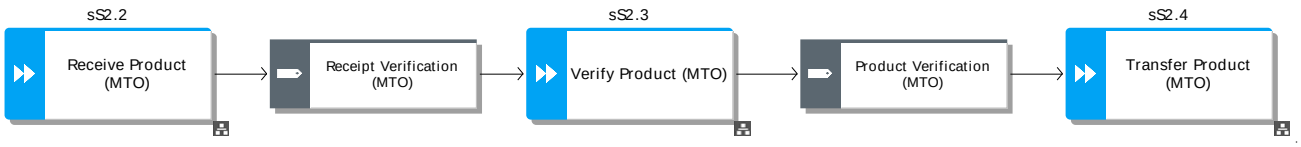
The process and actions required determining product conformance to requirements and criteria.

Metrics	
RL.3.19	% Orders/ Lines Received Defect Free
RL.3.21	% Orders/ lines received with correct content
RL.3.24	% Orders/lines received damage free
RS.3.140	Verify Product Cycle Time

Practices	
BP.011	Production Line Sequencing
BP.069	Raw Materials Receiving Process
BP.147	Receiving Goods Inspection

People	
HS.0002	Acceptance testing
HS.0108	Quality Management
HS.0112	Requirements acceptance criteria
HS.0115	Requirements criteria, verification methods & tools
HS.0117	Requirements justification / rationale
HS.0118	Requirements syntax, attributes, & baselines
HS.0155	Verification Strategies

Workflow



sS2.4 Transfer Product

The transfer of accepted product to the appropriate stocking location within the supply chain. This includes all of the activities associated with repackaging, staging, transferring, and stocking product and or application of service.

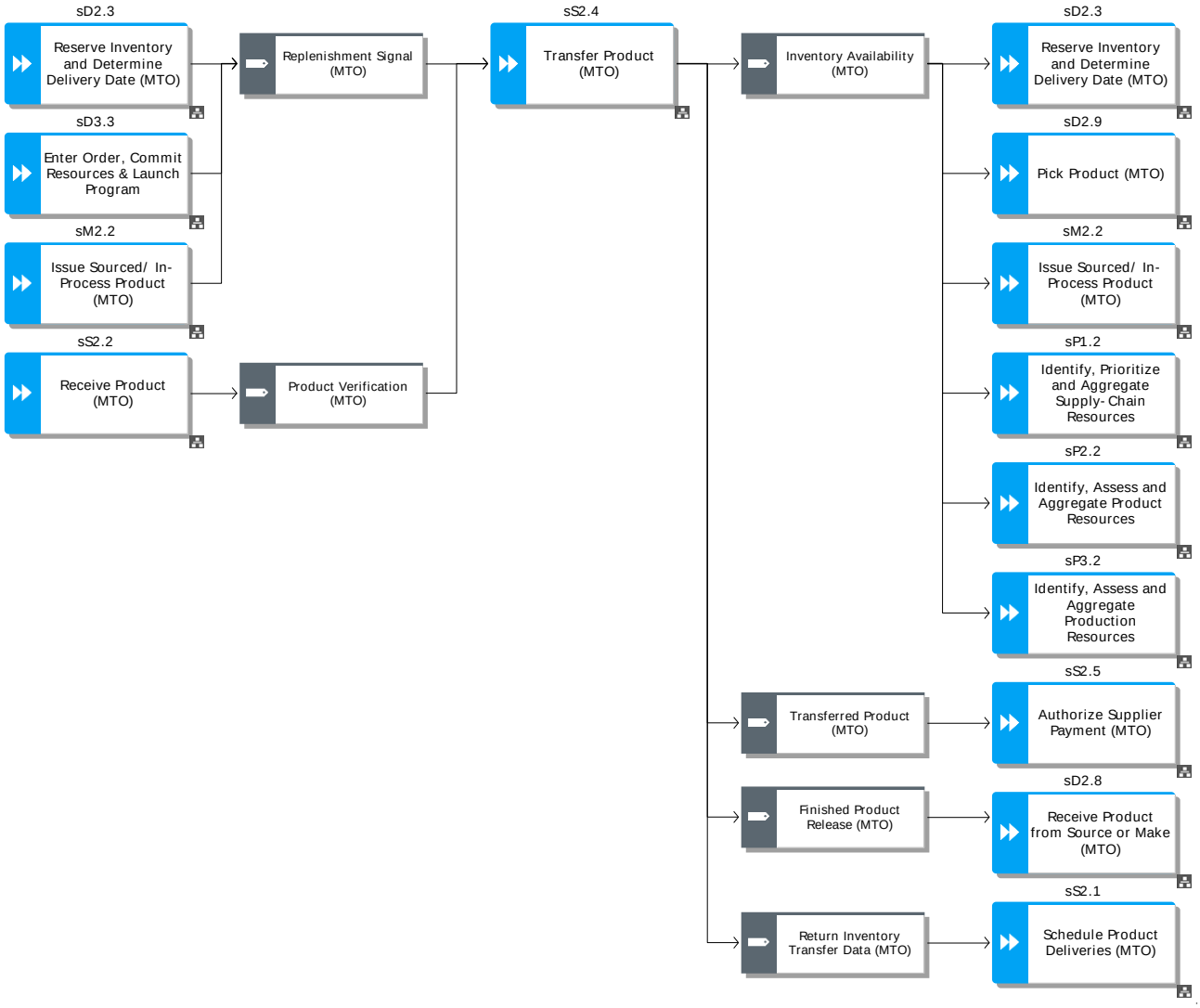
Metrics	
RL.3.25	% Product Transferred On-Time to Demand Requirement
RL.3.26	% Product Transferred without Transaction Errors
RS.3.139	Transfer Product Cycle Time
AM.2.2	Inventory Days of Supply

Practices	
BP.011	Production Line Sequencing
BP.069	Raw Materials Receiving Process

People	
HS.0009	Bar Code Handling/RFID (if available)
HS.0033	Data management
HS.0034	Discrepancy Reporting and Resolution
HS.0046	ERP Systems
HS.0058	Inventory Management
HS.0065	Lean Manufacturing
HS.0066	Legislation and Standards
HS.0069	Logistics Management
HS.0080	MSDS/CoC/BoL/Environmental Interpretation
HS.0086	Packaging
HS.0106	Property Control and Disposition
HS.0108	Quality Management
HS.0119	Return Management
HS.0139	Supplier Relationship Management (SRM)

sS2.4 Transfer Product

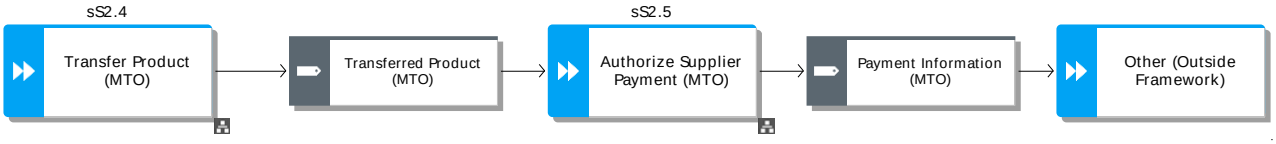
Workflow



sS2.5 Authorize Supplier Payment

The process of authorizing payments and paying suppliers for product or services. This process includes invoice collection, invoice matching and the issuance of checks.

Metrics	
RS.3.8	Authorize Supplier Payment Cycle Time
Practices	
BP.148	3-Way Delivery Verification
People	
HS.0001	3-way Receiving Match
HS.0002	Acceptance testing
HS.0022	Contract Management
HS.0034	Discrepancy Reporting and Resolution
HS.0036	Delivery Scheduling
HS.0046	ERP Systems
HS.0061	Item Master/BOM/BoL Interpretation
HS.0063	Labor Costs Verification
HS.0069	Logistics Management
HS.0074	Master Scheduling
HS.0087	Payment Processing
HS.0108	Quality Management
HS.0139	Supplier Relationship Management (SRM)
HS.0158	Warranty Return and Repair
Workflow	



sS3 Source Engineer-to-Order Product

The processes of identifying and selecting sources of supply, negotiating, validating, scheduling, ordering and receiving parts, assemblies or specialized products or services that are designed, ordered and/or built based on the requirements or specifications of a specific customer order.

Hierarchy	
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
sS3.4	Receive Product
sS3.5	Verify Product
sS3.6	Transfer Product
sS3.7	Authorize Supplier Payment

Metrics	
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time
RS.2.1	Source Cycle Time
AG.3.9	Additional source volumes obtained in 30 days
AG.3.40	Current Purchase Order Cycle Times
AG.3.42	Current Source Volume
AG.3.46	Demand sourcing-supplier constraints
CO.2.2	Cost to Source
CO.3.6	Cost to Authorize Supplier Payment
CO.3.7	Cost to Receive Product
CO.3.10	Cost to Verify Product
CO.3.11	Direct Material Cost
CO.3.14	Order Management Costs
CO.3.19	Risk Mitigation Costs (Source)
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.2.3	Days Payable Outstanding
AM.3.16	Inventory Days of Supply - Raw Material

sS3 Source Engineer-to-Order Product

Practices	
BP.035	Business Rule Review
BP.100	Strategic Sourcing
BP.101	Purchasing/Procurement Strategy
BP.131	Alternative Supplier Benchmarking
BP.132	Issue Invitation to Tender (Quote)
BP.134	Supplier Evaluation using Robust Evaluation Tool.
BP.144	Purchase Order Management
BP.145	Vendor Collaboration
BP.148	3-Way Delivery Verification
BP.161	Enterprise Level Spend Analysis
BP.163	Optimized Supplier Count

sS3.1 Identify Sources of Supply

The identification and qualification of potential suppliers capable of designing and delivering product that will meet all of the required product specifications.

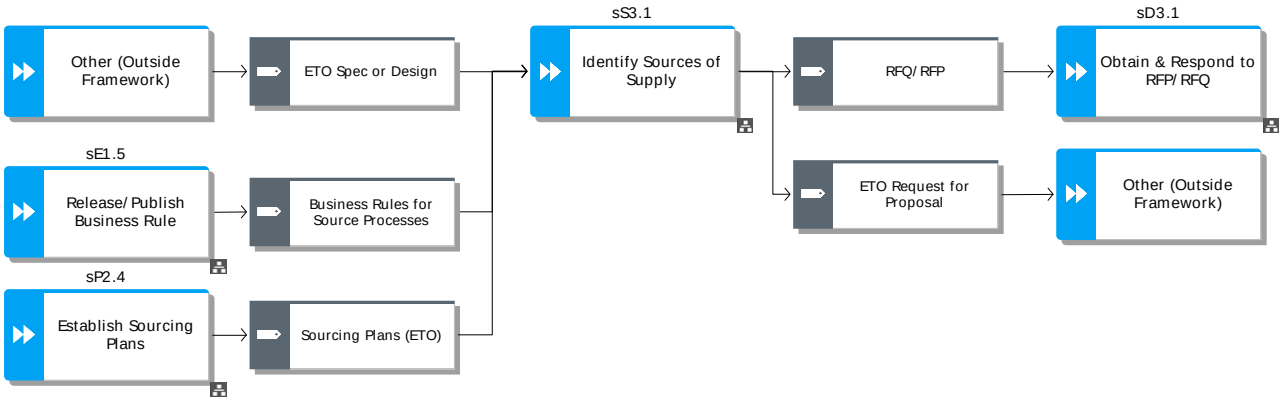
Metrics	
RS.3.35	Identify Sources of Supply Cycle Time
AM.3.2	% of material that has a valid
AM.3.3	% of materials that are recyclable/ reusable

Practices	
BP.100	Strategic Sourcing
BP.101	Purchasing/Procurement Strategy
BP.131	Alternative Supplier Benchmarking
BP.132	Issue Invitation to Tender (Quote)
BP.134	Supplier Evaluation using Robust Evaluation Tool.

People	
HS.0004	Advertising Methodologies
HS.0010	Basic Finance
HS.0022	Contract Management
HS.0033	Data management
HS.0042	Enabling Technology
HS.0043	Engineering
HS.0045	Environmental Requirements
HS.0050	Import/Export Regulations
HS.0054	Intellectual Property/Proprietary Data
HS.0076	Milestone/Performance Payments
HS.0094	Procurement
HS.0097	Product Development (PDR, CDR)
HS.0105	Project Management
HS.0108	Quality Management
HS.0125	Risk Assessment
HS.0134	Solicitation Methods
HS.0135	Solicitation/Competitive Bidding Process
HS.0139	Supplier Relationship Management (SRM)
HS.0158	Warranty Return and Repair

sS3.1 Identify Sources of Supply

Workflow



sS3.2 Select Final Supplier and Negotiate

The identification of the final supplier(s) based on the evaluation of RFQs, supplier qualifications and the generation of a contract defining the costs and terms and conditions of product availability.

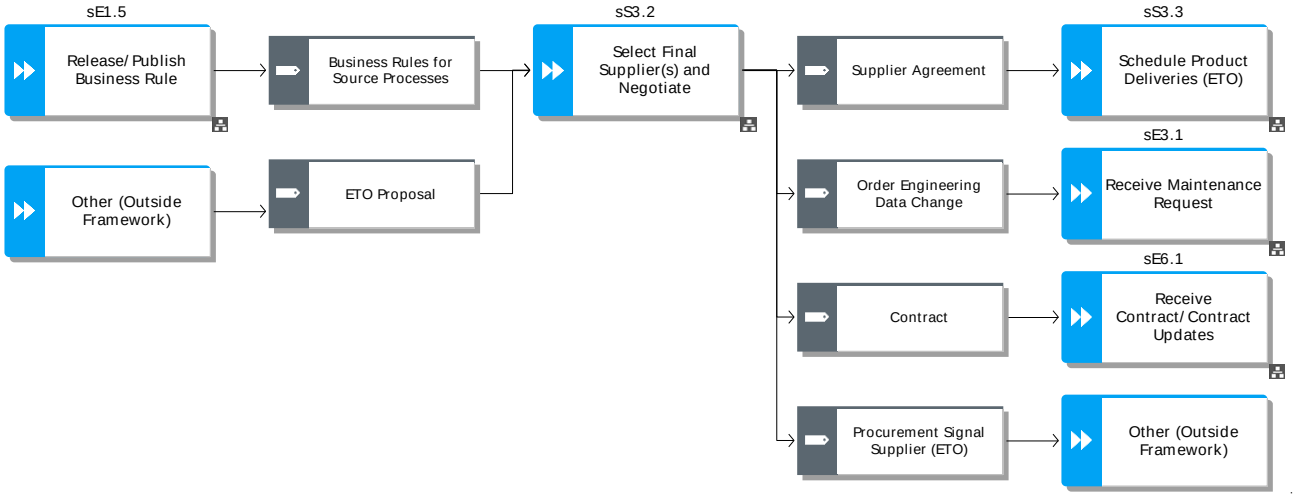
Metrics	
RL.3.17	% of suppliers with an EMS or ISO 14001 certification
RS.3.125	Select Supplier and Negotiate Cycle Time

Practices	
BP.068	Supplier Delivery Performance Analysis
BP.069	Raw Materials Receiving Process
BP.134	Supplier Evaluation using Robust Evaluation Tool.

People	
HS.0004	Advertising Methodologies
HS.0010	Basic Finance
HS.0012	Benchmarking
HS.0022	Contract Management
HS.0023	Controls and Compliance
HS.0033	Data management
HS.0036	Delivery Scheduling
HS.0042	Enabling Technology
HS.0045	Environmental Requirements
HS.0050	Import/Export Regulations
HS.0054	Intellectual Property/Proprietary Data
HS.0076	Milestone/Performance Payments
HS.0094	Procurement
HS.0125	Risk Assessment
HS.0135	Solicitation/Competitive Bidding Process
HS.0139	Supplier Relationship Management (SRM)
HS.0147	Technical Evaluation
HS.0158	Warranty Return and Repair

sS3.2 Select Final Supplier and Negotiate

Workflow



sS3.3 Schedule Product Deliveries

Scheduling and managing the execution of the individual deliveries of product against the contract. The requirements for product deliveries are determined based on the detailed sourcing plan. This includes all aspects of managing the contract schedule including prototypes and qualifications.

Metrics	
RL.3.27	% Schedules Changed within Supplier's Lead Time
RS.3.9	Average Days per Engineering Change
RS.3.10	Average Days per Schedule Change
RS.3.11	Average Release Cycle of Changes
RS.3.122	Schedule Product Deliveries Cycle Time

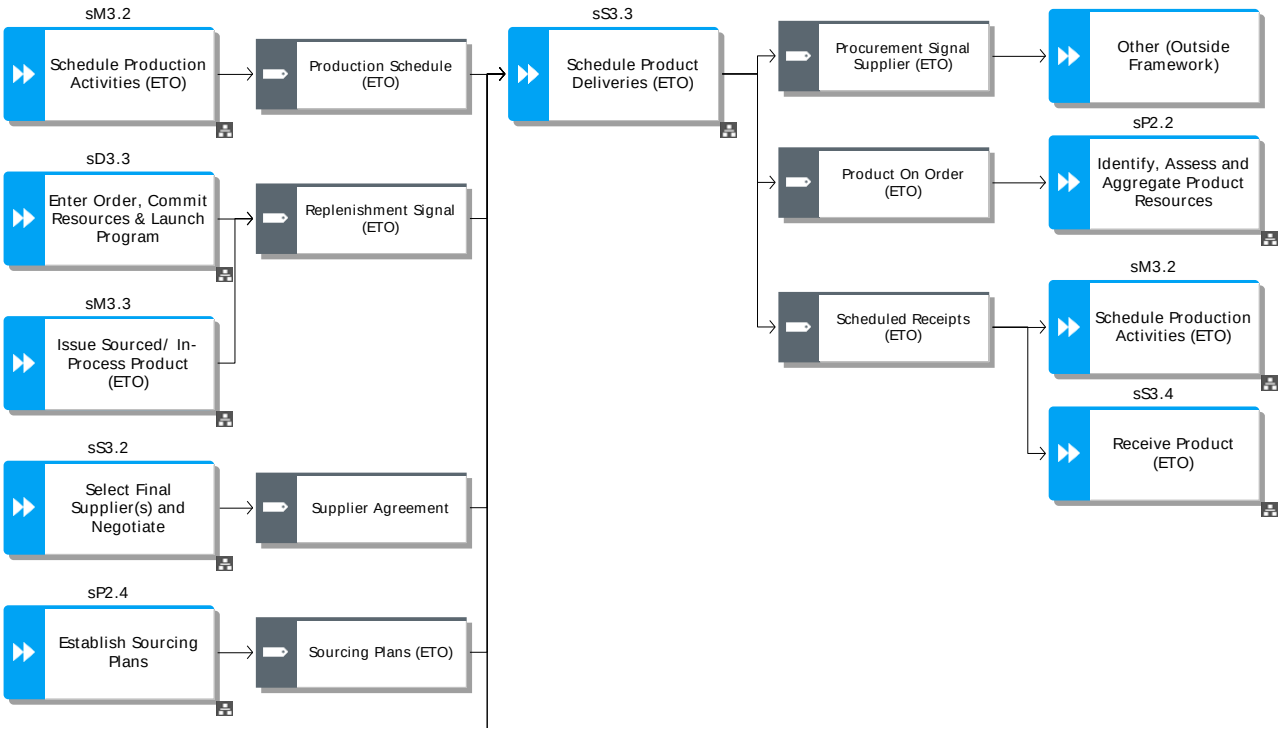
Practices	
BP.011	Production Line Sequencing
BP.041	Transportation Optimization
BP.069	Raw Materials Receiving Process
BP.122	Vendor Managed Inventory (VMI)
BP.144	Purchase Order Management
BP.145	Vendor Collaboration

People	
HS.0010	Basic Finance
HS.0012	Benchmarking
HS.0019	Change Notice Development
HS.0021	Consignment Agreement Development
HS.0022	Contract Management
HS.0023	Controls and Compliance
HS.0024	Cost/Price Analysis
HS.0034	Discrepancy Reporting and Resolution
HS.0035	Delivery Balancing
HS.0036	Delivery Scheduling
HS.0048	Forecasting
HS.0050	Import/Export Regulations
HS.0056	Interpreting Specifications
HS.0065	Lean Manufacturing
HS.0069	Logistics Management
HS.0074	Master Scheduling
HS.0076	Milestone/Performance Payments

sS3.3 Schedule Product Deliveries

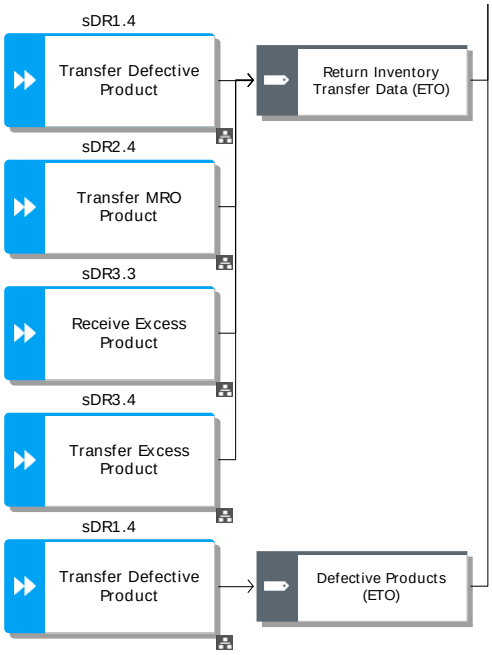
HS.0080	MSDS/CoC/BoL/Environmental Interpretation
HS.0083	Order Management
HS.0093	Prioritization
HS.0094	Procurement
HS.0103	Production Scheduling
HS.0108	Quality Management
HS.0125	Risk Assessment
HS.0135	Solicitation/Competitive Bidding Process
HS.0138	Subcontracting Types (FFP, CP, CPAF, Performance Based)
HS.0139	Supplier Relationship Management (SRM)
HS.0154	Vendor Managed Inventory
HS.0158	Warranty Return and Repair

Workflow



sS3.3 Schedule Product Deliveries

Workflow Continued



sS3.4 Receive Product

The process and associated activities of receiving product to contract requirements.

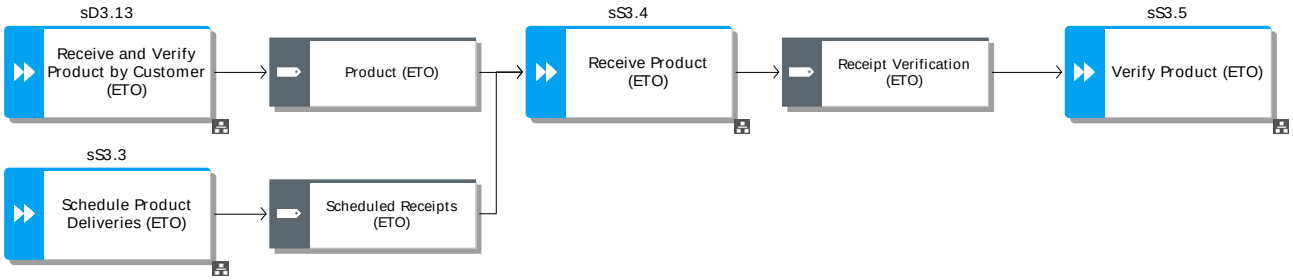
Metrics	
RL.3.18	% Orders/ Lines Processed Complete
RL.3.20	% Orders/ Lines Received On-Time To Demand Requirement
RL.3.22	% Orders/ lines received with correct packaging
RL.3.23	% Orders/ Lines Received with Correct Shipping Documents
RS.3.113	Receiving Product Cycle Time

Practices	
BP.011	Production Line Sequencing
BP.069	Raw Materials Receiving Process
BP.147	Receiving Goods Inspection

People	
HS.0001	3-way Receiving Match
HS.0009	Bar Code Handling/RFID (if available)
HS.0027	Cross Docking
HS.0033	Data management
HS.0034	Discrepancy Reporting and Resolution
HS.0046	ERP Systems
HS.0049	ID & Damage Inspection
HS.0058	Inventory Management
HS.0066	Legislation and Standards
HS.0069	Logistics Management
HS.0071	Logistics/Freight
HS.0080	MSDS/CoC/BoL/Environmental Interpretation
HS.0106	Property Control and Disposition
HS.0119	Return Management
HS.0139	Supplier Relationship Management (SRM)

sS3.4 Receive Product

Workflow



sS3.5 Verify Product

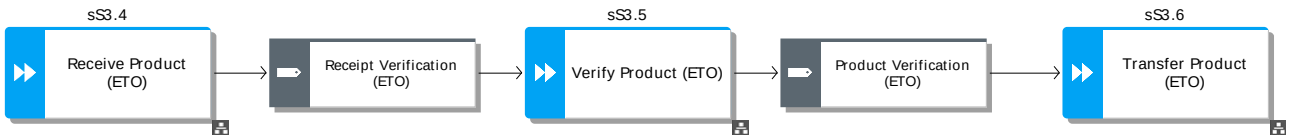
The process and actions required determining product conformance to requirements and criteria.

Metrics	
RL.3.19	% Orders/ Lines Received Defect Free
RL.3.21	% Orders/ lines received with correct content
RL.3.24	% Orders/lines received damage free
RS.3.140	Verify Product Cycle Time

Practices	
BP.011	Production Line Sequencing
BP.147	Receiving Goods Inspection

People	
HS.0002	Acceptance testing
HS.0009	Bar Code Handling/RFID (if available)
HS.0033	Data management
HS.0034	Discrepancy Reporting and Resolution
HS.0049	ID & Damage Inspection
HS.0065	Lean Manufacturing
HS.0080	MSDS/CoC/BoL/Environmental Interpretation
HS.0081	Office automation tools
HS.0106	Property Control and Disposition
HS.0108	Quality Management
HS.0112	Requirements acceptance criteria
HS.0113	Requirements allocation
HS.0114	Requirements change control & change notification
HS.0115	Requirements criteria, verification methods & tools
HS.0116	Requirements defect notification
HS.0117	Requirements justification / rationale
HS.0118	Requirements syntax, attributes, & baselines
HS.0119	Return Management
HS.0155	Verification Strategies

Workflow



sS3.6 Transfer Product

The transfer of accepted product to the appropriate stocking location within the supply chain. This includes all of the activities associated with repackaging, staging, transferring, and stocking product.

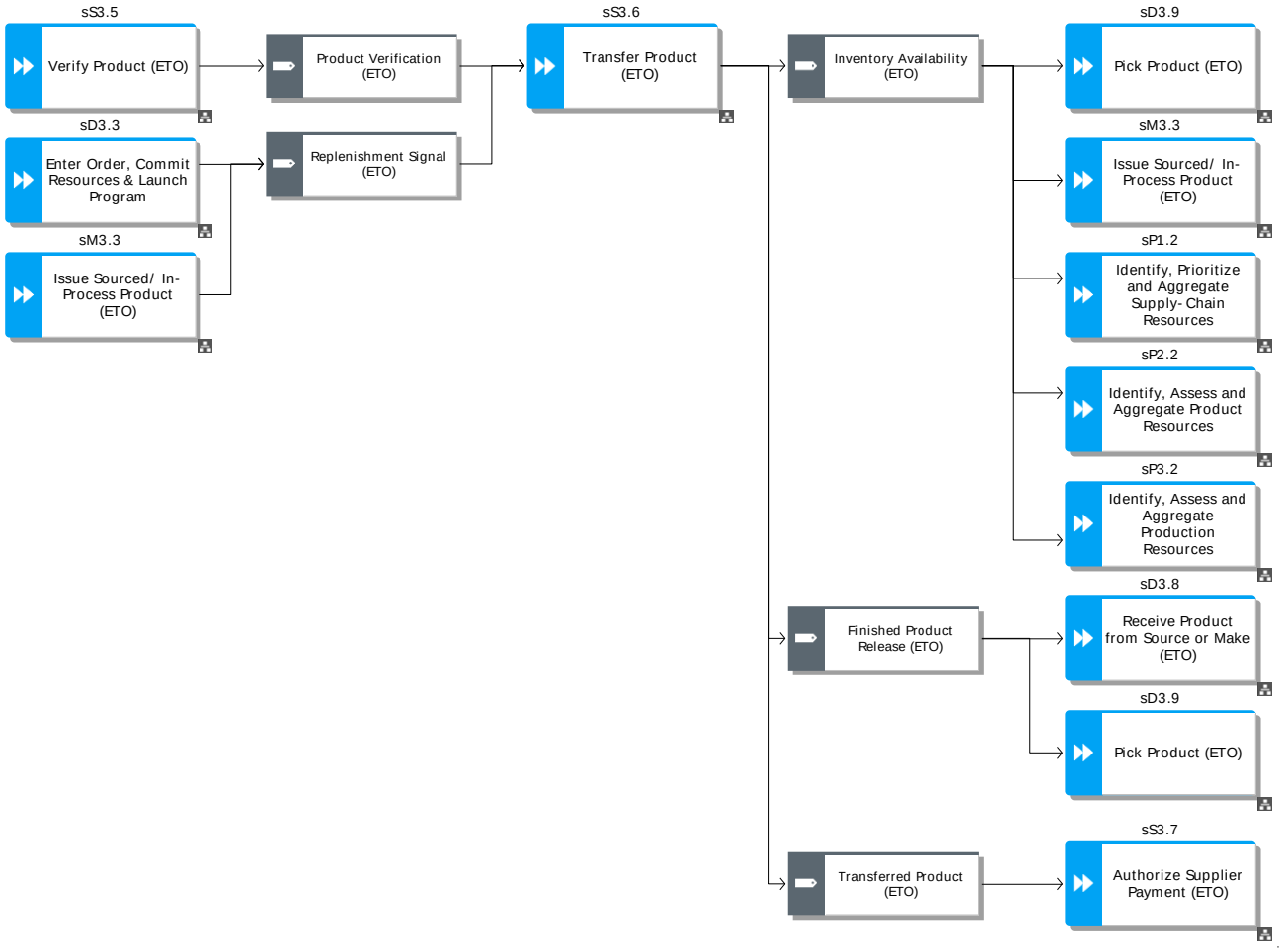
Metrics	
RL.3.25	% Product Transferred On-Time to Demand Requirement
RL.3.26	% Product Transferred without Transaction Errors
RS.3.139	Transfer Product Cycle Time
AM.2.2	Inventory Days of Supply

Practices	
BP.011	Production Line Sequencing

People	
HS.0009	Bar Code Handling/RFID (if available)
HS.0033	Data management
HS.0034	Discrepancy Reporting and Resolution
HS.0046	ERP Systems
HS.0058	Inventory Management
HS.0066	Legislation and Standards
HS.0069	Logistics Management
HS.0080	MSDS/CoC/BoL/Environmental Interpretation
HS.0086	Packaging
HS.0106	Property Control and Disposition
HS.0108	Quality Management
HS.0119	Return Management
HS.0139	Supplier Relationship Management (SRM)

sS3.6 Transfer Product

Workflow



sS3.7 Authorize Supplier Payment

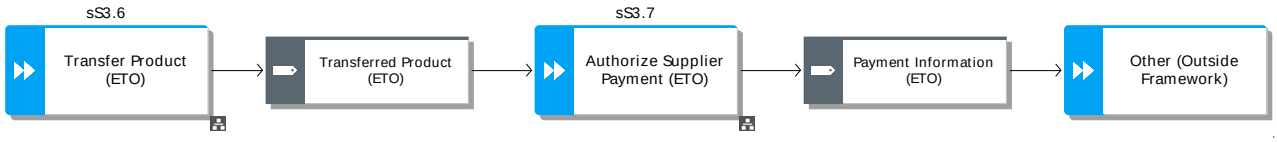
The process of authorizing payments and paying suppliers for product or services. This process includes invoice collection, invoice matching and the issuance of checks.

Metrics	
RS.3.8	Authorize Supplier Payment Cycle Time

Practices	
BP.005	Self-Invoicing
BP.148	3-Way Delivery Verification

People	
HS.0001	3-way Receiving Match
HS.0002	Acceptance testing
HS.0022	Contract Management
HS.0034	Discrepancy Reporting and Resolution
HS.0036	Delivery Scheduling
HS.0046	ERP Systems
HS.0061	Item Master/BOM/BoL Interpretation
HS.0063	Labor Costs Verification
HS.0069	Logistics Management
HS.0074	Master Scheduling
HS.0087	Payment Processing
HS.0108	Quality Management
HS.0139	Supplier Relationship Management (SRM)
HS.0158	Warranty Return and Repair

Workflow



Make

sM Make

The process of adding value to a deliverable through manufacturing or creation of a product or deliverable; or in services industries, creation of service deliverables.

Hierarchy	
sM1	Make-to-Stock
sM2	Make-to-Order
sM3	Engineer-to-Order

Metrics	
AG.1.1	Upside Supply Chain Adaptability
AG.1.2	Downside Supply Chain Adaptability
AG.1.3	Overall Value at Risk (VAR)
AM.1.1	Cash-to-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
CO.1.1	Total Supply Chain Management Costs
CO.1.2	Cost of Goods Sold
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time

sM1 Make-to-Stock

The process of adding value to a deliverable, through manufacturing or creation of a product or deliverable; or in services industries, creation of service deliverables. Make to stock products are intended to be shipped from finished goods or 'off the shelf' based on a pre-defined product/service catalogue, they can be completed prior to receipt of a customer order, and are generally produced to a planned schedule in accordance with a sales forecast. No customer reference or customer order detail or specification is attached to production or service orders, attached to or marked on the product, or recorded in the shop floor management or ERP system for Make-to-Stock products. Products or services that are 'configurable' cannot be delivered through the Deliver Stocked Product process, as configurable products require customer reference or customer order details.

Hierarchy	
sM1.1	Schedule Production Activities
sM1.2	Issue Material
sM1.3	Produce and Test
sM1.4	Package
sM1.5	Stage Product
sM1.6	Release Product to Deliver
sM1.7	Waste Disposal

Metrics	
RL.3.58	Yield
RS.1.1	Order Fulfillment Cycle Time
RS.2.2	Make Cycle Time
RS.3.21	Current manufacturing order cycle time
AG.2.2	Upside Make Adaptability
AG.2.7	Downside Make Adaptability
AG.3.2	% of labor used in manufacturing, not used in direct activity
AG.3.38	Current Make Volume
CO.2.3	Cost to Make
CO.3.11	Direct Material Cost
CO.3.12	Indirect Cost Related to Production
CO.3.13	Direct Labor Cost
CO.3.20	Risk Mitigation Costs
CO.1.2	Cost of Goods Sold
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.3.22	Recyclable waste as % of total waste

sM1 Make-to-Stock

Practices	
BP.003	Single-Minute Exchange of Die (SMED)
BP.035	Business Rule Review
BP.040	MTO Order Fulfillment Strategy
BP.098	Mobile Access of Information
BP.153	Bar coding/RFID

sM1.1 Schedule Production Activities

“Production” can be substituted with “Value-add” activities for services. Given plans for the production of specific parts, products, formulations, or service in specified quantities and planned availability of required sourced products or services, the scheduling of the operations to be performed in accordance with these plans. Scheduling includes sequencing, and, depending on the layout, any standards for setup and run. In general, intermediate production / value-add activities are coordinated prior to the scheduling of the operations to be performed in producing or generating a finished product or service.

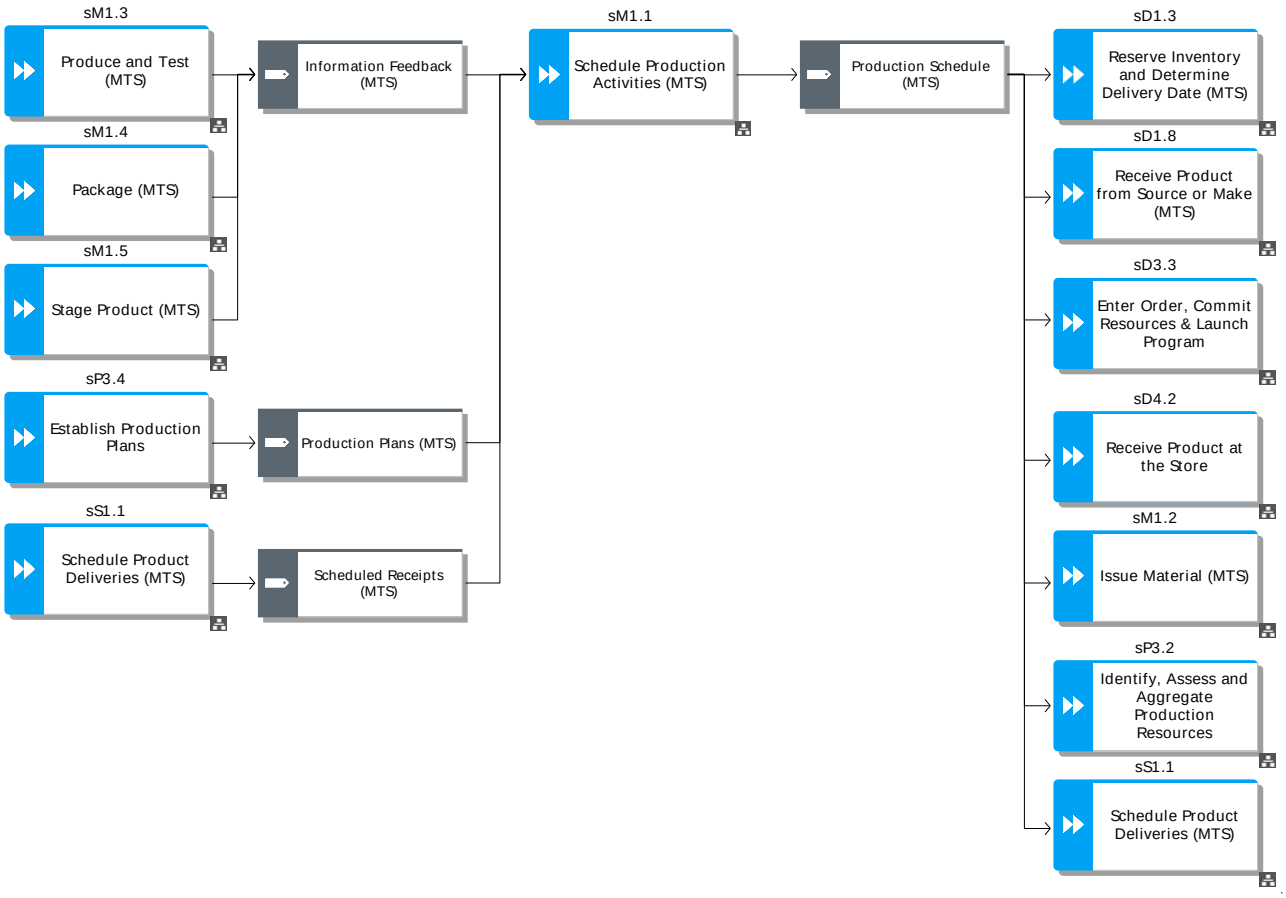
Metrics	
RL.3.49	Schedule Achievement
RS.3.123	Schedule Production Activities Cycle Time
AM.3.9	Capacity Utilization

Practices	
BP.011	Production Line Sequencing
BP.088	360 Degree Closure
BP.172	Production Scheduling Optimization Using Enabling Technologies

People	
HS.0065	Lean Manufacturing
HS.0082	Optimization
HS.0103	Production Scheduling

sM1.1 Schedule Production Activities

Workflow



sM1.2 Issue Material

The selection and physical movement of sourced/in-process product (e.g., raw materials, fabricated components, subassemblies, required ingredients, intermediate formulations (available code or services) from a stocking or resource location (e.g., stockroom, a location on the production floor, a supplier, data storage or resource pool, to a specific point of use location. Issuing product or resource includes the corresponding system transaction. The Bill of Materials / Bill of Service and routing information or recipe/production instructions will determine the products to be issued to support the production operation(s).

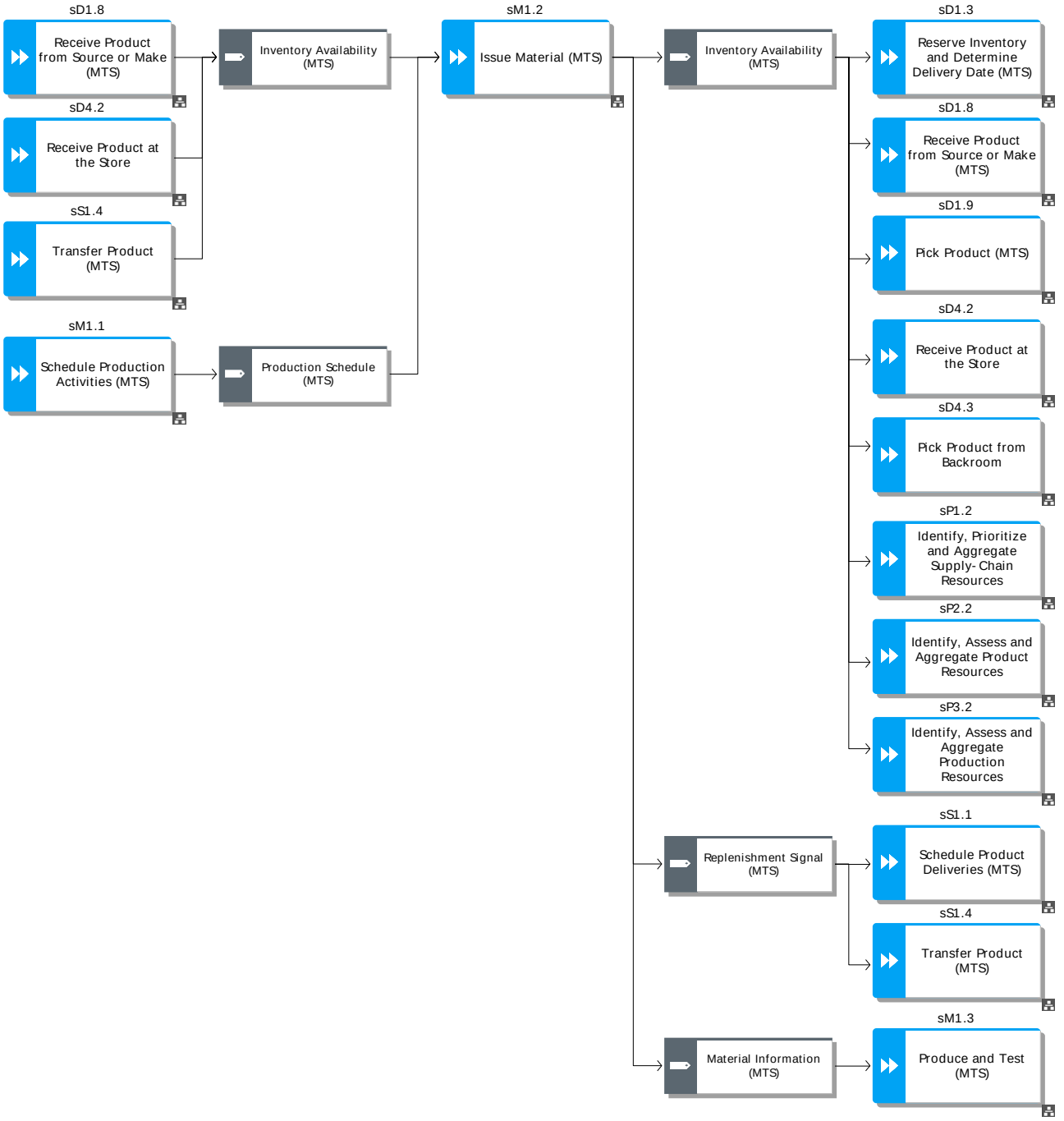
Metrics	
RS.3.49	Issue Material Cycle Time
AM.3.19	Packaging as % of total material

Practices	
BP.009	Kanban
BP.011	Production Line Sequencing
BP.012	Lot Tracking
BP.152	Automated Data Capture (ADC)
BP.171	Mixed Mode/Reverse Material Issue

People	
HS.0058	Inventory Management
HS.0065	Lean Manufacturing
HS.0088	Physical Capability

sM1.2 Issue Material

Workflow



sM1.3 Produce and Test

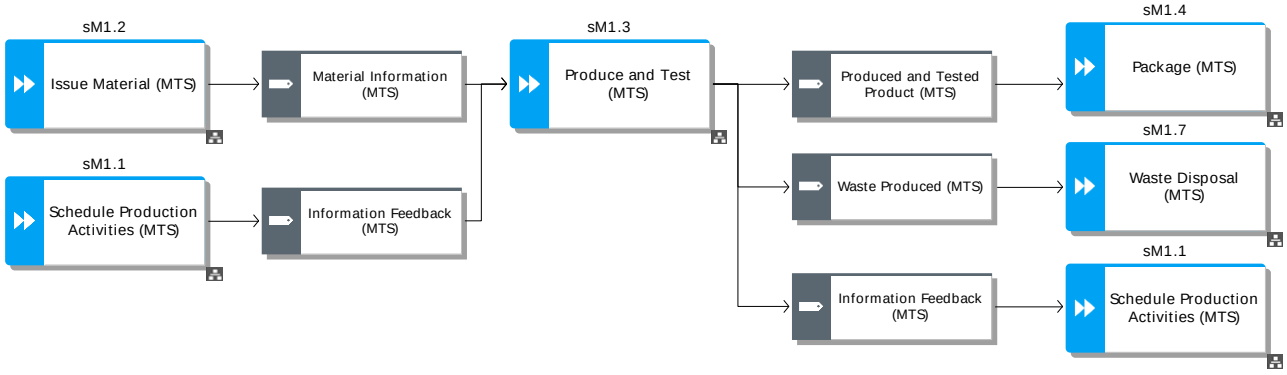
The series of activities performed upon sourced / in-process products or services to convert it a lower state (raw or semi-finished) to a state of completion and greater value. The processes associated with the validation of product performance to ensure conformance to defined specifications and requirements.

Metrics	
RL.3.36	Fill Rate
RL.3.55	Warranty and Returns
RL.3.56	Warranty Costs
RL.3.58	Yield
RL.3.59	Yield Variability
RS.3.4	Asset Turns
RS.3.101	Produce and Test Cycle Time
AM.3.5	% of production materials reused
AM.3.6	% of products consisting of previously used components
AM.3.9	Capacity Utilization
AM.3.14	Hazardous materials used during production process as a % of all materials

Practices	
BP.012	Lot Tracking
BP.152	Automated Data Capture (ADC)

People	
HS.0043	Engineering
HS.0065	Lean Manufacturing
HS.0099	Production

Workflow



sM1.4 Package product

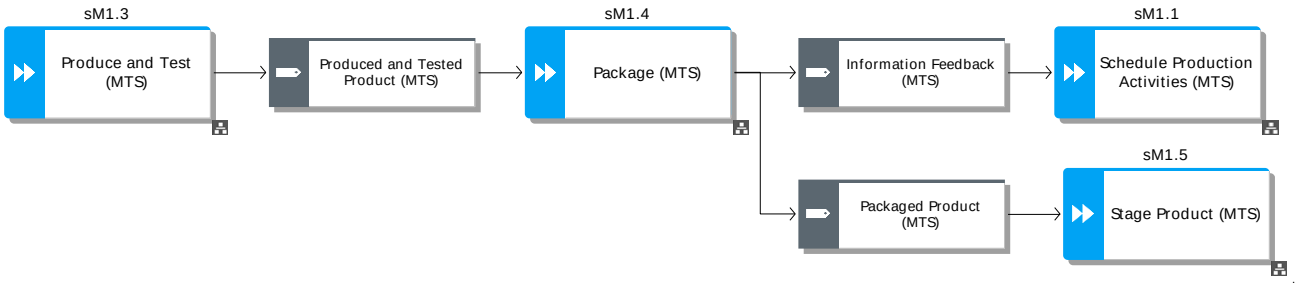
The series of activities that containerize completed products for storage or sale to end-users. Within certain industries, packaging may include cleaning or sterilization. Package is not applicable for Services

Metrics	
RL.3.31	Compliance Documentation Accuracy
RL.3.55	Warranty and Returns
RL.3.56	Warranty Costs
RL.3.58	Yield
RS.3.4	Asset Turns
RS.3.142	Package Cycle Time
AM.3.9	Capacity Utilization

Practices	
BP.012	Lot Tracking
BP.152	Automated Data Capture (ADC)

People	
HS.0079	MRP Systems
HS.0086	Packaging

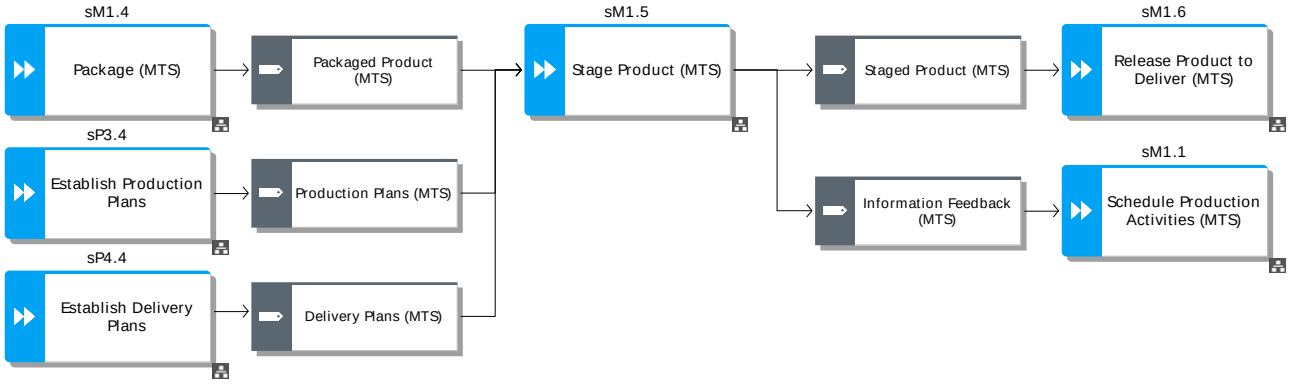
Workflow



sM1.5 Stage Product

This process could also include “Stage Resources” for services. The movement of packaged products or services into a temporary holding or waiting location to await movement to a delivery location. Products that are made to order may remain in the holding location to await shipment or transfer per the associated customer order. The movement to finished goods is part of the Deliver process.

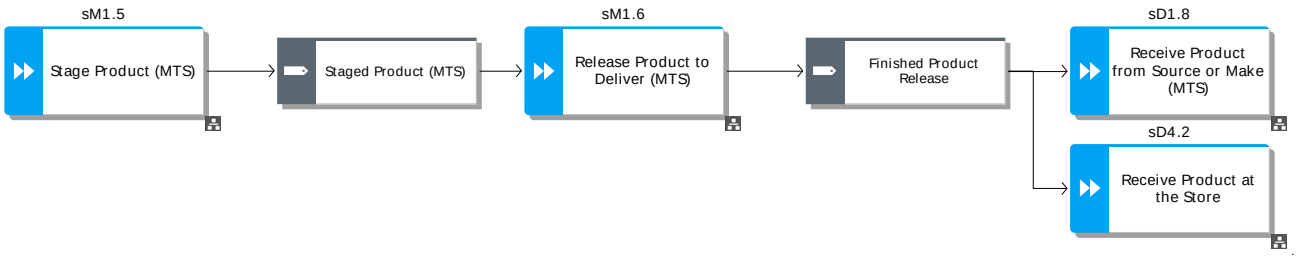
Metrics	
RS.3.128	Stage Finished Product Cycle Time
Practices	
BP.088	360 Degree Closure
People	
HS.0046	ERP Systems
HS.0058	Inventory Management
HS.0065	Lean Manufacturing
HS.0069	Logistics Management
Workflow	



sM1.6 Release Product to Deliver

Activities associated with post-production documentation, testing, or certification required prior to delivery of finished product or service to customer. Examples include assembly of batch records for regulatory agencies, laboratory tests for potency or purity, creating certificate of analysis, or other quality records and sign-off by the quality organization.

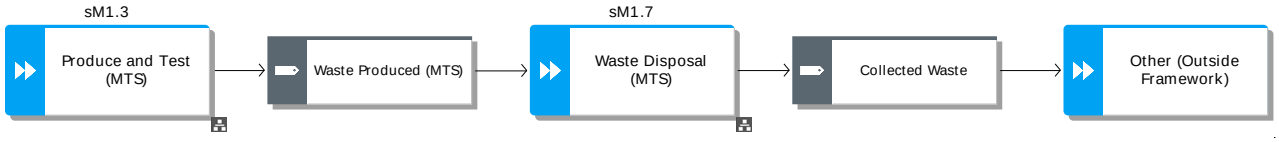
Metrics	
RL.3.1	# of complaints regarding missing environmental documentation
RL.3.2	# of recordkeeping related NOVs
RS.3.114	Release Finished Product to Deliver Cycle Time
Practices	
BP.089	Perfect Pick Put away
People	
HS.0006	Asset Management
HS.0046	ERP Systems
HS.0058	Inventory Management
HS.0069	Logistics Management
HS.0108	Quality Management
Workflow	



sM1.7 Waste / Surplus Management

Activities associated with collecting and managing waste / surplus produced during the value-add and test process including scrap material, unused resources and non-conforming products or deliverables.

Metrics	
RL.3.57	Waste Processing Errors
RS.3.141	Waste accumulation time
AM.3.15	Hazardous waste as % of total waste
Practices	
BP.012	Lot Tracking
People	
HS.0160	Waste Management
Workflow	



sM2 Make-to-Order

The process of adding value to a deliverable either as manufacturing or creation of a product or deliverable, or in services industries, creation of service deliverables for a specific customer order. Products and services are completed, built or configured only in response to a customer order, the customer order reference is attached to the production / service order, attached to or marked on the product / deliverable upon completion of the make process and referenced when transferring the product to Deliver. The product is identifiable throughout the value-add process, as made for a specific customer order.

Examples of alternative or related names for Make-to-Order are: Build-to-Order (BTO), Assemble-to- Order (ATO), Configure-to-Order (CTO), and postponement.

Hierarchy	
sM2.1	Schedule Production Activities
sM2.2	Issue Sourced/In-Process Product
sM2.3	Produce and Test
sM2.4	Package
sM2.5	Stage Finished Product
sM2.6	Release Finished Product to Deliver
sM2.7	Waste Disposal

Metrics	
RL.1.1	Perfect Order Fulfillment
RL.3.58	Yield
RS.2.2	Make Cycle Time
RS.3.21	Current manufacturing order cycle time
AG.2.2	Upside Make Adaptability
AG.2.7	Downside Make Adaptability
AG.3.2	% of labor used in manufacturing, not used in direct activity
AG.3.38	Current Make Volume
CO.2.3	Cost to Make
CO.3.11	Direct Material Cost
CO.3.12	Indirect Cost Related to Production
CO.3.13	Direct Labor Cost
CO.3.20	Risk Mitigation Costs
CO.1.2	Cost of Goods Sold
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.3.17	Inventory Days of Supply - WIP
AM.3.22	Recyclable waste as % of total waste

sM2 Make-to-Order

Practices	
BP.003	Single-Minute Exchange of Die (SMED)
BP.035	Business Rule Review
BP.040	MTO Order Fulfillment Strategy
BP.098	Mobile Access of Information
BP.153	Bar coding/RFID

sM2.1 Schedule Production Activities

Given plans to produce specific parts, products or formulations or service in specified quantities and planned availability of required sourced products/services, the scheduling of the operations to be performed in accordance with these plans. Scheduling includes sequencing, and, depending on the factory layout, any standards for setup and run. In general, intermediate production activities are coordinated prior to the scheduling of the operations to be performed in producing a finished product or service.

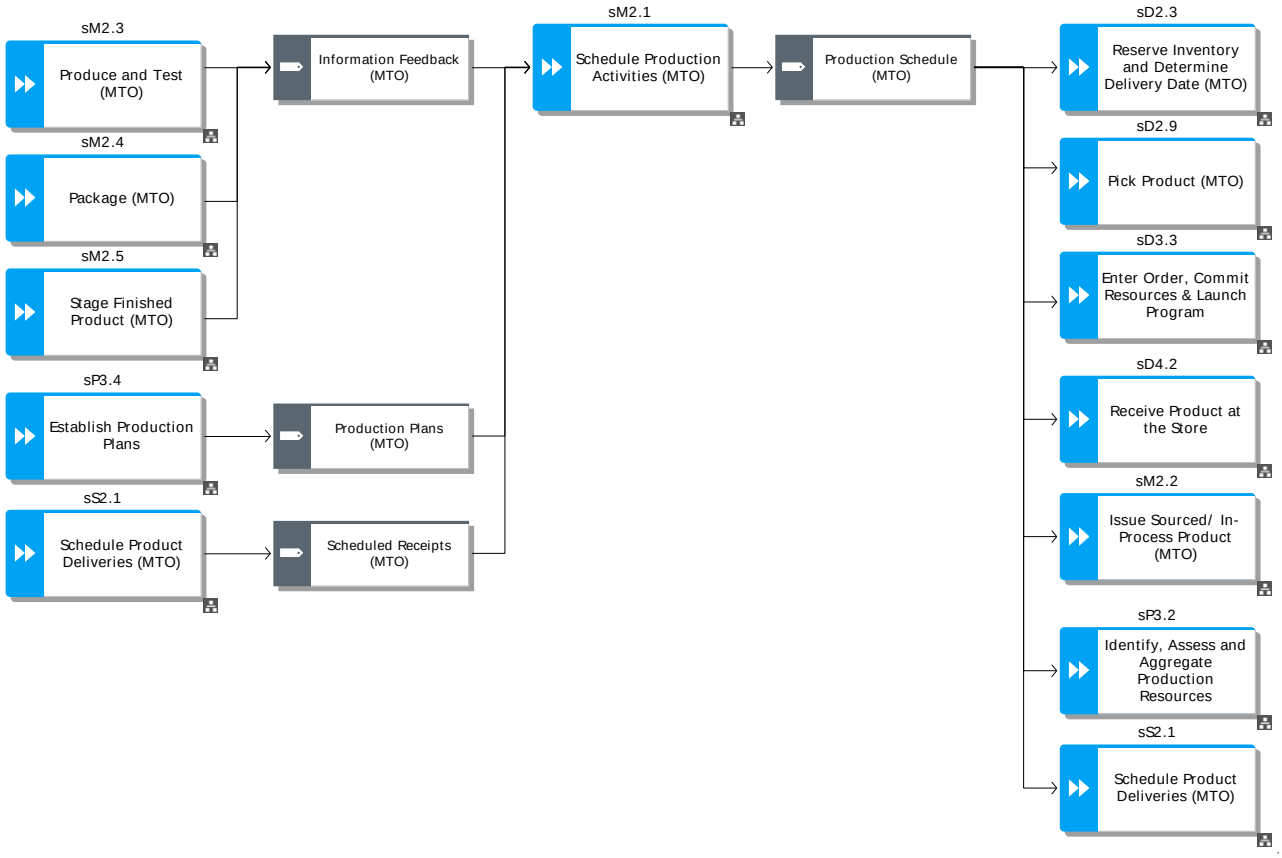
Metrics	
RL.3.49	Schedule Achievement
RS.3.123	Schedule Production Activities Cycle Time
AM.3.9	Capacity Utilization

Practices	
BP.011	Production Line Sequencing
BP.088	360 Degree Closure
BP.172	Production Scheduling Optimization Using Enabling Technologies

People	
HS.0065	Lean Manufacturing
HS.0082	Optimization
HS.0099	Production
HS.0103	Production Scheduling

sM2.1 Schedule Production Activities

Workflow



sM2.2 Issue Sourced/In-Process Product / Identify Service

The selection and physical movement of sourced/in-process product (e.g., raw materials, fabricated components, subassemblies, required ingredients, or intermediate formulations or services) from a stocking or resource location (e.g., stockroom, a location on the production floor, a supplier or resource pool) to a specific point of use location. Issuing product/resource includes the corresponding system transaction. The Bill of Materials/Bill of Service and routing information or recipe/production instructions will determine the products to be issued to support the production operation(s).

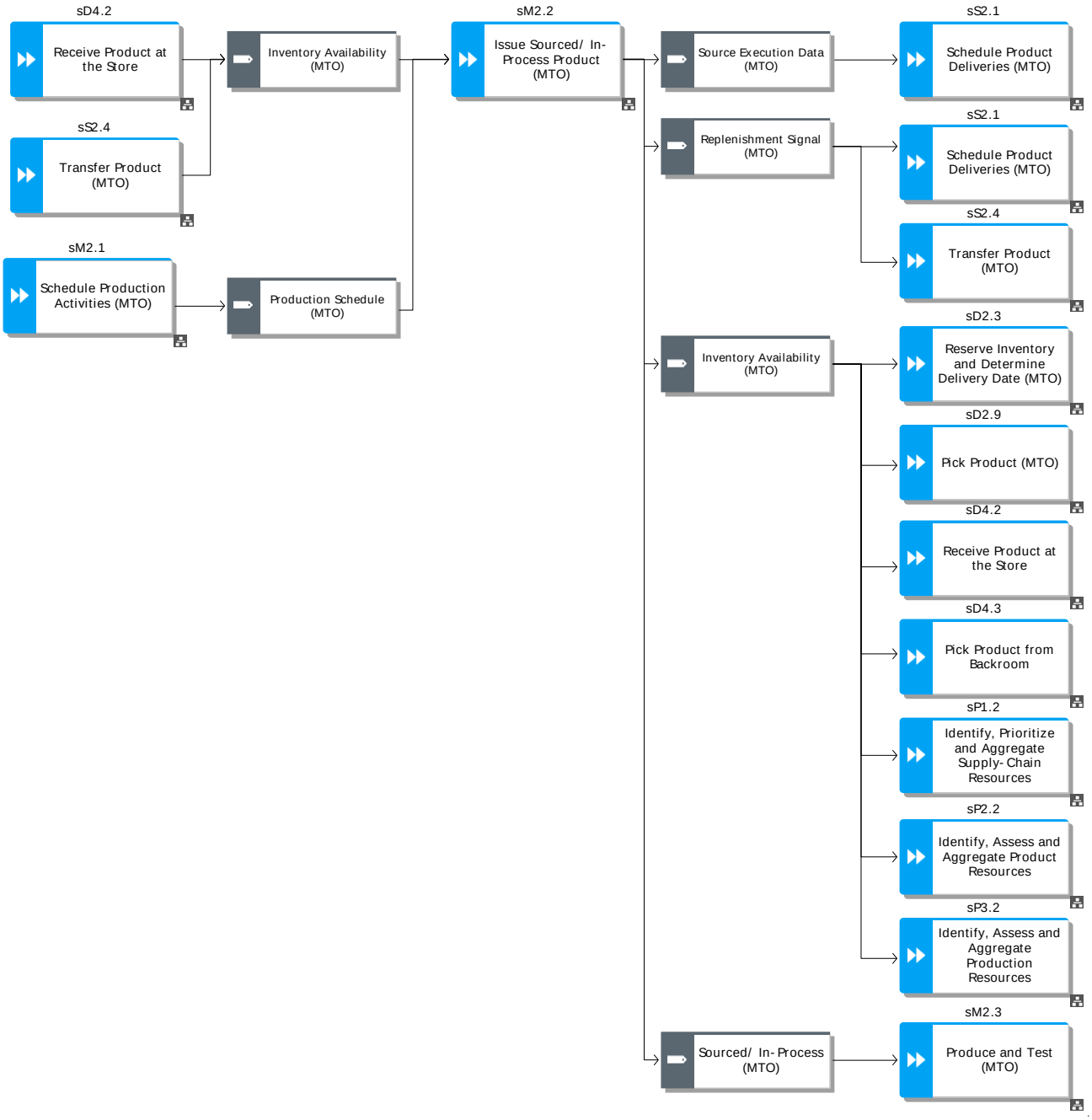
Metrics	
RS.3.50	Issue Sourced/In-Process Product Cycle Time
AM.3.19	Packaging as % of total material

Practices	
BP.011	Production Line Sequencing
BP.012	Lot Tracking
BP.152	Automated Data Capture (ADC)
BP.171	Mixed Mode/Reverse Material Issue

People	
HS.0058	Inventory Management
HS.0065	Lean Manufacturing
HS.0088	Physical Capability
HS.0160	Waste Management

sM2.2 Issue Sourced/In-Process Product

Workflow



sM2.3 Produce and Test

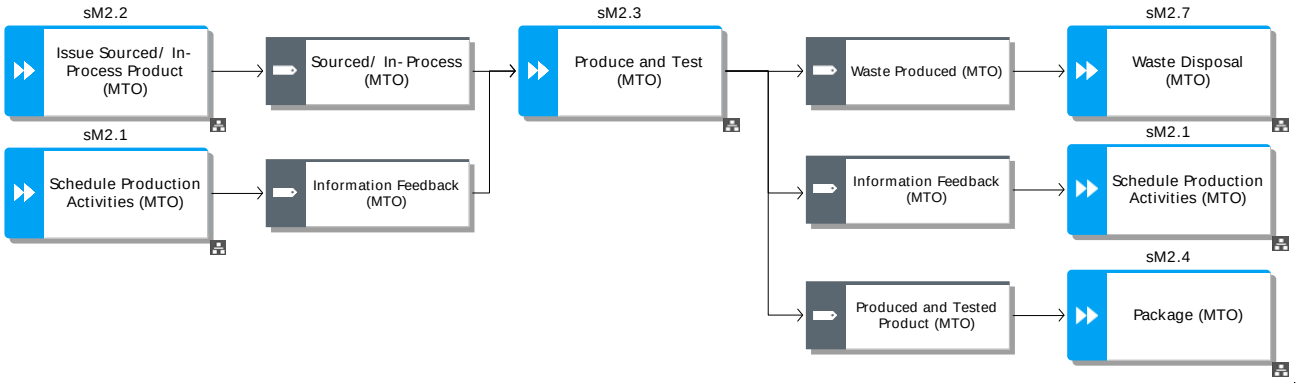
The series of activities performed upon sourced / in-process products or services to convert it from a lower state (raw or semi-finished) to a state of completion and greater value. The processes associated with the validation of product performance to ensure conformance to defined specifications and requirements.

Metrics	
RL.3.56	Warranty Costs
RL.3.58	Yield
RL.3.59	Yield Variability
RS.3.4	Asset Turns
RS.3.101	Produce and Test Cycle Time
AM.3.5	% of production materials reused
AM.3.6	% of products consisting of previously used components
AM.3.9	Capacity Utilization
AM.3.14	Hazardous materials used during production process as a % of all materials

Practices	
BP.012	Lot Tracking
BP.152	Automated Data Capture (ADC)

People	
HS.0043	Engineering
HS.0065	Lean Manufacturing
HS.0099	Production

Workflow



sM2.4 Package

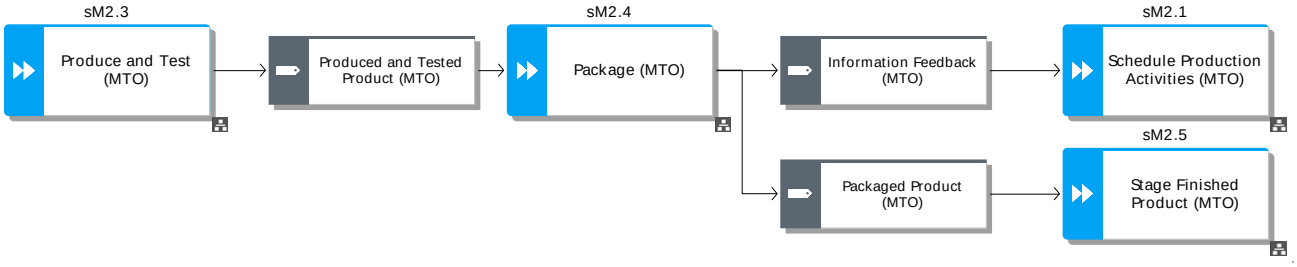
The series of activities that containerize completed products for storage or sale to end-users. Within certain industries, packaging may include cleaning or sterilization. Package is not applicable for Services

Metrics	
RL.3.31	Compliance Documentation Accuracy
RL.3.56	Warranty Costs
RL.3.58	Yield
RS.3.4	Asset Turns
RS.3.142	Package Cycle Time
AM.3.4	% of packaging/shipping materials reused internally
AM.3.9	Capacity Utilization

Practices	
BP.012	Lot Tracking
BP.152	Automated Data Capture (ADC)

People	
HS.0046	ERP Systems
HS.0086	Packaging

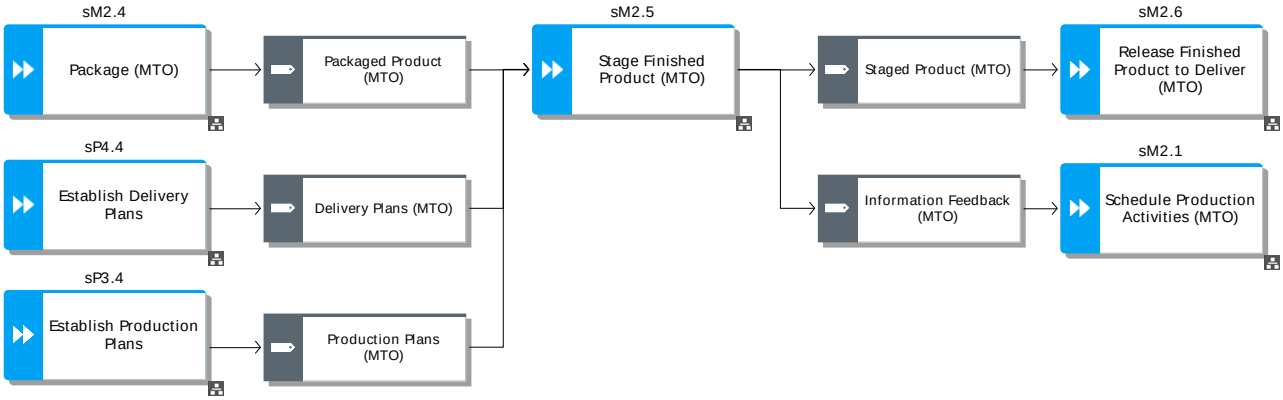
Workflow



sM2.5 Stage Finished Product

The movement of packaged products or services into a temporary holding / waiting location to await movement delivery location. Products that are made to order may remain in the holding location to await shipment / transfer per the associated customer order. The actual move transaction is part of the Deliver process.

Metrics	
RS.3.128	Stage Finished Product Cycle Time
Practices	
BP.088	360 Degree Closure
People	
HS.0046	ERP Systems
HS.0058	Inventory Management
HS.0065	Lean Manufacturing
HS.0069	Logistics Management
Workflow	



sM2.6 Release Finished Product to Deliver

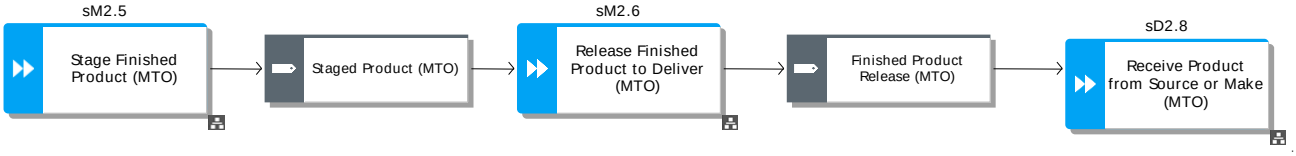
Activities associated with post-production documentation, testing, or certification required prior to delivery of finished product or service to customer. Examples include assembly of batch records for regulatory agencies, laboratory tests for potency or purity, creating certificate of analysis, or other quality records and sign-off by the quality organization.

Metrics	
RL.3.14	% of products meeting specified environmental performance requirements
RL.3.15	% of products with proper environmental labeling (if required)
RS.3.114	Release Finished Product to Deliver Cycle Time

Practices	
BP.089	Perfect Pick Put away

People	
HS.0046	ERP Systems
HS.0058	Inventory Management
HS.0069	Logistics Management
HS.0108	Quality Management

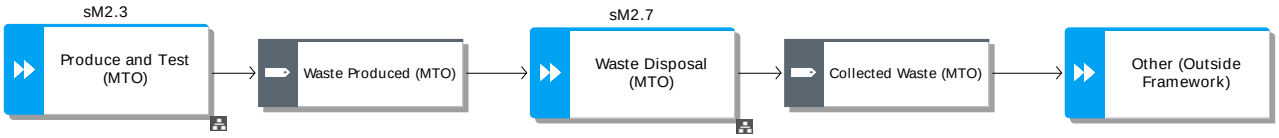
Workflow



sM2.7 Waste / Surplus Management

Activities associated with collecting and managing waste / surplus produced during the value-add and test process including scrap material and non-conforming products / deliverables.

Metrics	
RL.3.57	Waste Processing Errors
RS.3.141	Waste accumulation time
AM.3.15	Hazardous waste as % of total waste
Practices	
BP.012	Lot Tracking
People	
HS.0160	Waste Management
Workflow	



sM3 Engineer-to-Order

The process of adding value to a deliverable either as manufacturing or creation of a product or deliverable, or in services industries, creation of service deliverables, where the delivery object is not fully defined at the start of the process

The process of developing, designing, validating, and ultimately using a value adding process to produce products or services based on the requirements of a specific customer. In general Engineer- to-Order requires that work instructions may need to be defined or refined and material routing instructions may need to be added or modified. An example of an alternative or related name for Make Engineer-to-Order is: Design-to-Order (DTO).

Hierarchy	
sM3.1	Finalize Production Engineering
sM3.2	Schedule Production Activities
sM3.3	Issue Sourced/In-Process Product
sM3.4	Produce and Test
sM3.5	Package
sM3.6	Stage Finished Product
sM3.7	Release Product to Deliver
sM3.8	Waste Disposal

Metrics	
RL.1.1	Perfect Order Fulfillment
RL.3.58	Yield
RS.1.1	Order Fulfillment Cycle Time
RS.2.2	Make Cycle Time
RS.3.21	Current manufacturing order cycle time
AG.2.2	Upside Make Adaptability
AG.2.7	Downside Make Adaptability
AG.3.2	% of labor used in manufacturing, not used in direct activity
AG.3.38	Current Make Volume
CO.2.3	Cost to Make
CO.3.11	Direct Material Cost
CO.3.12	Indirect Cost Related to Production
CO.3.13	Direct Labor Cost
CO.3.14	Order Management Costs
CO.3.20	Risk Mitigation Costs
CO.1.2	Cost of Goods Sold
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets

AM.1.3	Return on Working Capital
AM.3.17	Inventory Days of Supply - WIP
AM.3.22	Recyclable waste as % of total waste

Practices	
BP.003	Single-Minute Exchange of Die (SMED)
BP.035	Business Rule Review
BP.098	Mobile Access of Information
BP.153	Bar coding/RFID

sM3.1 Finalize Production Engineering

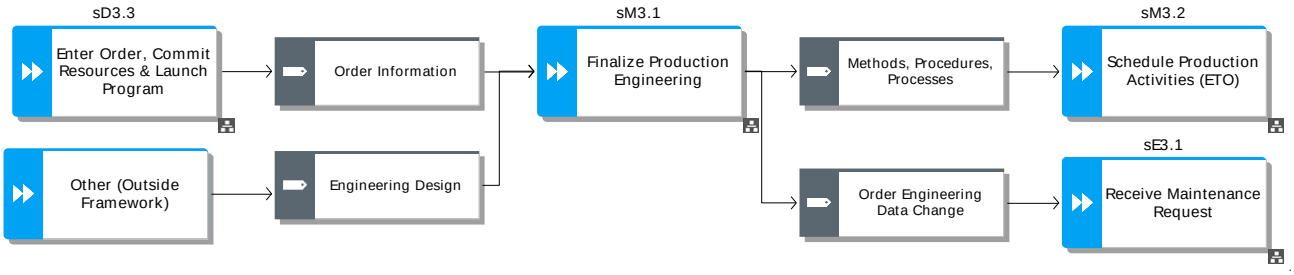
Engineering / configuration activities required after acceptance of order, but before deliverable or product can be produced. May include generation and delivery of final drawings, specifications, formulas, part programs, etc. In general, the last step in the completion of any preliminary engineering work done as part of the quotation process.

Metrics	
RS.3.33	Finalize Production Engineering Cycle Time

Practices	
BP.111	Electronic Technical Orders and Product Specifications
BP.119	Generation of Dynamic Bills of Materials
BP.120	3D Print / Rapid Prototyping
BP.121	Digital Packaging on Demand

People	
HS.0015	CAD/CAM
HS.0136	Specific fabrication knowledge based on product
HS.0152	Troubleshooting

Workflow



sM3.2 Schedule Production Activities

Given plans for the production of specific parts, products, , or formulations or service in specified quantities and planned availability of required sourced products/services, the scheduling of the operations to be performed in accordance with these plans. Scheduling includes sequencing, and, depending on the factory layout, any standards for setup and run. In general, intermediate production activities are coordinated prior to the scheduling of the operations to be performed in producing a finished product or service.

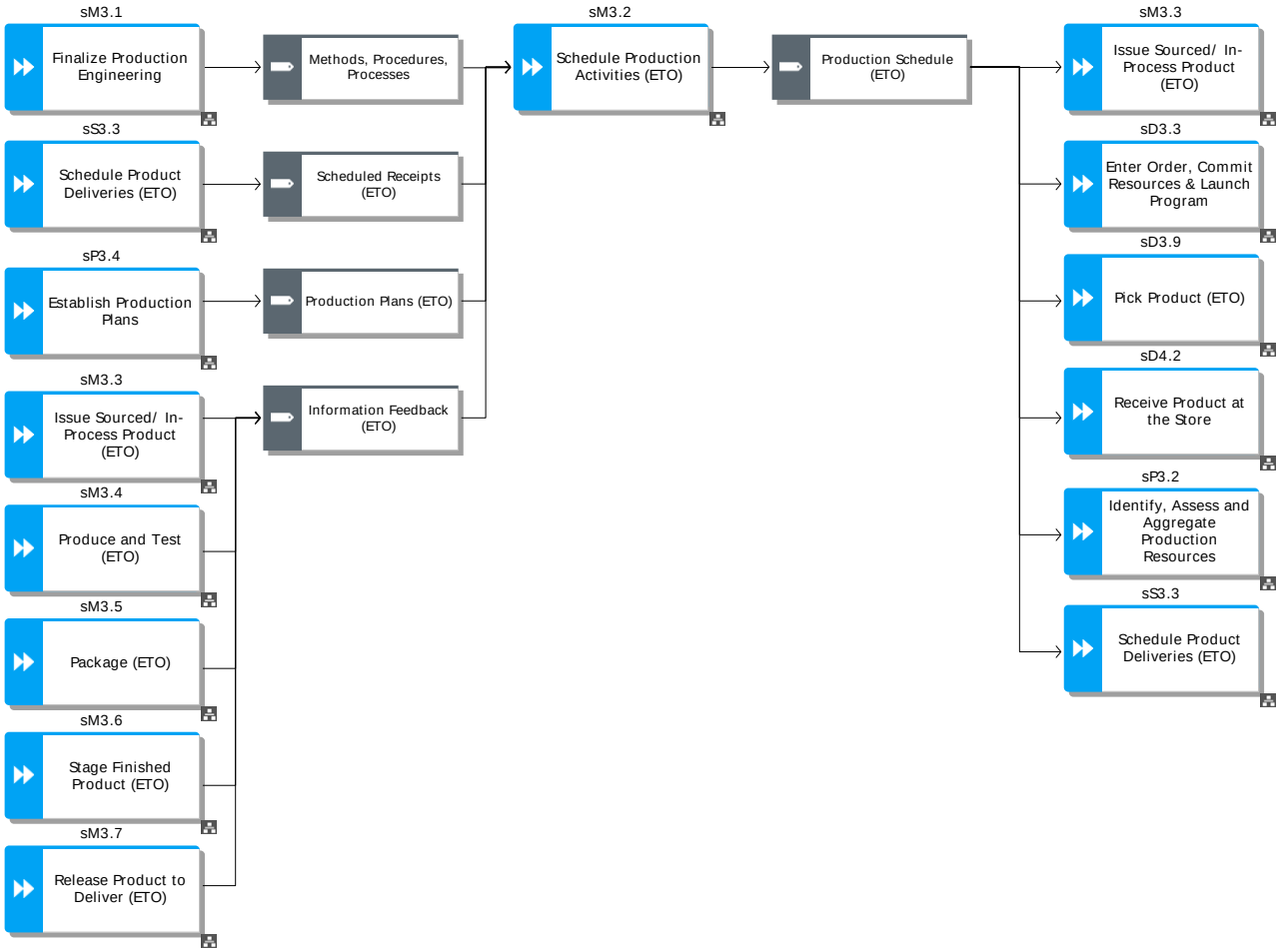
Metrics	
RL.3.49	Schedule Achievement
RS.3.123	Schedule Production Activities Cycle Time
AM.3.9	Capacity Utilization

Practices	
BP.011	Production Line Sequencing
BP.117	Embed Specialized Services
BP.119	Generation of Dynamic Bills of Materials
BP.121	Digital Packaging on Demand
BP.172	Production Scheduling Optimization Using Enabling Technologies

People	
HS.0046	ERP Systems
HS.0079	MRP Systems

sM3.2 Schedule Production Activities

Workflow



sM3.3 Issue Sourced/In-Process Product / Identify Resource

The selection and physical movement of sourced/in-process product (e.g., raw materials, fabricated components, subassemblies, required ingredients, intermediate formulations or services) from a stocking or resource location (e.g., stockroom, a location on the production floor, a supplier or resource pool) to a specific point of use location. Issuing product/resource includes the corresponding system transaction. The Bill of Materials/Bill of Service and routing information or recipe/production instructions will determine the products to be issued to support the production operation(s).

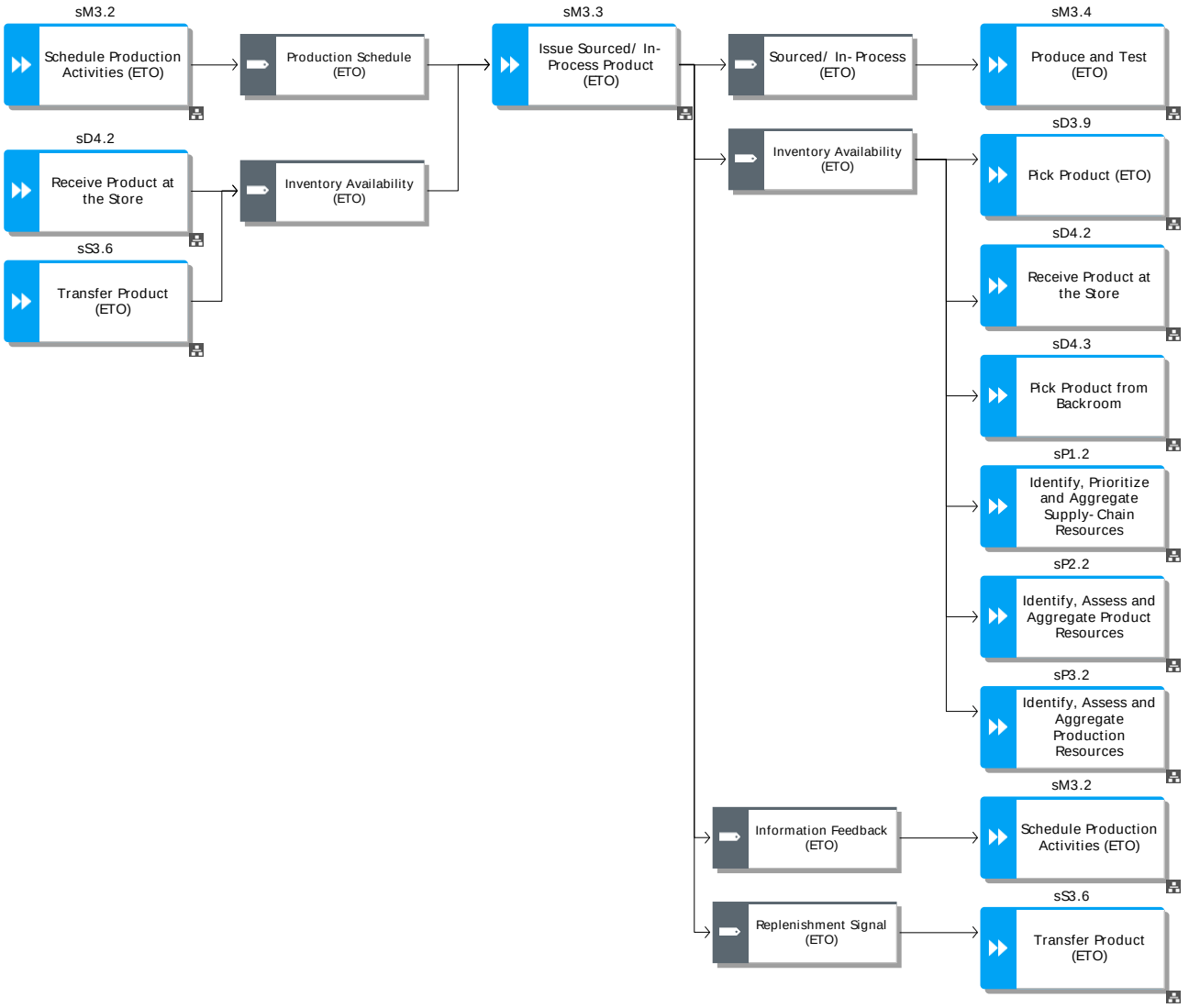
Metrics	
AM.3.19	Packaging as % of total material

Practices	
BP.011	Production Line Sequencing
BP.012	Lot Tracking
BP.117	Embed Specialized Services
BP.119	Generation of Dynamic Bills of Materials
BP.120	3D Print / Rapid Prototyping
BP.121	Digital Packaging on Demand
BP.152	Automated Data Capture (ADC)
BP.171	Mixed Mode/Reverse Material Issue

People	
HS.0046	ERP Systems
HS.0079	MRP Systems

sM3.3 Issue Sourced/In-Process Product

Workflow



sM3.4 Produce and Test

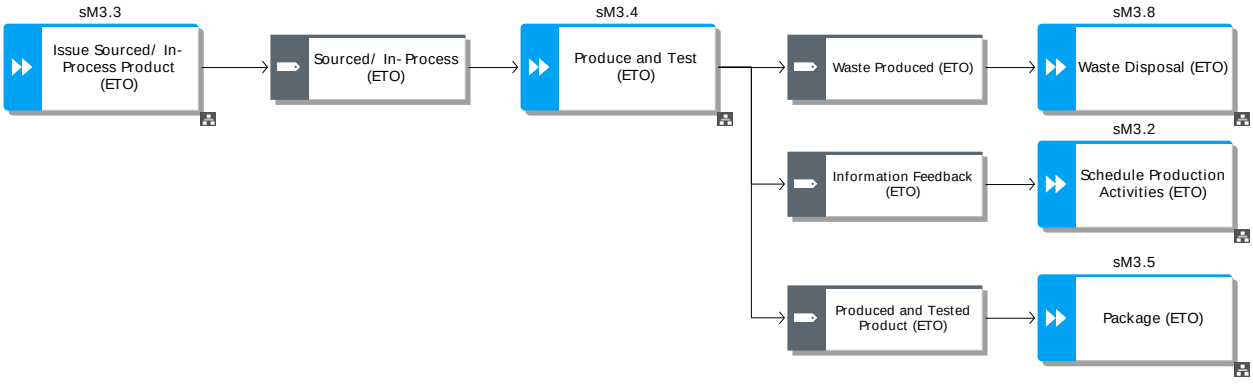
The series of activities performed upon sourced / in-process products or services to convert it from a lower state (raw or semi-finished) to a state of completion and greater value. The processes associated with the validation of product performance to ensure conformance to defined specifications and requirements.

Metrics	
RL.3.56	Warranty Costs
RL.3.58	Yield
RL.3.59	Yield Variability
RS.3.4	Asset Turns
RS.3.101	Produce and Test Cycle Time
AM.3.5	% of production materials reused
AM.3.6	% of products consisting of previously used components
AM.3.9	Capacity Utilization
AM.3.14	Hazardous materials used during production process as a % of all materials

Practices	
BP.012	Lot Tracking
BP.117	Embed Specialized Services
BP.119	Generation of Dynamic Bills of Materials
BP.120	3D Print / Rapid Prototyping
BP.121	Digital Packaging on Demand
BP.152	Automated Data Capture (ADC)

People	
HS.0043	Engineering
HS.0065	Lean Manufacturing
HS.0099	Production

Workflow



sM3.5 Package

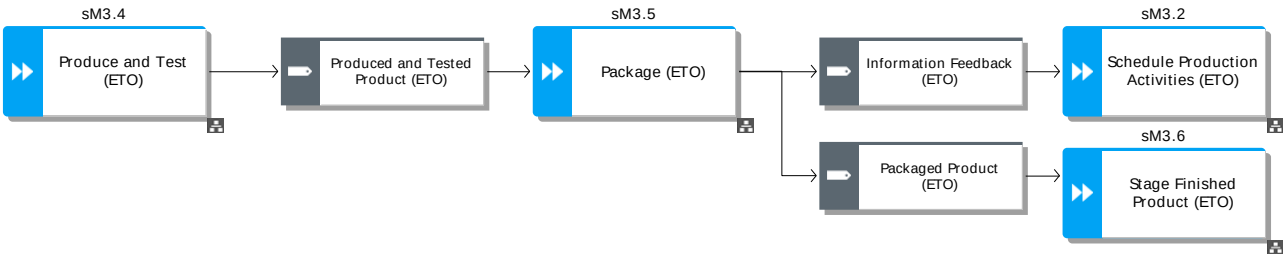
The series of activities that containerize completed products for storage or sale to end-users. Within certain industries, packaging may include cleaning or sterilization. Package is not applicable for Services

Metrics	
RL.3.31	Compliance Documentation Accuracy
RL.3.56	Warranty Costs
RL.3.58	Yield
RS.3.4	Asset Turns
RS.3.142	Package Cycle Time
AM.3.9	Capacity Utilization

Practices	
BP.012	Lot Tracking
BP.117	Embed Specialized Services
BP.119	Generation of Dynamic Bills of Materials
BP.121	Digital Packaging on Demand
BP.152	Automated Data Capture (ADC)

People	
HS.0046	ERP Systems
HS.0086	Packaging

Workflow



sM3.6 Stage Finished Product

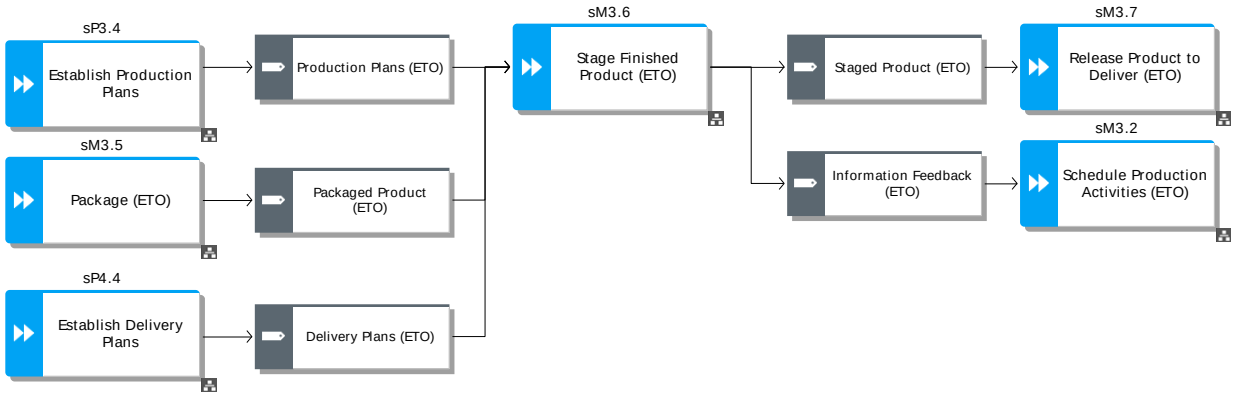
The movement of packaged products into a temporary holding location to await movement to a finished goods location. Products that are made to order may remain in the holding location to await shipment per the associated customer order. The actual move transaction is part of the Deliver process.

Metrics	
RS.3.128	Stage Finished Product Cycle Time

Practices	
BP.119	Generation of Dynamic Bills of Materials
BP.121	Digital Packaging on Demand

People	
HS.0046	ERP Systems
HS.0058	Inventory Management
HS.0065	Lean Manufacturing
HS.0069	Logistics Management

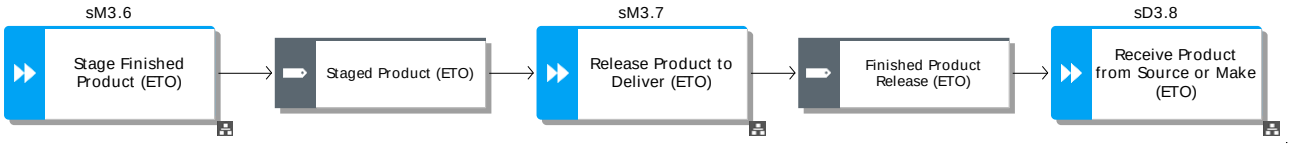
Workflow



sM3.7 Release Configured Product to Deliver

Activities associated with post-production documentation, testing, or certification required prior to delivery of finished product or service to customer. Examples include assembly of batch records for regulatory agencies, laboratory tests for potency or purity, creating certificate of analysis, or other quality records and sign-off by the quality organization.

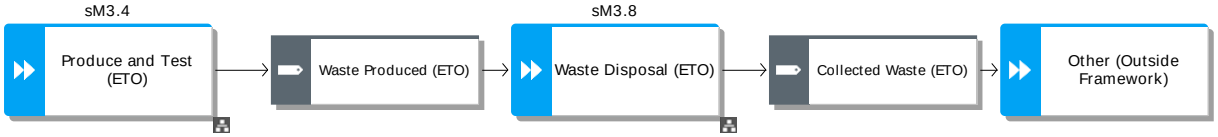
Metrics	
RS.3.114	Release Finished Product to Deliver Cycle Time
Practices	
BP.119	Generation of Dynamic Bills of Materials
People	
HS.0046	ERP Systems
HS.0058	Inventory Management
HS.0069	Logistics Management
HS.0108	Quality Management
Workflow	



sM3.8 Waste / Surplus Management

Activities associated with collecting and managing waste/surplus produced during the value-add and test process including scrap material, unused resources and non-conforming products/deliverables.

Metrics	
RL.3.57	Waste Processing Errors
RS.3.141	Waste accumulation time
AM.3.15	Hazardous waste as % of total waste
Practices	
BP.012	Lot Tracking
BP.119	Generation of Dynamic Bills of Materials
BP.121	Digital Packaging on Demand
People	
HS.0160	Waste Management
Workflow	



Deliver

sD Deliver

The processes associated with performing customer-facing order management and order fulfillment activities.

Hierarchy	
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
sD4	Deliver Retail Product

Metrics	
AG.1.1	Upside Supply Chain Adaptability
AG.1.2	Downside Supply Chain Adaptability
AG.1.3	Overall Value at Risk (VAR)
AM.1.1	Cash-to-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
CO.1.1	Total Supply Chain Management Costs
CO.1.2	Costs of Goods Sold
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time

sD1 Deliver Stocked Product

The process of delivering product that is sourced or made based on aggregated customer orders, projected orders/demand and inventory re-ordering parameters. The intention of Deliver Stocked Product is to have the product available when a customer order arrives (to prevent the customer from looking elsewhere). For services industries, these are services that are pre-defined and off-the- shelf (e.g. standard training). Products or services that are 'configurable' cannot be delivered through the Deliver Stocked Product process, as configurable products require customer reference or customer order details.

Hierarchy	
sD1.1	Process Inquiry and Quote
sD1.2	Receive, Enter, and Validate Order
sD1.3	Reserve Inventory and Determine Delivery Date
sD1.4	Consolidate Orders
sD1.5	Build Loads
sD1.6	Route Shipments
sD1.7	Select Carriers and Rate Shipments
sD1.8	Receive Product from Source or Make
sD1.9	Pick Product
sD1.10	Pack Product
sD1.11	Load Vehicle and Generate Shipping Documents
sD1.12	Ship Product
sD1.13	Receive and Verify Product by Customer
sD1.14	Install Product
sD1.15	Invoice

Metrics	
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time
RS.2.3	Deliver Cycle Time
RS.3.20	Current logistics order cycle time
AG.2.3	Upside Deliver Adaptability
AG.2.8	Downside Deliver Adaptability
AG.3.1	% of labor used in logistics, not used in direct activity
AG.3.4	Additional Delivery volume
AG.3.32	Current Delivery Volume
CO.3.14	Order Management Cost
CO.3.15	Order Delivery and / or Install Costs

sD1 Deliver Stocked Product

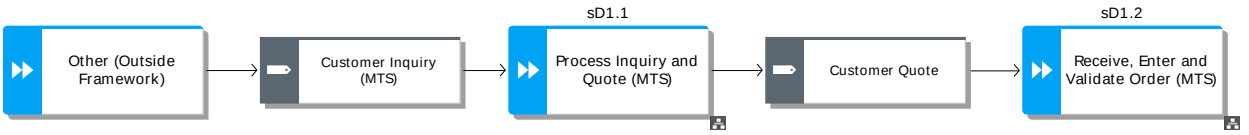
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.3.17	Inventory Days of Supply - WIP
AM.3.45	Inventory Days of Supply - Finished Goods

Practices	
BP.035	Business Rule Review
BP.055	Freight Carrier Delivery Performance Evaluation
BP.098	Mobile Access of Information
BP.122	Vendor Managed Inventory (VMI)
BP.153	Bar coding/RFID
BP.176	Omni-channel

sD1.1 Process Inquiry and Quote

Receive and respond to general customer inquiries and requests for quotes

Metrics	
RS.3.100	Process Inquiry & Quote Cycle Time
CO.3.14	Order Management Costs
Practices	
BP.114	Order Quotation System
BP.176	Omni-channel
People	
HS.0007	Availability Management
HS.0029	Customer Relationship Management (CRM)
HS.0092	Pricing Management
HS.0094	Procurement
HS.0098	Product Information Management (Product Data Management)
Workflow	



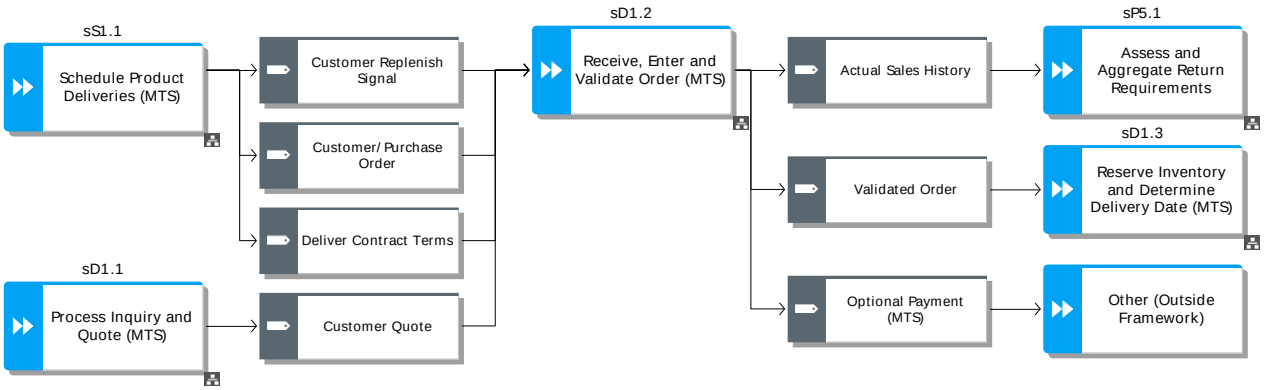
sD1.2 Receive, Enter, and Validate Order

Receive orders from the customer and enter them into a company's order processing system. Orders can be received through phone, fax, or electronic media. 'Technically' examine orders to ensure an orderable configuration and provide accurate price. Check the customer's credit.
Optionally accept payment.

Metrics	
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RS.3.94	Order Fulfillment Dwell Time
RS.3.112	Receive, Enter & Validate Order Cycle Time

People	
HS.0026	Credit/Collection Management
HS.0028	Customer Order Management
HS.0029	Customer Relationship Management (CRM)
HS.0064	Lead-time validation
HS.0092	Pricing Management
HS.0095	Product and Configuration Validation

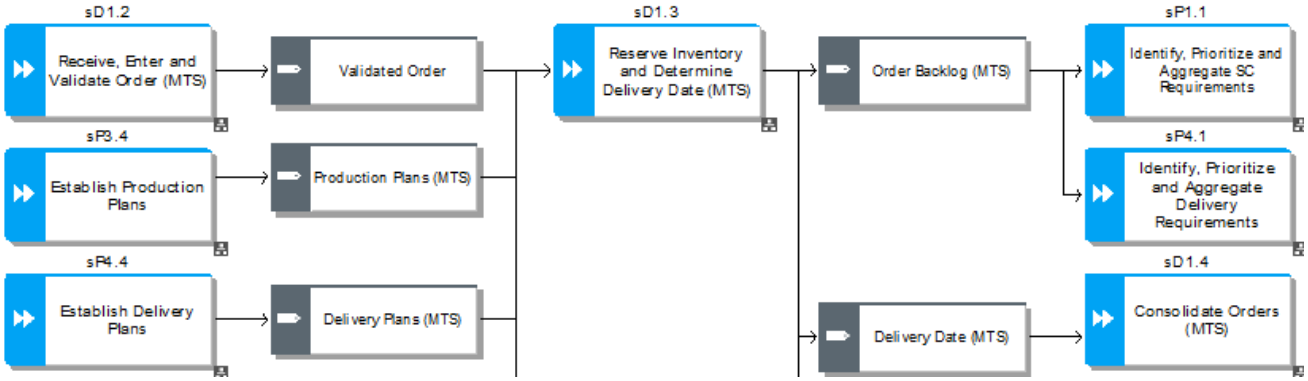
Workflow



sD1.3 Reserve Inventory and Determine Delivery Date

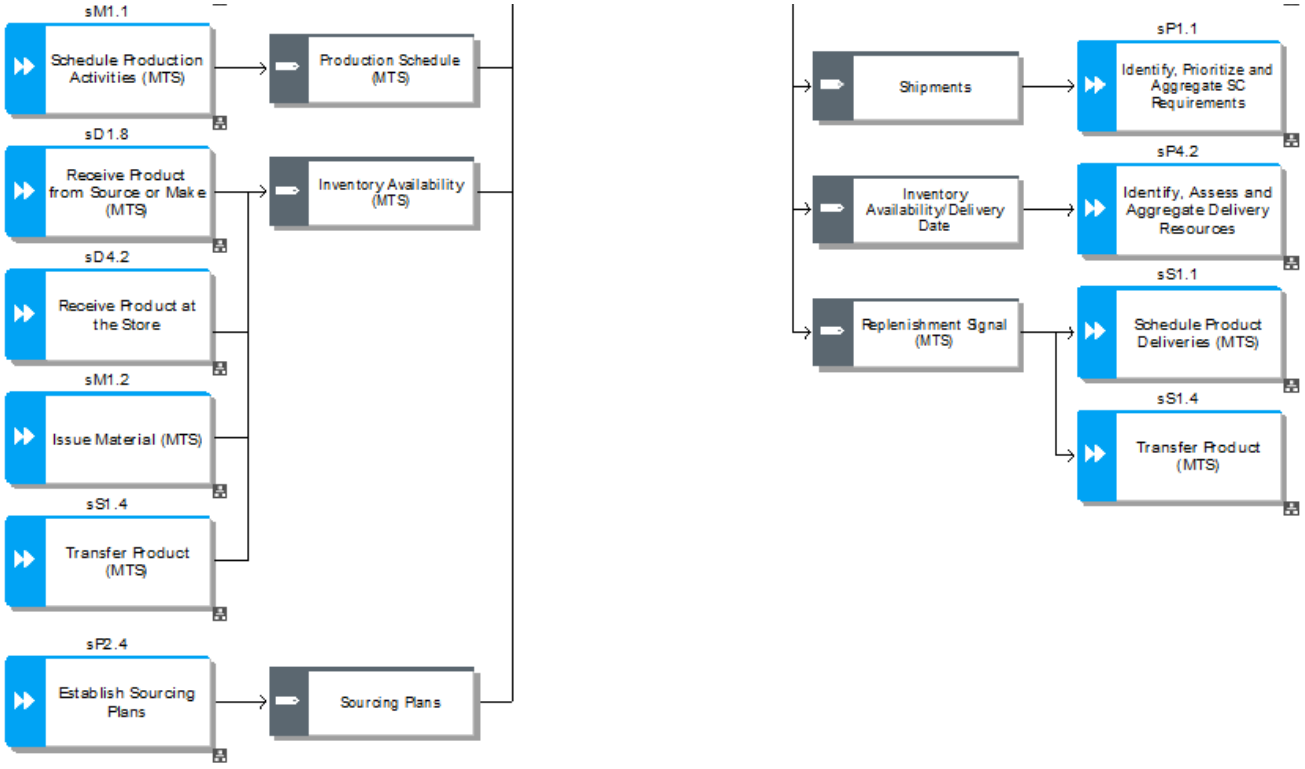
Inventory (both on hand and scheduled) is identified and reserved for specific orders and a delivery date is committed and scheduled.

Metrics	
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
RL.3.36	Fill Rate
RS.3.94	Order Fulfillment Dwell Time
RS.3.116	Reserve Resources and Determine Delivery Date Cycle Time
Practices	
BP.089	Perfect Pick Put away
BP.176	Omni-channel
People	
HS.0007	Availability Management
HS.0058	Inventory Management
HS.0083	Order Management
Workflow	



sD1.3 Reserve Inventory and Determine Delivery Date

Workflow Continued



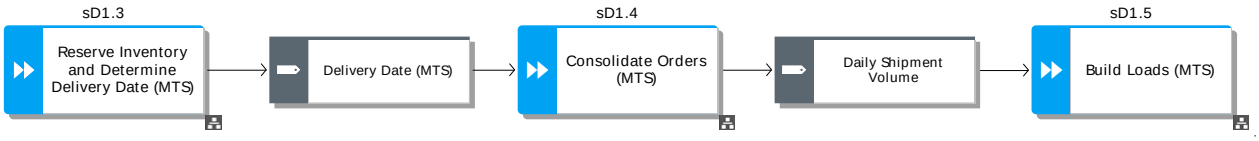
sD1.4 Consolidate Orders

The process of analyzing orders to determine the groupings that result in least cost/best service fulfillment and transportation.

Metrics	
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RS.3.18	Consolidate Orders Cycle Time
CO.3.14	Order Management Costs
CO.3.15	Order Deliver and / or Install Costs

People	
HS.0007	Availability Management
HS.0083	Order Management

Workflow



sD1.5 Build Loads

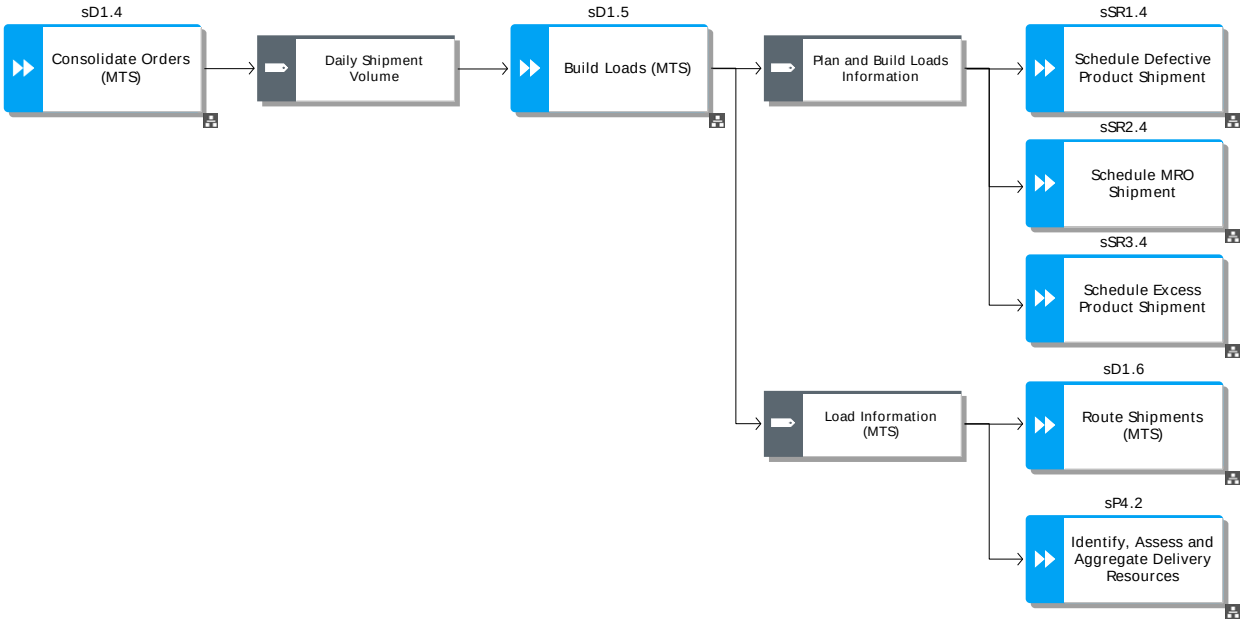
Transportation modes are selected and efficient loads are built.

Metrics	
RS.3.16	Build Loads Cycle Time
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs

Practices	
BP.122	Vendor Managed Inventory (VMI)
BP.176	Omni-channel

People	
HS.0018	Carrier Selection
HS.0068	Load Building
HS.0151	Transport Mode Selection

Workflow



sD1.6 Route Shipments

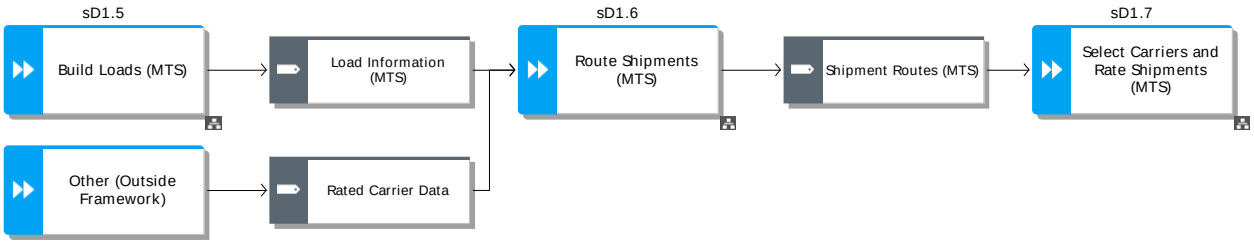
Loads are consolidated and routed by mode, lane and location.

Metrics	
RS.3.117	Route Shipments Cycle Time
CO.3.14	Order Management Costs
CO.3.15	Order Deliver and / or Install Costs

Practices	
BP.122	Vendor Managed Inventory (VMI)
BP.176	Omni-channel

People	
HS.0129	Route planning

Workflow



sD1.7 Select Carriers and Rate Shipments

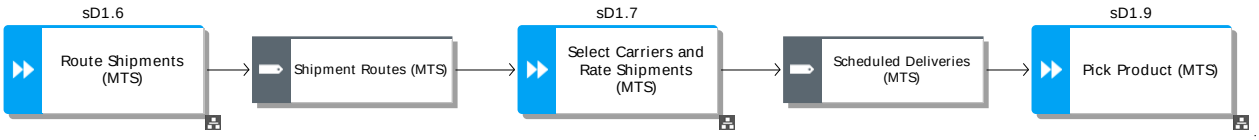
Specific carriers are selected by lowest cost per route and shipments are rated and tendered.

Metrics	
RL.3.16	% of suppliers meeting environmental metrics/criteria
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs

Practices	
BP.041	Transportation Optimization
BP.044	Inventory Financing Evaluation
BP.046	Expedite Outbound Customer Shipments
BP.176	Omni-channel

People	
HS.0069	Logistics Management

Workflow



sD1.8 Receive Product from Source or Make

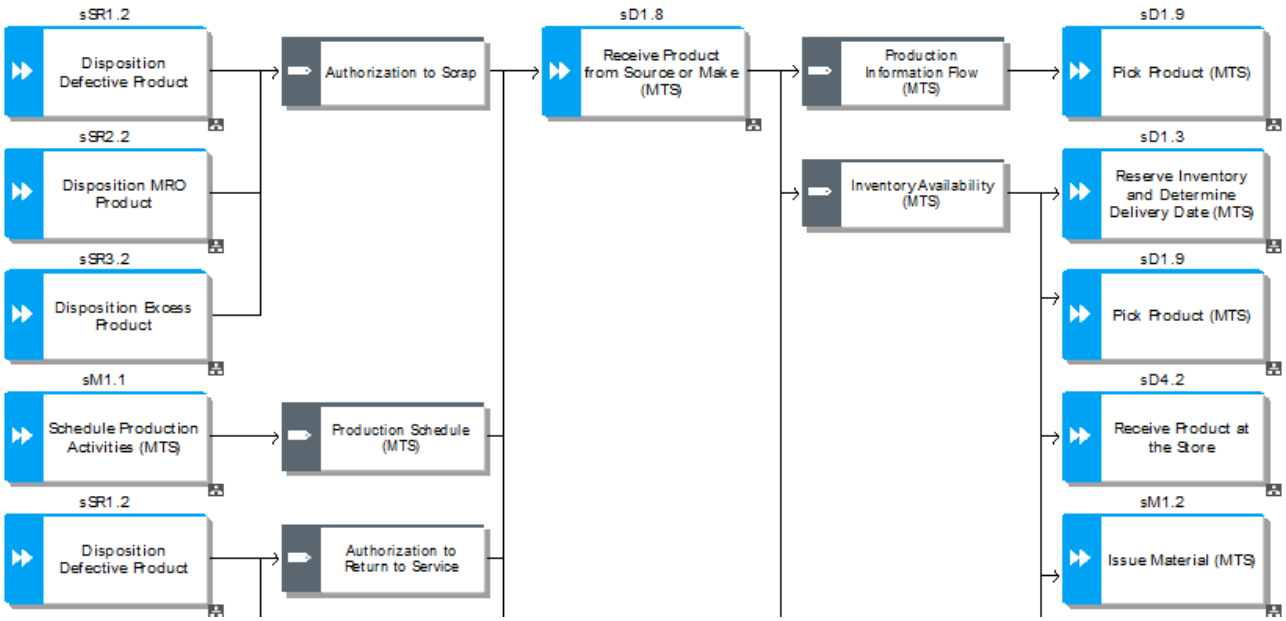
The activities such as receiving product, verifying, recording product receipt, determining put-away location, putting away and recording location that a company performs at its own warehouses. May include quality inspection.

Metrics	
RS.3.108	Receive Product from Make/Source Cycle Time
RS.3.110	Receive Product from Source or Make Cycle Time
CO.3.12	Indirect Cost Related to Production

Practices	
BP.009	Kanban
BP.089	Perfect Pick Put away
BP.176	Omni-channel

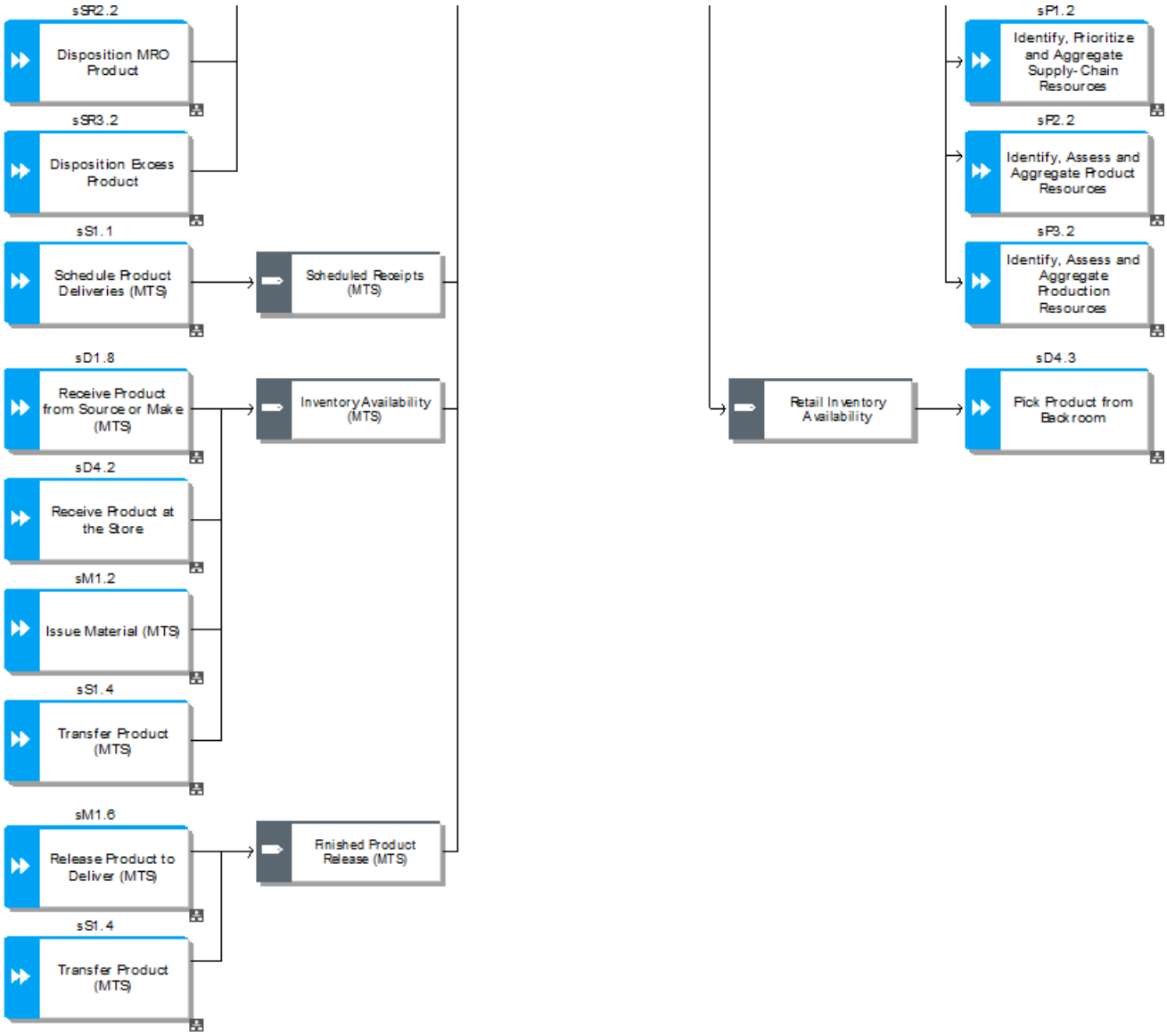
People	
HS.0075	Material handling equipment usage
HS.0104	Progress & performance reporting

Workflow



sD1.8 Receive Product from Source or Make

Workflow



sD1.9 Pick Product

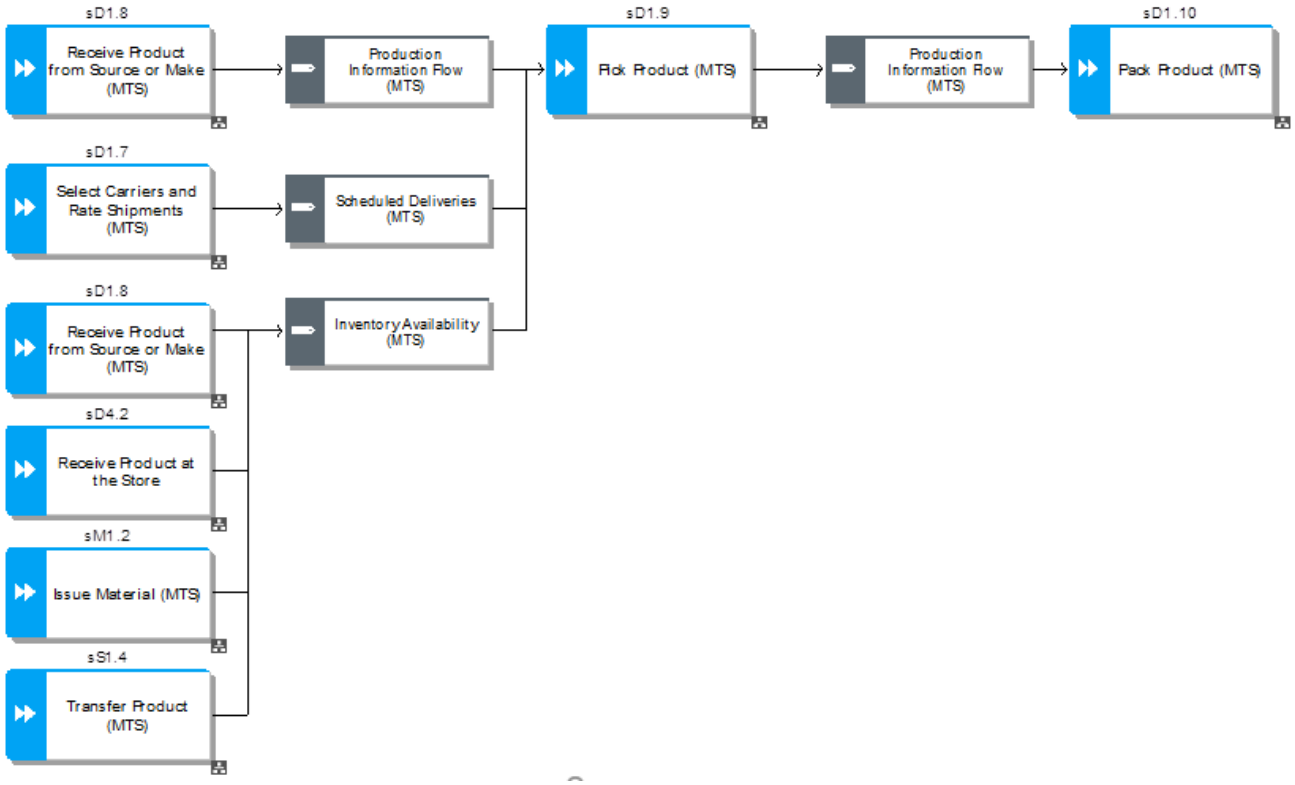
The series of activities including retrieving orders to pick, determining inventory availability, building the pick wave, picking the product, recording the pick and delivering product to shipping in response to an order.

Metrics	
RL.3.36	Fill Rate
RS.3.96	Pick Product Cycle Time
CO.3.12	Indirect Cost Related to Production

Practices	
BP.009	Kanban
BP.012	Lot Tracking
BP.089	Perfect Pick Put away
BP.176	Omni-channel

People	
HS.0075	Material handling equipment usage
HS.0104	Progress & performance reporting
HS.0161	Wave/batch picking

Workflow



sD1.10 Pack Product

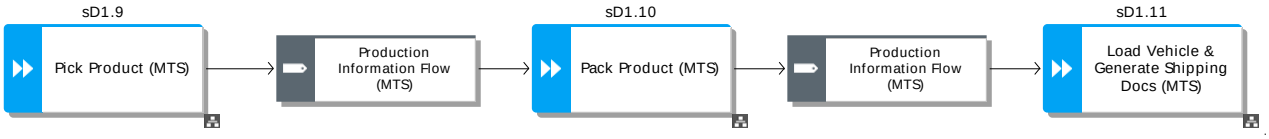
The activities such as sorting / combining the products, packing / kitting the products, paste labels, barcodes etc. and delivering the products to the shipping area for loading.

Metrics	
RL.3.4	% correct material documentation
RS.3.95	Pack Product Cycle Time
CO.3.12	Indirect Cost Related to Production

Practices	
BP.012	Lot Tracking
BP.176	Omni-channel

People	
HS.0062	Kitting/Packing
HS.0075	Material handling equipment usage
HS.0104	Progress & performance reporting

Workflow



sD1.11 Load Vehicle and Generate Shipping Documents

The series of tasks including placing/loading product onto modes of transportation, and generating the documentation necessary to meet internal, customer, carrier and government needs. Shipping documentation includes the invoice. Optionally verify customer credit.

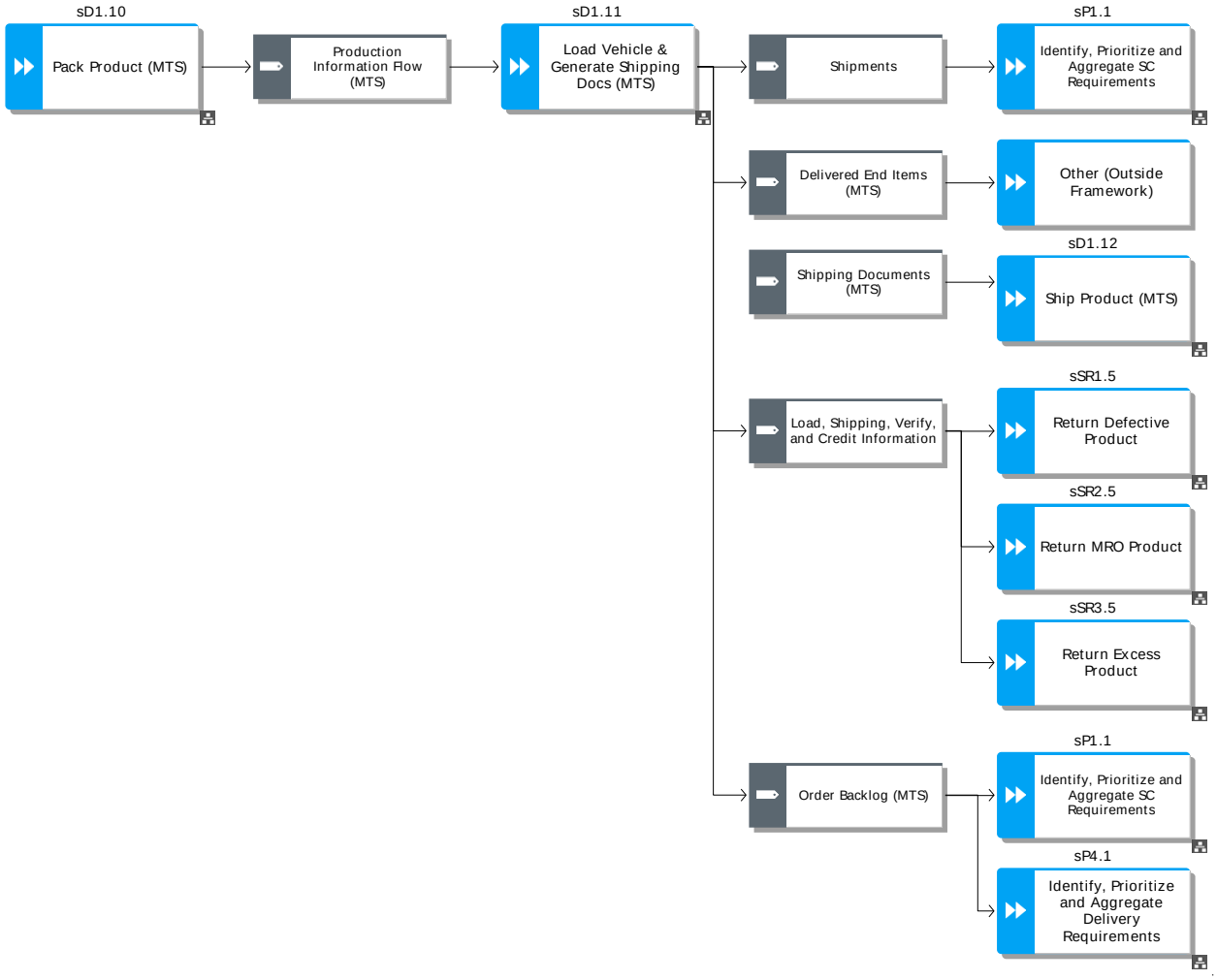
Metrics	
RL.2.2	Delivery Performance to Customer Commit Date
RL.2.3	Documentation Accuracy
RL.3.31	Compliance Documentation Accuracy
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RL.3.43	Other Required Documentation Accuracy
RL.3.45	Payment Documentation Accuracy
RL.3.50	Shipping Documentation Accuracy
RS.3.51	Load Product & Generate Shipping Documentation Cycle Time
CO.3.12	Indirect Cost Related to Production

Practices	
BP.012	Lot Tracking
BP.176	Omni-channel

People	
HS.0028	Customer Order Management
HS.0069	Logistics Management
HS.0075	Material handling equipment usage

sD1.11 Load Vehicle and Generate Shipping Documents

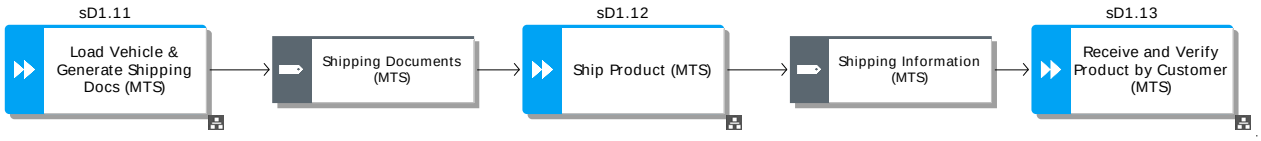
Workflow



sD1.12 Ship Product

The process of shipping the product to the customer site.

Metrics	
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RS.3.126	Ship Product Cycle Time
CO.3.15	Order Delivery and / or Install Costs
CO.3.12	Indirect Cost Related to Production
Practices	
BP.012	Lot Tracking
BP.046	Expedite Outbound Customer Shipments
BP.176	Omni-channel
People	
HS.0039	Driving certification (according to mode of transportation)
Workflow	



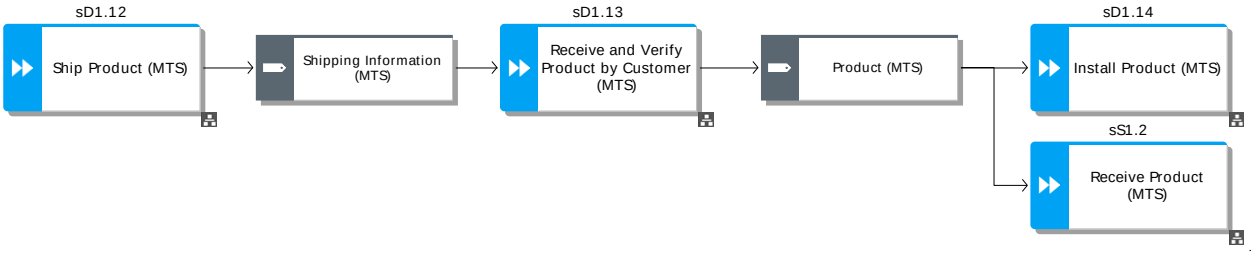
sD1.13 Receive and Verify Product by Customer

The process of receiving the shipment by the customer (either at customer site or at shipping area in case of self-collection) and verifying that the order was shipped complete and that the product meets delivery terms.

Metrics	
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
RL.2.4	Perfect Condition
RL.3.32	Customer Commit Date Achievement Time Customer Receiving
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RL.3.41	Orders Delivered Damage Free Conformance
RL.3.42	Orders Delivered Defect Free Conformance
RS.3.102	Receive & Verify Product by Customer Cycle Time
RS.3.103	Receive and Verify Product Cycle Time

People	
HS.0009	Bar Code Handling/RFID (if available)
HS.0108	Quality Management

Workflow



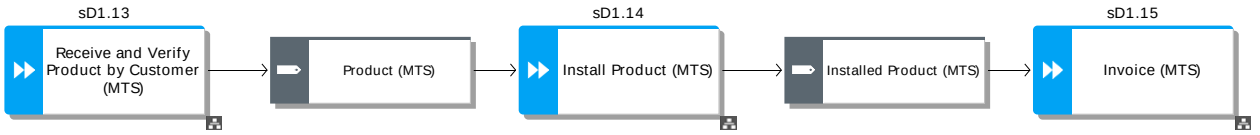
sD1.14 Install Product

When necessary, the process of preparing, testing and installing the product at the customer site. The product is fully functional upon completion.

Metrics	
RL.2.4	Perfect Condition
RL.3.12	% Of Faultless Installations
RS.3.46	Install Product Cycle Time

People	
HS.0043	Engineering
HS.0105	Project Management

Workflow



sD1.15 Invoice

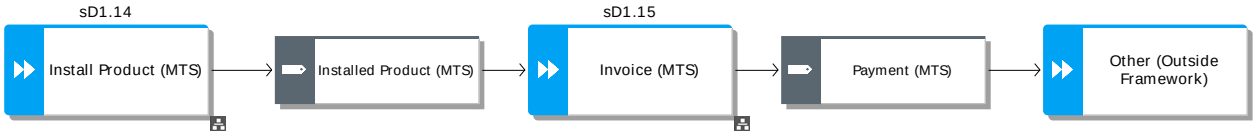
A signal is sent to the financial organization that the order has been shipped and that the billing process should begin and payment be received or be closed out if payment has already been received. Payment is received from the customer within the payment terms of the invoice.

Metrics	
RL.2.3	Documentation Accuracy
RL.3.11	% of Faultless Invoices
RS.3.48	Invoice Cycle Time
CO.3.14	Order Management Costs

Practices	
BP.012	Lot Tracking
BP.176	Omni-Channel

People	
HS.0003	Accounting
HS.0026	Credit/Collection Management

Workflow



sD2 Deliver Make-to-Order Product

The processes of delivering product / service that is sourced, configured, manufactured, and/or assembled from standard raw materials, parts, ingredients or sub-assemblies, in response to a specific firm customer order. A reference to the customer order is exchanged with the sourcing or value-add process and attached to or marked on the product / service. Products in stock are identifiable by customer order through labeling and inventory data management. Examples include assigning a serial number, lot number or batch number to a customer order prior to Make or Source, processes that generate a bill-of-materials for the associated Make process (e.g. configure-to-order and assemble-to-order) and the 'special order' process in retail.

Hierarchy	
sD2.1	Process Inquiry and Quote
sD2.2	Receive, Configure, Enter and Validate Order
sD2.3	Reserve Inventory and Determine Delivery Date
sD2.4	Consolidate Orders
sD2.5	Build Loads
sD2.6	Route Shipments
sD2.7	Select Carriers and Rate Shipments
sD2.8	Receive Product from Source or Make
sD2.9	Pick Product
sD2.10	Pack Product
sD2.11	Load Product & Generate Shipping Docs
sD2.12	Ship Product
sD2.13	Receive and Verify Product by Customer
sD2.14	Install Product
sD2.15	Invoice

Metrics	
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time
RS.2.3	Deliver Cycle Time
RS.3.20	Current logistics order cycle time
AG.2.3	Upside Deliver Adaptability
AG.2.8	Downside Deliver Adaptability
AG.3.1	% of labor used in logistics, not used in direct activity
AG.3.4	Additional Delivery volume
AG.3.32	Current Delivery Volume
CO.2.4	Cost to Deliver
CO.3.14	Order Management Costs

CO.3.15	Order Delivery and / or Install Costs
CO.3.21	Risk Mitigation Costs (Deliver)
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.3.17	Inventory Days of Supply - WIP
AM.3.45	Inventory Days of Supply - Finished Goods

Practices	
BP.035	Business Rule Review
BP.055	Freight Carrier Delivery Performance Evaluation
BP.098	Mobile Access of Information
BP.153	Bar coding/RFID
BP.176	Omni-channel

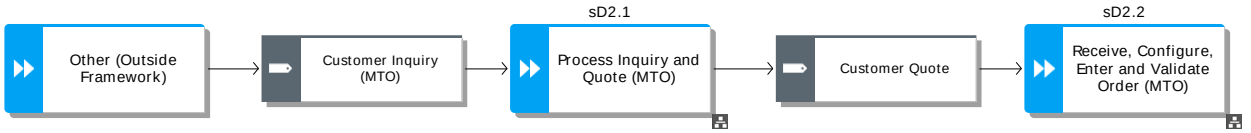
sD2.1 Process Inquiry and Quote

Receive and respond to general customer inquiries and requests for quotes.

Metrics	
CO.3.14	Order Management Costs

People	
HS.0007	Availability Management
HS.0029	Customer Relationship Management (CRM)
HS.0092	Pricing Management
HS.0094	Procurement
HS.0098	Product Information Management (Product Data Management)

Workflow



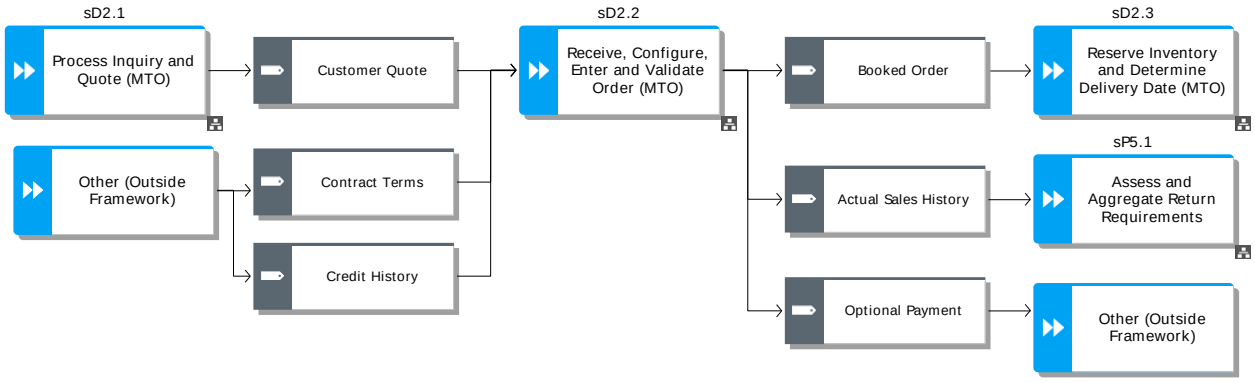
sD2.2 Receive, Configure, Enter and Validate Order

Receive orders from the customer and enter them into a company's order processing system. Orders can be received through phone, fax, or through electronic media. Configure your product to the customer's specific needs, based on standard available parts or options. 'Technically' examine order to ensure an orderable configuration and provide accurate price. Check the customer's credit. Optionally accept payment.

Metrics	
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RS.3.94	Order Fulfillment Dwell Time
RS.3.111	Receive, Configure, Enter & Validate Order Cycle Time
CO.3.14	Order Management Costs

People	
HS.0026	Credit/Collection Management
HS.0028	Customer Order Management
HS.0029	Customer Relationship Management (CRM)
HS.0064	Lead-time validation
HS.0092	Pricing Management
HS.0095	Product and Configuration Validation

Workflow



sD2.3 Reserve Inventory and Determine Delivery Date

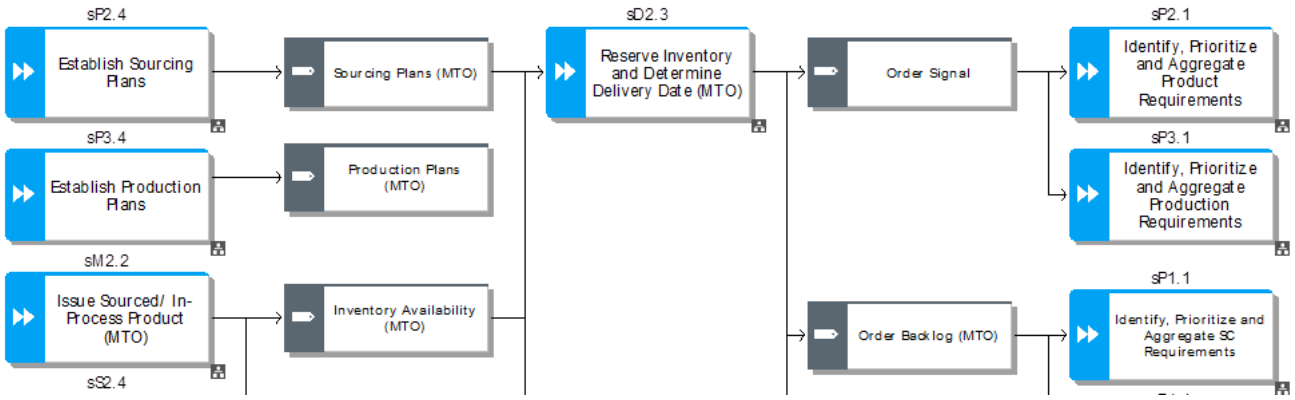
Inventory and/or planned capacity is identified and reserved for specific orders, and a delivery date is committed and scheduled.

Metrics	
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
RS.3.94	Order Fulfillment Dwell Time
RS.3.115	Reserve Inventory & Determine Delivery Date Cycle Time
CO.3.14	Order Management Costs

Practices	
BP.089	Perfect Pick Put away
BP.176	Omni-channel

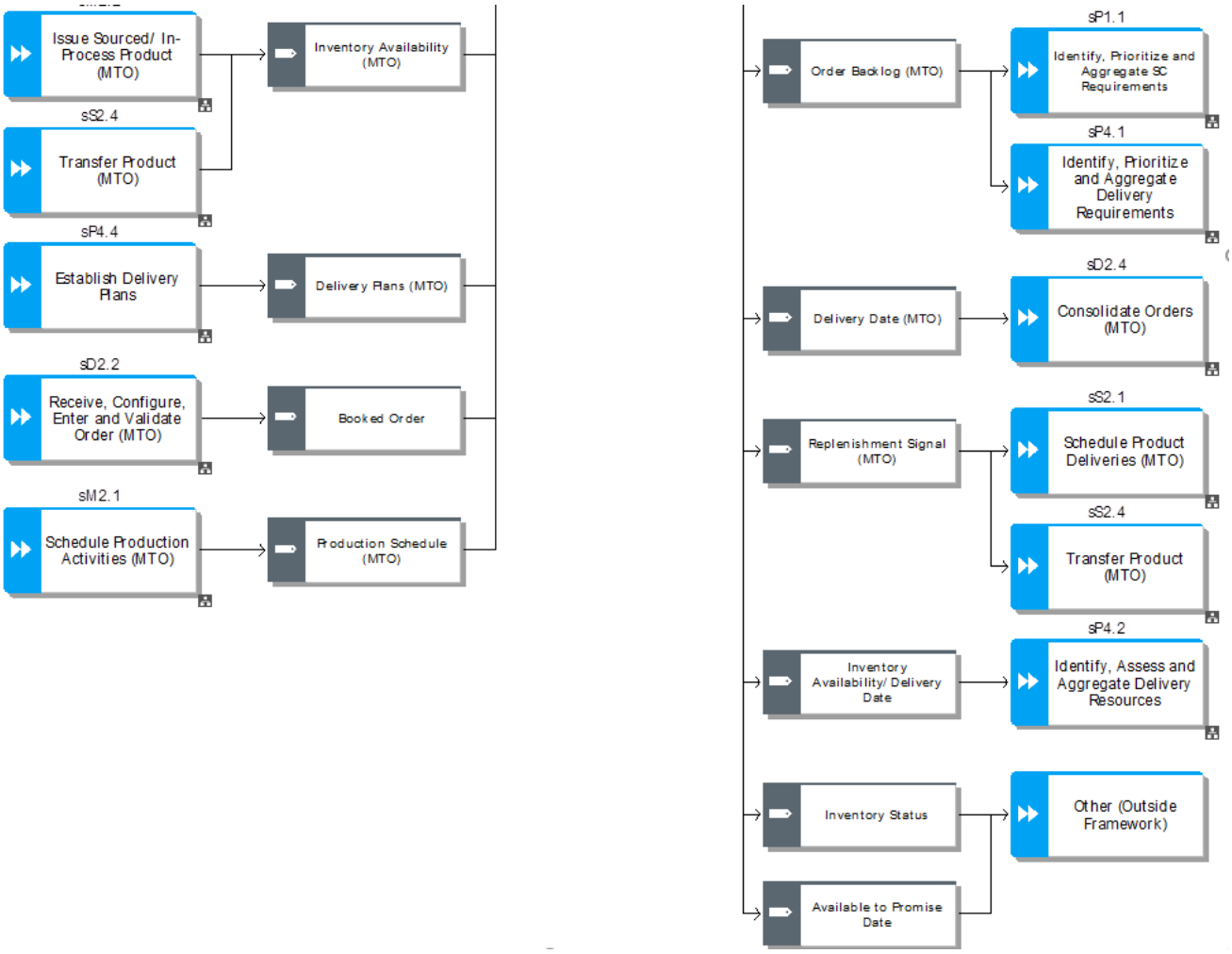
People	
HS.0007	Availability Management
HS.0058	Inventory Management
HS.0083	Order Management

Workflow



sD2.3 Reserve Inventory and Determine Delivery Date

Workflow Continued



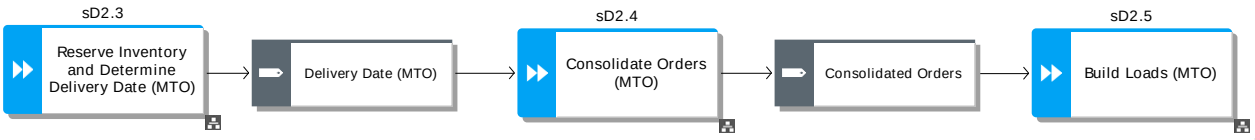
sD2.4 Consolidate Orders

The process of analyzing orders to determine the groupings that result in least cost/best service fulfillment and transportation.

Metrics	
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs

People	
HS.0007	Availability Management
HS.0083	Order Management

Workflow



sD2.5 Build Loads

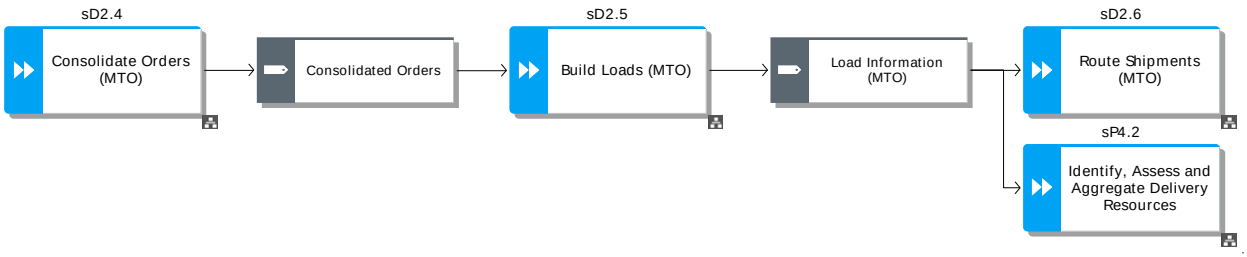
Transportation modes are selected and efficient loads are built.

Metrics	
RS.3.16	Build Loads Cycle Time
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs

Practices	
BP.122	Vendor Managed Inventory (VMI)
BP.176	Omni-channel

People	
HS.0018	Carrier Selection
HS.0068	Load Building
HS.0151	Transport Mode Selection

Workflow



sD2.6 Route Shipments

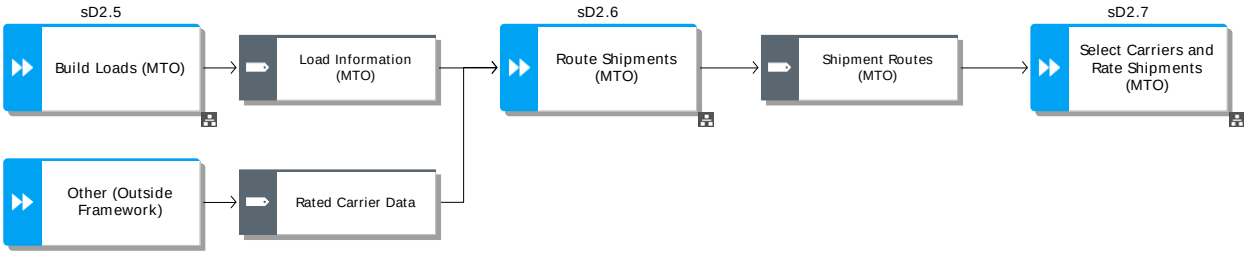
Loads are consolidated and routed by mode, lane, and location.

Metrics	
RS.3.117	Route Shipments Cycle Time
CO.2.4	Cost to Deliver
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs

Practices	
BP.122	Vendor Managed Inventory (VMI)
BP.176	Omni-channel

People	
HS.0129	Route planning

Workflow



sD2.7 Select Carriers and Rate Shipments

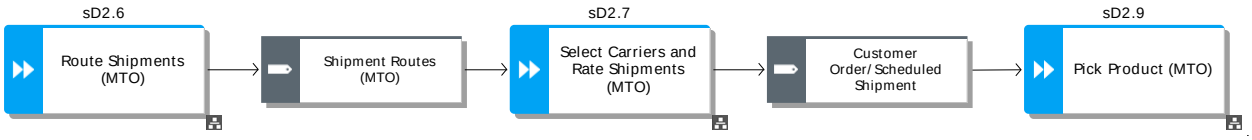
Specific carriers are selected by lowest cost per route and shipments are rated and tendered.

Metrics	
RL.3.16	% of suppliers meeting environmental metrics/criteria
CO.2.4	Cost to Deliver
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs

Practices	
BP.005	Self-Invoicing
BP.046	Expedite Outbound Customer Shipments
BP.044	Inventory Financing Evaluation
BP.176	Omni-channel

People	
HS.0069	Logistics Management

Workflow



sD2.8 Receive Product from Source or Make

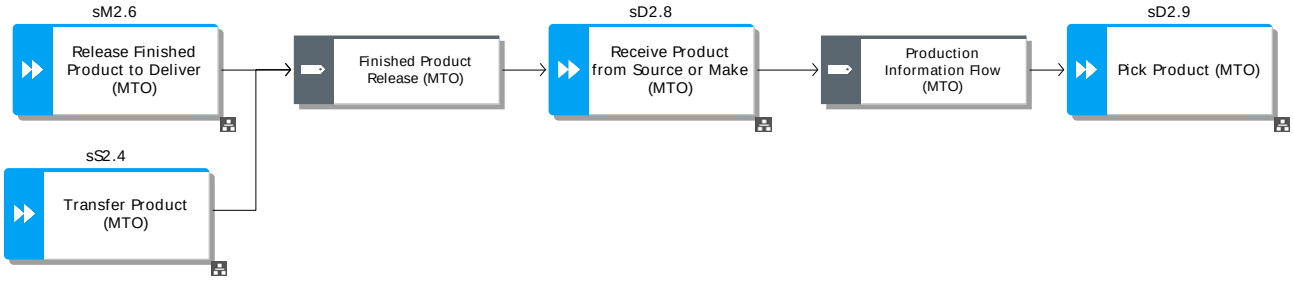
The activities such as receiving product, verifying, recording product receipt, determining put-away location, putting away and recording location for goods received from either Make or Source. May include quality inspection.

Metrics	
RS.3.108	Receive Product from Make/Source Cycle Time
RS.3.110	Receive Product from Source or Make Cycle Time
CO.3.10	Cost to Verify Product
CO.3.14	Order Management Costs Cost

Practices	
BP.041	Transportation Optimization
BP.089	Perfect Pick Put away
BP.176	Omni-channel

People	
HS.0075	Material handling equipment usage
HS.0104	Progress & performance reporting

Workflow



sD2.9 Pick Product

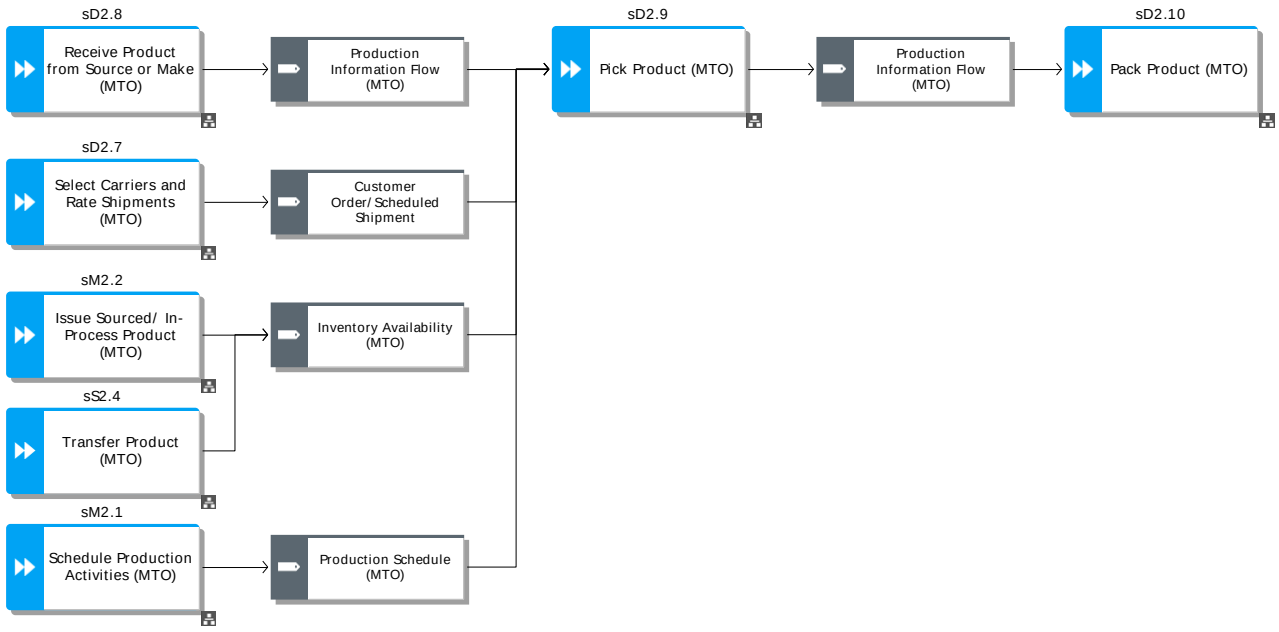
The series of activities including retrieving orders to pick, verifying inventory availability, building the pick wave, picking the product, recording the pick and delivering product to packing area in response to an order.

Metrics	
RL.3.4	% correct material documentation
RS.3.96	Pick Product Cycle Time
CO.3.12	Indirect Cost Related to Production

Practices	
BP.012	Lot Tracking
BP.089	Perfect Pick Put away
BP.176	Omni-channel

People	
HS.0075	Material handling equipment usage
HS.0104	Progress & performance reporting
HS.0161	Wave/batch picking

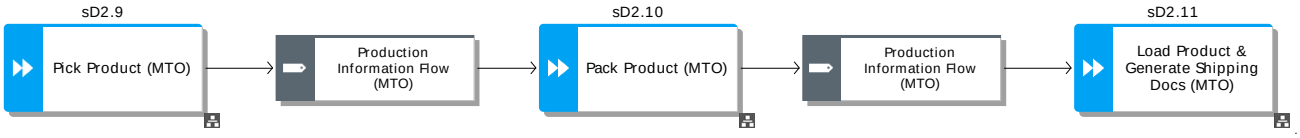
Workflow



sD2.10 Pack Product

The activities such as sorting / combining the products, packing / kitting the products, paste labels, barcodes etc. and delivering the products to the shipping area for loading.

Metrics	
RS.3.95	Pack Product Cycle Time
CO.3.12	Indirect Cost related to Production
Practices	
BP.012	Lot Tracking
BP.176	Omni-channel
People	
HS.0062	Kitting/Packing
HS.0075	Material handling equipment usage
HS.0104	Progress & performance reporting
Workflow	



sD2.11 Load Product & Generate Shipping Docs

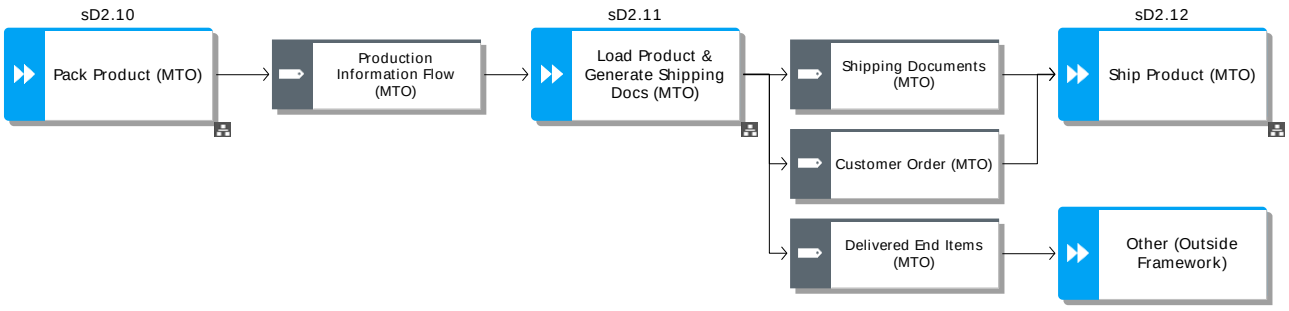
The series of tasks including placing/loading product onto modes of transportation, and generating the documentation necessary to meet internal, customer, carrier and government needs. Shipping documentation includes the invoice. Optionally verify customer credit.

Metrics	
RL.2.2	Delivery Performance to Customer Commit Date
RL.2.3	Documentation Accuracy
RL.3.31	Compliance Documentation Accuracy
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RL.3.43	Other Required Documentation Accuracy
RL.3.45	Payment Documentation Accuracy
RL.3.50	Shipping Documentation Accuracy
RS.3.51	Load Product & Generate Shipping Documentation Cycle Time
CO.3.12	Indirect Cost Related to Production

Practices	
BP.012	Lot Tracking
BP.176	Omni-channel

People	
HS.0028	Customer Order Management
HS.0069	Logistics Management
HS.0075	Material handling equipment usage

Workflow



sD2.12 Ship Product

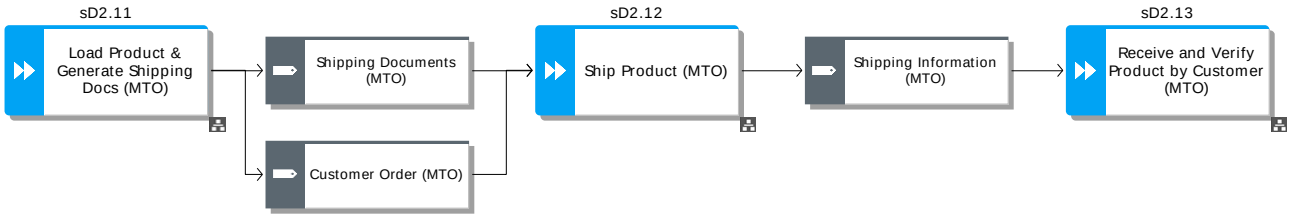
The process of shipping the product to the customer site.

Metrics	
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RS.3.126	Ship Product Cycle Time
CO.2.4	Cost to Deliver
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs

Practices	
BP.012	Lot Tracking
BP.046	Expedite Outbound Customer Shipments
BP.176	Omni-channel

People	
HS.0039	Driving certification (according to mode of transportation)

Workflow



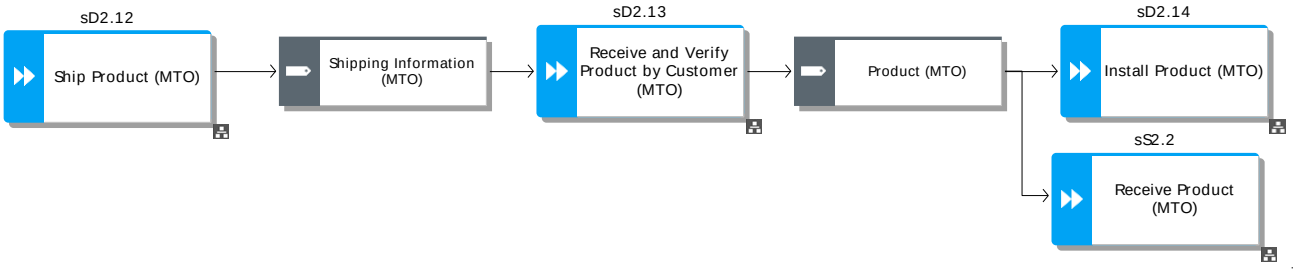
sD2.13 Receive and Verify Product by Customer

The process of receiving the shipment at the customer (either at customer site or at shipping area in case of self-collection) and verifying that the order was shipped complete and that the product meets delivery terms.

Metrics	
RL.2.2	Delivery Performance to Customer Commit Date
RL.2.4	Perfect Condition
RL.3.32	Customer Commit Date Achievement Time Customer Receiving
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RL.3.41	Orders Delivered Damage Free Conformance
RL.3.42	Orders Delivered Defect Free Conformance
RS.3.102	Receive & Verify Product by Customer Cycle Time
RS.3.103	Receive and Verify Product Cycle Time

People	
HS.0009	Bar Code Handling/RFID (if available)
HS.0108	Quality Management

Workflow



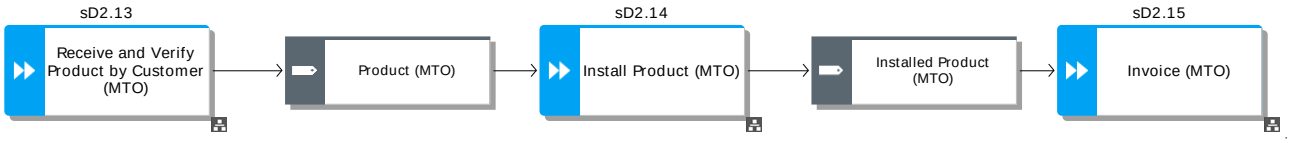
sD2.14 Install Product

When necessary, the process of preparing, testing and installing the product at the customer site. The product is fully functional upon completion.

Metrics	
RL.2.4	Perfect Condition
RS.3.46	Install Product Cycle Time

People	
HS.0043	Engineering
HS.0105	Project Management

Workflow



sD2.15 Invoice

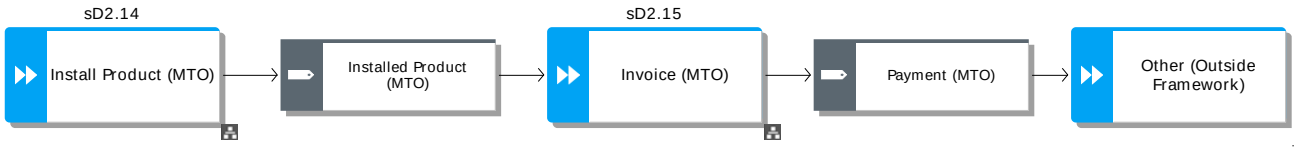
A signal is sent to the financial organization that the order has been shipped and that the billing process should begin and payment be received or be closed out if payment has already been received. Payment is received from the customer within the payment terms of the invoice.

Metrics	
RL.2.3	Documentation Accuracy
RL.3.11	% of Faultless Invoices
CO.3.14	Order Management Costs
AM.2.1	Days Sales Outstanding

Practices	
BP.012	Lot Tracking
BP.176	Omni-channel

People	
HS.0003	Accounting
HS.0026	Credit/Collection Management

Workflow



sD3 Deliver Engineer-to-Order Product

The process of obtaining, responding to, and allocating resources for a customer order that has unique requirements or specifications and delivering a product or service that is partially or fully designed, redesigned, manufactured, and/or assembled from a bill of materials / bill of service or recipe that includes one or more custom parts or ingredients. Design will begin only after the receipt and validation of a firm customer order.

Hierarchy	
sD3.1	Obtain and Respond to RFP/RFQ
sD3.2	Negotiate and Receive Contract
sD3.3	Enter Order, Commit Resources & Launch Program
sD3.4	Schedule Installation
sD3.5	Build Loads
sD3.6	Route Shipments
sD3.7	Select Carriers & Rate Shipments
sD3.8	Receive Product from Source or Make
sD3.9	Pick Product
sD3.10	Pack Product
sD3.11	Load Product & Generate Shipping Docs
sD3.12	Ship Product
sD3.13	Receive and Verify Product by Customer
sD3.14	Install Product
sD3.15	Invoice

Metrics	
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time
RS.2.3	Deliver Cycle Time
RS.3.20	Current logistics order cycle time
AG.2.3	Upside Deliver Adaptability
AG.2.8	Downside Deliver Adaptability
AG.3.1	% of labor used in logistics, not used in direct activity
AG.3.4	Additional Delivery volume
AG.3.32	Current Delivery Volume
CO.2.4	Cost to Deliver
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs

CO.3.21	Risk Mitigation Costs (Deliver)
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.3.17	Inventory Days of Supply - WIP
AM.3.45	Inventory Days of Supply - Finished Goods

Practices	
BP.035	Business Rule Review
BP.055	Freight Carrier Delivery Performance Evaluation
BP.098	Mobile Access of Information
BP.153	Bar coding/RFID
BP.170	Engineer to Order Production
BP.176	Omni-channel

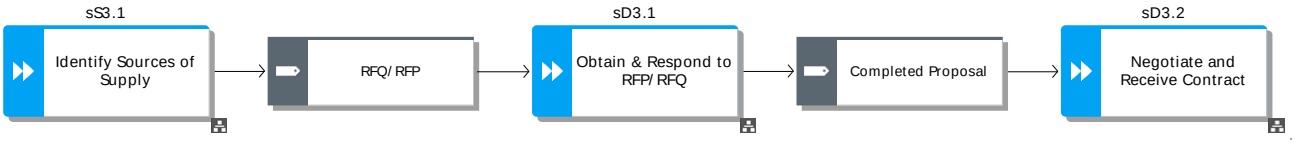
sD3.1 Obtain and Respond to RFP/RFQ

The process of receiving a request for proposal or request for quote, evaluating the request (estimating the schedule, developing costs estimates, establishing price), and responding to the potential customer.

Metrics	
RS.3.93	Obtain & Respond to Request for Quote (RFQ) / Request for Proposal (RFP) Cycle Time
CO.3.14	Order Management Costs

People	
HS.0060	Issue Proposal/Quote
HS.0094	Procurement
HS.0123	RFP/RFQ Management

Workflow



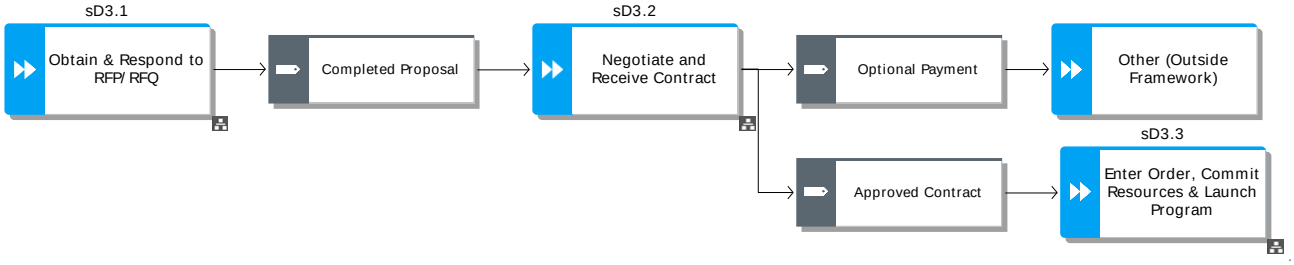
sD3.2 Negotiate and Receive Contract

The process of negotiating order details with customer (e.g., price, schedule, and product performance) and finalizing the contract. Optionally accept payment.

Metrics	
RS.3.92	Negotiate & Receive Contract Cycle Time
CO.3.14	Order Management Costs

People	
HS.0022	Contract Management

Workflow



sD3.3 Enter Order, Commit Resources & Launch Program

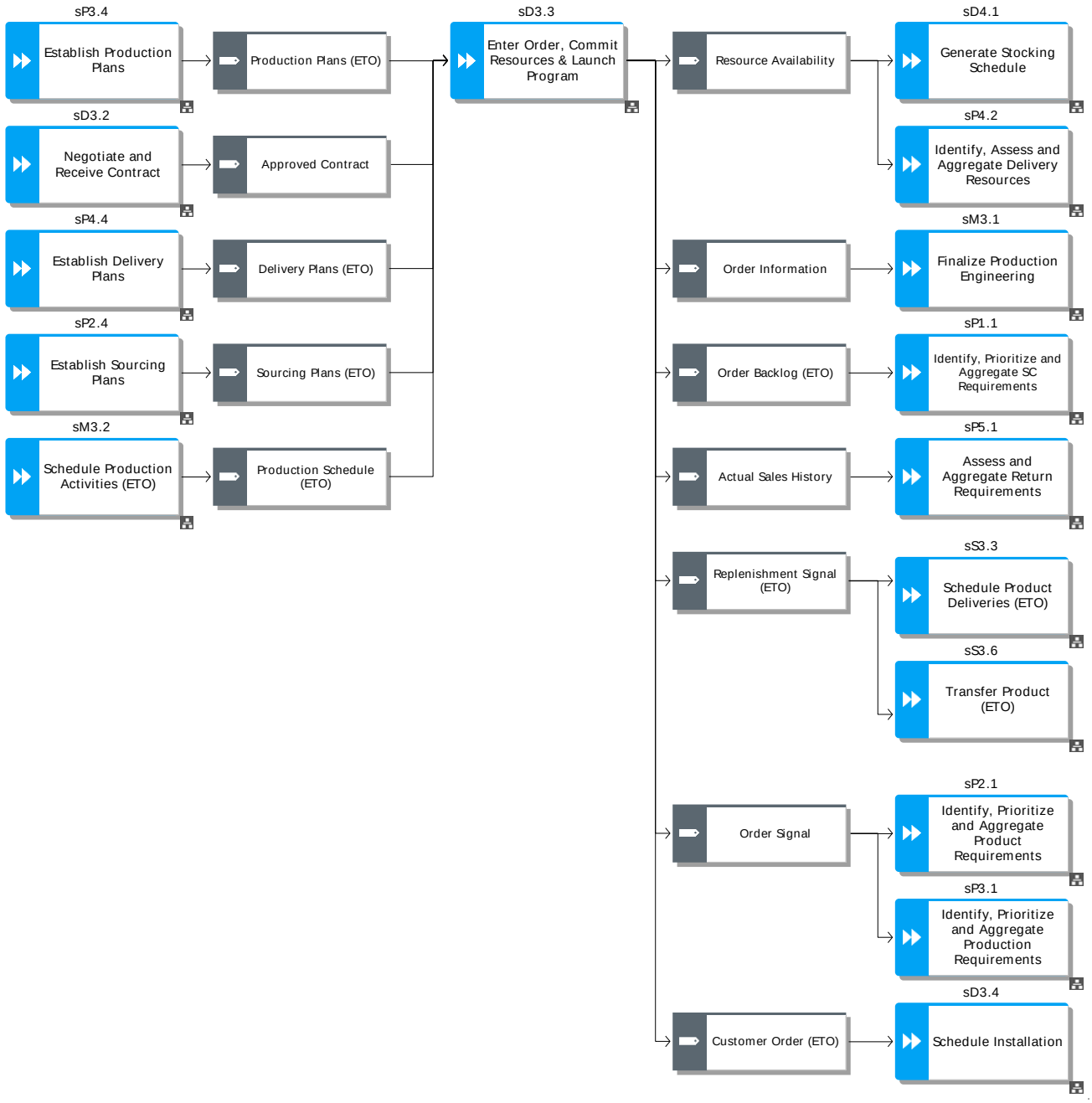
The process of entering/finalizing the customer's order, approving the planned resources (e.g., engineering, manufacturing, etc.) and officially launching the program.

Metrics	
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RS.3.25	Enter Order, Commit Resources & Launch Program Cycle Time
RS.3.94	Order Fulfillment Dwell Time
CO.3.14	Order Management Costs

People	
HS.0043	Engineering
HS.0073	Manufacturing Resource Commitment
HS.0083	Order Management
HS.0105	Project Management

sD3.3 Enter Order, Commit Resources & Launch Program

Workflow



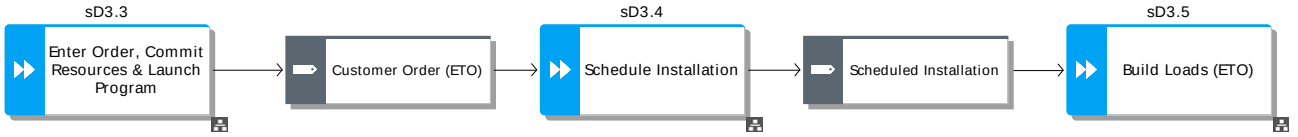
sD3.4 Schedule Installation

The process of evaluating the design and build schedules relative to customer requested installation date to determine installationschedule.

Metrics	
RS.3.120	Schedule Installation Cycle Time
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs

People	
HS.0014	Build Schedule Evaluation
HS.0038	Design/Engineering Schedule Development
HS.0052	Installation Scheduling

Workflow



sD3.5 Build Loads

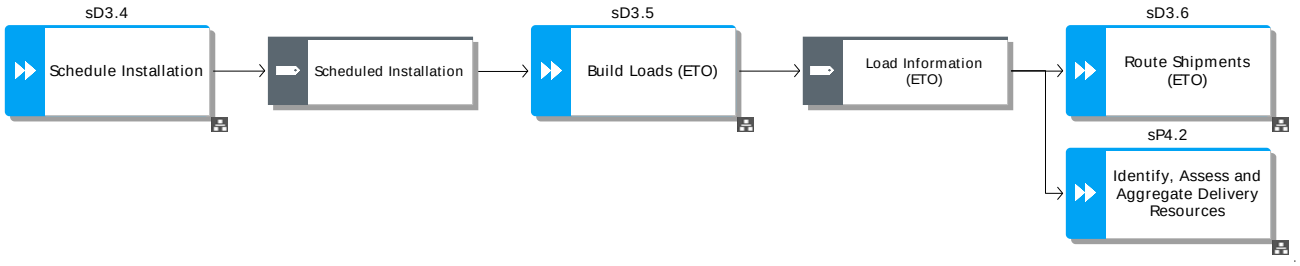
Transportation modes are selected and efficient loads are built.

Metrics	
RS.3.16	Build Loads Cycle Time
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs

Practices	
BP.122	Vendor Managed Inventory (VMI)
BP.176	Omni-channel

People	
HS.0018	Carrier Selection
HS.0068	Load Building
HS.0151	Transport Mode Selection

Workflow



sD3.6 Route Shipments

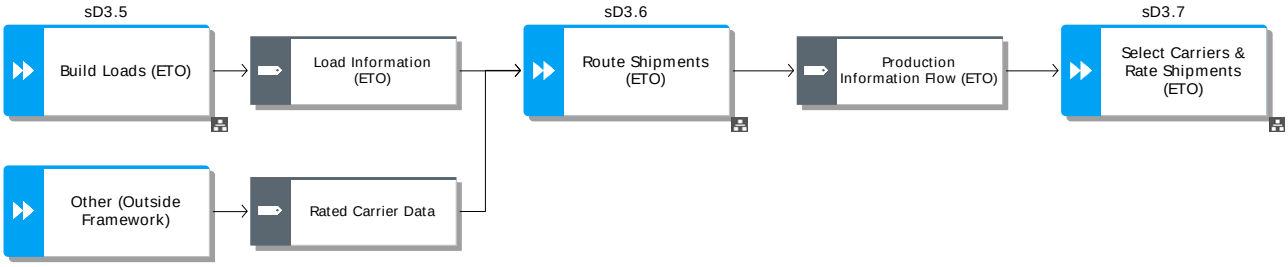
Loads are consolidated and routed by mode, lane, and location.

Metrics	
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RS.3.117	Route Shipments Cycle Time
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs

Practices	
BP.122	Vendor Managed Inventory (VMI)
BP.176	Omni-channel

People	
HS.0129	Route planning

Workflow



sD3.7 Select Carriers & Rate Shipments

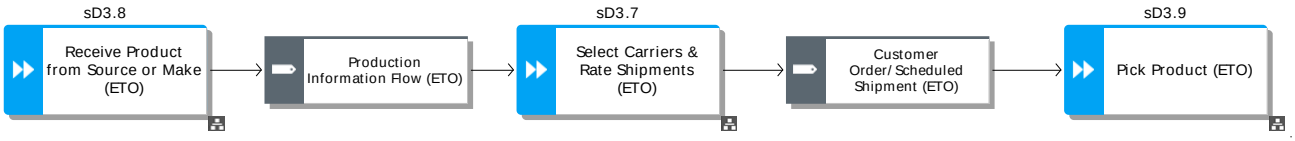
Specific carriers are selected by lowest cost per route and shipments are rated and tendered.

Metrics	
RS.3.124	Select Carriers & Rate Shipments Cycle Time
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs

Practices	
BP.041	Transportation Optimization
BP.044	Inventory Financing Evaluation
BP.176	Omni-channel

People	
HS.0069	Logistics Management

Workflow



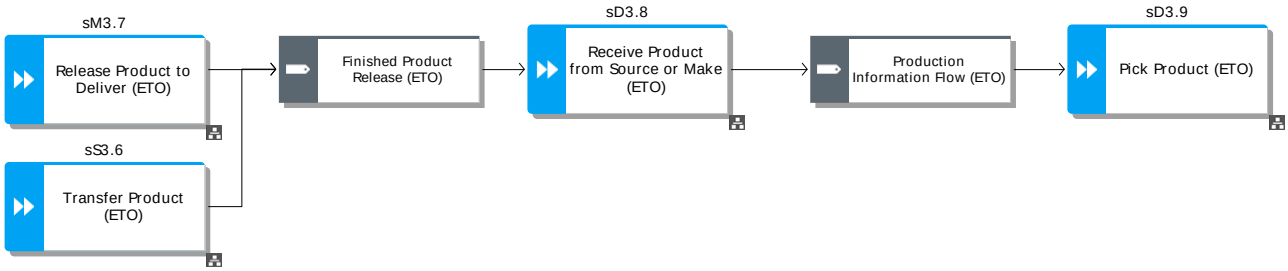
sD3.8 Receive Product from Source or Make

The activities such as receiving product, verifying, recording product receipt, determining put-away location, putting away and recording location for goods received from either Make or Source. May include quality inspection.

Metrics	
RL.3.4	% correct material documentation
RS.3.108	Receive Product from Make/Source Cycle Time
RS.3.110	Receive Product from Source or Make Cycle Time
CO.3.12	Indirect Cost Related to Production

People	
HS.0075	Material handling equipment usage
HS.0104	Progress & performance reporting

Workflow



sD3.9 Pick Product

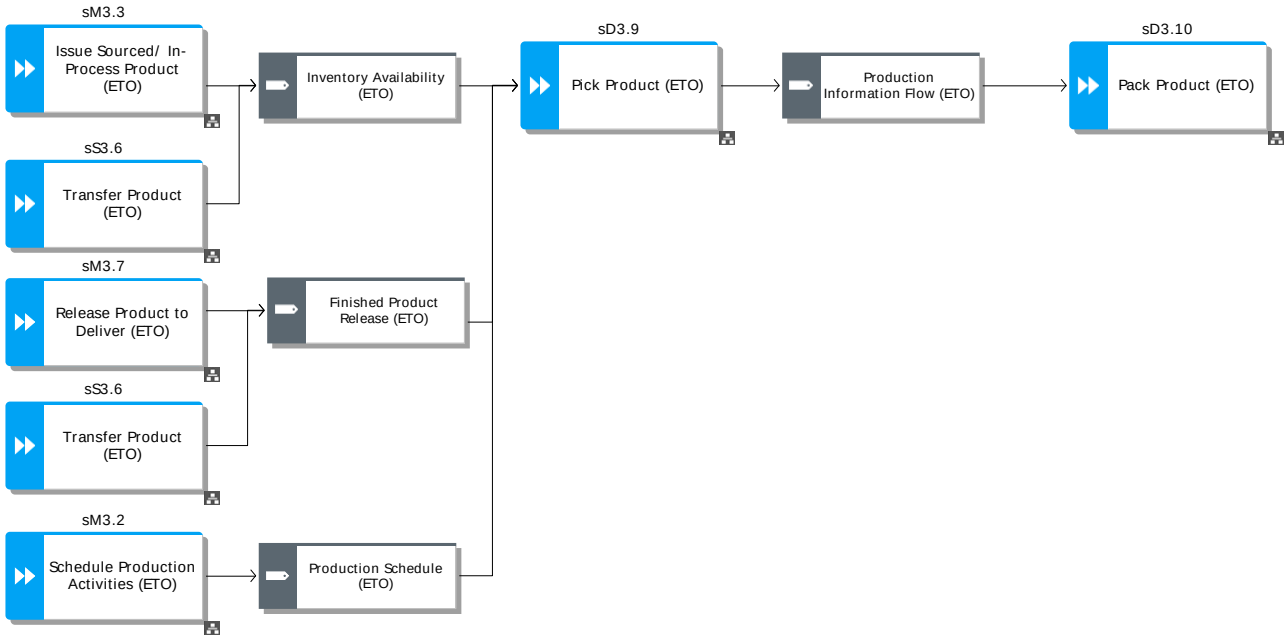
The series of activities including retrieving orders to pick, verifying inventory availability, building the pick wave, picking the product, recording the pick and delivering product to packing area in response to an order.

Metrics	
RS.3.96	Pick Product Cycle Time
CO.3.12	Indirect Cost Related to Production

Practices	
BP.012	Lot Tracking
BP.176	Omni-channel

People	
HS.0075	Material handling equipment usage
HS.0104	Progress & performance reporting
HS.0161	Wave/batch picking

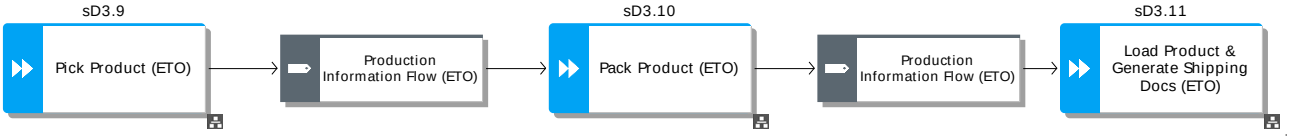
Workflow



sD3.10 Pack Product

The activities such as sorting / combining the products, packing / kitting the products, paste labels, barcodes etc. and delivering the products to the shipping area for loading.

Metrics	
RS.3.95	Pack Product Cycle Time
CO.3.13	Direct Labor Cost
Practices	
BP.012	Lot Tracking
BP.176	Omni-channel
People	
HS.0062	Kitting/Packing
HS.0075	Material handling equipment usage
HS.0104	Progress & performance reporting
Workflow	



sD3.11 Load Product & Generate Shipping Docs

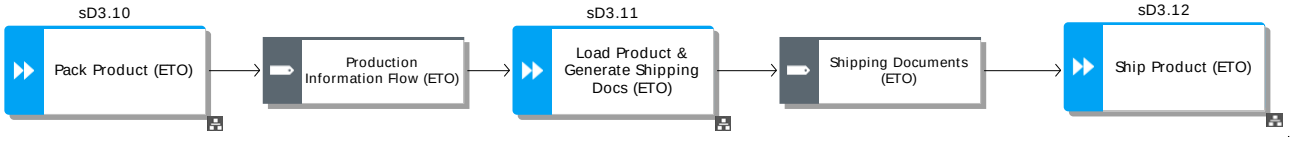
The series of tasks including placing/loading product onto modes of transportation, and generating the documentation necessary to meet internal, customer, carrier and government needs. Shipping documentation includes the invoice. Optionally verify customer credit.

Metrics	
RL.2.3	Documentation Accuracy
RL.3.31	Compliance Documentation Accuracy
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RL.3.43	Other Required Documentation Accuracy
RL.3.45	Payment Documentation Accuracy
RL.3.50	Shipping Documentation Accuracy
RS.3.51	Load Product & Generate Shipping Documentation Cycle Time
CO.3.13	Direct Labor Cost

Practices	
BP.012	Lot Tracking
BP.176	Omni-channel

People	
HS.0028	Customer Order Management
HS.0069	Logistics Management
HS.0075	Material handling equipment usage

Workflow



sD3.12 Ship Product

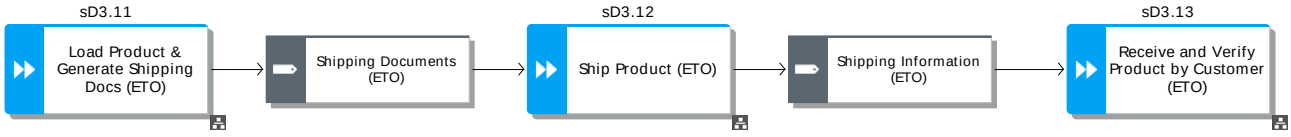
The process of shipping the product to the customer site.

Metrics	
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RS.3.126	Ship Product Cycle Time
CO.3.15	Order Delivery and / or Install Costs
CO.3.12	Indirect Cost Related to Production

Practices	
BP.012	Lot Tracking
BP.176	Omni-channel

People	
HS.0039	Driving certification (according to mode of transportation)

Workflow



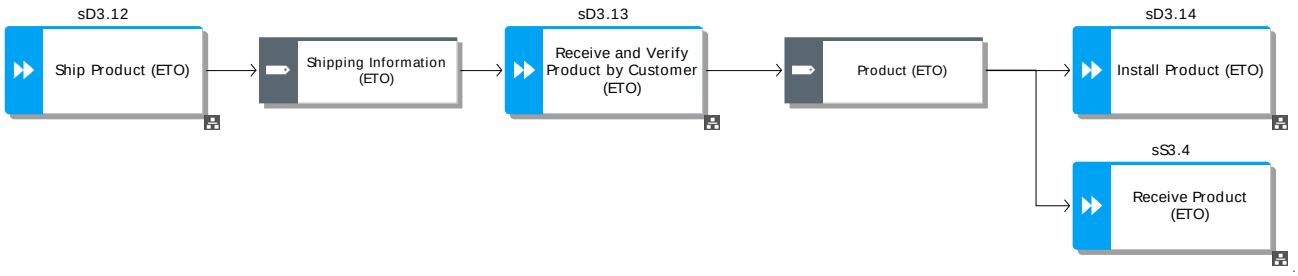
sD3.13 Receive and Verify Product by Customer

The process of receiving the shipment (either at customer site or at shipping area in case of self-collection) and verifying that the order was shipped complete and that the product meets delivery terms.

Metrics	
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
RL.2.4	Perfect Condition
RL.3.32	Customer Commit Date Achievement Time Customer Receiving
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RL.3.41	Orders Delivered Damage Free Conformance
RL.3.42	Orders Delivered Defect Free Conformance
RS.3.102	Receive & Verify Product by Customer Cycle Time
RS.3.103	Receive and Verify Product Cycle Time

People	
HS.0009	Bar Code Handling/RFID (if available)
HS.0108	Quality Management

Workflow



sD3.14 Install Product

The process of preparing, testing and installing the product at the customer site. The product is fully functional upon completion.

Metrics	
RL.2.4	Perfect Condition
RS.3.46	Install Product Cycle Time

People	
HS.0043	Engineering
HS.0105	Project Management

Workflow

sD3.15 Invoice

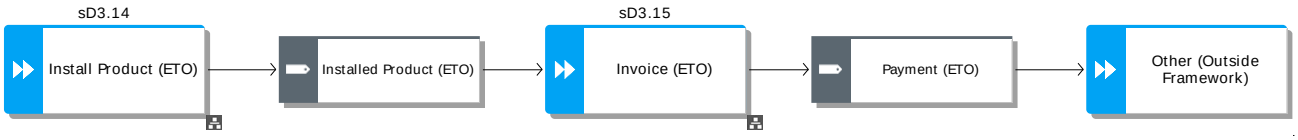
A signal is sent to the financial organization that the order has been shipped and that the billing process should begin and payment be received or be closed out if payment has already been received. Payment is received from the customer within the payment terms of the invoice.

Metrics	
RL.2.3	Documentation Accuracy
RL.3.11	% of Faultless Invoices
CO.3.14	Order Management Costs

Practices	
BP.012	Lot Tracking
BP.176	Omni-channel

People	
HS.0003	Accounting
HS.0026	Credit/Collection Management

Workflow



sD4 Deliver Retail Product

Deliver Retail Products are the processes used to acquire, merchandise, and sell finished goods at a retail store. A retail store is a physical location that sells products (and services) direct to the consumer using a point of sale process (manual or automated) to collect payment. Merchandising at a store level is the stocking and restocking of products in designated storage locations to generate sales in a retail store.

Hierarchy	
sD4.1	Generate Stocking Schedule
sD4.2	Receive Product at Store
sD4.3	Pick Product from backroom
sD4.4	Stock Shelf
sD4.5	Fill Shopping Cart
sD4.6	Checkout
sD4.7	Deliver and/or install

Metrics	
RS.1.1	Order Fulfillment Cycle Time
RS.2.3	Deliver Cycle Time
RS.2.4	Delivery Retail Cycle Time
AG.2.3	Upside Deliver Adaptability
AG.2.8	Downside Deliver Adaptability
AG.3.32	Current Delivery Volume
CO.2.4	Cost to Deliver
CO.3.14	Order Management Costs
CO.3.15	Order Delivery and / or Install Costs
CO.3.22	Risk Mitigation Costs (Return)
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital

sD4 Deliver Retail Product

Practices	
BP.035	Business Rule Review
BP.055	Freight Carrier Delivery Performance Evaluation
BP.098	Mobile Access of Information
BP.153	Bar coding/RFID
BP.176	Omni-channel

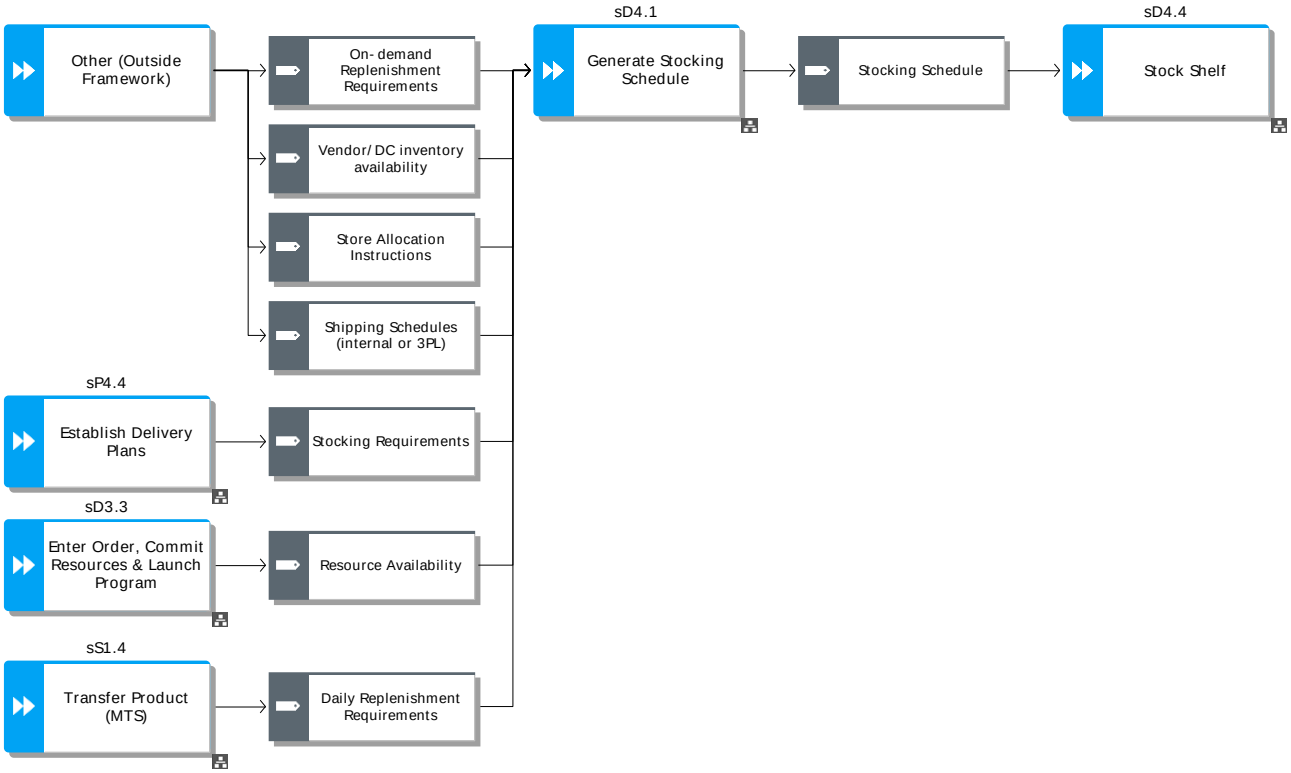
sD4.1 Generate Stocking Schedule

The process of scheduling resources to support item-stocking requirements.

Metrics	
RS.3.34	Generate Stocking Schedule Cycle Time
CO.3.14	Order Management Costs
CO.3.13	Direct Labor Costs

People	
HS.0069	Logistics Management
HS.0091	Planogram usage and strategies
HS.0131	Safety stock/replenishment calculations

Workflow



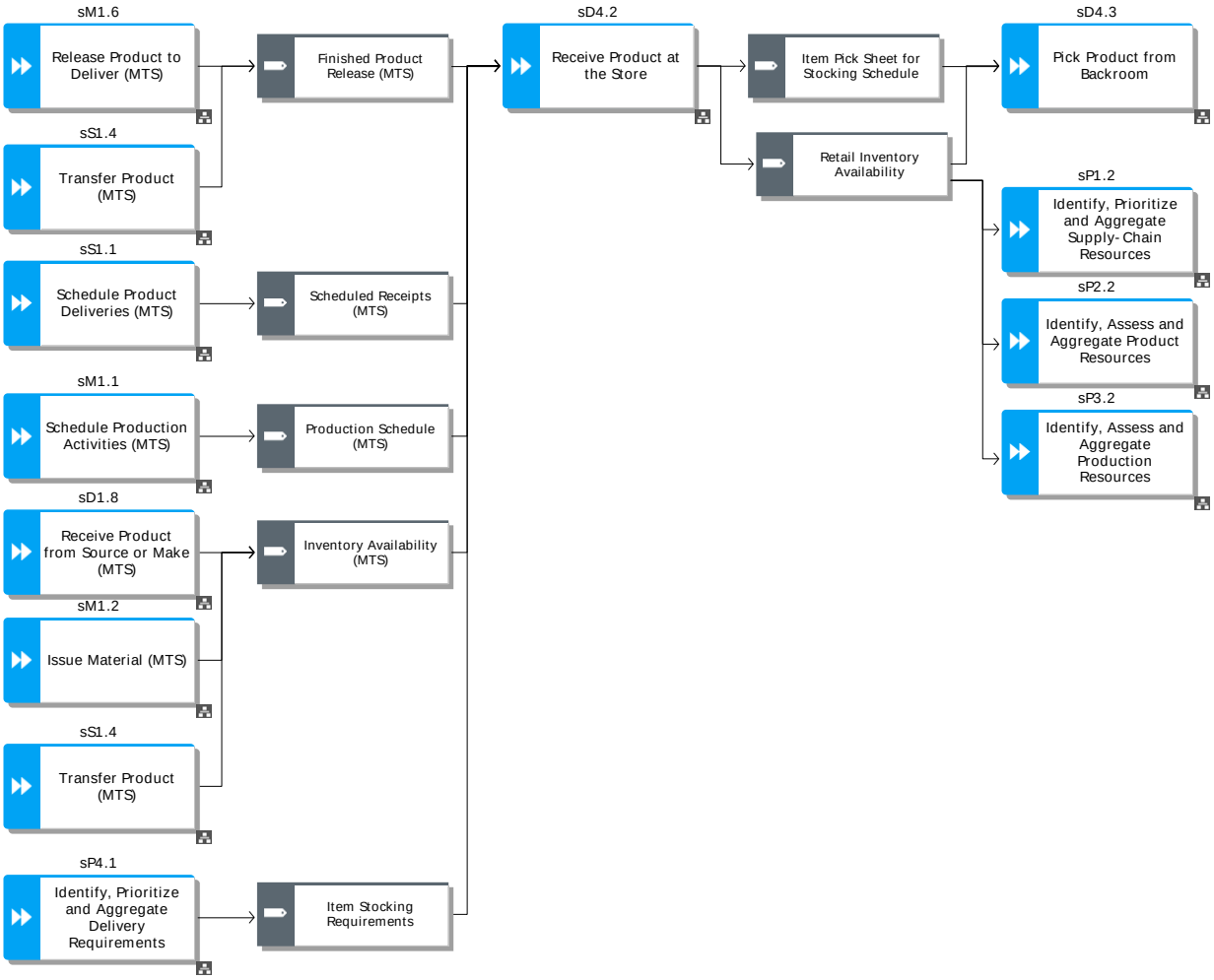
sD4.2 Receive Product at Store

The activities such as receiving product, verifying, recording product receipt, determining put-away location, putting away and recording location that a company performs at its own stores. May include quality inspection.

Metrics	
RS.3.107	Receive Product Cycle Time
RS.3.109	Receive Product at Store Cycle Time
CO.3.13	Direct Labor Costs

People	
HS.0058	Inventory Management
HS.0075	Material handling equipment usage
HS.0108	Quality Management
HS.0110	Receiving
HS.0131	Safety stock/replenishment calculations

Workflow



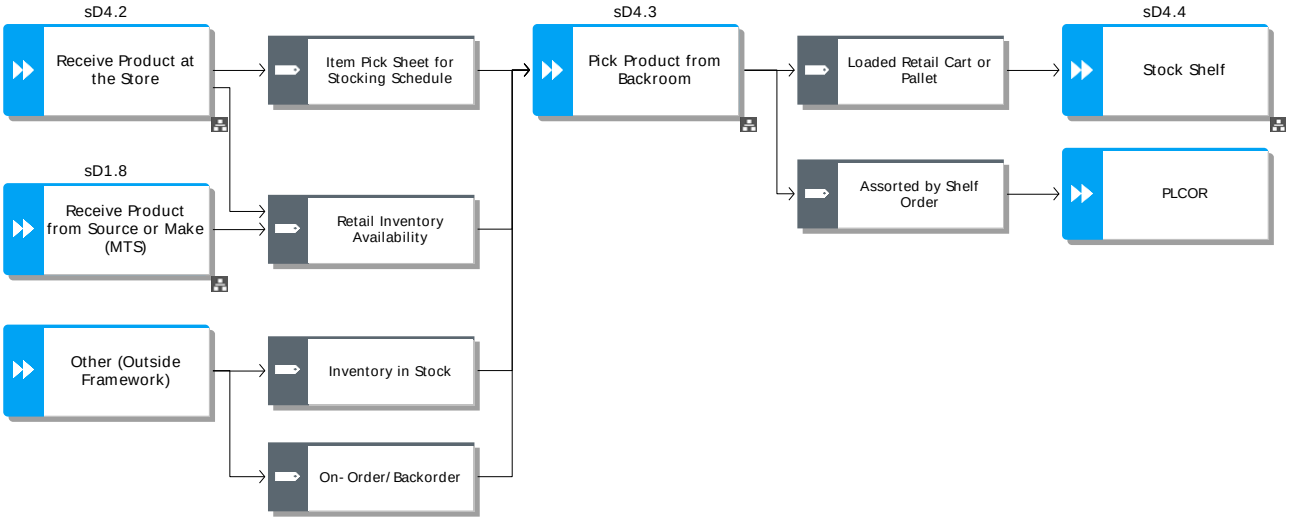
sD4.3 Pick Product from Backroom

The process of retrieving restocking orders to pick, determining inventory availability, building a pick wave, picking item and quantity from a designated backroom warehouse location, recording the resulting inventory transaction, and delivering the product to point of stock.

Metrics	
RS.3.97	Pick Product from Backroom Cycle Time
CO.3.13	Direct Labor Cost

People	
HS.0058	Inventory Management
HS.0075	Material handling equipment usage
HS.0090	Picking process / order batching
HS.0131	Safety stock/replenishment calculations

Workflow



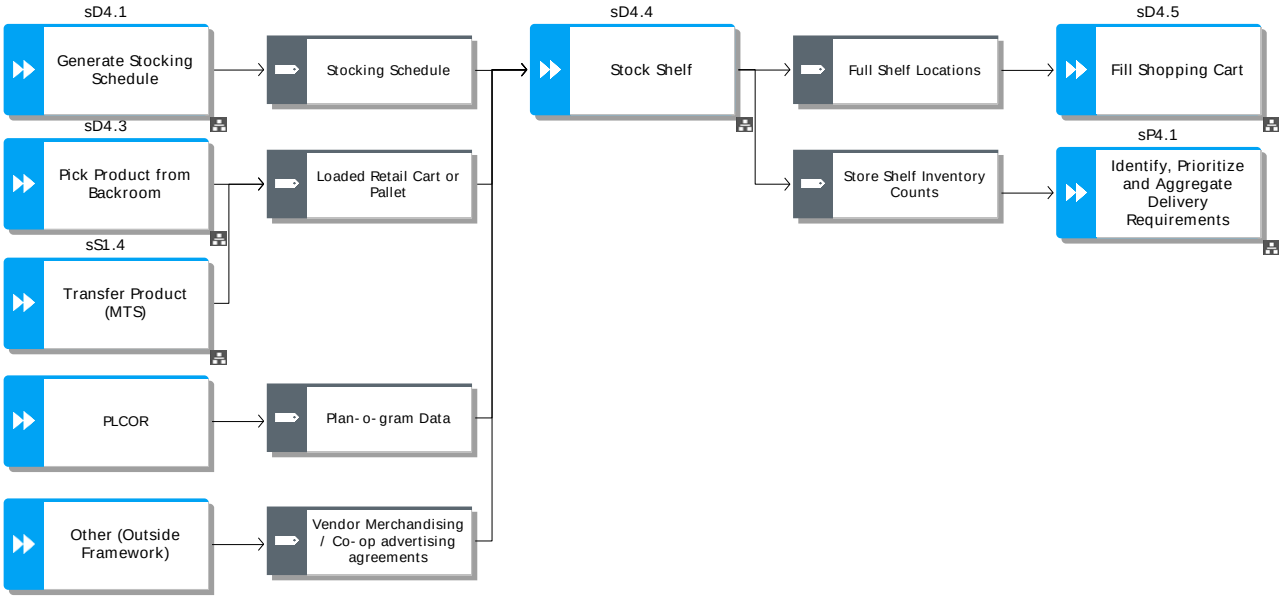
sD4.4 Stock Shelf

For restocks, the tasks associated with identifying the item location, stocking the shelf according to merchandise plans, and recording the appropriate inventory transaction. For promotional items and stock repositioning the tasks associated with shelf and point of sale preparation, stock placement, and end of sale activities.

Metrics	
RS.3.47	In-stock %
RS.3.129	Stock Shelf Cycle Time
CO.3.13	Direct Labor Cost

People	
HS.0058	Inventory Management
HS.0075	Material handling equipment usage
HS.0131	Safety stock/replenishment calculations

Workflow



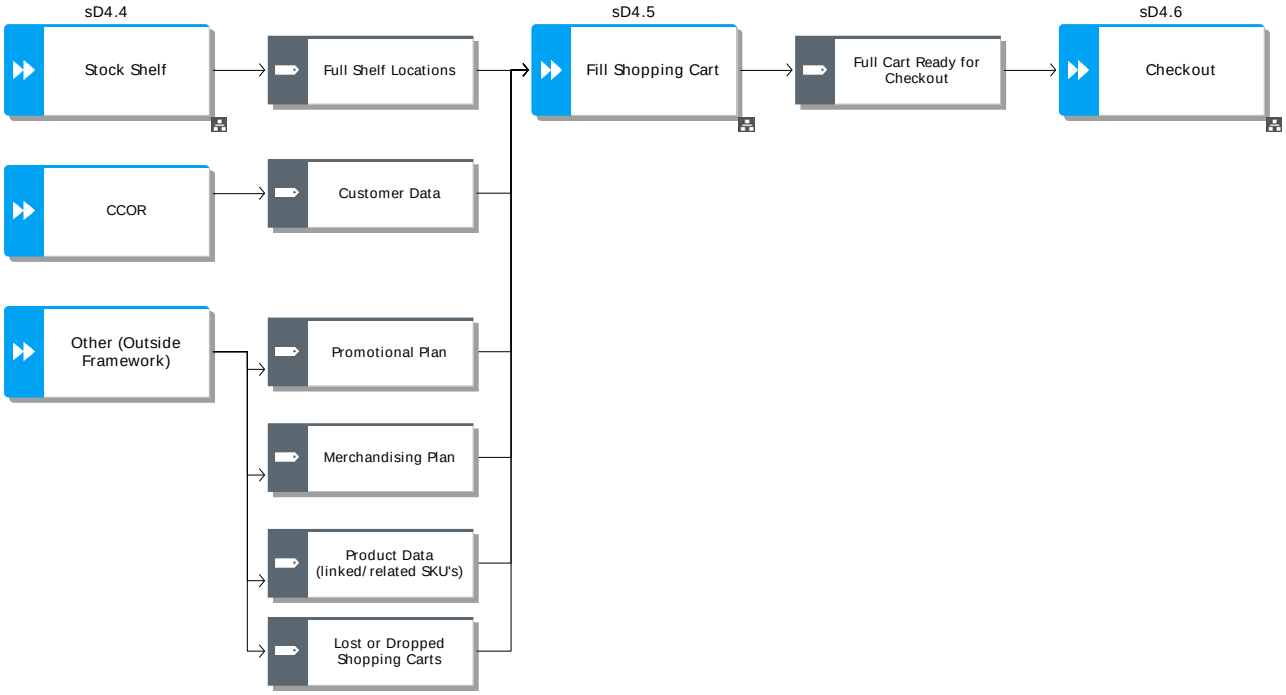
sD4.5 Fill Shopping Cart

Typical set of tasks associated with product selection, storage and movement through to checkout.

Metrics	
RL.3.7	% Item Location Accuracy
RS.3.32	Fill Shopping Cart Cycle Time
CO.3.13	Direct Labor Cost

People	
HS.0090	Picking process / order batching

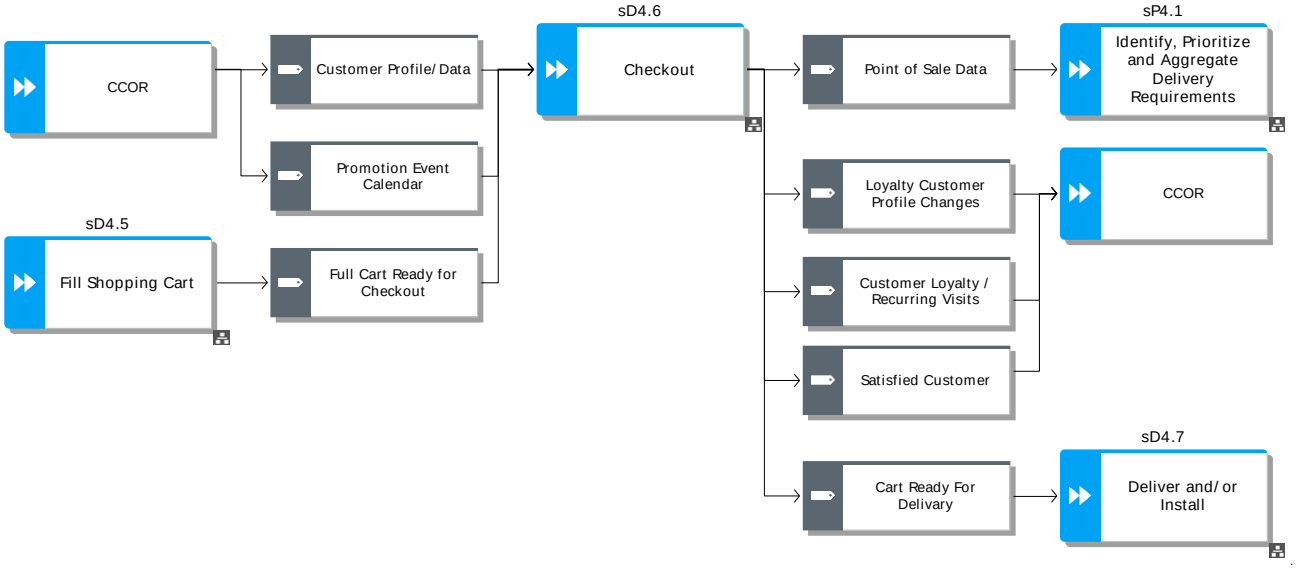
Workflow



sD4.6 Checkout

The processes and tasks associated with product checkout including scanning, method of payment, credit application and approval, service agreement, order confirmation, and/or invoice or receipt.

Metrics	
RS.3.17	Checkout Cycle Time
CO.3.14	Order Management Costs
Practices	
BP.012	Lot Tracking
BP.176	Omni-channel
People	
HS.0087	Payment Processing
HS.0096	Product checkout process
Workflow	



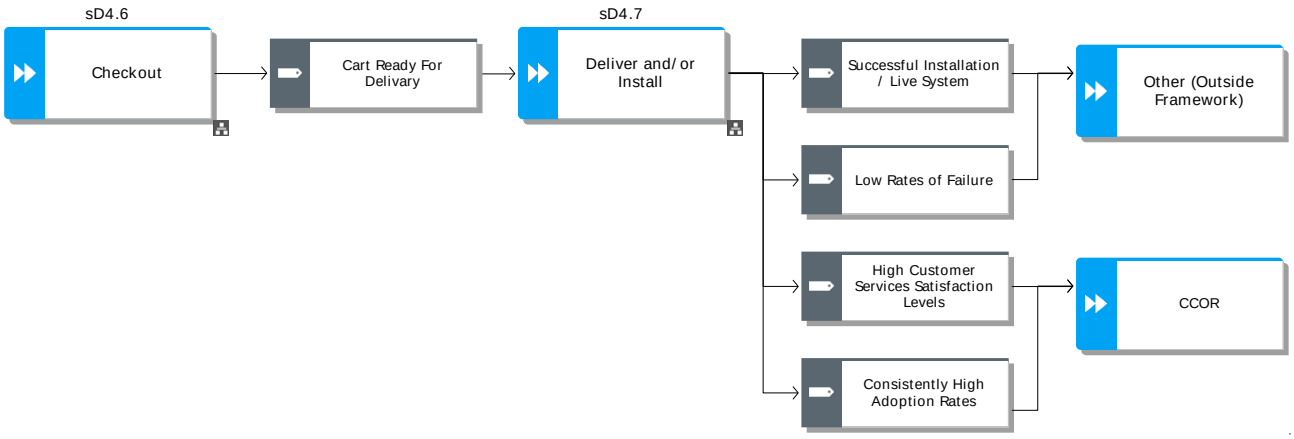
sD4.7 Deliver and/or install

The process of preparing and installing the product at the customer site. The product is fully functional upon completion.

Metrics	
RS.3.24	Deliver and/or Install Cycle Time
CO.3.15	Order Delivery and / or Install Costs
CO.3.13	Direct Labor Costs

People	
HS.0041	EHS regulations
HS.0051	Installation Requirements
HS.0075	Material handling equipment usage

Workflow



Return

sR Return

The processes associated with moving material from a customer back through the supply chain to address defects in product, ordering, or manufacturing, or to perform upkeep activities.

Hierarchy	
sSR1	Source Return Defective Product
sDR1	Deliver Return Defective Product
sSR2	Source Return MRO Product
sDR2	Deliver Return MRO Product
sSR3	Source Return Excess Product
sDR3	Deliver Return Excess Product

Metrics	
AG.1.1	Upside Supply Chain Adaptability
AG.1.2	Downside Supply Chain Adaptability
AG.1.3	Overall Value at Risk (VAR)
AM.1.1	Cash-to-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
CO.1.1	Total Supply Chain Management Costs
CO.1.2	Costs of Goods Sold
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time

sSR1 Source Return Defective Product

The return and disposition determination of defective products as defined by the warranty claims, product recall, non-conforming product and/or other similar policies including appropriate replacement. The Return Defective Product supports any type of product not conforming to specifications (including order non-conformance such as late or otherwise improper delivery); company business rules determine the definition of 'defective'. The physical disposition of the product may not be part of the return process.

Hierarchy	
sSR1.1	Identify Defective Product Condition
sSR1.2	Disposition Defective Product
sSR1.3	Request Defective Product Return Authorization
sSR1.4	Schedule Defective Product Shipment
sSR1.5	Return Defective Product

Metrics	
RS.1.1	Order Fulfillment Cycle Time
RS.3.22	Current supplier return order cycle time
RS.3.127	Source Return Cycle Time
AG.3.41	Current source return volume
CO.2.5	Cost to Return
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.3.21	Rebuild or recycle rate
AM.3.28	Percentage Defective Inventory

Practices	
BP.098	Mobile Access of Information
BP.129	Return Policy included with Shipping Document
BP.153	Bar coding/RFID

sSR1.1 Identify Defective Product Condition

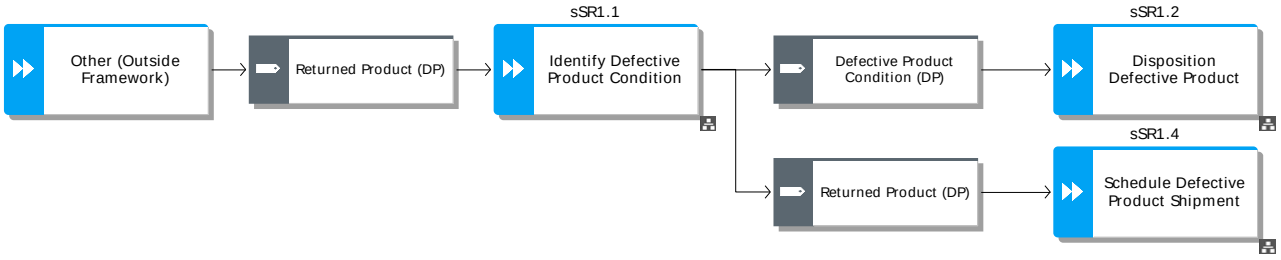
The process where the customer utilizes planned policies, business rules and product operating conditions inspection as criteria to identify and confirm that material is excess to requirements defective.

Metrics	
AM.3.29	Percentage Defective Inventory in Disposition

Practices	
BP.012	Lot Tracking
BP.089	Perfect Pick Put away
BP.110	Product Development/Engineering/Disposition Collaboration
BP.111	Electronic Technical Orders and Product Specifications

People	
HS.0029	Customer Relationship Management (CRM)
HS.0111	Regulatory Policy Management
HS.0157	Warranty process and policy

Workflow



sSR1.2 Disposition Defective Product

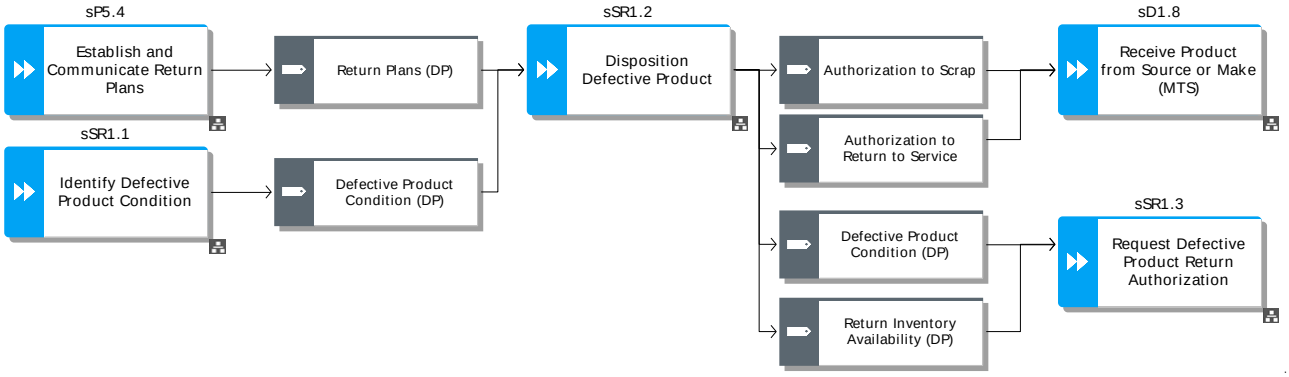
The process of the customer determining whether to return the defective item and the appropriate source contact for a return authorization.

Metrics	
AM.3.29	Percentage Defective Inventory in Disposition

Practices	
BP.142	Remote Return Authorization
BP.012	Lot Tracking

People	
HS.0058	Inventory Management

Workflow



sSR1.3 Request Defective Product Return Authorization

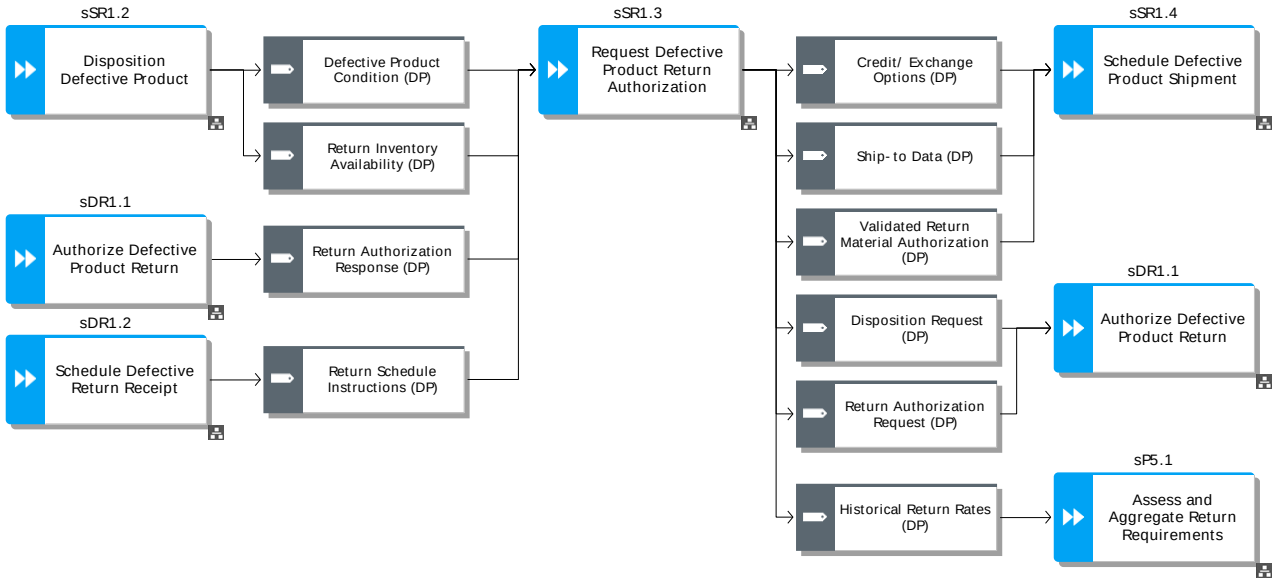
The process of a customer requesting and obtaining authorization, from last known holder or designated return center, for the return of defective product. Additionally, the customer and last known holder or designated return center would discuss enabling conditions such as return replacement or credit, packaging, handling, transportation and import / export requirements to facilitate the efficient return of the defective product.

Metrics	
AM.3.30	Percentage Defective Inventory in Return Authorization

Practices	
BP.012	Lot Tracking
BP.129	Return Policy included with Shipping Document
BP.140	Return Authorization Required
BP.141	Proactive Return Authorization
BP.142	Remote Return Authorization
BP.143	Preventive Returns
BP.168	Rotable Spares Pool

People	
HS.0031	Customer Repair and Return Policy and Process
HS.0069	Logistics Management

Workflow



sSR1.4 Schedule Defective Product Shipment

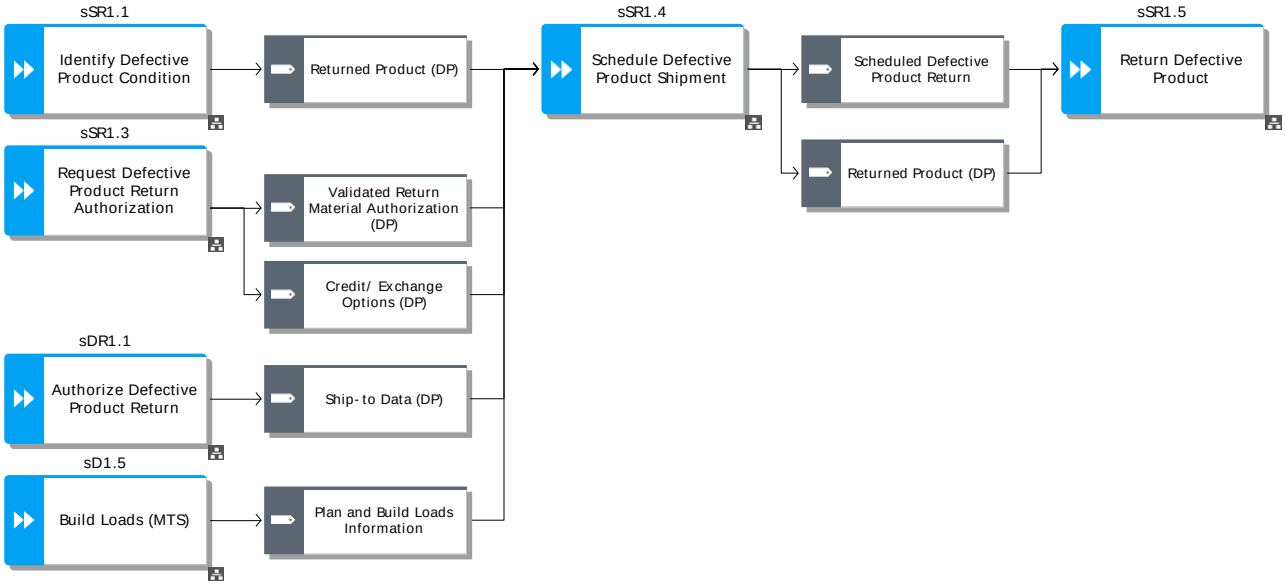
The process where the customer develops the schedule for a carrier to pick-up for delivery of the defective product. Activities include selecting the carrier and rates, preparing the item for transfer, preparing scheduling documentation and managing overall scheduling administration.

Metrics	
RL.3.28	% Shipping Schedules that Support Customer Required Return by Date
AM.3.32	Percentage Defective Product Inventory in Scheduling

Practices	
BP.167	Electronic Returns Tracking
BP.142	Remote Return Authorization
BP.140	Return Authorization Required
BP.123	Return Load Optimization

People	
HS.0069	Logistics Management

Workflow



sSR1.5 Return Defective Product

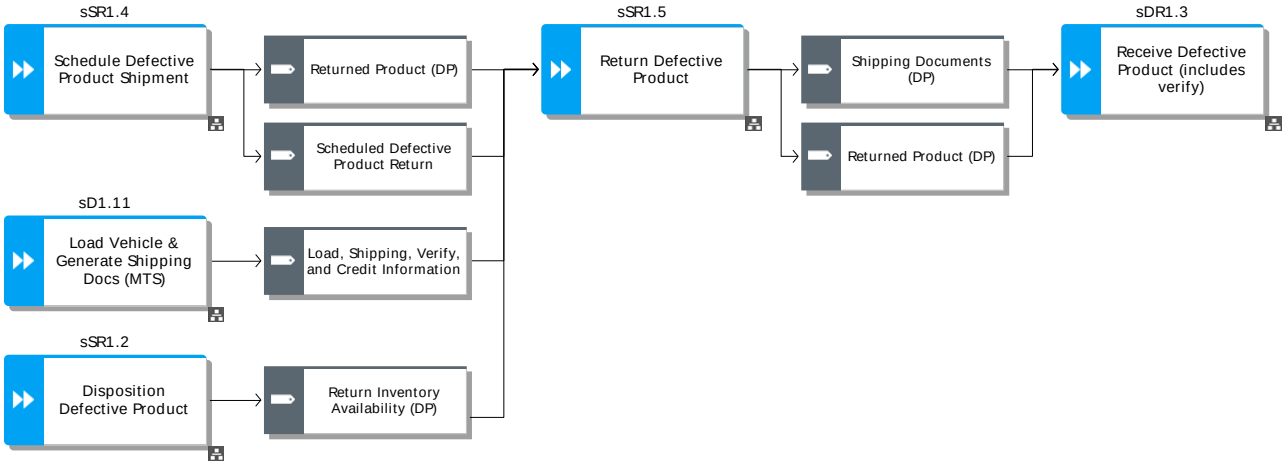
The process where the customer packages, and handles the defective product in preparation for shipping in accord with pre-determined conditions. The product is then provided by the customer to the carrier who physically transports the product and its associated documentation to the last known holder or designated return center.

Metrics	
RL.3.5	% Error-free Returns Shipped
RL.3.47	Return Shipments Shipped on Time
CO.3.15	Order Delivery and / or Install Costs
AM.3.21	Rebuild or recycle rate
AM.3.31	Percentage Defective Product Inventory in Transportation

Practices	
BP.012	Lot Tracking
BP.128	Vendor Recovery
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool

People	
HS.0046	ERP Systems
HS.0053	Installed base management
HS.0069	Logistics Management

Workflow



sDR1 Deliver Return Defective Product

The receipt and disposition determination of defective products as defined by the warranty claims, product recall, non-conforming product and/or other similar policies including appropriate replacement. The Return Defective Product supports any type of product not conforming to specifications (including order non-conformance such as late or otherwise improper delivery); company business rules determine the definition of 'defective'. The physical disposition of the product may not be part of the return process.

Hierarchy	
sDR1.1	Authorize Defective Product Return
sDR1.2	Schedule Defective Return Receipt
sDR1.3	Receive Defective Product (includes verify)
sDR1.4	Transfer Defective Product

Metrics	
RS.1.1	Order Fulfillment Cycle Time
RS.3.19	Current customer return order cycle time
AG.3.3	Additional deliver return volume
AG.3.31	Current Deliver Return Volume
AG.3.44	Customer return order cycle time reestablished and sustained in 30 days
CO.2.2	Cost to Source
CO.3.14	Order Management Cost
CO.2.5	Cost to Return
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.3.12	Deliver Return Cycle Time
AM.3.26	Return Rate
AM.3.28	Percentage Defective Inventory

Practices	
BP.012	Lot Tracking
BP.025	Self-Service Warranty Claim Submittal
BP.067	Returns Inventory Reduction
BP.129	Return Policy included with Shipping Document

sDR1.1 Authorize Defective Product Return

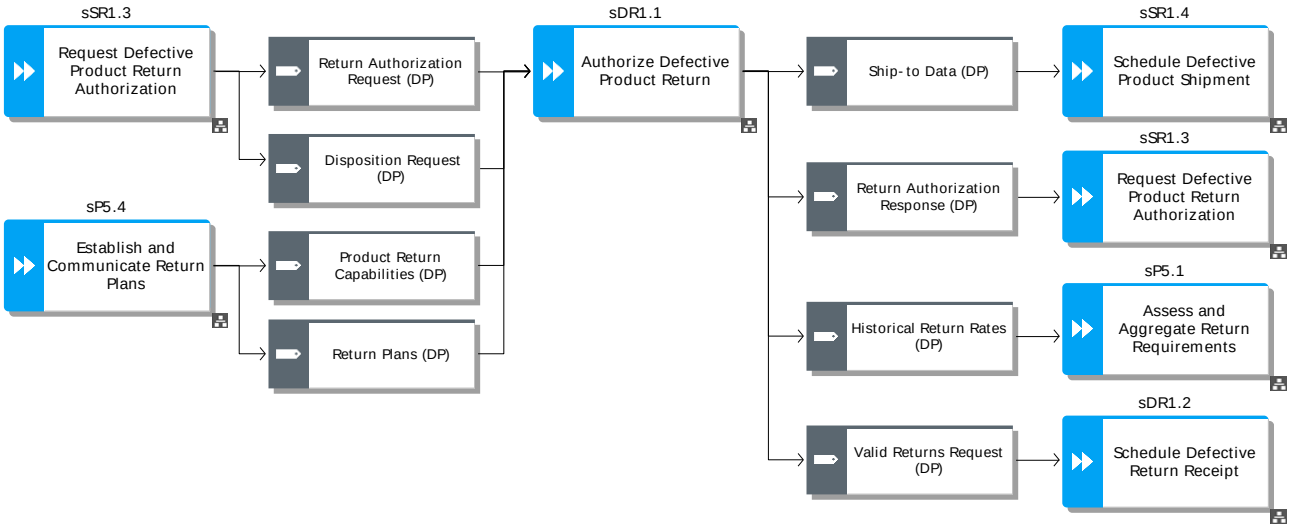
The process where the last known holder or designated return center receives a defective product return authorization request from a customer, determines if the item can be accepted and communicates decision to the customer. Accepting the request would include negotiating the conditions of the return with the customer, including authorizing return replacement or credit. Rejecting the request would include providing a reason for the rejection to the customer.

Metrics	
RS.3.5	Authorized Defective Return Cycle Time
CO.2.5	Cost to Return

Practices	
BP.012	Lot Tracking
BP.025	Self-Service Warranty Claim Submittal
BP.075	Web-based Return Material Authorization (RMA)
BP.077	Prepaid Return Shipping Label
BP.079	Loaner Program
BP.129	Return Policy included with Shipping Document
BP.140	Return Authorization Required
BP.142	Remote Return Authorization
BP.168	Rotable Spares Pool

People	
HS.0031	Customer Repair and Return Policy and Process
HS.0046	ERP Systems
HS.0058	Inventory Management

Workflow



sDR1.2 Schedule Defective Return Receipt

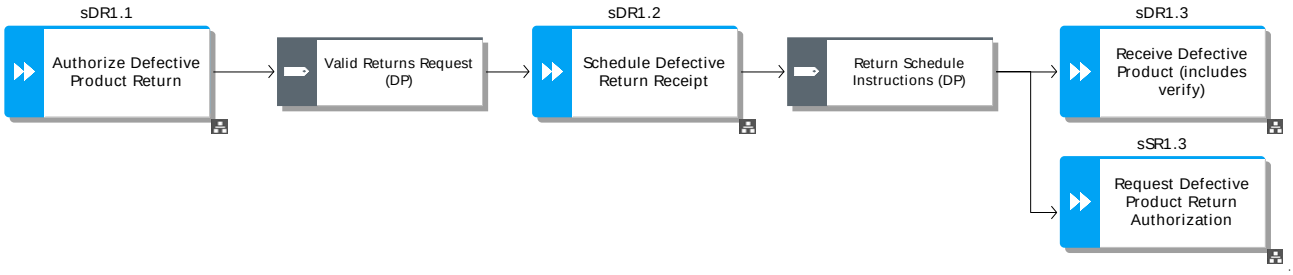
The process where the last known holder or designated return center evaluates the defective product handling requirements including negotiated conditions and develops a schedule that tells the Customer when to ship the product. The scheduling activity would also inform Receiving when to expect the shipment and where to send the product, for disposition, upon receipt.

Metrics	
RS.3.118	Schedule Defective Return Receipt Cycle Time

Practices	
BP.075	Web-based Return Material Authorization (RMA)
BP.077	Prepaid Return Shipping Label
BP.078	Return Tracking
BP.079	Loaner Program
BP.123	Return Load Optimization
BP.140	Return Authorization Required

People	
HS.0058	Inventory Management
HS.0069	Logistics Management

Workflow



sDR1.3 Receive Defective Product (includes verify)

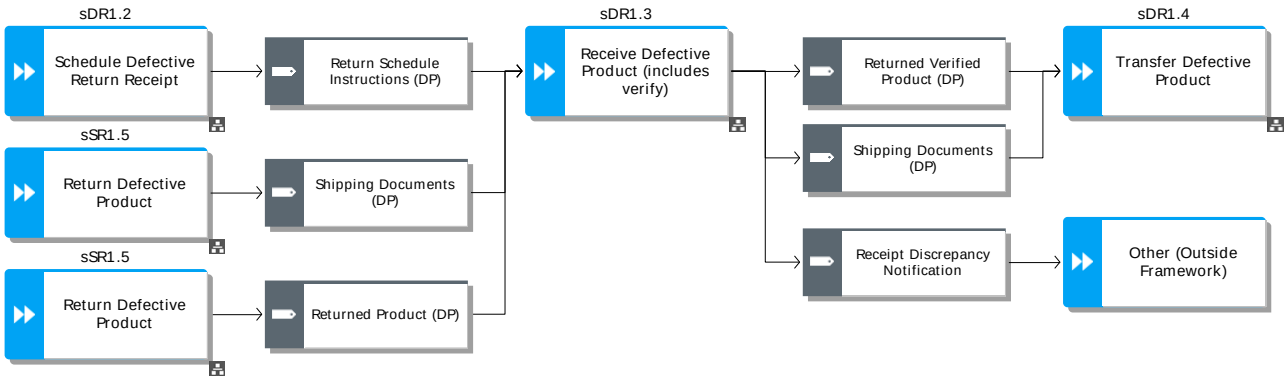
The process where the last known holder or designated return center receives and verifies the returned defective product against the return authorization and other documentation and prepares the item for transfer.

Metrics	
RS.3.104	Receive Defective Product Cycle Time

Practices	
BP.072	Inbound RMA-enabled Processing
BP.076	Bar Coding for Returned Materials
BP.077	Prepaid Return Shipping Label
BP.078	Return Tracking
BP.128	Vendor Recovery
BP.137	Carcass Disassembly
BP.140	Return Authorization Required
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool

People	
HS.0069	Logistics Management

Workflow



sDR1.4 Transfer Defective Product

The process where the last known holder or designated return center transfers the defective product to the appropriate process to implement the disposition decision.

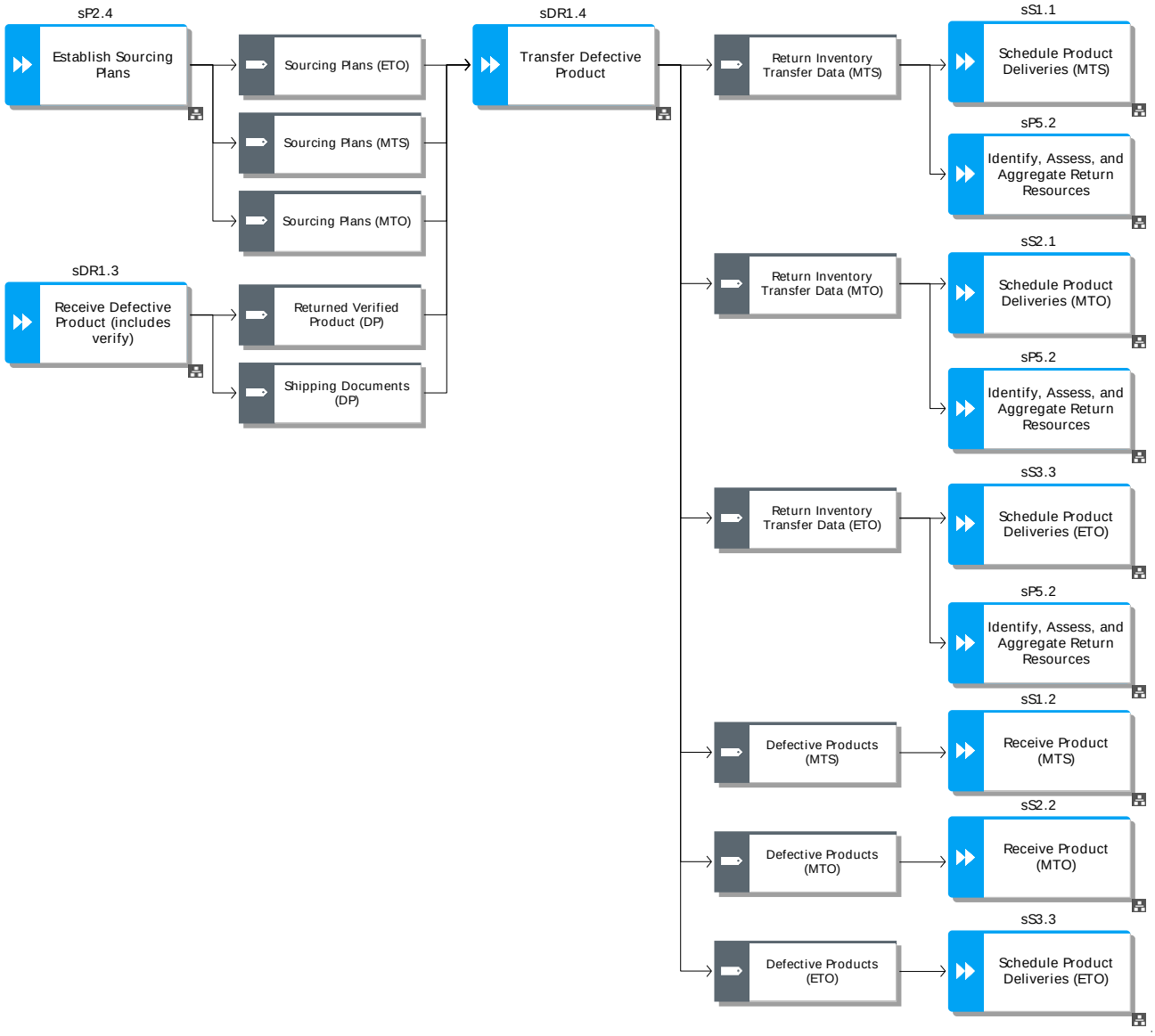
Metrics	
RS.3.136	Transfer Defective Product Cycle Time

Practices	
BP.073	Returns Receiving Refurbishment
BP.076	Bar Coding for Returned Materials
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool

People	
HS.0046	ERP Systems
HS.0058	Inventory Management

sDR1.4 Transfer Defective Product

Workflow



sSR2 Source Return MRO Product

The return of Maintenance, Repair and Overhaul (MRO) products or company assets for the purpose of servicing, repairing or upgrading it, as defined by Maintenance Plans or the occurrence or anticipation of risk of failure. Generally, company assets managed through a MRO process are expected to be refurbished to a useable condition and returned to service. The Return process does not represent the actual maintenance, repair or overhaul activities; these are generally represented by Make processes. The physical disposition of the product may not be part of the return process.

Hierarchy	
sSR2.1	Identify MRO Product Condition
sSR2.2	Disposition MRO Product
sSR2.3	Request MRO Return Authorization
sSR2.4	Schedule MRO Shipment
sSR2.5	Return MRO Product

Metrics	
RS.1.1	Order Fulfillment Cycle Time
CO.2.5	Cost to Return
CO.3.16	Cost to Source Return
CO.3.17	Cost to Deliver Return
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.3.21	Rebuild or recycle rate

sSR2.1 Identify MRO Product Condition

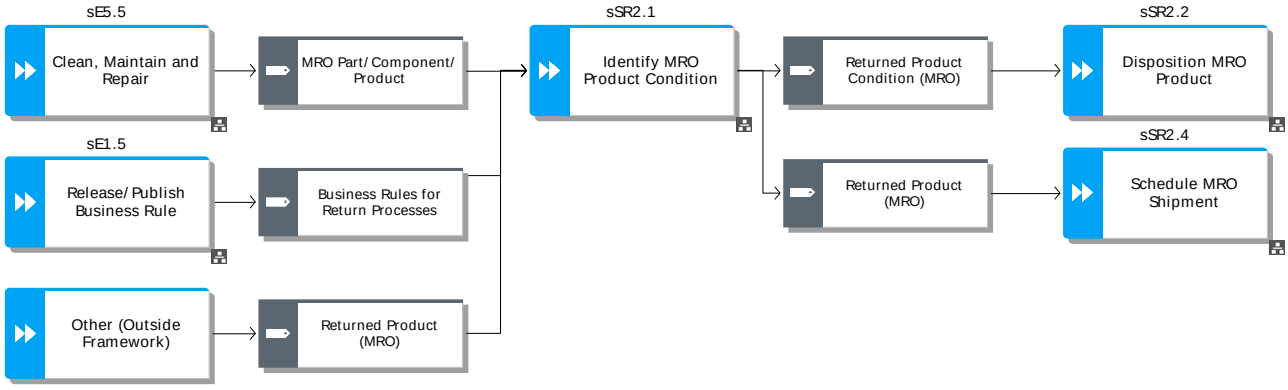
The process where the customer utilizes pre-determined MRO policies, business rules and product operating conditions as criteria to identify and confirm that an item requires maintenance, repair, overhaul or disposal. Includes operating failures and planned maintenance requirements.

Metrics	
AM.3.42	Percentage Unserviceable MRO Inventory in Identification

Practices	
BP.111	Electronic Technical Orders and Product Specifications
BP.169	Beyond Economic Repair (BER) Management

People	
HS.0108	Quality Management
HS.0148	Technical Manual Reading
HS.0149	Test Stand Operations

Workflow



sSR2.2 Disposition MRO Product

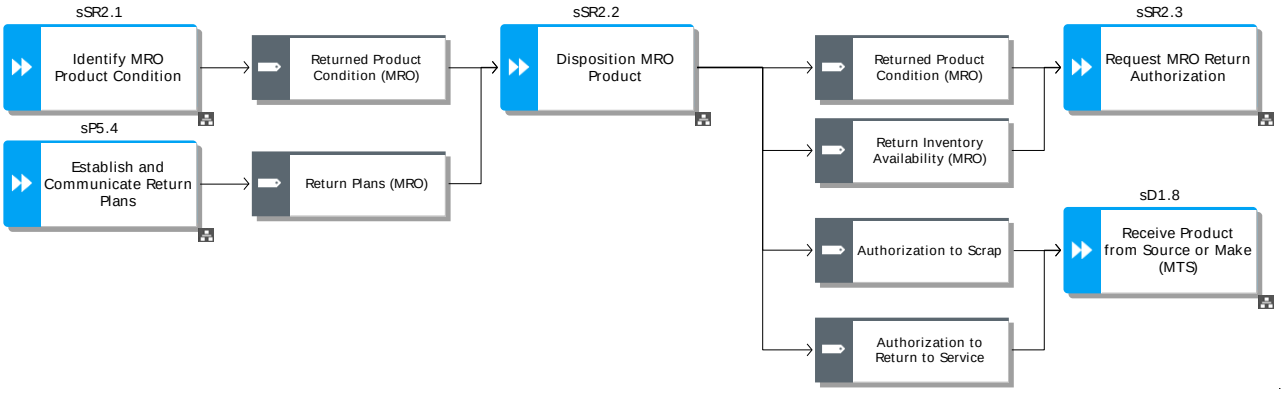
The process of the customer determining whether to service the item, what service is required, and who the appropriate service provider would be to service the item. Outputs include a decision to: (1) send a return authorization request to a service provider, (2) send the product back into service without requiring a return authorization request, or (3) discard the item.

Metrics	
RL.3.6	% Identified MRO Products Returned To Service
AM.3.29	Percentage Defective Inventory in Disposition
AM.3.39	Percentage Unserviceable MRO Inventory in Disposition

Practices	
BP.109	Carcass Prepositioning
BP.110	Product Development/Engineering/Disposition Collaboration
BP.169	Beyond Economic Repair (BER) Management

People	
HS.0031	Customer Repair and Return Policy and Process
HS.0046	ERP Systems
HS.0058	Inventory Management
HS.0122	Reverse Logistics
HS.0157	Warranty process and policy

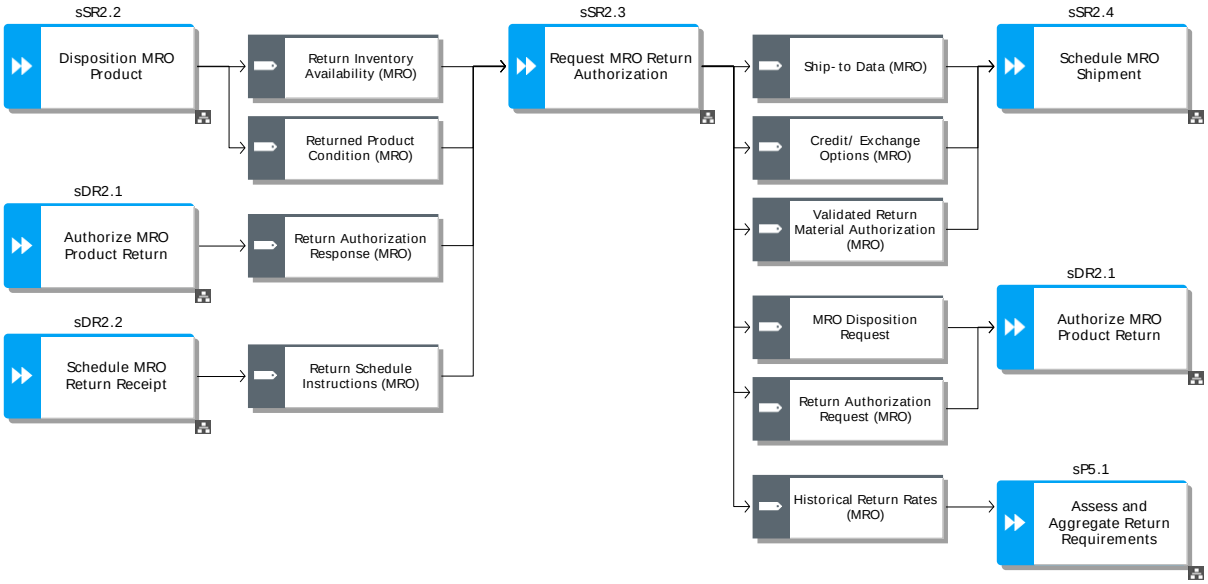
Workflow



sSR2.3 Request MRO Return Authorization

The process of a customer requesting and obtaining authorization, from a service provider, for the return of an MRO product. In addition to discussing the MRO issue, the customer and service provider would discuss enabling conditions such as return replacement or credit, packaging, handling, transportation and import / export requirements to facilitate the efficient return of the MRO product to the service provider. The customer may need to go through several return authorization iterations with multiple service providers before authorization is received.

Metrics	
AM.3.41	Percentage Unserviceable MRO Inventory in Return Authorization
Practices	
BP.143	Preventive Returns
BP.168	Rotable Spares Pool
BP.169	Beyond Economic Repair (BER) Management
People	
HS.0031	Customer Repair and Return Policy and
Process HS.0046	ERP Systems
HS.0058	Inventory Management
HS.0069	Logistics Management
HS.0122	Reverse Logistics
Workflow	



sSR2.4 Schedule MRO Shipment

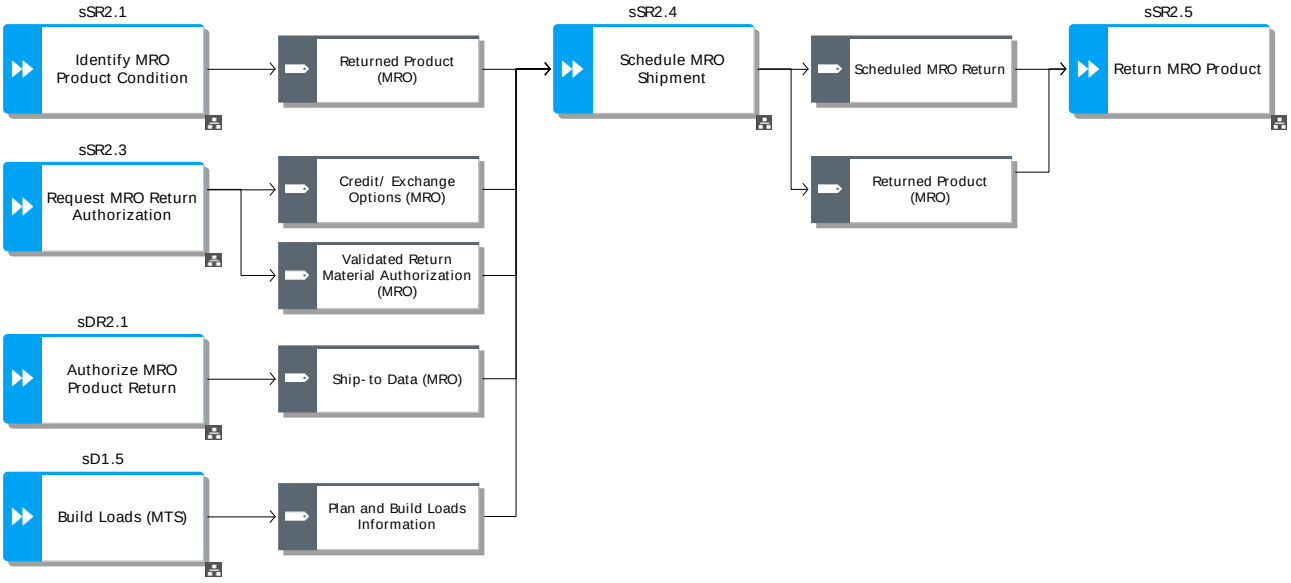
The process where the customer develops the schedule for a carrier to pick-up and deliver the MRO product. Activities include selecting the carrier and rates, preparing the item for transfer, preparing scheduling documentation and managing overall scheduling administration.

Metrics	
RL.3.28	% Shipping Schedules that Support Customer Required Return by Date
AM.3.43	Percentage Unserviceable MRO Inventory in Scheduling

Practices	
BP.109	Carcass Prepositioning
BP.167	Electronic Returns Tracking

People	
HS.0069	Logistics Management
HS.0122	Reverse Logistics

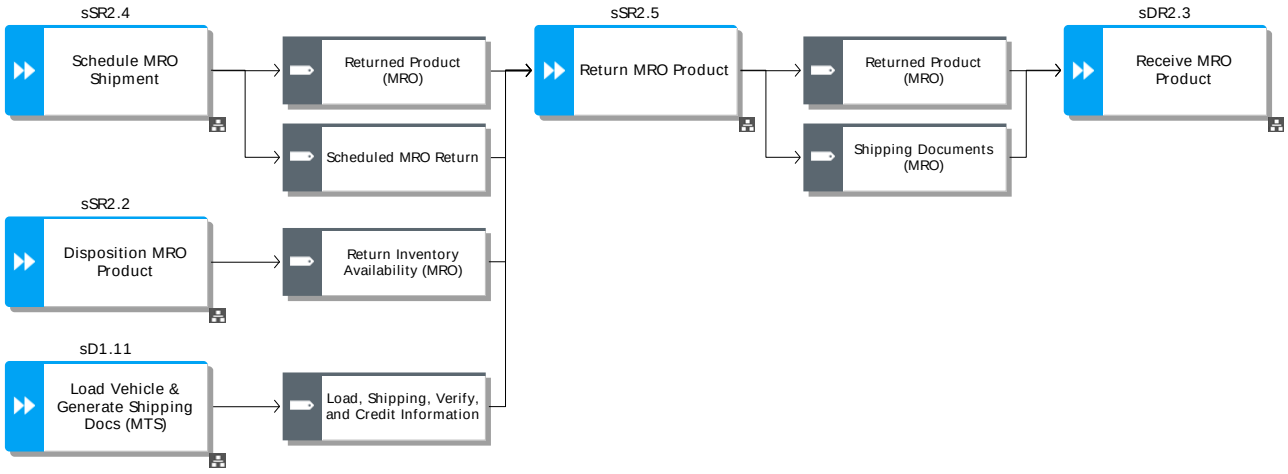
Workflow



sSR2.5 Return MRO Product

The process where the customer packages, and handles the MRO product in preparation for shipping in accord with pre-determined conditions. The product is then provided by the customer to the carrier who physically transports the product and its associated documentation to the service provider.

Metrics	
RL.3.5	% Error-free Returns Shipped
RL.3.47	Return Shipments Shipped on Time
CO.3.15	Order Deliver and / or Install Costs
AM.3.40	Percentage Unserviceable MRO Inventory in Transportation
Practices	
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool
People	
HS.0046	ERP Systems
HS.0069	Logistics Management
HS.0122	Reverse Logistics
Workflow	



sDR2 Deliver Return MRO Product

The receipt of Maintenance, Repair and Overhaul (MRO) products or company assets for the purpose of servicing, repairing or upgrading it, as defined by Maintenance Plans or the occurrence or anticipation of risk of failure. Generally, company assets managed through a MRO process are expected to be refurbished to a useable condition and returned to service. The Return process does not represent the actual maintenance, repair or overhaul activities; these are generally represented by Make processes. The physical disposition of the product may not be part of the return process.

Hierarchy	
sDR2.1	Authorize MRO Product Return
sDR2.2	Schedule MRO Return Receipt
sDR2.3	Receive MRO Product
sDR2.4	Transfer MRO Product

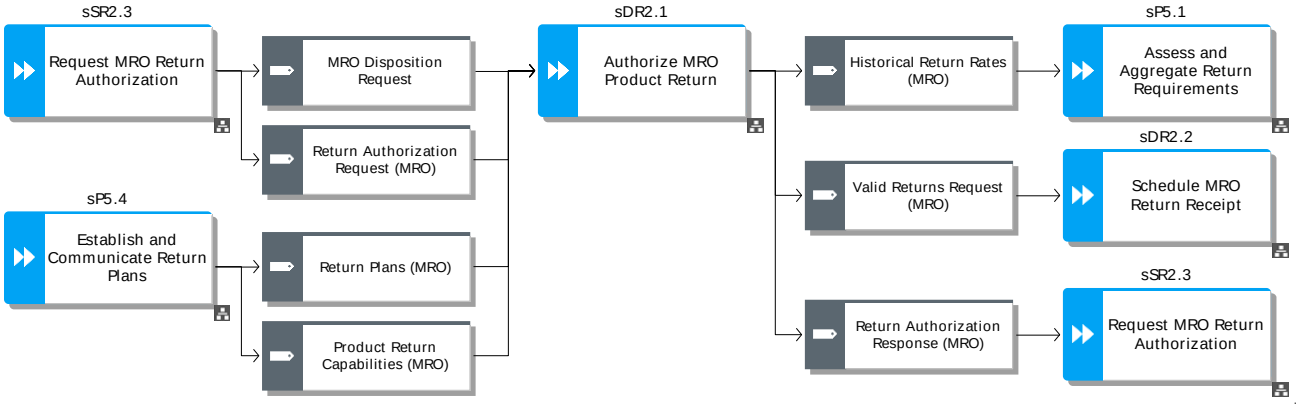
Metrics	
RL.3.13	% of MRO returns delivered to the correct service provider location
RS.1.1	Order Fulfillment Cycle Time
RS.3.19	Current customer return order cycle time
AG.2.5	Upside Deliver Return Adaptability
AG.3.3	Additional deliver return volume
AG.3.31	Current Deliver Return Volume
AG.3.44	Customer return order cycle time reestablished and sustained in 30 days
CO.2.2	Cost to Source
CO.3.14	Order Management Cost
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.3.12	Deliver Return Cycle Time
AM.3.39	Percentage Unserviceable MRO Inventory in Disposition

Practices	
BP.067	Returns Inventory Reduction

sDR2.1 Authorize MRO Product Return

The process where a service provider receives an MRO product return authorization request from a customer, determines if the item can be accepted for MRO and communicates their decision to the customer. Accepting the request would include negotiating the conditions of the return with the customer, including authorizing return replacement or credit. Rejecting the request would include providing a reason for the rejection to the customer.

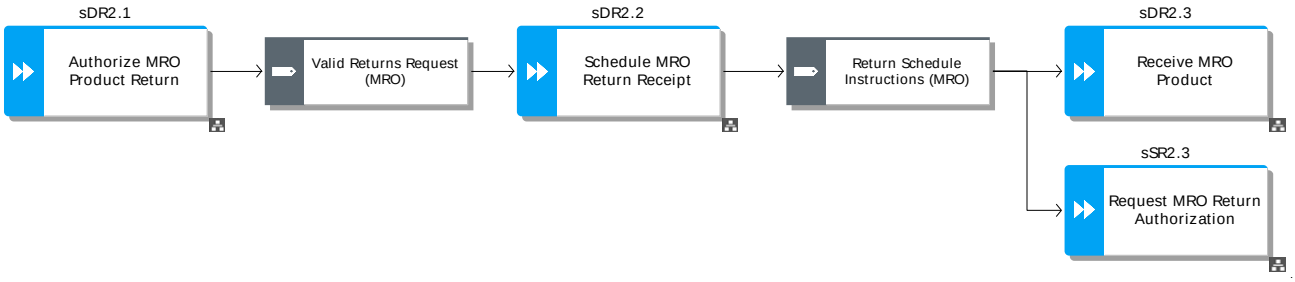
Metrics	
RS.3.7	Authorize MRO Product Return Cycle Time
Practices	
BP.168	Rotable Spares Pool
BP.169	Beyond Economic Repair (BER) Management
People	
HS.0029	Customer Relationship Management (CRM)
HS.0058	Inventory Management
HS.0069	Logistics Management
HS.0083	Order Management
HS.0122	Reverse Logistics
HS.0157	Warranty process and policy
Workflow	



sDR2.2 Schedule MRO Return Receipt

The process where the service provider evaluates the MRO service requirements including negotiated conditions and develops a schedule that tells the Customer when to ship the part. The scheduling activity would also inform Receiving when to expect the shipment and where to send the part, for induction or storage, upon receipt.

Metrics	
RS.3.121	Schedule MRO Return Receipt Cycle Time
Practices	
BP.112	Return Shipping Consolidation
BP.169	Beyond Economic Repair (BER) Management
People	
HS.0029	Customer Relationship Management (CRM)
HS.0069	Logistics Management
HS.0083	Order Management
Workflow	



sDR2.3 Receive MRO Product

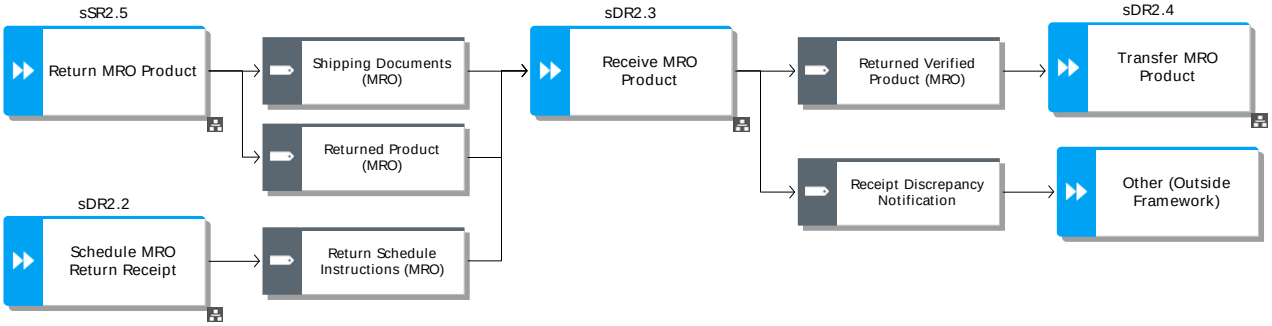
The process where the service provider receives and verifies the returned MRO item against the return authorization and other documentation and prepares the item for transfer.

Metrics	
RS.3.106	Receive MRO Product Cycle Time

Practices	
BP.108	Return Policy Conformance Integration
BP.109	Carcass Prepositioning
BP.137	Carcass Disassembly
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool

People	
HS.0083	Order Management
HS.0108	Quality Management
HS.0110	Receiving
HS.0157	Warranty process and policy

Workflow



sDR2.4 Transfer MRO Product

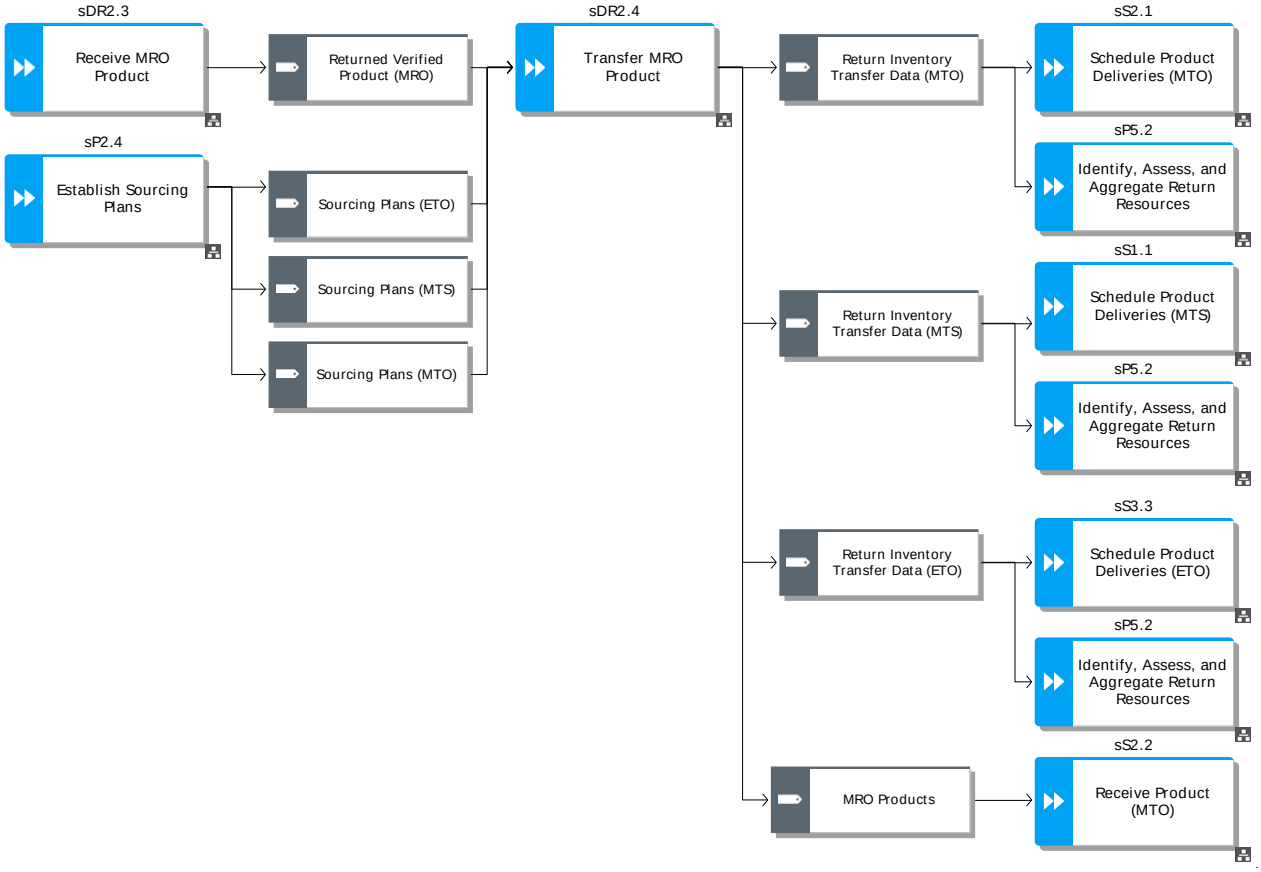
The process where the service provider transfers the MRO product to the appropriate process to implement the disposition decision.

Metrics	
RS.3.138	Transfer MRO Product Cycle Time

Practices	
BP.108	Return Policy Conformance Integration
BP.109	Carcass Prepositioning
BP.112	Return Shipping Consolidation
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool

People	
HS.0058	Inventory Management
HS.0075	Material handling equipment usage
HS.0083	Order Management

Workflow



sSR3 Source Return Excess Product

The return of excess or aging inventory or obsolete products as defined by the terms and conditions of a customer/supplier contract. The intention of excess product returns is to reallocate inventory to a location or organization that can sell the product that is considered in excess in the current location. The physical disposition of the product may not be part of the return process.

Hierarchy	
sSR3.1	Identify Excess Product Condition
sSR3.2	Disposition Excess Product
sSR3.3	Request Excess Product Return Authorization
sSR3.4	Schedule Excess Product Shipment
sSR3.5	Return Excess Product

Metrics	
RL.3.10	% of Excess Product Returns Delivered Complete to the Designated Return Center
RS.1.1	Order Fulfillment Cycle Time
RS.3.127	Source Return Cycle Time
CO.2.5	Cost to Return
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.3.8	Average age of Excess Inventory
AM.3.37	Percentage Excess Inventory

Practices	
BP.125	Automated Identification/Disposition of Over Shipments
BP.126	Supply Chain Visibility System
BP.127	Automated Alerts for Material Management
BP.129	Return Policy included with Shipping Document

sSR3.1 Identify Excess Product Condition

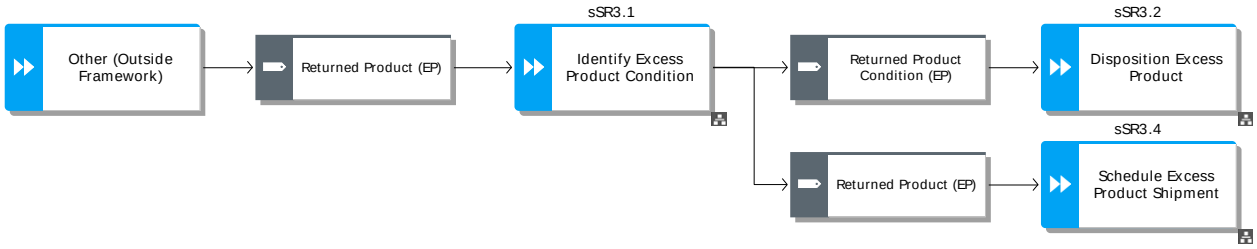
The process where the customer utilizes planned policies, business rules and product inspection as criteria to identify and confirm that material is in excess of the current requirements.

Metrics	
RL.3.40	Number of occurrences where excessive inventory is returned and followed
AM.3.36	Percentage Excess Inventory in Identification

Practices	
BP.125	Automated Identification/Disposition of Over Shipments
BP.142	Remote Return Authorization

People	
HS.0029	Customer Relationship Management (CRM)
HS.0101	Production Planning
HS.0157	Warranty process and policy

Workflow



sSR3.2 Disposition Excess Product

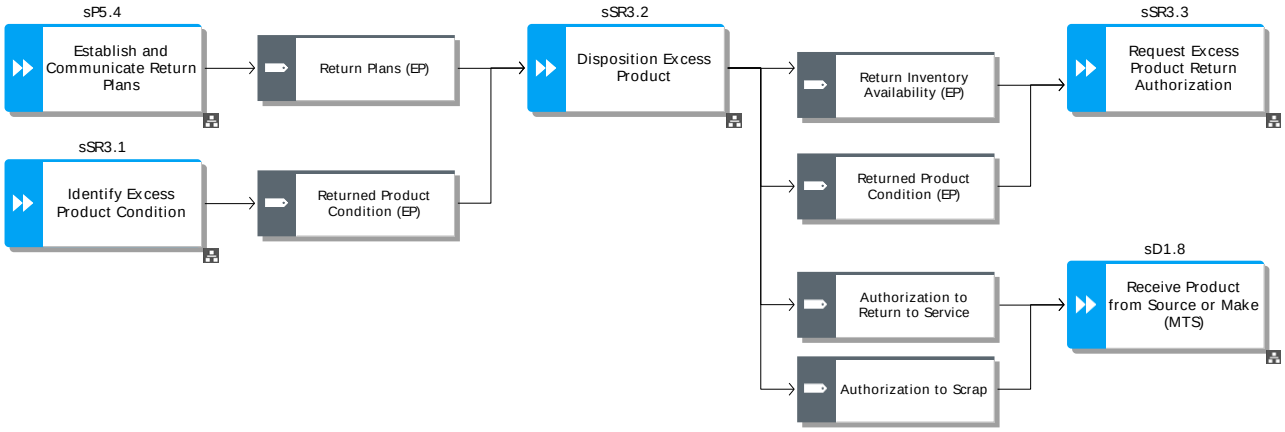
The process of the customer determining whether to return the excess material and identification of a designated return center a return authorization.

Metrics	
RL.3.39	Number of occurrences of incorrect designated return center
AM.3.33	Percentage Excess Inventory in Disposition

Practices	
BP.112	Return Shipping Consolidation
BP.125	Automated Identification/Disposition of Over Shipments
BP.142	Remote Return Authorization

People	
HS.0058	Inventory Management

Workflow



sSR3.3 Request Excess Product Return Authorization

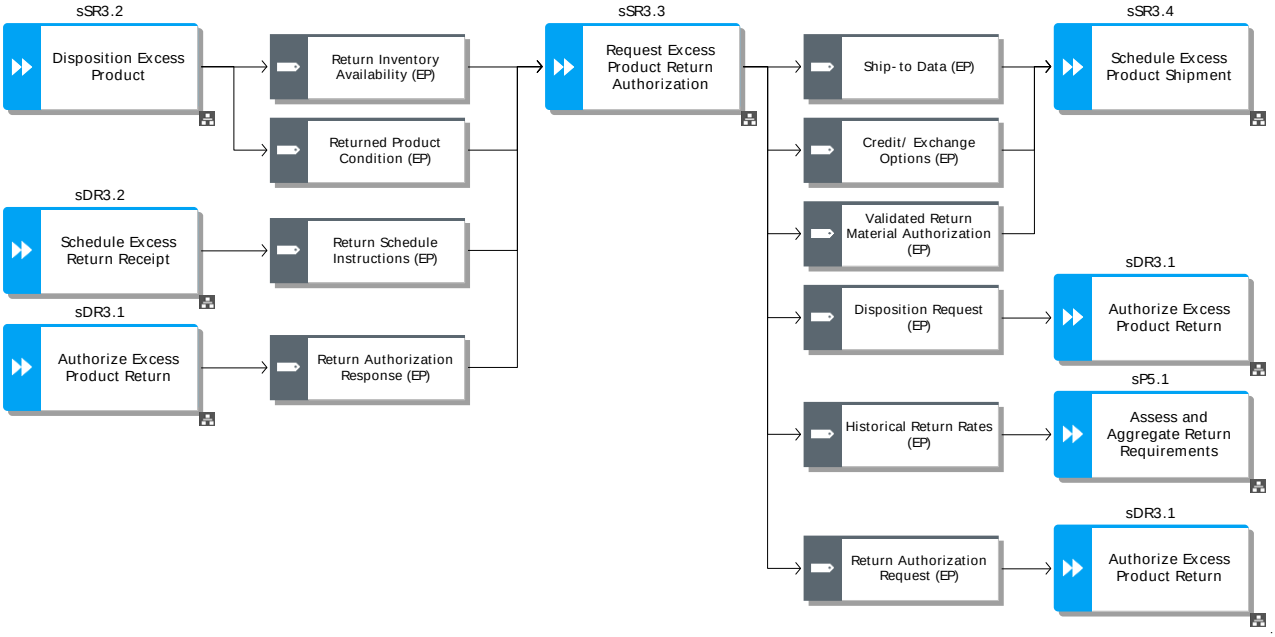
The process of a customer requesting and obtaining authorization, from the designated return center, for the return of excess product. Additionally, the customer and designated return center would negotiate enabling conditions such as return credit or cash discount, packaging, handling, transportation and import / export requirements to facilitate the efficient return of the excess product.

Metrics	
AM.3.35	Percentage Excess Inventory in Request Return Authorization

Practices	
BP.125	Automated Identification/Disposition of Over Shipments
BP.129	Return Policy included with Shipping Document
BP.140	Return Authorization Required
BP.141	Proactive Return Authorization
BP.142	Remote Return Authorization
BP.168	Rotable Spares Pool

People	
HS.0026	Credit/Collection Management
HS.0031	Customer Repair and Return Policy and Process
HS.0069	Logistics Management

Workflow



sSR3.4 Schedule Excess Product Shipment

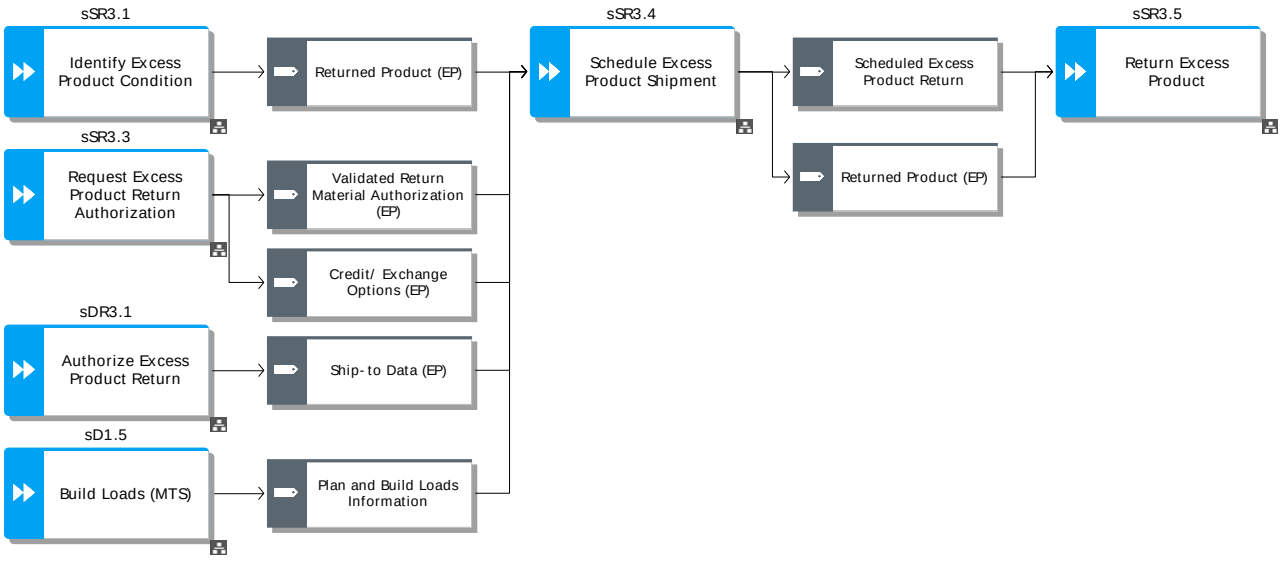
The process where the customer develops the schedule for a carrier to pick-up the excess product. Activities include selecting the carrier and rates, preparing the item for transfer, preparing scheduling documentation and managing overall scheduling administration.

Metrics	
RL.3.28	% Shipping Schedules that Support Customer Required Return by Date
AM.3.38	Percentage Excess Inventory in Scheduling

Practices	
BP.112	Return Shipping Consolidation
BP.123	Return Load Optimization
BP.140	Return Authorization Required
BP.167	Electronic Returns Tracking

People	
HS.0069	Logistics Management

Workflow



sSR3.5 Return Excess Product

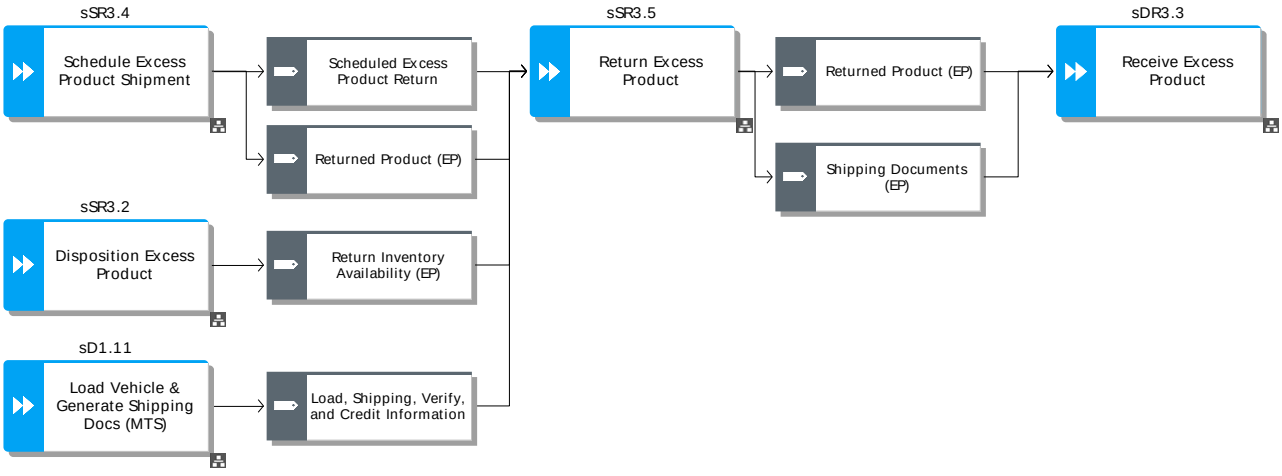
The process where the customer packages, and handles the excess product in preparation for shipping in accord with pre-determined conditions. The product is then provided by the customer to the carrier who physically transports the product and its associated documentation to the last known holder or designated return center.

Metrics	
RL.3.5	% Error-free Returns Shipped
RL.3.47	Return Shipments Shipped on Time
CO.3.15	Order Delivery and / or Install Costs
AM.3.34	Percentage Excess Inventory in Transportation

Practices	
BP.124	Return Shipment Insurance
BP.125	Automated Identification/Disposition of Over Shipments
BP.140	Return Authorization Required
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool

People	
HS.0046	ERP Systems
HS.0058	Inventory Management
HS.0069	Logistics Management

Workflow



sDR3 Deliver Return Excess Product

The receipt of excess or aging inventory or obsolete products as defined by the terms and conditions of a customer/supplier contract. The intention of excess product returns is to reallocate inventory to a location or organization that can sell the product that is considered in excess in the current location. The physical disposition of the product may not be part of the return process.

Hierarchy	
sDR3.1	Authorize Excess Product Return
sDR3.2	Schedule Excess Return Receipt
sDR3.3	Receive Excess Product
sDR3.4	Transfer Excess Product

Metrics	
RL.3.10	% of Excess Product Returns Delivered Complete to the Designated Return Center
RS.1.1	Order Fulfillment Cycle Time
RS.3.19	Current customer return order cycle time
AG.2.5	Upside Deliver Return Adaptability
AG.3.3	Additional deliver return volume
AG.3.31	Current Deliver Return Volume
AG.3.44	Customer return order cycle time reestablished and sustained in 30 days
CO.2.2	Cost to Source
CO.3.14	Order Management Cost
CO.2.5	Cost to Return
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.3.25	Return for Recycle Rate
AM.3.37	Percentage Excess Inventory

Practices	
BP.067	Returns Inventory Reduction
BP.125	Automated Identification/Disposition of Over Shipments
BP.126	Supply Chain Visibility System
BP.127	Automated Alerts for Material Management
BP.129	Return Policy included with Shipping Document

sDR3.1 Authorize Excess Product Return

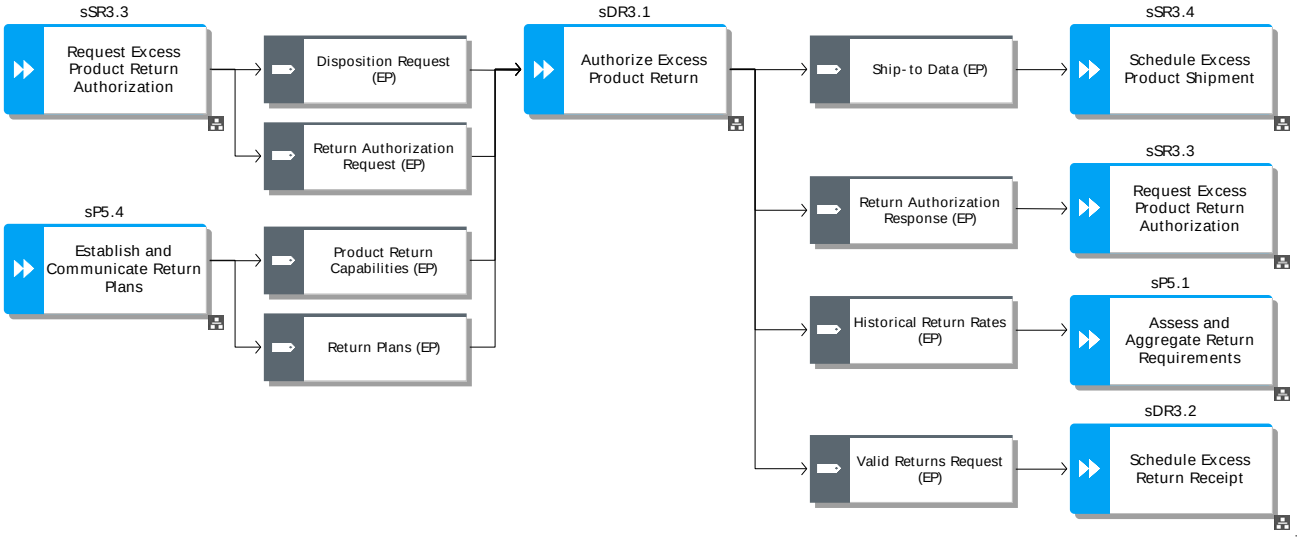
The process where the designated return center receives an excess product return authorization request from a customer, determines if the item can be accepted and communicates their decision to the customer. Accepting the request would include negotiating the conditions of the return with the customer, including authorizing credit or cash discount. Rejecting the request would include providing a reason for the rejection to the customer.

Metrics	
RS.3.6	Authorize Excess Product Return Cycle Time

Practices	
BP.125	Automated Identification/Disposition of Over Shipments
BP.129	Return Policy included with Shipping Document
BP.140	Return Authorization Required
BP.142	Remote Return Authorization
BP.168	Rotable Spares Pool

People	
HS.0026	Credit/Collection Management
HS.0031	Customer Repair and Return Policy and Process
HS.0058	Inventory Management
HS.0069	Logistics Management

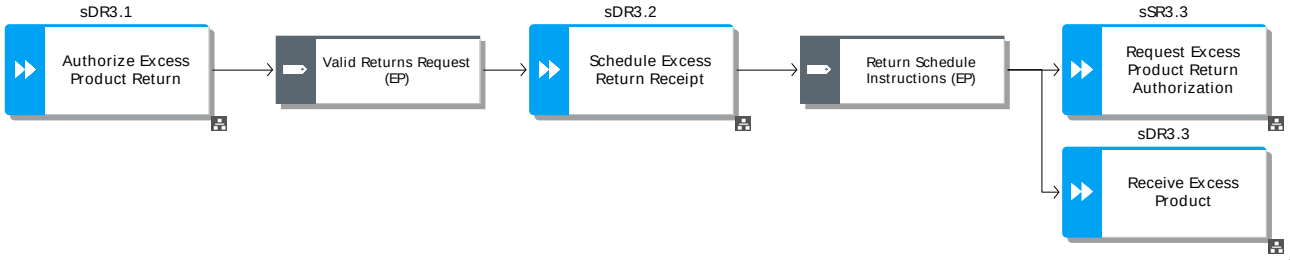
Workflow



sDR3.2 Schedule Excess Return Receipt

The process where the l designated return center evaluates an authorized excess material return to determine packaging and handling requirements. This assessment will lead to the development of a return disposition decision and a return schedule with terms and conditions that will tell the Customer how and when to ship the product. The scheduling activity would also inform the Return Center's Receiving department when to expect the shipment and where to send the product, for disposition, upon receipt.

Metrics	
RS.3.119	Schedule Excess Return Receipt Cycle Time
Practices	
BP.123	Return Load Optimization
BP.140	Return Authorization Required
BP.167	Electronic Returns Tracking
People	
HS.0058	Inventory Management
HS.0069	Logistics Management
Workflow	



sDR3.3 Receive Excess Product

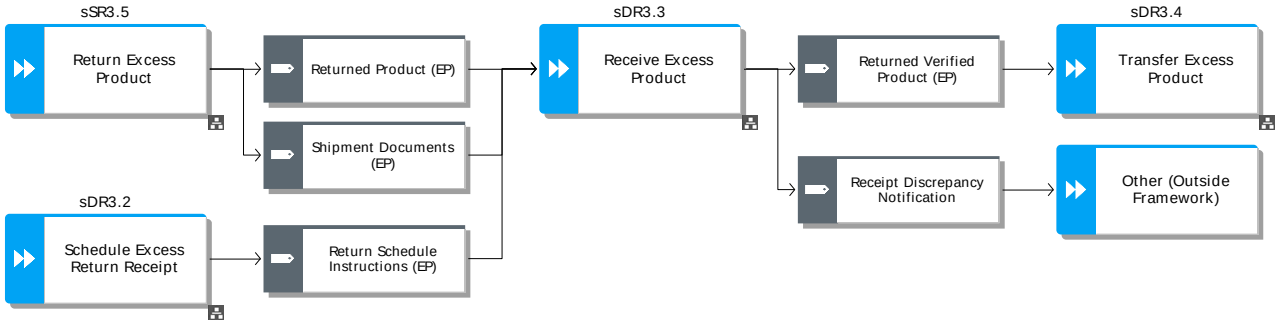
The process where the designated return center receives and verifies the returned excess product and associated documentation against the return authorization and other documentation and prepares the item for transfer. Administrate any discrepancies that arise.

Metrics	
RS.3.105	Receive Excess Product Cycle Time

Practices	
BP.124	Return Shipment Insurance
BP.125	Automated Identification/Disposition of Over Shipments
BP.140	Return Authorization Required
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool

People	
HS.0034	Discrepancy Reporting and Resolution
HS.0058	Inventory Management
HS.0069	Logistics Management

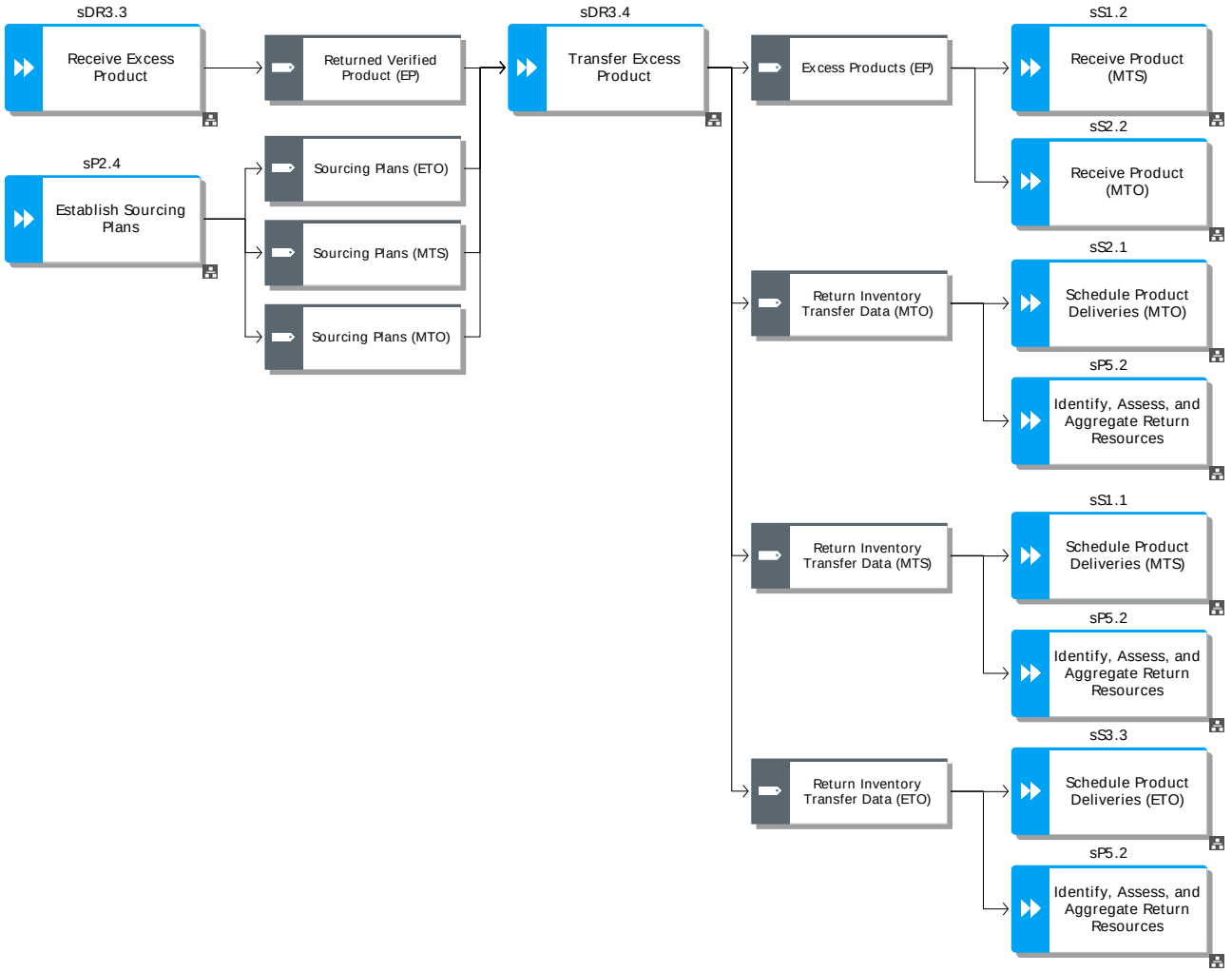
Workflow



sDR3.4 Transfer Excess Product

The process where the designated return center transfers the excess product to the appropriate process to implement the disposition decision.

Metrics	
RS.3.137	Transfer Excess Product Cycle Time
Practices	
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool
People	
HS.0058	Inventory Management
Workflow	



Enable

sE Enable

The processes associated with establishing, maintaining and monitoring information, relationships, resources, assets, business rules, compliance and contracts required to operate the supply chain as well as monitoring and managing the overall performance of the supply chain. Enable processes provide critical inputs and directions to support the realization and governance of the planning and execution processes of supply chains.

Enable processes interact and manage alignment with processes in other domains (for example: Financial processes, HR (Human Resource) processes, I(C)T (Information, Communication & Technology) processes, facilities management processes, product & portfolio management processes, product and process design processes and sales and support processes).

Hierarchy	
sE1	Manage Supply Chain Business Rules
sE2	Manage Supply Chain Performance
sE3	Manage Data and Information
sE4	Manage Supply Chain Human Resources
sE5	Manage Supply Chain Assets
sE6	Manage Supply Chain Contracts
sE7	Manage Supply Chain Network
sE8	Manage Regulatory Compliance
sE9	Manage Supply Chain Risk
sE10	Manage Supply Chain Procurement
sE11	Manage Supply Chain Technology

Metrics	
AG.1.1	Upside Supply Chain Adaptability
AG.1.2	Downside Supply Chain Adaptability
AG.1.3	Overall Value at Risk (VAR)
AM.1.1	Cash-to-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
CO.1.1	Total Supply Chain Management Costs
CO.1.2	Cost of Goods Sold
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time

sE1 Manage Supply Chain Business Rules

The process of establishing, documenting, communicating and publishing supply chain business rules. A business rule is a statement or parameter that defines or constrains some aspect of the business and is generally used in decision making. Business rules are intended to influence the outcomes of operating the supply chain. Business rules can apply to people, processes, corporate behavior and computing systems in an organization, and are put in place to help the organization achieve its goals while maintaining compliance to internal and external policies and laws

An example business rule may state "no returns accepted without a return authorization". Types of supply chain business rules include:

- Performance goals
- Rules to ensure or enforce compliance to regulations and policies (e.g. ITAR)
- Planning rules such as frequency, horizon and level of plans, planning BOMs
- Sourcing rules such as approved suppliers, blacklisted suppliers
- Manufacturing BOMs, equipment maintenance rules
- Customer service and customer segmentation rules such as order fulfillment lead time, inventory stocking methods and levels, allowable origin/destination combinations
- Logistics rules such as routes and modes, approved transportation, warehousing and 3PL service providers
- Product return policies, defective product disposition rules, refund/replacement rules
- Collaboration rules to align decision making across organizations

Note: sE1 Manage Business Rules generally does not develop policies, it translates policies into business rules applied to supply chain processes.

Hierarchy	
sE1.1	Gather Business Rule Requirements
sE1.2	Interpret Business Rule Requirement
sE1.3	Document Business Rule
sE1.4	Communicate Business Rule
sE1.5	Release/Publish Business Rule
sE1.6	Retire Business Rule

Metrics	
RS.3.54	Manage Business Rules for PLAN Processes Cycle Time
RS.3.55	Manage Business Rules for Return Processes Cycle Time
RS.3.57	Manage Deliver Business Rules Cycle Time
RS.3.79	Manage Production Rules Cycle Time
RS.3.86	Manage Sourcing Business Rules Cycle Time

sE1 Manage Supply Chain Business Rules

Practices	
BP.023	Business Rule Management
BP.125	Automated Identification/Disposition of Over Shipments
BP.128	Vendor Recovery
BP.129	Return Policy included with Shipping Document
BP.131	Alternative Supplier Benchmarking
BP.132	Issue Invitation to Tender (Quote)
BP.134	Supplier Evaluation using Robust Evaluation Tool.
BP.166	Document Management System
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool
BP.035	Business Rule Review

People	
HS.0025	Business Rule/Policy Management
HS.0045	Environmental Requirements
HS.0054	Intellectual Property/Proprietary Data
HS.0061	Item Master/BOM/BoL Interpretation
HS.0149	Test Stand Operations

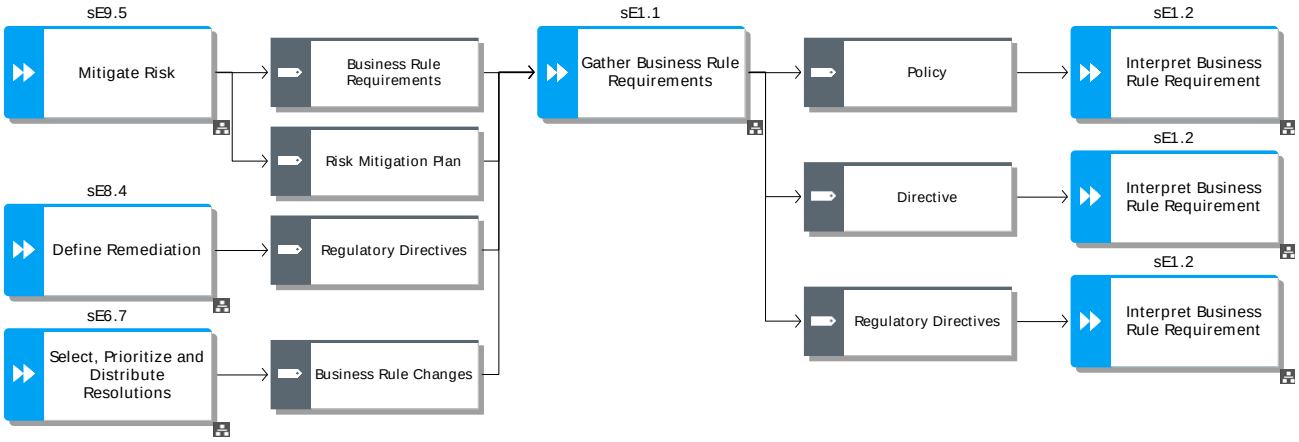
sE1.1 Gather Business Rule Requirements

The process of collecting, organizing, prioritizing and scheduling policies and directives requiring new supply chain business rules, changes to business rules or discontinuation of business rules. This may include scheduling and assigning activities to responsible individuals, groups or organizations.

Practices	
BP.023	Business Rule Management
BP.166	Document Management System
BP.175	Workflow Automation

People	
HS.0023	Controls and Compliance
HS.0025	Business Rule/Policy Management

Workflow



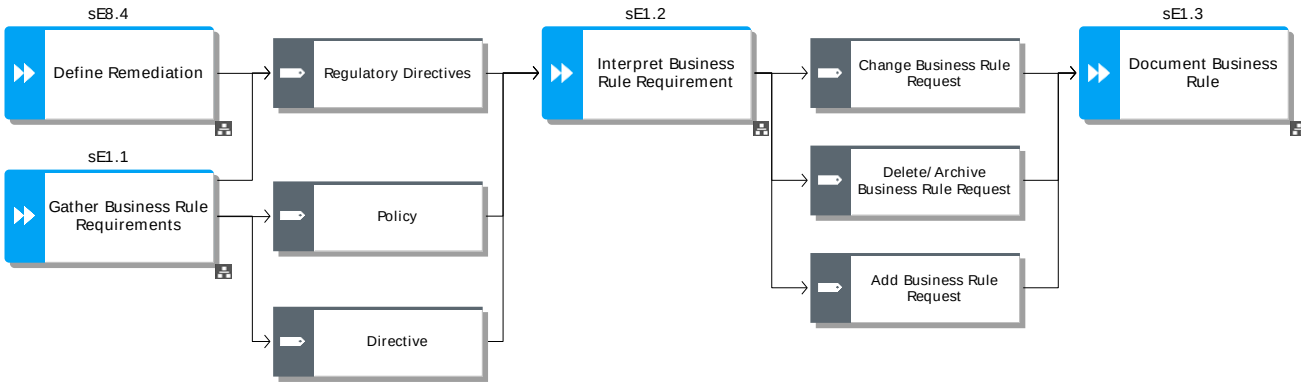
sE1.2 Interpret Business Rule Requirement

The process of determining how the policy or directive impacts supply chain processes, technology and business rules. This includes reviewing existing business rules and determining the need to add, change or delete business rules. The outcome is one or more of the following:

- Request to Add a Business Rule
- Request to Change a Business Rule
- Request to Delete or Archive a Business Rule

The purpose of this step is to identify the type of activities required and routing the request if required.

Practices	
BP.175	Workflow Automation
People	
HS.0023	Controls and Compliance
HS.0025	Business Rule/Policy Management
Workflow	



sE1.3 Document Business Rule

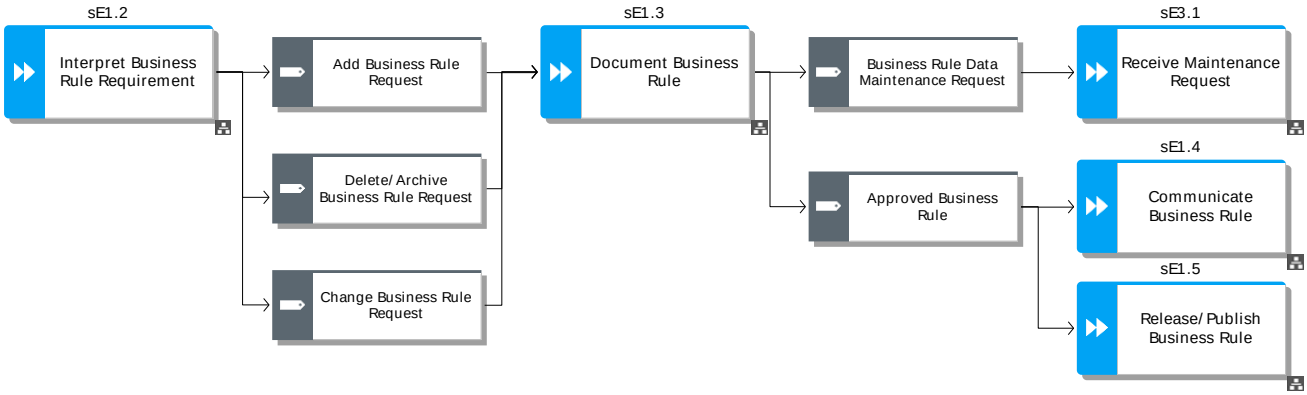
The process of writing the business rule in the appropriate system of record. This includes adding, editing and deleting policy and process documentation. A business rule includes a directive or policy, scope and effective date. Updates to existing business rules may include discontinuation information.

The final activity of Document Business Rule is obtaining formal approval. The output of this process step is a fully documented business rule that is signed off by the responsible function.

Practices	
BP.166	Document Management System
BP.175	Workflow Automation

People	
HS.0023	Controls and Compliance
HS.0025	Business Rule/Policy Management
HS.0041	EHS regulations
HS.0050	Import/Export Regulations
HS.0054	Intellectual Property/Proprietary Data
HS.0055	International Trade
HS.0066	Legislation and Standards
HS.0150	Total Quality Management (TQM)
HS.0157	Warranty process and policy

Workflow

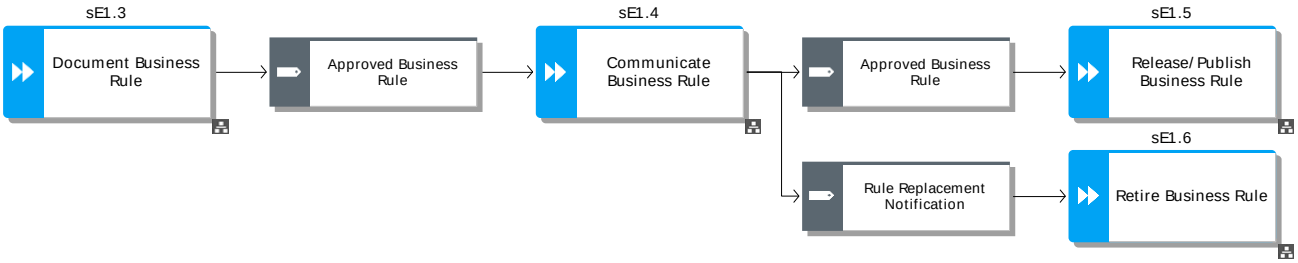


sE1.4 Communicate Business Rule

The process of creating awareness in the relevant organization and/or staff of the upcoming changes. This may include communications, training and education programs. For small or incremental changes a notice maybe sufficient.

Practices	
BP.166	Document Management System
BP.175	Workflow Automation

Workflow

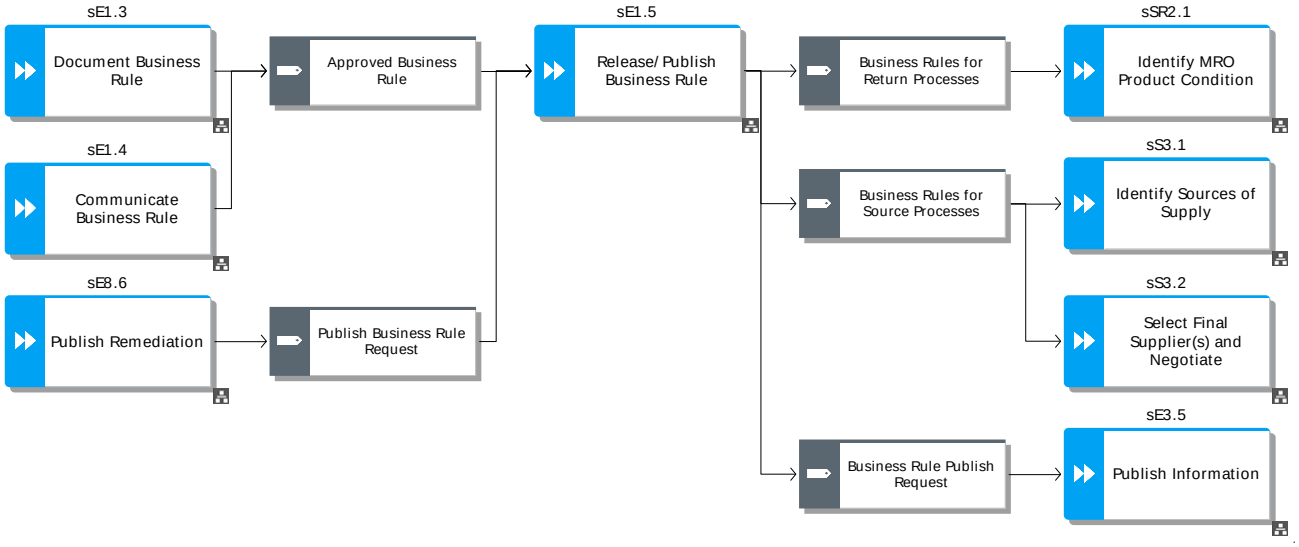


sE1.5 Release/Publish Business Rule

The process of activating the business rule. Business rules release may be time-phased --e.g. Bill of Materials release for newer revisions. This may include activation of a business rule in a software algorithm and starting to use a new or updated standard operating procedure. For large impact business rule changes this may include updating external websites, formal notifications to supply chain partners, etc. For business rules enacted in software and automated systems, this step should include appropriate modeling and testing prior to full activation in production instances.

Practices	
BP.166	Document Management System
BP.175	Workflow Automation

Workflow

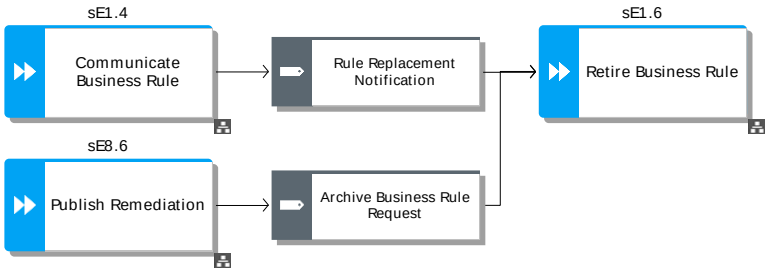


sE1.6 Retire Business Rule

The process of de-activating the business rule. Business rules retirement may be time-phased -- e.g. Bill of Materials replaced by newer revisions. This may include archiving the business rule in the associated software to avoid users from inadvertently using it or in order to comply to regulatory requirements or policies.

Practices	
BP.166	Document Management System
BP.175	Workflow Automation

Workflow



sE2 Manage Supply Chain Performance

The process of defining performance targets for supply chain metrics that align to overall business strategy and goals, and for reporting performance, identifying gaps in performance, performing root cause analysis, and developing and launching corrective actions to close gaps in performance. This process describes all levels and versions of managing supply chain performance. Examples include:

- Inventory Cycle Counting
- Inventory optimization projects
- Order cycle time reduction efforts
- Production and process quality improvement programs
- Supplier performance assessments
- Process and practice maturity assessments

Note: It is common for organizations to have multiple versions of this process in place, in different parts of the organization. At level-3 and 4, these processes may differ significantly depending on the objectives of each of these manage performance processes.

Hierarchy	
sE2.1	Initiate Reporting
sE2.2	Analyze Reports
sE2.3	Find Root Causes
sE2.4	Prioritize Root Causes
sE2.5	Develop Corrective Actions
sE2.6	Approve & Launch

Metrics	
RS.3.2	Assess Delivery Performance Cycle Time
RS.3.3	Assess Supplier Performance Cycle Time
RS.3.65	Manage Integrated Supply Chain Inventory Cycle Time
RS.3.70	Manage Performance of Return Processes Cycle Time
RS.3.71	Manage Performance of Supply Chain Cycle Time
RS.3.78	Manage Production Performance Cycle Time
CO.1.1	Total Supply Chain Management Costs

Practices	
BP.007	Baseline Inventory Monitoring
BP.008	Slow-moving Inventory Monitoring
BP.080	Performance Management
BP.082	Continuous Improvement
BP.183	Integrated Business Planning

BP.084	Inventory Cycle Counting
BP.083	Project Management
BP.088	360 Degree Closure
BP.089	Perfect Pick Put away
BP.090	Days of Supply Based MRP Proposal Management
BP.091	Work Center Load Evaluation
BP.092	Balance and firm within horizon
BP.093	Publish Production Plan
BP.103	Customer Data Line Of Responsibility
BP.128	Vendor Recovery
BP.129	Return Policy included with Shipping Document
BP.131	Alternative Supplier Benchmarking
BP.134	Supplier Evaluation using Robust Evaluation Tool.
BP.138	Theory of Constraints
BP.145	Vendor Collaboration
BP.151	Real time Package Tracking
BP.155	Standard Operating Procedures
BP.157	Just In Time Production
BP.160	Lean
BP.165	Convergence of SCOR with Lean and Six Sigma
BP.167	Electronic Returns Tracking
BP.013	Item Rationalization
BP.074	Process/Metrics Alignment

People	
HS.0010	Basic Finance
HS.0012	Benchmarking
HS.0065	Lean Manufacturing
HS.0072	Performance Management
HS.0082	Optimization
HS.0108	Quality Management
HS.0133	Six Sigma
HS.0142	Supply Chain Performance Measurements
HS.0150	Total Quality Management (TQM)

sE2.1 Initiate Reporting

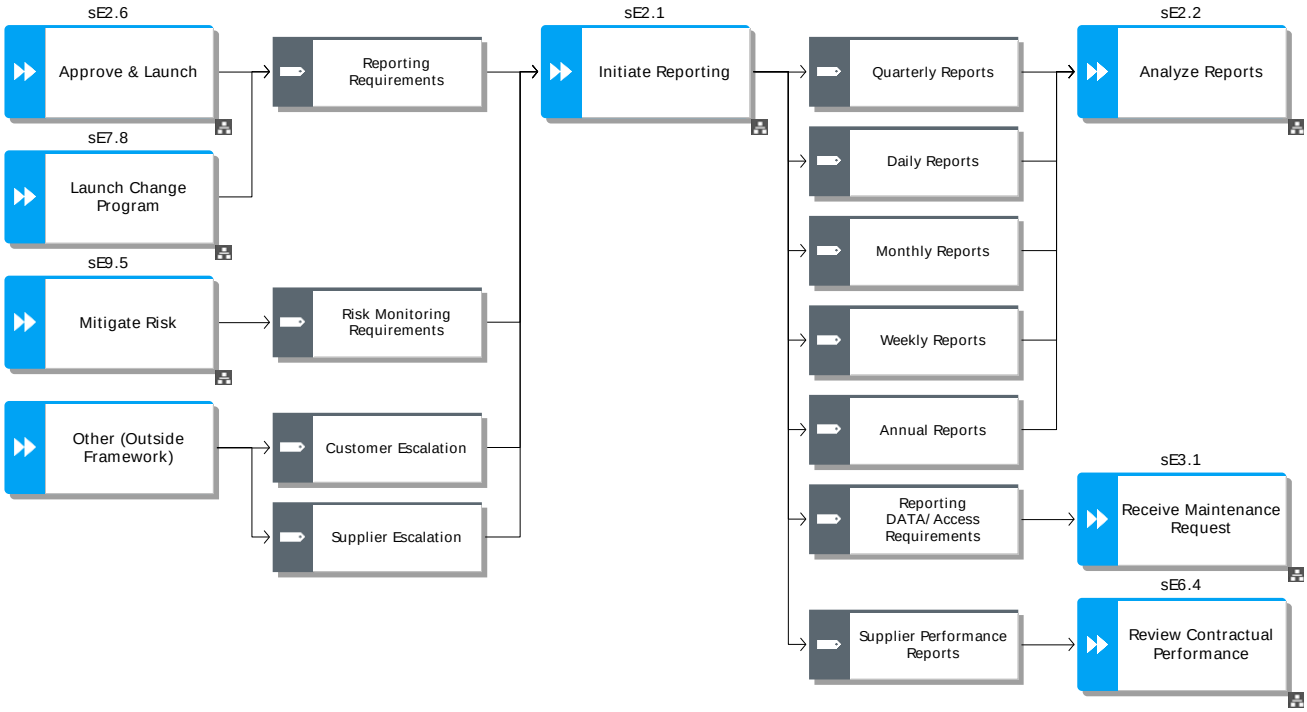
The process of scheduling, running reports, collecting and aggregating performance data. This includes running standard (pre-defined) reports as well as adhoc reporting. Ad hoc reporting includes developing a data collection plan and organizing data collection through:

- Inspections
- Measurement (e.g. stopwatch to measure duration of activities)
- Sampling
- Self-assessments (e.g. Baldridge Self-Assessment)

Note: Today reports may be delivered (pushed) to the user by electronic media. This process step represents the delivery of reports to the user in such scenarios.

People	
HS.0072	Performance Management

Workflow

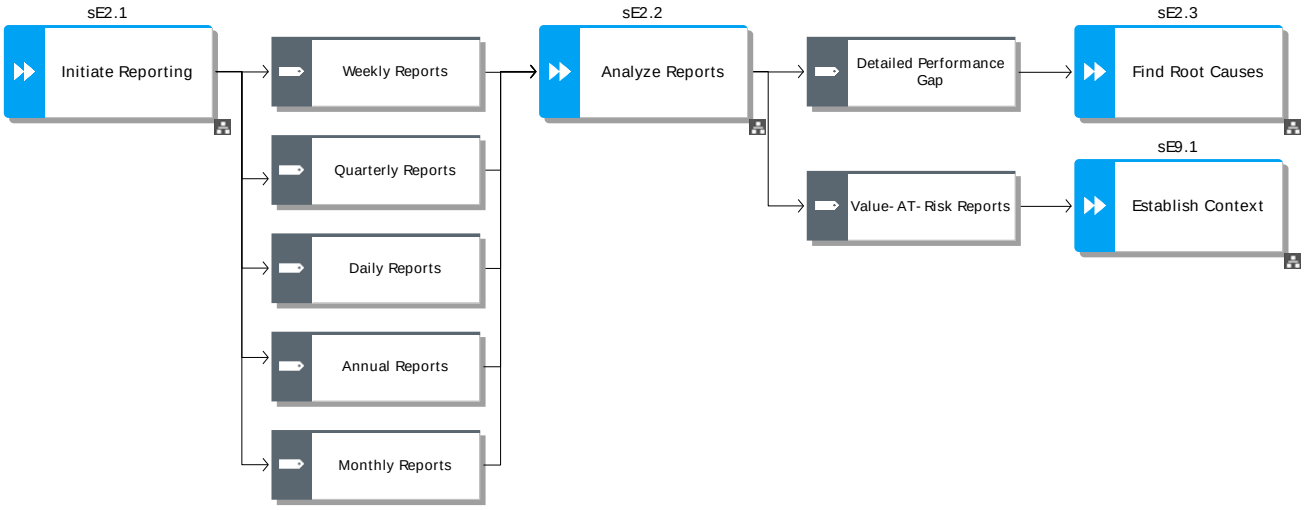


sE2.2 Analyze Reports

The process of reviewing the reported performance. This includes comparing actual performance and trends to targets set for each metric. Identify metrics that require root cause analysis and notification/scheduling of process owners or 'root cause analysis' resources.

People	
HS.0072	Performance Management
HS.0142	Supply Chain Performance Measurements

Workflow



sE2.3 Find Root Causes

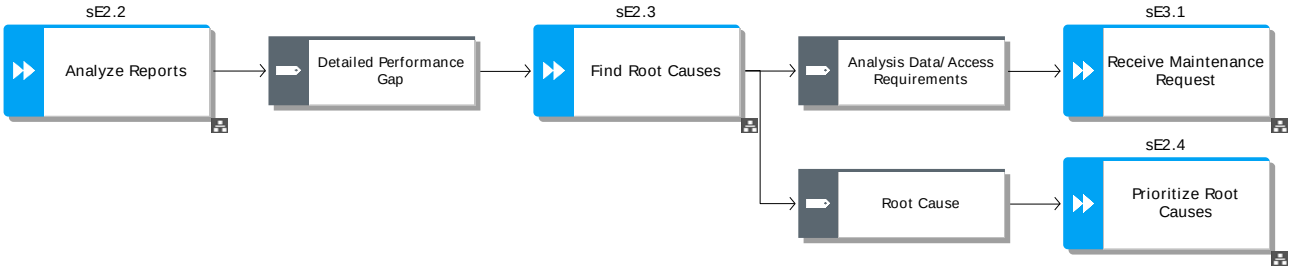
The process of analyzing the gaps in performance. Example root cause finding methods and techniques include:

- Adding commentary to reported data
- Metrics decomposition using diagnostic relationships of (SCOR) metrics
- Time studies, sampling, audits, cycle counting
- 5-Whys/Cause & Effect analysis
- Statistical Analysis Techniques: e.g. Histogram, Scatter Plots, ANOVA

All root causes are documented and quantified. Quantification is the calculation or estimation of the relative contribution to the gap in performance.

People	
HS.0072	Performance Management
HS.0142	Supply Chain Performance Measurements
HS.0152	Troubleshooting

Workflow

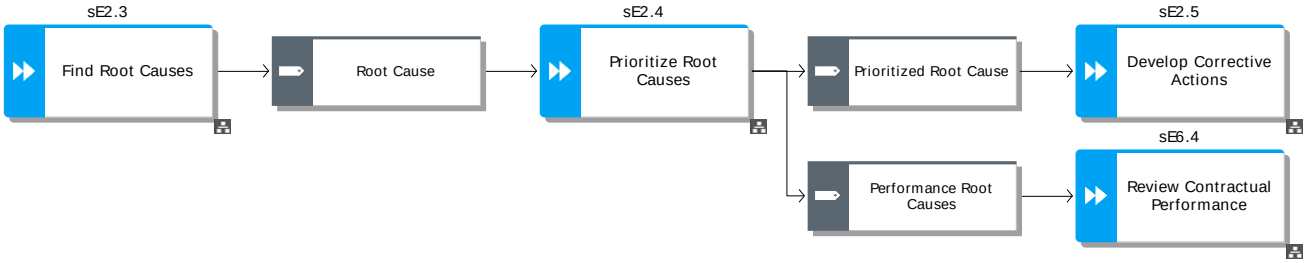


sE2.4 Prioritize Root Causes

The process of sorting root causes by relative contribution and prioritizing root causes. This includes assigning root causes to resources and scheduling development of corrective actions.

People	
HS.0072	Performance Management

Workflow



sE2.5 Develop Corrective Actions

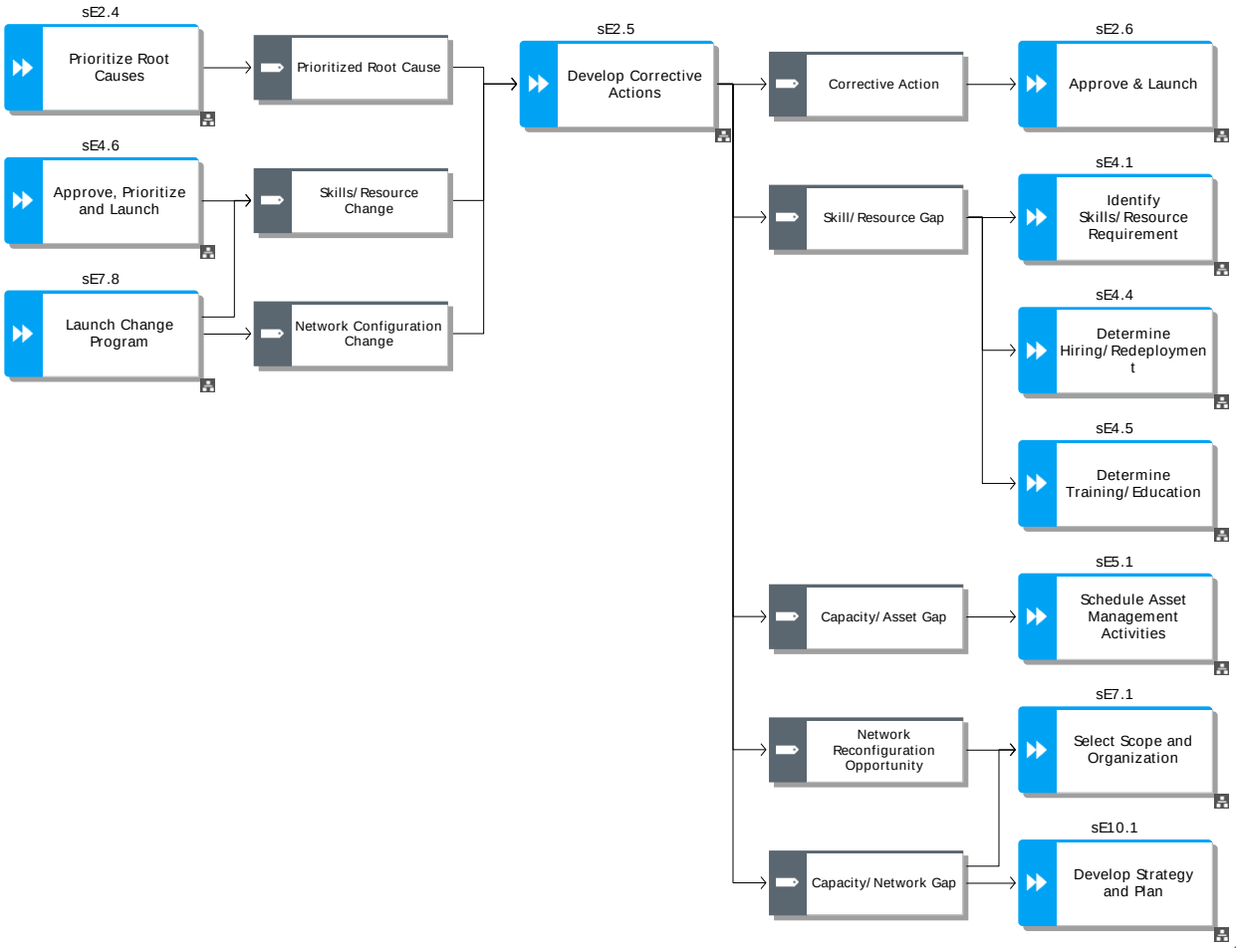
The process of identifying, documenting and testing corrective actions to address the root cause in order to close the performance gap. Corrections actions include:

- Organizational changes (hiring, redeployment)
- Policy changes (business rules)
- Process improvements (work instructions, training)
- Production equipment repairs/calibration
- Supply chain network reconfiguration
- Software algorithm changes (e.g. planning or scheduling logic)
- Technology introduction (new equipment, tools, software)

Note: This list of corrective actions is a general characterization for example purposes only. Different root causes may require different corrective actions.

People	
HS.0072	Performance Management

Workflow

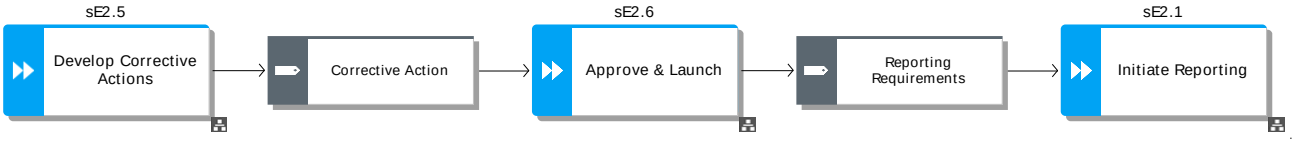


sE2.6 Approve & Launch

The process of obtaining approvals, prioritizing, communicating and launching the corrective actions.

People	
HS.0072	Performance Management

Workflow



sE3 Manage Data and Information

The process of collecting, maintaining and publishing data and information required to plan, operate, measure and manage the supply chain.

Examples of major data element categories include:

- Master Data: Foundational data on customers, suppliers, raw materials, BOMs, recipes, products, people, processes, and assets needed to operate the supply chain
- Transactional Data: Data associated with purchasing, receiving, material movements, value add operations, stocking, picking, packing, shipping, and delivery of materials and products
- Collaboration Data: Data from supply chain partners the provides the cross-organization supply chain visibility required to plan and execute the supply chain in an integrated end-to-end manner
- Meta Data: Data that describes and adds information about other data
- Performance Data: Metrics data and the associated raw input data needed to calculate metrics
- Other: Sensor / Internet of Things (IoT) data, social network data

Activities include adding, changing and deleting (archiving) information, maintaining user access (grant, revoke) and maintaining availability of the information (activate/deactivate).

Hierarchy	
sE3.1	Receive Maintenance Request
sE3.2	Determine/Scope Work
sE3.3	Maintain Content/Code
sE3.4	Maintain Access
sE3.5	Publish Information
sE3.6	Verify Information

Metrics	
RS.3.53	Maintain Source Data Cycle Time
RS.3.59	Manage Deliver Information Cycle Time
RS.3.68	Manage MAKE Information Cycle Time
RS.3.72	Manage PLAN Data Collection Cycle Time
RS.3.81	Manage Return Data Collection Cycle Time
CO.3.14	Order Management Costs

Practices	
BP.030	Inventory Record Accuracy
BP.007	Baseline Inventory Monitoring
BP.008	Slow-moving Inventory Monitoring

BP.012	Lot Tracking
BP.025	Self-Service Warranty Claim Submittal
BP.088	360 Degree Closure
BP.093	Publish Production Plan
BP.098	Mobile Access of Information
BP.099	Data Warehousing/Business Intelligence
BP.103	Customer Data Line Of Responsibility
BP.111	Electronic Technical Orders and Product Specifications
BP.126	Supply Chain Visibility System
BP.127	Automated Alerts for Material Management
BP.128	Vendor Recovery
BP.145	Vendor Collaboration
BP.160	Lean
BP.167	Electronic Returns Tracking

People	
HS.0033	Data management
HS.0046	ERP Systems
HS.0053	Installed base management
HS.0056	Interpreting Specifications
HS.0081	Office automation tools
HS.0098	Product Information Management (Product Data Management)

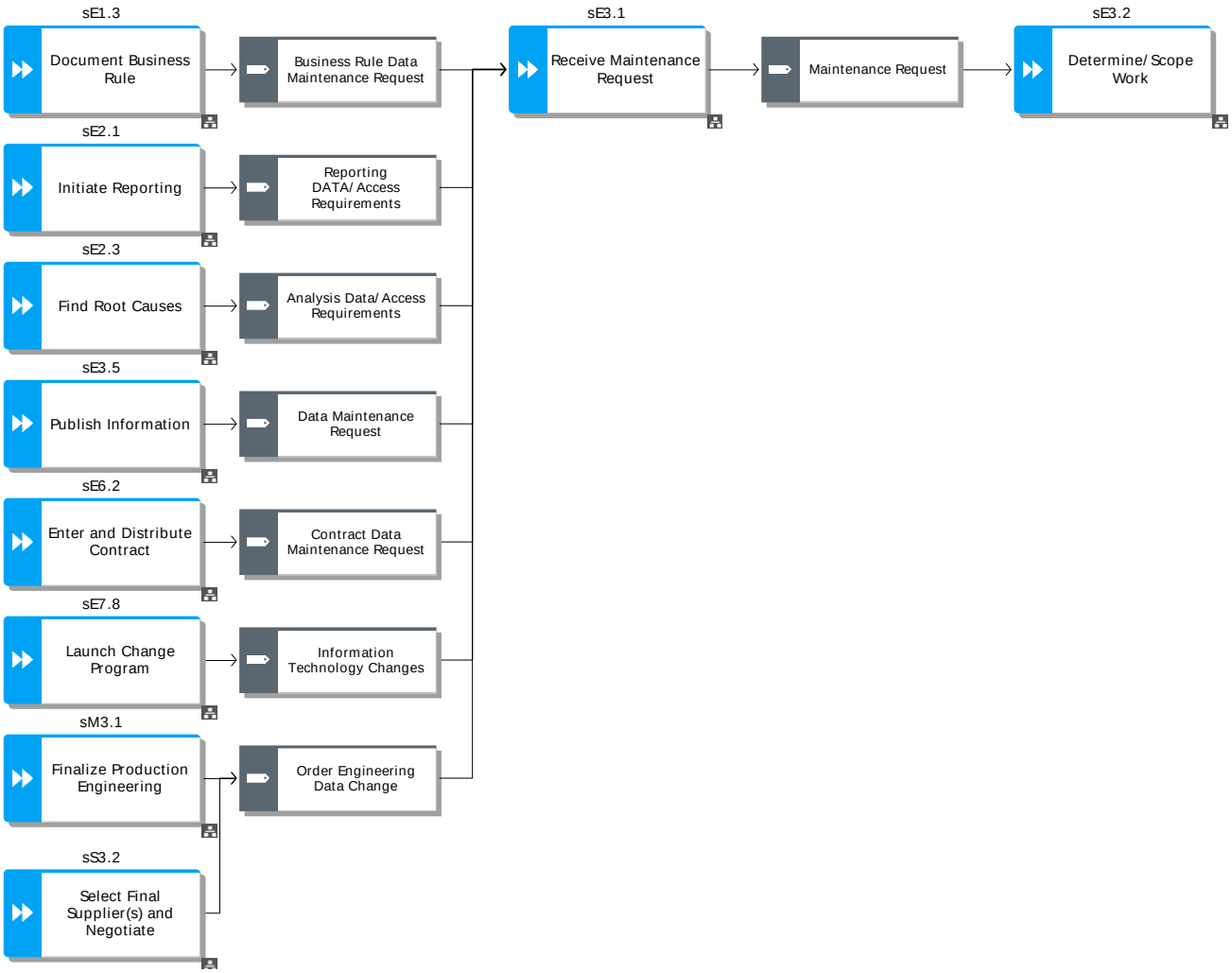
sE3.1 Receive Maintenance Request

The process of receiving, validating and logging the request for information, configuration or system functionality maintenance. Maintenance request types:

- Add data - creation of new record/document (includes duplicating existing records/documents)
- Change data - modification of an existing record/document
- Delete data - deletion of an existing record (includes archiving and un-publishing existing records/documents)
- Change configuration (includes creating and maintaining user access)
- Add code - (includes installing software updates and security updates)
- Change code (modification of software code)
- Delete code

This process may include assigning a ticket, tracking or order number and routing the request to the appropriate resource.

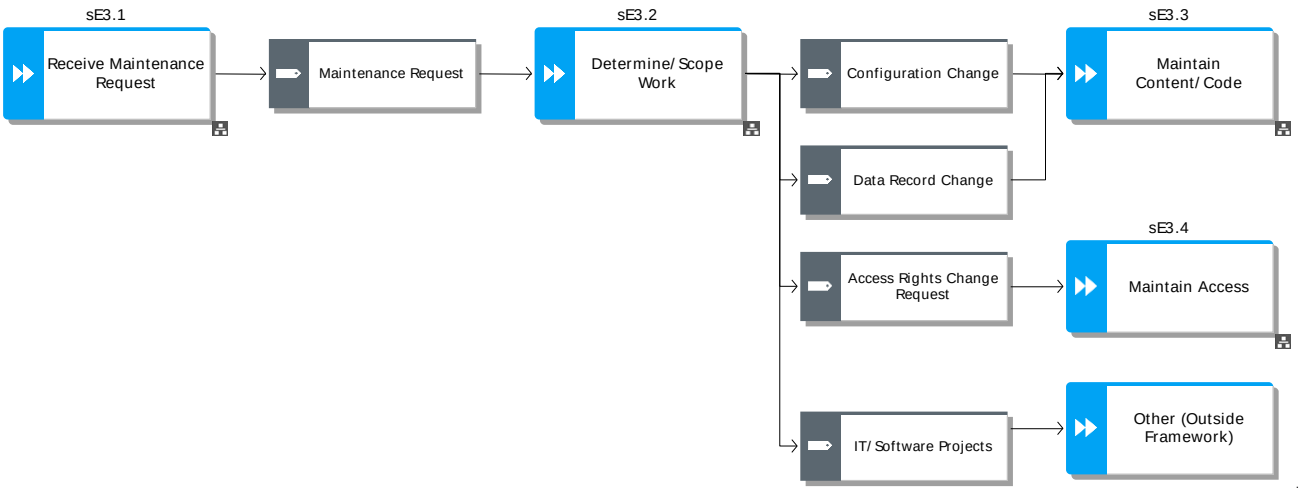
Workflow



sE3.2 Determine/Scope Work

The activities associated with determining the activities required to perform the requested maintenance. The requestor may be contacted for additional information. Complex requests may be setup as projects with appropriate work breakdown structure, milestones, acceptance criteria and deliverable schedules. This process may include routing the request to the appropriate resource.

Workflow



sE3.3 Maintain Content/Code

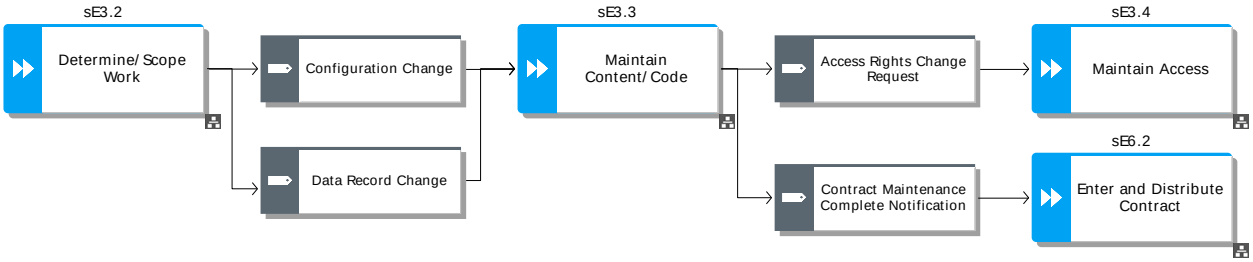
The process of formatting, entering, loading, editing or deleting the information, software updates and code changes requested. This includes verification of changes as needed (unit and integration testing). Typical changes included are:

- Data record maintenance (such as bills-of-materials, shipping routes)
- Configuration (system parameter) changes (such as activating and disabling system functionality)
- Loading/installing software updates (e.g. code changes from vendors or development groups)
- Loading/installing security updates

This process is not a placeholder for complex software engineering processes. Such processes would lay outside of the SCOR process framework.

People	
HS.0046	ERP Systems

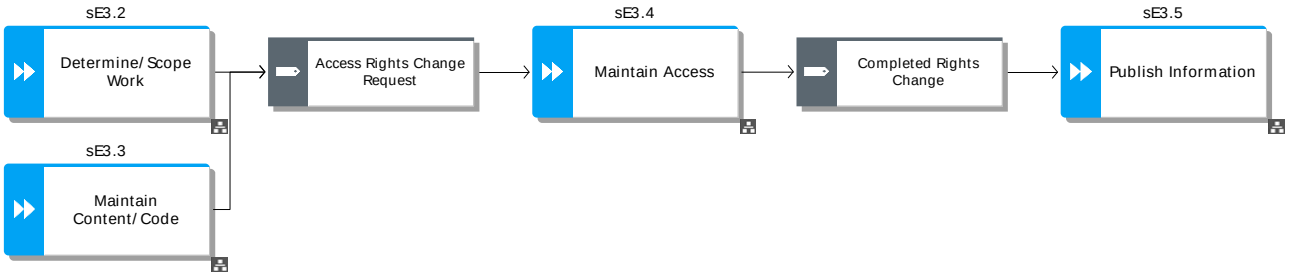
Workflow



sE3.4 Maintain Access

The process of establishing, changing or removing access rights for users.

Workflow

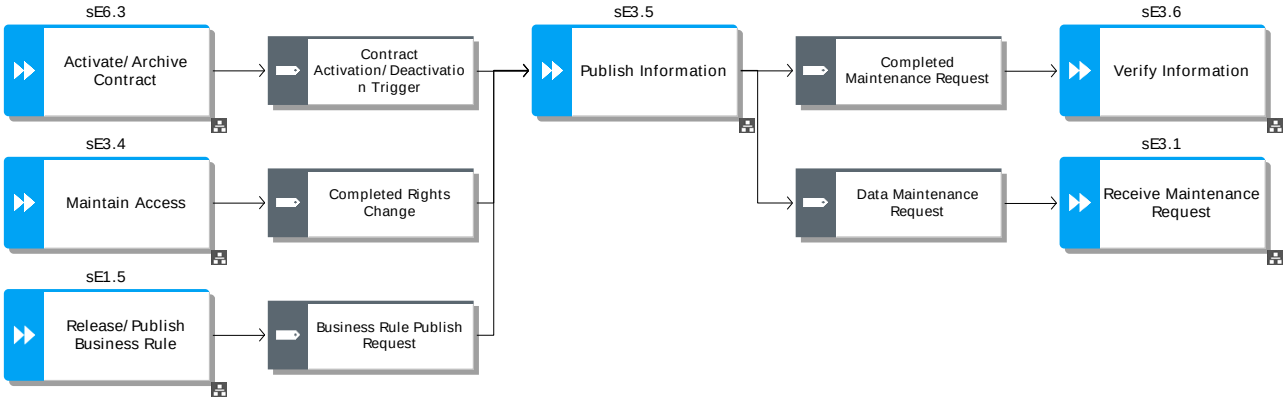


sE3.5 Publish Information

The process of activating the changes to information, configuration and/or code and populating the information to dependent systems, where applicable. For data record maintenance, this is the activation of the new data and populating dependent systems with the new data. For example, activating a bill-of-materials (BOM) in the system-of-record* and populating the BOM to dependent systems that require a copy of this data. This process may be manual, automated or a combination.

*system-of-record = the information storage system, which is the authoritative data source for a given data element or piece of information.

Workflow



sE3.6 Verify Information

The process of verifying the information is properly recorded in the system of record and populated to dependent systems. This includes verifying information is accessible to users.

Workflow

sE4 Manage Supply Chain Human Resources

The process of developing, governing and maintaining an organization of permanent, temporary and outsourced staff, with the right qualifications, in support of the business objects and supply chain goals. This includes identifying required and available skills in the organization, determining gaps in skills and competency levels, identifying training needs, resource gaps and excess resources.

Note: This is a planning process to ensure staff (capacity) is available at the right levels. The actual training, hiring and redeployment is not part of this process as those are HR processes.

Hierarchy	
sE4.1	Identify Skills/Resource Requirement
sE4.2	Identify Available Skills/Resources
sE4.3	Match Skills/Resources
sE4.4	Determine Hiring/Redeployment
sE4.5	Determine Training/Education
sE4.6	Approve, Prioritize and Launch

Metrics	
RL.3.37	Forecast Accuracy
CO.2.1	Cost to Plan
CO.2.3	Cost to Make
CO.3.13	Direct Labor Cost
CO.3.14	Order Management Costs
CO.3.12	Indirect Cost Related to Production
AM.3.9	Capacity Utilization

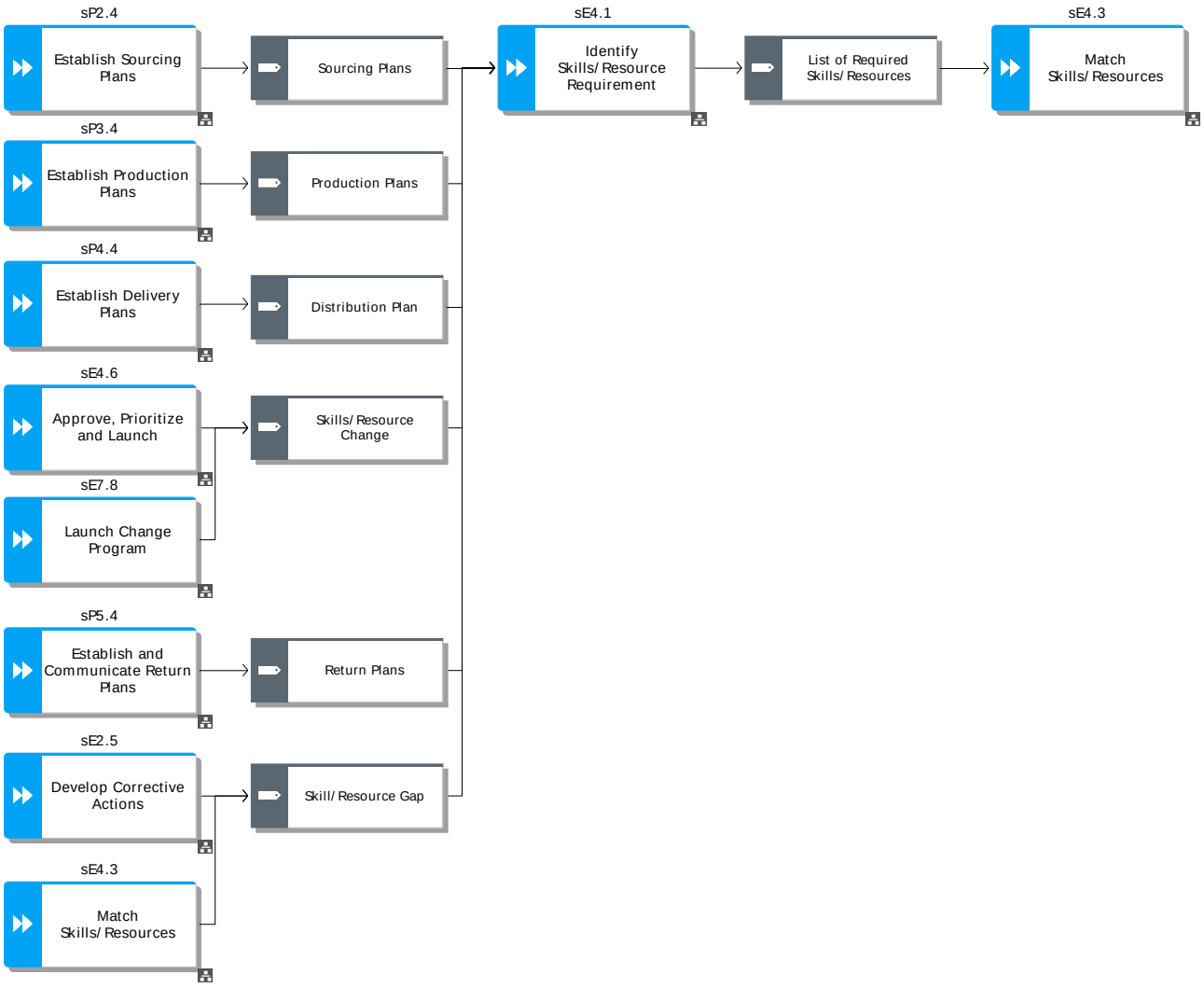
Practices	
BP.089	Perfect Pick Put away
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool
BP.113	Cross Functional Teams

People	
HS.0022	Contract Management
HS.0041	EHS regulations
HS.0066	Legislation and Standards
HS.0072	Performance Management
HS.0085	Outsourcing

sE4.1 Identify Skills/Resource Requirement

The activities associated with the collection of the required skills to operate (part of) the supply chain. Examples of this process are planning meetings, periodic performance reviews, reorganizations. The data collected should list the required skills and/or number of resources and is generally organized by entity (supply chain node, department, function or a combination of these).

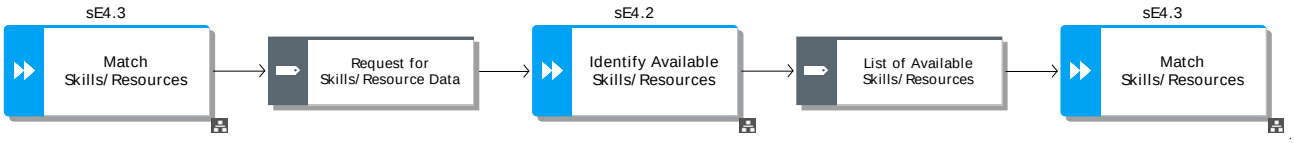
Workflow



sE4.2 Identify Available Skills/Resources

The activities associated with the collection of skills/resources currently available in the supply chain. Generally, this information is collected and organized by entity (supply chain node, department, function or a combination of these). Examples of this process include data collection for standard headcount reports, but should include temporary staff and outsourced resources.

Workflow



sE4.3 Match Skills/Resources

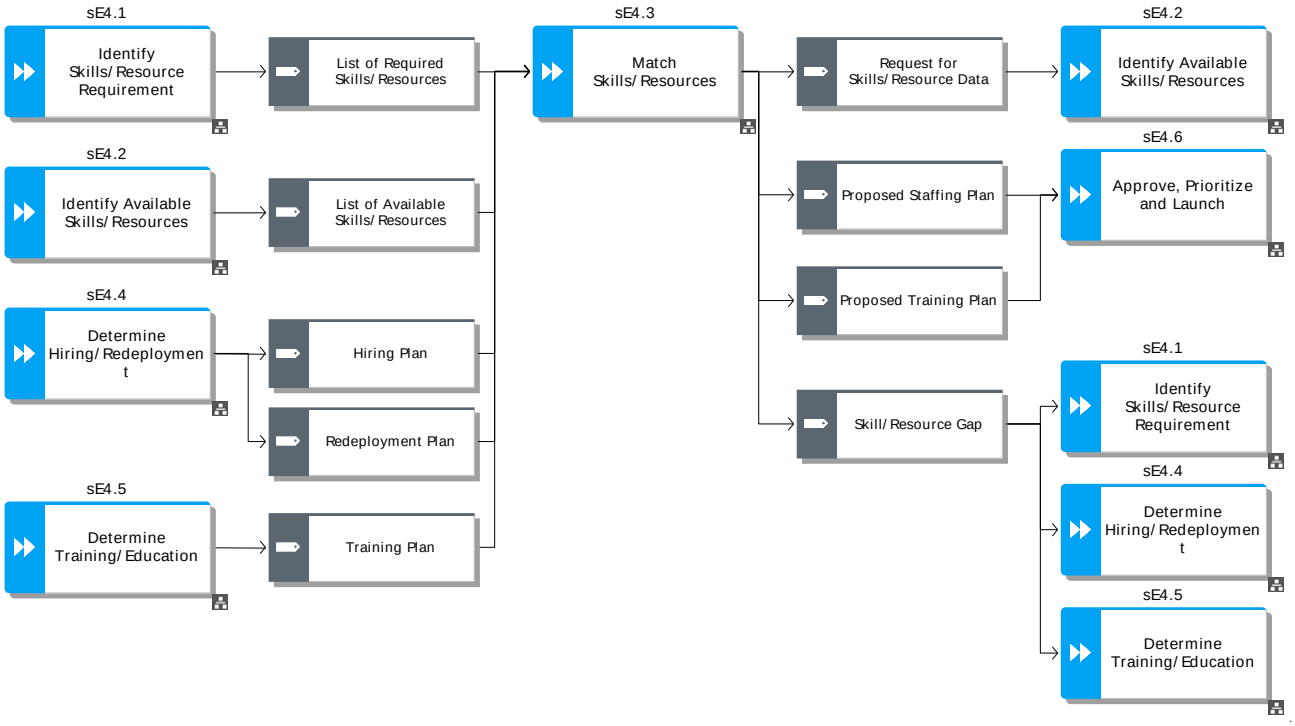
The activities associated with the matching of skills or resource demand with the available skills/ resources. The purpose of this process is to determine which skill/resource requirements (demand) can be met using existing resources, determine which skill/resource requirements are not supported by current available skills/resources (gap) and determine the skills/resources for which no demand exists (excess).

For each skill/resource gap or excess, one or more actions need to be identified to close the gap or address the excess:

- Training/Cross-training (add skills to existing resources)
- Hiring (add resources with existing skills)
- Redeployment (moving staff to different organizations or layoff)

It is important to consider the lead-time of these actions; scarce skills may have longer lead-times for example. Hiring includes temporary workers and all types of outsourced staff.

Workflow

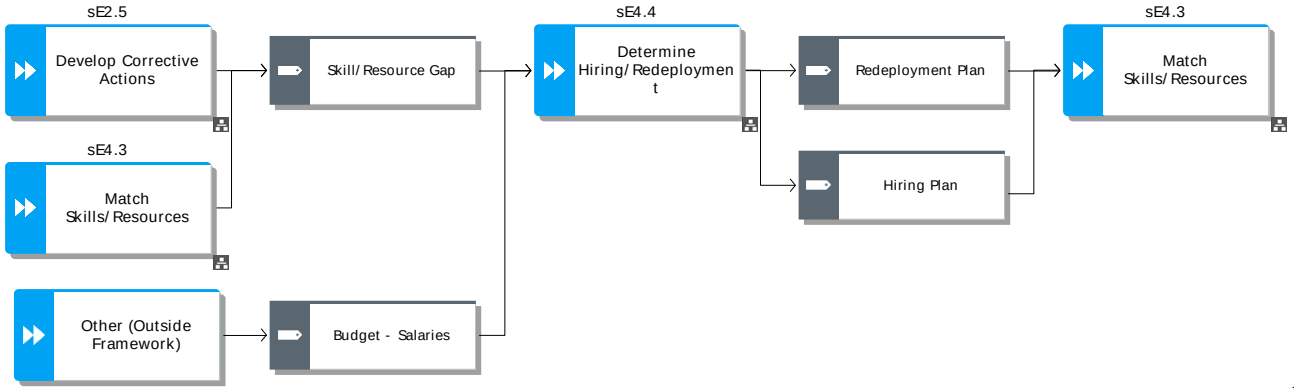


sE4.4 Determine Hiring/Redeployment

The activities associated with identification of sources of new hires or sources/destinations for redeployment. The purpose of this process step includes assessing the feasibility of hiring the required skills/resources within the required time period, assessing the feasibility of redeploying the excess employees (resources) and assessing the feasibility and impact of possible layoff of employees.

Note: At this stage this is a planning activity. The actual hiring process is not documented in SCOR as this is a Human Resources Management (HR) process. Employee in this context includes temporary workers and employees of service providers.

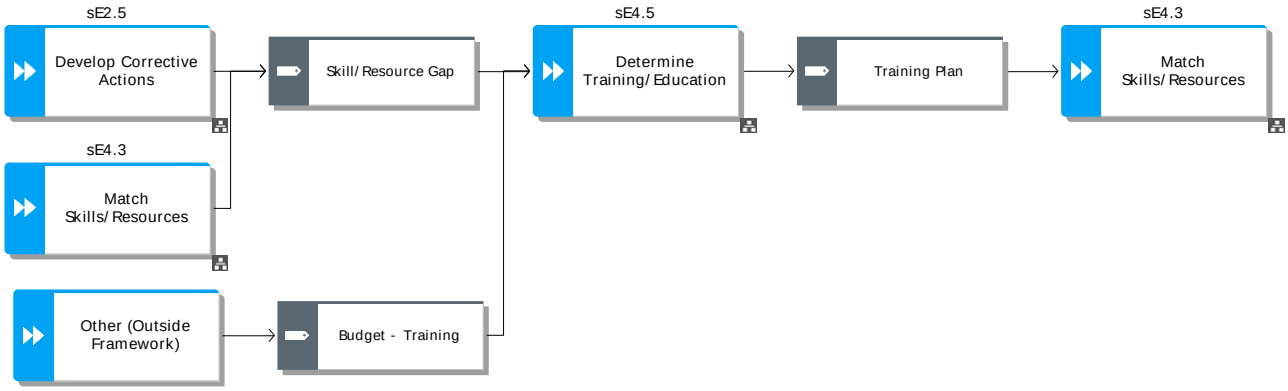
Workflow



sE4.5 Determine Training/Education

The activities associated with the identification of training and education programs to ensure existing (and newly hired) employees will have the appropriate skills to perform the work allocated to each individual employee. Employee in this definition may include temporary workers and employees of service providers.

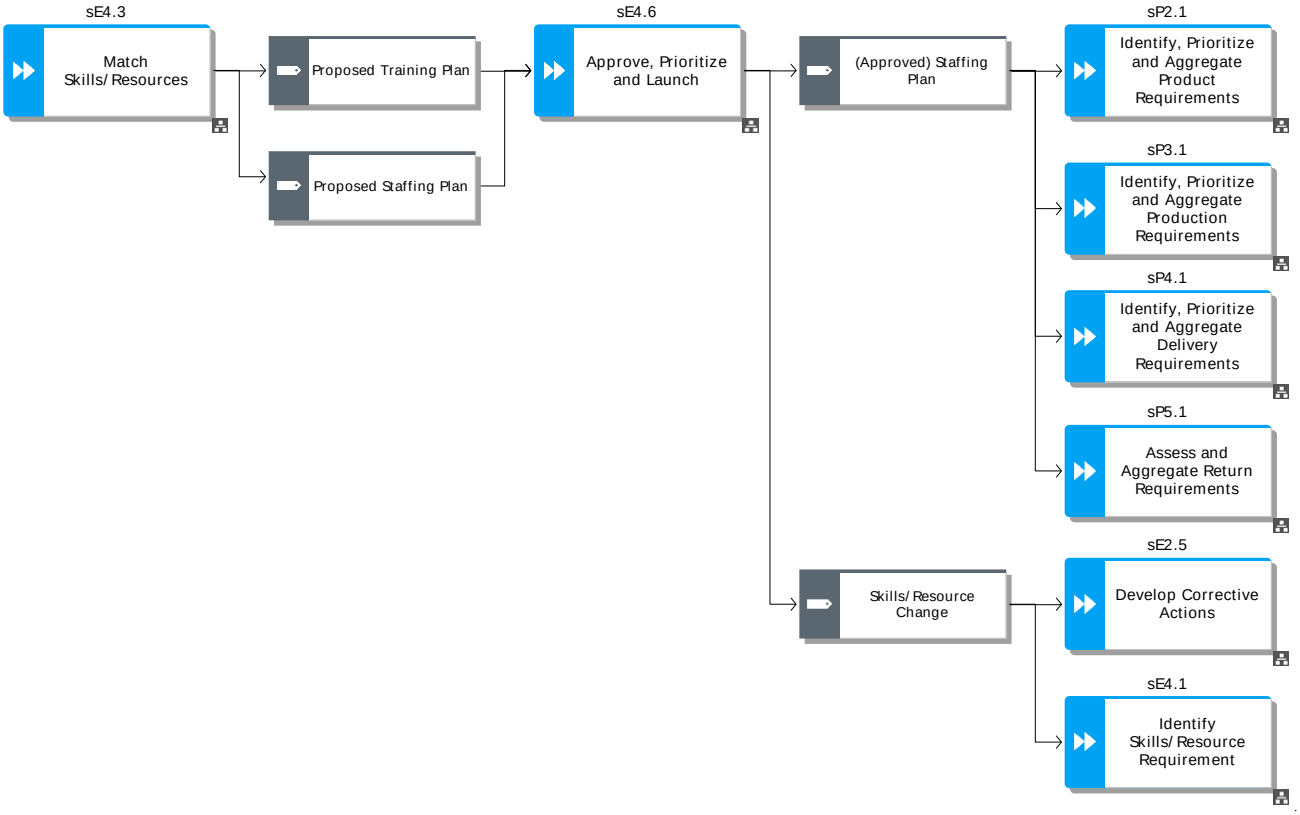
Workflow



sE4.6 Approve, Prioritize and Launch

The activities associated with obtaining approvals for hiring, redeployment, training and education plans, prioritizing and executing these plans. Additional resources and skills will become available over time, adjusting the labor component of capacity in Plan, Source, Make, Deliver, Return and/or Enable processes.

Workflow



sE5 Manage Supply Chain Assets

The process of scheduling, maintaining and dispositioning of supply chain assets developed for supply chain execution. This includes installation, repair, alteration, calibration and other activities necessary to sustain supply chain execution.

Discussion: This is more of a scheduling process to ensure assets (capacity) is available at the right levels at the right time. The actual maintenance, etc. processes are described using standard SCOR processes. For example: The process to perform routine maintenance on a truck is described using Return MRO and/or Make processes.

Hierarchy	
sE5.1	Schedule Asset Management Activities
sE5.2	Take Asset Off-line
sE5.3	Inspect and Troubleshoot
sE5.4	Install and Configure
sE5.5	Clean, Maintain and Repair
sE5.6	Decommission and Dispose
sE5.7	Inspect Maintenance
sE5.8	Reinstate Asset

Metrics	
RL.3.37	Forecast Accuracy
RS.3.64	Manage Integrated Supply Chain Capital Assets Cycle Time
AM.3.9	Capacity Utilization

Practices	
BP.104	Facility Master Planning
BP.106	Predictive Maintenance
BP.122	Vendor Managed Inventory (VMI)
BP.130	Identification of Obsolete Capital Assets
BP.133	Total Preventative Maintenance Program

People	
HS.0006	Asset Management
HS.0022	Contract Management
HS.0043	Engineering
HS.0085	Outsourcing
HS.0106	Property Control and Disposition

sE5.1 Schedule Asset Management Activities

The activities associated with receiving maintenance requests, receiving repair/replacement/ installation requests, maintaining preventive/regular maintenance tasks, scheduling individual maintenance tasks and assigning resources to individual maintenance tasks. Scheduling may include incorporating production and delivery plans and schedules and communication of maintenance schedules to production and delivery planning and scheduling processes.

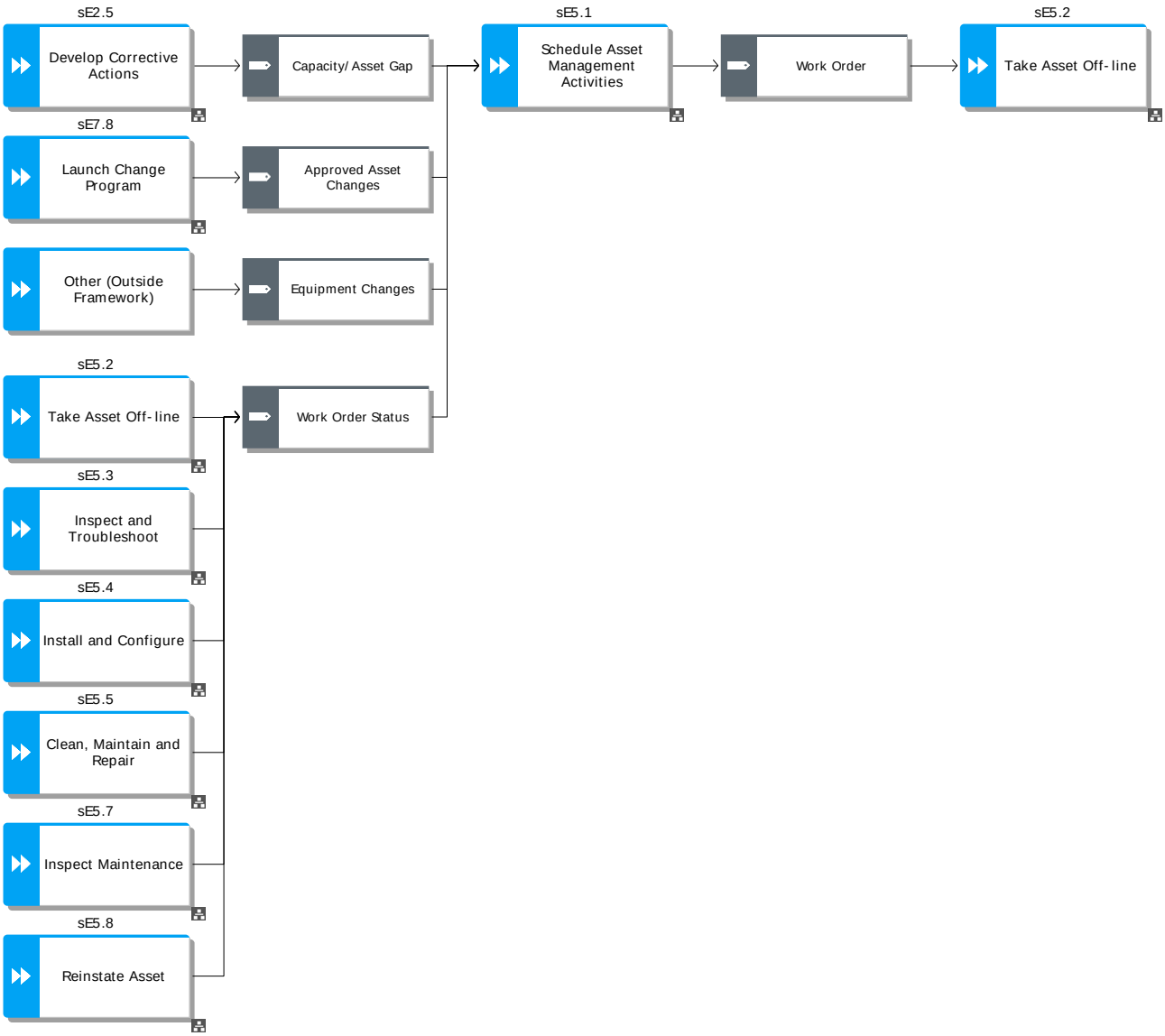
Metrics	
RS.3.56	Manage Capital Assets Cycle Time
RS.3.58	Manage Deliver Capital Assets Cycle Time
RS.3.64	Manage Integrated Supply Chain Capital Assets Cycle Time
RS.3.67	Manage MAKE Equipment and Facilities Cycle Time
RS.3.80	Manage Return Capital Assets Cycle Time

Practices	
BP.106	Predictive Maintenance
BP.133	Total Preventative Maintenance Program

People	
HS.0038	Design/Engineering Schedule Development HS.0043 Engineering
HS.0052	Installation Scheduling
HS.0103	Production Scheduling
HS.0104	Progress & performance reporting
HS.0106	Property Control and Disposition
HS.0108	Quality Management

sE5.1 Schedule Asset Management Activities

Workflow



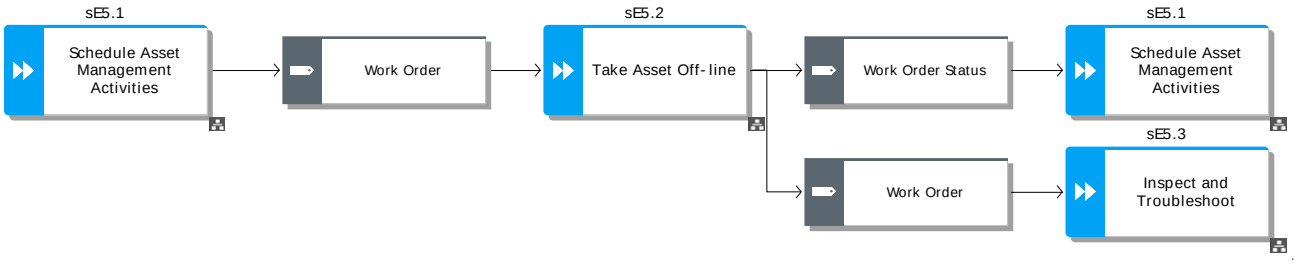
sE5.2 Take Asset Off-line

The activities associated with the preparation of the maintenance tasks. In general, terms this means the asset or equipment needs to be stopped or put into maintenance mode. Safety precautions need to be made to ensure the equipment cannot be restarted during maintenance without active approval of the maintenance operators/engineers. This may include installing safety barriers, transporting the asset/equipment to a location where the maintenance will take place, removing deposits/materials from production equipment (cleaning), unloading transportation equipment and backing up data from the equipment and associated automation systems.

Metrics	
RS.3.56	Manage Capital Assets Cycle Time
RS.3.58	Manage Deliver Capital Assets Cycle Time
RS.3.64	Manage Integrated Supply Chain Capital Assets Cycle Time
RS.3.67	Manage MAKE Equipment and Facilities Cycle Time
RS.3.80	Manage Return Capital Assets Cycle Time

People	
HS.0043	Engineering
HS.0148	Technical Manual Reading

Workflow



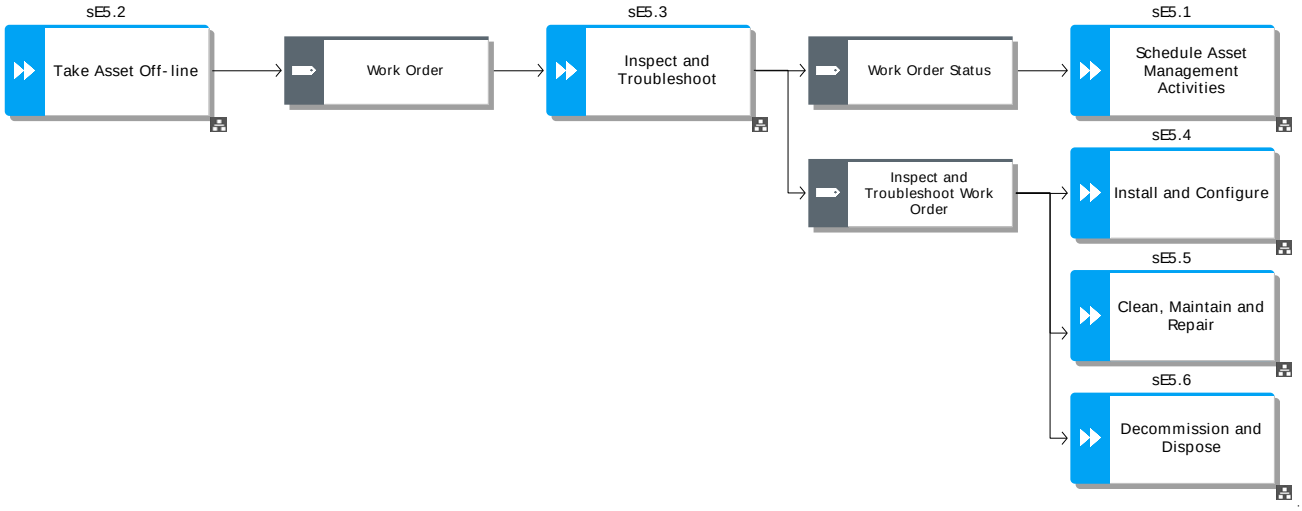
sE5.3 Inspect and Troubleshoot

The activities associated with assessing the overall status of the equipment, performing standard inspection and detailed troubleshooting if required. This includes identification of repairs, upgrades and maintenance tasks in order to bring the asset/equipment in optimal or acceptable working condition. This process may be the identification of readiness for installing new hardware or software and preparing (documenting) the steps of decommissioning and dispositioning for equipment/assets installation or de-installation and disposal.

Metrics	
RS.3.56	Manage Capital Assets Cycle Time
RS.3.58	Manage Deliver Capital Assets Cycle Time
RS.3.64	Manage Integrated Supply Chain Capital Assets Cycle Time
RS.3.67	Manage MAKE Equipment and Facilities Cycle Time
RS.3.80	Manage Return Capital Assets Cycle Time

People	
HS.0043	Engineering
HS.0108	Quality Management
HS.0148	Technical Manual Reading
HS.0152	Troubleshooting

Workflow



sE5.4 Install and Configure

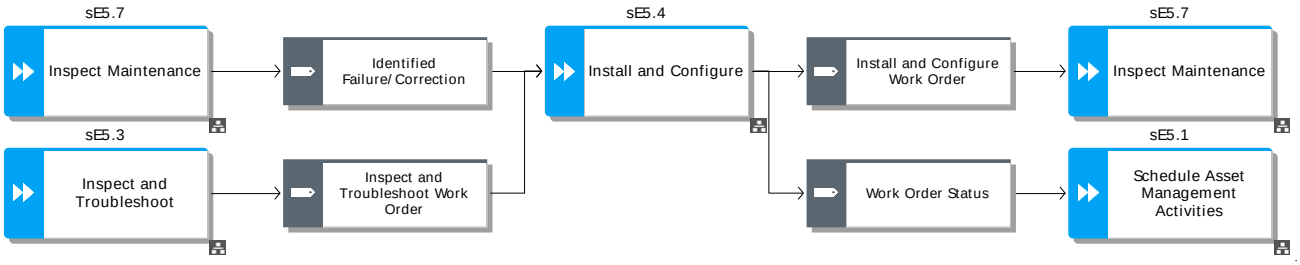
The activities associated with the installation of new hardware, software or functionality (equipment/ assets). This includes installation and initial testing of the new hardware, software or functionality. The general purpose of installation is to increase capacity or add/improve capabilities.

Note: This process step may trigger a separate supply chain (depending on the scale of the installation) building and installing new supply chain assets.

Metrics	
RS.3.56	Manage Capital Assets Cycle Time
RS.3.58	Manage Deliver Capital Assets Cycle Time
RS.3.64	Manage Integrated Supply Chain Capital Assets Cycle Time
RS.3.67	Manage MAKE Equipment and Facilities Cycle Time
RS.3.80	Manage Return Capital Assets Cycle Time

People	
HS.0043	Engineering

Workflow

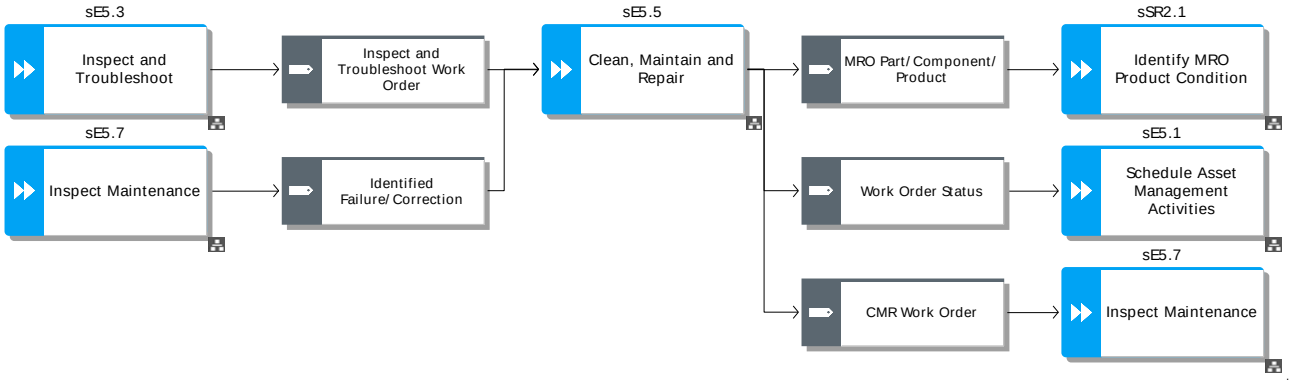


sE5.5 Clean, Maintain and Repair

The activities associated with the cleaning, replacement of parts, reconditioning of the equipment/ asset. (The general purpose of this process step is to bring the equipment/asset back in optimal/ acceptable operating condition). This may include measuring and testing of the equipment.

Note: This is a Make process for the function performing the maintenance/repair activities.

Metrics	
RS.3.56	Manage Capital Assets Cycle Time
RS.3.58	Manage Deliver Capital Assets Cycle Time
RS.3.64	Manage Integrated Supply Chain Capital Assets Cycle Time
RS.3.67	Manage MAKE Equipment and Facilities Cycle Time
RS.3.80	Manage Return Capital Assets Cycle Time
People	
HS.0043	Engineering
Workflow	

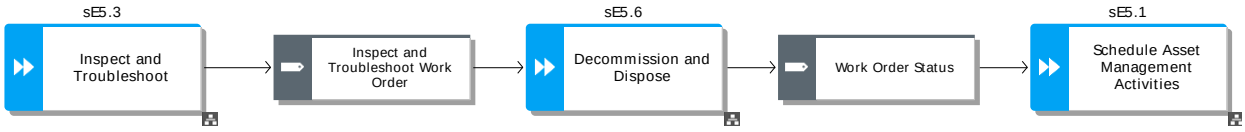


sE5.6 Decommission and Dispose

The activities associated with the de-installation and disposal of existing hardware, software or functionality (equipment/assets). This includes physical removal from the original point of use. The general purpose of installation is to replace capacity or remove outdated capabilities.

People	
HS.0043	Engineering
HS.0106	Property Control and Disposition

Workflow



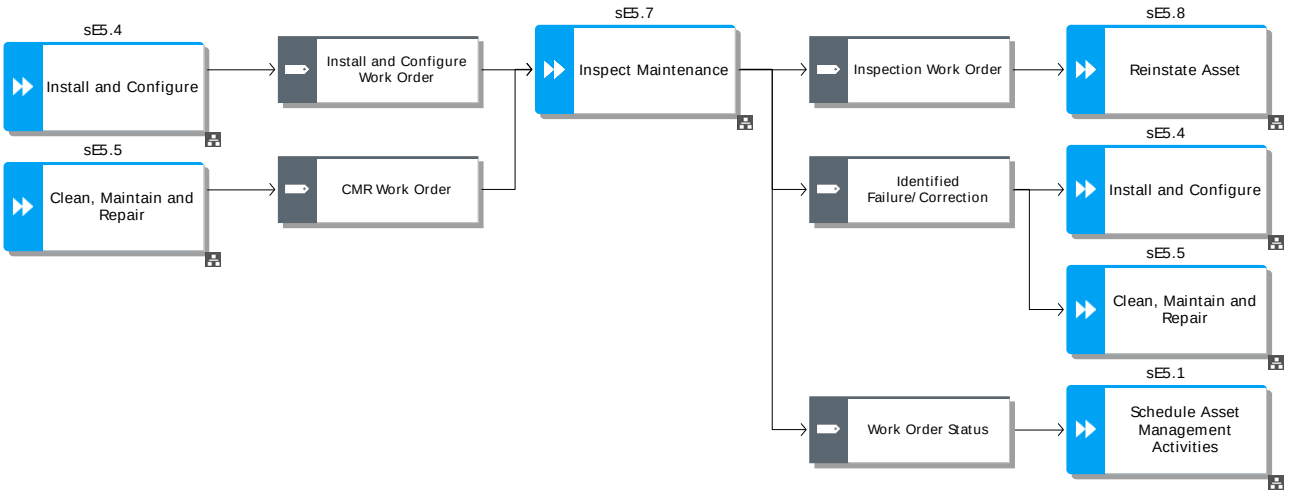
sE5.7 Inspect Maintenance

The activities associated with the inspection of the maintenance work performed. This may include performing test runs to assess whether new capacity or functionality is meeting expectations. This includes documentation of any inspection data, recording any inspection errors and obtaining approvals. The purpose of Inspect Maintenance is to verify the effectiveness/success of the maintenance activities.

Metrics	
RS.3.56	Manage Capital Assets Cycle Time
RS.3.58	Manage Deliver Capital Assets Cycle Time
RS.3.64	Manage Integrated Supply Chain Capital Assets Cycle Time
RS.3.67	Manage MAKE Equipment and Facilities Cycle Time
RS.3.80	Manage Return Capital Assets Cycle Time

People	
HS.0043	Engineering
HS.0095	Product and Configuration Validation
HS.0148	Technical Manual Reading

Workflow



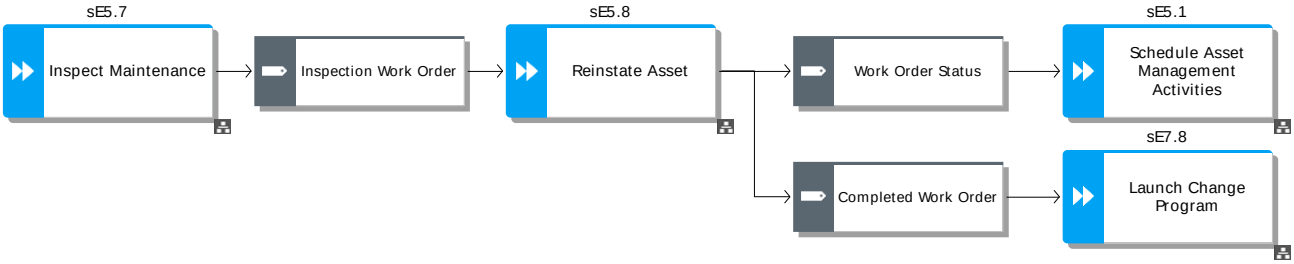
sE5.8 Reinstate Asset

The activities associated with completion of the maintenance work and preparing the equipment/ asset to be brought 'on-line'. The general purpose of this process step is to make the asset available for 'production' (add to capacity). This includes closing work orders and receiving and approving payment of invoices for work performed by external resources. Upon completion of this process step the asset is expected to be in full working condition.

Metrics	
RS.3.56	Manage Capital Assets Cycle Time
RS.3.58	Manage Deliver Capital Assets Cycle Time
RS.3.64	Manage Integrated Supply Chain Capital Assets Cycle Time
RS.3.67	Manage MAKE Equipment and Facilities Cycle Time
RS.3.80	Manage Return Capital Assets Cycle Time

People	
HS.0043	Engineering
HS.0148	Technical Manual Reading

Workflow



sE6 Manage Supply Chain Contracts / Agreements

The management and communication of contractual and non-contractual agreements in support of business objectives and supply chain goals. This includes all agreements related to supply chain operations, including: material and services acquisition, inventory stocking practices and levels, performance targets, planning and decision making, logistics and delivery, and data exchange and visibility.

Notes: This covers former sES.10 and parts of sES.6, sEM.6, sED.6, sER.6. The identification and selection of suppliers and contract negotiations reside in DCOR processes (and partially in sS3). Customer pursuit and closing customer contracts reside in CCOR processes.

Hierarchy	
sE6.1	Receive Contract / Agreement Updates
sE6.2	Enter and Distribute Contract / Agreement
sE6.3	Activate/Archive Contract/ Agreement
sE6.4	Review Contractual Performance Agreement
sE6.5	Identify Performance Issues/Opportunities
sE6.6	Identify Resolutions/Improvements
sE6.7	Select, Prioritize and Distribute Resolutions

Metrics	
RL.3.37	Forecast Accuracy
RS.3.87	Manage Supplier Agreements Cycle Time
CO.2.6	Mitigation Costs
CO.3.15	Order Delivery and / or Install Costs
AM.2.1	Days Sales Outstanding
AM.2.3	Days Payable Outstanding

Practices	
BP.042	Regular Review of Procurement Terms and Conditions
BP.162	Long Term Supplier Agreement/Partnership
BP.124	Return Shipment Insurance
BP.146	Cross-Docking
BP.153	Bar coding/RFID
BP.160	Lean
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool

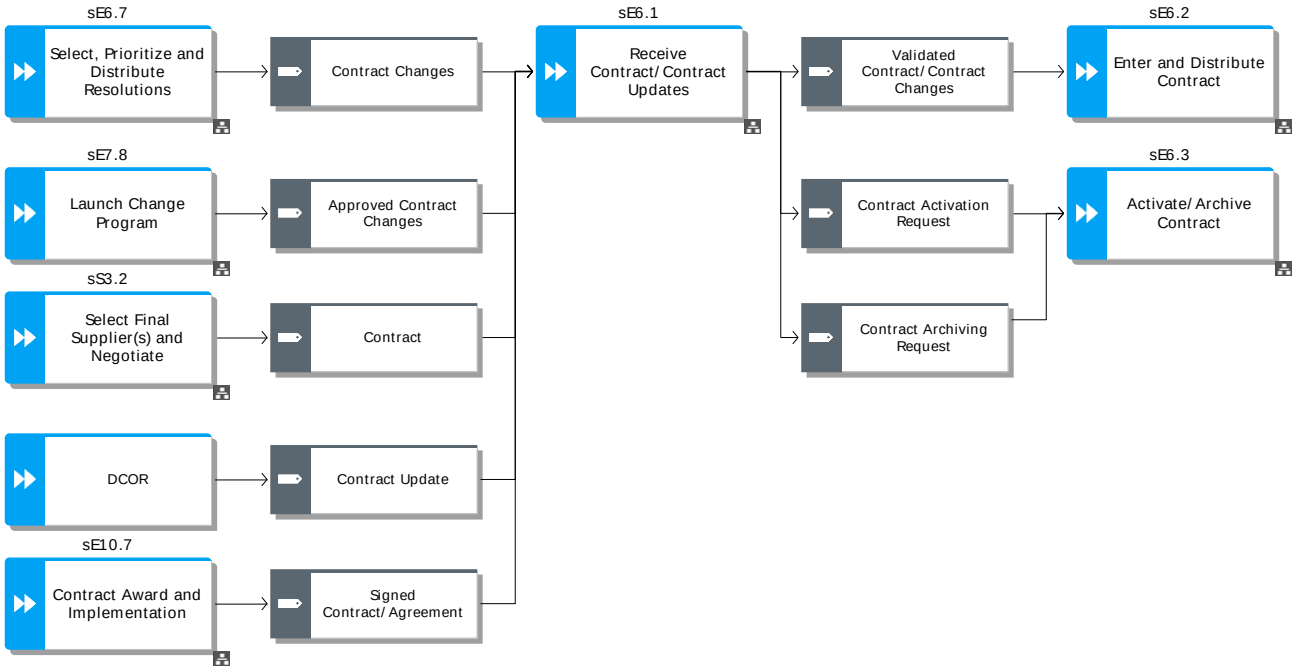
sE6 Manage Supply Chain Contracts / Agreements

People	
HS.0011	Basic Transportation Management
HS.0021	Consignment Agreement Development
HS.0022	Contract Management
HS.0032	Customer/Supplier Communication
HS.0054	Intellectual Property/Proprietary Data
HS.0055	International Trade
HS.0072	Performance Management
HS.0085	Outsourcing
HS.0094	Procurement
HS.0138	Subcontracting Types (FFP, CP, CPAF, Performance Based)
HS.0139	Supplier Relationship Management (SRM)

sE6.1 Receive Contract / Agreement Updates

The activities associated with receiving new contracts or changes to existing contracts. These contract updates may originate in Sales & Support processes (customer contracts) or in Product and Process Design processes (for material supplier or services providers such as transportation services, equipment maintenance services, IT services). This includes validation of contracts against criteria (business rules). A contract needs to include information such as effective date and duration, customer or supplier address and payment terms and may not be in conflict with business rules (and regulatory requirements).

Workflow

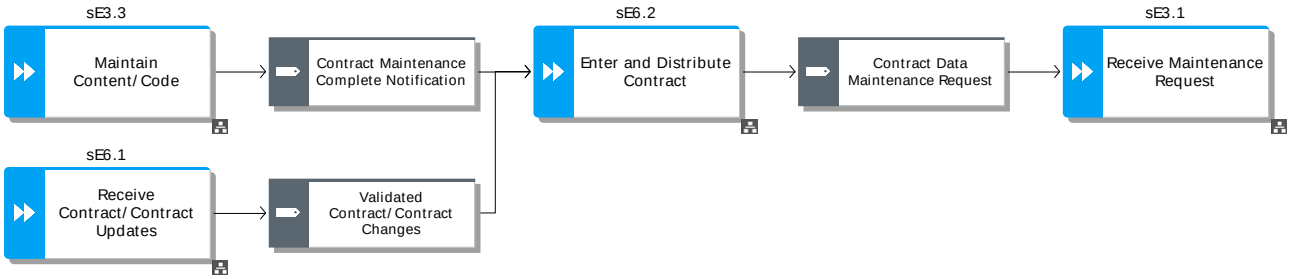


sE6.2 Enter and Distribute Contract / Agreement

The activities associated with entering contractual information in document management systems and ERP systems. This includes the 'translation' of contractual language/information into a format that the system can comprehend. A final step in this process is to distribute the contract or updates to an existing contract to the appropriate processes/functions.

Practices	
BP.166	Document Management System

Workflow

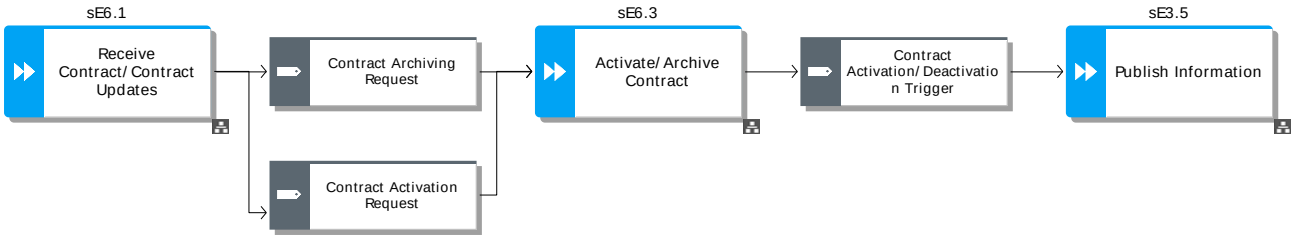


sE6.3 Activate / Archive Contract / Agreement

The activities associated with activation or de-activation and archiving the contract. This may include updating statuses of information in document management systems or ERP systems. This activity may be triggered and performed by the document management system or ERP system based on parameters entered as part of sE6.2 Enter and Distribute Contract.

Practices	
BP.166	Document Management System

Workflow

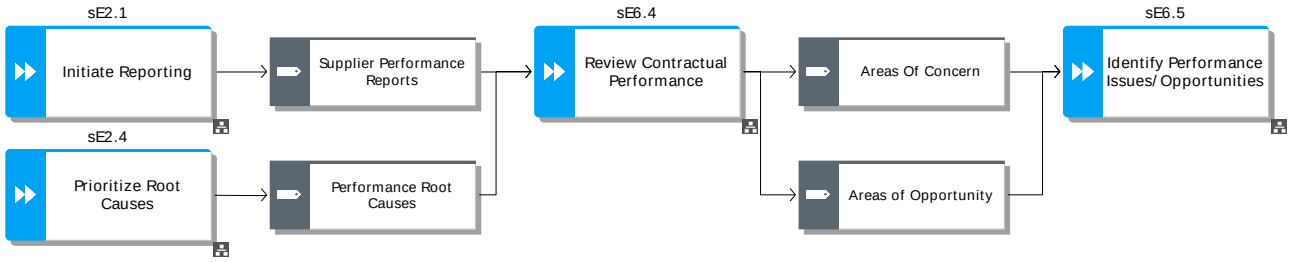


sE6.4 Review Contractual Performance

The activities associated with reviewing the performance of contractual parties (both supplier and customer). This includes comparing the contractual service level agreements with the actual service levels. This process may be triggered by a calendar event - such as annual or quarterly quality reviews or actual performance issues identified in daily supply chain processes.

Practices	
BP.131	Alternative Supplier Benchmarking

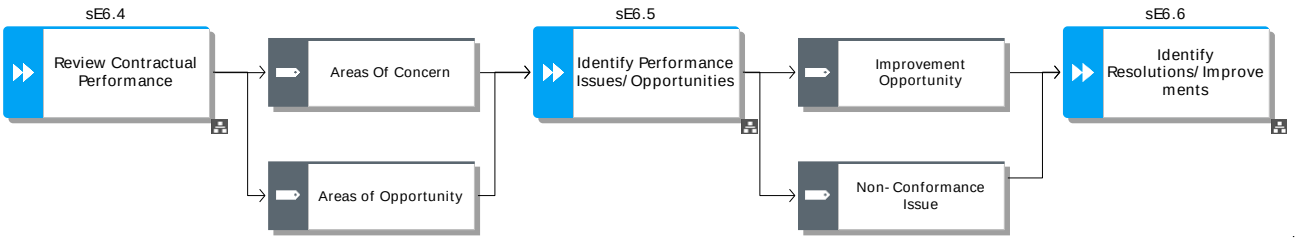
Workflow



sE6.5 Identify Performance Issues / Opportunities

The activities associated with identifying and prioritization of key performance issues or areas of ongoing process improvement. This includes notifying contractual partners of non-conformance to contractual agreements or agreed service level agreements. This process addresses both the non- compliance issues (severe) as well as areas of continuous improvement (non-severe, common interest).

Workflow



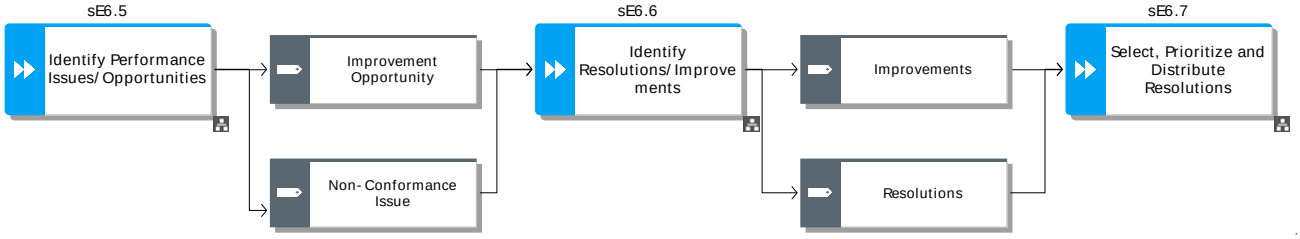
sE6.6 Identify Resolutions / Improvements

The activities associated with identifying ways to address the non-compliance or how to implement performance improvements. For non-compliance, this process may have one or a combination of outcomes:

- Terminate the contract
- Pay/Collect Penalties
- Update contract (service levels, quality levels, terms and conditions)
- Continue as-is (internal process, policy or business rule changes)

Litigation or mediation may be considered in this process. Litigation or mediation is not part of supply chain processes.

Workflow

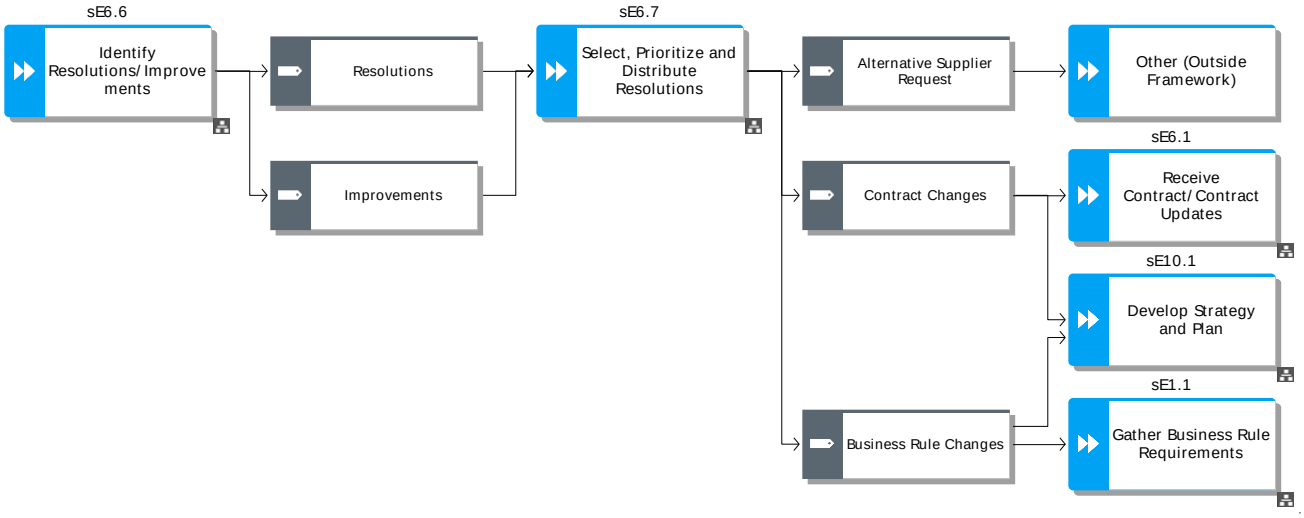


sE6.7 Select, Prioritize and Distribute Resolutions

The activities associated with selecting, obtaining approvals and prioritizing the appropriate issue resolution and distributing the resolution to the appropriate processes/functions.

Litigation or mediation may be the result of decisions made in this process. Litigation or mediation is not part of supply chain processes.

Workflow



sE7 Manage Supply Chain Network

The process of defining and managing the geographic and activity footprint of the supply chain. It defines the location of facilities and assignments of resources, distribution networks, suppliers, customers, materials, products, capacities, and/or capabilities to those locations.

Hierarchy	
sE7.1	Select Scope and Organization
sE7.2	Gather Input and Data
sE7.3	Develop Scenarios
sE7.4	Model/Simulate Scenarios
sE7.5	Project Impact
sE7.6	Select and Approve
sE7.7	Develop Change Program
sE7.8	Launch Change Program

Metrics	
RL.3.37	Forecast Accuracy
RS.3.66	Manage Integrated Supply Chain Transportation Cycle Time
RS.3.74	Manage Planning Configuration Cycle Time
RS.3.77	Manage Production Network Cycle Time
RS.3.83	Manage Return Network Configuration Cycle Time
RS.3.85	Manage Return Transportation Cycle Time
RS.3.88	Manage Supplier Network Cycle Time
RS.3.89	Manage Transportation (WIP) Cycle Time
RS.3.90	Manage Transportation Cycle Time
CO.1.1	Total Supply Chain Management Costs
CO.1.2	Cost of Goods Sold
AM.2.2	Inventory Days of Supply

Practices	
BP.016	Supply Network Planning
BP.024	Supply Chain Optimization (SCO)
BP.013	Item Rationalization
BP.122	Vendor Managed Inventory (VMI)
BP.123	Return Load Optimization
BP.138	Theory of Constraints
BP.145	Vendor Collaboration

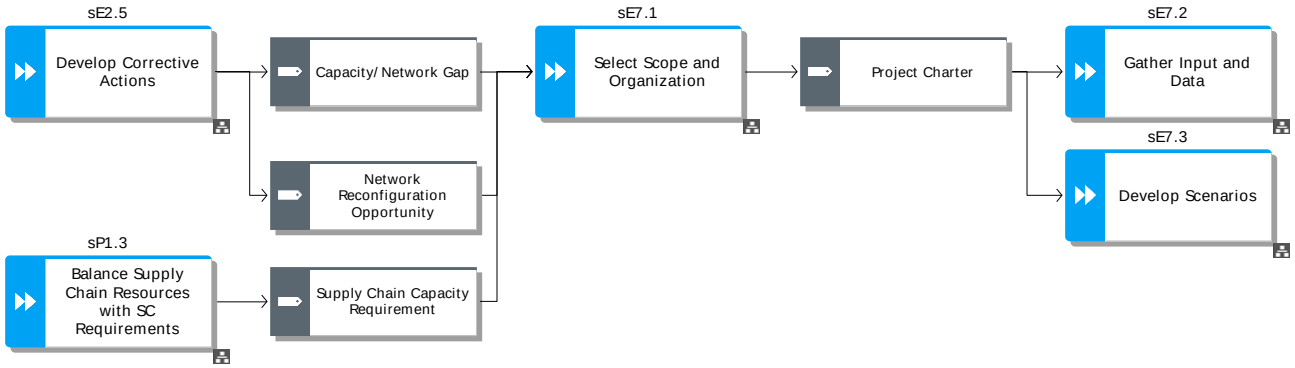
BP.155	Standard Operating Procedures
BP.156	Collaborative Planning, Forecasting and Replenishment (CPFR)
BP.157	Just In Time Production
BP.159	Electronic Data Interchange (EDI)
BP.160	Lean

People	
HS.0006	Asset Management
HS.0012	Benchmarking
HS.0016	Capacity Planning/Management
HS.0044	Enterprise Business Process
HS.0070	Logistics network modeling
HS.0072	Performance Management
HS.0082	Optimization
HS.0085	Outsourcing
HS.0093	Prioritization
HS.0141	Supply Chain Management
HS.0142	Supply Chain Performance Measurements

sE7.1 Select Scope and Organization

The activities associated with determining what part of the supply chain network will be assessed (the scope). Organizations that manage the supply chain network as a project structure will need to establish a project organization. Organization selection includes identification and securing availability of sponsor, stakeholders and data/information providers as well as selecting project team members.

Workflow

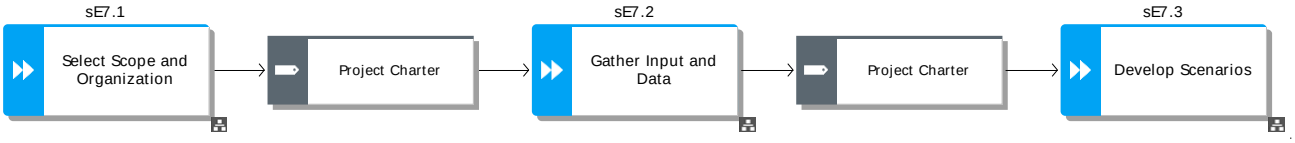


sE7.2 Gather Input and Data

The activities associated with identification of the objective of the supply chain ('what strategy does the supply chain need to support') and collection of data required to describe (model) the supply chain at the required level. Data collected includes: facilities costs, capacity and locations, transportation cost, capacity and lead times, customer volumes, order frequency and size and customer locations.

People	
HS.0033	Data management
HS.0072	Performance Management

Workflow

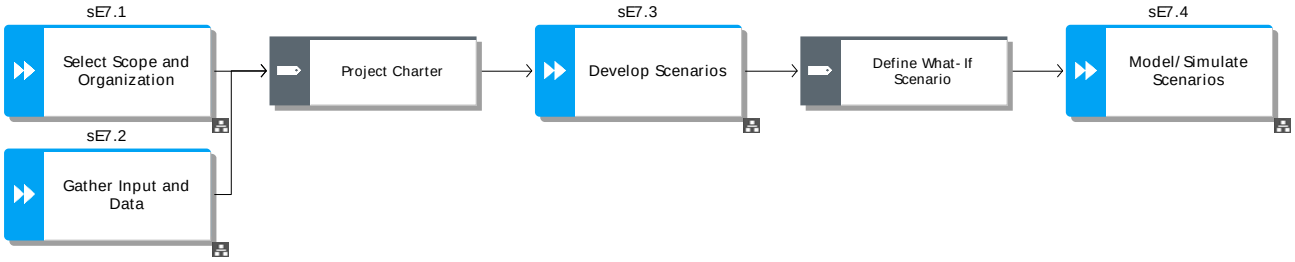


sE7.3 Develop Scenarios

The activities associated with the development of scenarios (what-if) in support of different strategies and projections. Scenarios may be developed for different detailed strategies, requirements and potential internal/external changes. Activities include management interview, external transportation and warehousing studies. Initial review of developed scenarios may result in rejection of the scenario or proceeding to simulation.

People	
HS.0082	Optimization
HS.0085	Outsourcing

Workflow

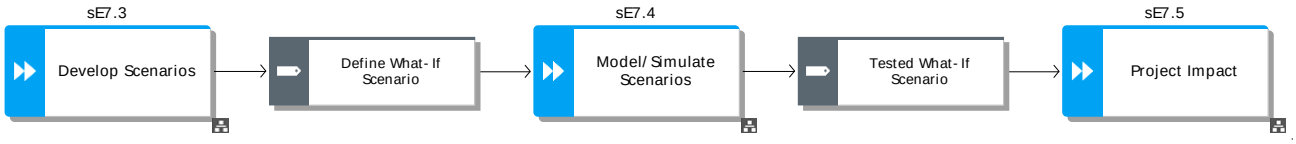


sE7.4 Model/Simulate Scenarios

The activities associated with the development of models and/or simulation models to run 'what-if' scenarios through a validation process. Simulation models may use automation, but conference room pilots or walk-throughs may also serve this purpose. The purpose of simulation is to validate feasibility of each scenario and find possible network/process design flaws. Automated simulation tools may also predict the performance of the new network/processes by simulating the processing of large numbers of orders.

People	
HS.0082	Optimization

Workflow

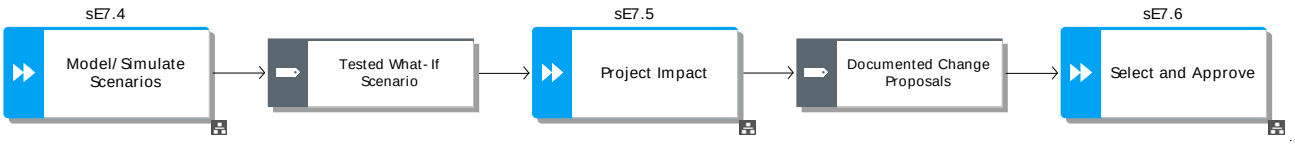


sE7.5 Project Impact

The activities associated with estimating the effort, risks, results of implementing the scenario. Effort includes the estimating the risks and duration and the funding, staffing and skills required for implementing the scenario. Risks includes estimating the impact on the Value-at-Risk for the supply chain. Results includes determining the changes to the performance of the supply chain on all relevant metrics.

People	
HS.0003	Accounting
HS.0126	Risk Identification
HS.0127	Risk Mitigation

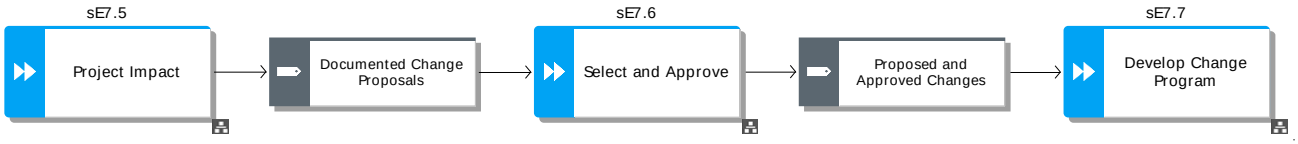
Workflow



sE7.6 Select and Approve

The activities associated with recommending and obtaining approvals for proposed supply chain network/configuration changes. This includes reviewing the 'what-if' scenarios and impact/benefit results with key stakeholders. The objective of this process is to identify the optimal solution and present this recommendation to sponsor and stakeholders and obtain approval to develop network change program.

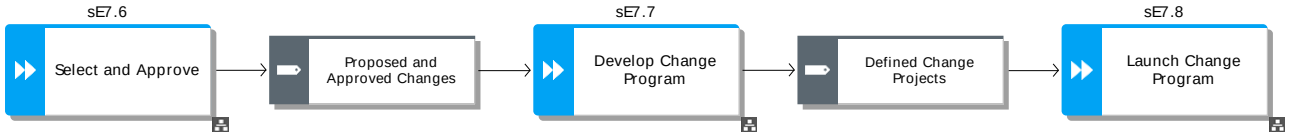
Workflow



sE7.7 Develop Change Program

The activities associated with developing the roadmap for change. This includes identifying the steps (or projects) required to implement changes to facilities, contracted parties, staffing, automation and process. Specific changes are assigned to unique owners. This includes reviewing the specific change/projects with key stakeholders. The objective of this process is to obtain approval to launch change projects.

Workflow

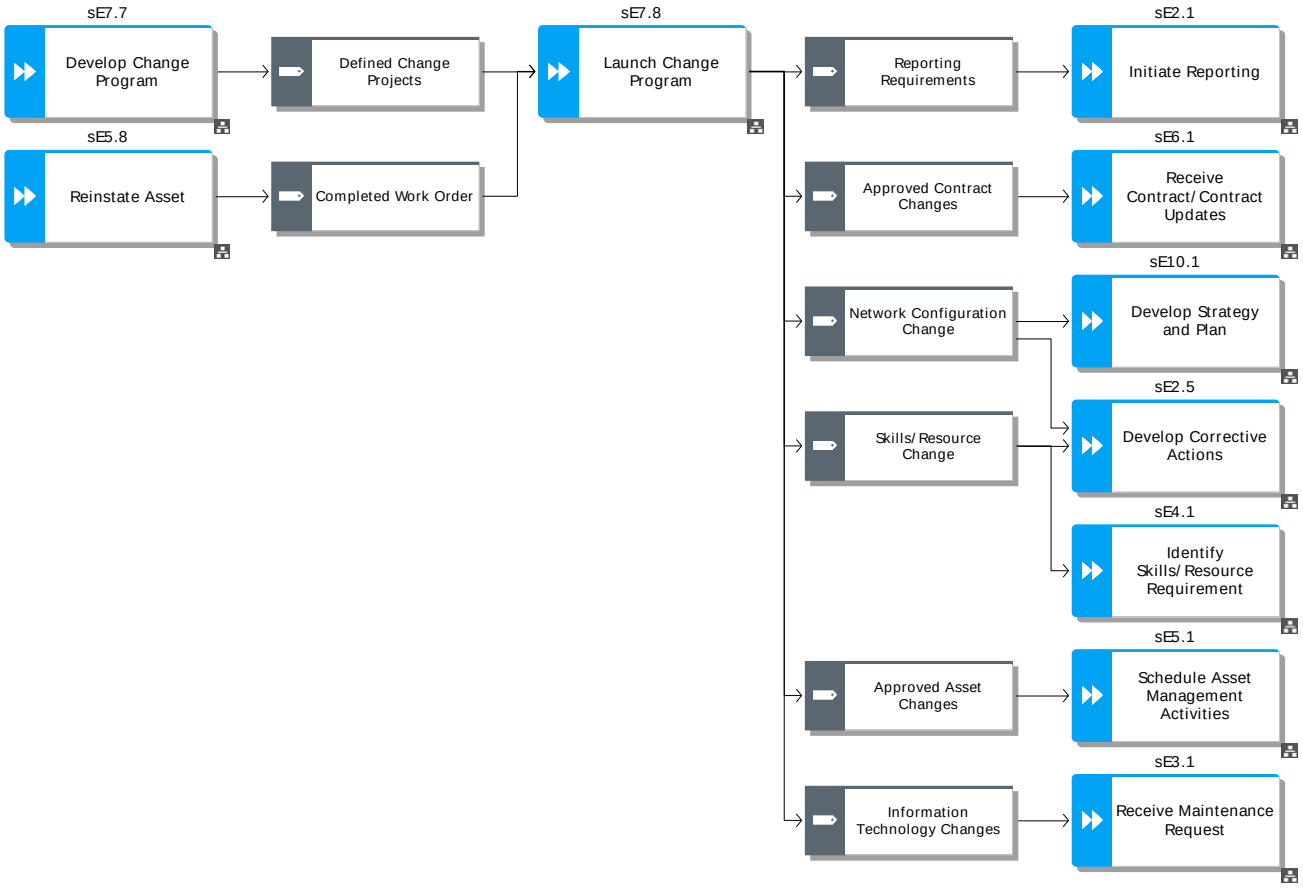


sE7.8 Launch Change Program

The activities associated with coordinating, starting and monitoring the individual change projects. This includes support the establishment of change projects, coordinate launch dates and communicate reporting requirements. Steps may include archiving the supply chain network/ configuration project documentation for future reference and dissolving the project team. Dissolving the project team requires transfer of responsibilities to monitor progress to appropriate organizations.

People	
HS.0105	Project Management

Workflow



sE8 Manage Regulatory and Voluntary Compliance

The process of identifying, collecting, assessing and integrating regulatory compliance requirements in standard supply chain processes, policies and business rules. This process also includes managing voluntary compliance to standards and certifications.

Regulatory Compliance is the term generally used to describe the policies and processes which organizations have in place to ensure that they comply with laws, rules and regulations put in place by external bodies (government) which control activity in a given jurisdiction. Often, organizations choose to go beyond regulatory compliance to meet voluntary compliance standards and/or pursue voluntary certifications for strategic reasons. Voluntary compliance to standards and certifications examples include: ISO standards, and optional certifications such as Rain Forest Alliance Certified, Sustainable Forestry Initiative, etc. A key component of Regulatory/Voluntary Compliance is establishing policies, business rules and processes to ensure legislative and regulatory compliance requirements are met. This includes ensuring personnel are aware of and take steps to comply with relevant laws, regulations, and standards, and the data or records retention used for compliance validation. Regulatory Compliance examples include: C-TPAT, Hazardous Materials, Import/Export, Labor, Licensing, Taxes. Note: These are examples, SCOR does not (attempt to) provide a complete list.

Hierarchy	
sE8.1	Monitor Regulatory Entities
sE8.2	Assess Regulatory Publications
sE8.3	Identify Regulatory Deficiencies
sE8.4	Define Remediation
sE8.5	Verify/Obtain License
sE8.6	Publish Remediation

Metrics	
RS.3.61	Manage Import/Export Requirements Cycle Time

Practices	
BP.166	Document Management System

People	
HS.0023	Controls and Compliance
HS.0025	Business Rule/Policy Management
HS.0041	EHS regulations
HS.0045	Environmental Requirements

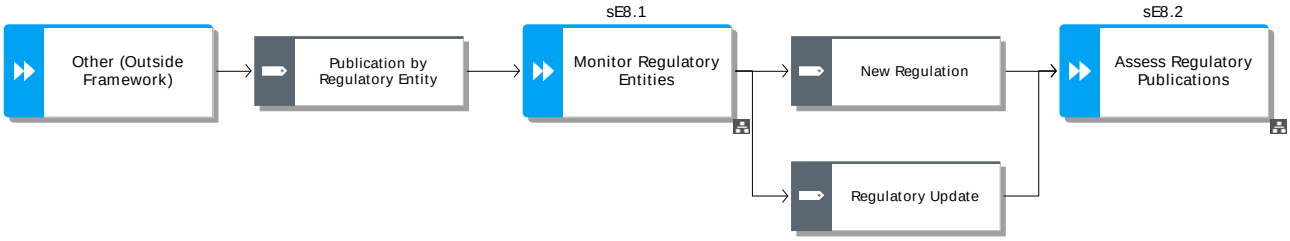
sE8 Manage Regulatory Compliance

HS.0050	Import/Export Regulations
HS.0054	Intellectual Property/Proprietary Data
HS.0066	Legislation and Standards
HS.0111	Regulatory Policy Management
HS.0157	Warranty process and policy
HS.0160	Waste Management

sE8.1 Monitor Regulatory Entities

The activities associated with identification regulatory publications, subscribing to publications, receiving and registering publications of relevant regulatory entities (e.g. government agencies).

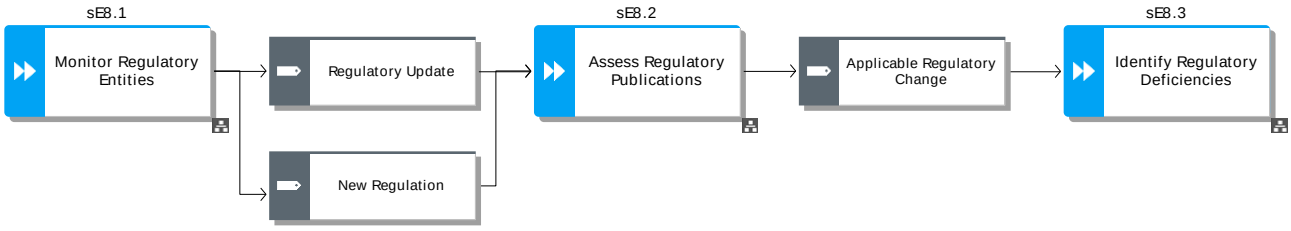
Workflow



sE8.2 Assess Regulatory Publications

The activities associated with reading, interpreting and researching policies, laws, rules and regulations. This includes determining if and how these regulatory requirements apply to the supply chain.

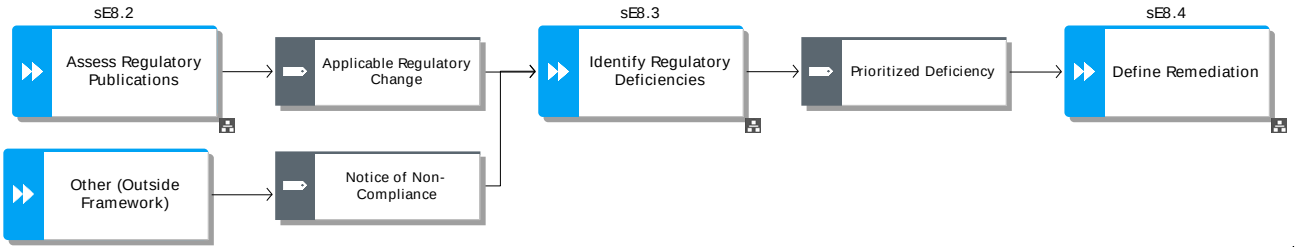
Workflow



sE8.3 Identify Regulatory Deficiencies

The activities associated with identification of past, current and future regulatory requirements that are not or cannot be met using existing processes, business rules and policies. This includes notification of deficiency status to impacted organizations.

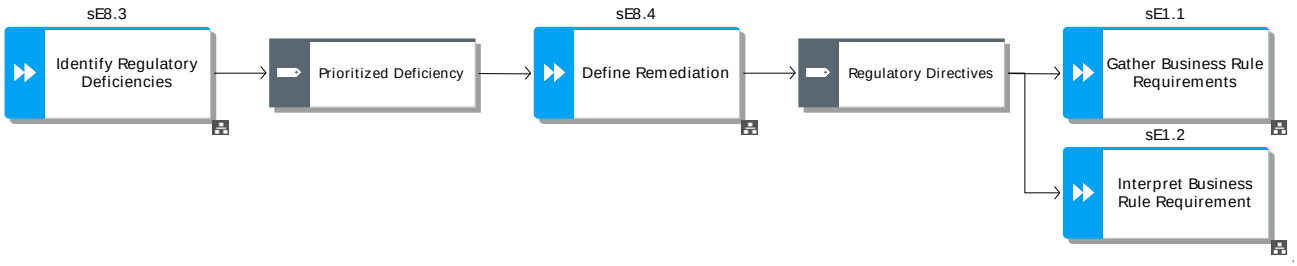
Workflow



sE8.4 Define Remediation

The activities associated with identification remediation alternatives, selecting and documenting processes, policies and business rules and setting documentation requirements to remediate a deficiency.

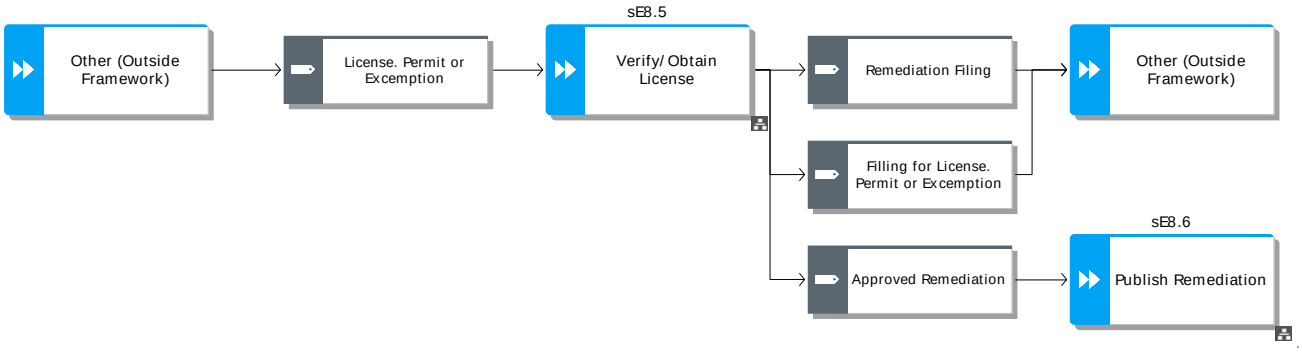
Workflow



sE8.5 Verify/Obtain License

The activities associated with verification of the remediation strategy with controlling entities and/or obtaining a license certifying compliance by the controlling entity.

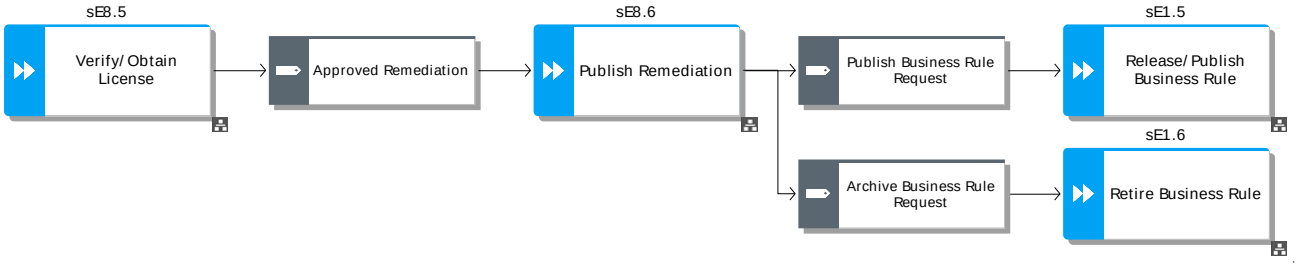
Workflow



sE8.6 Publish Remediation

The activities associated with approving and implementing changes to processes, policies and business rules. This may include distributing certification documentation to relevant organizations in the supply chain.

Workflow



sE9 Manage Supply Chain Risk

The process of identification and assessment of potential disruptions (risks) in the supply chain and developing a plan to mitigate these threats to operating the supply chain. Supply chain risks include:

- Disruptions in demand - e.g. customers going out of business
- Disruptions in supply - e.g. suppliers going out of business, supplier quality/performance issues
- Environmental disruptions - e.g. weather, flooding, earthquakes
- Financial disruptions - e.g. availability of credit, investors
- Fraud, theft and mismanagement - lack of risk mitigation
- Labor disruption - e.g. employee strikes, availability of qualified staff
- Terrorism and cyber attacks

Risk mitigation strategies include avoiding the risk, reducing the impact or probability of the risk, transferring the risk to another party and accepting part of the risk. Example changes to the supply chain network, process and resources include: insurance, relocation, dual/triple sourcing, outsourcing, insourcing, offshoring, reshoring, security, supply chain redesign, process redesign, business rule changes, contract renegotiation.

sE9 Manage Supply Chain Risk is closely aligned with section 5 of the ISO 31000 standard. ISO 31000 is a generic risk management standard across the enterprise, sE9 - Manage Supply Chain Risk is the adaptation for supply chain risk management. Note: ISO 31000 section 5.6 Monitor and Review is represented in SCOR as sE2 Manage Supply Chain Performance.

Discussion Note:

Risk Handling / Treatment: Once an enterprise understands its supply chain and analyzed its potential risks, it can implement an effective supply-chain risk management program with its partners, that is, its suppliers, carriers, and logistics providers. Such a program should have at least three elements: protecting the supply chain, responding to events, and continuing business operations while recovering from events.

Continual Monitoring of Risks and Their Treatment: Once an organization has established an Supply Chain Risk Management (SCRM) program, including processes for identifying and treating risks, it should implement a monitoring program, evaluating plans, procedures, and capabilities through periodic review, testing, post-incident reports, and other exercises. It should check conformity and effectiveness of the program, establish, implement, and maintain procedures for monitoring and taking corrective action as necessary. This includes reviewing other organizational changes that may affect SCRM.

Source: Supply Chain Risk Leadership Council

Hierarchy	
sE9.1	Establish Context
sE9.2	Identify Risk Events
sE9.3	Quantify Risks
sE9.4	Evaluate Risks
sE9.5	Risk Handling Strategy

sE9 Manage Supply Chain Risk

Metrics	
AG.1.3	Overall Value at Risk (VAR)
AG.2.10	Value at Risk (Plan)
AG.2.11	Value at Risk (Source)
AG.2.12	Value at Risk (Make)
AG.2.13	Value at Risk (Deliver)
AG.2.14	Value at Risk (Return)
AG.2.15	Time to Recovery (TTR)
CO.2.6	Risk / Mitigation Costs

Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.002	Risk Management Strategies
BP.004	Network Prioritization for Risk Identification
BP.081	Bowtie Risk Management
BP.093	Publish Production Plan
BP.134	Supplier Evaluation using Robust Evaluation Tool
BP.145	Vendor Collaboration
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.150	Maintain Supply Chain Risk Register
BP.173	Supply Chain Risk Monitoring
BP.174	Supply Chain Risk Assessment

People	
HS.0124	Risk and exception management
HS.0125	Risk Assessment
HS.0126	Risk Identification
HS.0127	Risk Mitigation
HS.0128	Risk Response Planning
HS.0142	Supply Chain Performance Measurements

sE9.1 Establish Context

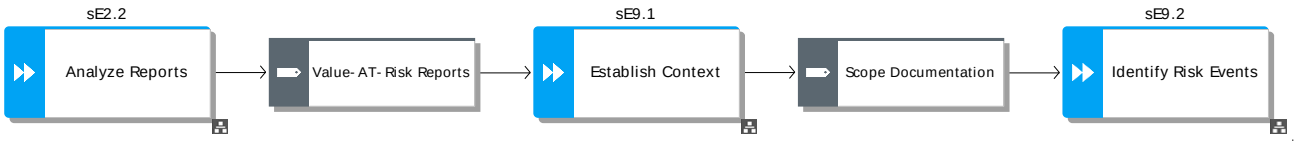
The process of defining and documenting the objectives and scope (internal and external) for managing risk. This includes developing/maintaining understanding of the internal and external relationships, internal and external factors that influence the supply chain's ability to achieve its objectives, and defining and maintaining a risk management organization -- stakeholders, governance structure, procedures and schedule.

Metrics	
AG.2.10	Value at Risk (Plan)
AG.2.11	Value at Risk (Source)
AG.2.12	Value at Risk (Make)
AG.2.13	Value at Risk (Deliver)
AG.2.14	Value at Risk (Return)
AG.2.15	Time to Recovery (TTR)

Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.081	Bowtie Risk Management

People	
HS.0124	Risk and exception management

Workflow



sE9.2 Identify Risk Events

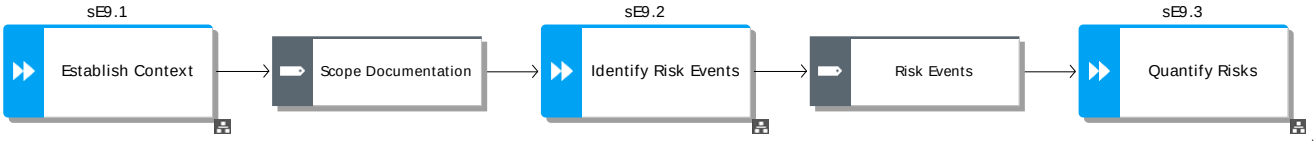
The process of identifying, collecting and documenting all potential risk events that may impact the organization from meeting its goals. This includes identification of sources of risks, identification and discovery of risk events.

This process generates a comprehensive list of all risks that may disrupt the supply chain, including information which processes in the supply chain will be directly and indirectly impacted by the occurrence of the risk event. A broad classification of risk types includes:

- Disruptions in demand - e.g. customers going out of business
- Disruptions in supply - e.g. suppliers going out of business, supplier quality/performance issues
- Environmental disruptions - e.g. weather, flooding, earthquakes
- Financial disruptions - e.g. availability of credit, investors
- Fraud, theft and mismanagement - lack of risk mitigation
- Labor disruption - e.g. employee strikes, availability of qualified staff
- Terrorism and cyber attacks

The number of risks within these types may differ by industry.

Practices	
BP.004	Network Prioritization for Risk Identification
People	
HS.0126	Risk Identification
Workflow	



sE9.3 Quantify Risks

The process of collecting and documenting for each potential risk the causes, probability and consequences. The standard metric for quantification of risk is Value at Risk (VaR):

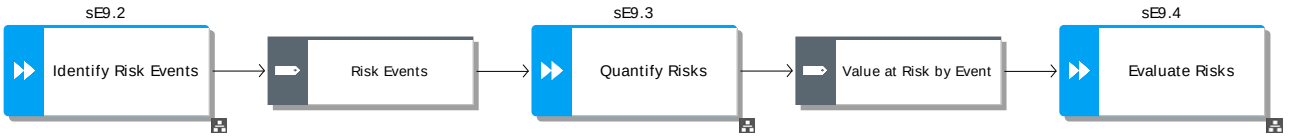
VaR = Probability of Occurrence x Monetary Impact of Occurrence

This process generates a comprehensive list of the monetary impact for all risks that may disrupt the supply chain. For certain types of risk events probability information may be available through government agencies, insurance companies or research firms. The monetary impact is determined based on the projected monetary impact for each supply chain for each risk event. For example:

- For a single sourced material, the supplier going out of business means the product manufactured using this material cannot be produced until a new supplier has been identified, qualified and integrated in the supply chain. The monetary impact would be the loss of the projected revenue for these products during the qualification and integration process of a new supplier.
- For a dual sourced material one of the two suppliers going out of business means the product manufactured using this material can only be produced for the percentage the remaining supplier may be able to support until a new supplier has been identified, qualified and integrated or until the remaining supplier can support 100% of the project revenue.

  Different risk events may have different monetary impacts: reduction of revenue vs. increase of cost.

Metrics	
AG.2.10	Value at Risk (Plan)
AG.2.11	Value at Risk (Source)
AG.2.12	Value at Risk (Make)
AG.2.13	Value at Risk (Deliver)
AG.2.14	Value at Risk (Return)
AG.2.15	Time to Recovery (TTR)
People	
HS.0125	Risk Assessment
Workflow	

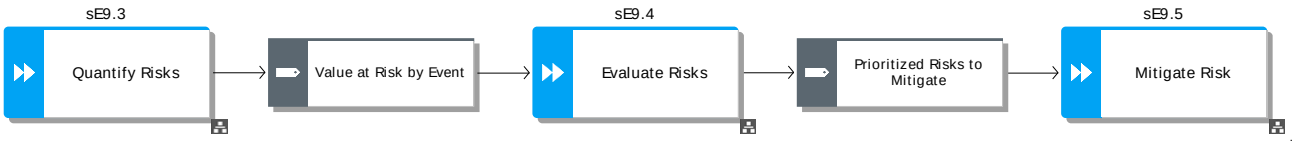


sE9.4 Evaluate Risks

The process of prioritizing risk events by VaR and determining for each risk whether mitigation actions are required or the risk is acceptable ('risk of doing business').

Practices	
BP.004	Network Prioritization for Risk Identification
BP.081	Bowtie Risk Management

Workflow

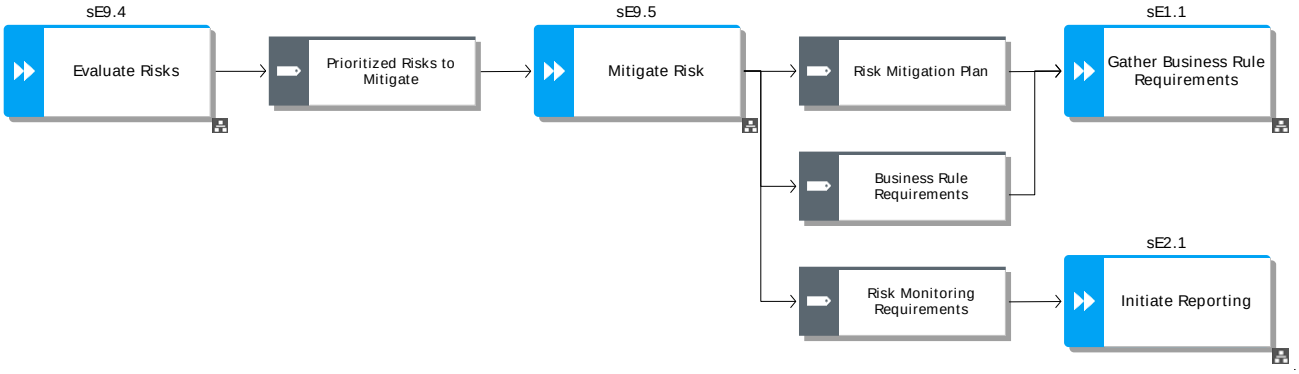


sE9.5 Mitigate Risk (Risk Handling Strategy)

The process of determining the actions required to eliminate, reduce or accept and monitor the risk creating, approving, communicating and launching the 'Risk Mitigation Plan'.

Practices	
BP.002	Risk Management Strategies

Workflow



sE10 Manage Supply Chain Procurement

The procurement cycle is the cyclical process of key steps when procuring goods or services

The concepts in this section were developed in conjunction with procurement standards outlined by the Chartered Institute of Procurement & Supply (CIPS). For more information on globally recognized procurement and supply practices please visit the CIPS website at www.cips.org

Discussion Note:

The following are not considered SCOR v12 metrics but can be utilized when managing supply chain procurement.

Procurement cycle time: The aggregate time required to identify procurement requirements, develop the strategy, identify qualified suppliers, issue/evaluate ITT/RFQ, evaluate bids/proposals from suppliers, and negotiate/sign contract.

- % of the Cost of Goods Sold purchased from suppliers
- % of purchases that are on strategic/long term contracts
- % of purchases that with Strategic Suppliers
- % of contracts that are Sole Source
- % of contracts that are Competitive (More than one supplier solicited)
- % of contracts that are Firm Fixed Price
- % of contracts that are Performance/Incentive based

Hierarchy	
sE10.1	Develop Strategy and Plan
sE10.2	Pre-Procurement / Market Test and Market Engagement
sE10.3	Develop Documentation, PPQ / Detailed Spec/ Combine with 1
sE10.4	Supplier Selection to Participate in ITT / RFQ / Negotiation
sE10.5	Issue ITT / RFQ
sE10.6	Bid / Tender Evaluation and Validation
sE10.7	Contract Award and Implementation

Metrics	
RS.1.1	Order Fulfillment Cycle Time
RS.2.1	Source Cycle Time

Practices	
BP.131	Alternative Supplier Benchmarking
BP.095	Bill of Material / Audit Control
BP.162	Long Term Supplier Agreement / Partnership
BP.144	Purchase Order Management
BP.101	Purchasing / Procurement Strategy
BP.042	Regular Review of Procurement Terms and Conditions
BP.100	Strategic Sourcing
BP.045	Vendor Collaboration

sE10 Manage Supply Chain Procurement

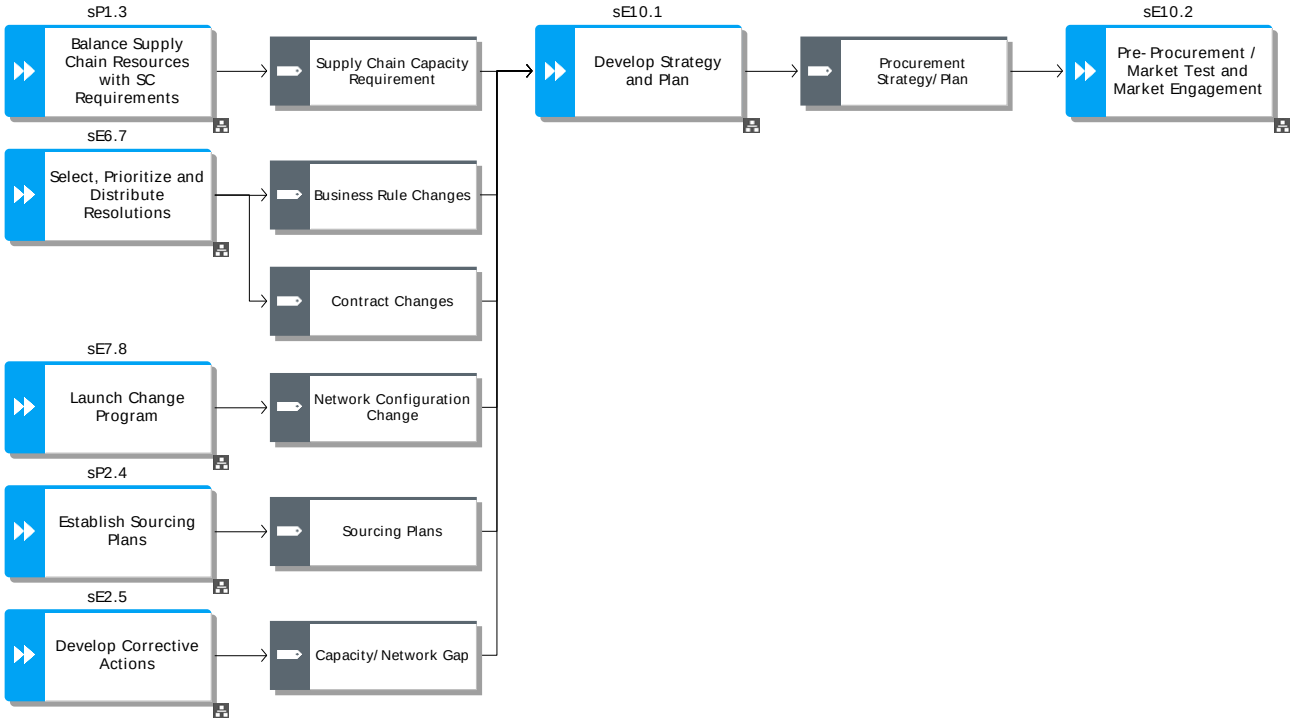
People	
HS.0162	Analytical Skills
HS.0020	Competitive Billing
HS.0022	Contract Management
HS.0181	Negotiation
HS.0094	Procurement
HS.0123	RFP / RFQ Management
HS.0139	Supplier Relationship Management (SRM)

sE10.1 Develop Strategy and Plan

The process of developing a sourcing strategy/plan needed to procure the products and services required by the organization. Inputs into this process include specifications, business requirements and marketplace assessment. Special care must be taken to ensure compliance with country specific laws and regulations.

In addition, compliance with internal policies and guidelines must be adhered to. Finally, supply chain risks must be accounted for in this plan.

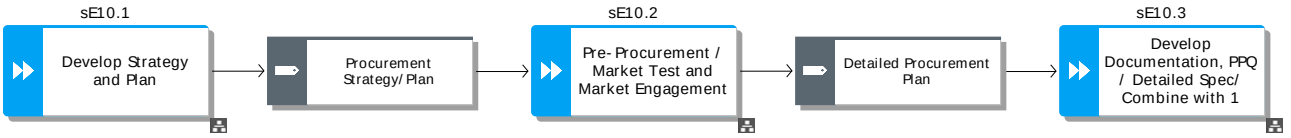
Workflow



sE10.2 Pre-Procurement / Market Test & Market Engagement

Market development identifies both stakeholder and business needs and the changes required in order to implement the procurement strategy to meet those needs flexibly. Testing the market or strategy will help to identify if it is the right time to go into the marketplace and other factors to consider such as crop cycles, what your competitors are doing, suppliers end of financial year or new legislation.

Workflow

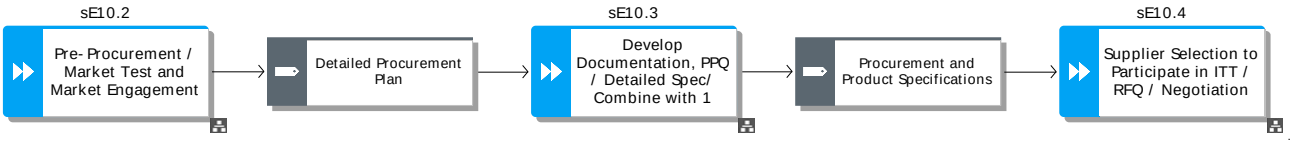


sE10.3 Develop Procurement Documentation (Pricing, Product, Quality (PPQ) / Detailed Spec)

Develop the tender (written offer to contract goods or services at a specified cost or rate) documents including a detailed breakdown of the volumes, service level agreement and terms and conditions along with a detailed specification to ensure consistency on pricing, product quality, and operational functionality of products. Ensuring correct product purpose can reduce the financial impact of incorrect specification further down the supply chain.

Care must be taken to understand the distinction between product requirements and product preferences, and to build in tolerances for suppliers to adhere to, not restricting the supply or build cost into the product. The specification will form part of the tender documentation issued to suppliers to quote on a like-for-like basis.

Workflow

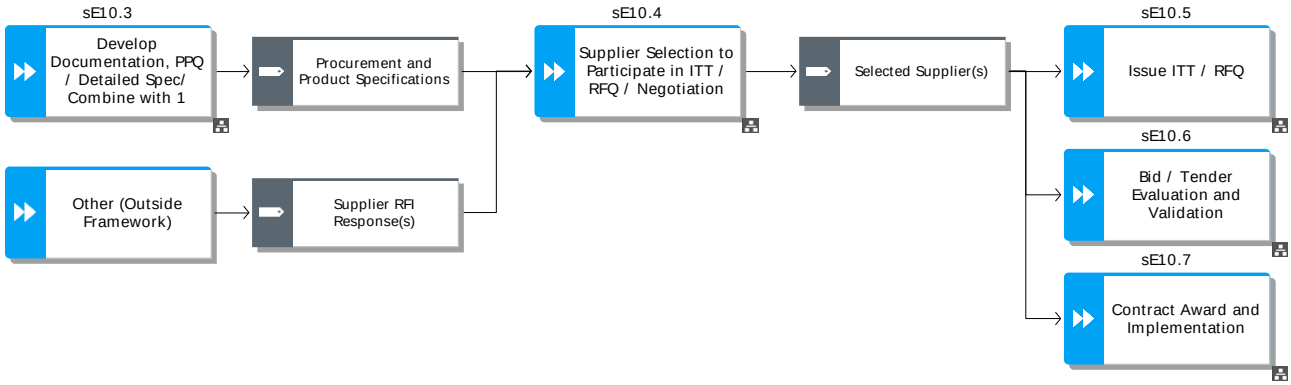


sE10.4 Supplier Selection to Participate in Invitation to Tender (ITT) / Request for Quotation (RFQ) Negotiation

Conducting a Request for Information (RFI) to gain insights into suppliers' size, capabilities, financials, strengths and weaknesses before assessing whether they should be included in the tender process.

Ranking the performance qualifiers against the business needs with key stakeholders is conducted before reviewing the RFI against the selection criteria to select suppliers to participate in the tender process.

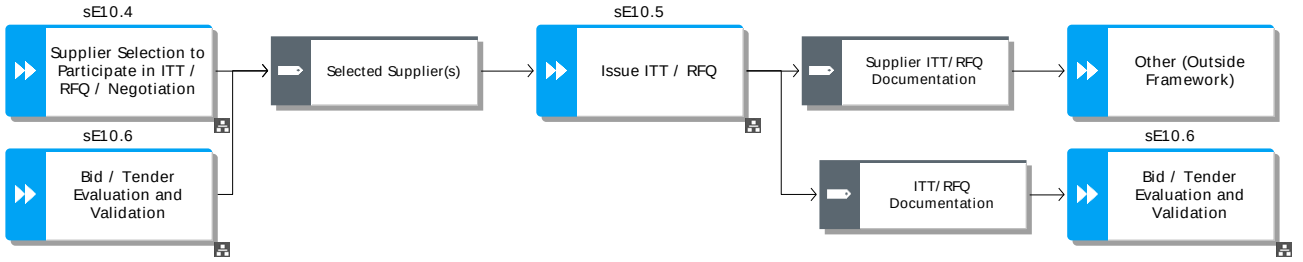
Workflow



sE10.5 Issue Invitation to Tender (ITT) and Request for Quotation (RFQ)

Once you have selected the companies to participate a formal ITT and RFQ is sent out to invited participants. Items to be included are specification and documentation developed around the business requirements along with clear timescales to respond.

Workflow

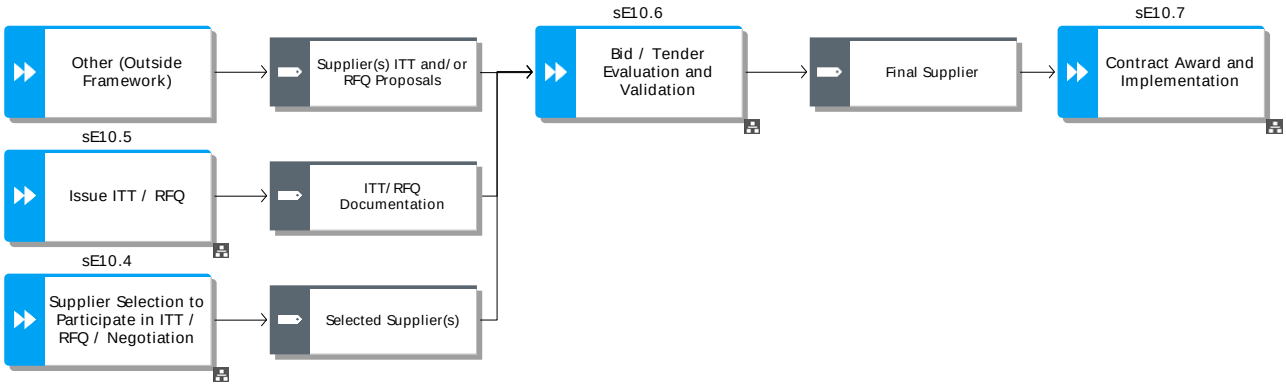


sE10.6 Bid / Tender Evaluation and Validation

Bids and/or proposals are evaluated and validated in order to select the preferred supplier(s). Whether tendering contracts for the supply of goods or services, tender evaluation should be carried out in a structured, disciplined and transparent manner. Most evaluations explore price comparisons alongside technical capability, capacity, quality of service and financial health.

At this stage a post tender negotiation often takes place, along with checking of references and credit checks or carrying out a supplier visit, technical audit, product sampling or a trial. Whole life costs should also be considered including decommissioning, removal or disposal costs.

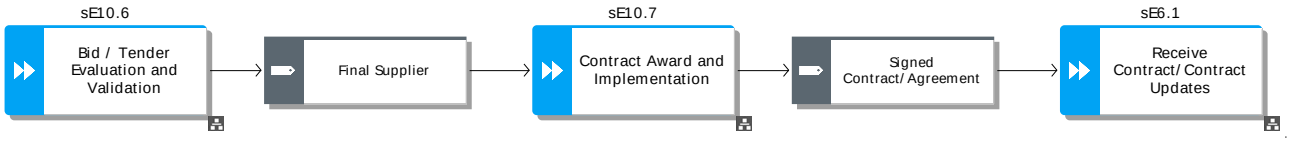
Workflow



sE10.7 Contract Award and Implementation

Once the supplier has been selected, a contract is typically developed that allows both parties to fully understand their obligations and key success criteria as part of the agreement. This forms the foundation to manage the contract and relationship effectively. The agreed terms and conditions help to minimize contractual risks and exposure when doing business. Once the contract and terms are agreed then the communication and implementation process can begin with clear timescales and parameters set out on both sides, including relevant stakeholder groups to manage the implementation effectively.

Workflow



sE11 Manage Supply Chain Technology

The process of defining, deploying, and managing the technology enablement involved in supply chain planning, execution, and performance management. The scope of technology enablement in the supply chain goes well beyond foundations ERP and MRP systems to include:

- Planning systems
- Supplier portals
- Sourcing tools and platforms
- Manufacturing execution systems (MES)
- Supply chain modeling and analytics tools
- Sensors and Internet of Things (IoT) solutions
- Process and activity automation solutions
- Supply chain visibility and collaboration tools and platforms
- Supply chain risk monitoring and management tools and platforms
- Metrics and reporting tools
- Demand sensing technologies (e.g. social network monitoring and analysis)

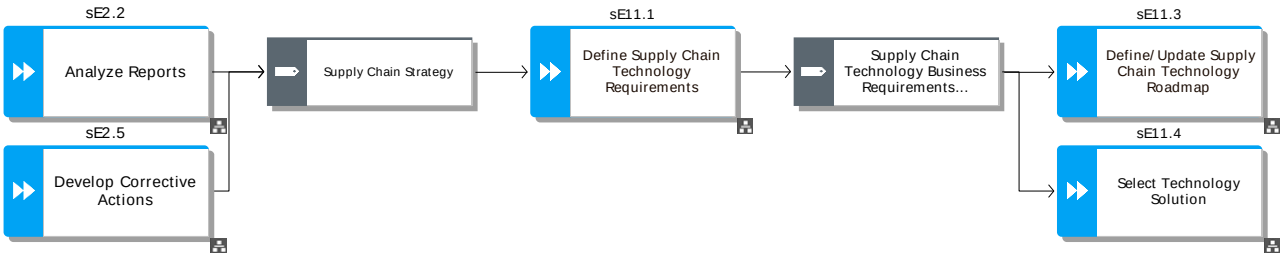
Discussion: Many organizations have enterprise-wide processes for managing technology. This process is not intended to duplicate or replace those enterprise processes, but is intended to reinforce the need for focused attention and participation of the supply chain organization in the definition of requirements and technology choices for the supply chain. It does not include the standard IT management activities for testing and implementation of new technology solutions.

Hierarchy	
sE6.1	Define Supply Chain Technology Requirements
sE6.2	Identify Technology Solution Alternatives
sE6.3	Define/Update Supply Chain IT Roadmap
sE6.4	Select Technology Solution
sE6.5	Deploy Technology Solution
sE6.6	Maintain and Improve Technology Solution
sE6.7	Retire Technology Solution

sE11.1 Define Supply Chain Technology Requirements

The activities associated with defining specific business process and information requirements for the business processes in scope. A comprehensive evaluation of requirements involves internal and external research to develop robust requirements which consider strategic performance characteristics and goals, regulatory and compliance requirements, and leading and emerging practices from within industry and across industries. Requirements definition should actively resist codifying legacy processes and practices as “requirements” unless they are compulsory, provide strategically differentiating capability, or are reflective of leading practices based on external research.

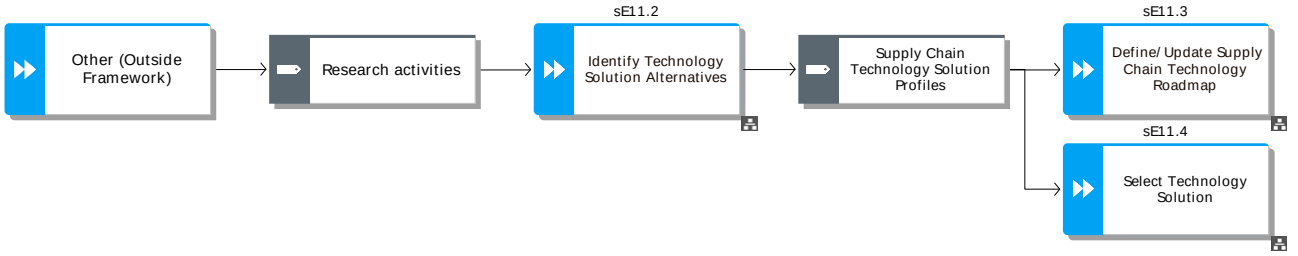
Workflow



sE11.2 Identify Technology Solution Alternatives

The activities associated with surveying and evaluating available technology options and capabilities. These activities can and should occur in parallel with sE11.1 so as not to have un-vetted “requirements” prematurely shape and direct technology/solution research and evaluation. Best practice is to maintain technology scanning as an ongoing business practice rather than as an episodic activity. Technology scanning and evaluation should create a clear understanding of the “art of the possible” as well as the risk profiles of various technology alternatives.

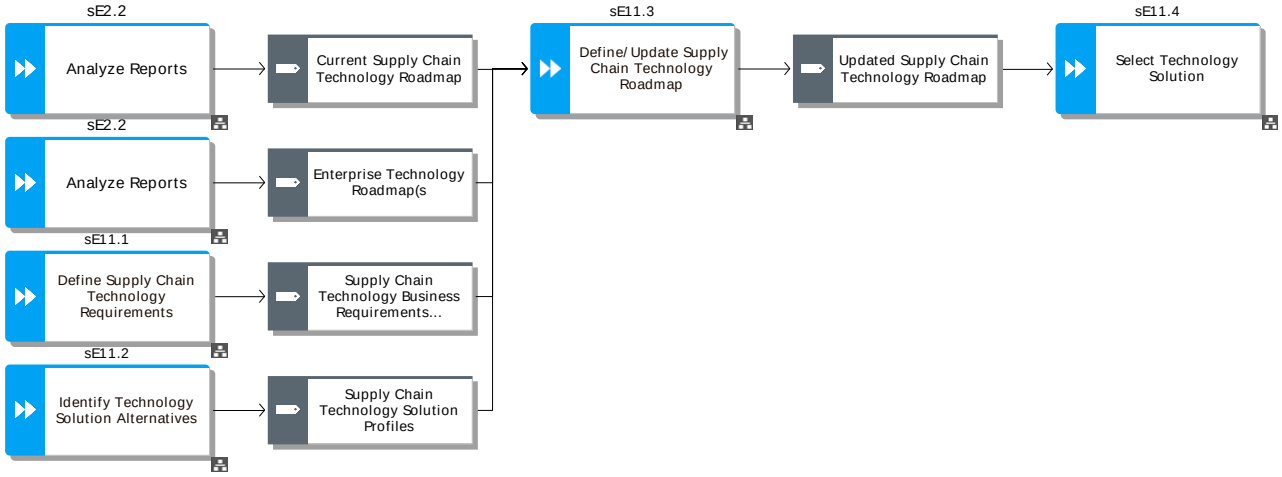
Workflow



sE11.3 Define/Update Supply Chain Technology Roadmap

The activities associated with synthesizing supply chain capability requirements and technology alternatives into an overarching plan for new technology adoption and implementation. Transitioning from existing to new technologies is typically a highly complex endeavor, made more complex as levels of integration continue to increase. With the high degree of interaction among integrated technology systems and data flows, effective adoption and integration of new technologies require a carefully constructed, time phased plan, or roadmap. All businesses should maintain a technology roadmap across the enterprise, with specific, detailed roadmaps for core business process domains such as supply chain. An effective roadmap shows the time-phased path from the existing technologies to new technologies, including any transitional and phased or bridged solutions. Roadmaps should reflect a 3-5 year horizon, but are always subject to change based on acceleration of emerging technologies, competitor behaviors, customer requirements, or disruptive changes in the value chain. Adding a technology solution to the roadmap is not as detailed and specific an exercise as technology selection activities in sE11.4. Roadmaps are intended to be guidance, subject to detailed evaluation and selection.

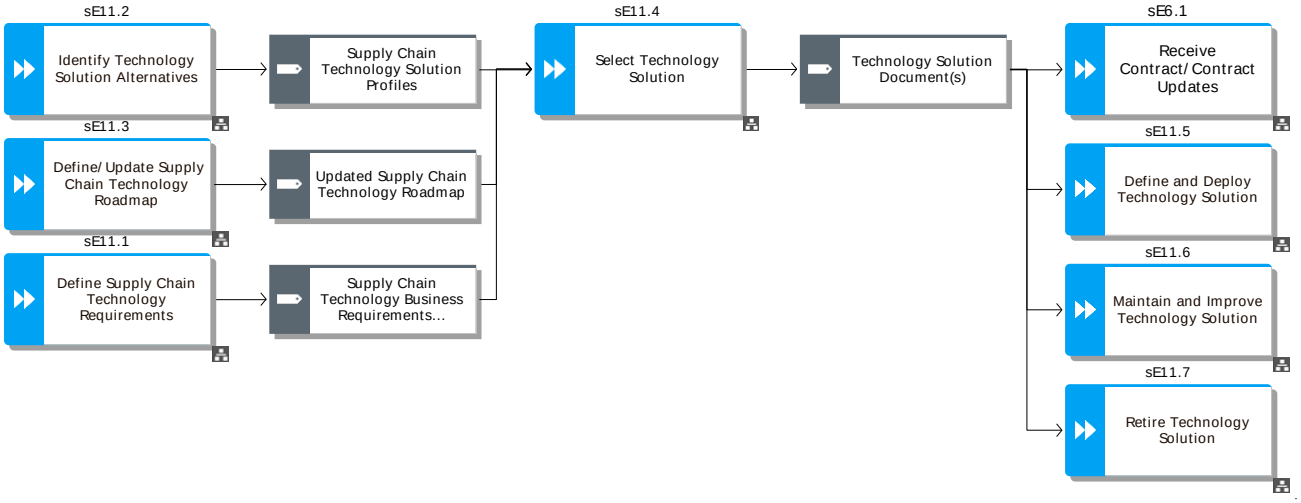
Workflow



sE11.4 Select Technology Solution

The activities associated with detailed matching of business requirements against technology alternatives to define the best overall solution, considering fit to requirements, compatibility with other integrating technologies, risks, and total costs of ownership for the technology. Technology selection is a cross-functional activity, and is most effective when comprehensive selection criteria and weightings are defined in advance.

Workflow



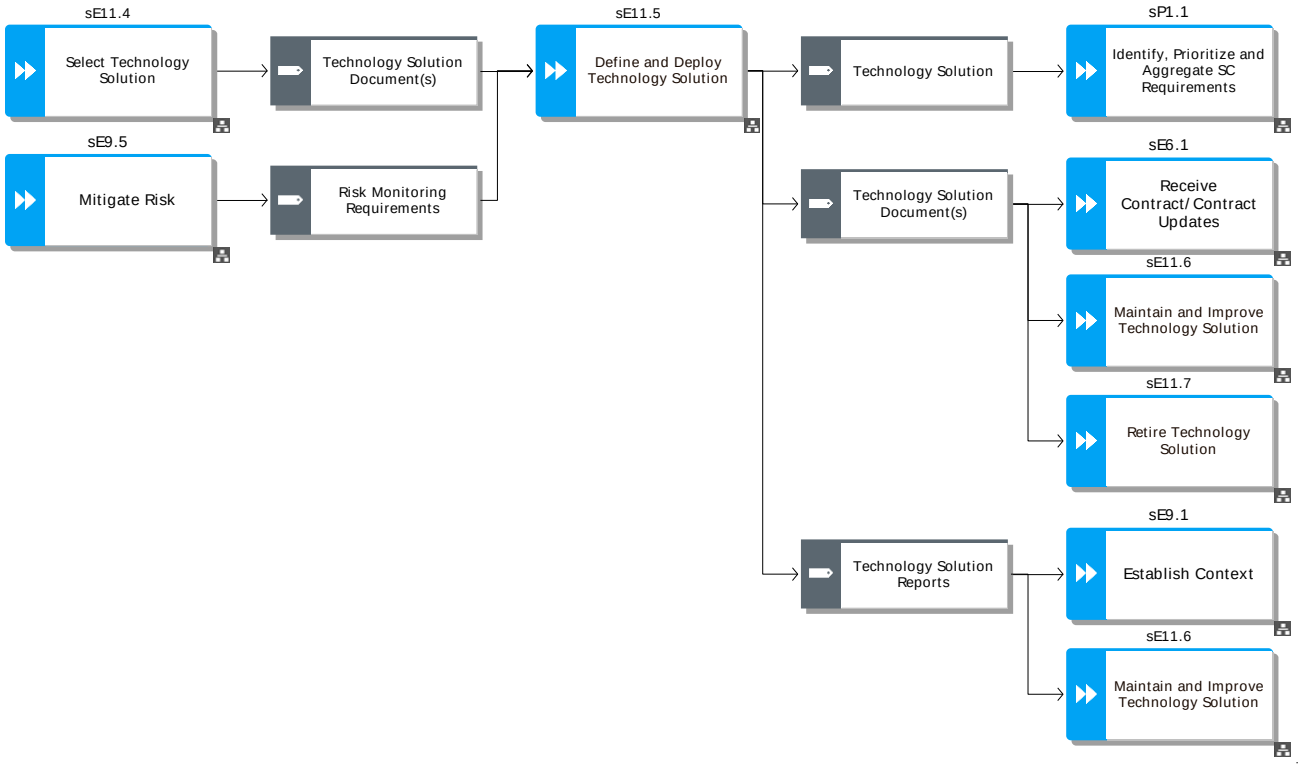
sE11.5 Deploy Technology Solution

The activities associated with developing, configuring, testing, piloting, and fully deploying new supply chain technologies. The specific technical activities involved in technology deployment are represented in IT implementation best practice approaches and models. Supply chain related activities involve assessing and mitigating supply chain risks associated with implementation issues and delays, possibly including:

- Incorrect information passing to customers, suppliers, or supply chain partners
- Supply chain delays and missed delivery dates
- Incorrect inventories
- Erroneous plans
- Product quality issues

Supply chain management plays a vital role in understanding and preparing for technology implementation problems. Technology deployment considerations (e.g. downtime, lost capacity) and risk mitigations (e.g. inventory buildup) as defined in sE9 become important inputs into supply chain plans.

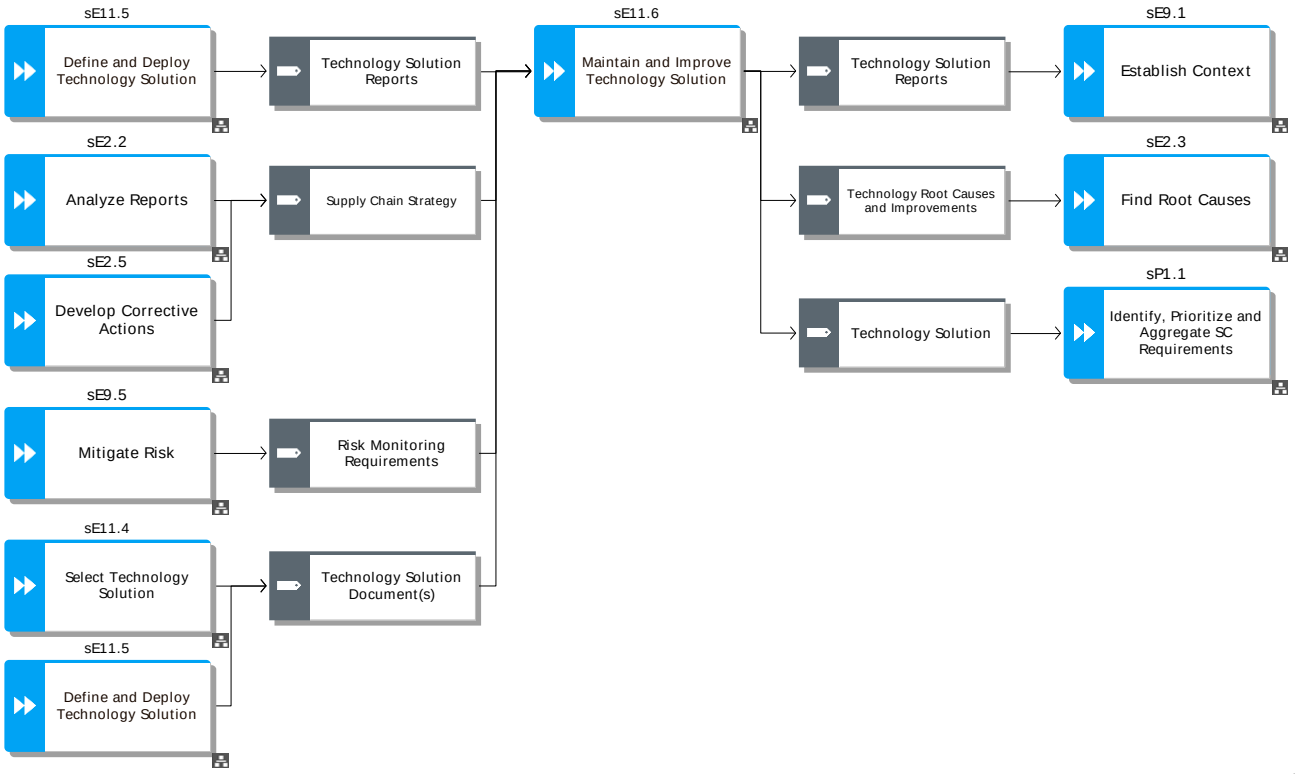
Workflow



sE11.6 Maintain and Improve Technology Solution

The activities associated with continuous improvement of technology solution performance through ongoing performance analysis and enhancement of models, algorithms, data quality and inputs, and configurations. As technology solutions become increasingly sophisticated, it is unlikely that initial models and configurations used at deployment are optimal. To accelerate improvement cycles, leading practices include the use of simulation and "digital twins" of supply chains or supply chain segments to rapidly evaluate and refine models and algorithms off-line before implementing live in the supply chain.

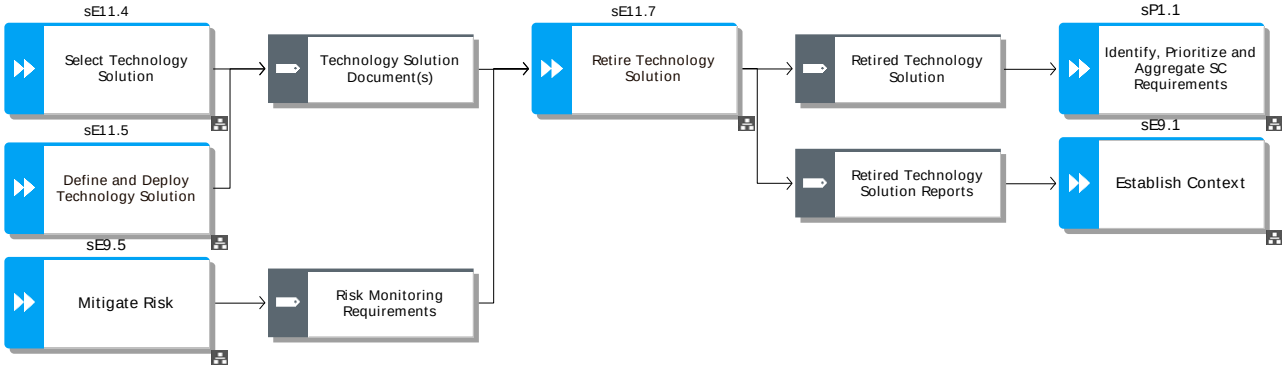
Workflow



sE11.7 Retire Technology Solution

The activities associated with removing a supply chain technology solution from active use. As with deployment, there are many technology related activities associated with solution retirement which are best represented in IT management models. Supply chain management's focus in solution retirement should focus on supply chain risk identification and mitigation, as well as ensuring that necessary data and meta-data from the retired system are effectively preserved. Many supply chain analytics can require significant amounts of historical data beyond corporate archiving policies, and supply chain managers should clearly identify such data records and work with IT managers to ensure its continued availability and use.

Workflow



Practices

Introduction to Practices

A practice is a unique way to configure a process or a set of processes. The uniqueness can be related to the automation of the process, a technology applied in the process, special skills applied to the process, a unique sequence for performing the process, or a unique method for distributing and connecting processes between organizations. All practices have links to one or more processes, one or more metrics and where available one or more skills.

Qualification of Practices

SCOR recognizes that several different types of practices exist within any organization:

- Emerging practices
- Best practices
- Standard practices

These practice categories go by other names as well. What's important to understand is that different practices have different performance expectations. The classification of a practice will vary by industry. For some industries, a practice may be standard, whereas the same practice may be considered an emerging or best practice in another industry. The SCOR classification of practices has been established based on input from practitioners and experts from a diverse range of industries.

Emerging practices

Emerging practices introduce new technology, knowledge or radically different ways of organizing processes. Emerging practices may yield a step change in performance by 'redefining the playing field' within an industry. Emerging practices may not be easy to adopt because of proprietary technology, or special knowledge may prevent wider adoption. Emerging practices generally have not been proven in a wide variety of environments and industries.
Risk: High, Results: High.

Best practices

Best practices are 'current', 'structured' and 'repeatable' practices that have had a proven and positive impact on supply chain performance.

- Current: Not emerging, not outmoded.
- Structured: Feature a clearly stated goal, scope, process, and procedure.
- Proven: Demonstrated in a working environment, and linked to key metrics.
- Repeatable: Proven in multiple organizations and industries.

SCOR best practices have been chosen by SCOR practitioners in diverse industries. It is understood that not all best practices will yield the same results for all industries or supply chains.
Risk: Moderate, Results: Moderate.

Standard practices

Standard practices are how a wide range of companies have historically done business by default or happenstance. These well-established practices do the job, but don't provide a significant cost or competitive advantage over other practices (except over declining practices).

Risk: Low, Results: Low.

Classification of Practices

All practices in SCOR have been classified to simplify finding a practice. The table below shows the classification categories for the SCOR practices. A practice may be linked to multiple categories.

Categories	
Business Process Analysis/Improvement	Planning and Forecasting
Customer Support	Product Lifecycle Management
Distribution Management	Production Execution
Information/Data Management	Purchasing/Procurement
Inventory Management	Reverse Logistics
Material Handling	Risk/Security Management
New Product Introduction	Sustainable Supply Chain Management
Order Engineering (ETO)	Transportation Management
Order Management	Warehousing People Management (Training)

The practices listed in SCOR are for identification purposes only. Further research and analysis is generally required to fully understand how to implement a practice. For example: SCOR recognizes S&OP as a practice and lists which processes and metrics may be impacted. For detailed process and implementation design, an organization will need to consult other sources -- such as books, case studies, seminars, and consultancies. Some practices may be registered by other organizations. APICS does not claim ownership of these practices but merely recognizes their relevance and value. Some practices may be copyright of their respective owners but many practices are in the common domain.

Practices by Classification

Business Process Analysis/Improvement

Customer Support

Distribution Management

Information Management

3-Way Delivery Verification	BP.148
3D Print / Rapid Prototyping	BP.120
Bar coding	BP.153
Business Rule Management	BP.023
Business Rule Review	BP.035
Convergence of SCOR with Lean and Six Sigma	BP.165
Customer Data Line of Responsibility	BP.103
Data Warehousing/Business Intelligence	BP.099
Distribution Planning	BP.017
Document Management System	BP.166
Electronic Data Interchange (EDI)	BP.159
Electronic Returns Tracking	BP.167
Generation of Dynamic Bills of Materials	BP.119
Inventory Record Accuracy	BP.030
Lot Tracking	BP.012
Master Data Accuracy	BP.062
Mobile Access of Information	BP.098
Performance Management	BP.080
Project Management	BP.083
Real time Package Tracking	BP.151
Standard Operating Procedures	BP.155
Supply Network Planning	BP.016
Transportation Management System	BP.115
Workflow Automation	BP.175

Inventory Management

Safety Stock Reduction	BP.064
3D Print / Rapid Prototyping	BP.120
ABC Inventory Classification	BP.087
ABC Inventory Classification System	BP.018
Automated Data Capture (ADC)	BP.152
Baseline Inventory Monitoring	BP.007
Bill of Material Audit/Control	BP.095
Consignment Inventory	BP.006
Consignment Inventory with Key Suppliers	BP.036
Consignment Inventory Management	BP.164

Returns Inventory Reduction	BP.067
Returns Policy to Reduce Returns Inventory	BP.066
Rotable Spares Pool	BP.168
Safety Stock Planning	BP.015
Slow-moving Inventory Monitoring	BP.008
Standard Operating Procedures	BP.155
Stock keeping Unit (SKU) Rationalization/Cost of Sales Analysis	BP.031
Supplier Delivery Performance Analysis	BP.068
Supplier Raw Material Quality Improvement	BP.056
Transportation Optimization	BP.041
Vendor Collaboration	BP.145
Vendor Managed Inventory (VMI)	BP.139
Vendor Managed Inventory (VMI)	BP.122
Manufacturing/Production	
Batch Size Reduction	BP.038
Carcass Prepositioning	BP.109
Continuous Improvement	BP.082
Convergence of SCOR with Lean and Six Sigma	BP.165
Cross Functional Teams	BP.113
Electronic Technical Orders and Product Specifications	BP.111
Engineer to Order Production	BP.170
Generation of Dynamic Bills of Materials	BP.119
Just In Time Production	BP.157
Lean	BP.160
Manufacturing Quality Improvements for Return Reduction	BP.054
Manufacturing Reliability Improvement	BP.053
Mixed Mode/Reverse Material Issue	BP.171
Predictive Maintenance	BP.106
Process/Metrics Alignment	BP.074
Production Line Sequencing	BP.011
Production Scheduling Optimization Using Enabling Technologies	BP.172
Right Size Frequency of Production Wheel	BP.039
Single-Minute Exchange of Die (SMED)	BP.003
Standard Operating Procedures	BP.155
Total Preventative Maintenance Program	BP.133

Material Handling

Production Line Sequencing	BP.011
Receiving Goods Inspection	BP.147
Rotable Spares Pool	BP.168
Task Management	BP.105

New Product Introduction

Bill of Material Audit/Control	BP.095
Design for Logistics (DFL) Management	BP.052
Generation of Dynamic Bills of Materials	BP.119
Project Management	BP.083

Order Engineering (ETO)

3D Print / Rapid Prototyping	BP.120
Automated Data Capture (ADC)	BP.152
Bill of Material Audit/Control	BP.095
Digital Packaging on Demand	BP.121
Embed Specialized Services	BP.117
Engineer to Order Production	BP.170
Generation of Dynamic Bills of Materials	BP.119

Order Management

Automated Data Capture (ADC)	BP.152
Bill of Material Audit/Control	BP.095
Collaborative Planning, Forecasting and Replenishment (CPFR)	BP.156
Generation of Dynamic Bills of Materials	BP.119
Logistics & Warehouse Planning	BP.096
MTO Order Fulfillment Strategy	BP.040
Order Quotation System	BP.114
Pick List Generation	BP.102
Process/Metrics Alignment	BP.074
Pull-Based Inventory Replenishment	BP.027
Purchase Order Management	BP.144
Standard Operating Procedures	BP.155
Task Management	BP.105
Vendor Collaboration	BP.145

People Management (Incl. Training)

Cross Functional Teams	BP.113

Inventory Management Training	BP.058
Planning/scheduling inventory training	BP.070
Planning and Forecasting	
ABC Inventory Classification	BP.087
Automated Data Capture (ADC)	BP.152
Balance and firm within horizon	BP.092
Bill of Material Audit/Control	BP.095
Characteristics-based Forecasting	BP.094
Collaborative Planning, Forecasting and Replenishment (CPFR)	BP.156
Convergence of SCOR with Lean and Six Sigma	BP.165
Days of Supply Based MRP Proposal Management	BP.090
Demand Management	BP.020
Demand Planning	BP.019
Demand Planning & Forecasting	BP.014
Facility Master Planning	BP.104
Improve S&OP process	BP.026
Integrated Business Planning	BP.184
Inventory Optimization	BP.028
Lean Planning	BP.049
Logistics & Warehouse Planning	BP.096
Long Term Supplier Agreement/Partnership	BP.162
Min-Max Replenishment	BP.010
MRP I	BP.022
Publish Production Plan	BP.093
Pull-Based Inventory Replenishment	BP.027
Safety Stock Planning	BP.015
Safety Stock Planning	BP.085
Sales and Operations Planning	BP.021
Scenario Planning	BP.184
Supply Network Planning	BP.086
Task Management	BP.105
Traditional Demand Forecasting Improvement	BP.033
Vendor Collaboration	BP.145
Vendor Managed Inventory (VMI)	BP.122
Work Center Load Evaluation	BP.091
Product Life Cycle Management	
Beyond Economic Repair (BER) Management	BP.169
Bill of Material Audit/Control	BP.095

Electronic Returns Tracking	BP.167
Electronic Technical Orders and Product Specifications	BP.111
Identification of Obsolete Capital Assets	BP.130
Item Rationalization	BP.013
Product Development/Engineering/Disposition Collaboration	BP.110
Project Management	BP.083
Return Policy Conformance Integration	BP.108
Standard Operating Procedures	BP.155

Purchasing

ABC Inventory Classification	BP.087
Alternative Supplier Benchmarking	BP.131
Automated Data Capture (ADC)	BP.152
Bill of Material Audit/Control	BP.095
Consignment Inventory with Key Suppliers	BP.036
Extend Inventory Planning using Collaboration (Key Suppliers)	BP.034
Inventory Financing Evaluation	BP.044
Issue Invitation to Tender (Quote)	BP.132
Logistics & Warehouse Planning	BP.096
Long Term Supplier Agreement/Partnership	BP.162
Maintain Supply Chain Risk Register	BP.150
Make-to-Stock Goods Receipt	BP.158
Supply base rationalization	BP.163
Production Line Sequencing	BP.011
Purchase Order Management	BP.144
Purchasing/Procurement Strategy	BP.101
Regular Review of Procurement Terms and Conditions	BP.042
Self-Invoicing	BP.005
Strategic Sourcing	BP.100
Supplier Evaluation using Robust Evaluation Tool.	BP.134
Supplier Research	BP.097
Vendor Collaboration	BP.145
Vendor Managed Inventory (VMI)	BP.122

Reverse Logistics

Automated Alerts for Material Management	BP.127
Automated Identification/Disposition of Over Shipments	BP.125
Bar Coding for Returned Materials	BP.076
Beyond Economic Repair (BER) Management	BP.169

Emerging

BP.E Emerging Practice

Emerging practices introduce new technology, knowledge or radically different ways of organizing processes. Emerging practices may yield a step change in performance by 'redefining the playing field' within an industry. Emerging practices may not be easy to adopt because of proprietary technology, or special knowledge may prevent wider adoption. Emerging practices generally have not been proven in a wide variety of environments and industries.

Investment, Risk: High, Results: High.

Hierarchy	
BP.120	3D Print/Rapid Prototyping
BP.121	Digital Packaging on Demand
BP.150	Maintain Supply Chain Risk Register
BP.176	Omni-channel
BP.177	Additive Manufacturing
BP.178	Block Chain
BP.179	Demand Driven MRP
BP.180	Demand Driven S&OP
BP.181	Digital Supply Chain
BP.182	Internet of Things
BP.183	Integrated Business Planning
BP.184	Scenario Planning
BP.188	SCM Object Synchronization – “3/4-way match”

BP.120 3D Print/Rapid Prototyping

3D printing is a phrase used to describe the process of creating three dimensional objects from digital file using a materials printer, in a manner similar to printing images on paper. Using 3D Print / Rapid Prototyping machines which employ an additive manufacturing process will take designs from Computer aided design, 3D scans or modeling software to produce a component or product using successive thin layers of material.

Processes	
sM3.1	Finalize Production Engineering
sM3.3	Issue Sourced/In-Process Product
sM3.4	Produce and Test

Metrics	
RL.1.1	Perfect Order Fulfillment

BP.121 Digital Packaging on Demand

The use of digital packaging printing to create custom product packaging unique to the customer and the product requirements. Packaging is digitally printed and cut to a per order design. This allows for unique physical and graphics designs to be produced in low quantities. The ability to produce short run on demand packaging increases efficiency, reduces inventory management, storage and waste.

Processes	
sM3.1	Finalize Production Engineering
sM3.2	Schedule Production Activities
sM3.3	Issue Sourced/In-Process Product
sM3.4	Produce and Test
sM3.5	Package
sM3.6	Stage Finished Product
sM3.8	Waste Disposal

Metrics	
RL.1.1	Perfect Order Fulfillment

BP.150 Maintain Supply Chain Risk Register

A risk register captures all the risk exposure for a supply chain, once the risks are identified and assessed in terms of probability of occurrence and impact. While developing this register, organization often follow the practice of grouping of risk like operational risks, technical risks, financial risks, legal risks, brand risk, environment risk, safety & health risk etc. and then identify specific supply chain risk and capture the impact of these specific risks on the key groups.

A risk matrix is then developed by plotting probability of occurrence on one axis and impact on the other axis. For each supply chain risk identified, populating it on the matrix will help arrive at a risk rating for each risk which in turn helps in prioritizing.

The following is an example of identifying risk, assessing them and categorizing them into a Risk Register. The cost impact magnitudes, probability breakdowns and category assignments can be adjusted based on your company size and risk complexity.

ID	Process	Risk Identification (Event)	Risk Assessment			Category
			Probability	Impact	VaR	
1	Source	Plastic Strip supplier shut down by labor strike	10.0%	$5,000	$500	Cat 5 (G)
2	Plan	Out of stock incidents with the distributors	25.0%	$1,000	$250	Cat 5 (G)
3	Make	Packing Equipment Failure	85.0%	$13,000	$11,050	Cat 3 (B)
4	Deliver	Increased delivery costs due to high price of fuel	95.5%	$10,000	$9,550	Cat 2 (O)
Total Risk Magnitude (VAR)					**$21,350**	

Risk Categories

Risk Category					Million USD	
Cat 4 (P)	Cat 2 (O)	Cat 2 (O)	Cat 1 (R)	Cat 1 (R)	> 500	Cost Impact
Cat 4 (P)	Cat 3 (B)	Cat 2 (O)	Cat 2 (O)	Cat 1 (R)	100 – 500	
Cat 5 (G)	Cat 4 (P)	Cat 3 (B)	Cat 2 (O)	Cat 2 (O)	50 – 100	
Cat 5 (G)	Cat 4 (P)	Cat 3 (B)	Cat 3 (B)	Cat 2 (O)	10 – 50	
Cat 5 (G)	Cat 5 (G)	Cat 4 (P)	Cat 3 (B)	Cat 3 (B)	5 – 10	
Cat 5 (G)	Cat 5 (G)	Cat 5 (G)	Cat 5 (G)	Cat 5 (G)	0.5 – 5	
Unlikely	Low	Moderate	High	Very High		
		Probability				

BP.150 Maintain Supply Chain Risk Register

Risk Priorities	Risk Category	Color
Priority 1	Category 1	Red (R)
Priority 2	Category 2	Orange (O)
Priority 3	Category 3	Blue (B)
Priority 4	Category 4	Purple (P)
Priority 5	Category 5	Green (G)

Processes	
sE9	Manage Supply Chain Risk

Metrics	
AG.1.3	Overall Value at Risk (VAR)
AG.2.9	Supplier's/Customer's/Product's Risk Rating

People	
HS.0125	Risk Assessment
HS.0126	Risk Identification

BP.176 Omni-channel

The blending of traditional retail business models with e-commerce retail operations has spawned the omni-channel supply chain operating model, where consumers are able to leverage all available sources of product information and have if fulfilled through their preferred channel. In the omni-channel framework, four primary elements exist: a) inventory stocking locations (or fulfillment origin points); b) customer access points (where the customer orders as well as where they take receipt of merchandise); c) the specific material flows between a) and b); and d) order fulfillment speed options.

Typical inventory stocking locations include fulfillment center warehouses, retail stores and vendors enabled to direct-ship merchandise to the retailer's customers. Customer access points include the retail store, his/her home address or a third-party pick-up location. Material flows connect these origin and destination points with various service speed choices (overnight, two-day or slower 'value' shipping) are offered. Additionally, many retailers are endeavoring to make sure their digital and physical operations appear to be complimentary and seamless to their customers. For example, items purchased on-line can be returned to a local store for credit and frequent-shopper rewards accumulate regardless of whether the items were purchase in-store or on-line.

Processes	
sD1	Deliver Stocked product
sD2	Deliver MTO product
sD3	Deliver ETO product
sD4	Deliver Retail product

Metrics	
CO.3.14	Order Management Cost
AM.1.1	Cash to cash cycle time
AM.3.45	Inventory days of supply

BP.177 Additive Manufacturing

Additive Manufacturing is different from traditional manufacturing it that it produces an object by adding layer upon after layer of material. The American Society for Testing and Materials defines Additive Manufacturing as the “process of joining materials to make objects from 3-D model data, usually layer upon layer, as opposed to subtractive manufacturing technologies.” (www.astm.org)

Additive Manufacturing promises to revolutionize the way we make things and will fundamentally change the way supply chains work. While this technology is over 30 years old, it is still changing and evolving. Many Chief Supply Chain Officers see this new technology as significant and possibly disruptive to their current supply chain network configurations. However, many of these supply chain leaders have not considered where the technology would best be utilized. It is important that a plan be thought out on where this technology could be employed to solve current manufacturing problems and develop plans for how best to leverage it into the future. The Navy has already deployed Additive Manufacturing machines on their ships to make needed parts for the ship while still out at sea and the Space Station has embraced Additive Manufacturing and currently has the technology on board to produce needed parts.

Additive Manufacturing, or 3-D Printing has the ability to produce complex geometries that are not possible with current manufacturing technologies. It fact, when coupled with computer aided design; increases in complexity result in minor design changes and add little to the production cost. However, this not the case with traditional subtractive manufacturing where even minor changes can result in large increases in production cost. Additive Manufacturing is especially well suited to low volume of customizable items. In fact, low volume production runs of products with complex geometries are considered the ‘sweet spot’ for this technology. While this technology remains vital to the rapid proto-type applications, it is now making inroads into traditional production of finished goods.

All Additive Manufacturing begins with a three-dimensional rendering of the object in a computer-generated model. This is achieved by either directly designing the object in a computer aided design package or by using a three-dimensional scanner to capture the desired object. Once the design is created, it is then sliced into layers. This technique is called tessellating and utilizes Standard Tessellation Language to break the design into a series of polygons and triangles to represent the external and internal structures.

There are currently seven different processes for additive manufacturing as defined by the American Society for Testing and Materials. The first is Vat Photopolymerization where a liquid vat of plastic is selectively cured using an ultraviolet light. The second type is Material Jetting where droplets of build material are selectively deposited on a build platform one layer at a time. The third method of 3-D printing is Material Extrusion where material is dispensed through a heated nozzle. The fourth process type is Powder Bed Fusion and uses thermal energy, such as a laser, to fuse the powdered material together. The fifth type of technology is Binder Jetting where powdered material is bound together with a type of glue until additional processing can be performed on the object. The sixth type Sheet Laminating where thin sheets of material are built by bonding sheet after sheet together to build the object. The seventh type of additive manufacturing is Direct Energy Deposition and uses thermal energy to fuse the material as it is being deposited instead of applying it to an existing bed of powder.

BP.177 Additive Manufacturing

Reduction of waste is a fundamental advantage to most Additive Manufacturing. Unlike traditional manufacturing where material is either cut or drilled away to produce the part; Additive Manufacturing greatly reduces the waste. This makes Additive Manufacturing especially attractive to Aerospace and Defense industry due to the high cost of materials like titanium.

Processes	
sM1	Make-to-Stock (MTS)
sM2	Make-to-Order (MTO)
sM3	Engineer-to-Order (ETO)

Metrics	
CO.2.3	Cost to Make
CO.1.2	Cost of Goods Sold (COGS)

BP.178 Block Chain

Blockchain is a term used to represent an entire set of technologies. This is an Emerging Practice that is rapidly capturing the attention of many suppliers and buyers of goods and services. However, the technology is still in the early stages of its evolution and development.

On a blockchain, transactions are recorded chronologically, forming an immutable chain, and can be more or less private or anonymous depending on how the technology is implemented. The ledger is distributed across many participants in the network — it doesn't exist in one place. Instead, copies exist and are simultaneously updated with every fully participating node in the ecosystem. A block could represent transactions and data of many types — currency, digital rights, intellectual property, identity, or property titles, to name a few.

This technology can be used to allow every node that participates in the network to verify the true state of the ledger at a very low cost. This is one step away from a distributed marketplace, and will enable new types of digital platforms."

Some see this technology/process as an answer to the internet's lack of an economic layer that would facilitate payments, increase spending and allow the acquiring and transfer of digital content easier. In addition, there is an expressed promise of smart supply chain contracts that provide greater security and enhanced transparency of actions taken by both the principle and the agent.

Reference: Blockchain, Explained Monday, http://ide.mit.edu/news-blog/blog/blockchain-explained

Processes	
sE1	Manage Business Rules
sE3	Manage Data & Information
sE5	Manage Supply Chain Assets

Metrics	
CO.1.1	Total Supply Chain Management Cost

BP.179 Demand Driven MRP (DDMRP)

DDMRP is Demand Driven Material Requirements Planning: A method to model, plan and manage supply chains to protect and promote the flow of relevant information and materials. DDMRP is the supply order generation and management engine of a demand driven operating model.

Processes	
sE1	Manage SC Business rules
sE3	Manage Data & Information
sE7	Manage SC network
sE9	Manage SC Risk

Metrics	
AG.1.3	Value at Risk (VaR)

BP.180 Demand Driven S&OP (DDS&OP)

DDS&OP is Demand Driven S&OP which is a bi-directional integration point in a Demand Driven Adaptive System between the strategic (annual, quarterly and monthly) and tactical (hourly, daily and weekly) relevant ranges of decision making. DDS&OP sets key parameters of a Demand Driven Operating Model based on business strategy, market intelligence and key business objectives (strategic information and requirements). DDS&OP also projects the model performance based on the strategic information and requirements and various model settings. Additionally, DDS&OP uses variance analysis based on past model performance (reliability, stability and velocity) to adapt the key parameters of a Demand Driven Operating Model and/or recommend strategic alterations to the model and project their respective impact on the business.

Processes	
sP1	Plan Supply Chain
sP2	Plan Source
sP3	Plan Make
sP4	Plan Deliver
sP5	Plan Return
sE2	Manage Performance

Metrics	
CO.1.1	Total Supply Chain Management cost
CO.2.1	Cost to Plan

BP.181 Digital Supply Chain

Digital supply chain encompasses the process of the delivery of digital media, be it music or video, by electronic means, from the point of origin (content provider) to destination (consumer). In much the same manner, a physical medium must go through a “supply chain” process in order to mature into a consumable product, digital media must pass through various stages in processing to get to a point in which the consumer can enjoy the music or video on a computer or television set.

A broader definition of the term "digital supply chain" is the use of digital technology and content to improve supply chain performance. Part of this refined definition recognizes that traditional supply chains configured to distribute goods or services can be enhanced via technology and digital content. For example, improved supplier support by providing real time inventory usage or real time monitoring of equipment in order to proactively schedule maintenance/part replacements. Another example would be enhanced user support via digital content for a physical item. Digital supply chains are enabled via the Internet of Things, Cloud Based Computing, Big Data, and Advance Analytics to name a few.

Processes	
sD	Deliver

BP.182 Internet of Things (IoT)

The Internet of Things refers to the network of physical objects connected through the internet, as well as the intelligent communication that occurs between them. There are many and far-reaching opportunities:

Improved Customer Feedback for Product Development: Companies can gain insight into consumer preferences and product usage that can be utilized to enhance existing products or in the development of new ones. For example, sensors on equipment could enable access to the key performance parameters such as time and duration of use, temperature, and operating conditions. This information then could be used to determine the estimated life remaining on parts and to plan maintenance activities. This would enhance condition based maintenance and greatly improve equipment up time.

Improved supply chain performance: IoT can drive performance improvements across the entire supply chain through automation and dramatically enhanced end-to-end visibility. Using a combination of sensors (radio frequency identification, or RFID), connected devices and communication channels (3G/4G, GPS, Bluetooth, Internet, etc.), companies will have the ability to monitor transit status, including factors such as location, temperature and diagnostics, in real time. For example, some companies are already using this technology to track real-time transit information, as well as model ideal routes to optimize the freshness of perishable cargo.

Processes	
sE1	Manage business rules
sE3	Manage data & information
sE7	Manage SC network
sE2	Manage SC Performance
Metrics	
CO.1.1	Total Supply Chain Management Cost
CO.2.1	Cost to Plan

BP.183 Integrated Business Planning (IBP)

Integrated Business Planning is a business process and capability that seeks to maximize company profitability by creating an enterprise-wide operating plan. The process drives decision making across all aspects of the business balancing customer demand, supply and company resources. The integrated business plan is generated at the level of detail needed for all participating business functions to execute activities required to achieve the plan. This is typically at an aggregate planning level with the ability to disaggregate to a more detailed level.

IBP is a mid-term planning process that focuses on month two and beyond, extending out past the fiscal year typically to 18 months. (Time frames depend on the industry sector). The goal of the IBP process is to develop consensus on a single business plan that aligns with the Strategy, Tactics, and Execution plans; and organization and functional Accountabilities, considering and understanding risk management.

The IBP process is owned by the executive/senior management team and is cross-functional in nature. Distinct to IBP is the appropriate integration, involvement and commitment of functions or areas like Product Management, Finance, New Product Introduction, Product Marketing, Engineering, Service/Support, as well as the more typical S&OP functions of Sales, Demand Planning/Forecasting, Operations/Manufacturing, and Sourcing/Procurement. An IBP process typically builds upon the foundation of an established S&OP (BP.021) process with continuous Review Meetings in each functional area (Product, Demand, Supply, Finance and Executive Decision Making).

Integrated Business Planning is unique from S&OP as it also includes other advanced practices, for example:

- Scenario Planning, BP.184
- Product Portfolio Management (including End of Life Planning), PLCOR
- Financial Integration
- Risk Mangement

Processes	
sP1	Plan Supply Chain
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP1.3	Balance Supply Chain Requirements with Supply Chain Resources
sP1.4	Establish and Communicate Supply Chains

Metrics	
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time
AG.1.1	Upside Supply Chain Adaptability
AG.1.2	Downside Supply Chain Adaptability

BP.183 Integrated Business Planning

AG.1.31	Overall Value-at-Risk
CO.1.1	Total Supply Chain Management Costs
AM.1.1	Cash-to-Cash Cycle Time
AM.1.2	Return on Fixed Assets
AM.1.3	Return on Working Capital
People	
HS.0016	Capacity Planning/Management
HS.0029	Customer Relationship Management (CRM)
HS.0046	ERP Systems
HS.0048	Forecasting
HS.0058	Inventory Management
HS.0067	Linear programming
HS.0070	Logistics network modeling
HS.0074	Master Scheduling
HS.0079	MRP Systems
HS.0102	Production Planning Capacity Utilization
HS.0103	Production Scheduling
HS.0132	Sales and Operations Planning (S&OP)

BP.184 Scenario Planning

Scenario Planning, also called What-If Analysis, is a process and analytical capability that enables real-time event driven decision making. Simulated business and supply chain impacts are evaluated based on changes to multiple input parameters. Each combination of parameter changes and outcomes is a scenario.

A robust Scenario provides decision support through identification of consequences or effects based on probable future events. Ultimately, the result of Scenario Planning is a recommendation or range of recommendations to be executed that most effectively balances supply chain trade-offs at the Strategic, Tactical and/or Operational level.

The process steps for conducting scenario planning generally fall within the following activities: Define the triggering event, Analyze possible outcomes, Develop Recommended Response(s), Review and Approve Recommended Response(s), Monitor Events and Execute Response. The outcome of Scenario Planning is a holistic decision with assigned responsibilities and a specific business result. Scenario Planning is an emerging practice that can be applied in the S&OP and Integrated Business Planning processes, continuously reviewed relative to leading and lagging indicators.

Processes	
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
Metrics	
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time
AG.1.1	Upside Supply Chain Adaptability
AG.1.2	Downside Supply Chain Adaptability
AG.1.3	Overall Value-at-Risk
CO.1.1	Total Supply Chain Management Cost
AM.1.1	Cash-to-Cash Cycle Time
AM.1.2	Return on Fixed Assets
AM.1.3	Return on Working Capital
People	
HS.0016	Capacity Planning/Management
HS.0024	Cost/Price Analysis
HS.0070	Logistics network modeling
HS.0085	Outsourcing
HS.0092	Pricing Management

BP.184 Scenario Planning

HS.0093	Prioritization
HS.0102	Production Planning Capacity Utilization
HS.0124	Risk and exception management
HS.0125	Risk Assessment
HS.0126	Risk Identification
HS.0127	Risk Mitigation
HS.0128	Risk Response Planning
HS.0130	S & OP Plan Communication
HS.0132	Sales and Operations Planning
HS.0137	Strategic Planning
HS.0151	Transport Mode Selection

BP.188 SCM Object Synchronization – "3/4-way match"

The ability to follow an object through the entire lifecycle across a supply chain is a foundational element in creation of visibility in order to gain supply chain control. The focus is to create object synchronization from Sales to Cash, to enable systems integration & digitalization.

The method to describe these object linkages is often referred to as 3- or 4-way match

"3-way match":

Term used in accounting, which refers to a procedure used when processing an invoice received from a vendor or supplier.

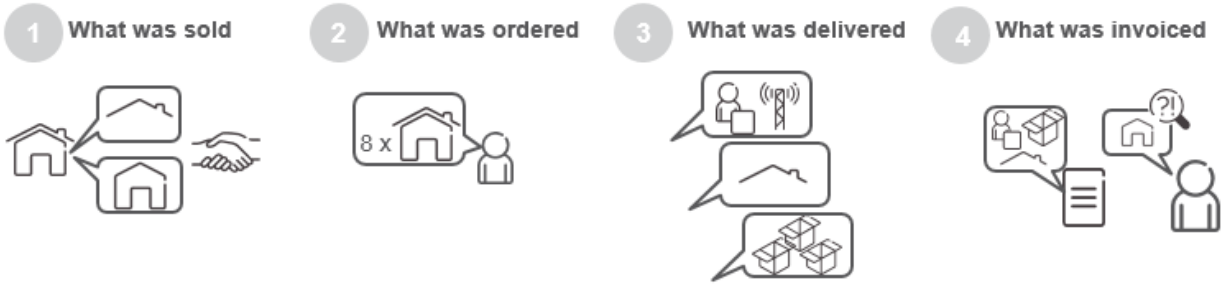
The purpose of the three-way match is to avoid paying incorrect and perhaps fraudulent invoices.
The "3-way" refer to:

- **Vendor's Invoice**
- **Purchase Order**
- **Receiving Documentation** (Goods Received)

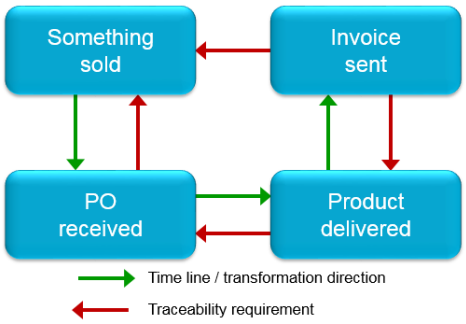
"Match" refers to the comparison of the **quantities, price per unit, PO description**, etc. appearing on the suppliers/vendor's invoice to the information on the purchase order and to the quantities received.
"4-way match":

For a vendor looking to get paid, it is reasonable to dictate or at least influence the content of a purchase order so that it can be matched in delivery and billing. Hence the 4th dimension preceding the purchase order.

- **Supplier quote/product catalogue**



For object synchronization, the key element is to start with the matching of Invoice- and Selling Data. There needs to be clear links between each step of the how the objects are managed in a value-chain.



In the SCOR model the linkages primarily show up in connection with managing the "Perfect order Fulfillment" metric. This is where the follow up of the quality from all preceding steps are measured as part of the "Perfect Documentation" follow up.

Successful methods for achieving 3- or 4-way match share the following input:

1. Early cross-functional involvement is crucial when structuring contract, sales orders and invoices
2. Delivery object naming convention through order, delivery and invoice
3. Customer product descriptions match orderable product descriptions at Seller
4. Customer PO content match orderable bill of quantity in Sellers system
5. Additional customer ordering handled as separate order
6. Set and stick to agreed way of working and business rules

Challenges to implement the solutions often occur in the interfaces between functional organizations and IT systems. To achieve a "Perfect Invoice" all preceding process steps, objects and organizational and IT silos need to be aligned

Processes	
sE1	Manage Data and Information
sE3	Manage Data and Information
Metrics	
RL.1.1	Perfect Order Fulfillment
RL.2.3	Documentation Accuracy
People	
HS.0033	Data Management

Best

BP.B Best Practice

Best practices are 'current', 'structured' and 'repeatable' practices that have had a proven and positive impact on supply chain performance:

- Current: Not emerging, not outmoded.
- Structured: Feature a clearly stated goal, scope, process, and procedure.
- Proven: Demonstrated in a working environment, and linked to key metrics.
- Repeatable: Proven in multiple organizations and industries.

SCOR best practices have been chosen by SCOR practitioners in diverse industries. It is understood that not all best practices will yield the same results for all industries or supply chains.

Investment, Risk: Moderate, Results: Moderate.

Hierarchy	
BP.002	Risk Management Strategies
BP.003	Single-Minute Exchange of Die (SMED)
BP.109	Carcass Prepositioning
BP.013	Item Rationalization
BP.016	Supply Network Planning
BP.024	Supply Chain Optimization (SCO)
BP.025	Self-Service Warranty Claim Submittal
BP.026	Improve S&OP process
BP.027	Pull-Based Inventory Replenishment
BP.028	Inventory Optimization
BP.029	Network Optimization
BP.031	Stock keeping Unit (SKU) Rationalization/Cost of Sales Analysis
BP.034	Extend Inventory Planning using Collaboration (Key Suppliers)
BP.036	Consignment Inventory with Key Suppliers
BP.041	Transportation Optimization
BP.049	Lean Planning
BP.052	Design for Logistics (DFL) Management
BP.053	Manufacturing Reliability Improvement
BP.055	Freight Carrier Delivery Performance Evaluation
BP.062	Master Data Accuracy
BP.071	Modal Optimization
BP.074	Process/Metrics Alignment
BP.076	Bar Coding for Returned Materials
BP.078	Return Tracking
BP.082	Continuous Improvement
BP.086	Supply Network Planning

BP.B Best Practice

BP.097	Supplier Research
BP.098	Mobile Access of Information
BP.099	Data Warehousing/Business Intelligence
BP.100	Strategic Sourcing
BP.101	Purchasing/Procurement Strategy
BP.106	Predictive Maintenance
BP.112	Return Shipping Consolidation
BP.113	Cross Functional Teams
BP.115	Transportation Management System
BP.122	Vendor Managed Inventory (VMI)
BP.123	Return Load Optimization
BP.125	Automated Identification/Disposition of Over Shipments
BP.126	Supply Chain Control Towers
BP.127	Automated Alerts for Material Management
BP.128	Return cost recovery
BP.129	Return Policy included with Shipping Document
BP.131	Alternative Supplier Benchmarking
BP.133	Total Preventative Maintenance Program
BP.134	Supplier Evaluation using Robust Evaluation Tool
BP.137	Carcass Disassembly
BP.138	Theory of Constraints
BP.139	Vendor Managed Inventory (VMI)
BP.141	Pre-issued return authorization
BP.145	Vendor Collaboration
BP.153	Bar Coding/RFID
BP.156	Collaborative Planning, Forecasting and Replenishment (CPFR)
BP.157	Just In Time Production
BP.160	Lean
BP.161	Enterprise Level Spend Analysis
BP.164	Consignment Inventory Management
BP.165	Convergence of SCOR with Lean and Six Sigma
BP.172	Production Scheduling Optimization Using Technology
BP.173	Supply Chain Risk Monitoring
BP.174	Supply Chain Risk Assessment
BP.175	Metadata
BP.185	Cost of Quality
BP.186	Data / Analytics
BP.187	Supply Chain Finance

BP.002 Risk Management Strategies

Risk management strategies are developed and communicated. Commonly used strategies are Risk Mitigation, Risk Avoidance, Risk Transfer and also Risk Acceptance.

- Risk Mitigation is a plan to reduce the probability of occurrence or minimize the impact of the risk.
- Risk Avoidance occurs when the supply chain risks are too high in terms of its probability of occurrence and impact and beyond the threshold limits of the organization's appetite for risk.
- Risk Transfer occurs when part or all the risk can be transferred to another process where it presents a better prospect of management or mitigation through less costly actions.
- Risk Acceptance occurs when a risk has low probability of occurrence and low impact and for which a contingency plan is easily available for deployment if the risk occurs.

Risk management strategies may differ by supply chain.

Processes	
sE9	Manage Supply Chain Risk
sE9.5	Mitigate Risk
Metrics	
AG.1.3	Overall Value at Risk (VAR)
CO.1.1	Total Supply Chain Management Cost
People	
HS.0124	Risk and exception management
HS.0125	Risk Assessment
HS.0126	Risk Identification
HS.0127	Risk Mitigation
HS.0128	Risk Response Planning

BP.003 Single-Minute Exchange of Die (SMED)

The practice of reducing the time it takes to change a production line, equipment or machine from running one product to the next. The ability to rapidly change between products is increasingly important in the situation where lot sizes are reducing. In general there are three focus areas to reduce changeover time:

- Eliminate. Eliminate non-essential activities. This includes replacing only essential parts and developing universal parts where possible.
- Prepare. Prepare and setup external to the equipment. Prepare the die (such as heating, flushing, calibration and alignment) prior to the changeover.
- Simplify. Simplify setup internal to the equipment. This includes the use of single- or limited-touch fasteners, auto- or self-alignment pins.

Similar to: Single-touch exchange of die.

Note: The single-minute reference is to the speed of exchange not the actual number of minutes it takes to make the change for each and all applications.

Processes	
sM1	Make-to-Stock
sM2	Make-to-Order
sM3	Engineer-to-Order

Metrics	
RS.2.2	Make Cycle Time
RS.3.49	Issue Material Cycle Time
RS.3.50	Issue Sourced/In-Process Product Cycle Time
RS.3.101	Produce and Test Cycle Time

People	
HS.0065	Lean Manufacturing

BP.109 Carcass Prepositioning

The practice of making disposition decisions for reparable parts/cores/carcasses early in the (Return Material Authorization) RMA process. Instructions for those decisions must be included in the authorization provided to customers responsible for shipping and internal stakeholders responsible for receiving. Routing decisions are also made and included in those instructions. Long lead time, high demand or prioritization criteria are applied, resulting in automatic induction into the Maintenance, Repair and Operations (MRO) process, routing to a storage location or disposal.

Processes	
sSR2.2	Disposition MRO Product
sSR2.4	Schedule MRO Shipment
sDR2.3	Receive MRO Product
sDR2.4	Transfer MRO Product

Metrics	
CO.2.5	Cost to Return
CO.3.16	Cost to Source Return
CO.3.17	Cost to Deliver Return
AM.3.39	Percentage Unserviceable MRO Inventory in Disposition
AM.3.43	Percentage Unserviceable MRO Inventory in Scheduling
AM.3.44	Percentage Unserviceable MRO Inventory

BP.013 Item Rationalization

Also, called SKU or product rationalization, item rationalization involves decision-making around adding, deleting, or retaining products, services, or features within a portfolio offering. Some strategies call for these decisions to be made at the product family level. Rationalization should consider at what stage of manufacturing the item becomes customized as well as how close to the customer order the customization to optimize operational cost and complexity. Given the multiple factors and tradeoffs implicit in rationalization decisions, Item rationalization should be considered an element of, but not a substitute for, a more comprehensive supply chain complexity management approach.

Item rationalization is important as any given product moves through it's life cycle. After the product introduction process an item must be periodically under review to identify the point it is in during the life cycle. A rationalization exercise should identify the most cost effective way to deliver the product to the market throughout its life cycle while taking into account things like cost-to-serve, margin, sales projections, as well as what other products and services are better enabled by the item.

Processes	
sP1	Plan Supply Chain
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP1.3	Balance Supply Chain Resources with SC Requirements
sP2.3	Balance Product Resources with Product Requirements
sP2.4	Establish Sourcing Plans
sP3.3	Balance Production Resources with Production Requirements
sP3.4	Establish Production Plans
sS2	Source Make-to-Order Product
sE2	Manage Performance
sE7	Manage Supply Chain Network

Metrics	
RS.3.42	Identify, Prioritize, and Aggregate Production Requirements Cycle Time
RS.3.60	Manage Finished Goods Inventories Cycle Time
RS.3.75	Manage Product Inventory Cycle Time
RS.3.76	Manage Product Life Cycle Time
AM.2.2	Inventory Days of Supply
AM.3.45	Inventory Days of Supply - Finished Goods

BP.013 Item Rationalization

People	
HS.0024	Cost/Price Analysis
HS.0032	Customer/Supplier Communication
HS.0037	Demand Management
HS.0058	Inventory Management
HS.0061	Item Master/BOM/BoL Interpretation
HS.0085	Outsourcing
HS.0098	Product Information Management (Product Data Management)
HS.0102	Production Planning Capacity Utilization
HS.0132	Sales and Operations Planning (S&OP)

BP.016 Supply Network Planning

Simulate and implement comprehensive tactical planning and sourcing decisions based on a single, globally consistent model.

The Supply Network Planning enables organizations to create a very close match between supply and demand by integrating purchasing, manufacturing, distribution, and transportation into one consistent model. By modeling the entire supply network and related constraints, it makes it possible to synchronize activities and plan material flow throughout the entire supply chain. The results are feasible plans for purchasing, manufacturing, inventory, and transportation.

The process also includes enabling organizations to dynamically determine how and when inventory should be distributed. The supporting system optimizes deployment plans based on available algorithms, as well as user rules and policies.

Processes	
sP1	Plan Supply Chain
sP1.4	Establish and Communicate Supply Chain Plans
sE7	Manage Supply Chain Network

Metrics	
RS.1.1	Order Fulfillment Cycle Time
RS.3.1	Align Supply Chain Unit Plan with Financial Plan Cycle Time
RS.3.98	Plan Cycle Time

People	
HS.0016	Capacity Planning/Management
HS.0069	Logistics Management
HS.0070	Logistics network modeling

BP.024 Supply Chain Optimization (SCO)

Supply Chain Optimization is a part of the enterprise strategic plan for leading edge companies. SCO allows top management to redesign the supply chain as part of the enterprise`s overall strategy, in response to actual or anticipated changes in the marketplace. Based on actual data or analyst projections (example: Oil will each $120.00 a barrel) companies run multiple computer simulations, looking for an optimal solution for:

- Vendor locations
- Inventory levels
- Global transportation costs
- Product lifecycle manage (NPI through EOL)
- Distribution hub locations
- Environmental (carbon footprint)

Improvements are planned in a proactive rather than reactive manner, providing financial and velocity advantage over competitors.

The optimized supply chain can provide a reduction in the cash to cash cycle, shorter customer lead times, lower inventory requirements, lower E&O inventories, and lower transportation costs. Technology providers offer individual applications and/or the complete set of optimization software packages in both IT Enterprise and SaaS solutions.

Processes	
sP1	Plan Supply Chain
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP2	Plan Source
sP2.1	Identify, Prioritize and Aggregate Product Requirements
sP2.2	Identify, Assess and Aggregate Product Resources
sP2.3	Balance Product Resources with Product Requirements
sP4	Plan Deliver
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sP4.2	Identify, Assess and Aggregate Delivery Resources
sP5	Plan Return
sP5.1	Assess and Aggregate Return Requirements
sP5.2	Identify, Assess and Aggregate Return Resources
sE7	Manage Supply Chain Network

Metrics	
RL.2.2	Delivery Performance to Customer Commit Date
RS.3.35	Identify Sources of Supply Cycle Time
RS.3.36	Identify, Assess and Aggregate Production Resources Cycle Time
RS.3.37	Identify, Assess, and Aggregate Delivery Resources Cycle Time

RS.3.38	Identify, Assess, and Aggregate Product Resources Cycle Time
RS.3.39	Identify, Assess, and Aggregate Supply Chain Resources Cycle Time
RS.3.40	Identify, Prioritize, and Aggregate Delivery Requirements Cycle Time
RS.3.41	Identify, Prioritize, and Aggregate Product Requirements Cycle Time
RS.3.42	Identify, Prioritize, and Aggregate Production Requirements Cycle Time
RS.3.43	Identify, Prioritize, and Aggregate Return Requirements Cycle Time
RS.3.44	Identify, Prioritize, and Aggregate Supply Chain Requirements Cycle Time

People	
HS.0037	Demand Management
HS.0044	Enterprise Business Process
HS.0045	Environmental Requirements
HS.0069	Logistics Management
HS.0070	Logistics network modeling
HS.0082	Optimization
HS.0124	Risk and exception management
HS.0132	Sales and Operations Planning (S&OP)

BP.025 Self-Service Warranty Claim Submittal

Self-Service Warranty Claim Submittal enables customers and service providers to submit warranty claims over the web, reducing internal validation and processing workload. This can be accomplished as a batch load of several claims at the same time or individual claims submitted one at a time. Information captured at time of submittal helps with further analysis and disposition. Results of the analysis can be made available online based on login access levels, so that the same information can be submitted to appropriate authorities as needed. Furthermore, auto approval and payment of certain claims can be considered if they satisfy certain criteria.

Processes	
sP5.2	Identify, Assess and Aggregate Return Resources
sP5.4	Establish and Communicate Return Plans
sDR1	Deliver Return Defective Product
sDR1.1	Authorize Defective Product Return
sE3	Manage Data and Information

Metrics	
RL.3.55	Warranty and Returns
RL.3.56	Warranty Costs
RS.3.5	Authorize Defective Product Return Cycle Time
RS.3.82	Manage Return Inventory Cycle Time
RS.3.83	Manage Return Network Configuration Cycle Time
RS.3.84	Manage Return Regulatory Requirements and Compliance Cycle Time

People	
HS.0031	Customer Repair and Return Policy and Process
HS.0119	Return Management
HS.0122	Reverse Logistics
HS.0157	Warranty process and policy
HS.0158	Warranty Return and Repair

BP.026 Improve S&OP process

Establish disciplined monthly cross-functional process to increase accuracy of demand management (Forecasting), establish biz inventory policy, and agreement on demand and supply balancing

Processes	
sP1	Plan Supply Chain
sP2	Plan Source
sP3	Plan Make

Metrics	
RL.2.2	Delivery Performance to Customer Commit Date
RS.3.1	Align Supply Chain Unit Plan with Financial Plan Cycle Time
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.027 Pull-Based Inventory Replenishment

Pull-based (Demand) replenishment is an approach that utilizes customer demand (`pull`) to replace and optimize inventory while reducing total net landed cost. It has been a widely recognized, effective practice fordecades.

With a pull-based approach, the signal to replenish downstream inventory is driven by actual demand or usage, rather than by a forecast that pushes products and materials into the supply chain. Pull-based replenishment uses methodology that uses historical demand variability between forecasted demand vs. real customer demand to identify the appropriate inventory levels.

Processes	
sP1	Plan Supply Chain
sP2	Plan Source
sP3	Plan Make

Metrics	
RL.1.1	Perfect Order Fulfillment
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.028 Inventory Optimization

Use of multi-echelon (simultaneous across all inventory stocking points in supply chain) stochastic (random variability) optimization. Traditionally used for replenish to forecast work process as an alternative to Pull-Based Replenishment, but can also be used to calculate Reorder Point

Processes	
sP1	Plan Supply Chain
sP2	Plan Source
sP3	Plan Make

Metrics	
RL.1.1	Perfect Order Fulfillment
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.029 Network Optimization

Supply chains and supply networks both describe the flow and movement of materials & information, by linking organizations together to serve the end-customer. Network Strategy Optimization can be used to determine optimal manufacturing and warehouse locations based on focusing on reducing total supply chain costs (typically biased on reducing transportation costs). This is done by reviewing a supply chain network of product supplying and market facing businesses to consolidate inventory stocking locations.

Processes	
sP1	Plan Supply Chain
sP2	Plan Source
sP3	Plan Make

Metrics	
RS.2.1	Source Cycle Time
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.031 Stock keeping Unit (SKU) Rationalization/Cost of Sales Analysis

Inventory reduction practice to determine which SKUs that can be terminated t using SKU Cost of Sales Analysis. May require working with customers to determine potential to change to another SKU or decision to abandon SKU due to poor sales.

Processes	
sP1	Plan Supply Chain

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.034 Extend Inventory Planning using Collaboration (Key Suppliers)

Collaborative inventory planning can be used as a way to extend supply chain planning with key customers. It can be done through a joint (Sales & Operations Planning)

S&OP meeting between each key customer and supplier to discuss how to manage demand and supply across the extended enterprise (key customers). S&OP will entail review of historical and future customer demand, demand forecast accuracy, planned outages by customer or supplier, long-term planning, etc. Collaborative forecasting, the supply chain members jointly maintain and update a single forecasting process in the system. Hence, forecasting information becomes centralized

Processes	
sP1	Plan Supply Chain

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.036 Consignment Inventory with Key Suppliers

Consignment inventory is a family of business models in which the buyer of a product provides certain information to a supplier of that product and the supplier takes full responsibility for maintaining an agreed of the material, usually at the buyer's consumption location (usually a store). Consignment Inventory can be combined with additional opportunities such as extend inventory planning across Key Suppliers by using collaboration. Intent is to have suppliers carry raw material inventory on their balance sheet until consumption.

Processes	
sP1	Plan Supply Chain

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.041 Transportation Optimization

Evaluate potential to change inbound/outbound transportation mode to `faster` mode depending on freight terms (FOB, etc.) to accelerate transfer of inventory title to customer and/or better match demand/supply to optimize inventory balances: Can be combined with additional opportunities such as, change sourcing decision to local stocking points (reduce cycle time), risk pooling

Processes	
sP1	Plan Supply Chain
sP2	Plan Source
sS1.1	Schedule Product Deliveries
sS2.1	Schedule Product Deliveries
sS3.3	Schedule Product Deliveries
sD1.7	Select Carriers and Rate Shipments
sD2.8	Receive Product from Source or Make
sD3.7	Select Carriers & Rate Shipments

Metrics	
RS.2.1	Source Cycle Time
CO.3.15	Order Delivery and / or Install Costs
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.048 Demand Shaping

Balance cost/value of offering discounts for customers to move forward orders on specific finished good products in inventory. Would require process and tools to identify and analyze value proposition/trade-off. May be able to leverage off of commercial tools to analyze payment incentives; can be combined with additional opportunities such as, Embed inventory management goals in Commercial or Expedite outbound customer shipments

Processes	
sP1	Plan Supply Chain

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.049 Lean Planning

Proper predictive models are the key to being able to proactively manage developing problems rather than reactively coping with the missed milestones. Lean planning creates real world project plans which robustly model the project from initiation to final delivery.

Beginning with the end deliverable is the best way to create a tactical plan. Lean planning identifies information flow between tasks and pushes back this information one task at a time during the planning process creates a robust project model that identifies ALL the work that must be completed to accomplish the end deliverable of the project.

Lean planning uses five focusing questions:

- What is this deliverable?
- Who makes this happen?
- What's the last significant thing that he/she does?
- What tangible inputs does he/she need?
- Are these enough?

The result is that each task has:

- The resource responsible for the task
- All of the required inputs identified
- The expected time to complete the task (50% confidence level)
- The guaranteed to complete estimate (95% confidence level)
- The quantifiable output that clearly signals the end of the task.

Processes	
sP1.3	Balance Supply Chain Resources with SC Requirements

Metrics	
RL.3.37	Forecast Accuracy

BP.052 Design for Logistics (DFL) Management

Change new product development process to embed reuse and/or risk assessment around inventory management (e.g., include check off from supply chain of potential inventory management impact of proposed new product development). This could include mandatory end of lifecycle for another product, Commercial`s agreement to potential inventory/working capital exposure, etc.

Processes	
sP1	Plan Supply Chain

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.053 Manufacturing Reliability Improvement

The practice includes use of reliability tools and implementation of work process roles within manufacturing to address manufacturing reliability. It incorporates analysis and simulation of the manufacturing process to identify opportunities to increase equipment reliability and improve manufacturing cost/capacity and service factors.

Processes	
sP1	Plan Supply Chain
sP3	Plan Make

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.055 Freight Carrier Delivery Performance Evaluation

The practice of formal freight carrier performance reviews to reduce the risk of landed cost budget variances. A formal freight carrier performance evaluation is crucial as transportation partners represent the interface between supplier and customer. The quality of delivery on time and in good condition has enormous impact on customer satisfaction, return rates and repeat sales

A carrier evaluation program needs a comprehensive list of evaluation metrics to reflect overall service performance and cost improvement objectives. Evaluation criteria should include quantitative as well as qualitative measures. Quantitative criteria may include on-time delivery performance, claims ratios, billing accuracy, cost performance and other measurable criteria. Qualitative measures may include driver and sales representative responsiveness, the quality of customer service, stakeholder surveys, customer complaints or other value-based assessments

In addition, a freight carrier`s delivery performance and impact related to supply lead-time variability (due to early and late deliveries) should be evaluated. If a product is shipped to a customer and it arrives late: then limited/no inventory available. Conversely, if a supplier ships raw material to a company and the shipment is received prior to the need date - then excess inventory is carried. This would require a work process that investigates reasons and how to manage such situations (i.e. situation attributable to supplier purposely shipping product early to move inventory quickly; receiving company may delay shipment receipt until inventory is needed; adjust the transit lead time to safeguard against this type of situations which is causing additional inventory due to carrier delivery performance)

Processes	
sP1	Plan Supply Chain
sP2	Plan Source
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
sD4	Deliver Retail Product

Metrics	
RS.2.1	Source Cycle Time
CO.2.4	Cost to Deliver
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.062 Master Data Accuracy

Re-validate existing Master Data (order lead times, replenishment times, transit times, etc.) to ensure it matches current operational capabilities and performance. This information is used in inventory reorder point and target setting to determine inventory replenishment size/frequency. This is a critical step in inventory management and requires the monthly discipline to keep up on this due to the number of processes/systems that rely on this information as key input variables; Establish clear role/responsibility/accountability for Master Data Management; Critical prerequisite for a wide range of inventory opportunities; Can be combined with additional opportunities such as, Pull-based Replenishment

Processes	
sP1	Plan Supply Chain

Metrics	
RL.2.3	Documentation Accuracy
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.071 Modal Optimization

Balance the trade-off between logistics cost reduction and increased capital costs. Factors include shipment lot size, per-shipment setup costs, consumption/demand of Raw Materials & storage capacity in order to identify the appropriate storage capacity to minimize freight costs;

Processes	
sP1	Plan Supply Chain
Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.074 Process/Metrics Alignment

Metric alignment refers to the organized and deliberate development of metrics across an organization. The process starts with organizational/business or supply chain metrics then decomposes to organizational processes at level-2, level-3, and further if desired.

Following are key traits that define good metrics:

- Align to supply chain and business strategy
- Have a clear line-of-sight to the customer or business objective
- Provide a balanced view of performance
- Unflinching measure of the truth – data driven
- Are actionable
- Answer the questions
  - Where are we now?
  - Where do we need to be?

Aligning metrics can be accomplished by following these steps:

- Define supply chains utilizing the SCOR methodology. This typically involves creating a matrix of product family versus customer group (example)

Supply Chain Definition Matrix

	Geography, Market and/or Customer				
	Retail	**Distributors**	**Direct**	**OEM**	**Government**
Food products	X	X	X		X
Technology Products	X			X	
Durable Products			X		

- Prioritize supply chain performance attributes as defined in the SCOR model. These are Reliability, Responsiveness, Agility, Cost, and Asset Management Efficiency (Assets). This step requires us to clearly document performance priorities by supply chain based on competitive pressure and customer requirements.

Competitive Requirements

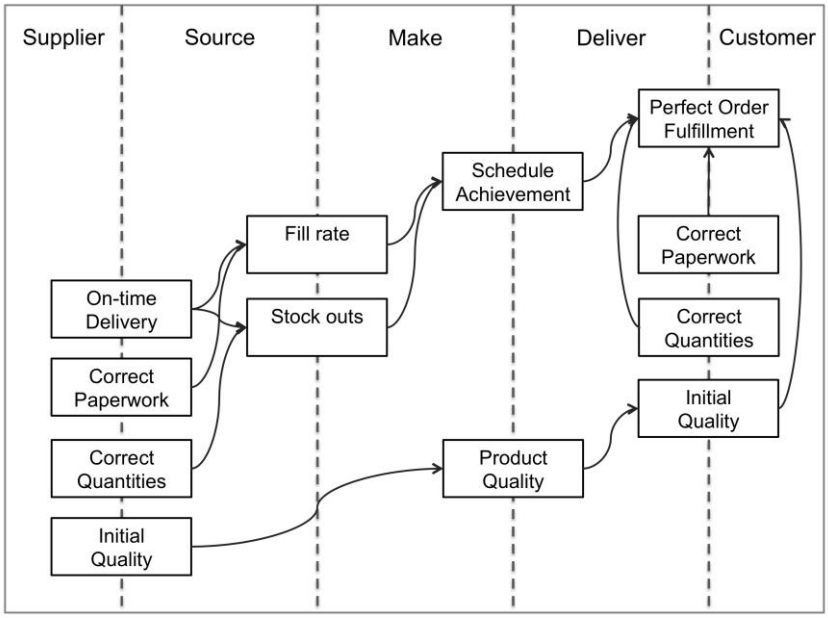
	Retail	**Distributors**	**Direct**	**OEM**	**Government**
Reliability	Superior	Parity	Parity	Parity	Parity
Responsiveness	Parity	Parity	Superior	Superior	Parity
Agility	Advantage	Advantage	Advantage	Advantage	Advantage
Cost	Advantage	Superior	Advantage	Advantage	Superior
Assets	Parity	Advantage	Parity	Parity	Advantage

BP.074 Process/Metrics Alignment

- The next step is to define key metrics for each supply chain. Utilizing the 5 performance attributes as the framework we select appropriate SCOR level-1 supply chain metrics.

Performance Attribute	Strategic Metric	Current Performance
Reliability	Perfect Order Fulfillment	79%
Responsiveness	Order Fulfillment Cycle Time	9 days
Agility	Upside Flexibility	110 days
Cost	Total Cost to Serve	89%
Assets	Cash-to-Cash Cycle Time	164 days

- Once metrics are defined at the supply chain level (level-1), then operational metrics should be selected or derived from this baseline. (See diagram below)



Processes	
sE2	Manage Performance

BP.076 Bar Coding for Returned Materials

Bar Coding allows faster and more accurate processing of returned materials. Receiving department can easily identify the materials returned from customer and move them through the transfer process.

ISO and IEC are the two organizations heavily involved in development of worldwide standards related with usage of bar codes. The mapping between regular text or data and barcodes is called a symbology. Initially, barcodes were used to represent any kind of written text by varying the width and spacing of parallel lines. This type of barcode symbology is referred to as linear or one- dimensional (1D). Later they evolved into other kinds of geometric patterns in two dimensions (2D). Although 2D systems use a variety of symbols (such as rectangles, dots, hexagons, etc.), they are generally referred to as barcodes as well. Barcodes were initially scanned by special optical scanners called barcode readers. Over time, additional types of scanner devices and software became available on devices including desktop printers and smartphones.

Business partners in a reverse logistics supply chain need to agree on type of bar code symbology, size and location on packaging to facilitate use of bar codes in returns processing. This agreement is established as result of collaboration between stakeholders, and technology to support this agreement needs to be acquired and deployed. The implementation includes bar code printers and readers depending on who will generate the barcode labels, and who will actually read the bar codes to perform certain tasks such as receiving, shipping, inventory transfers, etc. Type of information to be included on these labels depends on the process, and again needs to be agreed upon between stakeholders.

Bar coding on the package or returned item that identifies the products, as well as the original sales order number usually gets generated at the time the package is produced or shipped to the customer. However, additional information such as Return Material Authorization number, quantity, and reason for the return could be included on a new label as part of the return process.

Processes	
sDR1.3	Receive Defective Product (includes verify)
sDR1.4	Transfer Defective Product

Metrics	
RL.3.55	Warranty and Returns

BP.078 Return Tracking

Customers can track their shipment using the tracking number assigned by the carrier when they are returning a defective product. If the same information is provided to the vendor during Return Material Authorization process, receiving department can better plan for the receipt.

Processes	
sDR1.2	Schedule Defective Return Receipt
sDR1.3	Receive Defective Product (includes verify)

Metrics	
RL.3.55	Warranty and Returns

BP.082 Continuous Improvement

The continual improvement practice (CIP or CI) also often called a continuous improvement process) is an ongoing effort to improve products, services and/or processes. Delivery (customer valued) processes are constantly evaluated and improved in the light of their efficiency effectiveness and flexibility.

Successful companies recognize that the path to excellence and competitiveness is best achieved when the company culture embraces concepts of continuous improvement and incorporates these into all daily activities.

- Feedback -- The core principle of CIP is the (self) reflection of processes
- Efficiency -- The purpose of CIP is the identification, reduction and elimination of suboptimal processes
- Evolution -- The emphasis of CIP is on incremental continual steps rather than giant leaps

Continuous Improvement efforts seek 'incremental' improvement over time or 'breakthrough' improvement all at once.

Processes	
sE2	Manage Performance

BP.086 Supply Network Planning

Supply Network Planning is the integrated planning of all products of a supply chain over all relevant locations. Supply Network planning attempts to fulfill all demand considering all relevant constraints. For fulfillment, Supply Network Planning assigns available inventory, propagates demand to sourcing locations, finds substitute products, or explodes Bills-of-Materials. Using MRP-logic, Supply Network planning creates corresponding orders for supply such as purchase requests, purchases, transportation orders, or production orders.

Supply Network Planning can consider constraints such as available location inventory, inventory reservations, preferred vendors, preferred production sites, minimum inventory levels, preferred routings, bills-of-materials, and durations for sourcing, production, material handling, and transportation between locations.

In case of shortages, Supply Network planning can consider priorities between different types of demand such as more or less important orders from customers, demand from forecast, or replenishment orders, which maintain minimum inventory levels.

Supply Network Planning is a midterm planning practice. Typical planning horizons cover several weeks or months.

Aggregations:

- Demand, supply, and capacities are often aggregated into time buckets such as days, weeks, or months. Alternatively demand and supply can be represented as individual orders.
- Demand and supply for products can be aggregated into demand for product groups. Machine capacities can be aggregated into machine groups.

Solution methods:

- Multi-plant MRP: This approach executes MRP runs for every location. Dependencies between locations are resolved by heuristic methods, e.g., pre-defining a specific sequence or by executing more than one MRP run per location. Capacity constraints such as production capacity are either ignored or resolved in a second step.
- Linear and non-linear optimization: Demand, supply, and all constraints are translated into a linear or non-linear optimization problem, which can be solved using appropriate algorithms. These algorithms typically require a definition of time buckets, where demand, supply, and constraints are aggregated.
- Capable-to-match: In contrast to bucket-oriented optimization, capable-to-match prioritizes individual elements of supply and demand and matches them in order of priority. It allows to plan orders individually along the entire supply chain.

Reference SAP SCM APO or JDA I2 technologies

Processes	
sP1	Plan Supply Chain
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP1.3	Balance Supply Chain Resources with SC Requirements

BP.086 Supply Network Planning

Metrics	
RL.3.36	Fill Rate
RS.1.1	Order Fulfillment Cycle Time
RS.3.15	Balance Supply Chain Resources with Supply Chain Requirements Cycle Time
RS.3.39	Identify, Assess, and Aggregate Supply Chain Resources Cycle Time
RS.3.44	Identify, Prioritize, and Aggregate Supply Chain Requirements Cycle Time
RS.3.98	Plan Cycle Time
CO.1.1	Total Supply Chain Management Costs
CO.2.1	Cost to Plan
CO.2.4	Cost to Deliver
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.2.2	Inventory Days of Supply

BP.097 Supplier Research

The practice of identifying suitable suppliers who are able to meet the planned requirements. Consideration is usually given to the following points;

- Is the supplier approved to supply product (aerospace/wind energy/automotive industry driven)?
- Does the supplier have the capability (new opportunity)?
- Does the supplier have capacity?
- What are the current supplier lead times?
- Does the supplier have acceptable performance history?
- Will the supplier need to be qualified?
- What are the indicative prices (this is research and assumes no negotiation)

Once the answers to these questions are determined the purchaser/project team can determine risk and actions required through the planning phase before formal sourcing actions are implemented.

Processes	
sP2	Plan Source
sP2.3	Balance Product Resources with Product Requirements
sP2.4	Establish Sourcing Plans

Metrics	
RL.3.16	% of suppliers meeting environmental metrics/criteria
RL.3.17	% of suppliers with an EMS or ISO 14001 certification
RL.3.51	Supplier Mitigation Plans Implemented (percent)
AG.2.9	Supplier's/Customer's/Product's Risk Rating
AG.3.5	Additional demand sourcing-supplier constraints
AG.3.43	Current Sourcing/Supplier Constraints
AG.3.46	Demand sourcing-supplier constraints

People	
HS.0032	Customer/Supplier Communication
HS.0094	Procurement
HS.0125	Risk Assessment
HS.0139	Supplier Relationship Management (SRM)
HS.0141	Supply Chain Management
HS.0145	Supply Planning
HS.0150	Total Quality Management (TQM)

BP.098 Mobile Access of Information

Mobile access to information in supply chain means information on status metrics supply and demand are available in the internet smart phones and other similar mobile devices. This requires integration of heterogeneous hardware and software components that forms the supply chain.

The hardware includes Smartphones RF devices RFID devices Bar codes I-Pads laptops and other mobile and handheld devices. The software includes ERP (Enterprise Resource Planning) software various database and middleware network programs and protocols. Java OOPS (Object oriented programming) and enterprise services forms its core components.

Processes	
sP1	Plan Supply Chain
sM1	Make-to-Stock
sM2	Make-to-Order
sM3	Engineer-to-Order
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
sD4	Deliver Retail Product
sSR1	Source Return Defective Product
sE3	Manage Data and Information

Metrics	
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time
AG.1.1	Upside Supply Chain Adaptability
AG.1.2	Downside Supply Chain Adaptability
CO.1.1	Total Supply Chain Management Cost

BP.099 Data Warehousing/Business Intelligence

The practice of collecting and aggregating information required for decision-making, reporting and analysis. In computing a data warehouse (DW or DWH) is a database used for reporting and analysis. The data stored in the warehouse are collected from operational systems (such as marketplace, sales etc.). The data may pass through an operational data store for additional operations before they are used in the DW for reporting. The advantages of a data warehouse:

- Maintain data history even if the source transactional systems do not.
- Integrate data from multiple source systems enabling a central view across the enterprise. This benefit is always valuable but particularly so when the organization has grown by merger.
- Improve data quality by providing consistent codes and descriptions flagging or even fixing bad data.
- Present the organization's information consistently.
- Provide a single common data model for all data of interest regardless of the data's source.
- Restructure the data so that it makes sense to the business users.
- Restructure the data so that it delivers excellent query performance even for complex analytic queries without impacting the operational systems.
- Add value to operational business applications notably customer relationship management (CRM) systems.

The typical ETL-based (Extract, Transform, Load) data warehouse uses staging integration and access layers to house its key functions. The staging layer or staging database stores raw data extracted from each of the source data systems. The integration layer integrates the disparate data sets by transforming the data from the staging layer often storing this transformed data in an operational data store (ODS) database. The integrated data is then moved to yet another database often called the data warehouse database where the data is arranged into hierarchal groups often called dimensions and into facts and aggregate facts. The access layer helps users retrieve data.

Processes	
sE3	Manage Data and Information

Metrics	
CO.2.1	Cost to Plan
CO.2.2	Cost to Source
CO.2.3	Cost to Make
CO.2.4	Cost to Deliver
CO.3.14	Order Management Costs

BP.100 Strategic Sourcing

Strategic sourcing is an institutional procurement process that continuously improves and re-evaluates the purchasing activities of a company. Typical steps in a strategic sourcing process are:

- Assessment of a company`s current spend (what is bought where?)
- Assessment of the supply market (who offers what?)
- Total cost analyses (how much does it cost to provide those goods or services?)
- Identification of suitable suppliers
- Development of a procurement/purchasing strategy (where to buy what considering demand and supply situation, while minimizing risk and costs)
    - Multi Source/shared volumes
    - Sub Contract
    - Supplier change
    - In House manufacturing
- Negotiation with suppliers (products, service levels, prices, geographical coverage, etc.)
- Implementation of new supply structure
- Track results and restart assessment (continuous cycle)

Strategic sourcing includes more than the purchasing organization and how they interface with the markets and suppliers they buy from. The best strategic sourcing efforts include an internal component that educates the total organization in ways to interact with and derive optimum value from the supply chain.

Note: This practice sits between supplier research (PLAN) and supplier selection (SOURCE), therefore the boundaries of this task can sometimes be merged with these other tasks. Options can be limited due to other constraints; this can lead to a minimal amount of time being spent on this task. My view is that leading purchasing personnel will always go through this thought process and evaluation to ensure that new opportunities are not missed

Processes	
sP2.4	Establish Sourcing Plans
sS3	Source Engineer-to-Order Product
sS3.1	Identify Sources of Supply
Metrics	
RL.1.1	Perfect Order Fulfillment
RL.3.51	Supplier Mitigation Plans Implemented (percent)
AG.2.9	Supplier's/Customer's/Product’s Risk Rating
CO.2.2	Cost to Source
CO.3.11	Direct Material Cost
People	
HS.0094	Procurement
HS.0105	Project Management

BP.100 Strategic Sourcing

HS.0108	Quality Management
HS.0126	Risk Identification
HS.0127	Risk Mitigation
HS.0138	Subcontracting Types (FFP, CP, CPAF, Performance Based)
HS.0139	Supplier Relationship Management (SRM)
HS.0141	Supply Chain Management
HS.0143	Supply Chain Planning
HS.0150	Total Quality Management (TQM)

BP.101 Purchasing/Procurement Strategy

A procurement strategy is the planned approach of cost-effectively purchasing a company's required supplies, taking into consideration elements and factors such as the timeline for procurement, the funding and budget, the projected risks and opportunities.

To develop a procurement strategy or sourcing strategy, it is necessary to assess business objectives, available and existing resources and supplies, budget and the timeline. A key is to make sure that every detail contributes towards attaining the company`s established goals and objectives. Another key item is to choose to making or creating the materials (or doing procurement outsourcing).

Note: Influences on this practice will relate to how much time is available for the purchaser to implement any such strategy.

Processes	
sS3	Source Engineer-to-Order Product
sS3.1	Identify Sources of Supply
Metrics	
CO.2.2	Cost to Source
CO.3.11	Direct Material Cost
CO.3.14	Order Management Costs
People	
HS.0012	Benchmarking
HS.0020	Competitive Bidding
HS.0022	Contract Management
HS.0024	Cost/Price Analysis
HS.0032	Customer/Supplier Communication
HS.0094	Procurement
HS.0123	RFP/RFQ Management

BP.106 Predictive Maintenance

Predictive Maintenance or condition-based maintenance attempts to evaluate the condition of equipment by performing periodic or continuous (online) equipment condition monitoring. The ultimate goal of Predictive Maintenance is to perform maintenance at a scheduled point in time when the maintenance activity is most cost-effective and before the equipment loses performance within a threshold. This is in contrast to time- and/or operation count-based maintenance where a piece of equipment gets maintained whether it needs it or not. Time-based maintenance is labor intensive ineffective in identifying problems that develop between scheduled inspections and is not cost- effective.

The 'predictive' component of predictive maintenance stems from the goal of predicting the future trend of the equipment's condition. This approach uses principles of statistical process control to determine at what point in the future maintenance activities will be appropriate.

Most Predictive Maintenance inspections are performed while equipment is in service thereby minimizing disruption of normal system operations. Adoption of Predictive Maintenance can result in substantial cost savings and higher system reliability.

Processes	
sE5	Manage Supply Chain Assets
sE5.1	Schedule Asset Management Activities

Metrics	
RS.1.1	Order Fulfillment Cycle Time
RS.3.58	Manage Deliver Capital Assets Cycle Time

BP.112 Return Shipping Consolidation

Authorized returns are routed to central consolidation hubs or facilities, such as a 3rd Party Logistics Provider (3PL), nearest to the customer. `Gatekeeping` function routes product to the right location, eliminating the need for sorting at the hub. Consolidated shipments of repair and disposal are transferred to the appropriate location in larger volumes, thus reducing handling, overall processing time, and associated processing/transportation costs

Processes	
sDR2.2	Schedule MRO Return Receipt
sDR2.4	Transfer MRO Product
sSR3.2	Disposition Excess Product
sSR3.4	Schedule Excess Product Shipment

Metrics	
RS.3.106	Receive MRO Product Cycle Time
RS.3.138	Transfer MRO Product Cycle Time

BP.113 Cross Functional Teams

A cross-functional team is a group of people with different functional expertise working toward a common goal. It may include people from sales and marketing, finance, operations, human resources and IT departments. Typically, it includes employees from all levels of an organization. Members may also come from outside an organization (in particular from suppliers, key customers or consultants).

Cross-functional teams often function as self-directed teams responding to broad but not specific directives. Decision making within a team may depend on consensus but often is led by a manager/ coach/team leader.

Processes	
sE4	Manage Supply Chain Human Resources

BP.115 Transportation Management System

Transportation Management System (TMS) applications are used by major corporations to optimize plans and manage inbound and outbound logistics. The TMS controls and automates the entire logistics process end to end, reducing errors and assuring the best price and routing are always selected. TMS capabilities include:

- Rate and service data base to shop and optimize shipment
- Shipment creation, either manual or electronically directly from ERP system
- Electronically tender shipment to carrier
- Electronically prepare all necessary trade documents
- Real-time shipment visibility across carriers via web-based tracking from shipment acceptance to final delivery
- Company routing guide instructions
- Centralized data repository for all shipments regardless of carrier or mode
- Coordination of manufacturing scheduling and shipment optimization
- Provide visibility

A Transportation Management System generally is part of or integrated with the ERP (Enterprise Resource Planning) system.

Processes	
sP1	Plan Supply Chain
sP1.4	Establish and Communicate Supply Chain Plans
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sP4.2	Identify, Assess and Aggregate Delivery Resources
sP4.4	Establish Delivery Plans
sP5.1	Assess and Aggregate Return Requirements
sP5.2	Identify, Assess and Aggregate Return Resources
sP5.4	Establish and Communicate Return Plans
Metrics	
RL.2.2	Delivery Performance to Customer Commit Date
RL.3.32	Customer Commit Date Achievement Time Customer Receiving
RL.3.34	Delivery Location Accuracy
RL.3.50	Shipping Documentation Accuracy
RS.2.3	Deliver Cycle Time
CO.2.4	Cost to Deliver
People	
HS.0069	Logistics Management
HS.0071	Logistics/Freight
HS.0083	Order Management
HS.0151	Transport Mode Selection
HS.0158	Warranty Return and Repair

BP.122 Vendor Managed Inventory (VMI)

Vendor-managed inventory (VMI) is a family of business models in which the buyer of a product provides certain information to a supplier of that product and the supplier takes full responsibility for maintaining an agreed inventory of the material usually at the buyer's consumption location (usually a store). A third-party logistics provider can also be involved to make sure that the buyer has the required level of inventory by adjusting the demand and supply gaps.

VMI makes it less likely that a business will unintentionally become out of stock of a good and reduces inventory in the supply chain.

One of the keys to making VMI work is shared risk. In some cases, if the inventory does not sell the vendor (supplier) will repurchase the product from the buyer. In other cases, the product may be in the possession of the buyer but is not owned by the buyer until the sale takes place meaning that the buyer simply houses (and assists with the sale of) the product in exchange for a predetermined commission or profit (sometimes referred to as consignment stock).

VMI helps foster a closer understanding between the supplier and manufacturer by using Electronic Data Interchange formats EDI software and statistical methodologies to forecast and maintain correct inventory in the supply chain.

Processes	
sP1	Plan Supply Chain
sP2	Plan Source
sP4	Plan Deliver
sS1.1	Schedule Product Deliveries
sS2.1	Schedule Product Deliveries
sS3.3	Schedule Product Deliveries
sD1	Deliver Stocked Product
sD1.5	Build Loads
sD1.6	Route Shipments
sD2.5	Build Loads
sD2.6	Route Shipments
sD3.5	Build Loads
sD3.6	Route Shipments
sE5	Manage Supply Chain Assets
sE7	Manage Supply Chain Network

BP.123 Return Load Optimization

The practice of combining customer deliveries with customer pick-ups for returns or re-distribution. In high-tech industry, it is common to combine service delivery with pick up/replacement of defective product at customer site. Additionally, companies may combine pick up of return materials (defective or excess) or coordinate it with regular customer shipments, in order to optimize transportation.

Processes	
sSR1.4	Schedule Defective Product Shipment
sDR1.2	Schedule Defective Return Receipt
sSR3.4	Schedule Excess Product Shipment
sDR3.2	Schedule Excess Return Receipt
sE7	Manage Supply Chain Network

Metrics	
RL.3.5	% Error-free Returns Shipped
RL.3.10	% of Excess Product Returns Delivered Complete to the Designated Return Center
RL.3.47	Return Shipments Shipped on Time
CO.2.4	Cost to Deliver

BP.125 Automated Identification/Disposition of Over Shipments

Automated supply chain management systems allow verification and identification of over shipped product at time of receiving. Comparison against Purchase Order tolerance levels is normally done automatically by the system. This information (i.e., the quantity flagged by the system as excess) can be used to take action based on policies and business rules related to the return process.

Depending on company policies and agreement between the parties involved, over shipped product can be shipped back immediately or sent to a return location identified to continue with the next step in the process.

Note: Over Shipments (receipt of material exceeding the order quantity, inclusive of tolerances in the PO) are a receiving issue against PO requirements.

Processes	
sSR3	Source Return Excess Product
sSR3.1	Identify Excess Product Condition
sSR3.2	Disposition Excess Product
sSR3.3	Request Excess Product Return Authorization
sSR3.5	Return Excess Product
sDR3	Deliver Return Excess Product
sDR3.1	Authorize Excess Product Return
sDR3.3	Receive Excess Product
sE1	Manage Supply Chain Business Rules

Metrics	
RL.3.10	% of Excess Product Returns Delivered Complete to the Designated Return Center
CO.3.12	Indirect Cost Related to Production
CO.2.5	Cost to Return

BP.126 Supply Chain Control Towers

Collaboration between supply chain partners can be facilitated using a supply chain control tower. This allows supplier to see requirements and inventory levels at customer site, highlighting any potential excess inventory. Similarly, customer can easily identify supply/demand variations and take necessary action to return excess inventory if needed.

Note: This should be considered a standard, or perhaps declining practice due to its after-the-fact identification of excess to be returned. It would be emerging if the process involved avoidance of excess via close linkage of information between supplier and customer. A Kan-Ban approach is one way to provide just-in-time material while pro-actively minimizing excess inventory exposure.

Processes	
sSR3	Source Return Excess Product
sDR3	Deliver Return Excess Product
sE3	Manage Data and Information

Metrics	
AG.2.4	Upside Source Return Adaptability
AG.2.5	Upside Deliver Return Adaptability

BP.127 Automated Alerts for Material Management

The practice of using web-based or email alerts (containing ERP insights) to inform key supply chain partners about inventory levels and projected demand for key materials (supply and demand imbalance). Predetermined thresholds (typically analyzed in terms of days of supply) need to be identified and agreed upon. Automated alerts can then notify decision makers when inventory reach upper and lower thresholds until action to correct the supply and demand imbalance.

Processes	
sP5	Plan Return
sP5.1	Assess and Aggregate Return Requirements
sP5.2	Identify, Assess and Aggregate Return Resources
sSR3	Source Return Excess Product
sDR3	Deliver Return Excess Product
sE3	Manage Data and Information

Metrics	
CO.2.2	Cost to Source
CO.2.3	Cost to Make
AM.2.2	Inventory Days of Supply

BP.128 Return cost recovery

The practice of recovering the cost of materials and incremental cost occurred to return, repair and resend a return part to the supplier of the failing component. When a defective product is returned by a customer, an analysis to identify the source of the problem usually takes place. If the defect is determined to be related with to a component purchased from a vendor, the process of recovering part or all of the cost from the vendor is typically called 'Return cost recovery'. Further collaboration with vendor to prevent similar instances in the future, or improve quality can also be considered.

Note: A prerequisite for this practice is a written agreement with affected suppliers that includes details related to the warrantable conditions, excluded items (if any, such as expendables), the period of warranty coverage, when such period commences, and the extent in which some or all of the buyer's associated direct and indirect costs are reimbursed by the supplier.

Processes	
sSR1.5	Return Defective Product
sDR1.3	Receive Defective Product (includes verify)
sE1	Manage Supply Chain Business Rules
sE2	Manage Performance
sE3	Manage Data and Information

Metrics	
RL.3.55	Warranty and Returns
RL.3.56	Warranty Costs
CO.2.5	Cost to Return

BP.129 Return Policy included with Shipping Document

In order to better facilitate return process, and provide additional information about agreed upon return policies, it is common to include return policy together with the shipping documentation. This clearly identifies terms and conditions, and what kind of action should be taken in case of a return.

Note: This practice is probably best suited for shipment of product intended for end customers, and not component product being shipped to an OEM. Return policies are mow more often kept on supplier websites and referenced in documentation provided.

Processes	
sSR1	Source Return Defective Product
sSR1.3	Request Defective Product Return Authorization
sDR1	Deliver Return Defective Product
sDR1.1	Authorize Defective Product Return
sSR3	Source Return Excess Product
sSR3.3	Request Excess Product Return Authorization
sDR3	Deliver Return Excess Product
sDR3.1	Authorize Excess Product Return
sE1	Manage Supply Chain Business Rules
sE2	Manage Performance

Metrics	
RS.3.19	Current customer return order cycle time

BP.131 Alternative Supplier Benchmarking

The practice of requesting prices from a number of suppliers for a particular product or service. The prices are compared to the existing supplier in order to determine whether the current price paid is representative of the market/industry.

An informal research approach by the purchaser. If an existing supplier contract is for many different materials/ or service requirements, usually only a sample of those materials/service requirements are used to test the market price. When agreeing a medium term, formal contract with a supplier it is useful to include a clause that allows the purchaser the opportunity to benchmark against the market, which in turn allows the opportunity to discuss pricing concerns with the existing supplier.

Note: Caution must be taken when undertaking a benchmark exercise as spot rate analysis based on a selection of products does not always return comparable results.

Processes	
sS1	Source Stocked Product
sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product
sS3.1	Identify Sources of Supply
sE1	Manage Supply Chain Business Rules
sE2	Manage Performance
sE6.4	Review Contractual Performance

Metrics	
CO.2.1	Cost to Plan
CO1.2	Cost of Goods Sold

People	
HS.0010	Basic Finance
HS.0012	Benchmarking
HS.0024	Cost/Price Analysis
HS.0032	Customer/Supplier Communication

BP.133 Total Preventative Maintenance Program

Total Preventive Maintenance (TPM) is a production management approach that places the responsibility for routine maintenance on the workers who operate the machinery rather than employing separate maintenance personnel for that function. It encompasses both breakdown maintenance policy that involves dealing with problems as they occur and attempting to reduce their impact on operations and preventive maintenance policy that involves using such measures as inspecting cleaning adjusting and replacing worn parts to prevent breakdowns from occurring in the first place.

Preventive maintenance is performed periodically in order to reduce the incidence of equipment failure and the costs associated with it. It should be scheduled to avoid interfering with production. Common methods of planning preventive maintenance are based on the passage of time on the amount of usage the equipment receives and on an as-needed basis when problems are uncovered through inspections. Ideally preventive maintenance will take place just before failure occurs in order to maximize the time that equipment is in use between scheduled maintenance activities.

The decision of how much maintenance to perform involves the age and condition of the equipment the complexity of technology used the type of production process and other factors. For example, managers would tend to perform more preventive maintenance on older machines because new ones have only a slight risk of breakdown and need less work to stay in good condition. It is also important to perform routine maintenance prior to beginning a particularly large or important production run.

In TPM production employees are trained in both operating procedures and routine maintenance of equipment. They perform regular inspections of the machinery they operate and replace parts that have become worn through use before they fail. Since the production employees spend so much time working with the equipment they are likely to pick up small signals that a machine is in need of maintenance. Among the main benefits of TPM is that employees gain a more complete understanding of the functioning of the system. TPM also gives them increased input into their own productivity and the quality of their work.

Processes	
sE5	Manage Supply Chain Assets
sE5.1	Schedule Asset Management Activities

BP.134 Supplier Evaluation using Robust Evaluation Tool.

The practice of evaluating a supplier. A thorough supplier evaluation process will consider pricing, supplier structure and sustainability, supplier capability, supplier fit with company, acceptable contract terms and conditions.

A robust evaluation toll should be used which attempts to remove as much subjectivity as possible. Weighting can be given to certain evaluation criteria based on the importance to the purchaser. Price, Quality, Culture, Performance, Location etc.

An evaluation committee should jointly agree on the overall evaluation score. Members of the committee should include key stakeholders, purchasers and individuals who may not have a direct interest in the outcome but who are able to ask probing questions and challenge the norm.

This task should not be confused with evaluation of supplier materials (trials).

Processes	
sS1	Source Stocked Product
sS3	Source Engineer-to-Order Product
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sE1	Manage Supply Chain Business Rules
sE2	Manage Performance
sE9	Manage Supply Chain Risk

Metrics	
CO.2.2	Cost to Source
CO.2.3	Cost to Make
CO.2.6	Mitigation Cost

People	
HS.0010	Basic Finance
HS.0020	Competitive Bidding
HS.0022	Contract Management
HS.0024	Cost/Price Analysis
HS.0032	Customer/Supplier Communication
HS.0092	Pricing Management
HS.0094	Procurement
HS.0126	Risk Identification
HS.0137	Strategic Planning
HS.0139	Supplier Relationship Management (SRM)

BP.137 Carcass Disassembly (Industry Specific)

Returned Maintenance, Repair, Operations (MRO) items are disassembled to the bill of material level and component parts are tested. In accordance with specific business rules, components that meet or exceed technical performance parameters are placed in storage for use in future production.

Processes	
sDR1.3	Receive Defective Product (includes verify)
sDR2.3	Receive MRO Product

Metrics	
CO.2.5	Cost to Return
AM.3.39	Percentage Unserviceable MRO Inventory in Disposition
AM.3.41	Percentage Unserviceable MRO Inventory in Return Authorization
AM.3.44	Percentage Unserviceable MRO Inventory

BP.138 Theory of Constr'aints

The management approach focused on addressing performance gaps by the identification and elimination of a limited number of bottlenecks (of a supply chain). Theory of Constraints is based on the following paradigms:

- The purpose (goal) of a business is to "make money, now and in the future"
- The rate of goal achievement is limited by at least one constraining process
- A chain is no stronger than its weakest link

Theory of Constraints recommends five focusing steps of continuous improvement:

- Identify the constraint - find the equipment, people or policy that prevents the supply chain from achieving its goals;
- Decide how to exploit the constraint - how to get the most capacity out of the constrained process;
- Subordinate all processes to the decision in step 2 - align the whole supply chain to support the decision;
- Elevate the constraint - make other major changes needed to break the constraint;
- If, as a result of these steps, the constraint has moved, return to Step 1.

Theory of Constraints implements buffers before constraints to avoid the constrained process is waiting for other processes to complete. Processes with greater variance require larger buffers. (Combination of six sigma - a methodology focused on reducing variance of processes - will have synergetic effects). These buffers are mostly inventory of materials waiting to be processed by the constrained process. In supply chain inserting inventory is generally a hard sell, however the buffer inventory is significantly less than the inventory reduction further downstream.

The Drum-Buffer-Rope is the approach to analyze the manufacturing process:

- Drum - the physical constraint of the supply chain
- Buffer - the buffer that ensure the drum has work
- Rope - the scheduling process that releases orders to the drum one buffer time before due

Theory of Constraints was first introduced by Dr. Eliyahu M. Goldratt. Implementation of Theory of Constraints shifts viewing the whole as dissected silos, to identifying and maximizing the system's intrinsic flow.

Processes	
sE2	Manage Performance
sE7	Manage Supply Chain Network

Metrics	
RS.1.1	Order Fulfillment Cycle Time
AM.2.2	Inventory Days of Supply

BP.139 Vendor Managed Inventory (VMI)

The practice where the planning of inventory levels and the scheduling of deliveries to the customer is performed by the supplier of the materials or goods. VMI implementations require a Make-to-Stock inventory strategy for the goods or materials managed using VMI. Vendor Managed Inventory requires contractual agreements that stipulate the service level agreements and/or desired inventory levels.

Trust is a major requirement of VMI, for both supplier and customer in the relationship. Supplier may need to disclose lead times and VMI processes. Customers may need to disclose historic, current and future demand - including trends and seasonality. Implementation includes establishing process documentation, modification of contractual agreements and information technology changes.

Note: VMI by itself does not change the point of ownership transfer, nor does it change the location of the inventory. VMI changes the responsibility of the process that determines when materials/ goods need to be replenished and the scheduling of the replenishments. The supplier is the manager of the inventory. Vendor Managed Inventory can be combined with Outsourced Warehousing and Consignment Inventory to increase benefits. For example, if the supplier is both manager and owner of the inventory (i.e. VMI plus Consignment Inventory) then it may be referred to as `Vendor Owned Inventory` or VOI.

Related inventory management practices: Consignment Inventory, Outsourced Warehousing

Processes	
sS1.1	Schedule Product Deliveries
Metrics	
CO.2.1	Cost to Plan
People	
HS.0156	VMI planning and management

BP.141 Pre-issued return authorization

Pre-issued return authorization is the practice where a return authorization number is issued at the time of ordering or shipment of the goods to the customer. The proactive issuance of a return authorization number reduces the time, cost and possible errors associated with the process to receive and validate a return authorization request and issuing the authorization. This practice requires the policy: "No return without a return authorization number".

Note: The customer does not need to make a request for a return authorization number as the supplier is providing the number by default or proactively based on a certain logic. E.g. Amazon shipments include a return authorization and return shipping label.

Processes	
sSR1.3	Request Defective Product Return Authorization
sSR3.3	Request Excess Product Return Authorization

Metrics	
RS.3.19	Current customer return order cycle time
RS.3.22	Current supplier return order cycle time
CO.3.14	Order Management Cost

People	
HS.0119	Return Management
HS.0122	Reverse Logistics

BP.145 Vendor Collaboration

The practice of issuing a 12-month rolling picture of demand to the supplier. The schedule usually includes a fixed window of time where no change should be made, a flexible window where it is acceptable to change +/- qty or delivery time and a forecast window which gives the supplier an idea of future plans. The schedules are reviewed regularly i.e. monthly. This collaboration may enable vendors to provide a higher level of service at a lower cost.

Usually a formal contract has been agreed with the supplier on the price, specification and delivery volumes, and so strategic purchasing focus on the commercial points and an operational purchaser focuses on managing the order requirements and demands of production. Proven to be two very different skill sets, but equally important.

The expectation is that lead times become reduced as suppliers are able to forward plan resources, with less surprises. Used in industries which have regular purchases of product. Beneficial to those industries that must manage variation and changes.

Processes	
sP1	Plan Supply Chain
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
sP1.4	Establish and Communicate Supply Chain Plans
sP2.4	Establish Sourcing Plans
sS1	Source Stocked Product
sS1.1	Schedule Product Deliveries
sS2	Source Make-to-Order Product
sS2.1	Schedule Product Deliveries
sS3	Source Engineer-to-Order Product
sS3.3	Schedule Product Deliveries
sE2	Manage Performance
sE3	Manage Data and Information
sE7	Manage Supply Chain Network
sE9	Manage Supply Chain Risk

Metrics	
RL.2.1	% of Orders Delivered In Full
RL.3.27	% Schedules Changed within Supplier's Lead Time
RL.3.37	Forecast Accuracy
RL.3.49	Schedule Achievement
AG.1.1	Upside Supply Chain Flexibility
CO.3.13	Direct Labor Cost

BP.145 Vendor Collaboration

People	
HS.0013	Blanket purchase order process
HS.0032	Customer/Supplier Communication
HS.0036	Delivery Scheduling
HS.0037	Demand Management
HS.0046	ERP Systems
HS.0048	Forecasting
HS.0058	Inventory Management
HS.0072	Performance Management
HS.0083	Order Management
HS.0139	Supplier Relationship Management (SRM)
HS.0140	Supply Chain Leadership
HS.0141	Supply Chain Management
HS.0142	Supply Chain Performance Measurements
HS.0143	Supply Chain Planning
HS.0145	Supply Planning

BP.153 Bar coding

Bar coding is the practice of adding machine readable labels to packaging of goods, in order to increase reading speed and reducing reading errors. Bar coding requires a standard for bar coding, a barcode printer and a barcode reader. A barcode reader (or barcode scanner) is an electronic device for reading printed barcodes. Like a flatbed scanner it consists of a light source a lens and a light sensor translating optical impulses into electrical ones. The barcode scheme defines the technical details of a particular type of barcode: the width of the bars character set method of encoding checksum specifications etc.

Standards: There are many types of bar codes however most used ones are UCC/EAN128. This is the most commonly used standard in Retail and other industries. The new development in this area is RFID tags. In any of these forms it stores information about the product and passes it to any automated computerized software for further processing.

Processes	
sP1	Plan Supply Chain
sM1	Make-to-Stock
sM2	Make-to-Order
sM3	Engineer-to-Order
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
sD4	Deliver Retail Product
sSR1	Source Return Defective Product
sE6	Manage Supply Chain Contracts

Metrics	
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time
AG.1.1	Upside Supply Chain Adaptability
AG.1.2	Downside Supply Chain Adaptability
CO.3.12	Indirect Cost Related to Production
CO.3.13	Direct Labor Cost
CO.3.14	Order Management Cost

BP.156 Collaborative Planning, Forecasting and Replenishment (CPFR)

The CPFR® reference model provides a general framework for the collaborative aspects of planning, forecasting and replenishment processes. The model is considered a 'guideline' for trading partner collaboration which should be tailored specially for the industry and company readiness and maturity.

CPFR defines eight collaboration tasks:

- Collaboration Arrangement is the process of setting the business goals for the relationship defining the scope of collaboration and assigning roles responsibilities checkpoints and escalation procedures.
- The Joint Business Plan then identifies the significant events that affect supply and demand in the planning period such as promotions inventory policy changes store openings/closings and product introductions.
- Sales Forecasting projects consumer demand at the point of sale.
- Order Planning/Forecasting determines future product ordering and delivery requirements based upon the sales forecast inventory positions transit lead times and other factors.
- Order Generation transitions forecasts to firm demand.
- Order Fulfillment is the process of producing shipping delivering and stocking products for consumer purchase.
- Exception Management is the active monitoring of planning and operations for out-of bounds conditions.
- Performance Assessment calculates key metrics to evaluate the achievement of business goals uncover trends or develop alternative strategies.

Based on this general framework CPFR addresses collaboration scenarios (such as replenishment collaboration or collaborative assortment planning), collaboration roles (assigning responsibilities for the collaboration activities) and organizational implications for the partnering companies.

CPFR® is a registered trademark of VICS.org

Processes	
sE7	Manage Supply Chain Network

Metrics	
CO.2.1	Cost to Plan
CO.3.11	Direct Labor Cost
CO.3.12	Indirect Cost Related to Production
AM.2.2	Inventory Days of Supply
AM.3.37	Percentage Excess Inventory
AM.3.45	Inventory Days of Supply - Finished Goods

BP.157 Just In Time Production

Just in time (JIT) is a production strategy that strives to improve a business return on investment by reducing in-process inventory and associated carrying costs. Just-in-time is also known as the Toyota Production System. Just-In-Time processes rely on signals or Kanban between different points in the process which tell production when to make the next part or tell a supplier when to make the next delivery. Just-In-Time focuses on making materials or products available just before they are needed.

Kanban are usually 'tickets' but can be simple visual signals such as the presence or absence of a part on a shelf. Kan-bans are constructed to maximize frequency of delivery and minimize inventory. Implemented correctly JIT focuses on continuous improvement and can improve a manufacturing organization's return on investment quality and efficiency. To achieve continuous improvement key areas of focus could be flow employee involvement and quality.

Note: Just-In-Time like Lean Manufacturing remove inventory buffers from the system. When a shortage or unpredicted delay occurs JIT opponents say this may negatively impact the Agility of a JIT production process. In recent years manufacturers have continued to try to hone forecasting methods such as applying a trailing 13-week average as a better predictor for JIT planning, however some research demonstrates that basing JIT on the presumption of stability is inherently flawed.

Processes	
sE2	Manage Performance
sE7	Manage Supply Chain Network

BP.160 Lean

Lean Manufacturing, Lean Enterprise or Lean Production often simply 'Lean' is a production practice that considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful and thus a target for elimination. Working from the perspective of the customer who consumes a product or service 'value' is defined as any action or process that a customer would be willing to pay for.

Lean activities therefore focus on the elimination of waste. There are 7 types of waste to consider:

- Overproduction -- making more than is needed
- Transport -- excessive movement of materials
- Motion -- inefficient movement of people or assets
- Waiting -- underutilization of people
- Inventory -- material lying around unused
- Over processing -- manufacturing to a higher quality standard than required by the customer
- Defects -- time spent correcting defects including the scrap that results and the time that is wasted

The Lean or TPS (Toyota Production System) concept was developed in large part by Toyoda Kiichiro Taiichi Ohno and Toyoda Sakichi following WW II.

Processes	
sE2	Manage Performance
sE3	Manage Data and Information
sE6	Manage Supply Chain Contracts
sE7	Manage Supply Chain Network

BP.161 Enterprise Level Spend Analysis

Spend analysis involved collection of data across procures to pay process in an enterprise and slicing and dicing these data into useful information. It is used for supplier negotiation future saving forecasting working capital and cash management activities. The various software available in the industry include: SAAS, ARIBA, SAP-SRM, Oracle-Supply chain. Enterprise Level Spend Analysis aims at enhancing visibility of the spends in an organization and provides high value input for operational and strategic decisions.

Processes	
sP2	Plan Source
sS1	Source Stocked Product
sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product

Metrics	
RS.2.1	Source Cycle Time
AG.1.3	Overall Value at Risk (VAR)
CO.1.1	Total Supply Chain Management Cost
CO.2.1	Cost to Plan
CO.2.3	Cost to Make
CO.3.11	Direct Material Cost
CO.3.14	Order Management Cost
CO.2.5	Cost to Return
CO.1.2	Cost of Goods Sold
AM.2.2	Inventory Days of Supply
AM.2.6	Accounts Payable (Payables Outstanding)
AM.2.8	Inventory

BP.164 Consignment Inventory Management

The practice of making inventory available at the customer premises, while the vendor carries the cost of ownership and liability of these materials or goods. The customer assumes ownership and liability at time of consumption or sale of these materials or goods. Payment is made on the basis of the contractually agreed terms following the moment of assuming ownership. Generally, the contractual agreement documents both the terms and the moment/trigger of assuming ownership by the customer.

Consignment (or Vendor Owned Inventory) may be combined with VMI (Vendor Managed Inventory).

Processes	
sS1.2	Receive Product
sS1.3	Verify Product
sS1.4	Transfer Product
sS1.5	Authorize Supplier Payment

Metrics	
AM.1.1	Cash-To-Cash Cycle Time
AM.2.2	Inventory Days of Supply
AM.3.16	Inventory Days of Supply - Raw Material

People	
HS.0021	Consignment Agreement Development
HS.0022	Contract Management
HS.0023	Controls and Compliance

BP.165 Convergence of SCOR with Lean and Six Sigma

The practice of implementing a structured process improvement framework, leveraging the best tools and techniques applicable to the problem at hand.

Lean Manufacturing, Six Sigma, and SCOR are independent methodologies that are being applied to help companies improve their operations. The norm for most companies is usually to choose one of the 3 and exclude the others due to cost, complexity, or familiarity factors. Choosing only one means however we must deal with tradeoffs since each methodology has something unique to offer. SCOR is the ideal supply chain analysis tool and offers an efficient way to identify improvement opportunities. These opportunities can then be used as the input to Lean or Six Sigma project portfolios and can help ensure results that impact the bottom line.

Processes	
sE2	Manage Performance

Metrics	
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time
AG.1.1	Upside Supply Chain Adaptability
AG.1.2	Downside Supply Chain Adaptability
CO.1.1	Total Supply Chain Management Costs
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital

BP.172 Production Scheduling Optimization Using Technology

Effective scheduling should not only include production related attributes (e.g. rated/demonstrated capacity asset loading sequencing changeover constraints etc.) but also other directly and indirectly related processes. Due to the complexity and data intensity of this practice this particular process is typically managed by a separate (and possibly dedicated) module within an ERP system. The objective of production scheduling optimization is to maximize the throughput on a given asset while optimizing (increasing or decreasing depending upon the characteristic) the other related processes. Examples of other activities that should be considered when optimizing a production schedule are as follows:

- Preventative maintenance program schedule and requirements - This information is typically stored and managed in a separate maintenance management system or EPR module. A linkage between the requirements of the maintenance program and the scheduling system is critical to achieve overall optimization.
- Shared resource considerations - While production routings should provide the majority of requirements for a given production run availability and compatibility of other resources/assets (either co-located or remote) should be available to the scheduling tool. Shared resource information would generally be available in an ERP's advanced planning module (e.g. network planner etc.) or in the resource management data tables/modules.
- MRP and DRP requirements - While some scheduling systems might include material and distribution planning requirements and optimized production schedule must have access to data regarding in-bound material availabilities as well as out-bound distribution schedules. If MRP/DRP processes are managed separately from production scheduling then these processes/systems must be integrated to not only to seamlessly communication requirements but also to ensure that the overall production schedule is optimized.
- Product quality management considerations - Similar to other processes noted above management of product quality can also be managed in a separate process/system. An effective scheduling system must have real-time access to any product quality constraints (e.g. products or families on hold etc.) This will ensure that production capacity is not allocated to defective designs etc.

Processes	
sM1.1	Schedule Production Activities
sM2.1	Schedule Production Activities
sM3.2	Schedule Production Activities

Metrics	
RL.3.49	Schedule Achievement
RS.3.123	Schedule Production Activities Cycle Time
AM.3.9	Capacity Utilization

BP.173 Supply Chain Risk Monitoring

The practice of establishing a formal process to continuously monitor the changes in probability or impact of risk events.

Once areas of risk have been identified, an organization needs to monitor their internal and external environment. Risk monitoring:

- Helps to predict when risky events are becoming more likely
- Helps identify new risks (link to Supply Chain Risk Identification best practice)
- Continuously assesses the effectiveness of a Supply Chain Risk Management (SCRM) program

Real time metrics and periodic reports provide decision makers knowledge of upcoming risks. Statistical analysis of key metrics can reveal trends. Visibility into supplier and customer metrics increases the ability to monitor. Reports on risk monitoring can be combined with existing management reviews and meetings. Monitoring can also include monitoring qualitative sources of information such as news or weather reports to identify events that are precursors to risks.

It is important to monitor indicators that would appear early in a risk event or, better, even before it occurs by indicating an increasing likelihood. If monitoring only reveals a risk well after its first occurrence, it will likely be too late to adequately respond to it.

Monitoring can also be used to test the effectiveness of risk controls. If a plan to mitigate or prevent a risk has been implemented, monitoring can check to see if the corresponding metrics show no signs of the risk occurring. The effectiveness of the Supply Chain Risk Management program can be assessed by monitoring three general aspects:

- The risk exposure present in the supply chain - Use Value-at-Risk (VAR) metric
- The portion of risk actively mitigated - Use VAR for risk with active mitigations divided by total VAR
- The ability to respond and adapt to risk events - Use time to recover (TTR) metric

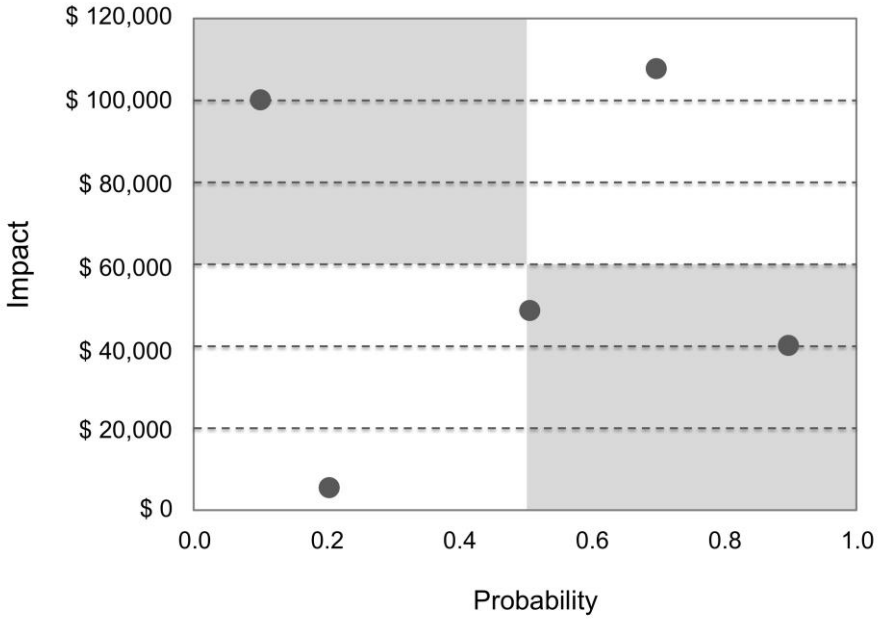
Processes	
sE9	Manage Supply Chain Risk
Metrics	
RS.3.31	External Event Response (average days)
AG.1.3	Overall Value at Risk (VAR)
AG.3.55	Internal Event Response (average days)
People	
HS.0124	Risk and exception management
HS.0125	Risk Assessment
HS.0126	Risk Identification
HS.0127	Risk Mitigation
HS.0128	Risk Response Planning

BP.174 Supply Chain Risk Assessment

Supply Chain Risk assessment provides management with an understanding of where the greatest risks may exist in order to prioritize resources for risk mitigation and management. Performing such assessments will involve clarifying the nature of the risk, understanding conditions that may lead to the event, knowing how frequently such events have happened or can be expected to happen, and the potential impact of such events. The team can then prioritize addressing the risks. Risk assessment is typically made up of two measures: Probability and Impact.

- **Probability** measures the likelihood that a supply chain interrupting event will occur. With formal probability, a probability of 0 means the event will never occur and a probability of 1 means the event will surely occur. The exact probability may be difficult to determine unless historical data exists that can be used to find the frequency of the event occurring. Alternatively, an organization can use a subjective probability, or degree of belief, based on the opinions of experts. A time horizon is necessary to define the probability in a useful way (e.g., the likelihood that an event will occur in the next year or the likelihood that the event will occur in the next 50 years).
- **Impact** measures the consequences on the organization when the event occurs. It can be measured directly, for example in terms of monetary impact. It can also be measured on a scale, for example from zero to one with zero being very little negative consequence, 0.5 being a medium amount of consequence, and 1 (one) being a very severe consequence. Methods for measuring impact include "what-if" simulations, financial models, and opinions of teams of experts. Impact may also be measured in terms of other SCOR metrics besides financials.

Summary risk score – A summary risk score can be calculated for each risk by multiplying the Impact times the Probability to get an expected value of the risk. Then risks can be ranked by risk score. Also, the risks can be shown on a map or graph. An example is shown below.



Other methods for assessment include:

- Failure Mode Effects Analysis (FMEA)
- Fault Tree Analysis (FTA)
- Event Tree analysis (ETA)

A risk assessment tool in the form of qualitative and quantitative spreadsheet that can be used by management teams to organize the assessment of risks to an organization. The tool can also contain information on relevant causes of those risks and their assessment, mitigation options and the impact of various mitigation plans. This helps establish standards for the measurement, reporting, and limiting of risk. The tool can contain risk categories from other known best practices such as COSO.

Quantitative Risk Analysis: Tools and Techniques for Assessment

Data Collection:

- **Interviews:** Interviewing techniques are used to quantify the likelihood and impact of risks on project objectives. The information required depends on the type of probability distributions that will be used. For example, the information would be collected on optimistic scenarios (low), pessimistic (high) and more likely for some commonly used distributions, mean and standard deviation for others.
- **Probability distributions**: The continuous probability distributions represent the uncertainty in values, such as duration of schedule activities and costs of project components. The discrete distributions can be used to represent uncertain events, as the result of a test or a possible scenario in a decision tree.

Risk analysis:

- **Sensitivity analysis**. The sensitivity analysis helps determine which risks are greatest potential impacts on supply chain disrupts. It examines the extent to which the uncertainty of each chain element affects the objective being examined when all other uncertain elements are held in their baseline values. Operations Research Methods can use it.
- **Decision tree analysis**: In general, the decision tree analysis is structured using a decision tree diagram that describes a situation that is being considered and the implications of each of the available choices and possible scenarios. It incorporates the cost of each available choice, the probabilities of each scenario and the return of each alternative logical path. The resolution of the decision tree provides the Expected Monetary Value - EMV (or other measure of interest in the organization) for each alternative, when all the awards and subsequent decisions are quantified.
- **Modeling and simulation**: A supply chain simulation uses a model that translates the uncertainties specified at a detailed level for each process potential impact on supply chain objectives and performance planned. Simulations are usually performed using the Monte Carlo technique or specific software available on market. In one simulation, the supply chain model is computed many times and the entries values are randomly chosen from a probability distribution function (example: cost of transportation elements or lead time on schedule activities). The probability function is built by each iteration from the probability distributions of each variable. A probability distribution (example: total cost or delay) is calculated.

Figure 1 shows the interaction among some suggested tools for risks assessment.

BP.174 Supply Chain Risk Assessment

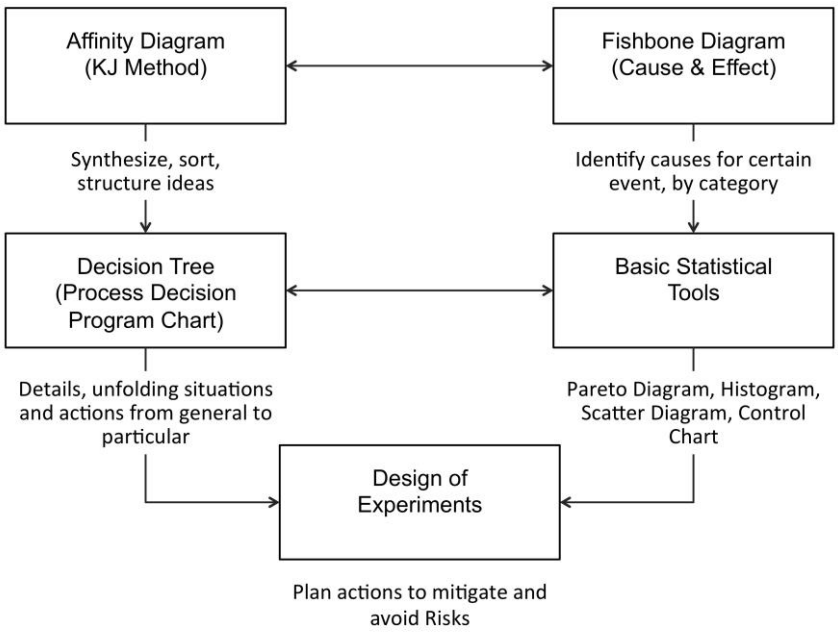


Figure 1: Interaction tools for risks assessment

Note:

Risk assessment is a tool for quantifying the potential impact of supply chain disruptions and is a key tool for prioritizing mitigation activities. Risk assessment should be used to increase the veracity of a supply chain risk management program and better support resource allocations.

Risk management is widely discussed, but practitioners have differing views of the categories, significance, and how to integrate mitigation plans into the overall project or operational plan. A frequent issue is that management focuses on the highest impact risks, overlooking more frequent occurrences. This tool should help standardize risk management vocabulary and practices within an organization. It can help embed risk management in the operating and project plan.

A best practice is to have project teams update the assessment/plan as project milestones are completed (such as file permits, FEL3, etc.), keeping the risk mitigation plan integrated with overall project by eliminating risk mitigation plans which are no longer pertinent.

BP.174 Supply Chain Risk Assessment

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	Good risk assessments will identify the most significant risks to be mitigated and, therefore, decrease the likelihood of disruptions to reliability. Improves reliability by facilitating risk mitigation plans.
Responsiveness	None Identified
Flexibility	Good risk assessments will identify the most significant risks to be mitigated and, therefore, increase the ability to increase flexibility.
Cost	Good risk assessments will identify the most significant risks to be mitigated and, therefore, best allocate cost resources to mitigate risks. Improves cost control by identifying factors which can costs to exceed forecast, and by facilitating risk mitigation plans.
Asset Management	None Identified

Key Best Practice Success Factors

- Technology Features - Some more sophisticated methods of risk assessment involve the use of simulations to derive approximations for the impact of risks. A variety of different types of supply chain simulation software is available and may be used for this purpose. Microsoft Excel software, or equivalent.
- Other Success Factors - Procedure for use of this Best Practice in the context of the firm's vocabulary and policies.

Processes	
sE9	Manage Supply Chain Risk

Metrics	
CO.2.1	Cost to Plan
CO.2.6	Mitigation Costs
CO.3.18	Risk Mitigation Costs (Plan)
CO.3.19	Risk Mitigation Costs (Source)
CO.3.20	Risk Mitigation Costs (Make)
CO.3.21	Risk Mitigation Costs (Deliver)
CO.3.22	Risk Mitigation Costs (Return)

BP.174 Supply Chain Risk Assessment

People	
HS.0124	Risk and exception management
HS.0125	Risk Assessment
HS.0126	Risk Identification
HS.0127	Risk Mitigation
HS.0128	Risk Response Planning

BP.175 Metadata

Metadata summarizes basic information about data, which can make finding and working with particular instances of data easier. Having the ability to filter through that metadata makes it much easier for someone to locate a specific data asset.

Ideally, in an enterprise environment, metadata should be generated whenever data is created, acquired, added to, deleted from, or updated. Metadata management is designed to ensure that metadata is added appropriately and that mechanisms are in place to optimize its effectiveness.

Common metadata includes:

- Description: This meta element describes the type of content found. For example, the description for this page tells this search engine that the page contains a definition of the term metadata.
- Title: This provides a title for the content on the page, which is shown by search engines in results. For this page, it is: What is Metadata? – from APICS Dictionary
- Keywords: This provides the search engine with additional keywords that are related to the content that's on the page.

Metadata management is the business discipline for managing the metadata about the information assets of the organization. Metadata is “information that describes various facets of an information asset to improve its usability throughout its life cycle.”

Benefits of metadata management include:

- Consistency of definitions of metadata so that terminology variations don't cause data retrieval problems.
- Less redundancy of effort and greater consistency across multiple instances of data because data can be reused appropriately.
- Maintenance of information across the organization that is not dependent on a particular employee's knowledge.
- Greater efficiency leading to faster product and project delivery.

Processes	
sE1	Manage Supply Chain Business Rules
sE3	Manage Data and Information
Metrics	
sE1	Manage Supply Chain Business Rules
People	
HS.0033	Data Management

BP.185 Cost of Quality

Cost of quality is a methodology that allows an organization to determine the extent to which its resources are used for activities that prevent poor quality, that appraise the quality of the organization's products or services, and that result from internal and external failures. Having such information allows an organization to determine the potential savings to be gained by implementing process improvements.

Quality-related activities that incur costs may be divided into prevention costs, appraisal costs, and internal and external failure costs.

Prevention costs

Prevention costs are incurred to prevent or avoid quality problems. These costs are associated with the design, implementation, and maintenance of the quality management system. They are planned and incurred before actual operation.

Appraisal costs

Appraisal costs are associated with measuring and monitoring activities related to quality. These costs are associated with the suppliers' and customers' evaluation of purchased materials, processes, products, and services to ensure that they conform to specifications.

Internal failure costs

Internal failure costs are incurred to remedy defects discovered before the product or service is delivered to the customer. These costs occur when the results of work fail to reach design quality standards and are detected before they are transferred to the customer.

External failure costs

External failure costs are incurred to remedy defects discovered by customers. These costs occur when products or services that fail to reach design quality standards are not detected until after transfer to the customer.

Excerpted from *The ASQ Quality Improvement Pocket Guide: Basic History, Concepts, Tools, and Relationships*, Grace L. Duffy, ASQ Quality Press, 2013, pages 62–65.

Processes	
sP	Plan
sS	Source
sM	Make
sD	Deliver
sR	Return

Metrics	
CO.1.1	Total Supply Chain Management Costs

BP.186 Data / Analytics

Data and analytics including: descriptive, diagnostic, predictive, prescriptive

Enterprise and external data, which may include enterprise resource planning (ERP), customer relationship management (CRM), point of sale, social media, etc. is sometimes referred to as business intelligence (BI) or even Big Data depending on its volume, velocity, and degree of structure. Data may be structured or unstructured as in images, video, sound, and social media which may challenge more traditional relational structures. Many applications exist for employing data and analytics including consumer sentiment analysis, operations troubleshooting, resource utilization improvement, fraud detection, cost-to-serve, and intelligent movement of goods throughout the value chain.

Levels of maturity exist in how this data is used in relation to the timeframe it will impact. Descriptive analytics uses data mining to uncover patterns, e.g., in metrics reporting and represents a reporting of historical occurrences. Diagnostic applications look at past performance and attempt to characterize why the event happened. In this case an analytics dashboard might be helpful. A classic example of predictive analytics is forecasting, whether it be for expected maintenance, traffic patterns, demand, or likelihood of fraud. Machine learning applies automated approaches to constantly evaluate and improve accuracy of predictive models and algorithms. Prescriptive analytics uses data to create actionable insights that guide decision-making. Both static and in-line dynamic solutions exist.

Processes	
sE1	Manage Supply Chain Business Rules
sE2	Manage Supply Chain Performance
sE3	Manage Data & Information

BP.187 Supply Chain Finance

Supply chain finance is a technology-based set of processes that link the buyer, seller and financing institution to lower financing costs and improved business efficiency. Specifically, supply chain finance provides short-term credit the buyer and the seller that that optimizes working capital. Technology is used to automate transactions and track invoice approval and settlement process.

The purpose of supply chain financing is to increase value, mitigate risk, and improve financial performance through collaborative relationships that plan, steer, control and manage the supply and demand of financial resources in the supply network.

While supply chain finance is currently seen as an emerging supply chain practice and is still relatively new, many see a rapid growth with and market development. One reason seen to be driving this growth is that many organization's receivables are under-utilized asset class for raising finance and the need to improve the productivity of working capital.

Supply Chain Finance has relevance and impact across:

i) Micro-level: individual businesses
ii) Meso-level: total supply chain
iii) Macro-level: national and global economy

Processes	
sP1	Plan Supply Chain
sE7	Manage Supply Chain Network
sE9	Manage Supply Chain Risk

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue

Standard

BP.S Standard Practice

Standard practices are how a wide range of companies have historically done business by default or happenstance. These well-established practices do the job, but don't provide a significant cost or competitive advantage over other practices (except over declining practices).

Investment, Risk: Low, Results: Low.

Hierarchy	
BP.001	Supply Chain Risk Management (SCRM)
BP.004	Network Prioritization for Risk Identification
BP.005	Self-Invoicing
BP.006	Consignment Inventory
BP.007	Baseline Inventory Monitoring
BP.008	Slow-moving Inventory Monitoring
BP.009	Kanban
BP.010	Min-Max Replenishment
BP.011	Production Line Sequencing
BP.012	Lot Tracking
BP.014	Demand Planning & Forecasting
BP.015	Safety Stock Planning
BP.017	Distribution Planning
BP.018	ABC Inventory Classification System
BP.019	Demand Planning
BP.020	Demand Management
BP.021	Sales and Operations Planning
BP.022	MRP I
BP.023	Business Rule Management
BP.030	Inventory Record Accuracy
BP.032	Reduce / Write-off Slow Moving Inventory
BP.033	Traditional Demand Forecasting Improvement
BP.035	Business Rule Review
BP.037	Manufacturing Direct/Drop Shipment
BP.038	Batch Size Reduction
BP.039	Right Size Frequency of Production Wheel
BP.040	MTO Order Fulfillment Strategy
BP.042	Regular Review of Procurement Terms and Conditions
BP.044	Inventory Financing Evaluation
BP.045	Delay Inbound Supplier Shipments
BP.046	Expedite Outbound Customer Shipments
BP.047	Finished Goods Inventory Postponement

BP.S Standard Practice

BP.048	Demand Shaping
BP.054	Manufacturing Quality Improvements for Return Reduction
BP.056	Supplier Raw Material Quality Improvement
BP.058	Inventory Management Training
BP.061	Reduce Non-Strategic Inventory Level
BP.063	Optimize Sourcing Decisions to Local Source Point
BP.064	Safety Stock Reduction
BP.066	Returns Policy to Reduce Returns Inventory
BP.067	Returns Inventory Reduction
BP.068	Supplier Delivery Performance Analysis
BP.069	Raw Materials Receiving Process
BP.070	Planning/scheduling inventory training
BP.072	Inbound RMA-enabled Processing
BP.073	Returns Receiving Refurbishment
BP.075	Web-based Return Material Authorization (RMA)
BP.077	Prepaid Return Shipping Label
BP.080	Performance Management
BP.083	Project Management
BP.084	Inventory Cycle Counting
BP.085	Safety Stock Planning
BP.087	ABC Inventory Classification
BP.089	Perfect Pick Put away
BP.090	Days of Supply Based MRP Proposal Management
BP.091	Work Center Load Evaluation
BP.092	Balance and firm within horizon
BP.093	Publish Production Plan
BP.094	Characteristics-based Forecasting
BP.095	Bill of Material Audit/Control
BP.096	Logistics & Warehouse Planning
BP.102	Pick List Generation
BP.103	Customer Data Line of Responsibility
BP.104	Facility Master Planning
BP.105	Task Management
BP.107	Distributed Order Management
BP.108	Return Policy Conformance Integration
BP.110	Product Development/Engineering/Disposition Collaboration

BP.S Standard Practice

BP.111	Electronic Technical Orders and Product Specifications
BP.114	Order Quotation System
BP.116	Expedited Logistics
BP.117	Embed Specialized Services
BP.118	Transportation Management Outsourcing
BP.119	Generation of Dynamic Bills of Materials
BP.124	Return Shipment Insurance
BP.130	Identification of Obsolete Capital Assets
BP.132	Issue Invitation to Tender (Quote)
BP.135	Return Authorization
BP.136	Outsourced Reverse Logistics
BP.140	Return Authorization Required
BP.142	Remote Return Authorization
BP.143	Preventive Returns
BP.144	Purchase Order Management
BP.146	Cross-Docking
BP.147	Receiving Goods Inspection
BP.148	3-Way Delivery Verification
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.151	Real time Package Tracking
BP.152	Automated Data Capture (ADC)
BP.155	Standard Operating Procedures
BP.158	Make-to-Stock Goods Receipt
BP.159	Electronic Data Interchange (EDI)
BP.162	Long Term Supplier Agreement/Partnership
BP.163	Supply base rationalization
BP.166	Document Management System
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool
BP.169	Beyond Economic Repair (BER) Management
BP.170	Engineer to Order Production
BP.171	Mixed Mode/Reverse Material Issue

BP.001 Supply Chain Risk Management (SCRM)

Supply chain risk management is the systematic identification, assessment and mitigation of potential disruptions in logistics networks with the objective to reduce their negative impact on the logistics network's performance.

A high number of potential disruptions can negatively impact supply chain performance. Potential disruptions can either occur within the supply chain (e.g. insufficient quality, unreliable suppliers, machine break-down, uncertain demand, etc.) and outside (e.g. flooding, terrorism, labor strikes, natural disasters, etc.). Both are considered in an integral three-phase approach for supply chain risk management:

- Risk Identification: What can go wrong? What is uncertain? Based on a description of a supply chain with SCOR, each single process should be looked at with regards to potential disruptions that may negatively harm the performance and which countermeasures are already in place. Result of this phase is a list of the relevant supply chain risks.
- Risk Assessment: How likely is it that a certain potential incident will occur? What is the impact? The likelihood of occurrence and the negative impact on SCOR performance measures of each supply chain risk should be qualitatively or quantitatively evaluated. Result of this phase is a list of serious risks that can be visualized in a risk portfolio with the dimension probability of occurrence and negative impact.
- Risk Mitigation: How can the risks be controlled and monitored? Mitigation measures (e.g. improved planning methods, alternative suppliers, response plans, redundant infrastructure, etc.) should be evaluated for the serious risks. After having checked the cost-efficiency of the alternative measures, the appropriate measures should be chosen and implemented. A risk can be mitigated by decreasing the likelihood that it will occur or by decreasing its impact if it does occur. Alternatives to mitigation include acceptance, transfer, and risk sharing.

Best Practice Need and Suitability Indicators:

Supply chain risk management is suitable especially for supply chains in uncertain environments, with low redundancies in terms of material and capacity buffers as well as high requirements on the supply chain performance. Risk management is particularly applicable to organizations that have a low tolerance for risk in their business strategy.

Additional Comments

Examples for typical supply chain risks are raw material shortage, supplier failures, increased material price, machine break-down, uncertain demand, inaccurate forecasts, change orders and transportation failure. Other risks not directly related to the supply chain are for example product liability risk or strategy risk. Therefore supply chain risks are only a part of all business risks. Hence, supply chain risk management should be integrated in an enterprise risk management.

For the implementation of supply chain risk management in organizations the process and responsibilities have to be clearly defined. The resources, e.g. staff, budget, should be assigned by the top management. The participating staff members need to be motivated and skilled.

BP.001 Supply Chain Risk Management (SCRM)

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	The over-all objective of SCRM is to increase the reliability of the supply chain and decrease the variability of the order fulfillment.
Responsiveness	The variability of the order fulfillment cycle time is reduced and the recovery time from disruptions is shortened.
Flexibility	Due to the proactive proceeding the supply chain is better prepared for sudden changes and thus more flexible.
Cost	The logistics costs are reduced in the long run.
Asset Management	The variability of inventories in the supply chain is reduced.

Key Best Practice Success Factors

Technology - Features modeling and simulation tools are frequently employed to identify and assess risks as well as mitigation approaches. Advanced planning tools can be employed to rapidly reconfigure the supply chain in response to a disruption. Moreover, software for well- established assessment techniques, e.g. FMEA, FTA, ETA, exists.

Other Success Factors - The risk management process should be carried out cross functional and - if possible - together with representatives from all companies of the supply chain.

Processes	
sE9	Manage Supply Chain Risk
sE9.1	Establish Context

Metrics	
AG.1.3	Overall Value at Risk (VAR)
CO.2.6	Mitigation Costs
CO.3.18	Risk Mitigation Costs (Plan)
CO.3.19	Risk Mitigation Costs (Source)
CO.3.20	Risk Mitigation Costs (Make)
CO.3.21	Risk Mitigation Costs (Deliver)
CO.3.22	Risk Mitigation Costs (Return

People	
HS.0124	Risk and exception management
HS.0125	Risk Assessment
HS.0126	Risk Identification
HS.0127	Risk Mitigation
HS.0128	Risk Response Planning

BP.004 Network Prioritization for Risk Identification

Network prioritization for risk identification is the process of prioritizing parts of a supply chain for risk analysis based on the overall risk potential in each portion of the supply chain. Prioritization is typically based on the criticality of the component or product flowing through a portion of the supply chain to your business and the number of sources for the material flowing through that portion of the supply chain.

Processes	
sE9	Manage Supply Chain Risk
sE9.2	Identify Risk Events
sE9.4	Evaluate Risks
Metrics	
RL.3.54	VAR of product/customer performance –
AG.2.9	Supplier's/Customer's/Product's Risk Rating
CO.2.1	Cost to Plan
CO.2.2	Cost to Source
CO.2.3	Cost to Make
CO.2.4	Cost to Deliver
CO.2.6	Mitigation Costs (Risk)
CO.3.14	Order Management Costs
People	
HS.0124	Risk and exception management
HS.0125	Risk Assessment
HS.0126	Risk Identification
HS.0127	Risk Mitigation
HS.0128	Risk Response Planning

BP.005 Self-Invoicing

The practice where a customer generates the invoices for the products or services it consumed from a supplier. The advantage of this process for the company that self-invoices is that reconciliation processes - such as 3-way verification prior to payment of invoices - are no longer required. (The reconciliation processes are transferred to the supplier.) A common application of this process is self-invoicing for transportation services and materials consumed from supplier-owned/consignment inventory. Conditions for self-invoicing:

- Clear service level agreements in place between supplier and customer of the product or service.
- Clear ways to measure the level and quality at which the services were delivered or materials were consumed.
- Defined and agreed processes for record-keeping, reporting and claims.
- Standards for electronic data communication between supplier and customer (EDI)

Consignment inventory is not a pre-requisite for self-invoicing. Materials ordered (call-offs) from a master contract may also qualify for self-invoicing.

Alternative names: Self-billing

Processes	
sS3.7	Authorize Supplier Payment
sD2.7	Select Carriers and Rate Shipments

Metrics	
CO.2.2	Cost to Source
CO.2.3	Cost to Make
CO.3.11	Direct Material Cost
CO.3.12	Indirect Cost Related to Production
CO.2.4	Cost to Deliver
CO.3.14	Order Management Costs
AM.2.3	Days Payable Outstanding

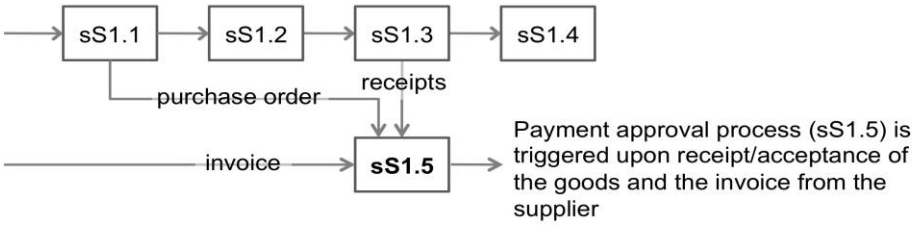
BP.006 Consignment Inventory

The organization of source processes where the ownership of materials transfers are based on a signal further down in the supply chain (for example Make or Deliver). Whereas the ownership transfer for `regular` inventory is triggered by the receipt and/or verification of the condition of the materials received, the consignment inventory practice is designed to delay the ownership transfer to the completion of an activity such as assembly, production or shipment to the customer. Application of consignment inventory does not lower the physical inventory by default; it impacts ownership of the inventory. Implementation of consignment inventory will free up cash.

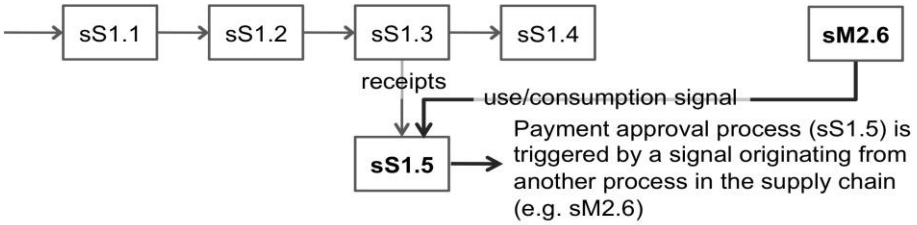
Alternative names: Supplier Owned Inventory (SOI), Vendor Owned Inventory (VOI)

Note: Under Consignment Inventory the responsibility to plan and replenish inventory levels does not transfer to the supplier (see: vendor managed inventory). Nor does the supplier perform any warehousing activities. (See: Outsourced Warehousing). Consignment Inventory can be combined with Outsourced Warehousing and Vendor Managed Inventory to increase the benefits.

Non-consignment example



Consignment example



Processes	
sS1	Source Stocked Product
sS1.2	Receive Product
sS1.3	Verify Product
sS1.4	Transfer Product
sS1.5	Authorize Supplier Payment

BP.006 Consignment Inventory

Metrics	
AM.1.1	Cash-To-Cash Cycle Time
AM.2.2	Inventory Days of Supply
AM.3.16	Inventory Days of Supply - Raw Material

People	
HS.0058	Inventory Management

BP.007 Baseline Inventory Monitoring

To avoid overstock situations, we regularly review Baseline inventory levels. Baseline inventory is defined as the lowest stock level that a particular SKU actually had during the last 12 months. It means that there will be a baseline inventory for all those items that did not have a stock-out. At maximum, the baseline inventory should match the safety stock. If it is significantly higher than the safety stock (the safety stock is never effectively utilized), the planning parameters and buffers in the system need to be reviewed. To evaluate a whole product range, we calculate the total aggregate value of baseline inventory. The metric is expressed as total value, number of items affected, and as
% of overall stock value.

This practice will be most effective in a more stable environment with established products. In a highly dynamic market environment, an important outcome of S&OP will be the setting of strategic buffer stocks for key items. To check whether they are on a reasonable level, baseline evaluation can be used.

Processes	
sP1.3	Balance Supply Chain Resources with SC Requirements
sE2	Manage Performance
sE3	Manage Data and Information

Metrics	
RS.3.4	Asset Turns
AM.2.2	Inventory Days of Supply
AM.3.45	Inventory Days of Supply - Finished Goods

People	
HS.0033	Data management
HS.0048	Forecasting
HS.0058	Inventory Management
HS.0130	S & OP Plan Communication
HS.0132	Sales and Operations Planning (S&OP)
HS.0142	Supply Chain Performance Measurements

BP.008 Slow-moving Inventory Monitoring

To avoid overstock situations, we regularly review Slow-moving inventory levels. Slow-moving inventory is defined as the value of those SKUs whose stock level is higher than the total consumption within the last 12 months

Slow-moving inventory can result from various reasons. In most cases, there are constraints in terms of time and quantity of supply which do not match with the demand side of the business (such as minimum lot sizes, constrained equipment, expected shortage of raw-materials etc.) To evaluate a whole product range, we calculate the total aggregate value of slow-moving inventory. The metric is expressed as total value, number of items affected, and as % of overall stock value.

Then, slow-moving items are classified into three reason codes: opportunistic stock, technical (supply) reasons, and market (demand) reasons. Newly introduced items are separated from the measurement.

This practice can be applied for any kind of inventory (raw materials, semi-finished, finished goods), except newly introduced items.

Processes	
sP1.3	Balance Supply Chain Resources with SC Requirements
sE2	Manage Performance
sE3	Manage Data and Information
Metrics	
RS.3.4	Asset Turns
AM.2.2	Inventory Days of Supply
AM.3.45	Inventory Days of Supply - Finished Goods
People	
HS.0033	Data management
HS.0048	Forecasting
HS.0058	Inventory Management
HS.0130	S & OP Plan Communication
HS.0132	Sales and Operations Planning (S&OP)
HS.0142	Supply Chain Performance Measurements

BP.009 Kanban

An inventory replenishment technique where a material is replenished based on consumption. Today Kan-ban can be implemented using different 'technologic solutions' but a classic example of Kan-ban is the two-bin-system: One bin is at the point of consumption (for example the factory floor), the second bin is in process to be filled and placed behind the second. Once the first bin is depleted it will be send to be filled and the second bin now becomes the first bin. See illustration.

Example formula to calculate the bin-size for a two-bin system:

> Minimum bin-size = [projected consumption per time unit] * [cycle-time to replenish in time units] / [number of bins] = 100 per day * 3 days / 2 bins = 150

This formula does not deal with variations in projected consumption or cycle-time but illustrates a Kan-ban system does not need to be complex. The minimum bin-size compensates for the cycle-time to refill an empty bin. The number of bins can be increased to reduce the amount of material in each bin. The bin-system described assumes re-usable bins. Example applications of Kan-ban today use Kanban-cards to signal the need to replenish stock at the point of use. This may shorten the cycle- time of the process and thus decrease the bin-size. It may create additional packing materials that need to be disposed. ERP systems can replace physical Kanban-cards with electronic signals and dashboards.

Alternative names: Two-bin system, three bin system.

Note:

- Although many sources characterize Kanban as a pull-system it is important to understand that Kanban in-fact is a to-stock strategy, as the calculation contains a projected demand (read: forecast). The benefit over other replenishment techniques is that no complex or comprehensive planning or scheduling algorithms need to run to trigger replenishment.
- Kanban can be applied in all processes requiring a replenishment signal, this includes Source, Make and Deliver processes.

Processes	
sS1.1	Schedule Product Deliveries
sM1.2	Issue Material
sD1.8	Receive Product from Source or Make
sD1.9	Pick Product

Metrics	
AM.1.1	Cash-To-Cash Cycle Time
AM.2.2	Inventory Days of Supply

People	
HS.0058	Inventory Management

BP.010 Min-Max Replenishment

An inventory replenishment practice where purchase requisitions or purchase orders are created when inventory for an item drops below the Minimum inventory level. The requisition or order quantity will bring the inventory back to the Maximum inventory level. Min-Max Replenishment methods are generally implemented through automation. Different configuration options exist for Min-Max Replenishment:

- Physical Min-Max Replenishment purely incorporates on-hand inventory, existing customer orders are not included in the calculations. This has characteristics close to a Kanban system.
- Logical Min-Max Replenishment nets customer orders from the on-hand inventory. If this inventory net of orders is less than the minimum order quantity a requisition or order will be created. This aligns to Available-to-Promise or Capable-to-Promise practices. Further details may include netting only clean orders or netting all orders. (Clean orders are orders that are free of customer holds, credit holds, etc.

The calculation of the Min-level includes replenishment cycle-time and a buffer (for variability in demand and cycle-time). The Max-level is preferably the Min-level plus EOQ (Economic Order Quantity).

Generally, min-max replenishment requires process automation. Re-ordering is triggered by running a re-planning program or report.

Alternative name: Order-point system.

Note:

- The Minimum inventory level is not the lowest level the inventory will reach in a min-max replenishment system, the name re-order point would fit better. Inventory will continue to drop until the ordered items are received. Similarly, the Maximum inventory level will not be achieved for the same reason.
- Min-Max Replenishment works best in an environment where inventory reduction is linear or gradual and replenishment cycle-times have low variability. In environments with large variability in demand and/or replenishment cycle-times this practice may result in stock-outs.
- Min-Max Replenishment applies only in a to-stock inventory strategy.

Processes	
sP2.3	Balance Product Resources with Product Requirements
sP2.4	Establish Sourcing Plans
sS1.1	Schedule Product Deliveries

Metrics	
AM.1.1	Cash-To-Cash Cycle Time
AM.2.2	Inventory Days of Supply
AM.3.16	Inventory Days of Supply - Raw Material
AM.3.17	Inventory Days of Supply - WIP

People	
HS.0058	Inventory Management

BP.011 Production Line Sequencing

The practice where materials are ordered, shipped, received and/or staged in the same sequence as they will be consumed. The materials generally are configurable or have many variants (an example variant: shades of color). This practice can be applied in on-site processes and in supplier-to-manufacturer processes.

- On-site processes: The materials are picked from an inventory location (such as raw material warehouse) in the exact sequence of the production schedule/line and delivered to the point-of-use (pick-to-sequence). The operator is required to use the materials in the sequence they were provided. This can apply to materials sourced using S1, S2 and S3 processes.
- Supplier-to-manufacturer processes: The materials are ordered from the supplier in sequence (order-in-sequence). The supplier processes the order and loads the transportation vehicle in sequence (ship-to-sequence). The materials are then unloaded and delivered to the point-of-use (receive-to-sequence). This version applies to S2 and S3 sourcing only.

It is important that order managers, material handlers and operators understand that the materials should remain in-sequence at all times. Accidental sequencing may cause erroneous products, dangerous working conditions and rework. Example physical implementations include conveyor systems but also the use of trays or bins that allow the materials to be kept in sequence during transportation and handling.

Alternative names: Just-In-Sequence, In-Line Vehicle Sequencing (ILVS)

Note: This is not FIFO. FIFO addresses using/delivering the oldest materials first. Production Line Sequencing eliminates the cost, time and inventory needed for searching and sorting through materials.

Processes	
sS1.4	Transfer Product
sS2.1	Schedule Product Deliveries
sS2.2	Receive Product
sS2.3	Verify Product
sS2.4	Transfer Product
sS3.3	Schedule Product Deliveries
sS3.4	Receive Product
sS3.5	Verify Product
sS3.6	Transfer Product
sM1.1	Schedule Production Activities
sM1.2	Issue Material
sM2.1	Schedule Production Activities
sM2.2	Issue Sourced/In-Process Product
sM3.2	Schedule Production Activities
sM3.3	Issue Sourced/In-Process Product

BP.011 Production Line Sequencing

Metrics	
RS.3.49	Issue Material Cycle Time
RS.3.50	Issue Sourced/In-Process Product Cycle Time
RS.3.113	Receiving Product Cycle Time
CO.3.12	Indirect Cost Related to Production
CO.3.13	Direct Labor Cost

BP.012 Lot Tracking

The practice of storing information about the history and/or genealogy of a product or material. This may include where it was sourced, the different materials used to make it, the grade of the materials and other product genealogy type information. Lot tracking has three fundamental requirements:

- A means to identify the lot or serial number (identify)
- A system to record milestones for each lot or serial number (record)
- A process to retrieve information by lot or serial number (display)

Lot tracking may make use of barcoding, RFID tags or other visual or electronic methods to identify the lot. Modern ERP systems generally offer lot recording and display functionality. Hardware and operator/handler instructions may be required to read the lot identifiers and communicate the event/ milestone to the recording system (ERP).
To establish a lot tracking system it is important to understand what information needs to be collected, where and at what level. The scope of where information is collected may extend beyond the boundaries of your organization. For example: registering users/owners of your products - these users/owners can be your customers-customer. The need for lot tracking may be dictated by regulatory requirements, risk mitigation strategies, process excellence initiatives or customer requirements.

Alternative names: Serial Tracking, Serial/Lot Tracking, Lot History, Lot Tracking & Tracing, Material Traceability

Note: Lot Tracking is not Electronic Product Coding (EPC) or Universal Product Coding (UPC). EPC and UPC identify the product or material, not the lot, batch or serial number.

Processes	
sS1.2	Receive Product
sS2.2	Receive Product
sM1.2	Issue Material
sM1.3	Produce and Test
sM1.4	Package
sM1.7	Waste Disposal
sM2.2	Issue Sourced/In-Process Product
sM2.3	Produce and Test
sM2.4	Package
sM2.7	Waste Disposal
sM3.3	Issue Sourced/In-Process Product
sM3.4	Produce and Test
sM3.5	Package
sM3.8	Waste Disposal
sD1.9	Pick Product
sD1.10	Pack Product
sD1.11	Load Vehicle and Generate Shipping Documents
sD1.12	Ship Product

sD1.15	Invoice
sD2.9	Pick Product
sD2.10	Pack Product
sD2.11	Load Product & Generate Shipping Docs
sD2.12	Ship Product
sD2.15	Invoice
sD3.9	Pick Product
sD3.10	Pack Product
sD3.11	Load Product & Generate Shipping Docs
sD3.12	Ship Product
sD3.15	Invoice
sD4.6	Checkout
sSR1.1	Identify Defective Product Condition
sSR1.2	Disposition Defective Product
sSR1.3	Request Defective Product Return Authorization
sSR1.5	Return Defective Product
sDR1	Deliver Return Defective Product
sDR1.1	Authorize Defective Product Return
sE3	Manage Data and Information
Metrics	
RL.2.3	Documentation Accuracy
RL.3.11	% of Faultless Invoices
RL.3.23	% Orders/ Lines Received with Correct Shipping Documents
RL.3.31	Compliance Documentation Accuracy
RL.3.43	Other Required Documentation Accuracy
RL.3.50	Shipping Documentation Accuracy
People	
HS.0006	Asset Management
HS.0009	Bar Code Handling/RFID (if available)
HS.0033	Data management
HS.0034	Discrepancy Reporting and Resolution
HS.0046	ERP Systems
HS.0049	ID & Damage Inspection
HS.0053	Installed base management
HS.0108	Quality Management

BP.014 Demand Planning & Forecasting

Demand Planning & Forecasting: Use state-of-the-art forecasting algorithms for product life-cycle planning and trade promotion planning.

Understanding and predicting customer demand is vital to manufacturers and distributors to avoid stock-outs and maintain adequate inventory levels. While forecasts are never perfect, they are necessary to prepare for actual demand. In order to maintain an optimized inventory and effective supply chain, accurate demand forecasts are imperative together with the most advanced algorithm. The algorithms are the core of the demand and supply management solutions. It is what makes it possible to seamlessly work at any level of aggregation and along any dimension like product, channel or customer with ease and performance yet without rigid forecast pyramids.

Success measurement: Forecast accuracy in the supply chain is typically measured using the Mean Absolute Percent Error or MAPE. Statistically MAPE is defined as the average of percentage errors. Most practitioners, however, define and use the MAPE as the Mean Absolute Deviation divided by Average Sales. This is in effect a volume weighted MAPE. This is also referred to as the MAD/Mean ratio.

A simpler and more elegant method to calculate MAPE across all the products forecasted is to divide the sum of the absolute deviations by the total sales of all products.

Processes	
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
Metrics	
RL.1.1	Perfect Order Fulfillment
People	
HS.0046	ERP Systems
HS.0048	Forecasting
HS.0067	Linear programming
HS.0070	Logistics network modeling

BP.015 Safety Stock Planning

Meet desired customer service levels while maintaining a minimum amount of safety stock.

The standard methods of safety stock planning are used to build stock on hand according to the safety stock values that companies define in their location product master, depending on previous experience. In contrast to model-based safety stock planning, forecast errors are not considered when they use the standard methods. Safety stock values can be maintained as a static or time-dependent value.

The advanced methods of safety stock planning are used to calculate the time-dependent safety stock for finished products and components. In this type of planning, the system takes into account the demand forecasts and forecast errors within the supply chain.

Processes	
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP1.3	Balance Supply Chain Resources with SC Requirements

Metrics	
RS.3.1	Align Supply Chain Unit Plan with Financial Plan Cycle Time
CO.2.1	Cost to Plan
CO.2.3	Cost to Make
CO.2.4	Cost to Deliver

People	
HS.0048	Forecasting
HS.0058	Inventory Management
HS.0069	Logistics Management
HS.0073	Manufacturing Resource Commitment
HS.0079	MRP Systems
HS.0082	Optimization

BP.017 Distribution Planning

Determine the best short-term strategy to meet demand and to replenish stocking locations.

Distribution Planning enables the user to set certain inventory control parameters (like a safety stock) and calculate the time-phased inventory requirements. This process is also commonly referred to as Distribution Requirements Planning (DRP).

DRP uses several variables:

- the on-hand inventory at the end of a period.
- the backordered demand at the end of a period.
- the required quantity of product needed at the beginning of a period.
- the constrained quantity of product available at the beginning of a period.
- the recommended order quantity at the beginning of a period.

DRP needs the following information:

- the demand in a future period.
- the scheduled receipts at the beginning of a period.
- the safety stock requirement for a period.
- the on-hand inventory at the beginning of a period.

Processes	
sP4	Plan Deliver
sP5	Plan Return

Metrics	
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
RL.3.33	Delivery Item Accuracy
RL.3.34	Delivery Location Accuracy
RL.3.35	Delivery Quantity Accuracy
RL.3.36	Fill Rate

People	
HS.0021	Consignment Agreement Development
HS.0033	Data management
HS.0035	Delivery Balancing
HS.0036	Delivery Scheduling

BP.018 ABC Inventory Classification System

The ABC classification system is the Pareto analysis of a range of inventory items, into three or four inventory categories. The ABC system requires different levels of inventory control for each of the categories. A calculation common method is to use *standard cost x quantity used per time period*. The system can be structured as simple as:

- Calculate the 12-month forecasted spend (at standard cost) for all inventory components.
- Rank the items in descending order.
- The "A" items are the top and should account for 70-80% of the total usage.
- The "B" items make up the next 15-20% of total annual usage.
- The "C" items are the remaining items are the remaining 5-10%
- Excess and Obsolete inventory still on the books can be labeled as "D".

The tables below provide an example for ABC classification.

Table 1 Item Annual Spend

Item	Standard Cost	QTY/year	Total Spend	% Annual Spend
98236	0.10	5000	500.00	3.64
76342	30.00	200	6000.00	43.64
92134	12.00	400	4800.00	34.9
37542	.50	2000	1000.00	7.27
67733	3.00	100	300.00	2.22
19534	1.00	400	400	2.9
39866	2.50	500	750	5.45

Table 2 ABC Classification

Item	% Annual Spend	Classification
76342	43.64	A
92134	34.9	A
37542	7.27	B
39866	5.45	B
98236	3.64	B
67733	2.22	C
19534	2.9	C

ABC classification is used to create the audit sampling tables used during daily cycle counts to monitor perpetual inventories. Root Cause Analysis and Closed Loop Corrective Action are used to correct discrepancies found during the cycle counts and improve system reliability and eliminate stock outs.

BP.018 ABC Inventory Classification System

Processes	
sP1	Plan Supply Chain
Metrics	
RL.2.2	Delivery Performance to Customer Commit Date
People	
HS.0003	Accounting
HS.0058	Inventory Management
HS.0124	Risk and exception management
HS.0131	Safety stock/replenishment calculations

BP.019 Demand Planning

A key step for the Sales and Operations (S&OP) monthly process. Demand Planning is the process used for developing an accurate and comprehensive material forecast through combining statistical forecasting techniques and judgement to construct demand estimates for products and services (both high and low volume; lumpy and continuous) across the supply chain from the suppliers' raw materials to the consumers' needs. Items can be aggregated by product family, geographical location, product life cycle, and so forth, to determine an estimate of consumer demand for finished products, service parts, and services. Numerous forecasting methods are tested and combined with judgements to determine the best integration of techniques and judgement to minimize forecast error. The resulting plan is the sum of all inputs from various stakeholders within the supply chain. Stakeholders include:

- Material planners: provide a statistical view of the plan horizon and inventory analysis
- Suppliers via Buyers: provide inputs on material lead times, problems, and flexibility within the plan horizon
- Customers via Sales: provide upside or downside analysis of requirements outside the statistical forecast
- Marketing: provide an analysis of the impact of special marketing programs and incentives that could impact the forecast
- Engineering and Product Managers: provide the schedules and material requirements for NPI
- Service: provide the inputs for all service part requirements
- Manufacturing: provides the capacity analysis over the plan horizon

Only after the complete analysis and consensus from stakeholders is achieved are their individual demands aggregated and a forecast entered into the ERP system.

Processes	
sP1	Plan Supply Chain
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
Metrics	
RL.1.1	Perfect Order Fulfillment
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
People	
HS.0016	Capacity Planning/Management
HS.0029	Customer Relationship Management (CRM)
HS.0046	ERP Systems
HS.0048	Forecasting
HS.0058	Inventory Management
HS.0074	Master Scheduling
HS.0079	MRP Systems
HS.0102	Production Planning Capacity Utilization
HS.0103	Production Scheduling
HS.0132	Sales and Operations Panning (S&OP)

BP.020 Demand Management

Demand Management takes Demand Planning to the next level and integrates the plan up and down the supply chain as well as across the enterprise. It takes a holistic view of a multi-unit enterprise, its markets, and its trade partners capabilities. Using sophisticated software tools and web technologies, supply chain managers are able to aggregate demand, manage inventories and respond in near real time to changes in demand. Multiple, real time applications are used within a Demand Management process to analyze and evaluate changes in demand and the impact on supply. Demand Management establishes priorities when supply is lacking and facilitates the planning and use of resources for profitable business results.

In marketing, it's the process of planning, executing, controlling and monitoring the design, pricing, promotion, and distribution of products and services to bring about organizational and individual needs.

Centralized systems and applications, capable of receiving, monitoring and processing information in real time from various business unit ERPs is used in the Demand Management process. These applications are O/S and ERP application agnostic and can operate as part of the enterprise IT infrastructure or as a SAAS application.

Processes	
sP1	Plan Supply Chain
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
Metrics	
RL.1.1	Perfect Order Fulfillment
RL.3.3	# of staff-related environmental violations
RS.3.4	Asset Turns
People	
HS.0014	Build Schedule Evaluation
HS.0016	Capacity Planning/Management
HS.0029	Customer Relationship Management (CRM)
HS.0032	Customer/Supplier Communication
HS.0033	Data management
HS.0037	Demand Management
HS.0073	Manufacturing Resource Commitment
HS.0074	Master Scheduling
HS.0079	MRP Systems
HS.0082	Optimization
HS.0101	Production Planning
HS.0102	Production Planning Capacity Utilization
HS.0130	S & OP Plan Communication
HS.0132	Sales and Operations Planning (S&OP)
HS.0143	Supply Chain Planning

BP.021 Sales and Operations Planning

Mid to Long Term supply chain planning practice which seeks to compare the forecast sales plan to the company resources, (production capacity, people, raw materials) and analyze where any imbalances to the plan might exist.

A continuous practice undertaken on a monthly basis looking forward on a rolling 12 month basis. The focus is generally from month two or three as it is assumed the immediate month is planned. (Time frames will depend on the industry sector)

A strategic tool normally reviewed by the executive/senior management team who are able to make decisions to remove any imbalance such as change to shift patterns, headcount, inventory policies.

Processes	
sP1	Plan Supply Chain
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP1.3	Balance Supply Chain Resources with SC Requirements
sP1.4	Establish and Communicate Supply Chain Plans

Metrics	
RL.1.1	Perfect Order Fulfillment
RL.3.3	# of staff-related environmental violations
RS.1.1	Order Fulfillment Cycle Time
RS.3.1	Align Supply Chain Unit Plan with Financial Plan Cycle Time
RS.3.4	Asset Turns
AG.3.47	Direct Labor Availability

People	
HS.0016	Capacity Planning/Management
HS.0033	Data management
HS.0037	Demand Management
HS.0048	Forecasting
HS.0074	Master Scheduling
HS.0130	S & OP Plan Communication
HS.0137	Strategic Planning
HS.0143	Supply Chain Planning

BP.022 MRP I

A 'plan' scheme of different inventory management practices has been adopted by a company in a mixed model manufacturing environment (ATO - Assemble-to-Order, MTO - Make-to-Order; MTS - Make-to-Stock)

Starting from inventory management practices, five inventory management methods according to type of materials and customer delivery lead time are identified, as shown in the attached excel file.

These practices are respond to inventory optimization and the required service level.

Processes	
sP3	Plan Make
Metrics	
RL.2.1	% of Orders Delivered In Full
People	
HS.0074	Master Scheduling
HS.0077	MPS Methodologies and Techniques

BP.023 Business Rule Management

Business Rules Management is the practice where business rules are in a (human-readable) form that are used by, but not embedded in, supply chain systems. The business rules should be visible, easily modified by nonprogrammers, and usable by any application and channel. Business Rules Management formalizes a supply chain's critical business rules in a language that business and IT staff understand. Business rules are established to help an organization achieve its goals and are an unambiguous statement to support decision making. The formal specification of a business rule becomes information for process and rules engines to run.

Categories of business rules. A statement of a business rule falls into one of four categories:

- Definitions of business terms - The most basic element of a business rule is the language used to express it. The very definition of a term is itself a business rule that describes how people think and talk about things. Thus, defining a term is establishing a category of business rule. Terms have traditionally been documented in glossaries or as entities in a conceptual model.
- Facts relating terms to each other - The nature or operating structure of an organization can be described in terms of the facts that relate terms to each other. To say that a customer can place an order is a business rule. Facts can be documented as natural language sentences or as relationships attributes and generalization structures in a graphical model.
- Constraints (here called 'action assertions') - Every enterprise constrains behavior in some way and this is closely related to constraints on what data may or may not be updated. To prevent a record from being made is in many cases to prevent an action from taking place.
- Derivations - Business rules (including laws of nature) define how knowledge in one form may be transformed into other knowledge possibly in a different form.

Organizations driving to incorporate business rule development and documentation into its data stewardship efforts consider:

- Focus on the major business activities of each subject area to discover the currently relevant and foremost business rules
- Include the examination of business rules that use human judgment as well as system activities so that the rules document actions that are not limited by what an application does ('business' rules)
- Examine current workflows processes and new activities to discover essential business rules that may have been hidden
- Review the process for defining maintaining and enforcing business rules
- Identify other practices within the organization that create business rules (e.g. mandates policies guidelines etc.)
- Identify a process for retiring ineffective or outdated business rules and the documentation of this change
- Develop basic business rules during any data definition effort recording the rules and the associated meta data building from known and established rules to articulating new (or undefined) business rules.

Guidelines for effective business rules management. Business rules should:

- Be written and made explicit.
- Be expressed in plain language.
- Exist independent of procedures and workflows (e.g. multiple models).
- Build on facts, and facts should build on concepts as represented by terms (e.g. glossaries).

BP.023 Business Rule Management

Guidelines for effective business rules management. Business rules should:

- Be written and made explicit.
- Be expressed in plain language.
- Exist independent of procedures and workflows (e.g. multiple models).
- Build on facts, and facts should build on concepts as represented by terms (e.g. glossaries).
- Guide or influence behavior in desired ways.
- Be motivated by identifiable and important business factors.
- Be accessible to authorized parties (e.g. collective ownership).
- Be single sourced.
- Be specified directly by those people who have relevant knowledge (e.g. active stakeholder participation).
- Be managed.

Note: Business Rules Management Systems (BRMS) support the automation of the Business Rules Management practice.

Processes	
sE1	Manage Supply Chain Business Rules
sE1.1	Gather Business Rule Requirements

BP.030 Inventory Record Accuracy

Establish disciplined monthly process to ensure timely reporting of accurate inventory (physical inventory matches ERP inventory & identify sitting inventory not identified by a SKU) at the manufacturing and terminal locations; Aligns inventory assignment to the downstream consuming business as the owning business plant

Processes	
sP1	Plan Supply Chain
sE3	Manage Data and Information

Metrics	
RL.2.3	Documentation Accuracy
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.032 Reduce / Write-off Slow Moving Inventory

Analyze and determine what inventory can be written off due to age, shelf-life, and/or lack of demand. This is usually governed by how much the business is willing/able to write-off based on their reserves and impact to financial statement

Processes	
sP1	Plan Supply Chain

Metrics	
RL.3.29	Age of Product / Customer Risk Data (months)
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.033 Traditional Demand Forecasting Improvement

Use of more sophisticated qualitative and quantitative forecasting processes and tools to improve customer demand forecast typically at SKU level. This would be an improvement to traditional forecasting process; can be combined with additional opportunities such as, S&OP, which uses forecasting modeling.

Examples of Qualitative forecasting methods:

- Informed opinion and judgment
- Delphi method
- Market research
- Historical life-cycle Analogy.

Example of Quantitative forecasting methods:

- Last period demand
- Arithmetic Average
- Simple Moving Average (N-Period)
- Weighted Moving Average (N-period)
- Simple Exponential Smoothing
- Multiplicative Seasonal Index

Processes	
sP1	Plan Supply Chain

Metrics	
RL.1.1	Perfect Order Fulfillment
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.035 Business Rule Review

Business rule review is performed by supply chain middle and upper level management of an organization. In this process manager ensures that the framework for analysis of the business rule is in line with the objectives and strategy of the organization. The rule itself needs to be aligned with the operational aspects it will govern. The rule should be clearly defined and linked to the respective business process or processes.

Processes	
sP1	Plan Supply Chain
sP2	Plan Source
sP3	Plan Make
sP4	Plan Deliver
sP5	Plan Return
sS1	Source Stocked Product
sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product
sM1	Make-to-Stock
sM2	Make-to-Order
sM3	Engineer-to-Order
sD1	Deliver Stocked Product
sD2	Deliver Make-to-Order Product
sD3	Deliver Engineer-to-Order Product
sD4	Deliver Retail Product
sE1	Manage Supply Chain Business Rules

Metrics	
RL.1.1	Perfect Order Fulfillment
RS.1.1	Order Fulfillment Cycle Time
AG.1.1	Upside Supply Chain Adaptability
AG.1.2	Downside Supply Chain Adaptability
AG.1.3	Overall Value at Risk (VAR)
CO.2.1	Cost to Plan

BP.037 Manufacturing Direct/Drop Shipment

The practice of shipping products and goods directly from the manufacturing plant to the customer (bypassing consolidation activities in warehouses and/or distribution centers). In Retail, Direct Shipment (also called Drop Shipment) is a supply chain management technique in which the retailer does not keep goods in stock, but instead transfers customer orders and shipment details to either the manufacturer or a wholesaler, who then ships the goods directly to the customer.

Using direct ship will bypass a distribution network and may reduce distribution finished goods inventory based on Customer Locations. Direct ship can be combined with additional opportunities such as Inventory Management by using Network Optimization.

Processes	
sP1	Plan Supply Chain
sP2	Plan Source

Metrics	
RS.2.1	Source Cycle Time
CO.2.4	Cost to Deliver
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory
AM.3.9	Capacity Utilization

BP.038 Batch Size Reduction

Use Lean principles to reduce size of manufacturing batch sizes to better match customer demand vs. asset utilization/quality issues. Historically, manufacturing companies have operated with large batch sizes in order to maximize machine utilization, assuming that changeover times were `fixed` and could not be reduced. Because Lean calls for the production of parts to customer demand, the ideal batch size is ONE. However, a batch size of one is not always practical, so the goal is to practice continuous improvement to reduce the batch size as low as possible. Reducing batch sizes reduces the amount of work-in-process inventory (WIP). Not only does this reduce inventory-carrying costs, but also production lead-time or cycle time is approximately directly proportional to the amount of WIP. Therefore, smaller batch sizes shorten the overall production cycle, enabling companies to deliver more quickly and to invoice sooner (for improved cash flow). Shorter production cycles increases inventory turns and allows the company to operate profitably at lower margins, which enables price reductions, which increases sales and market share.

Batch size reduction can be combined with additional opportunities such as, Right size frequency of production wheel or Reorder Point Production Models (Pull-Based Replenishment).

Processes	
sP1	Plan Supply Chain
sP3	Plan Make

Metrics	
RS.2.2	Make Cycle Time
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory
AM.3.9	Capacity Utilization

BP.039 Right Size Frequency of Production Wheel

Use Lean principles to increase frequency/agility of production wheel, or production cycle in order to modify production planning and right-size finished goods and work-in-process inventory. This can be combined with reduction of manufacturing batch sizes and additional opportunities such as, Right size manuf. batch sizes or Reorder Point Production Models (Pull-Based Replenishment)

Processes	
sP1	Plan Supply Chain
sP3	Plan Make

Metrics	
RS.2.2	Make Cycle Time
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory
AM.3.9	Capacity Utilization

BP.040 MTO Order Fulfillment Strategy

Evaluate potential to change order fulfillment strategy from Make-To-Stock (MTS) to Make-To-Order (MTO) SKU by SKU to offset need to carry inventory due to infrequent demand or low demand. Key is the manufacturing flexibility/agility to make this happen in short lead time for the customer; Can be combined with additional opportunities such as, SKU Rationalization or postponement

Processes	
sP1	Plan Supply Chain
sM1	Make-to-Stock
sM2	Make-to-Order

Metrics	
RL.1.1	Perfect Order Fulfillment
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.042 Regular Review of Procurement Terms and Conditions

Evaluate monthly/quarterly/annually potential changes to procurement contract terms with suppliers to focus on potential inventory impacts (early delivery, quality, receipt inspection, VMI, incentives, technology enablement RFID, barcode, shrink wrap, master pack labels, shipment notification to carrier) to minimize raw material inventory levels; Consolidate internal business purchasing contracts of shared raw material suppliers to one global purchasing contracts to leverage global buying power; Can be combined with additional opportunities such as, reduce customer consignment stock, enable supplier collaboration

Processes	
sP1	Plan Supply Chain
sP2	Plan Source
sE6	Manage Supply Chain Contracts

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.044 Inventory Financing Evaluation

Evaluate potential to use external finance company to `purchase inventory` while in-transit or in certain circumstances and sell back to the company prior to delivery to customer. Some of the other larger 3PLs offers this as a service as part of international transportation

Processes	
sP1	Plan Supply Chain
sP2	Plan Source
sD1.7	Select Carriers and Rate Shipments
sD2.7	Select Carriers and Rate Shipments
sD3.7	Select Carriers & Rate Shipments

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.045 Delay Inbound Supplier Shipments

Analyze and execute a delay in inbound supplier raw material shipments to reduce raw material costs at summer break, end-of-year or other scheduled plant closure. This would defer any additional raw material inventory (based on plant shutdown & restart timing) to only when absolutely required at a plant location

Processes	
sP1	Plan Supply Chain

Metrics	
RS.2.1	Source Cycle Time
CO.3.7	Cost to Receive Product
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.046 Expedite Outbound Customer Shipments

The practice of analyzing the cost of maintaining inventory vs. the cost of transportation for opportunities to optimize total cost. Specific opportunities are likely more pronounced for final leg shipments (more quickly transfer product ownership to customer and higher potential for storage costs). Total cost should include transport cost, inventory carrying cost, storage cost and throughput costs (handling costs)

Processes	
sP1	Plan Supply Chain
sD1.7	Select Carriers and Rate Shipments
sD1.12	Ship Product
sD2.7	Select Carriers and Rate Shipments
sD2.12	Ship Product

Metrics	
RS.2.1	Source Cycle Time
CO.2.4	Cost to Deliver
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.047 Finished Goods Inventory Postponement

Provide process to determine and execute optimum placement and volume for Inventory in the Value Stream (Chain). Requires analysis of Value Stream and identification of opportunities for Demand Pooling of materials. Requires detailed analysis of required delivery and cumulative lead time and manufacturing and logistics capabilities; can be combined with additional opportunities such as, Change order fulfillment strategy, MTS vs. MTO, decoupling point analysis

Processes	
sP1	Plan Supply Chain

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.048 Demand Shaping

Balance cost/value of offering discounts for customers to move forward orders on specific finished good products in inventory. Would require process and tools to identify and analyze value proposition/trade-off. May be able to leverage off of commercial tools to analyze payment incentives; can be combined with additional opportunities such as, Embed inventory management goals in Commercial or Expedite outbound customer shipments

Processes	
sP1	Plan Supply Chain

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.054 Manufacturing Quality Improvements for Return Reduction

This consists of efforts to address manufacturing quality & improving manufacturing cost/capacity and service factor. This would require analysis/simulation of quality losses/returns and opportunities for inventory reduction. This also includes formulating a process & timeline by which to move off-grade/ returned product off the books.

Processes	
sP1	Plan Supply Chain
sP3	Plan Make

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory
AM.3.9	Capacity Utilization

BP.056 Supplier Raw Material Quality Improvement

Provide analysis of potential value that could be gained from raw material inventory reduction (in addition to traditional manufacturing quality/capacity and service factors). Would require analysis/ simulation of current impact of raw material quality opportunities for inventory reduction with improved quality. May add to value proposition for efforts. Can be combined with additional opportunities such as Embedded Inventory Management goals in Purchasing

Processes	
sP1	Plan Supply Chain
sS1	Source Stocked Product

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory
AM.3.9	Capacity Utilization

BP.058 Inventory Management Training

Develop a training curriculum and monitor key employee participation/completion in the areas of inventory management (particularly with schedulers, planners, SC managers) as well as exposure to emerging best practices/technology (e.g., inventory optimization, collaboration, etc.). This can be done with existing training courses via online SC resources and APICS, AMR Research/Gartner, and other trade organization meetings/events;

Processes	
sP1	Plan Supply Chain

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.061 Reduce Non-Strategic Inventory Level

Unsold inventory is not `money in the bank`. A company should identify idle assets by analyzing production records, reviewing stock status reports to isolate inventory that is slow moving or out of balance, and sell/reduce the nonstrategic inventory. This would include selling of obsolete and excess inventory by establishing and offering short term discounts to turn inventory to cash.

Processes	
sP1	Plan Supply Chain

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.063 Optimize Sourcing Decisions to Local Source Point

Assess potential to change sourcing decisions to local source point (likely the optimal source point) to reduce overall replenishment lead time. This would reduce both transportation and inventory costs. This could impact service level and revenue objectives depending on balance demand and supply decisions. Consider using advanced planning system to Optimize sourcing decisions. Can be combined with additional opportunities such as, Network Optimization

Note: Buying less expensive materials from a remote supplier with associated higher inventory levels might be more economical than sourcing more expensive per unit materials from a nearby supplier with associated reduced inventory levels. Hence overall effect should be considered.

Processes	
sP1	Plan Supply Chain

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.064 Safety Stock Reduction

Pursue a more aggressive Reorder Point / safety stock target replenishment stance that places more risk on the chance of a stock out. This can be done quickly to help mitigate a potential sharp downturn in demand. Also, includes evaluating costs of holding Raw Material; Materials /Supply compared to the demand needs; Can be combined with additional opportunities such as, Pull Based Replenishment or Inventory Optimization

Note: Service level targets, balancing inventory with service level and potential sharp upturn in demand should also be considered.

Processes	
sP1	Plan Supply Chain

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.066 Returns Policy to Reduce Returns Inventory

Evaluate and establish a business returns policy (buyer`s remorse, defectives, warranty, overstock, Root Cause Investigation to determine & eliminate return cause, etc.) including determining its impact to overall inventory management. Develop plans for reuse/resale, if possible. Proactively model potential returns inventory levels, include in projected overall inventory levels and determine appropriate inventory costing.

Note: Competitors return policy for the equivalent product should be considered

Processes	
sP1	Plan Supply Chain
Metrics	
RL.3.40	Number of occurrences where excessive inventory is returned and followed
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory
AM.3.26	Return Rate

BP.067 Returns Inventory Reduction

Develop a process for efficiently receiving, processing and disposition of returned products. The cycle time in this returns process can be reduced through the use of an automated ERP system. This process can be combined with additional opportunities such as, Reduce returns inventory by returns policy decisions.

Processes	
sDR1	Deliver Return Defective Product
sDR2	Deliver Return MRO Product
sDR3	Deliver Return Excess Product

Metrics	
RL.3.40	Number of occurrences where excessive inventory is returned and followed
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory
AM.3.26	Return Rate

BP.068 Supplier Delivery Performance Analysis

Track and analyze the on time delivery performance for suppliers. Take action for large volume/value raw materials to insure that there is no consistent early receipt of raw materials prior to requested date. Re-enforce through policy and training to planners/manufacturing and warehouse not to accept early shipments. Establish a penalty to supplier for receipt of early shipments; can be combined with additional opportunities such as, Embed Inventory Management goals in Purchasing

Processes	
sS1.2	Receive Product
sS2.2	Receive Product
sS3.2	Select Final Supplier and Negotiate

Metrics	
AM.1.3	Return on Working Capital
AM.2.8	Inventory

BP.069 Raw Materials Receiving Process

Develop process for efficiently receiving and processing raw materials from suppliers to minimize receipt of raw materials. Components of this process may include receipt of advanced shipping notification (ASN), receiving inspections, bar code label scanning, use of master pack labels, shrink wrap (if applicable), receiving and put away (place in a specific location). This process can be combined with additional opportunities such as Improve Supplier Early Delivery Performance

Processes	
sS1.2	Receive Product
sS1.3	Verify Product
sS1.4	Transfer Product
sS2.2	Receive Product
sS2.3	Verify Product
sS2.4	Transfer Product
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
sS3.4	Receive Product

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.070 Planning/scheduling inventory training

Improve employee knowledge of inventory control to increase level of performance in inventory management. Intent is to increase proficiency to be able to lower the inventory levels by more effective management vs. reduce headcount; Can be combined with additional opportunities such as, improve employee knowledge of inventory management

Processes	
sP1	Plan Supply Chain

Metrics	
AM.1.3	Return on Working Capital
AM.2.4	Supply Chain Revenue
AM.2.8	Inventory

BP.072 Inbound RMA-enabled Processing

This practice of requiring and enforcing a return shipment is accompanied by a company-issued Return Material (or Merchandise) Authorization (or Agreement) (RMA). Information and data associated with an RMA, when available at the point of receipt, will allow for expedited receipt and verification processes. Typical RMA detail includes SKU number(s), description(s), quantities, return condition, reason for return, and requested next action. Prior to the physical receipt of the inbound materials, the receiving function would obtain a summary of all anticipated returns. This summary report would serve as the basis for validation (items, quantities, etc.) as well as provide direction regarding storage locations and possibly disposition (return to stock, rework, resell as used, destroy, etc.) after completion of the receipt. Storage/staging locations could vary depending upon the next required action for the return materials.

Processes	
sDR1.3	Receive Defective Product (includes verify)
Metrics	
RS.3.104	Receive Defective Product Cycle Time
CO.3.13	Direct Labor Cost
CO.2.5	Cost to Return
People	
HS.0110	Receiving
HS.0119	Return Management

BP.073 Returns Receiving Refurbishment

The practice of refurbishing materials during the receiving processes (i.e. Source processes) for returned materials.

This practice enables shorter processing cycle times through the refurbishment of materials that have been deemed eligible for rework and return. Specifically, when defective materials are returned and processed by the receiving function, repairs, modifications, or enhancements are made by the same receiving personnel (versus resources associated with the Make process elements) and sent to the shipping function for return to the original recipient. This practice would only be used for a subset of refurbishment processes (e.g. high volume repair returns, minor modifications required, etc.) and would require additional training for and capabilities from receiving personnel. The benefit of this process would be not only shorter overall return processing time, but also reduced capacity requirements from existing assets/processes related to the Make process elements.

Processes	
sDR1.4	Transfer Defective Product
Metrics	
RS.3.136	Transfer Defective Product Cycle Time
CO.3.13	Direct Labor Cost
CO.2.5	Cost to Return
People	
HS.0062	Kitting/Packing
HS.0110	Receiving
HS.0119	Return Management

BP.075 Web-based Return Material Authorization (RMA)

BP.075 RMA is also known as "Goods Return Authorization (GRA)" in some countries.'

RMA establishes procedures and policy to clearly identify under which circumstances a return from a customer will be accepted, and outline the steps to follow in order to process the return.

It is common or standard practice to establish RMA procedures and policy involving paperwork to be submitted by the Customer using mail, fax or e-mail (and processed?)
Best practice is to enable customers to fill out RMA forms over the web, and submit requests to be reviewed/processed electronically, cutting down the manual effort, processing time, and risk of error, resulting in lower processing cost and better customer service.

When an RMA is approved, customer ships the product to the designated location in the specified manner. Shipment recorded by the customer, acts as the advanced shipping notice for the receiving department, which is informed about the scheduled delivery.

Processes	
sDR1.1	Authorize Defective Product Return
sDR1.2	Schedule Defective Return Receipt

Metrics	
RL.3.55	Warranty and Returns

BP.077 Prepaid Return Shipping Label

More and more companies are providing prepaid return shipping labels and instructions for return at the time the product is sold and shipped to the customer. Common examples include: return if customer is unsatisfied with merchandise, return of the empty container that the new full container has replaced (e.g., printer cartridges), The return freight cost has been pre-negotiated, the original shipping package can be re-used for the return, and once the return label is used further tracking is also available via transportation companies using the tracking number pre-assigned to the label.

Processes	
sDR1.1	Authorize Defective Product Return
sDR1.2	Schedule Defective Return Receipt
sDR1.3	Receive Defective Product (includes verify)

Metrics	
RL.3.55	Warranty and Returns

BP.080 Performance Management

Performance management (PM) includes activities that ensure that goals are consistently being met in an effective and efficient manner. Performance management can focus on the performance of an organization a department employee or even the processes to build a product or service as well as many other areas. 3 things are required to achieve effective performance management:

- The organization, department or employee must heave measurements that tell them what their current performance is
- The organization department or employee must also have a performance goal that is where do they need to be
- There must exist the means or methodology to adjust performance

Without basic performance management tools managing a supply chain is difficult or impossible.

Processes	
sE2	Manage Performance

BP.083 Project Management

Project management is the discipline of planning, organizing, securing, managing, leading and controlling resources to achieve specific goals. Regardless of the methodology traditional project management usually includes the following phases:

- Initiation
- Planning or development
- Production or execution
- Monitoring and controlling
- Closing

Common project methodologies include:

- PRINCE2 -- PRINCE2 is a structured approach to project management released in 1996 as a generic project management method.
- Critical chain project management -- Critical chain project management (CCPM) is a method of planning and managing project execution designed to deal with uncertainties inherent in managing projects while taking into consideration limited availability of resources (physical human skills as well as management & support capacity) needed to execute projects.
- Event chain methodology -- Event chain methodology is an uncertainty modeling and schedule network analysis technique that is focused on identifying and managing events and event chains that affect project schedules.
- Process-based management -- Also furthering the concept of project control is the incorporation of process-based management. This area has been driven by the use of Maturity models such as the CMMI (capability maturity model integration)
- Agile project management -- Agile project management approaches based on the principles of human interaction management are founded on a process view of human collaboration.
- Lean project management -- Lean project management combines principles from lean manufacturing with agile project management to focus on delivering more value with less waste.

Leading project management standards include:

- Capability Maturity Model from the Software Engineering Institute
- GAPPS Global Alliance for Project Performance Standards -- an open source standard describing COMPETENCIES for project and program managers
- A Guide to the Project Management Body of Knowledge from the Project Management Institute (PMI)
- HERMES method, Swiss general project management method, selected for use in Luxembourg and international organizations
- The ISO standards ISO 9000, a family of standards for quality management systems, and the ISO 10006:2003, for Quality management systems and guidelines for quality management in projects
- PRINCE2, Projects IN Controlled Environments
- Association for Project Management Body of Knowledge
- Team Software Process (TSP) from the Software Engineering Institute
- Total Cost Management Framework, AACE International's Methodology for Integrated Portfolio, Program and Project Management

BP.083 Project Management

- V-Model, an original systems development method
- The Logical framework approach, which is popular in international development organizations
- IAPPM, The International Association of Project & Program Management, guide to project auditing and rescuing troubled projects

This list is not intended to be all-inclusive.

Processes	
sE2	Manage Performance

BP.084 Inventory Cycle Counting

A process to regularly comparing the inventory-on-hand with the inventory recorded and reconciling the differences. The ability to determine root causes of differences in inventory is required for an effective inventory management. This process is can be conducted while the site is in operation (In general there is no need to halt operations to support cycle counting).

The following definitions apply to cycle counting:

ABC Analysis: A process where the value of use (unit cost x consumption quantity) or production (unit cost x production quantity) is used to determine the inventory management practices. Items with the highest transactional value (A items) have tight inventory control with frequent inventory verification. Items with the lowest transactional value (C items) have less stringent inventory control and have less frequent inventory verification.

Hit: A cycle count in which the perpetual inventory record and the physical inventory count is within tolerances set by this procedure (see section 5).

Miss: A cycle count in which the perpetual inventory record and the physical inventory count is not within tolerances set by this procedure (see section 5)

Recorder Inventory or Perpetual inventory quantity: The book quantity (the quantity recorded in the ERP system) of the material at the time of the cycle count.

Physical Inventory or Inventory-On-Hand: A process to compare the perpetual inventory quantity with the physical inventory quantity of all materials at one time and reconciling the differences. This process usually requires the operation to be shut down for the duration of the inventory process.

Overview of Process Steps:

- Conduct ABC analysis for all raw materials, semi-finished, and Finished goods based on the following criteria:

Category	% of Transactional Value	Typical % of materials
A	Top 80%	20%
B	Next 15%	30%
C	Bottom 5%	50%

Note: This ABC analysis should be conducted annually or more frequently if the nature of the operation changes significantly between annual reviews.

- Make adjustments to the ABC analysis if business requirements require tighter inventory control than is determined by the ABC analysis. Only upward adjustments from C to B or B to A should be made.
- Assign personnel who will be responsible for the cycle counting process at site/unit. There must be clear delineation of authority between those who conduct the inventory count, identify differences, and determine root causes and those who adjust the financial records.
- Start cycle counting process. Cycle counting should be done on a regular basis, preferably daily. Sites should strongly consider conducting a full physical inventory prior to initiating a cycle counting process.

BP.084 Inventory Cycle Counting

- For those cycle counts that result in a “miss” or the value of the difference is >$10,000, financially reconcile differences between perpetual inventory record and physical inventory. If the cycle count results in a “hit” and the value of the difference is <$10,000, there is no need to financially reconcile the differences
- If differences result in a “miss” for inventory record accuracy purposes, conduct root cause analysis in addition to reconciling inventory records. Document the root cause analysis and any corrective actions that result from the analysis in the site’s corrective action systems. Document that corrective action was completed. Minimum requirements for corrective action documentation include the corrective action to be taken, the person(s) responsible for the corrective action, an expected completion date, a description of the action taken, and an actual completion date.
- Calculate Inventory Record Accuracy (IRA) metrics monthly and on a 12-month moving average basis. For those sites where a physical inventory has been completed within the past year, calculate the average including only the months since the physical inventory.
- Report IRA and inventory adjustments made as a result of cycle counting through line leadership.

Processes	
sE2	Manage Performance

BP.085 Safety Stock Planning

The practice of safety stock planning defines for every product at every location (strictly speaking), Safety Stock is established for items that have Independent Demand. Dependent Demand (such as parts or materials that are used in producing a Finished Good that has Independent Demand) would not have safety stock. A minimum inventory level in order to protect from stock-outs. The inventory level can be expressed in quantity of SKUs (static value) or days of supply (dynamic value). The dynamic value is calculated using anticipated demand figures.

Safety stock planning has two purposes:

- Shield from delays or quality issues on the supply side, which could not be forecast accurately, or anticipated early enough
- Cover unexpected demand

Safety stock planning balances the cost of stock-outs (in lost sales or expediting costs) with carrying costs for the safety stock (see above) for a desired service level. Safety stock levels need to be reviewed if patterns in demand or supply change or inventory carrying costs change. Safety stock planning is most often applied to sourced material and other products with low volatility in demand. Safety stock planning typically does not apply to make-to-order or engineer-to-order products, where Safety Stock Planning would be applied at the to the component level. Single-level safety stock planning calculates safety stock for every product and location independently. Multi-level safety stock planning considers interdependencies between location products along the supply chain:

- Bill-of-Material: Decide whether to keep inventory of a product or its components. Shift inventory at component level, if few components can be assembled to many products at short notice.
- Distribution: Shift inventory from distribution centers to the producing plant if there are many distribution centers with volatile demand whereas the total demand is less volatile, if distribution centers can be delivered at short notice.

Multi-level safety stock planning minimizes the total inventory for a given service level.

Processes	
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP1.3	Balance Supply Chain Resources with SC Requirements

Metrics	
RL.3.36	Fill Rate
RS.3.15	Balance Supply Chain Resources with Supply Chain Requirements Cycle Time
RS.3.39	Identify, Assess, and Aggregate Supply Chain Resources Cycle Time
CO.2.1	Cost to Plan
AM.3.17	Inventory Days of Supply - WIP

BP.087 ABC Inventory Classification

The ABC inventory classification system groups inventory by their turnover. 'A' items are the top 80% of the total annual usage dollars, 'B' items make up the next 15% of total annual usage, and 'C' items are the remaining items are the remaining 5%. This analysis serves as a base for directing a planner's attention and decision making. E.g., A-parts are planned more carefully or a company expects more rebates from their suppliers for A-parts.

ABC inventory classification simplifies rules for planning and procurement operations as corresponding rules are defined not for individual materials but for all A-parts, B-parts, and C-parts.

An extension to the ABC classification is the ABX-xyz classification, which in addition groups inventory items by their demand pattern:

- x: Regular demand, low volatility
- y: Seasonal demand, high volatility
- z: irregular demand

The result is a 3-by-3 matrix with a total of 9 classes, which allows to define business rules for planning and procurement more individually.

Processes	
sP1	Plan Supply Chain
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP1.3	Balance Supply Chain Resources with SC Requirements
sP2	Plan Source
sP2.2	Identify, Assess and Aggregate Product Resources
sP2.3	Balance Product Resources with Product Requirements

Metrics	
RS.3.15	Balance Supply Chain Resources with Supply Chain Requirements Cycle Time
RS.3.36	Identify, Assess and Aggregate Production Resources Cycle Time
RS.3.39	Identify, Assess, and Aggregate Supply Chain Resources Cycle Time
RS.3.41	Identify, Prioritize, and Aggregate Product Requirements Cycle Time
RS.3.44	Identify, Prioritize, and Aggregate Supply Chain Requirements Cycle Time
RS.3.98	Plan Cycle Time
AG.3.30	Current capital requirements (accounting policy)
CO.2.2	Cost to Source
CO.2.3	Cost to Make
AM.1.1	Cash-To-Cash Cycle Time
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital
AM.2.2	Inventory Days of Supply

BP.089 Perfect Pick Put away

The practice of 'Perfect Pick' Put away entails ensuring that when finished goods are in a position to be picked for a Sales Order Delivery they are in the correct quantity in the correct physical location and in the correct condition for a 'perfect pick'.

- Check that the product is received in the correct quantity and in a Saleable Condition from Production
- If necessary, check that the relevant Quality Management steps have been completed e.g. Results have been recorded/a usage decision has been made.
- Ensure that the relevant supporting documentation is available e.g. Certificate of Analysis.
- Check that the Product has been stored in the correct quantity and in correct Storage Location or Warehouse Bin and that all relevant Warehouse postings have been confirmed.

Note: Ensuring that the put away of Finished Goods stock is such that the right quality and quantity is in the right place means that the downstream pick process for the Customer Delivery is optimal.

Processes	
sP4.2	Identify, Assess and Aggregate Delivery Resources
sP4.4	Establish Delivery Plans
sM1.6	Release Product to Deliver
sM2.6	Release Finished Product to Deliver
sD1.3	Reserve Inventory and Determine Delivery Date
sD1.8	Receive Product from Source or Make
sD1.9	Pick Product
sD2.3	Reserve Inventory and Determine Delivery Date
sD2.8	Receive Product from Source or Make
sD2.9	Pick Product
sSR1.1	Identify Defective Product Condition
sE2	Manage Performance
sE4	Manage Supply Chain Human Resources

Metrics	
RL.2.4	Perfect Condition
RL.3.4	% correct material documentation
RL.3.7	% Item Location Accuracy
RL.3.19	% Orders/ Lines Received Defect Free
RL.3.21	% Orders/ lines received with correct content
RL.3.42	Orders Delivered Defect Free Conformance
RL.3.43	Other Required Documentation Accuracy

BP.089 Perfect Pick Put away

RS.2.3	Deliver Cycle Time
RS.3.37	Identify, Assess, and Aggregate Delivery Resources Cycle Time
RS.3.40	Identify, Prioritize, and Aggregate Delivery Requirements Cycle Time
RS.3.47	In-stock %
RS.3.51	Load Product & Generate Shipping Documentation Cycle Time
RS.3.57	Manage Deliver Business Rules Cycle Time
RS.3.59	Manage Deliver Information Cycle Time
RS.3.96	Pick Product Cycle Time
RS.3.108	Receive Product from Make/Source Cycle Time
RS.3.109	Receive Product at Store Cycle Time
RS.3.110	Receive Product from Source or Make Cycle Time
RS.3.114	Release Finished Product to Deliver Cycle Time
CO.3.14	Order Management Costs
CO.3.13	Direct Labor Costs
People	
HS.0009	Bar Code Handling/RFID (if available)
HS.0034	Discrepancy Reporting and Resolution
HS.0036	Delivery Scheduling
HS.0046	ERP Systems
HS.0049	ID & Damage Inspection
HS.0058	Inventory Management
HS.0068	Load Building
HS.0071	Logistics/Freight
HS.0083	Order Management
HS.0090	Picking process / order batching
HS.0110	Receiving
HS.0142	Supply Chain Performance Measurements
HS.0150	Total Quality Management (TQM)
HS.0161	Wave/batch picking

BP.090 Days of Supply Based MRP Proposal Management

The practice of reviewing and maintaining MRP proposals by days of supply entails understanding demand and the corresponding MAKE proposals and then monitoring the exceptions:

- Evaluate Planned Orders for Production as per output from MRP with reference to oldest demand
- By exception validate MRP proposals matching demand and that business rules are satisfied
- Reschedule where possible
- Adjust proposal quantities and dates according to business intelligence e.g. S&OP input

Comments: Management by exception when understanding production proposals for a select number of SKUs in a vast Production Range is key to an efficient planning process

Processes	
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
sP2.1	Identify, Prioritize and Aggregate Product Requirements
sP3.1	Identify, Prioritize and Aggregate Production Requirements
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sP5.1	Assess and Aggregate Return Requirements
sE2	Manage Performance

Metrics	
RL.3.38	Number of notices of violation received
RS.3.42	Identify, Prioritize, and Aggregate Production Requirements Cycle Time
RS.3.44	Identify, Prioritize, and Aggregate Supply Chain Requirements Cycle Time
RS.3.49	Issue Material Cycle Time
RS.3.50	Issue Sourced/In-Process Product Cycle Time
RS.3.54	Manage Business Rules for PLAN Processes Cycle Time
RS.3.55	Manage Business Rules for Return Processes Cycle Time
RS.3.57	Manage Deliver Business Rules Cycle Time
RS.3.72	Manage PLAN Data Collection Cycle Time
RS.3.78	Manage Production Performance Cycle Time
RS.3.79	Manage Production Rules Cycle Time
CO.2.1	Cost to Plan
CO.3.13	Direct Labor Cost

People	
HS.0028	Customer Order Management
HS.0037	Demand Management
HS.0046	ERP Systems

BP.090 Days of Supply Based MRP Proposal Management

HS.0074	Master Scheduling
HS.0079	MRP Systems
HS.0083	Order Management
HS.0101	Production Planning
HS.0103	Production Scheduling
HS.0124	Risk and exception management
HS.0132	Sales and Operations Planning (S&OP)

BP.091 Work Center Load Evaluation

The practice of evaluating Work Centre loading entails identifying bottlenecks in operations and then evaluating the planned loads on these work centers:

- Evaluate work center loading over the optimal horizon(s)
- Evaluate pooled capacities and/or work center hierarchies.
- Record relevant information for input to balancing processes.
- Ensure all shift patterns efficiencies, breakdowns, maintenance shutdowns etc. are reflected in the available Production resources

Processes	
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP3.2	Identify, Assess and Aggregate Production Resources
sE2	Manage Performance
Metrics	
RS.3.36	Identify, Assess and Aggregate Production Resources Cycle Time
RS.3.39	Identify, Assess, and Aggregate Supply Chain Resources Cycle Time
RS.3.78	Manage Production Performance Cycle Time
RS.3.79	Manage Production Rules Cycle Time
CO.3.13	Direct Labor Cost
AM.3.9	Capacity Utilization
People	
HS.0037	Demand Management
HS.0046	ERP Systems
HS.0073	Manufacturing Resource Commitment
HS.0102	Production Planning Capacity Utilization
HS.0124	Risk and exception management

BP.092 Balance and firm within horizon

The practice of balancing and firming up production activities and available resources entails best satisfying demand given the various resource, material and other restraints:

- Schedule (manual or automatic) MRP Proposals (date and quantity) to optimize the given work center loads within the agreed firm horizon.
- Delete any proposals that cannot be satisfied within the firm horizon (to be regenerated outside the firm horizon after next MRP run).
- Record specific extraordinary items for input to S&OP

Comments: The assumption is that run times and available capacity is correct

Processes	
sP1.3	Balance Supply Chain Resources with SC Requirements
sP3.3	Balance Production Resources with Production Requirements
sE2	Manage Performance

Metrics	
RS.3.13	Balance Production Resources with Production Requirements Cycle Time
RS.3.15	Balance Supply Chain Resources with Supply Chain Requirements Cycle Time
RS.3.78	Manage Production Performance Cycle Time
RS.3.79	Manage Production Rules Cycle Time
CO.2.3	Cost to Make
CO.3.13	Direct Labor Cost

People	
HS.0037	Demand Management
HS.0046	ERP Systems
HS.0073	Manufacturing Resource Commitment
HS.0079	MRP Systems
HS.0101	Production Planning
HS.0103	Production Scheduling
HS.0124	Risk and exception management

BP.093 Publish Production Plan

The practice of sharing the Production Plan with the Sales & Operations Planning Business Process(es) as well as with any 'systems' e.g. ERP system ensures that the established plan is clearly visible up and down stream on the Supply Chain

- Publish the Plan to all stakeholders: short term plan for Production Execution, medium term firm plan for procurement
- Enable S&OP & System visibility of planned incoming receipts in form of released orders and/ or firm planned orders

Comments: Key to a plan is that all stakeholders have sight of the same plan! The sharing of the plan through business processes as well as through a system e.g. ERP allows for the stakeholders and the plan to flex and adapt to changes. Customer demands ensure constant change.

Processes	
sP1.4	Establish and Communicate Supply Chain Plans
sP2.4	Establish Sourcing Plans
sP3.4	Establish Production Plans
sP4.4	Establish Delivery Plans
sP5.4	Establish and Communicate Return Plans
sE2	Manage Performance
sE3	Manage Data and Information
sE9	Manage Supply Chain Risk

Metrics	
RL.3.49	Schedule Achievement
RS.3.28	Establish Production Plans Cycle Time
RS.3.30	Establish Supply Chain Plans Cycle Time
RS.3.71	Manage Performance of Supply Chain Cycle Time
RS.3.78	Manage Production Performance Cycle Time
RS.3.79	Manage Production Rules Cycle Time
RS.3.98	Plan Cycle Time
CO.2.1	Cost to Plan

People	
HS.0037	Demand Management
HS.0046	ERP Systems
HS.0073	Manufacturing Resource Commitment
HS.0074	Master Scheduling
HS.0079	MRP Systems
HS.0083	Order Management

BP.093 Publish Production Plan

HS.0101	Production Planning
HS.0103	Production Scheduling
HS.0124	Risk and exception management
HS.0132	Sales and Operations Planning (S&OP)
HS.0142	Supply Chain Performance Measurements
HS.0143	Supply Chain Planning

BP.094 Characteristics-based Forecasting

Characteristics-Based Forecasting (CBF) is a powerful tool that enables you to forecast demand on both the product and the characteristics level. Configurable products have characteristics, which can take several values. This value assignment is called configuration (of a product variant). Although there may be many possible combinations, not all of these combinations are possible or you do not want to produce several combinations. In characteristics-based forecasting, you can produce demand plans for combinations of characteristic values or for individual values. You generally restrict the characteristics used in CBF to those that are important for planning purposes.

Example:

Characteristics and values of a car: Color: White, red, blue, black Transmission: Stick shift, automatic gear Fuel type: Regular, Diesel There are constraints between characteristic values. Some combinations are not allowed. In the above car example, there may be no Fuel type = Diesel allowed, if Transmission = automatic gear is selected, whereas Fuel type = Regular is allowed for transmissions. Characteristic-based forecast allows forecasting on characteristic values. Supply is later calculated also based on components derived from these values. Example of a characteristic- based for the above car: Demand total for cars forecasted for next month: 1000 each Color: White 20%, red 10%, blue 20%, black 50% Transmission: Stick shift: 60%, automatic gear 40% Fuel type: Regular 80%, Diesel 20% Planning would be inconsistent if constraints are violated in the percentages. In order to avoid such inconsistencies, characteristic-based forecast allows optionally defining partial combinations and forecasting them. Example of a 3 partial combinations for the above car: Stick shift transmission with regular fuel: 40% Stick shift transmission with Diesel: 20% Automatic gear transmission with regular fuel: 40% Note that the Color is not part of the combination because it is not constrained by the other characteristics. Based on the total number forecast and the percentages behind characteristic values and combinations, supply planning can plan supply of components, reserve machine capacity, etc.

Processes	
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements

Metrics	
RL.3.37	Forecast Accuracy
RS.3.44	Identify, Prioritize, and Aggregate Supply Chain Requirements Cycle Time
CO.2.1	Cost to Plan

BP.095 Bill of Material Audit/Control

The accuracy of the bills of material has a major impact on the accuracy of the financial statements. If the Bill of Materials for products are incorrect the parts assumed to be in the products will be incorrect which means that product costs will be wrong too.

The best way to implement bill audits is to tie them to the production schedule so that any products scheduled to be manufactured in the near future are reviewed the most frequently. This focuses attention on those bills with the highest usage though it is still necessary to review the bills of less frequently used products from time to time. The engineering staff, the production scheduler, the warehouse staff and the production staff can conduct the review. The reason for using so many people is that they all have input into the process. The engineering staff has the best overall knowledge of the product while the production scheduler is the most aware of production shortages caused by problems with the bills and the warehouse staff sees components returned to the warehouse that were listed in the bills but not actually used; the production staff must assemble products and knows from practical experience which bills are inaccurate. Thus a variety of people (preferably all of them) can influence the bill of material review process.

Measuring a bill of material includes several steps:

- Ensure that the correct part quantities are listed
- Verify that parts should be included in the product at all
- Ensure correct subassemblies roll up into the final product

Accurately managing your bills of materials (BOMs) confirms that a company is building the right product with the right parts meaning fewer errors less scrap and rework higher quality and better cost control.

Note: While this is considered a best practice experience suggests that some manufacturing organizations do not always adopt routine reviews of BOMs. Errors are usually detected when other supply chain risks emerge i.e. not enough product ordered incorrect product ordered.

Processes	
sP2	Plan Source
sP2.1	Identify, Prioritize and Aggregate Product Requirements
Metrics	
RL.1.1	Perfect Order Fulfillment
RL.3.42	Orders Delivered Defect Free Conformance
RL.3.47	Return Shipments Shipped on Time
People	
HS.0005	Assembly Process Design
HS.0033	Data management
HS.0038	Design/Engineering Schedule Development
HS.0043	Engineering
HS.0061	Item Master/BOM/BoL Interpretation
HS.0062	Kitting/Packing
HS.0095	Product and Configuration Validation
HS.0097	Product Development (PDR, CDR)
HS.0098	Product Information Management (Product Data Management)

BP.096 Logistics & Warehouse Planning

The practice of considering the following key points at the point of planning rather than at the point of make; Distribution channels Locations from/to Mode of transport Paperwork required (legislative e.g. hazardous goods) Any Duties/Taxes (as a cost) Warehouse strategy - is there enough capacity to stock materials what affect will this have on my purchasing strategy with the supplier. Should I obtain additional storage?

The Logistics and warehouse planning process need to be a subset of the overall Supply Chain planning process that includes MRP (Material Requirement Planning) and DRP (Distribution requirements planning). The input to the warehouse and logistics planning will need to flow from the overall Supply chain plan.

Note: Additional costs may occur through failure to consider this subject as early on in the planning phase as possible. Experience to date suggests that many organizations undertake this practice just before the deliver phase.

Processes	
sP2	Plan Source
sP2.2	Identify, Assess and Aggregate Product Resources
sP2.3	Balance Product Resources with Product Requirements
sP2.4	Establish Sourcing Plans

Metrics	
RL.3.7	% Item Location Accuracy
RL.3.20	% Orders/ Lines Received On-Time To Demand Requirement
RL.3.24	% Orders/lines received damage free
RL.3.28	% Shipping Schedules that Support Customer Required Return by Date
RS.3.61	Manage Import/Export Requirements Cycle Time
RS.3.62	Manage Incoming Product Cycle Time
RS.3.90	Manage Transportation Cycle Time
RS.3.124	Select Carriers & Rate Shipments Cycle Time
AG.3.51	Internal and External (3PL) storage capacity needed for current delivery volume
AG.3.52	Internal and External (3PL) storage capacity needed for current return volume
AG.3.53	Internal and External facilities/storage capacity needed for current make volume

People	
HS.0002	Acceptance testing
HS.0011	Basic Transportation Management
HS.0048	Forecasting
HS.0050	Import/Export Regulations

BP.096 Logistics & Warehouse Planning

HS.0058	Inventory Management
HS.0069	Logistics Management
HS.0070	Logistics network modeling
HS.0071	Logistics/Freight
HS.0089	Physical Distribution Systems
HS.0122	Reverse Logistics
HS.0129	Route planning
HS.0143	Supply Chain Planning
HS.0151	Transport Mode Selection

BP.102 Pick List Generation

A Pick List is a sequential list of all components and materials required to fill a specific production, sales or interplant order. It often specifies the location in the warehouse that allows warehouse personnel to efficiently locate and assemble material for orders ready for shipment and sometimes consolidates requirements from more than one order. The idea is that you pick order items into transport bins for the orders, then pack them, and then schedule the shipments.

A pick list is typically ordered by the location of the items in the warehouse, so that a `picker` is able to go through the warehouse and retrieve the items in the same sequence as the pick list. The Pick List can be as simple as a manually created excel spreadsheet or a report automatically generated by a Warehouse Managementsystem.

Processes	
sP1	Plan Supply Chain
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements

Metrics	
RL.1.1	Perfect Order Fulfillment
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
RL.2.3	Documentation Accuracy

People	
HS.0083	Order Management

BP.103 Customer Data Line of Responsibility

Principles and process to continuously improve data quality and accuracy are in place that include clear ownership and accountabilities for data, a defined process executed on a periodic basis to review data quality and conduct root cause corrective action (RCCA).

Data quality accuracy or other metrics should be tracked to assess performance trends. Scope includes data standards, master data management standards and system's application. Roles, responsibilities and ownership of specific data fields identified and resourced.

- Stage 1- Data quality is non-existent or not an organized field of activity in a business. Data and data processing is siloed. “Firefighting mode.”
- Stage 2 - Rules for data governance emerge, but the emphasis remains on correcting data issues emphasis remains on correcting data issues
- Stage 3 - Data governance processes are built into the foundation of the business
- Stage 4 - Real-time activities and preventive data quality rules and processes emerge
- Stage 5 - New initiatives are only approved after careful consideration of how the initiatives will impact the existing data infrastructure. Automated policies are in place to ensure that data remains consistent, accurate and reliable throughout the enterprise.

Relevant Metrics (external to SCOR):

$$\text{Master Data Accuracy \%} = \frac{\text{\# of Master Data Records Correct}}{\text{\# of Master Data Records Verified}} \times 100\%$$

$$\text{Data Completion} = \frac{\text{\# of Required Fields Populated}}{\text{\# of Required Fields Verified}} \times 100\%$$

$$\text{Data Consistency \%} = \frac{\text{\# of Data Fields Matching Value and Format}}{\text{\# of Data Fields Verified}} \times 100\%$$

Processes	
sE2	Manage Performance
sE3	Manage Data and Information

BP.104 Facility Master Planning

A facility master plan is a document that describes an overall physical development concept through maps and narrative. It provides a framework for the physical environment to include buildings. The Facilities Master Plan document reflects a strategy to provide the facilities that support a company's mission statement. The plan is guided by a vision statement and supporting goals.

The development of the master plan is in cooperation with strategic facility planning and starts with the development of scenarios representing different priorities and criteria. It is best accomplished with input from experts and all stakeholders. Components of a facility master plan include:

- Regulatory analysis
- Security strategy
- Phasing plans
- Cost projections
- Environmental design

The master plan can include varying levels of detail but usually includes;

- Zoning, regulation, covenant assessments
- Space standards/benchmarks descriptions
- Space use program
- Workflow analysis
- Engineering assessment/plan
- Site plan
- Architectural image concepts
- Long term maintenance plan
- Construction estimates
- Phasing or sequencing plan

The master plan is often summarized as a colored site drawing and/or timeline of projects.

Processes	
sE5	Manage Supply Chain Assets

Metrics	
AM.1.2	Return on Supply Chain Fixed Assets
AM.1.3	Return on Working Capital

BP.105 Task Management

The task management process is used to determine the resources and sequence of tasks for complex delivery processes including aggregation and staging of products for shipment. Task Management allows the company to forecast manpower, skill set and capital equipment needs to comply with committed shipment dates.

Effective task management supposes managing all aspects of a task, including its status, priority, time, human and financial resources assignments, recurrences, and notifications. These can be lumped together broadly into the basic activities of task management.

- As a discipline, task management embraces several key activities including:
- Creative activities such as task planning, brainstorming, creation, elaboration, clarification, organization, reduction, targeting and preliminary prioritization.
- Functional activities regarding personnel, sales, quality or other management areas, for the ultimate purpose of ensuring production of final goods and services for delivery to customers.
- Project activities pertaining to planning and time and costs reporting.
- Service activities pertain to client and internal company services provision, including customer relationship management and knowledge management.
- Performance activities pertain to tracking performance and fulfillment of assigned tasks.
- Report activities pertain to the presentation of information regarding the other five activities listed, including graphical display.

Task management software tools abound in the marketplace. Some are free; others exist for enterprise-wide deployment purposes. Some boast enterprise-wide task creation, visualization and notifications capabilities - among others - scalable to small, medium and Fortune 100 size companies, from individual projects to ongoing corporate task management.

Processes	
sP1	Plan Supply Chain
sP4	Plan Deliver
sP4.3	Balance Delivery Resources and Capabilities with Delivery Requirements
Metrics	
RL.1.1	Perfect Order Fulfillment
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
People	
HS.0016	Capacity Planning/Management
HS.0028	Customer Order Management
HS.0036	Delivery Scheduling

BP.107 Distributed Order Management

Distributed Order Management plans the shipment of materials and finished goods from multiple distribution points and/or multiple suppliers to customer locations. Distributed Order Management helps reduce lead times, lower the cost of transportation and meet non-forecasted demand by providing multiple delivery options to the planner.

Distributed order management plays key roles in customer experience by centrally brokering and managing orders from multiple sales channels to ensure customer orders are executed to customer expectations. The order management system also provides a 360-degree view of all of the customer`s purchases across all of the seller`s channels which improves supply chain efficiency as well as an improved customer experience.

Processes	
sP4	Plan Deliver
sP4.2	Identify, Assess and Aggregate Delivery Resources
sP4.4	Establish Delivery Plans
Metrics	
RL.1.1	Perfect Order Fulfillment
RL.2.1	% of Orders Delivered In Full
RL.2.2	Delivery Performance to Customer Commit Date
People	
HS.0083	Order Management

BP.108 Return Policy Conformance Integration

The practice of implementing standard procedures and enabling technology to ensure conformance to return policies. Automated policies and supporting processes collect and share important failure/ status data with appropriate organizations responsible for repair and overhaul, disposal, product lifecycle management, component part procurement, production planning and/or scheduling.

Processes	
sDR2.3	Receive MRO Product
sDR2.4	Transfer MRO Product

Metrics	
CO.2.5	Cost to Return
AM.3.12	Deliver Return Cycle Time
AM.3.39	Percentage Unserviceable MRO Inventory in Disposition
AM.3.44	Percentage Unserviceable MRO Inventory

BP.110 Product Development/Engineering/Disposition Collaboration

Product Development/Engineering groups should be in constant contact and communication with disposition authority. Product Development/Engineering groups should be alerted of all disposition decisions through automatic alerts/routings to adjust any technical documentation, configuration management system, or product specifications if appropriate.

Processes	
sSR1.1	Identify Defective Product Condition
sSR2.2	Disposition MRO Product

Metrics	
AM.3.12	Deliver Return Cycle Time
AM.3.28	Percentage Defective Inventory
AM.3.29	Percentage Defective Inventory in Disposition
AM.3.39	Percentage Unserviceable MRO Inventory in Disposition
AM.3.44	Percentage Unserviceable MRO Inventory

BP.111 Electronic Technical Orders and Product Specifications

The development of technical data is an inherent part of the engineering design, development and manufacturing of products. New business practices that use digital methodologies and products have demonstrated cost savings, process improvements, and expanded capability for interoperability. This include the utilization of Portable Maintenance Aids (PMAs), Integrated Electronic Technical Manuals (IETMs), Job Performance Aids (JPAs) and other forms of electronic Technical Orders and Product Specifications to aid in identifying product condition. These tools should have a tie to the PLM/Configuration Management system to ensure any changes to product or system specifications are utilized in evaluating the product condition.

Processes	
sM3.1	Finalize Production Engineering
sSR1.1	Identify Defective Product Condition
sSR2.1	Identify MRO Product Condition
sE3	Manage Data and Information

Metrics	
RS.3.9	Average Days per Engineering Change
RS.3.68	Manage MAKE Information Cycle Time
CO.2.3	Cost to Make

BP.114 Order Quotation System

The functional group responsible for accepting and managing the customer quotation should have the information and systems that would support the following capabilities:

- Ability to provide immediate pricing and associated pricing discounts for various quantity breaks (for both similar items and mixed orders, if applicable).
- Ability to provide approximate lead time estimates on all items/order lines. This would include fulfillment estimates according to original customer requirement, as well as adjusted/negotiated dates, if applicable.
- Ability to quote pricing and lead time not only on requested items/quantities, but also the ability to provide alternative quotations without losing or altering the original quotation.
- Ability to convert initial or subsequent quotations directly into firm orders.
- Ability to identify and provide alternative quotations based on additional configurations that would provide similar performance at lower cost, etc.

Typically, an organization`s customer service group would manage this practice. However, in the event that a functional group other than the customer service or order management group is responsible for this process element (e.g. commercial pricing group, etc.), then the ability to seamlessly move customer quotes between internal functions is also a critical element of this practice.

Processes	
sD1.1	Process Inquiry and Quote
Metrics	
RS.3.100	Process Inquiry & Quote Cycle Time
People	
HS.0083	Order Management
HS.0092	Pricing Management
HS.0095	Product and Configuration Validation

BP.116 Expedited Logistics

Expedited logistics (or express logistics) is the process that occurs when delivery plans are revised as a result of delays in shipments, critical orders inside standard lead times or the requirement for replacement parts. The standard practiced used in most industries is telephone or fax individual carriers (ocean, trucking and air) to determine the best price to delivery combination that fits within the delivery schedule. The change in standard process results in substantial increases in transportation costs and time.

Processes	
sP1	Plan Supply Chain
sP4	Plan Deliver
sP4.4	Establish Delivery Plans
Metrics	
RL.2.2	Delivery Performance to Customer Commit Date
People	
HS.0151	Transport Mode Selection

BP.117 Embed Specialized Services

Add additional capability, processes and expertise by embedding specialized packaging, product completion and pack out services on-site from a 3rd party provider.

By embedding 3rd party services into your manufacturing or distribution operations you can add significant capabilities to your supply chain while leveraging your existing network and assets without significant supply chain redesign and re-engineering.

Processes	
sM3.2	Schedule Production Activities
sM3.3	Issue Sourced/In-Process Product
sM3.4	Produce and Test
sM3.5	Package

Metrics	
RL.1.1	Perfect Order Fulfillment
RS.3.21	Current manufacturing order cycle time
RS.3.28	Establish Production Plans Cycle Time
CO.3.13	Direct Labor Costs
CO.2.4	Cost to Deliver
AM.1.2	Return on Supply Chain Fixed Assets

BP.118 Transportation Management Outsourcing

Small businesses can be at a significant cost disadvantage for both inbound and outbound freight. Large global corporations have the both the buying power to leverage spend and capital to invest in sophisticated transportation software.

Outsourcing transportation creates an opportunity for small businesses to combine their transportation spend and get a lower overall tariff rate. The outsourcing partner will pass through a percentage of the savings to its customers.

Processes	
sP4	Plan Deliver
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sP4.2	Identify, Assess and Aggregate Delivery Resources
sP4.3	Balance Delivery Resources and Capabilities with Delivery Requirements
sP4.4	Establish Delivery Plans
sP5	Plan Return
sP5.1	Assess and Aggregate Return Requirements

Metrics	
RL.2.2	Delivery Performance to Customer Commit Date
RS.3.66	Manage Integrated Supply Chain Transportation Cycle Time
RS.3.90	Manage Transportation Cycle Time
RS.3.124	Select Carriers & Rate Shipments Cycle Time
CO.3.010	Material Transportation Cost
CO.3.022	Transportation Cost

BP.119 Generation of Dynamic Bills of Materials

Production flexibility, and being able to produce different mixes or a variety of products quickly, without sacrificing efficiency at lower volumes of production, is one of the core tenets of being make to order. The Generation of Dynamic Bills of Materials (using IT Application) based on customer order requirements & specification, product and customer rules allows not only the substitution of different raw material types on the fly, but also allows the flexibility of complete reinvention for once off production requirement. This Bill of materials drives the manufacturing/assembly process, shop floor scheduling, inventory planning, resource allocation and cost calculations and is used for a single order only.

Processes	
sM3.1	Finalize Production Engineering
sM3.2	Schedule Production Activities
sM3.3	Issue Sourced/In-Process Product
sM3.4	Produce and Test
sM3.5	Package
sM3.6	Stage Finished Product
sM3.7	Release Product to Deliver
sM3.8	Waste Disposal

Metrics	
RL.1.1	Perfect Order Fulfillment

BP.124 Return Shipment Insurance

The practice of buying insurance for high value excess inventory return shipments.

Processes	
sSR3.5	Return Excess Product
sDR3.3	Receive Excess Product
sE6	Manage Supply Chain Contracts

Metrics	
CO.2.4	Cost to Deliver
CO.2.5	Cost to Return
AM.3.10	Defective product disposition costs as % total Source Return cost

BP.130 Identification of Obsolete Capital Assets

Products that are deemed obsolete capital assets have typically not sold in some time, and are at the end of their shelf life. When capital assets become obsolete, wear out or become outdated, their capital assets should be disposed of.

To identify obsolete inventory, a company should conduct regular inventory review meetings. A manager and an accounting official to attend a meeting to go over expense reports. They should review inventory-ordering information on the company's expense accounts. Payables should be reviewed to find the listing of products purchased by your company. The payables should be sorted by "last-used" date or "where used". Products with no dates listed, or very old dates, are likely part of obsolete inventory. Also, if the inventory does not have a location under the "where used" heading, it will also likely be considered obsolete. After finding obsolete inventory, team members can decide how to move or liquidate the products.

Processes	
sE5	Manage Supply Chain Assets

Metrics	
AM.2.5	Supply Chain Fixed Assets
AM.2.8	Inventory
AM.3.8	Average age of Excess Inventory

BP.132 Issue Invitation to Tender (Quote)

The practice of issuing an invitation to tender to a number of suppliers who have the capability to supply a product or service. The tender can also be advertised for any qualified supplier to participate in, this is more common in the public sector.

This practice creates competition and enables the purchaser the opportunity to compare and evaluate a number of suppliers on comparable data. Widely used to purchase services and in some countries to meet competition/purchasing standards. More commonly used where multiple suppliers exist.

A comprehensive tender document will include the terms and conditions of the tender, the purchaser's company terms and conditions, the specification of services or materials required and a forecast of service quantity requirements.

A transparent purchasing contract method that demonstrates due diligence to any external auditor.

Comments: This task can be quite time consuming however investment in this practice is important if the contract is a medium term contract and of high value.

Processes	
sS1	Source Stocked Product
sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product
sS3.1	Identify Sources of Supply
sE1	Manage Supply Chain Business Rules

Metrics	
CO.2.2	Cost to Source
CO.1.2	Cost of Goods Sold

People	
HS.0010	Basic Finance
HS.0020	Competitive Bidding
HS.0022	Contract Management
HS.0024	Cost/Price Analysis
HS.0032	Customer/Supplier Communication
HS.0092	Pricing Management
HS.0094	Procurement
HS.0105	Project Management

BP.135 Return Authorization

The Return Authorization (Return Material Authorization/Return Merchandise Authorization/Goods Return Authorization) process provides the inputs into the reverse logistics plan. Customers provide a detailed description on why the part or product is being returned. Based on the information provided the company can plan in advance one of the following actions:

- Ship a replacement unit to the customer
- Schedule the return unit for warranty repair
- Schedule the return unit an Out of warranty repair
- Return the unit to stock
- Return the unit to vendor

Processes	
sP5	Plan Return
sP5.1	Assess and Aggregate Return Requirements
sP5.3	Balance Return Resources with Return Requirements
sP5.4	Establish and Communicate Return Plans
Metrics	
RS.3.43	Identify, Prioritize, and Aggregate Return Requirements Cycle Time
People	
HS.0031	Customer Repair and Return Policy and Process

BP.136 Outsourced Reverse Logistics

Rather than manage returns as part of a service organization or operations many companies turn to outsourced service providers including Contract Manufacturers, EMS providers and Third Party Logistics providers for returns management. The outsourcing partner will plan for part or all of the returns process including:

Returns management issue RA/RMA and provides the customer with shipment instructions Schedule disposition of the returned product (repair, refurbish and upgrade) Return units under warranty to suppliers Plan repackaging and redistribution

Facilities that are singularly focused on returns management can plan for variation by cross training personnel and moving them when needed to meet an increase in returns volume for a specific customer.

Processes	
sP5	Plan Return
sP5.1	Assess and Aggregate Return Requirements
sP5.2	Identify, Assess and Aggregate Return Resources
sP5.3	Balance Return Resources with Return Requirements
sP5.4	Establish and Communicate Return Plans
sS2	Source Make-to-Order Product
Metrics	
RS.3.43	Identify, Prioritize, and Aggregate Return Requirements Cycle Time
CO.2.4	Cost to Deliver
CO.3.13	Direct Labor Cost
CO.2.5	Cost to Return
People	
HS.0122	Reverse Logistics

BP.140 Return Authorization Required

The practice of requiring the issuance and usage of a return authorization number to (ship and accept the) return of goods or materials. This practice requires the policy: 'No return without a return authorization number'. The Return Authorization Required practice improves warranty reporting, reduces the risk of fraud and improves the overall cost related to return processes and fraud.

Alternative names: Return Material Authorization, Return Merchandize Authorization, Goods Return Authorization

Note: The request for a return authorization number is generally made by the customer or consumer. Return Authorization Required practice can be automated using bar coding technology.

Processes	
sSR1.3	Request Defective Product Return Authorization
sSR1.4	Schedule Defective Product Shipment
sDR1.1	Authorize Defective Product Return
sDR1.2	Schedule Defective Return Receipt
sDR1.3	Receive Defective Product (includes verify)
sSR3.3	Request Excess Product Return Authorization
sR3.4	Schedule Excess Product Shipment
sSR3.5	Return Excess Product
sDR3.1	Authorize Excess Product Return
sDR3.2	Schedule Excess Return Receipt
sDR3.3	Receive Excess Product

Metrics	
RS.3.19	Current customer return order cycle time
RS.3.22	Current supplier return order cycle time
RS.3.104	Receive Defective Product Cycle Time
RS.3.105	Receive Excess Product Cycle Time
CO.2.5	Cost to Return
AG.2.14	Value at Risk (Return)

People	
HS.0119	Return Management
HS.0122	Reverse Logistics

BP.142 Remote Return Authorization

Remote Return Authorization is the practice where identification of the state of materials/ merchandize and the disposition decision takes place at the customer or in the store (on behalf of the supplier). Making the disposition decision at the customer or in-store eliminates the cost of shipping and handling of the materials/merchandize for materials/merchandize do not need to be returned and/or disposed.

Implementation of the remote return authorization practice requires the clear establishment and communication of rules and instructions for the identification, disposition and authorization of returns, replacement, repair and/or reimbursement. This practice generally imposes reporting requirements on the party that performs the remote inspection and authorization.

Processes	
sSR1.2	Disposition Defective Product
sSR1.3	Request Defective Product Return Authorization
sSR1.4	Schedule Defective Product Shipment
sDR1.1	Authorize Defective Product Return
sSR3.1	Identify Excess Product Condition
sSR3.2	Disposition Excess Product
sSR3.3	Request Excess Product Return Authorization
sDR3.1	Authorize Excess Product Return

Metrics	
CO.3.13	Direct Labor Cost
CO.2.4	Cost to Deliver
CO.3.14	Order Management Costs
CO.2.5	Cost to Return

People	
HS.0119	Return Management
HS.0122	Reverse Logistics

BP.143 Preventive Returns

The practice of issuing notices to consumers/customers requesting the return of goods or materials due to possible defects or damages to products shipped. This includes notifying distributors, intermediaries or channel partners that may hold these goods for resale purposes. The purpose of preventive returns is to protect name brand, avoid injury or disruption of operations of the supply chain itself or its customers and avoid associated cost.

Examples of preventive returns include recalls in the automotive, electronics and food industries.

Note: This practice may in certain cases be required by law. Not all preventive returns are required by law though. The severity and risk strategy of the company may determine the application of preventive returns.

Processes	
sSR1.3	Request Defective Product Return Authorization
sSR2.3	Request MRO Return Authorization

Metrics	
AG.1.3	Overall Value at Risk (VAR)
AG.2.14	Value at Risk (Return)
CO.3.13	Direct Labor Costs
CO.2.4	Cost to Deliver
CO.2.5	Cost to Return

People	
HS.0125	Risk Assessment
HS.0150	Total Quality Management (TQM)
HS.0158	Warranty Return and Repair

BP.144 Purchase Order Management

The practice of issuing a purchase order for a number of products which are required in the short to midterm. Such orders take into account the supplier lead time.

Specification of product and price quoted by the supplier are included on the purchase order. If a formal contract exists, then the buyer's standard terms and conditions including price and lead times will be used from it.

As new demand is identified a new purchase order is created after receiving a price. A routine process usually used to buy products or services that change frequently or are one off purchases.

Processes	
sS1	Source Stocked Product
sS1.1	Schedule Product Deliveries
sS2	Source Make-to-Order Product
sS2.1	Schedule Product Deliveries
sS3	Source Engineer-to-Order Product
sS3.3	Schedule Product Deliveries
Metrics	
RL.2.1	% of Orders Delivered In Full
RL.3.20	% Orders/ Lines Received On-Time To Demand Requirement
RS.2.1	Source Cycle Time
RS.3.3	Assess Supplier Performance Cycle Time
CO.3.13	Direct Labor Cost
People	
HS.0010	Basic Finance
HS.0083	Order Management
HS.0094	Procurement

BP.146 Cross-Docking

Cross docking is the practice of unloading materials from an incoming vehicle and loading these materials directly onto outbound vehicles without putting away into the regular storage locations in a warehouse. It involves little or no storing in between and may involve one or more such transfers before reaching final destination.

Thus, it reduces time to deliver and some material handling and storage cost.

Processes	
sP2	Plan Source
sP4	Plan Deliver
sE6	Manage Supply Chain Contracts

Metrics		
RS.3.11	Average Release Cycle of Changes	
RS.3.12	Balance Product Resources with Product Requirements Cycle Time	
RS.3.109	Receive Product at Store Cycle Time	
RS.3.114	Release Finished Product to Deliver Cycle Time	
RS.3.122	Schedule Product Deliveries Cycle Time CO.3.13	Direct Labor Cost
CO.2.4	Cost to Deliver	
AM.1.1	Cash-To-Cash Cycle Time	

BP.147 Receiving Goods Inspection

The practice of inspecting goods upon receipt for any delivery discrepancies such as:

- Damage
- Incorrect quantity to purchase order
- Incorrect quantity to delivery paperwork
- Paperwork is complete and correct
- Tests or samples of some materials are taken

If any check shows a discrepancy the goods may be quarantined or rejected following the returns process. The return process will need to ensure that Vendor provides credit for goods returned.

Processes	
sS1	Source Stocked Product
sS1.3	Verify Product
sS2.2	Receive Product
sS2.3	Verify Product
sS3.4	Receive Product
sS3.5	Verify Product

Metrics	
RL.2.3	Documentation Accuracy
RL.2.4	Perfect Condition
RL.3.19	% Orders/ Lines Received Defect Free
RL.3.21	% Orders/ lines received with correct content
RL.3.22	% Orders/ lines received with correct packaging
RL.3.23	% Orders/ Lines Received with Correct Shipping Documents
RL.3.24	% Orders/lines received damage free
CO.3.7	Cost to Receive Product
AM.3.2	% of material that has a valid
AM.3.29	Percentage Defective Inventory in Disposition
AM.3.30	Percentage Defective Inventory in Return Authorization

People	
HS.0023	Controls and Compliance
HS.0034	Discrepancy Reporting and Resolution
HS.0049	ID & Damage Inspection
HS.0058	Inventory Management
HS.0066	Legislation and Standards
HS.0069	Logistics Management

BP.147 Receiving Goods Inspection

HS.0108	Quality Management
HS.0110	Receiving
HS.0112	Requirements acceptance criteria
HS.0116	Requirements defect notification
HS.0119	Return Management

BP.148 3-Way Delivery Verification

The practice of checking received invoices from suppliers against the quantities received and against the associated Purchase Order, Contract or Vendor Schedule to ensure that:

- The goods were received
- The correct quantity has been invoiced
- The correct price has been invoiced

Processes	
sS1	Source Stocked Product
sS1.5	Authorize Supplier Payment
sS2	Source Make-to-Order Product
sS2.5	Authorize Supplier Payment
sS3	Source Engineer-to-Order Product
sS3.7	Authorize Supplier Payment

Metrics	
RL.2.3	Documentation Accuracy
RL.3.11	% of Faultless Invoices
RL.3.48	Risk Mitigation Plan
CO.3.7	Cost to Receive Product
CO.3.11	Direct Material Cost
CO.1.2	Cost of Goods Sold
AM.2.3	Days Payable Outstanding
AM.2.6	Accounts Payable (Payables Outstanding)

People	
HS.0001	3-way Receiving Match
HS.0003	Accounting
HS.0010	Basic Finance
HS.0087	Payment Processing
HS.0092	Pricing Management

BP.149 Supply Chain Risk Management Strategy Implementation and Analysis

Implement the established SCRM Strategies by allocating appropriate budget, deployment of human resources and utilization of suitable tools. The results of implementation should be captured and compared against desired outcomes for each metric.

Processes	
sE9	Manage Supply Chain Risk

Metrics	
AG.1.3	Overall Value at Risk (VAR)
CO.2.1	Cost to Plan
CO.2.6	Risk Mitigation Costs

People	
HS.0124	Risk and exception management
HS.0125	Risk Assessment
HS.0126	Risk Identification
HS.0127	Risk Mitigation
HS.0128	Risk Response Planning

BP.151 Real time Package Tracking

Real time package tracking refers to technology that allows packages and other types of assets including vehicles to be tracked utilizing GPS, cellular phone or other networks. A device such as an RFID or M2M antenna is attached to the package/asset. Typically, customers can login to a web interface and determine the location of their packages including information such as current trajectory and travel history vehicle speed package temperature and level of light exposure.

Alerts may be established that notify customers or owners when a package has been picked up is in transit and has been successfully delivered. Utilizing self-powered GPS trackers placed either individually in packages sporadically throughout a related shipment or within courier satchels and vehicles Customers can track the exact location of their shipment at any given time. When GPS signals are unavailable tracking devices automatically default to the cellular network and relay their positions through the closest cell tower.

Processes	
sE2	Manage Performance

BP.152 Automated Data Capture (ADC)

Production-related ADC is an enabler for many of the MAKE level 3 and 4 process elements. Similar to other types of ADC that support other SCOR processes (e.g. DELIVER RETURN etc.) the actual data capture format/technology can take many forms. The most common format includes bar codes associated with a bill of materials (BOM) or production order. The BOM is scanned at multiple points in the process to track multiple statuses and performance measures.

Common examples of MAKE process data captured in ADC include the following:

- Inventory issuances/allocations and on-hand levels
- Order completion status - Labor requirements/tracking
- Process cycle and dwell times - Asset efficiency data
- Quality data

Data from this type of ADC is transacted (both transmitted and received) on a real-time/or near real- time basis in order to support other ERP functionality (e.g. order and inventory management planning/ scheduling etc.)

Processes	
sM1.2	Issue Material
sM1.3	Produce and Test
sM1.4	Package
sM2.2	Issue Sourced/In-Process Product
sM2.3	Produce and Test
sM2.4	Package
sM3.3	Issue Sourced/In-Process Product
sM3.4	Produce and Test
sM3.5	Package

Metrics	
RL.3.26	% Product Transferred without Transaction Errors
AM.3.43	Percentage Unserviceable MRO Inventory in Scheduling

BP.155 Standard Operating Procedures

The term standard operating procedure, or SOP, is used in a variety of different contexts, including healthcare, aviation, education, industry, and military.

The U.S. military sometimes uses the term “Standing” — rather than Standard — Operating Procedure, because a military SOP refers to a unit's unique procedures, which are not necessarily standard to another unit. "Standard" could imply that there is a one (standard) procedure to be used across all units.

An SOP is a written document or instruction detailing all steps and activities of a process or procedure. An SOP provides employees with a reference to common business practices, activities, or tasks. New employees use an SOP to answer questions without having to interrupt supervisors to ask how an operation is performed. The international quality standard ISO 9001 essentially requires the determination of processes (documented as standard operating procedures) used in any manufacturing process that could affect the quality of the product.

Well-documented SOPs help ensure consistency in process execution and provides an effective tool for documenting process steps and their sequence, business rules, best practices, and exception handling, as well as who is responsible.

Processes	
sE2	Manage Performance
sE7	Manage Supply Chain Network

BP.158 Make-to-Stock Goods Receipt

Make to Order approach is utilized in cases of high value and highly customized items. This approach originated from the high holding cost for raw material WIP and finished goods for highly technology oriented products like automobile computer servers medical and weather forecasting machinery and other industries. Make to Order strategy is adopted to deliver against the specifications of a customer Order.

It calls for technical skills and know-how to develop a supplier network to identify the companies suitable for Make to Order and Make to Stock scenario vendors. Besides it is difficult to identify the point where stock is a part of Make to Order and not included as “make to Stock” inventory. This point is called decoupling point.

Goods Receipt: Made to Order good receipt may be calculated back from the customer required date of the materials or Supplier delivery dates from the point of view of finished goods the model may work as like this:

Goods Receiving Date of the raw material in the store = Customer expected date - (Transport lead time of the finished good + Quality inspection time for the finished goods + Shipping time of the finished goods + Manufacturing time of the FG + receiving time of Raw materials in the store)

The point of view of the Raw materials receiving from Supplier delivery dates

Goods Receiving Date of the raw material in the store = (Delivery date on the purchase Order - Transportation lead time of the Raw materials - GR processing time in the Raw material store)

Here the inspection of raw materials is considered at raw material supplier firm. Few related aspects to Goods receipt in Make to Order approach are:

- Production Line Sequencing
- Lot Tracking and Goods Inspection
- Manufacturing and scheduling count on Production Line Sequencing.

The scope of Material requirement planning in all the advanced ERPs like SAP, Oracle, etc., give effective ways to schedule manufacturing for Make to Order stocks.

Lot Tracking -- Various industries like biotech/pharmaceuticals foods chemicals and automobile ancillary track their products with lot/batch numbers. We can find on the foil of a pharma products a Batch/Lot no. The lot number allows the manufacturer to track a batch of the product which was produced in a manufacturing run or at a particular time in case there are quality or warranty issues in future.

All the advanced ERPs like SAP Oracle apps etc. enables the business to create or use lot numbers and associate them with your inventory items when the inventory is received or manufactured. It will then track the inventory through sales and shipping and allow business to search for sales orders shipments receipts deliveries with a batch/ lot number.

BP.158 Make-to-Stock Goods Receipt

Goods Inspection -- Pre shipment inspection forms a part of quality assurance between the goods supplier firm and ultimate customer. Some of the aspects that is checked are:

- Quantity of the goods/number of packages
- Quality and make of the products.
- Compliance with the order specification at random or 100% quality check.
- Compliance with the destination country standards.

Comments:

The main advantage of Make-to-Order is the ability to meet the customer order specifications and reduction of risk of raw material, WIP and finished goods stock holding. Demand fluctuations have adverse effect on products made to customer orders causing a reduction of capacity utilization.

To mitigate inventory holding risk for finished goods and raw materials a proactive demand management should be in place to balance Make to Order and Make to stock inventory. There are effective modes like ABC analysis, 80/20 system to analyze and take a decision to maintain the inventory levels to cater to future demand.

Processes	
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
Metrics	
RS.2.1	Source Cycle Time
People	
HS.0046	ERP Systems
HS.0048	Forecasting

BP.159 Electronic Data Interchange (EDI)

The practice of exchanging workflow related documents - such as forecasts, purchase orders, order confirmations, work orders, inventory adjustments, and invoices - via electronic standard messages.

EDI stands for Electronic Data Interchange. It is the application-to-application transfer of business documents between computers. The transfer of files requires that the sender and receiver agree upon a standard document format for the document that is to be transmitted. EDI is the electronic communication of business transactions such as orders confirmations and invoices between organizations. Third parties provide EDI services that enable organizations with different equipment to connect. Although interactive access may be a part of it EDI implies direct computer-to-computer transactions into vendors' databases and ordering systems.

An EDI message contains a string of data elements each of which represents a singular fact such as a price product model number and so forth separated by delimiter. The entire string is called a data segment. One or more data segments framed by a header and trailer form a transaction set which is the EDI unit of transmission (equivalent to a message). A transaction set often consists of what would usually be contained in a typical business document or form. The parties who exchange EDI transmissions are referred to as trading partners.

Advantages of EDI:

- Cost savings
- Eliminate repetitive activities
- Time reduction
- Improved customer service

There are a number of key points that makes EDI very different from other forms of paper or electronic communications. Firstly, EDI happens between companies -- it is cross enterprise. While the growth in the use of computers and other advanced technologies has been tremendous during the past decades the same trend is beginning to happen between companies. While the technology of EDI can be used internally within an organization by definition EDI is organization to organization.

Processes	
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP2.1	Identify, Prioritize and Aggregate Product Requirements
sP3.1	Identify, Prioritize and Aggregate Production Requirements
sP3.2	Identify, Assess and Aggregate Production Resources
sP3.3	Balance Production Resources with Production Requirements
sE7	Manage Supply Chain Network

Metrics	
RL.1.1	Perfect Order Fulfillment
RS.2.2	Make Cycle Time
CO.2.1	Cost to Plan
CO.2.2	Cost to Source
CO.3.13	Direct Labor Cost

BP.162 Long Term Supplier Agreement/Partnership

The Long Term Supplier Agreement/Partnership is a communication framework of buyer and supplier relationship. It varies in two continuums from very informal to highly formal such as bound by strict legal contracts. The other one is from a simple supplier of commodity to a partner in the value chain. In a very basic level most of the long term agreements replaces the conventional multiple purchase orders. In the most complex ones involves long term strategic partnership with sharing of know-how and involvement in early product development.

It aims at total quality management across the value chain.

Processes	
sP2	Plan Source
sE6	Manage Supply Chain Contracts

Metrics	
CO.2.1	Cost to Plan
RS.2.1	Source Cycle Time
AG.1.1	Upside Supply Chain Adaptability
AM.2.2	Inventory Days of Supply

BP.163 Supply base rationalization

One of the measures of purchasing performance is average purchasing volume per supplier. There is a balance to be struck between numbers of supplier for a material vs. negotiation power. Increasing number supplier enhance competition and drive down the prices at the same time too many suppliers will also have negative effects of reducing purchasing volume which reduces interest of supplier and quantity based benefits as well needed more effort from purchasing manager to coordinate with suppliers. Spend analysis is a very good starting point to get a guideline for optimum number of supplier count.

Processes	
sP2	Plan Source
sS1	Source Stocked Product
sS2	Source Make-to-Order Product
sS3	Source Engineer-to-Order Product

Metrics	
CO.2.1	Cost to Plan
AG.1.1	Upside Supply Chain Flexibility
AM.1.1	Cash-To-Cash Cycle Time

BP.166 Document Management System

A Document Management System (DMS) is a computer system (or set of computer programs) used to track and store electronic documents and/or images of paper documents. Document Management Systems are generally capable of keeping track of different versions created by different users (revision control/tracking). Document Management Systems are considered a component of Enterprise Content Management (ECM) systems and related to digital asset management, document imaging, workflow systems and records management systems.

Document Management Systems eliminate the need for managing paper versions of documents (copies in multiple locations, archiving and document retention).

Processes	
sE1	Manage Supply Chain Business Rules
sE1.1	Gather Business Rule Requirements
sE1.3	Document Business Rule
sE1.4	Communicate Business Rule
sE1.5	Release/Publish Business Rule
sE1.6	Retire Business Rule
sE6.2	Enter and Distribute Contract
sE6.3	Activate/Archive Contract
sE8	Manage Regulatory Compliance

Metrics	
RL.3.4	% correct material documentation

People	
HS.0025	Business Rule/Policy Management
HS.0098	Product Information Management (Product Data Management)
HS.0114	Requirements change control & change notification
HS.0115	Requirements criteria, verification methods & tools
HS.0116	Requirements defectnotification
HS.0117	Requirements justification / rationale
HS.0118	Requirements syntax, attributes, & baselines

BP.167 Electronic Returns Tracking

The practice of using electronic systems to track the location of returns within the supply chain allows better Turn Around Time for return and repairs, or replacements. In-transit visibility can show if there are delays or potential shipping issues such as customs, weather delays, or other areas where the return process may be off schedule.

Different technology can be applied to add electronic tracking. The simplest form is barcoding, 2D Barcoding and Unique Identification (UID), through to the most sophisticated which Active Radio Frequency Identification (RFID) and Auto-ID data capture (AIDC). Regardless of item identification technology used, an Information Technology system must be set up to track item locations as they are scanned in and display the item location to supply chain analysts.

More sophisticated systems can be set up to do automated analysis of information to immediately identify potential issues. An example may be reviewing transfer cycle times to see if they fall within a certain time limit, and if they are outside a limit then a supply chain analyst would be notified to determine resolution. Setting up business rules and notifications within the tracking systems helps to automate the return process and reduce required manpower.

Processes	
sSR1.4	Schedule Defective Product Shipment
sSR1.5	Return Defective Product
sDR1.3	Receive Defective Product (includes verify)
sDR1.4	Transfer Defective Product
sSR2.4	Schedule MRO Shipment
sSR2.5	Return MRO Product
sDR2.3	Receive MRO Product
sDR2.4	Transfer MRO Product
sSR3.4	Schedule Excess Product Shipment
sSR3.5	Return Excess Product
sDR3.2	Schedule Excess Return Receipt
sDR3.3	Receive Excess Product
sDR3.4	Transfer Excess Product
sE1	Manage Supply Chain Business Rules
sE2	Manage Performance
sE3	Manage Data and Information
sE4	Manage Supply Chain Human Resources
sE6	Manage Supply Chain Contracts

BP.167 Electronic Returns Tracking

Metrics	
RL.2.2	Delivery Performance to Customer Commit Date
RL.3.5	% Error-free Returns Shipped
RL.3.6	% Identified MRO Products Returned To Service
RL.3.10	% of Excess Product Returns Delivered Complete to the Designated Return Center
RL.3.13	% of MRO returns delivered to the correct service provider location
RL.3.25	% Product Transferred On-Time to Demand Requirement
RL.3.26	% Product Transferred without Transaction Errors
RL.3.47	Return Shipments Shipped on Time
RS.3.7	Authorize MRO Product Return Cycle Time
RS.3.22	Current supplier return order cycle time
People	
HS.0009	Bar Code Handling/RFID (if available)
HS.0029	Customer Relationship Management (CRM)
HS.0031	Customer Repair and Return Policy and Process
HS.0032	Customer/Supplier Communication
HS.0034	Discrepancy Reporting and Resolution
HS.0046	ERP Systems
HS.0119	Return Management
HS.0120	Return Plan Aggregation
HS.0122	Reverse Logistics
HS.0151	Transport Mode Selection
HS.0152	Troubleshooting

BP.168 Rotable Spares Pool

Rotable Spares Pool is an inventory of serviceable parts that can replace a customer's broken part to increase their recovery time. This practice is particularly useful when it is necessary to minimize customer downtime, especially with complex long lead time repair items.

A challenge with this strategy is ensuring the rotable spares pool is Form, Fit, and Function replaceable with whatever item is being exchanged. Another challenge is potential technology obsolescence which would leave any inventory obsolete and be a cost. It is best to use a rotable spares pool with a high-demand, long lead time item that is not prone to obsolescence (typically structural items that are frequently broken and repaired).

Processes	
sSR1.3	Return Defective Product Return Authorization
sSR1.5	Return Defective Product
sDR1.1	Authorize Defective Product Return
sDR1.3	Receive Defective Product (includes verify)
sDR1.4	Transfer Defective Product
sSR2.3	Request MRO Return Authorization
sSR2.5	Return MRO Product
sDR2.1	Authorize MRO Product Return
sDR2.3	Receive MRO Product
sDR2.4	Transfer MRO Product
sSR3.3	Request Excess Product Return Authorization
sSR3.5	Return Excess Product
sDR3.1	Authorize Excess Product Return
sDR3.3	Receive Excess Product
sDR3.4	Transfer Excess Product
sE1	Manage Supply Chain Business Rules
sE4	Manage Supply Chain Human Resources
sE6	Manage Supply Chain Contracts

Metrics	
RL.2.2	Delivery Performance to Customer Commit Date
RL.3.32	Customer Commit Date Achievement Time Customer Receiving
RS.1.1	Order Fulfillment Cycle Time
RS.2.3	Deliver Cycle Time
RS.3.5	Authorize Defective Product Return Cycle Time

BP.168 Rotable Spares Pool

RS.3.6	Authorize Excess Product Return Cycle Time
RS.3.7	Authorize MRO Product Return Cycle Time
RS.3.14	Balance Return Resources with Return Requirements Cycle Time
People	
HS.0007	Availability Management
HS.0011	Basic Transportation Management
HS.0028	Customer Order Management
HS.0029	Customer Relationship Management (CRM)
HS.0031	Customer Repair and Return Policy and Process
HS.0032	Customer/Supplier Communication
HS.0033	Data management
HS.0034	Discrepancy Reporting and Resolution
HS.0036	Delivery Scheduling
HS.0037	Demand Management
HS.0058	Inventory Management
HS.0078	MRO Management
HS.0083	Order Management
HS.0095	Product and Configuration Validation
HS.0119	Return Management
HS.0122	Reverse Logistics
HS.0131	Safety stock/replenishment calculations
HS.0157	Warranty process and policy
HS.0158	Warranty Return and Repair

BP.169 Beyond Economic Repair (BER) Management

The practice of assessing items as they are removed for Maintenance, Repair and Overhaul to determine whether repair would cost more than buying a replacement part. Determining this before shipment of the item for repair can reduce transportation costs. Any salvageable components should be taken of the item before scrapping it as additional repair parts.

The identification process may require test equipment and other assessment tools or personnel at the site where BER assessment is being made. Depots are a likely location for this practice to take place because of the availability of tools and personnel.

Processes	
sSR2.1	Identify MRO Product Condition
sSR2.2	Disposition MRO Product
sSR2.3	Request MRO Return Authorization
sDR2.1	Authorize MRO Product Return
sDR2.2	Schedule MRO Return Receipt

Metrics	
RS.3.7	Authorize MRO Product Return Cycle Time
RS.3.83	Manage Return Network Configuration Cycle Time
RS.3.84	Manage Return Regulatory Requirements and Compliance Cycle Time
RS.3.85	Manage Return Transportation Cycle Time
RS.3.106	Receive MRO Product Cycle Time
RS.3.121	Schedule MRO Return Receipt Cycle Time
RS.3.138	Transfer MRO Product Cycle Time
CO.2.4	Cost to Deliver
CO.2.5	Cost to Return
CO.1.2	Cost of Goods Sold
AM.3.39	Percentage Unserviceable MRO Inventory in Disposition
AM.3.40	Percentage Unserviceable MRO Inventory in Transportation
AM.3.41	Percentage Unserviceable MRO Inventory in Return Authorization
AM.3.42	Percentage Unserviceable MRO Inventory in Identification
AM.3.43	Percentage Unserviceable MRO Inventory in Scheduling
AM.3.44	Percentage Unserviceable MRO Inventory

BP.169 Beyond Economic Repair (BER) Management

People	
HS.0002	Acceptance testing
HS.0019	Change Notice Development
HS.0024	Cost/Price Analysis
HS.0031	Customer Repair and Return Policy and Process
HS.0078	MRO Management
HS.0122	Reverse Logistics
HS.0147	Technical Evaluation
HS.0148	Technical Manual Reading
HS.0149	Test Stand Operations
HS.0158	Warranty Return and Repair

BP.170 Engineer to Order Production

ETO is a strategy of manufacturing whereby finished goods are manufactured up to the specification of customer orders. It calls for higher lead time to design and manufacture as per exact specifications of the customer. Generally, the technique of identifying materials with material numbers and bill of material (list of material in FG, WIP and all sublevels), routing number and concept of work centers are utilized to manufacture these complex and high tech products. Advanced ERP systems offer the option of utilizing these concepts into the manufacturing process. Medical detection instruments photo detectors system monitoring equipment are typical example of ETO products.

Processes	
sD3	Deliver Engineer-to-Order Product
Metrics	
RL.3.35	Delivery Quantity Accuracy
People	
HS.0022	Contract Management

BP.171 Mixed Mode/Reverse Material Issue

Back flush is a concept where issuing of the material automatically happens once the finished product is ready. For example, assume 2 units of Raw Material 'R' is required to make a single Finished Product 'P'. As soon as 1 unit of 'P' is produced the inventory system reduces 2 units of 'R'. This concept is very well known in the industry as Back flush. The drawback of this system is that there is no real-time visibility of Raw material 'R' in the whole process. The accuracy of the inventory is also dependent on theoretical assumption that 2 'R's are required to make 1'P'.

However, many industries do not have the luxury of having accurate theoretical inventory quantity. Mixed Mode Practice (or Reverse Issue Method) is be used in the production lines where the input quantity varies based on several process parameters. A system can be enabled where as soon as the first step of the manufacturing process is started the theoretical raw material quantity is issued against the job. In the example above as soon as the 1st step to manufacture product 'P' starts in the inventory system 2 units of R are issued. Once the final step of the manufacturing process is completed the reverse issue method comes into picture. Based on the process conditions experienced let's say 1.8 units of Raw Material 'R' are used up to make 1 quantity of 'P' then the operator enters the Reverse issue quantity in the system as '-0.2' (1.8 - 2). This is entered at the time of entering the finished quantities produced at the end of the manufacturing process step.

However, let's say during manufacturing 2.2 units of Raw Material 'R' is used up to make 1 quantity of 'P' then the operator enters the reverse issue quantity in the system as '+0.2' (2.2 - 2). The advantage in this system is that there is an accurate quantity of raw material in the inventory system at any point of time.

Processes	
sM1.2	Issue Material
sM2.2	Issue Sourced/In-Process Product
sM3.3	Issue Sourced/In-Process Product
Metrics	
CO.3.3	Cost to Plan (Make)
AM.3.16	Inventory Days of Supply - Raw Material
People	
HS.0022	Contract Management

People

Introduction to People

The People section of SCOR introduces standards for managing talent in the supply chain. This skills management framework within SCOR compliments process reference, metrics reference, and practice reference components with an integrated view of supply chain skills in four areas:

- Baseline skills necessary for the overall process area (e.g., Sourcing, or Planning) and for the individual process.
- Critical skills that differentiate leaders in a particular process area from those who only perform at a baseline level.
- Performance measures through SCOR metrics that relate to continuous assessment of job performance in each process area.
- Credentialing of supply chain skills, including training or certification programs, related to the specific process area that tend to indicate superior job performance.

The key elements of the People section are Skills, Experiences, and Trainings.

Skill

Skill is the capacity to deliver pre-determined results with minimal input of time and energy. Skills are further defined by Experiences, Trainings and Competency levels. Examples of supply chain skills include: Master Scheduling, Import/Export Regulations, Production Planning, and Risk Mitigation. Skills are coded in the SCOR framework as “HS.000”

Experience

Experience is the knowledge or ability acquired by observation or active participation. Experience is obtained by doing the work in a real life environment and undergoing different situations that require different actions. Example experiences include: Cycle Counting, Cross Docking, and Hazardous Materials Handling. A full listing of recognized Experience areas can be found at the end of this section. Experiences are coded in the SCOR framework as “HE.000”

Training

Training develops a skill or type of behavior through instruction. Examples of training includes formal trainings such as SCOR-P, but also includes courses and on-the-job training. A full listing of recognized Trainings can be found at the end of this section. Trainings are coded in the SCOR framework as “HT.000”

Competency

Competency Level describes the level or state of qualification to perform a certain role or tasks. SCOR recognizes 5 commonly accepted competency levels:

- Novice: Untrained beginner, no experience, requires and follows detailed documentation to be able to perform the work.
- Beginner: Performs the work, with limited situational perception.
- Competent: Understands the work and can determine priorities to reach goals.
- Proficient: Oversees all aspects of the work and can prioritize based on situational aspects.
- Expert: Intuitive understanding. Experts can apply experience patterns to new situations.

Each skill is linked to Experiences and Trainings in SCOR. Competency level is to Skill what Maturity Level is to Process. SCOR does not list or suggest competency levels by skill.

SKILLS

3-way Receiving Match	HS.0001
Acceptance testing	HS.0002
Accounting	HS.0003
Advertising Methodologies	HS.0004
Analytical Skills	HS.0162
Assembly Process Design	HS.0005
Asset Management	HS.0006
Auditing	HS.0163
Automation	HS.0164
Availability Management	HS.0007
Bar Code Handling/RFID (if available)	HS.0009
Basic Finance	HS.0010
Basic Transportation Management	HS.0011
Benchmarking	HS.0012
Blanket purchase order process	HS.0013
Build Schedule Evaluation	HS.0014
Business Rule/Policy Management	HS.0025
CAD/CAM	HS.0015
Capacity Planning/Management	HS.0016
Carrier Selection	HS.0018
Change Management	HS.0165
Change Notice Development	HS.0019
Classification	HS.0166
Competitive Bidding	HS.0020
Consignment Agreement Development	HS.0021
Contingency Planning	HS.0167
Contract Management	HS.0022
Controls and Compliance	HS.0023
Corporate Strategy	HS.0168
Cost to Serve	HS.0169
Cost/Price Analysis	HS.0024
Credit/Collection Management	HS.0026
Cross Docking	HS.0027
Customer Expectations	HS.0170
Customer Order Management	HS.0028
Customer Relationship Management (CRM)	HS.0029
Customer Repair and Return Policy and Process	HS.0031
Customer Segmentation	HS.0171
Customer/Supplier Communication	HS.0032
Data management & analytics	HS.0033
Delivery Balancing	HS.0035
Delivery Scheduling	HS.0036
Demand Management	HS.0037
Design/Engineering Schedule Development	HS.0038
Discrepancy Reporting and Resolution	HS.0034
Driving certification (according to mode of transportation)	HS.0039
EHS regulations	HS.0041
Enabling Technology	HS.0042
Engineering	HS.0043
Enterprise Business Process	HS.0044

Environmental Requirements	HS.0045
ERP Systems	HS.0046
Exception Management	HS.0172
Financial Management	HS.0173
Financial Modeling	HS.0174
Fleet/Carrier Capabilities	HS.0175
Forecasting	HS.0048
Geopolitics	HS.0176
Heuristics	HS.0177
ID & Damage Inspection	HS.0049
Import/Export Regulations	HS.0050
Installation Requirements	HS.0051
Installation Scheduling	HS.0052
Installed base management	HS.0053
Intellectual Property/Proprietary Data	HS.0054
International Trade	HS.0055
Interpreting Specifications	HS.0056
Inventory Management	HS.0058
Inventory Policy	HS.0178
Issue Proposal/Quote	HS.0060
Item Master/BOM/BoL Interpretation	HS.0061
Key Performance Indicator (KPI)	HS.0179
Kitting/Packing	HS.0062
Labor Costs Verification	HS.0063
Lead-time validation	HS.0064
Lean Manufacturing	HS.0065
Legislation and Standards	HS.0066
Linear programming	HS.0067
Load Building	HS.0068
Logistics Management	HS.0069
Logistics network modeling	HS.0070
Logistics/Freight	HS.0071
Manufacturing Resource Commitment	HS.0073
Master Scheduling	HS.0074
Material Classification	HS.0180
Material handling equipment usage	HS.0075
Milestone/Performance Payments	HS.0076
MPS Methodologies and Techniques	HS.0077
MRO Management	HS.0078
MRP Systems	HS.0079
MSDS/CoC/BoL/Environmental Interpretation	HS.0080
Negotiation	HS.0181
Network Design	HS.0182
Office automation tools	HS.0081
Optimization	HS.0082
Order Management	HS.0083
Outsourcing	HS.0085
Packaging	HS.0086
Payment Processing	HS.0087
Performance Management	HS.0072
Physical Capability	HS.0088
Physical Distribution Systems	HS.0089

Picking process / order batching	HS.0090
Planogram usage and strategies	HS.0091
Pricing Management	HS.0092
Prioritization	HS.0093
Process Mapping	HS.0183
Procurement	HS.0094
Product and Configuration Validation	HS.0095
Product checkout process	HS.0096
Product Development (PDR, CDR)	HS.0097
Product Information Management (Product Data Management)	HS.0098
Production	HS.0099
Production Planning	HS.0101
Production Planning Capacity Utilization	HS.0102
Production Scheduling	HS.0103
Progress & performance reporting	HS.0104
Project Management	HS.0105
Property Control and Disposition	HS.0106
Push Systems	HS.0107
Quality Management	HS.0108
Receiving	HS.0110
Reconciliation	HS.0184
Regulatory Policy Management	HS.0111
Requirements acceptance criteria	HS.0112
Requirements allocation	HS.0113
Requirements change control & change notification	HS.0114
Requirements criteria, verification methods & tools	HS.0115
Requirements defect notification	HS.0116
Requirements justification / rationale	HS.0117
Requirements syntax, attributes, & baselines	HS.0118
Research	HS.0185
Return Management	HS.0119
Return Plan Aggregation	HS.0120
Returns strategy development	HS.0121
Reverse Logistics	HS.0122
RFP/RFQ Management	HS.0123
Risk and exception management	HS.0124
Risk Assessment	HS.0125
Risk Identification	HS.0126
Risk Mitigation	HS.0127
Risk Response Planning	HS.0128
Route planning	HS.0129
S & OP Plan Communication	HS.0130
Safety stock/replenishment calculations	HS.0131
Sales and Operations Planning (S&OP)	HS.0132
Sales Strategy	HS.0186
Six Sigma	HS.0133
Solicitation Methods	HS.0134
Solicitation/Competitive Bidding Process	HS.0135
Specific fabrication knowledge based on product	HS.0136
Stakeholder Management	HS.0187
Stock Strategy	HS.0188

Strategic Planning	HS.0137
Subcontracting Types (FFP, CP, CPAF, Performance Based)	HS.0138
Supplier Relationship Management (SRM)	HS.0139
Supply Chain Leadership	HS.0140
Supply Chain Management	HS.0141
Supply Chain Mapping	HS.0189
Supply Chain Performance Measurements	HS.0142
Supply Chain Planning	HS.0143
Supply Chain Security	HS.0144
Supply Planning	HS.0145
Technical Evaluation	HS.0147
Technical Manual Reading	HS.0148
Test Stand Operations	HS.0149
Total Quality Management (TQM)	HS.0150
Transport Mode Selection	HS.0151
Trend Analysis	HS.0190
Triple Bottom Line	HS.0191
Troubleshooting	HS.0152
Vendor Managed Inventory	HS.0154
Verification Strategies	HS.0155
VMI planning and management	HS.0156
Warehouse Management Systems (WMS)	HS.0192
Warranty process and policy	HS.0157
Warranty Return and Repair	HS.0158
Waste Management	HS.0160
Wave/batch picking	HS.0161
Yard Management	HS.0193

Skills

HS.0001 3-way Receiving Match

Knowledge of the process of reconciling invoices with purchase orders and goods received notes in order to authorize payment of invoices.

Processes	
sS1.2	Receive Product
sS2.1	Schedule Product Deliveries
sS2.2	Receive Product
sS2.5	Authorize Supplier Payment
sS3.4	Receive Product
sS3.7	Authorize Supplier Payment

Experiences	
HE.0009	Bar Coding/RFID
HE.0078	Electronic Data Interchange (EDI) Systems
HE.0083	Enterprise Resource Planning (ERP)
HE.0100	Financial Accounting
HE.0160	Material Resource Planning (MRP)

Trainings	
HT.0006	APICS CPIM
HT.0012	Basic legal process (embargo, black list)
HT.0014	Basic Supply Chain Finance
HT.0016	Business Ethics/Conduct training
HT.0035	Credit Management
HT.0052	ERP Systems Training
HT.0055	Exception Management
HT.0082	Language skills
HT.0109	Product Specific Training
HT.0145	Supply Chain Security

Practices	
BP.148	3-Way Delivery Verification

HS.0002 Acceptance testing

Working knowledge of Functional and/or Quality Assurance testing of product to ensure it will perform in accordance with its intended contractual agreement for form, fit and function. Acceptance testing may in some instances be performed at the supplier's facility and/or at the customer's final delivery location. Successful product acceptance testing may be a prerequisite for supplier payment.

Processes	
sS1.3	Verify Product
sS2.3	Verify Product
sS2.5	Authorize Supplier Payment
sS3.5	Verify Product
sS3.7	Authorize Supplier Payment

Experiences	
HE.0183	Performance Reporting Systems Development/Use
HE.0208	Quality Management Systems
HE.0276	Technical Interface

Trainings	
HT.0006	APICS CPIM
HT.0016	Business Ethics/Conduct training
HT.0052	ERP Systems Training
HT.0082	Language skills
HT.0102	Negotiation Skills
HT.0109	Product Specific Training
HT.0123	Safety and Environmental Management (industry specific, company specific and country specific)

Practices	
BP.169	Beyond Economic Repair (BER) Management

HS.0003 Accounting

The process of collecting, analyzing, and communicating financial information about a business entity to specified stakeholders

Processes	
sD1.15	Invoice
sD2.15	Invoice
sD3.15	Invoice
sE7.5	Project Impact

Experiences	
HE.0002	Accounting
HE.0003	Accounts Receivable
HE.0130	International Financial Reporting Standards
HE.0232	Sarbanes Oxley

Trainings	
HT.0006	APICS CPIM
HT.0012	Basic legal process (embargo, black list)
HT.0013	Basic Science
HT.0014	Basic Supply Chain Finance
HT.0016	Business Ethics/Conduct training
HT.0052	ERP Systems Training
HT.0082	Language skills
HT.0102	Negotiation Skills
HT.0109	Product Specific Training

Practices	
BP.018	ABC Inventory Classification System
BP.148	3-Way Delivery Verification

HS.0004 Advertising Methodologies

Knowledge of effective procurement or business development communication techniques to inform and/or solicit potential suppliers regarding product or service specifications.

Processes	
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate

Experiences	
HE.0011	Basic Procurement
HE.0156	Market Knowledge

Trainings	
HT.0055	Exception Management
HT.0102	Negotiation Skills
HT.0145	Supply Chain Security

HS.0005 Assembly Process Design

The arrangement of workers, machines, and equipment in which the product being assembled passes consecutively from operation to operation until completed.

Experiences	
HE.0154	Manufacturing engineering
HE.0155	Manufacturing Management

HS.0006 Asset Management

The process (which requires the use of spreadsheets or software) to identify, collect, maintain and track the company's assets.

Processes	
sM1.6	Release Product to Deliver
sE5	Manage Supply Chain Assets
sE7	Manage Supply Chain Network

Experiences	
HE.0002	Accounting
HE.0010	Basic Finance
HE.0046	Cost/Benefit Analysis
HE.0205	Project Management
HE.0298	Utilizing Finance Systems
HE.0311	Written/Verbal Communication

Practices	
BP.012	Lot Tracking

HS.0007 Availability Management

The process of managing and allocating available resources and inventory (at various levels) based on business rules. This would include date, lead time, capacity and inventory management skills.

Processes	
sD1.1	Process Inquiry and Quote
sD1.3	Reserve Inventory and Determine Delivery Date
sD1.4	Consolidate Orders
sD2.1	Process Inquiry and Quote
sD2.3	Reserve Inventory and Determine Delivery Date
sD2.4	Consolidate Orders

Experiences	
HE.0008	ATP logic/calculation
HE.0061	Customer Stocking Agreements Management
HE.0083	Enterprise Resource Planning (ERP)
HE.0131	Inventory Management
HE.0140	Knowledge of business rules concerning customer
HE.0171	On time-shipping and delivery metric logic/calculation
HE.0204	Production Planning/Scheduling
HE.0305	Warehouse/Distribution Management

Trainings	
HT.0051	Equipment & Machine usage certification (trucks & lifting equipment)
HT.0069	Import/Export Regulations
HT.0084	Lean Manufacturing Training
HT.0109	Product Specific Training
HT.0123	Safety and Environmental Management (industry specific, company specific and country specific)
HT.0145	Supply Chain Security
HT.0155	Warehouse Management

Practices	
BP.168	Rotable Spares Pool

HS.0009 Bar Code Handling/RFID (if available)

Basic working knowledge of the concept of applying or incorporating onto/into a product an optical machine-readable representation of data (bar code) and /or using radio waves with radio-frequency identification tags (RFID) for the purpose of the identification and tracking of that product.

Processes	
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sP4.2	Identify, Assess and Aggregate Delivery Resources
sP4.4	Establish Delivery Plans
sP5.1	Assess and Aggregate Return Requirements
sS1.2	Receive Product
sS1.3	Verify Product
sS1.4	Transfer Product
sS2.2	Receive Product
sS2.4	Transfer Product
sS3.4	Receive Product
sS3.5	Verify Product
sS3.6	Transfer Product
sD1.13	Receive and verify Product by Customer
sD2.13	Receive and verify Product by Customer
sD3.13	Receive and verify Product by Customer

Experiences	
HE.0009	Bar Coding/RFID
HE.0083	Enterprise Resource Planning (ERP)
HE.0094	Exception management tool usage/experience
HE.0115	Identification methodologies
HE.0159	Master Data/Document Management
HE.0197	Product Identification System
HE.0208	Quality Management Systems
HE.0212	Receiving and Verifying Product
HE.0293	Transportation/Warehouse Management systems (TMS/WMS)

HS.0009 Bar Code Handling/RFID (if available)

Trainings	
HT.0006	APICS CPIM
HT.0012	Basic legal process (embargo, black list)
HT.0013	Basic Science
HT.0014	Basic Supply Chain Finance
HT.0016	Business Ethics/Conduct training
HT.0035	Credit Management
HT.0052	ERP Systems Training
HT.0068	IFRS/US GAAP revenue recognition
HT.0082	Language skills
HT.0096	Microsoft Project
HT.0102	Negotiation Skills
HT.0109	Product Specific Training
HT.0112	Project Management
HT.0123	Safety and Environmental Management (industry specific, company specific and country specific)
HT.0145	Supply Chain Security

Practices	
BP.012	Lot Tracking
BP.089	Perfect Pick Put away
BP.167	Electronic Returns Tracking

HS.0010 Basic Finance

Working knowledge and ability to effectively interpret and communicate general financial accounting practices and principles which maintain company and regulatory compliance.

Processes	
sP2.3	Balance Product Resources with Product Requirements
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
sE2	Manage Performance

Experiences	
HE.0004	Advanced Financial Accounting Principles
HE.0010	Basic Finance
HE.0047	Cost/Price Analysis
HE.0101	Financial Collaboration
HE.0102	Financial Planning
HE.0230	Sales and Operations Planning (S&OP)
HE.0298	Utilizing Finance Systems

Trainings	
HT.0012	Basic legal process (embargo, black list)
HT.0014	Basic Supply Chain Finance
HT.0016	Business Ethics/Conduct training
HT.0035	Credit Management
HT.0055	Exception Management
HT.0102	Negotiation Skills
HT.0109	Product Specific Training

Practices	
BP.131	Alternative Supplier Benchmarking
BP.132	Issue Invitation to Tender (Quote)
BP.134	Supplier Evaluation using Robust Evaluation Tool
BP.144	Purchase Order Management
BP.148	3-Way Delivery Verification

HS.0011 Basic Transportation Management

The management of transportation operations of all types, including tracking and managing every aspect of vehicle maintenance, fuel costing, routing and mapping, warehousing, communications, EDI implementations, traveler and cargo handling, carrier selection and management, accounting

Processes	
sP2.1	Identify, Prioritize and Aggregate Product Requirements
sP2.2	Identify, Assess and Aggregate Product Resources
sP2.3	Balance Product Resources with Product Requirements
sP2.4	Establish Sourcing Plans
sE6	Manage Supply Chain Contracts

Experiences	
HE.0023	Carrier selection & qualification
HE.0046	Cost/Benefit Analysis
HE.0083	Enterprise Resource Planning (ERP)
HE.0116	Import/Export Logistics
HE.0159	Master Data/Document Management
HE.0162	Materials portfolio and specifications
HE.0205	Project Management
HE.0209	Quality processes related to inventory management (test times, shelf life)
HE.0230	Sales and Operations Planning (S&OP)
HE.0236	Selecting & Scheduling Modes of Transportation
HE.0247	Spreadsheet Management
HE.0265	Supplier Service Strategy Agreements
HE.0281	Transport Outsourcing
HE.0286	Transportation planning
HE.0299	Utilizing Transportation Management Systems

HS.0011 Basic Transportation Management

Trainings	
HT.0006	APICS CPIM
HT.0014	Basic Supply Chain Finance
HT.0016	Business Ethics/Conduct training
HT.0025	Communicating Customer & Supplier Information
HT.0052	ERP Systems Training
HT.0055	Exception Management
HT.0069	Import/Export Regulations
HT.0073	Introduction to Supply Chain
HT.0082	Language skills
HT.0090	Logistics Operations
HT.0102	Negotiation Skills
HT.0109	Product Specific Training
HT.0123	Safety and Environmental Management (industry specific, company specific and country specific)
HT.0126	SCOR
HT.0145	Supply Chain Security
HT.0152	Transportation planning
HT.0155	Warehouse Management
HT.0157	APICS Principals of Distribution and Logistics
Practices	
BP.168	Rotable Spares Pool

HS.0012 Benchmarking

Working knowledge of the process of capturing and comparing one's own business processes and performance metrics to industry peers and/or best practices from other industries. Typical measures include quality, time, and cost, with the goal of closing performance gaps and doing things better, faster, and cheaper.

Processes	
sS1.1	Schedule Product Deliveries
sS2.1	Schedule Product Deliveries
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
sE2	Manage Performance
sE7	Manage Supply Chain Network
Experiences	
HE.0185	Performance Reporting System/ERP System
HE.0244	Six Sigma
Trainings	
HT.0112	Project Management
HT.0159	APICS Principals of Managing Operations
Practices	
BP.131	Alternative SupplierBenchmarking

HS.0013 Blanket purchase order process

Working knowledge of the procurement process for soliciting, issuing and administering "open-ended" (period for performance) type purchase orders or contracts which combine and group numerous line items of (generally) like products onto a purchase order or contract.

Processes	
sS2.2	Receive Product

Experiences	
HE.0167	Negotiation

Practices	
BP.145	Vendor Collaboration

HS.0014 Build Schedule Evaluation

Analyzing a product installation schedule against the constraints and requirements in order to ensure feasibility to effectively and efficiently complete the installation process.

Processes	
sD3.4	Schedule Installation
Experiences	
HE.0008	ATP logic/calculation
HE.0083	Enterprise Resource Planning (ERP)
HE.0204	Production Planning/Scheduling
Trainings	
HT.0068	IFRS/US GAAP revenue recognition
Practices	
BP.020	Demand Management

HS.0015 CAD/CAM

The process to use computer technology to aid in the design, analysis, and manufacture of products.

Processes	
sM3.1	Finalize Production Engineering

Experiences	
HE.0012	Bills of Material/Specs/Fabrication Methodology

HS.0016 Capacity Planning/Management

The process of determining and managing the production capacity needed by an organization to meet changing demands for its products.

Processes	
sP5.2	Identify, Assess and Aggregate Return Resources
sE7	Manage Supply Chain Network

Experiences	
HE.0018	Capacity planning
HE.0083	Enterprise Resource Planning (ERP)
HE.0104	Forecasting
HE.0133	Inventory Valuation/Financial Analysis
HE.0159	Master Data/Document Management
HE.0163	Modeling Techniques
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0230	Sales and Operations Planning (S&OP)
HE.0236	Selecting & Scheduling Modes of Transportation
HE.0247	Spreadsheet Management
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times
HE.0293	Transportation/Warehouse Management systems (TMS/WMS)

Trainings	
HT.0006	APICS CPIM
HT.0012	Basic legal process (embargo, black list)
HT.0014	Basic Supply Chain Finance
HT.0021	Capacity Management (Aggregate Planning)
HT.0023	Cellular Manufacturing
HT.0035	Credit Management
HT.0149	Techniques of Detailed Capacity Planning Process
HT.0160	APICS Principles of Manufacturing Management
HT.0161	APICS Principles of Operations Planning

Practices	
BP.016	Supply Network Planning
BP.019	Demand Planning
BP.020	Demand Management
BP.021	Sales and Operations Planning
BP.183	Integrated Business Planning
BP.184	Scenario Planning

HS.0018 Carrier Selection

Selection of a transportation mode and service provider in order to meet due dates, cost and service objectives

Processes	
sD1.5	Build Loads
sD2.5	Build Loads
sD3.5	Build Loads

Experiences	
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0180	Packaging Configuration and Palletizing
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times

Trainings	
HT.0006	APICS CPIM
HT.0052	ERP Systems Training
HT.0130	Shop Floor-system specific

HS.0019 Change Notice Development

Working knowledge of the procurement process and the ability to clearly disseminate specific contractual or technical requirements which have changed to Sourced contractors, suppliers or vendors.

Processes	
sS1.5	Authorize Supplier Payment
sS3.3	Schedule Product Deliveries

Experiences	
HE.0005	Advanced Procurement
HE.0011	Basic Procurement

Trainings	
HT.0069	Import/Export Regulations

Practices	
BP.169	Beyond Economic Repair (BER) Management

HS.0020 Competitive Bidding

Working knowledge of procurement process for requesting and receiving bids/quotes from competing contractors, suppliers, or vendors based on product part numbers, scope, specifications, terms and conditions and in some cases, the criteria by which the bids will be evaluated.

Processes	
sS2.2	Receive Product
Experiences	
HE.0005	Advanced Procurement
Practices	
BP.132	Issue Invitation to Tender (Quote)
BP.134	Supplier Evaluation using Robust Evaluation Tool.

HS.0021 Consignment Agreement Development

Working knowledge of Consignment Agreements which are when one party provides goods/services to another party for sale by that other party. The initial party only gets paid when the other party completes the sale of the goods/services.

Processes	
sS2.1	Schedule Product Deliveries
sS3.3	Schedule Product Deliveries
sE6	Manage Supply Chain Contracts

Experiences	
HE.0035	Consignment practices

Practices	
BP.017	Distribution Planning
BP.164	Consignment Inventory Management

HS.0022 Contract Management

Experience in solicitation process, bid/proposal evaluation, contract award and post award administration, and closeout. Such knowledge for setting up such agreements is required throughout the Source functions.

Processes	
sS1.5	Authorize Supplier Payment
sS2.1	Schedule Product Deliveries
sS2.5	Authorize Supplier Payment
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
sS3.7	Authorize Supplier Payment
sD3.2	Negotiate and Receive Contract
sE4	Manage Supply Chain Human Resources
sE5	Manage Supply Chain Assets
sE6	Manage Supply Chain Contracts

Experiences	
HE.0005	Advanced Procurement
HE.0008	ATP logic/calculation
HE.0010	Basic Finance
HE.0011	Basic Procurement
HE.0014	Business model and sales channel
HE.0028	Collaborative Planning, Forecasting and Replenishment (CPFR)
HE.0030	Company Pricing/Margin Policy
HE.0031	Company terms and conditions
HE.0033	Configuration Management
HE.0041	Contractual Terms & Conditions
HE.0081	Engineering/Design Management
HE.0083	Enterprise Resource Planning (ERP)
HE.0093	Establishing Technical/Contracts Team
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0146	Legal Impact
HE.0153	Managing and Measuring Performance
HE.0167	Negotiation

HS.0022 Contract Management

HE.0177	Order-to-cash process
HE.0188	PLM/PDM knowledge
HE.0205	Project Management
HE.0208	Quality Management Systems
Trainings	
HT.0028	Contract Management
HT.0030	Contracting for Supply Professionals
HT.0038	CTL
HT.0051	Equipment & Machine usage certification (trucks & lifting equipment)
HT.0114	Quality Management Systems
HT.0123	Safety and Environmental Management (industry specific, company specific and country specific)
HT.0145	Supply Chain Security
Practices	
BP.132	Issue Invitation to Tender (Quote)
BP.134	Supplier Evaluation using Robust Evaluation Tool.
BP.164	Consignment Inventory Management
BP.170	Engineer to Order Production
BP.171	Mixed Mode/Reverse Material Issue

HS.0023 Controls and Compliance

Awareness of relevant regulations, laws and requirements, whether external or internal, and the ability to devise, implement and document the relevant and necessary controls in order to maintain compliance and successfully pass auditing requirements.

Processes	
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
sE1.1	Gather Business Rule Requirements
sE1.2	Interpret Business Rule Requirement
sE1.3	Document Business Rule
sE8	Manage Regulatory Compliance

Experiences	
HE.0011	Basic Procurement

Practices	
BP.147	Receiving Goods Inspection
BP.164	Consignment Inventory Management

HS.0024 Cost/Price Analysis

Basic financial understanding of analyzing the costs/prices associated with a bid/proposal/quotation for a sourced product for the purpose of attaining best cost/price and/or best value for that product. Also, used to determine general understanding of the requirements by the supplier(s) and price reasonableness.

Processes	
sS1.5	Authorize Supplier Payment
sS3.3	Schedule Product Deliveries

Experiences	
HE.0010	Basic Finance
HE.0042	Cost Analysis

Trainings	
HT.0069	Import/Export Regulations
HT.0155	Warehouse Management

Practices	
BP.013	Item Rationalization
BP.088	360 Degree Closure
BP.131	Alternative Supplier Benchmarking
BP.132	Issue Invitation to Tender (Quote)
BP.134	Supplier Evaluation using Robust Evaluation Tool
BP.169	Beyond Economic Repair (BER) Management
BP.184	Scenario Planning

HS.0025 Business Rule/Policy Management

A documented set of basic principles and associated guidelines, formulated and enforced by the governing body or an assigned committee of an organization that direct and limit a company's decisions and actions in pursuit of its objectives.

Processes	
sE1	Manage Supply Chain Business Rules
sE1.1	Gather Business Rule Requirements
sE1.2	Interpret Business Rule Requirement
sE1.3	Document Business Rule
sE8	Manage Regulatory Compliance

Experiences	
HE.0050	Creating/Reviewing/Updating Company Policies
HE.0079	Enforcing Company Policies
HE.0123	Industry Specific Regulatory Knowledge
HE.0205	Project Management
HE.0216	Regulatory Policies/Compliance
HE.0268	Supply Chain Management

Practices	
BP.166	Document Management System

HS.0026 Credit/Collection Management

Set of activities to assess and rate the credit risk of a customer (ability to meet their financial obligations), identify/block non-creditworthy customers, manage outstanding balances, process credits, and investigate/pursue overdues.

Processes	
sD1.2	Receive, Enter, and Validate Order
sD1.15	Invoice
sD2.2	Receive, Configure, Enter and Validate Order
sD2.15	Invoice
sD3.15	Invoice
sSR3.3	Request Excess Product Return Authorization
sDR3.1	Authorize Excess Product Return

Experiences	
HE.0003	Accounts Receivable
HE.0024	Cash Application
HE.0029	Collections
HE.0051	Credit Management
HE.0073	Dispute Management
HE.0117	Import/Export Regulations
HE.0167	Negotiation
HE.0177	Order-to-cash process
HE.0181	Payment methods
HE.0216	Regulatory Policies/Compliance

Trainings	
HT.0006	APICS CPIM
HT.0046	Engineering
HT.0052	ERP Systems Training
HT.0123	Safety and Environmental Management (industry specific, company specific and country specific)
HT.0133	Six Sigma Greenbelt

HS.0027 Cross Docking

Basic knowledge of linking, staging and moving received sourced products with/to existing open orders minimizing the need for product inventory or storage.

Processes	
sS1.2	Receive Product
sS2.2	Receive Product
sS3.4	Receive Product

Experiences	
HE.0054	Cross Docking

Trainings	
HT.0080	ISO Certification
HT.0098	MRP Systems training
HT.0157	APICS Principles of Distribution and Logistics

HS.0028 Customer Order Management

The process or the work flow associated with the identification, receipt, acceptance, picking, packing, delivery and of the packed item(s) to a shipping carrier.

Processes	
sD1.2	Receive, Enter, and Validate Order
sD1.11	Load Vehicle and Generate Shipping Documents
sD2.2	Receive, Configure, Enter and Validate Order
sD2.11	Load Product & Generate Shipping Docs
sD3.11	Load Product & Generate Shipping Docs

Experiences	
HE.0031	Company terms and conditions
HE.0053	CRM Methods and Tools
HE.0078	Electronic Data Interchange (EDI) Systems
HE.0131	Inventory Management

Trainings	
HT.0006	APICS CPIM
HT.0046	Engineering
HT.0080	ISO Certification
HT.0161	APICS Principles of Operations Planning

Practices	
BP.090	Days of Supply Based MRP Proposal Management
BP.168	Rotable Spares Pool

HS.0029 Customer Relationship Management (CRM)

The process for managing a company's relations and interactions with clients and sales prospects, possibly including the synchronization of business processes with the objective of identifying, attracting, and managing new and existing customers.

Processes	
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
sD1.1	Process Inquiry and Quote
sD1.2	Receive, Enter, and Validate Order
sD2.1	Process Inquiry and Quote
sD2.2	Receive, Configure, Enter and Validate Order
sSR1.1	Identify Defective Product Condition
sDR2.1	Authorize MRO Product Return
sDR2.2	Schedule MRO Return Receipt
sSR3.1	Identify Excess Product Condition

Experiences	
HE.0002	Accounting
HE.0014	Business model and sales channel
HE.0028	Collaborative Planning, Forecasting and Replenishment (CPFR)
HE.0031	Company terms and conditions
HE.0051	Credit Management
HE.0053	CRM Methods and Tools
HE.0057	Customer Relationship Management (CRM)
HE.0058	Customer Requirements Management
HE.0061	Customer Stocking Agreements Management
HE.0078	Electronic Data Interchange (EDI) Systems
HE.0082	Enterprise Business Process
HE.0083	Enterprise Resource Planning (ERP)
HE.0096	Existing internal metrics and relationships
HE.0122	Industry Specific Knowledge and Experience
HE.0123	Industry Specific Regulatory Knowledge
HE.0127	Internal market/SKU segmentation logic
HE.0159	Master Data/Document Management
HE.0160	Material Resource Planning (MRP)
HE.0163	Modeling Techniques
HE.0165	MS Office (Excel, PowerPoint, Word, Access)

HE.0167	Negotiation
HE.0176	Order Processing System/Enterprise Resource Planning Systems Usage (ERP) System
HE.0198	Product Life Cycle Management
HE.0199	Product Portfolio understanding
HE.0221	Return Process
HE.0247	Spreadsheet Management
HE.0269	Supply Chain Performance Management/Metrics
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times
HE.0302	Vendor Managed Inventory
Trainings	
HT.0017	Business model and sales channel
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0046	Engineering
HT.0052	ERP Systems Training
HT.0061	Fork Truck Licensing
HT.0080	ISO Certification
HT.0084	Lean Manufacturing Training
HT.0089	Logistics Management
HT.0095	Mechanic Certification
HT.0101	NDT
HT.0109	Product Specific Training
HT.0133	Six Sigma Greenbelt
HT.0134	Six Sigma Yellow belt
HT.0145	Supply Chain Security
HT.0161	APICS Principles of Operations Planning
Practices	
BP.019	Demand Planning
BP.020	Demand Management
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool
BP.183	Integrated Business Planning

HS.0031 Customer Repair and Return Policy and Process

The actions, tasks and responsibilities concerned with the decision to repair all mechanical/electrical out of order/broken products in line with the internal return rules.

Processes	
sSR1.3	Request Defective Product Return Authorization
sDR1.1	Authorize Defective Product Return
sSR2.2	Disposition MRO Product
sSR2.3	Request MRO Return Authorization
sSR3.3	Request Excess Product Return Authorization
sDR3.1	Authorize Excess Product Return
Experiences	
HE.0002	Accounting
HE.0017	Business Rules/Regulatory Policy/Company Return Policy
HE.0051	Credit Management
HE.0067	Defective product handling
HE.0095	Excess product handling
HE.0123	Industry Specific Regulatory Knowledge
HE.0167	Negotiation
HE.0221	Return Process
Trainings	
HT.0066	Green systems engineering
HT.0070	Industry specific regulatory certification
HT.0080	ISO Certification
HT.0116	Regulatory Compliance
HT.0129	Scrap Re-Selling
HT.0133	Six Sigma Greenbelt
HT.0134	Six Sigma Yellow belt
Practices	
BP.025	Self-Service Warranty Claim Submittal
BP.135	Return Authorization
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool
BP.169	Beyond Economic Repair (BER) Management
BP.135	Return Authorization
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool
BP.169	Beyond Economic Repair (BER) Management

HS.0032 Customer/Supplier Communication

Process of transferring customer/supplier information by speech or writing

Processes	
sE6	Manage Supply Chain Contracts
Trainings	
HT.0025	Communicating Customer & Supplier Information
Practices	
BP.013	Item Rationalization
BP.020	Demand Management
BP.131	Alternative Supplier Benchmarking
BP.132	Issue Invitation to Tender (Quote)
BP.134	Supplier Evaluation using Robust Evaluation Tool.
BP.145	Vendor Collaboration
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool

HS.0033 Data management & analytics

Working knowledge of the processes required to develop, execute and sustain plans, policies, programs and practices that control, protect, deliver and enhance the value of data and information systems/assets.

Processes	
sS1.2	Receive Product
sS1.3	Verify Product
sS1.4	Transfer Product
sS2.2	Receive Product
sS2.4	Transfer Product
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sS3.4	Receive Product
sS3.5	Verify Product
sS3.6	Transfer Product
sE3	Manage Data and Information

Experiences	
HE.0039	Contract Administration/Management
HE.0066	Data/Document Management
HE.0083	Enterprise Resource Planning (ERP)
HE.0160	Material Resource Planning (MRP)
HE.0205	Project Management
HE.0296	Utilizing Company Specific Business Systems
HE.0297	Utilizing Customer Relationship Management System
HE.0298	Utilizing Finance Systems
HE.0299	Utilizing Transportation Management Systems
HE.0300	Utilizing Warehouse Management Systems

Trainings	
HT.0006	APICS CPIM
HT.0046	Engineering
HT.0052	ERP Systems Training
HT.0080	ISO Certification
HT.0098	MRP Systems training
HT.0133	Six Sigma Greenbelt
HT.0135	Software training programs (depends on software)

HS.0033 Data management & analytics

Practices	
BP.017	Distribution Planning
BP.007	Baseline Inventory Monitoring
BP.008	Slow-moving Inventory Monitoring
BP.012	Lot Tracking
BP.020	Demand Management
BP.021	Sales and Operations Planning
BP.168	Rotable Spares Pool

HS.0034 Discrepancy Reporting and Resolution

Knowledge of techniques, systems, tools and human skills required to establish effective procedures to identify defective and missing product and then report onward, either internally or externally, ensuring closure on reports and improvements to avoid future repetition.

Processes	
sS1.2	Receive Product
sS1.3	Verify Product
sS1.4	Transfer Product
sS1.5	Authorize Supplier Payment
sS2.1	Schedule Product Deliveries
sS2.2	Receive Product
sS2.4	Transfer Product
sS2.5	Authorize Supplier Payment
sS3.3	Schedule Product Deliveries
sS3.4	Receive Product
sS3.5	Verify Product
sS3.6	Transfer Product
sS3.7	Authorize Supplier Payment
sDR3.3	Receive Excess Product

Experiences	
HE.0007	Asset Management
HE.0043	Cost Effectiveness
HE.0072	Disposition Resolution
HE.0083	Enterprise Resource Planning (ERP)
HE.0095	Excess product handling
HE.0208	Quality Management Systems
HE.0212	Receiving and Verifying Product
HE.0240	Shelf Life Management
HE.0274	Technical Collaboration

HS.0034 Discrepancy Reporting and Resolution

Trainings	
HT.0009	Basic and Advanced Business
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0046	Engineering
HT.0052	ERP Systems Training
HT.0060	Forecasting Techniques
HT.0080	ISO Certification
HT.0095	Mechanic Certification
HT.0101	NDT
HT.0109	Product Specific Training
HT.0134	Six Sigma Yellow belt
HT.0145	Supply Chain Security
Practices	
BP.012	Lot Tracking
BP.089	Perfect Pick Put away
BP.147	Receiving Goods Inspection
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool

HS.0035 Delivery Balancing

Delivery balancing is one part of Master Scheduling and involves the balancing of deliveries from suppliers against constrained criteria. These criteria may be opening hours, FLT capacity, docking facilities etc. The process involves negotiation with suppliers as well as capacity planning internally.

Processes	
sS1.1	Schedule Product Deliveries
sS2.1	Schedule Product Deliveries
sS3.3	Schedule Product Deliveries

Experiences	
HE.0039	Contract Administration/Management
HE.0305	Warehouse/Distribution Management

Practices	
BP.017	Distribution Planning

HS.0036 Delivery Scheduling

Basic knowledge of scheduling and managing sourced product deliveries in order to meet the requirements of inventory replenishment or scheduled production plans.

Processes	
sS2.5	Authorize Supplier Payment
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
sS3.7	Authorize Supplier Payment

Experiences	
HE.0025	CDR
HE.0028	Collaborative Planning, Forecasting and Replenishment (CPFR)
HE.0052	Critical Path
HE.0136	Item Master
HE.0182	PDR
HE.0277	Technical Requirements Understanding
HE.0311	Written/Verbal Communication

Trainings	
HT.0006	APICS CPIM
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0052	ERP Systems Training
HT.0084	Lean Manufacturing Training
HT.0089	Logistics Management
HT.0109	Product Specific Training
HT.0116	Regulatory Compliance
HT.0145	Supply Chain Security

Practices	
BP.017	Distribution Planning
BP.089	Perfect Pick Put away
BP.145	Vendor Collaboration
BP.168	Rotable Spares Pool

HS.0037 Demand Management

The manufacturing management process by which raw materials and production capacity are optimally allocated to meetdemand

Processes	
sP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
sP1.3	Balance Supply Chain Resources with SC Requirements
sP2.1	Identify, Prioritize and Aggregate Product Requirements

Experiences	
HE.0010	Basic Finance
HE.0017	Business Rules/Regulatory Policy/Company Return Policy
HE.0048	Cost/Service Modeling
HE.0069	Demand Management
HE.0078	Electronic Data Interchange (EDI) Systems
HE.0082	Enterprise Business Process
HE.0083	Enterprise Resource Planning (ERP)
HE.0096	Existing internal metrics and relationships
HE.0104	Forecasting
HE.0122	Industry Specific Knowledge and Experience
HE.0127	Internal market/SKU segmentation logic
HE.0131	Inventory Management
HE.0150	Make/Buy decision analysis
HE.0159	Master Data/Document Management
HE.0160	Material Resource Planning (MRP)
HE.0162	Materials portfolio and specifications
HE.0163	Modeling Techniques
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0167	Negotiation
HE.0198	Product Life Cycle Management
HE.0199	Product Portfolio understanding
HE.0200	Product Profitability
HE.0204	Production Planning/Scheduling
HE.0209	Quality processes related to inventory management (test times, shelf life)
HE.0229	Safety Stock Management
HE.0230	Sales and Operations Planning (S&OP)
HE.0241	Shipment Planning/ Order Backlog Manipulation
HE.0247	Spreadsheet Management

HE.0251	Statistical Modeling/Analysis
HE.0263	Supplier production and lead time capabilities
HE.0264	Supplier Relationship Management (SRM)
HE.0265	Supplier Service Strategy Agreements
HE.0269	Supply Chain Performance Management/Metrics
Trainings	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM
HT.0017	Business model and sales channel
HT.0027	Conflict Resolution
HT.0034	CPFR
HT.0060	Forecasting Techniques
HT.0066	Green systems engineering
HT.0067	IBF Certification
HT.0070	Industry specific regulatory certification
HT.0080	ISO Certification
HT.0102	Negotiation Skills
HT.0122	S&OP training (Oliver Wight, Tom Wallace or equivalent)
HT.0127	SCOR-P Certification
HT.0129	Scrap Re-Selling
HT.0133	Six Sigma Greenbelt
HT.0134	Six Sigma Yellow belt
HT.0136	Statistics
HT.0142	Supply Chain Management
HT.0145	Supply Chain Security
HT.0154	Vendor Managed Inventory
HT.0161	APICS Principles of Operations Planning

HS.0037 Demand Management

Practices	
BP.013	Item Rationalization
BP.020	Demand Management
BP.021	Sales and Operations Planning
BP.024	Supply Chain Optimization (SCO)
BP.090	Days of Supply Based MRP Proposal Management
BP.092	Balance and firm within horizon
BP.145	Vendor Collaboration
BP.168	Rotable Spares Pool
BP.091	Work Center Load Evaluation

HS.0038 Design/Engineering Schedule Development

Analyzing the constraints and requirements of a product design cycle in order to evaluate and ensure the timely availability of the product design for building and installation of a product.

Processes	
sD3.4	Schedule Installation
sE5.1	Schedule Asset Management Activities

Experiences	
HE.0033	Configuration Management
HE.0080	Engineering Capacity Management
HE.0081	Engineering/Design Management

HS.0039 Driving certification (according to mode of transportation)

Ownership of the official, valid (not expired) document stating that the person is authorized and able to drive (a) class(es) of vehicles.

Processes	
sD1.12	Ship Product
sD2.12	Ship Product
sD3.12	Ship Product

Experiences	
HE.0061	Customer Stocking Agreements Management
HE.0122	Industry Specific Knowledge and Experience
HE.0211	Reading Maps/Using Navigator

Trainings	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM
HT.0017	Business model and sales channel
HT.0145	Supply Chain Security

HS.0041 EHS regulations

The actions, tasks, and responsibilities concerned with the observance and application of the environment, health, and safety rules and standards.

Processes	
sD4.7	Deliver and/or install
sE1.3	Document Business Rule
sE4	Manage Supply Chain Human Resources
sE8	Manage Regulatory Compliance

Experiences	
HE.0084	Environmental, Health and Safety Systems

Trainings	
HT.0050	Environmental regulation

HS.0042 Enabling Technology

Working awareness of relevant technology that could/can be used to improve the effectiveness or efficiency of operations within Source, but also widely across the Supply Chain or the enterprise. Must be able to deploy with appropriate financial justification using project and change management support.

Processes	
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate

Experiences	
HE.0009	Bar Coding/RFID
HE.0083	Enterprise Resource Planning (ERP)
HE.0160	Material Resource Planning (MRP)

Trainings	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM
HT.0017	Business model and sales channel
HT.0027	Conflict Resolution

HS.0043 Engineering

The discipline, art and profession of acquiring and applying technical, scientific, and mathematical knowledge to design and implement materials, structures, machines, devices, systems, and processes that safely realize a desired objective or invention

Processes	
sS3.1	Identify Sources of Supply
sM1.3	Produce and Test
sM2.3	Produce and Test
sM3.4	Produce and Test
sD1.14	Install Product
sD2.14	Install Product
sD3.3	Enter Order, Commit Resources & Launch Program
sD3.14	Install Product
sE5	Manage Supply Chain Assets
sE5.1	Schedule Asset Management Activities
sE5.2	Take Asset Off-line
sE5.3	Inspect and Troubleshoot
sE5.4	Install and Configure
sE5.5	Clean, Maintain and Repair
sE5.6	Decommission and Dispose
sE5.7	Inspect Maintenance
sE5.8	Reinstate Asset

Experiences	
HE.0033	Configuration Management
HE.0081	Engineering/Design Management
HE.0084	Environmental, Health and Safety Systems
HE.0089	Establishing Engineering and Product Design
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0216	Regulatory Policies/Compliance
HE.0235	Security and compliance
HE.0249	Standards and testing
HE.0274	Technical Collaboration
HE.0275	Technical Data Understanding
HE.0311	Written/Verbal Communication

HS.0043 Engineering

Trainings	
HT.0006	APICS CPIM
HT.0014	Basic Supply Chain Finance
HT.0102	Negotiation Skills
HT.0122	S&OP training (Oliver Wight, Tom Wallace or equivalent)
HT.0127	SCOR-P Certification
HT.0136	Statistics
HT.0142	Supply Chain Management
HT.0145	Supply Chain Security

HS.0044 Enterprise Business Process

The end-to-end (cross-departmental, and often, cross-company) coordination of work activities that create and deliver ultimate value to customers

Processes	
sP2.1	Identify, Prioritize and Aggregate Product Requirements
sE7	Manage Supply Chain Network
Experiences	
HE.0069	Demand Management
HE.0083	Enterprise Resource Planning (ERP)
HE.0104	Forecasting
HE.0268	Supply Chain Management
Trainings	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM
HT.0007	APICS CSCP
Practices	
BP.024	Supply Chain Optimization (SCO)

HS.0045 Environmental Requirements

Familiarity and understanding of internal and external goals, objectives, rules and laws pertaining to the operation of the Source function within the organization. Must have the ability to manage those requirements on behalf of the organization to meet strategic goals

Processes	
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sE1	Manage Supply Chain Business Rules
sE8	Manage Regulatory Compliance

Experiences	
HE.0112	Hazardous Materials Handling

Trainings	
HT.0060	Forecasting Techniques
HT.0076	Inventory Management
HT.0079	ISM CPSM
HT.0097	Modeling Techniques

Practices	
BP.024	Supply Chain Optimization (SCO)

HS.0046 ERP Systems

Working awareness of and conversant with installing and operating appropriate Enterprise Resource Planning (ERP) systems relevant to the organization concerned. ERP is defined as an integrated computer based system used to manage internal and external resources including tangible assets, financial resources, materials and human resources.

Processes	
sS1.2	Receive Product
sS1.4	Transfer Product
sS2.2	Receive Product
sS2.4	Transfer Product
sS2.5	Authorize Supplier Payment
sS3.4	Receive Product
sS3.6	Transfer Product
sS3.7	Authorize Supplier Payment
sM1.5	Stage Product
sM1.6	Release Product to Deliver
sM2.4	Package
sM2.5	Stage Finished Product
sM2.6	Release Finished Product to Deliver
sM3.2	Schedule Production Activities
sM3.3	Issue Sourced/In-Process Product
sM3.5	Package
sM3.6	Stage Finished Product
sM3.7	Release Product to Deliver
sSR1.5	Return Defective Product
sDR1.1	Authorize Defective Product Return
sDR1.4	Transfer Defective Product
sSR2.2	Disposition MRO Product
sSR2.3	Request MRO Return Authorization
sSR2.5	Return MRO Product
sSR3.5	Return Excess Product
sE3	Manage Data and Information

Experiences	
HE.0009	Bar Coding/RFID
HE.0032	Computer Literate
HE.0067	Defective product handling

HS.0046 ERP Systems

HE.0083	Enterprise Resource Planning (ERP)
HE.0086	ERP Software Specific Experience
HE.0131	Inventory Management
HE.0160	Material Resource Planning (MRP)
HE.0176	Order Processing System/Enterprise Resource Planning Systems Usage (ERP) System
Trainings	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0027	Conflict Resolution
HT.0060	Forecasting Techniques
HT.0076	Inventory Management
HT.0079	ISM CPSM
HT.0097	Modeling Techniques
HT.0099	MS Office (Excel, PowerPoint, Word, Access)
HT.0102	Negotiation Skills
HT.0136	Statistics
HT.0147	Team skills training
HT.0161	APICS Principles of Operations Planning
Practices	
BP.012	Lot Tracking
BP.014	Demand Planning & Forecasting
BP.019	Demand Planning
BP.088	360 Degree Closure
BP.089	Perfect Pick Put away
BP.090	Days of Supply Based MRP Proposal Management
BP.091	Work Center Load Evaluation
BP.092	Balance and firm within horizon
BP.145	Vendor Collaboration
BP.158	Make-to-Stock Goods Receipt
BP.167	Electronic Returns Tracking
BP.183	Integrated Business Planning

HS.0048 Forecasting

The process of predicting production requirements to meet estimated sales in a particular forecasting period. Considerations include previous sales, the general state of the economy, consumer preferences, and competitive products. Production forecasting decisions affect budgetary and scheduling decisions.

Processes	
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sP4.2	Identify, Assess and Aggregate Delivery Resources
sP4.3	Balance Delivery Resources and Capabilities with Delivery Requirements
sP4.4	Establish Delivery Plans
sP5.1	Assess and Aggregate Return Requirements
sP5.2	Identify, Assess and Aggregate Return Resources
sS1.1	Schedule Product Deliveries
sS2.1	Schedule Product Deliveries
sS3.3	Schedule Product Deliveries

Experiences	
HE.0028	Collaborative Planning, Forecasting and Replenishment (CPFR)
HE.0083	Enterprise Resource Planning (ERP)
HE.0131	Inventory Management
HE.0133	Inventory Valuation/Financial Analysis
HE.0139	Kanban System
HE.0159	Master Data/Document Management
HE.0163	Modeling Techniques
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0206	Pull Systems
HE.0230	Sales and Operations Planning (S&OP)
HE.0247	Spreadsheet Management
HE.0302	Vendor Managed Inventory

Trainings	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM

HS.0048 Forecasting

HT.0007	APICS CSCP
HT.0021	Capacity Management (Aggregate Planning)
HT.0034	CPFR
HT.0060	Forecasting Techniques
HT.0067	IBF Certification
HT.0076	Inventory Management
HT.0079	ISM CPSM
HT.0097	Modeling Techniques
HT.0099	MS Office (Excel, PowerPoint, Word, Access)
HT.0102	Negotiation Skills
HT.0111	Production Plan
HT.0113	Push Systems
HT.0124	Sales and Operations Planning
HT.0136	Statistics
HT.0147	Team skills training
HT.0161	APICS Principles of Operations Planning

Practices	
BP.007	Baseline Inventory Monitoring
BP.008	Slow-moving Inventory Monitoring
BP.014	Demand Planning & Forecasting
BP.015	Safety Stock Planning
BP.019	Demand Planning
BP.021	Sales and Operations Planning
BP.145	Vendor Collaboration
BP.158	Make-to-Stock Goods Receipt
BP.183	Integrated Business Planning

HS.0049 ID & Damage Inspection

Working knowledge and ability to identify and inspect Sourced products for compliance with contractual part numbers, specifications, drawings, etc., including quality requirements and damage- free product receipt.

Processes	
sS1.2	Receive Product
sS1.3	Verify Product
sS2.2	Receive Product
sS3.4	Receive Product
sS3.5	Verify Product

Experiences	
HE.0208	Quality Management Systems
HE.0240	Shelf Life Management

Trainings	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0060	Forecasting Techniques
HT.0076	Inventory Management
HT.0079	ISM CPSM
HT.0097	Modeling Techniques
HT.0099	MS Office (Excel, PowerPoint, Word, Access)

Practices	
BP.012	Lot Tracking
BP.089	Perfect Pick Put away
BP.147	Receiving Goods Inspection

HS.0050 Import/Export Regulations

The knowledge and understanding of the laws and regulations governing the import and export requirements of materials including working with the states, other federal agencies, and foreign governments to ensure compliance with laws governing the import and export of many of these materials.

Processes	
sP2.1	Identify, Prioritize and Aggregate Product Requirements
sP2.2	Identify, Assess and Aggregate Product Resources
sP2.3	Balance Product Resources with Product Requirements
sP2.4	Establish Sourcing Plans
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sP4.2	Identify, Assess and Aggregate Delivery Resources
sP5.1	Assess and Aggregate Return Requirements
sP5.2	Identify, Assess and Aggregate Return Resources
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
sE1.3	Document Business Rule
sE8	Manage Regulatory Compliance

Experiences	
HE.0017	Business Rules/Regulatory Policy/Company Return Policy
HE.0039	Contract Administration/Management
HE.0083	Enterprise Resource Planning (ERP)
HE.0100	Financial Accounting
HE.0116	Import/Export Logistics
HE.0159	Master Data/Document Management
HE.0162	Materials portfolio and specifications
HE.0167	Negotiation
HE.0180	Packaging Configuration and Palletizing
HE.0209	Quality processes related to inventory management (test times, shelf life)
HE.0230	Sales and Operations Planning (S&OP)
HE.0247	Spreadsheet Management
HE.0265	Supplier Service Strategy Agreements
HE.0281	Transport Outsourcing
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times

HS.0050 Import/Export Regulations

Trainings	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0060	Forecasting Techniques
HT.0076	Inventory Management
HT.0079	ISM CPSM
HT.0096	Microsoft Project
HT.0097	Modeling Techniques
HT.0099	MS Office (Excel, PowerPoint, Word, Access)
HT.0102	Negotiation Skills
HT.0136	Statistics
HT.0147	Team skills training

HS.0051 Installation Requirements

The information, resources and skills requirements to effectively install purchased products as per customer requirements.

Processes	
sD4.7	Deliver and/or install

Experiences	
HE.0066	Data/Document Management
HE.0125	Industry/product-specific installation experience
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations

Trainings	
HT.0006	APICS CPIM
HT.0037	CSCMP

HS.0052 Installation Scheduling

The process of managing requirement and constraints associated with an installation schedule in order to effectively schedule product installation as per customer requirements.

Processes	
sD3.4	Schedule Installation
sE5.1	Schedule Asset Management Activities

Experiences	
HE.0205	Project Management
HE.0237	Service / Installation Management

Trainings	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM

HS.0053 Installed base management

Actions, tasks and responsibilities concerned with maintenance and update of info related to the number of units of the company products/platform actually installed and in use around the world.

Processes	
sSR1.5	Return Defective Product
sE3	Manage Data and Information
Experiences	
HE.0131	Inventory Management
Trainings	
HT.0007	APICS CSCP
Practices	
BP.012	Lot Tracking

HS.0054 Intellectual Property/Proprietary Data

Conversant with and effectively manage Proprietary Data and Intellectual property on behalf of the organization. Proprietary Data is defined as internally generated data that contains technical or other types of information controlled by an organization to safeguard its competitive edge. Proprietary Data may be protected by copyright, patent or trade secret laws in which case it is called Intellectual Property

Processes	
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sE1	Manage Supply Chain Business Rules
sE1.3	Document Business Rule
sE6	Manage Supply Chain Contracts
sE8	Manage Regulatory Compliance

Experiences	
HE.0126	Intellectual Property Reporting & Restrictions

Trainings	
HT.0060	Forecasting Techniques
HT.0076	Inventory Management

HS.0055 International Trade

The exchange of capital, goods, and services across international borders or territories

Processes	
sE1.3	Document Business Rule
sE6	Manage Supply Chain Contracts

Experiences	
HE.0129	International business

Trainings	
HT.0062	Fundamentals of International Trade

HS.0056 Interpreting Specifications

Basic working knowledge and ability to read, interpret, understand, and effectively communicate (internally and externally) technical specifications and/or drawings to support timely design and delivery of products meeting minimum requirements.

Processes	
sS2.1	Schedule Product Deliveries
sS3.3	Schedule Product Deliveries
sE3	Manage Data and Information

Experiences	
HE.0278	Technical Specifications

Trainings	
HT.0060	Forecasting Techniques
HT.0076	Inventory Management

HS.0058 Inventory Management

The formal management of the timing and quantities of goods to be ordered and stocked by an organization in order that demand can always be satisfied without excess expenditure

Processes	
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP2.1	Identify, Prioritize and Aggregate Product Requirements
sP2.2	Identify, Assess and Aggregate Product Resources
sP2.3	Balance Product Resources with Product Requirements
sP2.4	Establish Sourcing Plans
sP3.1	Identify, Prioritize and Aggregate Production Requirements
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sP4.2	Identify, Assess and Aggregate Delivery Resources
sP4.3	Balance Delivery Resources and Capabilities with Delivery Requirements
sP4.4	Establish Delivery Plans
sP5.1	Assess and Aggregate Return Requirements
sP5.2	Identify, Assess and Aggregate Return Resources
sP5.3	Balance Return Resources with Return Requirements
sS1.2	Receive Product
sS1.4	Transfer Product
sS2.2	Receive Product
sS2.4	Transfer Product
sS3.4	Receive Product
sS3.6	Transfer Product
sM1.2	Issue Material
sM1.5	Stage Product
sM1.6	Release Product to Deliver
sM2.2	Issue Sourced/In-Process Product
sM2.5	Stage Finished Product
sM2.6	Release Finished Product to Deliver
sM3.6	Stage Finished Product
sM3.7	Release Product to Deliver
sD1.3	Reserve Inventory and Determine Delivery Date
sD2.3	Reserve Inventory and Determine Delivery Date
sD4.2	Receive Product at Store
sD4.3	Pick Product from backroom
sD4.4	Stock Shelf

sSR1.2	Disposition Defective Product
sDR1.1	Authorize Defective Product Return
sDR1.2	Schedule Defective Return Receipt
sDR1.4	Transfer Defective Product
sSR2.2	Disposition MRO Product
sSR2.3	Request MRO Return Authorization
sDR2.1	Authorize MRO Product Return
sDR2.4	Transfer MRO Product
sSR3.2	Disposition Excess Product
sSR3.5	Return Excess Product
sDR3.1	Authorize Excess Product Return
sDR3.2	Schedule Excess Return Receipt
sDR3.3	Receive Excess Product
sDR3.4	Transfer Excess Product

Experiences	
HE.0001	ABC Accounting
HE.0002	Accounting
HE.0006	Allocation rules and strategy
HE.0009	Bar Coding/RFID
HE.0011	Basic Procurement
HE.0012	Bills of Material/Specs/Fabrication Methodology
HE.0017	Business Rules/Regulatory Policy/Company Return Policy
HE.0039	Contract Administration/Management
HE.0059	Customer Service Strategy Agreements
HE.0063	Cycle Counting
HE.0066	Data/Document Management
HE.0067	Defective product handling
HE.0069	Demand Management
HE.0078	Electronic Data Interchange (EDI) Systems
HE.0083	Enterprise Resource Planning (ERP)
HE.0085	EOQ management
HE.0095	Excess product handling
HE.0100	Financial Accounting
HE.0104	Forecasting

HS.0058 Inventory Management

HE.0111	Handling Management
HE.0112	Hazardous Materials Handling
HE.0119	Industrial engineering
HE.0122	Industry Specific Knowledge and Experience
HE.0131	Inventory Management
HE.0132	Inventory strategy
HE.0133	Inventory Valuation/Financial Analysis
HE.0152	Management of service Strategy agreements with customers
HE.0159	Master Data/Document Management
HE.0160	Material Resource Planning (MRP)
HE.0162	Materials portfolio and specifications
HE.0163	Modeling Techniques
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0167	Negotiation
HE.0175	Order Management
HE.0176	Order Processing System/Enterprise Resource Planning Systems Usage (ERP) System
HE.0184	Performance/Cost Trade-offs
HE.0187	Planogram tool usage
HE.0196	Product display management
HE.0198	Product Life Cycle Management
HE.0199	Product Portfolio understanding
HE.0204	Production Planning/Scheduling
HE.0205	Project Management
HE.0209	Quality processes related to inventory management (test times, shelf life)
HE.0214	Regulatory and company return policy
HE.0216	Regulatory Policies/Compliance
HE.0229	Safety Stock Management
HE.0230	Sales and Operations Planning (S&OP)
HE.0234	Scrapping procedure
HE.0247	Spreadsheet Management
HE.0251	Statistical Modeling/Analysis
HE.0263	Supplier production and lead time capabilities
HE.0264	Supplier Relationship Management (SRM)
HE.0265	Supplier Service Strategy Agreements
HE.0300	Utilizing Warehouse Management Systems

HS.0058 Inventory Management

HE.0302	Vendor Managed Inventory
HE.0304	Warehouse Experience
HE.0305	Warehouse/Distribution Management
HE.0307	Waste Disposal Procedure
HE.0311	Written/Verbal Communication
Trainings	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0011	Basic Inventory Concepts
HT.0038	CTL
HT.0039	CTPAT
HT.0045	Enabling Technology
HT.0060	Forecasting Techniques
HT.0073	Introduction to Supply Chain
HT.0076	Inventory Management
HT.0079	ISM CPSM
HT.0097	Modeling Techniques
HT.0099	MS Office (Excel, PowerPoint, Word, Access)
HT.0102	Negotiation Skills
HT.0127	SCOR-P Certification
HT.0136	Statistics
HT.0140	Supplier Relationship Management (SRM)
HT.0146	Taxes/Duties Education
HT.0147	Team skills training
HT.0158	APICS Principles of Inventory Management
HT.0161	APICS Principles of Operations Planning
Practices	
BP.006	Consignment Inventory
BP.018	ABC Inventory Classification System
BP.007	Baseline Inventory Monitoring
BP.008	Slow-moving Inventory Monitoring
BP.009	Kanban
BP.010	Min-Max Replenishment
BP.013	Item Rationalization

HS.0058 Inventory Management

BP.015	Safety Stock Planning
BP.019	Demand Planning
BP.088	360 Degree Closure
BP.089	Perfect Pick Put away
BP.145	Vendor Collaboration
BP.147	Receiving Goods Inspection
BP.168	Rotable Spares Pool
BP.183	Integrated Business Planning

HS.0060 Issue Proposal/Quote

The compilation of all required specifications and details need to generate and communicate an RFP/Q.

Processes	
sD3.1	Obtain and Respond to RFP/RFQ
Experiences	
HE.0210	Quotation/CRM tool
Trainings	
HT.0006	APICS CPIM

HS.0061 Item Master/BOM/BoL Interpretation

The ability to understand, interpret and effectively communicate a part master record (item master) or bill of materials (BOM) of parts lists that details description, unit of measure, dimensions, group/ family classification, production or sourcing data, quality requirements and/or restrictions, and other pertinent information. Such item masters and BOMs are generally maintained within ERP or MRP systems.

Processes	
sS2.5	Authorize Supplier Payment
sS3.7	Authorize Supplier Payment
sE1	Manage Supply Chain Business Rules
Experiences	
HE.0294	Unit of Measure Understanding
HE.0306	Warehousing Min/Max Shelf Life
Trainings	
HT.0127	SCOR-P Certification
Practices	
BP.013	Item Rationalization
BP.088	360 Degree Closure

HS.0062 Kitting/Packing

The process of aggregating and packing all elements belonging to a customer order.

Processes	
sD1.10	Pack Product
sD2.10	Pack Product
sD3.10	Pack Product

Experiences	
HE.0066	Data/Document Management
HE.0131	Inventory Management
HE.0180	Packaging Configuration and Palletizing
HE.0202	Product/Supplier Knowledge
HE.0305	Warehouse/Distribution Management

Trainings	
HT.0006	APICS CPIM
HT.0038	CTL
HT.0132	Six Sigma Certification

Practices	
BP.073	Returns Receiving Refurbishment

HS.0063 Labor Costs Verification

Capability of calculating, understanding, reporting on, and if necessary, be able to taking corrective action to control labor costs within one's area of responsibility against budgets or objectives that have been set. Labor cost is defined as the total expenditure borne by employers in order to employ workers and goes beyond straight wages or salaries.

Processes	
sS2.1	Schedule Product Deliveries
sS2.5	Authorize Supplier Payment
sS3.7	Authorize Supplier Payment

Experiences	
HE.0239	Service Provider Agreements

HS.0064 Lead-time validation

The process of analyzing and validating feasibility of customer required lead-times.

Processes	
sD1.2	Receive, Enter, and Validate Order
sD2.2	Receive, Configure, Enter and Validate Order
Experiences	
HE.0008	ATP logic/calculation
HE.0083	Enterprise Resource Planning (ERP)
HE.0238	Service level calculation tools and metrics
Trainings	
HT.0038	CTL
HT.0039	CTPAT
HT.0127	SCOR-P Certification

HS.0065 Lean Manufacturing

The process of identifying processes that impede the optimization of production. By using various principles (value stream mapping, five s, root cause analysis) identify waste and/or process inefficiencies with the goal of optimizing production.

Processes	
sP5.2	Identify, Assess and Aggregate Return Resources
sP5.3	Balance Return Resources with Return Requirements
sP5.4	Establish and Communicate Return Plans
sS1.4	Transfer Product
sS2.1	Schedule Product Deliveries
sS2.4	Transfer Product
sS3.3	Schedule Product Deliveries
sS3.5	Verify Product
sM1.1	Schedule Production Activities
sM1.2	Issue Material
sM1.3	Produce and Test
sM1.5	Stage Product
sM2.1	Schedule Production Activities
sM2.2	Issue Sourced/In-Process Product
sM2.3	Produce and Test
sM2.5	Stage Finished Product
sM3.4	Produce and Test
sM3.6	Stage Finished Product
sE2	Manage Performance

Experiences	
HE.0033	Configuration Management
HE.0038	Continuous learning
HE.0044	Cost Management
HE.0055	Cross training
HE.0065	Data Collection/Input
HE.0083	Enterprise Resource Planning (ERP)
HE.0103	Flow Manufacturing
HE.0114	Hoshin Kanri
HE.0133	Inventory Valuation/Financial Analysis
HE.0138	Just-In-Time Inventory
HE.0139	Kanban System

HS.0065 Lean Manufacturing

HE.0144	Lean Manufacturing
HE.0149	Logistics sourcing strategy and contract management
HE.0159	Master Data/Document Management
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0190	Point of Use Storage
HE.0191	Preventative Maintenance
HE.0192	Process Engineering
HE.0194	Process management
HE.0206	Pull Systems
HE.0208	Quality Management Systems
HE.0225	Root cause analysis
HE.0230	Sales and Operations Planning (S&OP)
HE.0243	Single Minute Exchange of Dies
HE.0247	Spreadsheet Management
HE.0250	Statistical control techniques
HE.0251	Statistical Modeling/Analysis
HE.0259	Supplier Data Exchange
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times
HE.0301	Value Stream Mapping
HE.0308	Water Spider
Trainings	
HT.0006	APICS CPIM
HT.0038	CTL
HT.0039	CTPAT
HT.0060	Forecasting Techniques
HT.0084	Lean Manufacturing Training
HT.0132	Six Sigma Certification
HT.0146	Taxes/Duties Education
HT.0160	APICS Principles of Manufacturing Management
Practices	
BP.003	Single-Minute Exchange of Die (SMED)

HS.0066 Legislation and Standards

Legislation and Standards affect many parts of the Source activity. The context here is receiving product and relates to general legislation affecting the product being received as well as the specific standards or specifications that applies to the product. Knowledge and experience is required to manage conformance systems and actions to be taken when out of conformance is detected.

Processes	
sS1.2	Receive Product
sS1.4	Transfer Product
sS2.2	Receive Product
sS2.4	Transfer Product
sS3.4	Receive Product
sS3.6	Transfer Product
sE1.3	Document Business Rule
sE4	Manage Supply Chain Human Resources
sE8	Manage Regulatory Compliance

Experiences	
HE.0084	Environmental, Health and Safety Systems
HE.0110	Government Regulations
HE.0134	ISO Compliance

Trainings	
HT.0006	APICS CPIM
HT.0038	CTL
HT.0039	CTPAT
HT.0060	Forecasting Techniques

Practices	
BP.147	Receiving Goods Inspection

HS.0067 Linear programming

The branch of mathematics concerned with the minimization or maximization of a linear function of several variables and inequalities; used in many branches of industry to minimize costs or maximize production

Processes	
sP5.3	Balance Return Resources with Return Requirements

Experiences	
HE.0083	Enterprise Resource Planning (ERP)
HE.0104	Forecasting
HE.0159	Master Data/Document Management
HE.0163	Modeling Techniques
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0230	Sales and Operations Planning (S&OP)
HE.0247	Spreadsheet Management

Trainings	
HT.0084	Lean Manufacturing Training

Practices	
BP.014	Demand Planning & Forecasting
BP.183	Integrated Business Planning

HS.0068 Load Building

The process of order consolidation to meet service, cost, delivery and product specification requirements.

Processes	
sD1.5	Build Loads
sD2.5	Build Loads
sD3.5	Build Loads

Experiences	
HE.0071	Dispatch procedures
HE.0112	Hazardous Materials Handling
HE.0147	Load building process and control
HE.0167	Negotiation

Trainings	
HT.0006	APICS CPIM
HT.0038	CTL
HT.0060	Forecasting Techniques

Practices	
BP.089	Perfect Pick Put away

HS.0069 Logistics Management

The process for planning, implementing, and controlling the efficient, effective, forward, and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements and thus add value for the customer.

Processes	
sP5.4	Establish and Communicate Return Plans
sS1.1	Schedule Product Deliveries
sS1.2	Receive Product
sS1.4	Transfer Product
sS2.1	Schedule Product Deliveries
sS2.2	Receive Product
sS2.4	Transfer Product
sS2.5	Authorize Supplier Payment
sS3.3	Schedule Product Deliveries
sS3.4	Receive Product
sS3.6	Transfer Product
sS3.7	Authorize Supplier Payment
sM1.5	Stage Product
sM1.6	Release Product to Deliver
sM2.5	Stage Finished Product
sM2.6	Release Finished Product to Deliver
sM3.6	Stage Finished Product
sM3.7	Release Product to Deliver
sD1.7	Select Carriers and Rate Shipments
sD1.11	Load Vehicle and Generate Shipping Documents
sD2.7	Select Carriers and Rate Shipments
sD2.11	Load Product & Generate Shipping Docs
sD3.7	Select Carriers & Rate Shipments
sD3.11	Load Product & Generate Shipping Docs
sD4.1	Generate Stocking Schedule
sSR1.3	Request Defective Product Return Authorization
sSR1.4	Schedule Defective Product Shipment
sSR1.5	Return Defective Product
sDR1.2	Schedule Defective Return Receipt
sDR1.3	Receive Defective Product (includes verify)
sSR2.3	Request MRO Return Authorization
sSR2.4	Schedule MRO Shipment

HS.0069 Logistics Management

sSR2.5	Return MRO Product
sDR2.1	Authorize MRO Product Return
sDR2.2	Schedule MRO Return Receipt
sSR3.3	Request Excess Product Return Authorization
sSR3.4	Schedule Excess Product Shipment
sSR3.5	Return Excess Product
sDR3.1	Authorize Excess Product Return
sDR3.2	Schedule Excess Return Receipt
sDR3.3	Receive Excess Product

Experiences	
HE.0002	Accounting
HE.0009	Bar Coding/RFID
HE.0017	Business Rules/Regulatory Policy/Company Return Policy
HE.0020	Carrier Agreement Implementation
HE.0021	Carrier performance management
HE.0039	Contract Administration/Management
HE.0044	Cost Management
HE.0046	Cost/Benefit Analysis
HE.0053	CRM Methods and Tools
HE.0068	Delivery Scheduling
HE.0083	Enterprise Resource Planning (ERP)
HE.0095	Excess product handling
HE.0097	External Supplier Systems Interface
HE.0099	Finance
HE.0100	Financial Accounting
HE.0104	Forecasting
HE.0107	Freight Management
HE.0117	Import/Export Regulations
HE.0123	Industry Specific Regulatory Knowledge
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0152	Management of service Strategy agreements with customers
HE.0159	Master Data/Document Management
HE.0163	Modeling Techniques
HE.0165	MS Office (Excel, PowerPoint, Word, Access)

HE.0167	Negotiation
HE.0184	Performance/Cost Trade-offs
HE.0204	Production Planning/Scheduling
HE.0216	Regulatory Policies/Compliance
HE.0221	Return Process
HE.0230	Sales and Operations Planning (S&OP)
HE.0239	Service Provider Agreements
HE.0242	Shipping Document Creation/Management
HE.0247	Spreadsheet Management
HE.0258	Supplier Certification
HE.0282	Transportation Inbound/Outbound
HE.0283	Transportation Consolidation
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times
HE.0285	Transportation Paperwork
HE.0287	Transportation Rating/Pricing
HE.0289	Transportation Scheduling
HE.0290	Transportation Tracking
HE.0292	Transportation/Freight Management
HE.0293	Transportation/Warehouse Management systems (TMS/WMS)
HE.0305	Warehouse/Distribution Management
HE.0311	Written/Verbal Communication

Trainings	
HT.0003	Advanced Negotiations/Collaborative Planning
HT.0005	Agreement construct/Legal requirements
HT.0006	APICS CPIM
HT.0008	Automation Tools
HT.0022	CAPS
HT.0024	Certification Schemes
HT.0028	Contract Management
HT.0033	Cost/Price Analysis
HT.0036	Cross Docking
HT.0043	Electronic Data Exchange Systems
HT.0044	Electronic Identification Systems
HT.0046	Engineering
HT.0047	Enterprise & Material Resource Planning Systems

HS.0069 Logistics Management

HT.0049	Enterprise Strategic Business Rules
HT.0052	ERP Systems Training
HT.0056	Federal/National/International Regulatory Compliance
HT.0076	Inventory Management
HT.0080	ISO Certification
HT.0084	Lean Manufacturing Training
HT.0090	Logistics Operations
HT.0091	Managing Hazardous Materials
HT.0098	MRP Systems training
HT.0102	Negotiation Skills
HT.0104	Occupational Safety & Health
HT.0106	Packaging and palletizing
HT.0112	Project Management
HT.0114	Quality Management Systems
HT.0117	Requirements traceability
HT.0123	Safety and Environmental Management (industry specific, company specific and country specific)
HT.0127	SCOR-P Certification
HT.0128	SCORmark
HT.0132	Six Sigma Certification
HT.0142	Supply Chain Management
HT.0151	Trade-offs in Logistics Costs
HT.0155	Warehouse Management
HT.0157	APICS Principles of Distribution and Logistics
Practices	
BP.015	Safety Stock Planning
BP.016	Supply Network Planning
BP.024	Supply Chain Optimization (SCO)
BP.115	Transportation Management System
BP.147	Receiving Goods Inspection

HS.0070 Logistics network modeling

The process of planning, implementing, and controlling the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements.

Processes	
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sP4.2	Identify, Assess and Aggregate Delivery Resources
sP4.3	Balance Delivery Resources and Capabilities with Delivery Requirements
sP4.4	Establish Delivery Plans
sP5.1	Assess and Aggregate Return Requirements
sP5.2	Identify, Assess and Aggregate Return Resources
sE7	Manage Supply Chain Network

Experiences	
HE.0083	Enterprise Resource Planning (ERP)
HE.0159	Master Data/Document Management
HE.0163	Modeling Techniques
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0180	Packaging Configuration and Palletizing
HE.0247	Spreadsheet Management
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times
HE.0293	Transportation/Warehouse Management systems (TMS/WMS)

Trainings	
HT.0028	Contract Management
HT.0029	Contract Negotiation
HT.0036	Cross Docking
HT.0043	Electronic Data Exchange Systems
HT.0044	Electronic Identification Systems
HT.0049	Enterprise Strategic Business Rules
HT.0052	ERP Systems Training
HT.0056	Federal/National/International Regulatory Compliance
HT.0063	General Accounting
HT.0065	Green Procurement
HT.0076	Inventory Management
HT.0084	Lean Manufacturing Training
HT.0090	Logistics Operations
HT.0098	MRP Systems training

HS.0070 Logistics network modeling

HT.0104	Occupational Safety & Health
HT.0112	Project Management
HT.0114	Quality Management Systems
HT.0120	Risk Management
HT.0127	SCOR-P Certification
HT.0132	Six Sigma Certification
HT.0139	Subcontracting Management
HT.0142	Supply Chain Management
HT.0153	Transportation/Logistics

Practices	
BP.014	Demand Planning & Forecasting
BP.016	Supply Network Planning
BP.024	Supply Chain Optimization (SCO)
BP.183	Integrated Business Planning
BP.184	Scenario Planning

HS.0071 Logistics/Freight

Working knowledge of the management and integration of information, sourced product/material, transportation, inventory, warehousing, material-handling, and packaging, and occasionally security, between the point of origin and the point of consumption in order to meet customer requirements.

Processes	
sS1.2	Receive Product
sS2.2	Receive Product
sS3.4	Receive Product

Experiences	
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times

Trainings	
HT.0056	Federal/National/International Regulatory Compliance
HT.0080	ISO Certification
HT.0142	Supply Chain Management
HT.0157	APICS Principles of Distribution and Logistics

Practices	
BP.089	Perfect Pick Put away
BP.115	Transportation Management System

HS.0072 Performance Management

A framework that identifies opportunities for performance improvement through use of performance measures such as standards and indicators.

Processes	
sE2	Manage Performance
sE2.1	Initiate Reporting
sE2.2	Analyze Reports
sE2.3	Find Root Causes
sE2.4	Prioritize Root Causes
sE2.5	Develop Corrective Actions
sE2.6	Approve & Launch
sE4	Manage Supply Chain Human Resources
sE6	Manage Supply Chain Contracts
sE7	Manage Supply Chain Network
sE7.2	Gather Input and Data

Experiences	
HE.0153	Managing and Measuring Performance
HE.0172	Operations

Trainings	
HT.0032	Cost Reduction Efforts
HT.0073	Introduction to Supply Chain
HT.0157	APICS Principles of Distribution and Logistics
HT.0158	APICS Principles of Inventory Management

Practices	
BP.145	Vendor Collaboration

HS.0073 Manufacturing Resource Commitment

The efficient and effective allocation of an organization's manufacturing resources and assets with the objective of meeting customer demands/requirements.

Processes	
sD3.3	Enter Order, Commit Resources & Launch Program

Experiences	
HE.0083	Enterprise Resource Planning (ERP)
HE.0204	Production Planning/Scheduling

Practices	
BP.015	Safety Stock Planning
BP.020	Demand Management
BP.091	Work Center Load Evaluation
BP.092	Balance and firm within horizon

HS.0074 Master Scheduling

Knowledge of coordinating and keeping track of all the different components related to the Source activity. Individual activities e.g. deliveries, orders, clearances, contract negotiations etc. will have their own schedules but an overall perspective needs to be maintained both for the Source activity and the smooth operation of the whole Supply Chain

Processes	
sS1.1	Schedule Product Deliveries
sS1.5	Authorize Supplier Payment
sS2.1	Schedule Product Deliveries
sS2.5	Authorize Supplier Payment
sS3.3	Schedule Product Deliveries
sS3.7	Authorize Supplier Payment

Experiences	
HE.0009	Bar Coding/RFID
HE.0017	Business Rules/Regulatory Policy/Company Return Policy
HE.0032	Computer Literate
HE.0083	Enterprise Resource Planning (ERP)
HE.0084	Environmental, Health and Safety Systems
HE.0160	Material Resource Planning (MRP)

Trainings	
HT.0005	Agreement construct/Legal requirements
HT.0021	Capacity Management (Aggregate Planning)
HT.0024	Certification Schemes
HT.0029	Contract Negotiation
HT.0044	Electronic Identification Systems
HT.0046	Engineering
HT.0049	Enterprise Strategic Business Rules
HT.0052	ERP Systems Training
HT.0056	Federal/National/International Regulatory Compliance
HT.0076	Inventory Management
HT.0080	ISO Certification
HT.0084	Lean Manufacturing Training
HT.0090	Logistics Operations
HT.0091	Managing Hazardous Materials
HT.0098	MRP Systems training
HT.0114	Quality Management Systems
HT.0132	Six Sigma Certification
HT.0161	APICS Principles of Operations Planning

HS.0074 Master Scheduling

Practices	
BP.019	Demand Planning
BP.020	Demand Management
BP.021	Sales and Operations Planning
BP.022	MRP I
BP.090	Days of Supply Based MRP Proposal Management
BP.183	Master Scheduling

HS.0075 Material handling equipment usage

The ability to manipulate various types of material handling systems (e.g. forklifts, conveyors, palletizers, etc.) to pick, pack, and store orders and inventory.

Processes	
sD1.8	Receive Product from Source or Make
sD1.9	Pick Product
sD1.10	Pack Product
sD1.11	Load Vehicle and Generate Shipping Documents
sD2.8	Receive Product from Source or Make
sD2.9	Pick Product
sD2.10	Pack Product
sD2.11	Load Product & Generate Shipping Docs
sD3.8	Receive Product from Source or Make
sD3.9	Pick Product
sD3.10	Pack Product
sD3.11	Load Product & Generate Shipping Docs
sD4.2	Receive Product at Store
sD4.3	Pick Product from backroom
sD4.4	Stock Shelf
sD4.7	Deliver and/or install
sDR2.4	Transfer MRO Product

Experiences	
HE.0009	Bar Coding/RFID
HE.0066	Data/Document Management
HE.0105	Forklift or Other Material Handling Equipment Experience
HE.0131	Inventory Management
HE.0202	Product/Supplier Knowledge
HE.0227	Safety Requirements
HE.0305	Warehouse/Distribution Management

HS.0075 Material handling equipment usage

Trainings	
HT.0001	Advanced Accounting principles
HT.0004	Advertising Methodologies
HT.0006	APICS CPIM
HT.0015	Blanket Purchase Agreements
HT.0028	Contract Management
HT.0049	Enterprise Strategic Business Rules
HT.0052	ERP Systems Training
HT.0063	General Accounting
HT.0064	General Procurement & Subcontracting
HT.0079	ISM CPSM
HT.0084	Lean Manufacturing Training
HT.0098	MRP Systems training
HT.0108	Procurement/Subcontracting On Job Training
HT.0114	Quality Management Systems
HT.0127	SCOR-P Certification
HT.0132	Six Sigma Certification
HT.0142	Supply Chain Management
HT.0153	Transportation/Logistics
HT.0157	APICS Principles of Distribution and Logistics

HS.0076 Milestone/Performance Payments

Working knowledge of contractual requirements for the authorization of monetary payments for the successful completion of pre-defined development or performance milestones

Processes	
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
Experiences	
HE.0262	Supplier Performance Assessment
Trainings	
HT.0056	Federal/National/International Regulatory Compliance
HT.0057	Financial Accounting
HT.0065	Green Procurement
HT.0078	IP, Technology patents and copyrights

HS.0077 MPS Methodologies and Techniques

The techniques used in material requirements planning systems to develop a detailed plan for product manufacturing. The master production schedule takes account of the requirements of various departments, including sales (delivery dates), finance (inventory minimization), and manufacturing (minimization of setup times) to schedules production and the purchasing of materials within the capacity of and resources available to the production system.

Processes	
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources
sP3.1	Identify, Prioritize and Aggregate Production Requirements
Experiences	
HE.0012	Bills of Material/Specs/Fabrication Methodology
HE.0019	Capital planning
HE.0083	Enterprise Resource Planning (ERP)
HE.0096	Existing internal metrics and relationships
HE.0142	Lead time management
HE.0150	Make/Buy decision analysis
HE.0160	Material Resource Planning (MRP)
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0230	Sales and Operations Planning (S&OP)
HE.0247	Spreadsheet Management
Trainings	
HT.0028	Contract Management
HT.0057	Financial Accounting
HT.0064	General Procurement & Subcontracting
HT.0080	ISO Certification
HT.0108	Procurement/Subcontracting On Job Training
HT.0127	SCOR-P Certification
HT.0161	APICS Principles of Operations Planning
Practices	
BP.022	MRP I

HS.0078 Maintenance, Repair, and Operations (MRO) Management

All actions which have the objective of retaining or restoring an item in or to a state in which it can perform its required function. The actions include the combination of all technical and corresponding administrative, managerial, and supervision actions

Experiences	
HE.0164	MRO management

Practices	
BP.168	Rotable Spares Pool
BP.169	Beyond Economic Repair (BER) Management

HS.0079 MRP Systems

The process of ensuring materials and products are available for production and delivery to customers, maintaining the lowest possible level of inventory and planning manufacturing activities, delivery schedules and purchasing activities.

Processes	
sS1.4	Transfer Product
sM1.4	Package
sM3.2	Schedule Production Activities
sM3.3	Issue Sourced/In-Process Product

Experiences	
HE.0016	Business plans
HE.0036	Construction reasoning
HE.0075	DOT/EPA
HE.0104	Forecasting
HE.0158	Master build plan
HE.0160	Material Resource Planning (MRP)
HE.0203	Production build process

Trainings	
HT.0001	Advanced Accounting principles
HT.0010	Basic and Advanced Finance
HT.0028	Contract Management
HT.0046	Engineering
HT.0094	Material Planning Process
HT.0116	Regulatory Compliance
HT.0158	APICS Principles of Inventory Management
HT.0160	APICS Principles of Manufacturing Management

Practices	
BP.015	Safety Stock Planning
BP.019	Demand Planning
BP.020	Demand Management
BP.088	360 Degree Closure
BP.090	Days of Supply Based MRP Proposal Management
BP.092	Balance and firm within horizon
BP.183	Balance and firm within horizon

HS.0080 MSDS/CoC/BoL/Environmental Interpretation

Working knowledge and understanding of strict regulatory adherence to health and environmental requirements/restrictions associated with particular products as detailed on Material Safely Data Sheets (MSDS) or Certificates of Compliance CoC), throughout product ordering, receipt, storage, stage, transport and final delivery.

Processes	
sS1.1	Schedule Product Deliveries
sS1.2	Receive Product
sS1.3	Verify Product
sS1.4	Transfer Product
sS2.1	Schedule Product Deliveries
sS2.2	Receive Product
sS2.4	Transfer Product
sS3.3	Schedule Product Deliveries
sS3.4	Receive Product
sS3.5	Verify Product
sS3.6	Transfer Product

Experiences	
HE.0112	Hazardous Materials Handling
HE.0227	Safety Requirements

Trainings	
HT.0028	Contract Management
HT.0064	General Procurement & Subcontracting
HT.0087	Legal Rules
HT.0108	Procurement/Subcontracting On Job Training
HT.0132	Six Sigma Certification

HS.0081 Office automation tools

Familiarity with relevant Office Automation Tools and be able to deploy against financial justification as appropriate taking account of project and change management requirements. Office Automation Tools are defined as all tools and methods that can be applied to office activities which make it possible to improve effectiveness or efficiency of those activities.

Processes	
sS1.3	Verify Product
sS3.5	Verify Product
sE3	Manage Data and Information

Experiences	
HE.0165	MS Office (Excel, PowerPoint, Word, Access)

Trainings	
HT.0108	Procurement/Subcontracting On Job Training
HT.0132	Six Sigma Certification

HS.0082 Optimization

The process of improving various aspects of the business resulting in (such as) increased profits, improved product or greater customer satisfaction.

Processes	
sM1.1	Schedule Production Activities
sM2.1	Schedule Production Activities
sE2	Manage Performance
sE7	Manage Supply Chain Network
sE7.3	Develop Scenarios
sE7.4	Model/Simulate Scenarios

Experiences	
HE.0018	Capacity planning
HE.0046	Cost/Benefit Analysis
HE.0083	Enterprise Resource Planning (ERP)
HE.0119	Industrial engineering
HE.0122	Industry Specific Knowledge and Experience
HE.0174	Optimization software
HE.0233	SCOR
HE.0268	Supply Chain Management

Trainings	
HT.0048	Enterprise Optimization
HT.0060	Forecasting Techniques
HT.0065	Green Procurement
HT.0084	Lean Manufacturing Training
HT.0116	Regulatory Compliance
HT.0149	Techniques of Detailed Capacity Planning Process

Practices	
BP.015	Safety Stock Planning
BP.020	Demand Management
BP.024	Supply Chain Optimization (SCO)

HS.0083 Order Management

The process or the work flow associated with the identification, receipt, acceptance, picking, packing, delivery and of the packed item(s) to a shipping carrier.

Processes	
sS1.1	Schedule Product Deliveries
sS2.1	Schedule Product Deliveries
sS2.2	Receive Product
sS3.3	Schedule Product Deliveries
sD1.3	Reserve Inventory and Determine Delivery Date
sD1.4	Consolidate Orders
sD2.3	Reserve Inventory and Determine Delivery Date
sD2.4	Consolidate Orders
sD3.3	Enter Order, Commit Resources & Launch Program
sDR2.1	Authorize MRO Product Return
DR2.2	Schedule MRO Return Receipt
sDR2.3	Receive MRO Product
sDR2.4	Transfer MRO Product

Experiences	
HE.0031	Company terms and conditions
HE.0053	CRM Methods and Tools
HE.0078	Electronic Data Interchange (EDI) Systems HE.0083 Enterprise Resource Planning (ERP)
HE.0098	Fast track, partial delivery
HE.0106	Forwarder management
HE.0167	Negotiation
HE.0175	Order Management
HE.0204	Production Planning/Scheduling
HE.0238	Service level calculation tools and metrics
HE.0270	Supply chain planning
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times
HE.0289	Transportation Scheduling

HS.0083 Order Management

Trainings	
HT.0003	Advanced Negotiations/Collaborative Planning
HT.0025	Communicating Customer & Supplier Information
HT.0033	Cost/Price Analysis
HT.0047	Enterprise & Material Resource Planning Systems
HT.0049	Enterprise Strategic Business Rules
HT.0056	Federal/National/International Regulatory Compliance
HT.0084	Lean Manufacturing Training
HT.0108	Procurement/Subcontracting On Job Training
HT.0112	Project Management
HT.0127	SCOR-P Certification
HT.0128	SCORmark
HT.0157	APICS Principles of Distribution and Logistics
HT.0161	APICS Principles of Operations Planning

Practices	
BP.088	360 Degree Closure
BP.089	Perfect Pick Put away
BP.090	Days of Supply Based MRP Proposal Management
BP.114	Order Quotation System
BP.115	Transportation Management System
BP.144	Purchase Order Management
BP.145	Vendor Collaboration
BP.168	Rotable Spares Pool

HS.0085 Outsourcing

A company that contracts with another company to provide services that might otherwise be performed by in-house employees

Processes	
sE4	Manage Supply Chain Human Resources
sE5	Manage Supply Chain Assets
sE6	Manage Supply Chain Contracts
sE7	Manage Supply Chain Network
sE7.3	Develop Scenarios
Experiences	
HE.0179	Outsourcing
HE.0258	Supplier Certification
Trainings	
HT.0105	Outsourcing
HT.0157	APICS Principles of Distribution and Logistics
Practices	
BP.013	Item Rationalization
BP.184	Scenario Planning

HS.0086 Packaging

The processes of coordinating a system of preparing goods for transport, warehousing, logistics, sale, and end use. This process includes any written, electronic, or graphic communications on the packaging or on a separate but associated label.

Processes	
sS1.4	Transfer Product
sS2.4	Transfer Product
sS3.6	Transfer Product
sM1.4	Package
sM2.4	Package
sM3.5	Package

Experiences	
HE.0037	Container optimization
HE.0119	Industrial engineering
HE.0148	Local/national/global transportation guidelines
HE.0180	Packaging Configuration and Palletizing

Trainings	
HT.0043	Electronic Data Exchange Systems
HT.0076	Inventory Management
HT.0080	ISO Certification
HT.0104	Occupational Safety & Health
HT.0108	Procurement/Subcontracting On Job Training
HT.0112	Project Management
HT.0114	Quality Management Systems
HT.0120	Risk Management
HT.0157	APICS Principles of Distribution and Logistics

HS.0087 Payment Processing

Working knowledge of the processes and policies required for contractual authorization of payments for sourced products and services. This includes basic financial accounting practices.

Processes	
sS2.1	Schedule Product Deliveries
sS2.5	Authorize Supplier Payment
sS3.7	Authorize Supplier Payment
sD4.6	Checkout

Experiences	
HE.0002	Accounting
HE.0066	Data/Document Management
HE.0083	Enterprise Resource Planning (ERP)
HE.0220	Retail payment management

Trainings	
HT.0010	Basic and Advanced Finance
HT.0028	Contract Management
HT.0056	Federal/National/International Regulatory Compliance
HT.0084	Lean Manufacturing Training
HT.0127	SCOR-P Certification
HT.0139	Subcontracting Management
HT.0142	Supply Chain Management

Practices	
BP.148	3-Way Delivery Verification

HS.0088 Physical Capability

The ability to complete a process through the use of dexterity, strength or other capacities.

Processes	
sM1.2	Issue Material
sM2.2	Issue Sourced/In-Process Product

Experiences	
HE.0105	Forklift or Other Material Handling Equipment Experience
HE.0135	Item crib management

Trainings	
HT.0043	Electronic Data Exchange Systems
HT.0044	Electronic Identification Systems

HS.0089 Physical Distribution Systems

The set of activities concerned with efficient movement of finished goods from the end of the production operation to the consumer.

Experiences	
HE.0023	Carrier selection & qualification
HE.0138	Just-In-Time Inventory
HE.0144	Lean Manufacturing
HE.0157	Marketing
HE.0169	Network Optimization
HE.0205	Project Management
HE.0233	SCOR
HE.0297	Utilizing Customer Relationship Management System
Trainings	
HT.0074	Inventory Centralization
HT.0081	Just - In - Time (JIT)
HT.0084	Lean Manufacturing Training
HT.0107	Physical Distribution Systems
HT.0126	SCOR

HS.0090 Picking process / order batching

The process of selecting and collecting SKUs and materials in a specified order and quantity with the objective of satisfying customers' orders.

Processes	
sD4.3	Pick Product from backroom
sD4.5	Fill Shopping Cart

Experiences	
HE.0066	Data/Document Management
HE.0131	Inventory Management
HE.0187	Planogram tool usage

Trainings	
HT.0091	Managing Hazardous Materials
HT.0106	Packaging and palletizing
HT.0114	Quality Management Systems
HT.0132	Six Sigma Certification
HT.0155	Warehouse Management

Practices	
BP.089	Perfect Pick Put away

HS.0091 Planogram usage and strategies

The process of using a planogram to diagram fixtures and products to illustrate how and where retail products should be displayed, usually on a store shelf in order to increase customer purchases

Processes	
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sD4.1	Generate Stocking Schedule

Experiences	
HE.0131	Inventory Management
HE.0159	Master Data/Document Management
HE.0163	Modeling Techniques
HE.0204	Production Planning/Scheduling
HE.0247	Spreadsheet Management
HE.0253	Stocking plan management

Trainings	
HT.0006	APICS CPIM
HT.0084	Lean Manufacturing Training
HT.0114	Quality Management Systems
HT.0127	SCOR-P Certification

HS.0092 Pricing Management

The analysis and setting of prices (on a per unit or volume basis) to meet required characteristics, business rules and/or business performance requirements.

Processes	
sD1.1	Process Inquiry and Quote
sD1.2	Receive, Enter, and Validate Order
sD2.1	Process Inquiry and Quote
sD2.2	Receive, Configure, Enter and Validate Order

Experiences	
HE.0030	Company Pricing/Margin Policy
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0167	Negotiation
HE.0177	Order-to-cash process

Trainings	
HT.0049	Enterprise Strategic Business Rules
HT.0052	ERP Systems Training
HT.0098	MRP Systems training

Practices	
BP.114	Order Quotation System
BP.132	Issue Invitation to Tender (Quote)
BP.134	Supplier Evaluation using Robust Evaluation Tool.
BP.148	3-Way Delivery Verification
BP.184	Scenario Planning

HS.0093 Prioritization

The knowledge and ability to arrange process steps, jobs or orders in queue, or product receipts in the proper sequence in order to meet product/service production and deliveries as scheduled.

Processes	
sS1.1	Schedule Product Deliveries
sS2.1	Schedule Product Deliveries
sS3.3	Schedule Product Deliveries
sE7	Manage Supply Chain Network

Experiences	
HE.0017	Business Rules/Regulatory Policy/Company Return Policy
HE.0190	Point of Use Storage

Trainings	
HT.0028	Contract Management
HT.0041	Disposition Resolution
HT.0114	Quality Management Systems

Practices	
BP.184	Scenario Planning

HS.0094 Procurement

Working knowledge of the process for acquiring goods and/or services at the best possible total cost of ownership, in the right quantity, quality, at the right time and in the right place, with all required documentation. This may include simple repetitive Make-to-Stock purchases or more complex Make- to-Order or Engineer-to-Order products.

Processes	
sS1.1	Schedule Product Deliveries
sS2.1	Schedule Product Deliveries
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
sD1.1	Process Inquiry and Quote
sD2.1	Process Inquiry and Quote
sD3.1	Obtain and Respond to RFP/RFQ
sE6	Manage Supply Chain Contracts

Experiences	
HE.0011	Basic Procurement
HE.0017	Business Rules/Regulatory Policy/Company Return Policy
HE.0083	Enterprise Resource Planning (ERP)
HE.0087	Establishing Commercial Requirements
HE.0088	Establishing Effective SOW, Specifications, and Evaluation Criteria
HE.0092	Establishing Source and Evaluation Criteria
HE.0100	Financial Accounting
HE.0109	Funnel update/ management
HE.0210	Quotation/CRM tool
HE.0275	Technical Data Understanding

Trainings	
HT.0006	APICS CPIM
HT.0015	Blanket Purchase Agreements
HT.0017	Business model and sales channel
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0028	Contract Management
HT.0049	Enterprise Strategic Business Rules
HT.0063	General Accounting
HT.0079	ISM CPSM

HS.0094 Procurement

HT.0084	Lean Manufacturing Training
HT.0102	Negotiation Skills
HT.0109	Product Specific Training
HT.0127	SCOR-P Certification
HT.0132	Six Sigma Certification
HT.0142	Supply Chain Management
HT.0145	Supply Chain Security
HT.0153	Transportation/Logistics
HT.0158	APICS Principles of Inventory Management

Practices	
BP.144	Purchase Order Management
BP.132	Issue Invitation to Tender (Quote)
BP.134	Supplier Evaluation using Robust Evaluation Tool.

HS.0095 Product and Configuration Validation

The analysis of stated product and configuration specifications against required and feasible product's performance, functional, and physical requirements.

Processes	
sD1.2	Receive, Enter, and Validate Order
sD2.2	Receive, Configure, Enter and Validate Order
sE5.7	Inspect Maintenance

Experiences	
HE.0030	Company Pricing/Margin Policy
HE.0033	Configuration Management
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations

Trainings	
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0116	Regulatory Compliance

Practices	
BP.114	Order Quotation System
BP.168	Rotable Spares Pool

HS.0096 Product checkout process

The process of removing a product from inventory and exchanging funds for the value of the product in a retail supply chain

Processes	
sD4.6	Checkout

Experiences	
HE.0057	Customer Relationship Management (CRM)
HE.0066	Data/Document Management
HE.0131	Inventory Management
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations

Trainings	
HT.0102	Negotiation Skills
HT.0109	Product Specific Training
HT.0116	Regulatory Compliance

HS.0097 Product Development (PDR, CDR)

Familiarity and awareness of the Product Development process and its key steps and the interaction with the Source activity. Where Product Development activities fall to suppliers ensure a seamless process with the product development specialists whilst managing commercial and logistical demands and expectations. Ensure that risk and reward are controlled throughout the process with suppliers.

Processes	
sS3.1	Identify Sources of Supply
Experiences	
HE.0274	Technical Collaboration
Trainings	
HT.0052	ERP Systems Training

HS.0098 Product Information Management (Product Data Management)

The use of software or other tools to capture and maintain information on products and/or services through their life cycle.

Processes	
sD1.1	Process Inquiry and Quote
sD2.1	Process Inquiry and Quote
sE3	Manage Data and Information

Experiences	
HE.0033	Configuration Management
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0188	PLM/PDM knowledge

Trainings	
HT.0109	Product Specific Training

Practices	
BP.013	Item Rationalization
BP.166	Document Management System

HS.0099 Production

The process of using machines, tools, materials and labor to make things for use or sale.

Processes	
sM1.3	Produce and Test
sM2.1	Schedule Production Activities
sM2.3	Produce and Test
sM3.4	Produce and Test
Experiences	
HE.0122	Industry Specific Knowledge and Experience
Trainings	
HT.0102	Negotiation Skills
HT.0116	Regulatory Compliance
HT.0159	APICS Principles of Managing Operations
HT.0160	APICS Principles of Manufacturing Management
HT.0161	APICS Principles of Operations Planning
Practices	
BP.088	360 Degree Closure

HS.0101 Production Planning

Actions, tasks and responsibilities concerned with the planning, scheduling and releasing of production orders in order to satisfy demand while optimizing the available and planned resources/ capacity.

Processes	
sSR3.1	Identify Excess Product Condition
Experiences	
HE.0176	Order Processing System/Enterprise Resource Planning Systems Usage (ERP) System
Trainings	
HT.0020	Capability & Organization Risks
HT.0161	APICS Principles of Operations Planning
Practices	
BP.020	Demand Management
BP.090	Days of Supply Based MRP Proposal Management
BP.092	Balance and firm within horizon

HS.0102 Production Planning Capacity Utilization

The process of determining the production capacity, maximum amount of work that an organization is capable of completing in a given period of time, needed by an organization to meet changing demands for its products.

Processes	
sP2.1	Identify, Prioritize and Aggregate Product Requirements
sP2.2	Identify, Assess and Aggregate Product Resources
sP2.3	Balance Product Resources with Product Requirements
sP2.4	Establish Sourcing Plans
sP3.1	Identify, Prioritize and Aggregate Production Requirements
sP3.2	Identify, Assess and Aggregate Production Resources
sP3.3	Balance Production Resources with Production Requirements
sP3.4	Establish Production Plans

Experiences	
HE.0059	Customer Service Strategy Agreements
HE.0083	Enterprise Resource Planning (ERP)
HE.0085	EOQ management
HE.0159	Master Data/Document Management
HE.0160	Material Resource Planning (MRP)
HE.0162	Materials portfolio and specifications
HE.0163	Modeling Techniques
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0167	Negotiation
HE.0204	Production Planning/Scheduling
HE.0209	Quality processes related to inventory management (test times, shelf life)
HE.0230	Sales and Operations Planning (S&OP)
HE.0247	Spreadsheet Management
HE.0251	Statistical Modeling/Analysis
HE.0263	Supplier production and lead time capabilities
HE.0265	Supplier Service Strategy Agreements

HS.0102 Production Planning Capacity Utilization

Trainings	
HT.0006	APICS CPIM
HT.0017	Business model and sales channel
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0042	Distribution and warehousing policies
HT.0052	ERP Systems Training
HT.0061	Fork Truck Licensing
HT.0084	Lean Manufacturing Training
HT.0089	Logistics Management
HT.0102	Negotiation Skills
HT.0109	Product Specific Training
HT.0116	Regulatory Compliance
HT.0118	Return Scheduling
HT.0119	Reverse Logistics
HT.0121	Routing and rating
HT.0127	SCOR-P Certification
HT.0132	Six Sigma Certification
HT.0145	Supply Chain Security
HT.0156	Warranty Policy Training

Practices	
BP.013	Item Rationalization
BP.019	Demand Planning
BP.020	Demand Management
BP.091	Work Center Load Evaluation
BP.183	Integrated Business Planning
BP.184	Scenario Planning

HS.0103 Production Scheduling

The process of efficiently managing the assets to minimize the production time and costs, by instructing a production facility what to make, when, with which staff, and on which equipment.

Processes	
sS1.1	Schedule Product Deliveries
sS2.1	Schedule Product Deliveries
sS3.3	Schedule Product Deliveries
sM1.1	Schedule Production Activities
sM2.1	Schedule Production Activities
sE5.1	Schedule Asset Management Activities

Experiences	
HE.0034	Conflict Resolution
HE.0044	Cost Management
HE.0083	Enterprise Resource Planning (ERP)
HE.0119	Industrial engineering
HE.0131	Inventory Management
HE.0160	Material Resource Planning (MRP)
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0208	Quality Management Systems
HE.0225	Root cause analysis
HE.0230	Sales and Operations Planning (S&OP)
HE.0311	Written/Verbal Communication

Trainings	
HT.0006	APICS CPIM
HT.0017	Business model and sales channel
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0046	Engineering
HT.0052	ERP Systems Training
HT.0071	Industry Specific Test Stand Certification
HT.0084	Lean Manufacturing Training
HT.0089	Logistics Management
HT.0095	Mechanic Certification
HT.0102	Negotiation Skills
HT.0109	Product Specific Training
HT.0116	Regulatory Compliance

HS.0103 Production Scheduling

HT.0119	Reverse Logistics
HT.0132	Six Sigma Certification
HT.0145	Supply Chain Security
Practices	
BP.019	Demand Planning
BP.090	Days of Supply Based MRP Proposal Management
BP.092	Balance and firm within horizon
BP.183	Integrated Business Planning

HS.0104 Progress & performance reporting

The definition, implementation, and usage of metrics designed to track and improve process performance

Processes	
sD1.8	Receive Product from Source or Make
sD1.9	Pick Product
sD1.10	Pack Product
sD2.8	Receive Product from Source or Make
sD2.9	Pick Product
sD2.10	Pack Product
sD3.8	Receive Product from Source or Make
sD3.9	Pick Product
sD3.10	Pack Product
sE5.1	Schedule Asset Management Activities

Experiences	
HE.0065	Data Collection/Input
HE.0305	Warehouse/Distribution Management

Trainings	
HT.0006	APICS CPIM
HT.0017	Business model and sales channel
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0052	ERP Systems Training
HT.0102	Negotiation Skills
HT.0109	Product Specific Training
HT.0116	Regulatory Compliance
HT.0119	Reverse Logistics
HT.0127	SCOR-P Certification
HT.0145	Supply Chain Security
HT.0156	Warranty Policy Training

HS.0105 Project Management

The discipline of planning, organizing, and managing resources to bring about the successful completion of specific project goals and objectives.

Processes	
sS3.1	Identify Sources of Supply
sD1.14	Install Product
sD2.14	Install Product
sD3.3	Enter Order, Commit Resources & Launch Program
sD3.14	Install Product
sE7.8	Launch Change Program

Experiences	
HE.0008	ATP logic/calculation
HE.0060	Customer Site Readiness Verification
HE.0090	Establishing Product Life Cycle
HE.0219	Resource and Installation Material Organization
HE.0274	Technical Collaboration
HE.0310	WIP Reporting

Trainings	
HT.0006	APICS CPIM
HT.0017	Business model and sales channel
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0040	Disposal procedure and environmental rules
HT.0052	ERP Systems Training
HT.0076	Inventory Management
HT.0089	Logistics Management
HT.0091	Managing Hazardous Materials
HT.0109	Product Specific Training
HT.0114	Quality Management Systems
HT.0116	Regulatory Compliance
HT.0119	Reverse Logistics
HT.0127	SCOR-P Certification
HT.0145	Supply Chain Security
HT.0159	APICS Principles of Managing Operations

Practices	
BP.132	Issue Invitation to Tender (Quote)

HS.0106 Property Control and Disposition

Working knowledge of policies, procedures and processes required for the purchase, receipt, transport, usage and safeguarding of all company assets, including inventory and other sourced products. This includes regulatory requirements for proper disposal or excess.

Processes	
sS1.2	Receive Product
sS1.3	Verify Product
sS1.4	Transfer Product
sS2.2	Receive Product
sS2.4	Transfer Product
sS3.4	Receive Product
sS3.5	Verify Product
sS3.6	Transfer Product
sE5	Manage Supply Chain Assets
sE5.1	Schedule Asset Management Activities
sE5.6	Decommission and Dispose

Experiences	
HE.0002	Accounting
HE.0084	Environmental, Health and Safety Systems
HE.0227	Safety Requirements

Trainings	
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0088	Load building and Planning
HT.0102	Negotiation Skills
HT.0109	Product Specific Training
HT.0116	Regulatory Compliance
HT.0121	Routing and rating
HT.0145	Supply Chain Security

HS.0107 Push Systems

Manufacturing system in which production is based on a projected production plan and where information flows from management to the market, the same direction in which the materials flow

Trainings	
HT.0157	APICS Principles of Distribution and Logistics
HT.0160	APICS Principles of Manufacturing Management

HS.0108 Quality Management

The organizational structure, procedures, processes and resources needed to implement quality management.

Processes	
sS1.3	Verify Product
sS1.4	Transfer Product
sS2.1	Schedule Product Deliveries
sS2.3	Verify Product
sS2.4	Transfer Product
sS2.5	Authorize Supplier Payment
sS3.1	Identify Sources of Supply
sS3.3	Schedule Product Deliveries
sS3.5	Verify Product
sS3.6	Transfer Product
sS3.7	Authorize Supplier Payment
sM1.6	Release Product to Deliver
sM2.6	Release Finished Product to Deliver
sM3.7	Release Product to Deliver
sD1.13	Receive and verify Product by Customer
sD2.13	Receive and verify Product by Customer
sD3.13	Receive and verify Product by Customer
sD4.2	Receive Product at Store
sSR2.1	Identify MRO Product Condition
sDR2.3	Receive MRO Product
sE2	Manage Performance
sE5.1	Schedule Asset Management Activities
sE5.3	Inspect and Troubleshoot

Experiences	
HE.0017	Business Rules/Regulatory Policy/Company Return Policy
HE.0045	Cost Reduction Efforts
HE.0076	Economic Repair Assessment
HE.0091	Establishing Quality Requirements
HE.0144	Lean Manufacturing
HE.0153	Managing and Measuring Performance
HE.0172	Operations

HS.0108 Quality Management

HE.0201	Product Structure
HE.0208	Quality Management Systems
HE.0212	Receiving and Verifying Product
HE.0221	Return Process
HE.0231	Sampling methods
HE.0244	Six Sigma
HE.0252	Statistical Principles
Trainings	
HT.0020	Capability & Organization Risks
HT.0021	Capacity Management (Aggregate Planning)
HT.0053	Evaluating Performance of Production Operations
HT.0054	Evaluating Quality Management Process
HT.0114	Quality Management Systems
HT.0149	Techniques of Detailed Capacity Planning Process
HT.0150	Total Quality Management (TQM)
HT.0159	APICS Principles of Managing Operations
Practices	
BP.012	Lot Tracking
BP.088	360 Degree Closure
BP.147	Receiving Goods Inspection

HS.0110 Receiving

The process of systemically and physically moving materials from an in-bound supply source to a short or long-term intermediate storage location.

Processes	
sD4.2	Receive Product at Store
sDR2.3	Receive MRO Product

Experiences	
HE.0017	Business Rules/Regulatory Policy/Company Return Policy
HE.0066	Data/Document Management
HE.0131	Inventory Management
HE.0187	Planogram tool usage
HE.0216	Regulatory Policies/Compliance

Trainings	
BP.0157	APICS Principles of Distribution and Logistics
BP.0158	APICS Principles of Inventory Management

Practices	
BP.088	360 Degree Closure
BP.072	Inbound RMA-enabled Processing
BP.073	Returns Receiving Refurbishment
BP.089	Perfect Pick Put away
BP.147	Receiving Goods Inspection

HS.0111 Regulatory Policy Management

Actions, tasks and responsibilities concerned with a set of quality/legal/administrative/internal rules and standards to be complied with

Processes	
sSR1.1	Identify Defective Product Condition
sE8	Manage Regulatory Compliance

Experiences	
HE.0216	Regulatory Policies/Compliance

HS.0112 Requirements acceptance criteria

Ability to understand, interpret and effectively communicate to contractors, suppliers, or vendors product specifications and/or technical data which clearly delineates specific requirements regarding product acceptance.

Processes	
sS1.3	Verify Product
sS2.3	Verify Product
sS3.5	Verify Product

Experiences	
HE.0208	Quality Management Systems

Practices	
BP.147	Receiving Goods Inspection

HS.0113 Requirements allocation

Manage the allocation of defined specifications to materials and services being procured. Defined specifications will be straightforward. Generic specifications will require a level of understanding and liaison if need be with Technical personnel.

Processes	
sS1.3	Verify Product
sS3.5	Verify Product

Experiences	
HE.0012	Bills of Material/Specs/Fabrication Methodology

HS.0114 Requirements change control & change notification

Manage a system that ensures up to date specifications are available when required and that an audit trail back to suppliers and internal Quality exists.

Processes	
sS1.3	Verify Product
sS3.5	Verify Product

Experiences	
HE.0027	Change management system

Practices	
BP.166	Document Management System

HS.0115 Requirements criteria, verification methods & tools

Ability to manage all aspects of Requirements Criteria, Verification Methods and Tools. Requirements criteria is a statement of needs, rules, standards or tests that must be used in evaluating a decision, idea, opportunity, program, project etc. to form a correct judgment regarding the intended goal.

Processes	
sS1.3	Verify Product
sS2.3	Verify Product
sS3.5	Verify Product

Experiences	
HE.0183	Performance Reporting Systems Development/Use
HE.0208	Quality Management Systems
HE.0218	Requirements verification methods & tools

Practices	
BP.166	Document Management System

HS.0116 Requirements defect notification

To understand the importance of Requirements Defect Notification and to manage a system to monitor, analyze, highlight, and then notify for action, defects arising. Trend and pattern analysis is important as well as the correct flow of information to, and relationships with, suppliers.

Processes	
sS1.3	Verify Product
sS3.5	Verify Product

Experiences	
HE.0208	Quality Management Systems

Practices	
BP.147	Receiving Goods Inspection
BP.166	Document Management System

HS.0117 Requirements justification / rationale

Ability to assemble and then present internally and externally the Requirements Justification/ Rationale required for your organization concerning for example the quality requirements for a vital component/material supplied by a third party. Effective justifications/rationale will be linked to internal as well as external requirements and fulfil short, medium and longer term needs.

Processes	
sS1.3	Verify Product
sS2.3	Verify Product
sS3.5	Verify Product

Experiences	
HE.0208	Quality Management Systems

Practices	
BP.166	Document Management System

HS.0118 Requirements syntax, attributes, & baselines

Ability to demonstrate familiarity in the use of Requirements Syntax, Attributes & Baselines. For example, attributes to be considered would include: - feasible, traceable one level higher, complete, testable, unambiguous etc.

Processes	
sS1.3	Verify Product
sS2.3	Verify Product
sS3.5	Verify Product

Experiences	
HE.0279	Technical writing of requirements deliverables

Practices	
BP.166	Document Management System

HS.0119 Return Management

Ability to execute the process of identifying and handling products or material which require return or disposal, regardless if it is a return for warranty repairs, damaged or defective goods (including expired shelf life), or maintenance, repair and overhaul (MRO). This process requires to be executed with strict compliance with all contractual terms and conditions, regulatory, and environmental (and green) restrictions.

Processes	
sS1.2	Receive Product
sS1.3	Verify Product
sS1.4	Transfer Product
sS2.2	Receive Product
sS2.4	Transfer Product
sS3.4	Receive Product
sS3.5	Verify Product
sS3.6	Transfer Product

Experiences	
HE.0146	Legal Impact
HE.0221	Return Process
HE.0257	Supplier & shipping agreements

Practices	
BP.073	Returns Receiving Refurbishment
BP.072	Inbound RMA-enabled Processing
BP.025	Self-Service Warranty Claim Submittal
BP.140	Return Authorization Required
BP.141	Proactive Return Authorization
BP.142	Remote Return Authorization
BP.147	Receiving Goods Inspection
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool

HS.0120 Return Plan Aggregation

The process of developing, analyzing, and maintaining an organizational return plan.

Processes	
sP5.4	Establish and Communicate Return Plans

Experiences	
HE.0083	Enterprise Resource Planning (ERP)
HE.0159	Master Data/Document Management
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0247	Spreadsheet Management
HE.0293	Transportation/Warehouse Management systems (TMS/WMS)

Practices	
BP.167	Electronic Returns Tracking

HS.0121 Returns strategy development

A system for managing the returns of faulty products.

Processes	
sP5.3	Balance Return Resources with Return Requirements

Experiences	
HE.0001	ABC Accounting
HE.0083	Enterprise Resource Planning (ERP)
HE.0104	Forecasting
HE.0152	Management of service Strategy agreements with customers
HE.0159	Master Data/Document Management
HE.0163	Modeling Techniques
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0230	Sales and Operations Planning (S&OP)
HE.0247	Spreadsheet Management
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times
HE.0293	Transportation/Warehouse Management systems (TMS/WMS)

HS.0122 Reverse Logistics

End-to-end activities, responsibilities and tasks to accept, operationally process and successfully close the returns of products/materials because of unwanted product, defect, repair, refurbishing, recycling.

Processes	
sSR2.2	Disposition MRO Product
sSR2.3	Request MRO Return Authorization
sSR2.4	Schedule MRO Shipment
sSR2.5	Return MRO Product
sDR2.1	Authorize MRO Product Return

Experiences	
HE.0002	Accounting
HE.0076	Economic Repair Assessment
HE.0221	Return Process
HE.0264	Supplier Relationship Management (SRM)
HE.0268	Supply Chain Management
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times

Trainings	
HT.0157	APICS Principles of Distribution and Logistics

Practices	
BP.141	Proactive Return Authorization
BP.025	Self-Service Warranty Claim Submittal
BP.136	Outsourced Reverse Logistics
BP.140	Return Authorization Required
BP.142	Remote Return Authorization
BP.167	Electronic Returns Tracking
BP.168	Rotable Spares Pool
BP.169	Beyond Economic Repair (BER) Management

HS.0123 RFP/RFQ Management

The process by which specification and pricing proposals are evaluated, rated and accepted/rejected based upon criteria and objectives of the overall sourcing process.

Processes	
sD3.1	Obtain and Respond to RFP/RFQ

Experiences	
HE.0008	ATP logic/calculation
HE.0014	Business model and sales channel
HE.0030	Company Pricing/Margin Policy
HE.0031	Company terms and conditions
HE.0033	Configuration Management
HE.0053	CRM Methods and Tools
HE.0081	Engineering/Design Management
HE.0083	Enterprise Resource Planning (ERP)
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0167	Negotiation
HE.0177	Order-to-cash process
HE.0188	PLM/PDM knowledge

HS.0124 Risk and exception management

The identification, assessment, and prioritization of risks and exceptions followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events

Processes	
sP2.1	Identify, Prioritize and Aggregate Product Requirements
sP2.2	Identify, Assess and Aggregate Product Resources
sP2.3	Balance Product Resources with Product Requirements
sP2.4	Establish Sourcing Plans
sE9	Manage Supply Chain Risk
sE9.1	Establish Context

Experiences	
HE.0083	Enterprise Resource Planning (ERP)
HE.0120	Industry Analysis of Supply Markets
HE.0159	Master Data/Document Management
HE.0162	Materials portfolio and specifications
HE.0167	Negotiation
HE.0204	Production Planning/Scheduling
HE.0209	Quality processes related to inventory management (test times, shelf life)
HE.0230	Sales and Operations Planning (S&OP)
HE.0247	Spreadsheet Management
HE.0263	Supplier production and lead time capabilities
HE.0265	Supplier Service Strategy Agreements
HE.0269	Supply Chain Performance Management/Metrics
HE.0270	Supply chain planning

Trainings	
HT.0092	Managing Supply Risk - AMR
HT.0159	APICS Principles of Managing Operations

HS.0124 Risk and exception management

Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.018	ABC Inventory Classification System
BP.024	Supply Chain Optimization (SCO)
BP.090	Days of Supply Based MRP Proposal Management
BP.091	Work Center Load Evaluation
BP.092	Balance and firm within horizon
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.173	Supply Chain Risk Monitoring
BP.174	Supply Chain Risk Assessment
BP.184	Scenario Planning

HS.0125 Risk Assessment

Working knowledge and ability to identify and analyze program and critical technical process risks to increase and the likelihood of meeting or impeding both performance criteria, schedule and cost objectives, including the ability to identify process consequences and their likelihood of occurrence.

Processes	
sS2.1	Schedule Product Deliveries
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
sE9	Manage Supply Chain Risk
sE9.3	Quantify Risks

Experiences	
HE.0002	Accounting
HE.0046	Cost/Benefit Analysis
HE.0134	ISO Compliance
HE.0222	Risk Analysis

Trainings	
HT.0020	Capability & Organization Risks
HT.0125	SCC SCRM using SCOR
HT.0159	APICS Principles of Managing Operations

Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.143	Preventive Returns
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.150	Maintain Supply Chain Risk Register
BP.173	Supply Chain Risk Monitoring
BP.174	Supply Chain Risk Assessment
BP.184	Scenario Planning

HS.0126 Risk Identification

Discovering, defining, describing, documenting and communicating supply chain risks before they become problems and adversely affect process

Processes	
sE7.5	Project Impact
sE9	Manage Supply Chain Risk
sE9.2	Identify Risk Events
Experiences	
HE.0050	Creating/Reviewing/Updating Company Policies
HE.0079	Enforcing Company Policies
HE.0195	Procurement experience
HE.0216	Regulatory Policies/Compliance
HE.0222	Risk Analysis
HE.0261	Supplier management
HE.0268	Supply Chain Management
Trainings	
HT.0125	SCC SCRM using SCOR
HT.0159	APICS Principles of Managing Operations
Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.134	Supplier Evaluation using Robust Evaluation Tool.
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.150	Maintain Supply Chain Risk Register
BP.173	Supply Chain Risk Monitoring
BP.174	Supply Chain Risk Assessment
BP.184	Scenario Planning

HS.0127 Risk Mitigation

Systematic reduction in the extent of exposure to a risk and/or the likelihood of its occurrence.

Processes	
sE7.5	Project Impact
sE9	Manage Supply Chain Risk
Experiences	
HE.0205	Project Management
Trainings	
HT.0125	SCC SCRM using SCOR
HT.0157	APICS Principles of Distribution and Logistics
HT.0159	APICS Principles of Managing Operations
Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.173	Supply Chain Risk Monitoring
BP.174	Supply Chain Risk Assessment
BP.184	Scenario Planning

HS.0128 Risk Response Planning

An activity that involves identifying the covered entity assets that may be subject to some risk program

Processes	
sE9	Manage Supply Chain Risk
Experiences	
HE.0270	Supply chain planning
Trainings	
HT.0125	SCC SCRM using SCOR
Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.002	Risk Management Strategies
BP.004	Network Prioritization for Risk Identification
BP.081	Bowtie Risk Management
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.173	Supply Chain Risk Monitoring
BP.174	Supply Chain Risk Assessment
BP.184	Scenario Planning

HS.0129 Route planning

The process of selecting and scheduling carriers and determining the path which the product will take from the first to the final stop of the journey, according to order delivery requirements and geographic constraints.

Processes	
sD1.6	Route Shipments
sD2.6	Route Shipments
sD3.6	Route Shipments

Experiences	
HE.0022	Carrier rating / routing guides usage
HE.0083	Enterprise Resource Planning (ERP)
HE.0112	Hazardous Materials Handling
HE.0117	Import/Export Regulations
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0226	Routing tool usage
HE.0247	Spreadsheet Management
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times
HE.0288	Transportation Regulations
HE.0293	Transportation/Warehouse Management systems (TMS/WMS)

HS.0130 S & OP Plan Communication

The process of reviewing and communicating the output and changes in the Sales and Operations Plan.

Processes	
sP1.4	Establish and Communicate Supply Chain Plans
Experiences	
HE.0230	Sales and Operations Planning (S&OP)
Trainings	
HT.0161	APICS Principles of Operations Planning
Practices	
BP.007	Baseline Inventory Monitoring
BP.008	Slow-moving Inventory Monitoring
BP.020	Demand Management
BP.021	Sales and Operations Planning
BP.184	Scenario Planning

HS.0131 Safety stock/replenishment calculations

The calculation of appropriate stocking levels to mitigate demand variability through the inclusion of all relevant lead times, variability during lead times, and desired service levels.

Processes	
sD4.1	Generate Stocking Schedule
sD4.2	Receive Product at Store
sD4.3	Pick Product from backroom
sD4.4	Stock Shelf

Experiences	
HE.0131	Inventory Management
HE.0253	Stocking plan management

Trainings	
HT.0019	Calculating Safety Stock
HT.0161	APICS Principles of Operations Planning

Practices	
BP.018	ABC Inventory Classification System
BP.168	Rotable Spares Pool

HS.0132 Sales and Operations Planning (S&OP)

A set of decision-making processes to balance demand and supply, to integrate financial planning and operational planning, and to link high level strategic plans with day-to-day operations necessary to achieves focus, alignment and synchronization among all functions of the organization.

Processes	
sP2.3	Balance Product Resources with Product Requirements
Experiences	
HE.0269	Supply Chain Performance Management/Metrics
HE.0271	Supply Chain Requirements
Trainings	
HT.0161	APICS Principles of Operations Planning
Practices	
BP.007	Baseline Inventory Monitoring
BP.008	Slow-moving Inventory Monitoring
BP.013	Item Rationalization
BP.019	Demand Planning
BP.020	Demand Management
BP.024	Supply Chain Optimization (SCO)
BP.090	Days of Supply Based MRP Proposal Management
BP.183	Integrated Business Planning
BP.184	Scenario Planning

HS.0133 Six Sigma

A basic understanding of statistical analysis and/or working knowledge and ability to apply of the Six Sigma business methodology for improving the quality of process outputs by identifying and removing the causes of defects (errors) and, minimizing variability in business processes.

Processes	
sP5.1	Assess and Aggregate Return Requirements
sP5.2	Identify, Assess and Aggregate Return Resources
sP5.3	Balance Return Resources with Return Requirements
sP5.4	Establish and Communicate Return Plans
sE2	Manage Performance

Experiences	
HE.0039	Contract Administration/Management
HE.0083	Enterprise Resource Planning (ERP)
HE.0118	Inbound quality management
HE.0131	Inventory Management
HE.0159	Master Data/Document Management
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0230	Sales and Operations Planning (S&OP)
HE.0247	Spreadsheet Management

Trainings	
HT.0161	APICS Principles of Operations Planning

HS.0134 Solicitation Methods

Solicitation Methods involves one's ability to request and/or seek bids, proposals, quotations or, requests for information and/or business, but unlike an offer it is only an indication rather than a binding bid. In the context of Source one seeks such information prior to agreeing to, or executing contracts. Solicitation methods can take many forms including electronic but there is a skill in managing a breadth of interest to arrive at an appropriate contract commensurate with the investment needed in the process.

Processes	
sS3.1	Identify Sources of Supply

Experiences	
HE.0011	Basic Procurement

HS.0135 Solicitation/Competitive Bidding Process

The process of identifying the products or services required and efficiently soliciting and procuring same.

Processes	
sS1.1	Schedule Product Deliveries
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries

Experiences	
HE.0011	Basic Procurement

HS.0136 Specific fabrication knowledge based on product

Personnel in Source should have sufficient knowledge of the specific fabrication route for any given product to inform and illuminate the Source activity. The mindset to be involved and inquisitive is paramount.

Processes	
sM3.1	Finalize Production Engineering

Experiences	
HE.0012	Bills of Material/Specs/Fabrication Methodology
HE.0083	Enterprise Resource Planning (ERP)
HE.0160	Material Resource Planning (MRP)

HS.0137 Strategic Planning

An organization's process of defining its strategy, or direction, and making decisions on allocating its resources to pursue this strategy, including its capital and people.

Experiences	
HE.0254	Strategic Planning

Trainings	
HT.0031	Corporate Strategy
HT.0137	Strategic Issues
HT.0138	Strategic Planning

Practices	
BP.021	Sales and Operations Planning
BP.134	Supplier Evaluation using Robust Evaluation Tool.
BP.184	Scenario Planning

HS.0138 Subcontracting Types (FFP, CP, CPAF, Performance Based)

The process of letting and managing contracts in accordance with federal, state and local laws and company guidelines.

Processes	
sS2.1	Schedule Product Deliveries
sS3.3	Schedule Product Deliveries
sE6	Manage Supply Chain Contracts

Experiences	
HE.0255	Subcontracting

HS.0139 Supplier Relationship Management (SRM)

The process of working collaboratively with suppliers vital to the organizational success to maximize the potential value of those relationships

Processes	
sP2.1	Identify, Prioritize and Aggregate Product Requirements
sP2.2	Identify, Assess and Aggregate Product Resources
sP2.3	Balance Product Resources with Product Requirements
sP2.4	Establish Sourcing Plans
sS1.1	Schedule Product Deliveries
sS1.2	Receive Product
sS1.4	Transfer Product
sS1.5	Authorize Supplier Payment
sS2.1	Schedule Product Deliveries
sS2.2	Receive Product
sS2.4	Transfer Product
sS2.5	Authorize Supplier Payment
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
sS3.4	Receive Product
sS3.6	Transfer Product
sS3.7	Authorize Supplier Payment
sE6	Manage Supply Chain Contracts

Experiences	
HE.0005	Advanced Procurement
HE.0010	Basic Finance
HE.0011	Basic Procurement
HE.0012	Bills of Material/Specs/Fabrication Methodology
HE.0013	Bundling practices
HE.0035	Consignment practices
HE.0064	D & B Reports Review
HE.0083	Enterprise Resource Planning (ERP)
HE.0121	Industry specific domain knowledge
HE.0122	Industry Specific Knowledge and Experience
HE.0128	Internal organizational vs functional knowledge
HE.0156	Market Knowledge

HS.0139 Supplier Relationship Management (SRM)

HE.0159	Master Data/Document Management
HE.0160	Material Resource Planning (MRP)
HE.0162	Materials portfolio and specifications
HE.0167	Negotiation
HE.0170	Off-shore contracting
HE.0185	Performance Reporting System/ERP System
HE.0198	Product Life Cycle Management
HE.0204	Production Planning/Scheduling
HE.0206	Pull Systems
HE.0209	Quality processes related to inventory management (test times, shelf life)
HE.0213	Reducing Total Cost of Ownership
HE.0222	Risk Analysis
HE.0224	Risk Management
HE.0230	Sales and Operations Planning (S&OP)
HE.0246	Spend & Supply Demand Analysis
HE.0247	Spreadsheet Management
HE.0248	Stakeholder Management
HE.0260	Supplier Identification, Qualification
HE.0263	Supplier production and lead time capabilities
HE.0265	Supplier Service Strategy Agreements
HE.0266	Supply Chain Collaboration & Partnerships
HE.0272	Supply Demand Segmentation
HE.0303	Vendor Rating System
Trainings	
HT.0158	APICS Principles of Inventory Management
Practices	
BP.134	Supplier Evaluation using Robust Evaluation Tool.
BP.145	Vendor Collaboration

HS.0140 Supply Chain Leadership

The knowledge and know-how of supply chain including the best practices and best-in-class systems needed to fulfill his or her duties.

Experiences	
HE.0268	Supply Chain Management
Trainings	
HT.0141	Supply Chain Leadership
Practices	
BP.145	Vendor Collaboration

HS.0141 Supply Chain Management

The management of a network of interconnected businesses involved in the ultimate provision of product and service packages required by end customers

Processes	
sE7	Manage Supply Chain Network
Experiences	
HE.0049	Creating and Management of Business Rules
HE.0050	Creating/Reviewing/Updating Company Policies
HE.0205	Project Management
HE.0256	Supervisory/Management
HE.0267	Supply Chain Leadership
HE.0268	Supply Chain Management
HE.0270	Supply chain planning
Trainings	
HT.0072	Integrated Supply Chain Management
HT.0073	Introduction to Supply Chain
HT.0141	Supply Chain Leadership
HT.0157	APICS Principles of Distribution and Logistics
HT.0160	APICS Principles of Manufacturing Management
HT.0161	APICS Principles of Operations Planning
Practices	
BP.145	Vendor Collaboration

HS.0142 Supply Chain Performance Measurements

Performance measurement and metrics used to set objectives, evaluating performance, and determine future course of action in a supply chain

Processes	
sE2	Manage Performance
sE2.2	Analyze Reports
sE2.3	Find Root Causes
sE7	Manage Supply Chain Network
sE9	Manage Supply Chain Risk
Experiences	
HE.0153	Managing and Measuring Performance
HE.0172	Operations
HE.0258	Supplier Certification
Trainings	
HT.0025	Communicating Customer & Supplier Information
HT.0032	Cost Reduction Efforts
HT.0073	Introduction to Supply Chain
HT.0132	Six Sigma Certification
HT.0143	Supply Chain Performance Measurements
Practices	
BP.007	Baseline Inventory Monitoring
BP.008	Slow-moving Inventory Monitoring
BP.089	Perfect Pick Put away
BP.145	Vendor Collaboration

HS.0143 Supply Chain Planning

The coordination of linked resources across all or part of a supply chain in eliminating or reducing manufacturing and logistics bottlenecks and creating optimized schedules based on shared inventory and order information.

Experiences	
HE.0186	Planning
HE.0205	Project Management
HE.0270	Supply chain planning
Trainings	
HT.0144	Supply chain planning
Practices	
BP.020	Demand Management
BP.021	Sales and Operations Planning
BP.145	Vendor Collaboration

HS.0144 Supply Chain Security

The process of adding/enhancing the security of the supply chain. It combines traditional practices of supply chain management with the security requirements of the system, which are driven by threats such as terrorism, piracy, and theft.

Processes	
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sP4.2	Identify, Assess and Aggregate Delivery Resources
sP4.3	Balance Delivery Resources and Capabilities with Delivery Requirements
sP5.1	Assess and Aggregate Return Requirements
sP5.2	Identify, Assess and Aggregate Return Resources
sP5.3	Balance Return Resources with Return Requirements

Experiences	
HE.0083	Enterprise Resource Planning (ERP)
HE.0094	Exception management tool usage/experience
HE.0108	Fuel Price Hedging Strategy
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times

HS.0145 Supply Planning

The process of identifying, prioritizing, and aggregating, as a whole with constituent parts, all sources of supply that are required and add value in the supply chain of a product or service at the appropriate level, horizon and interval.

Processes	
sP1.2	Identify, Prioritize and Aggregate Supply Chain Resources

Experiences	
HE.0048	Cost/Service Modeling
HE.0082	Enterprise Business Process
HE.0083	Enterprise Resource Planning (ERP)
HE.0122	Industry Specific Knowledge and Experience
HE.0127	Internal market/SKU segmentation logic
HE.0159	Master Data/Document Management
HE.0160	Material Resource Planning (MRP)
HE.0163	Modeling Techniques
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0167	Negotiation
HE.0198	Product Life Cycle Management
HE.0199	Product Portfolio understanding
HE.0247	Spreadsheet Management
HE.0269	Supply Chain Performance Management/Metrics

Practices	
BP.145	Vendor Collaboration

HS.0147 Technical Evaluation

Many activities within the Source function require technical evaluation. Whilst expert opinion can be sought, Source personnel must have sufficient technical background to be able to look at any decision to be taken from the technical perspective. The mindset and willingness to so engage is important. This includes an understanding of technical requirements and the ability to effectively communication with other technical organizations within the enterprise as well as those providing the technical specifications.

Processes	
sS3.2	Select Final Supplier and Negotiate

Experiences	
HE.0274	Technical Collaboration

Practices	
BP.169	Beyond Economic Repair (BER) Management

HS.0148 Technical Manual Reading

Review of documentation containing instructions for installation, operation, use, maintenance, parts list, support, and training requirements for the effective deployment of an equipment, machine, process, or system.

Processes	
sSR2.1	Identify MRO Product Condition
sE5.2	Take Asset Off-line
sE5.3	Inspect and Troubleshoot
sE5.7	Inspect Maintenance
sE5.8	Reinstate Asset

Experiences	
HE.0070	Diagram Reading

Practices	
BP.169	Beyond Economic Repair (BER) Management

HS.0149 Test Stand Operations

A test carried out on a machine, a component, or software before it is released for use, to ensure that it works properly.

Processes	
sSR2.1	Identify MRO Product Condition
sE1	Manage Supply Chain Business Rules

Experiences	
HE.0202	Product/Supplier Knowledge

Practices	
BP.169	Beyond Economic Repair (BER) Management

HS.0150 Total Quality Management (TQM)

Total Quality Management (or TQM) is a management concept coined by W. Edwards Demings to reduce the errors produced during the manufacturing or service process, increase customer satisfaction, streamline supply chain management, aim for modernization of equipment and ensure workers have the highest level of training.

Processes	
sE1.3	Document Business Rule
sE2	Manage Performance

Experiences	
HE.0015	Business Performance Management
HE.0027	Change management system
HE.0057	Customer Relationship Management (CRM)
HE.0153	Managing and Measuring Performance
HE.0172	Operations
HE.0193	Process Improvement
HE.0205	Project Management
HE.0208	Quality Management Systems

Trainings	
HT.0073	Introduction to Supply Chain
HT.0114	Quality Management Systems
HT.0126	SCOR
HT.0150	Total Quality Management (TQM)
HT.0159	APICS Principles of Managing Operations

Practices	
BP.143	Preventive Returns
BP.089	Perfect Pick Put away

HS.0151 Transport Mode Selection

The process of analyzing and selecting an appropriate transportation mode(s) in order to meet cost and service objectives

Processes	
sD1.5	Build Loads
sD2.5	Build Loads
sD3.5	Build Loads

Experiences	
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0180	Packaging Configuration and Palletizing
HE.0184	Performance/Cost Trade-offs
HE.0284	Transportation Management - Mode Capabilities/Capacities/Lead Times

Trainings	
HT.0157	APICS Principles of Distribution and Logistics

Practices	
BP.115	Transportation Management System
BP.116	Expedited Logistics
BP.167	Electronic Returns Tracking
BP.184	Scenario Planning

HS.0152 Troubleshooting

The process of using a logical, systematic search for the source of a problem so that it can be solved, and so the product or process can be made operational again.

Processes	
sM3.1	Finalize Production Engineering
sE2.3	Find Root Causes
sE5.3	Inspect and Troubleshoot

Experiences	
HE.0077	Electrical/ pneumatic/hydro etc.
HE.0245	Specific Systems knowledge

Practices	
BP.167	Electronic Returns Tracking

HS.0154 Vendor Managed Inventory

Working knowledge of procurement and Vendor Managed Inventory (VMI) business model whereby the individual can clearly and concisely communicate specific information to a supplier for a particular product(s) for which that supplier will take full responsibility for maintaining an agreed inventory of the product(s).

Processes	
sS2.1	Schedule Product Deliveries
sS3.3	Schedule Product Deliveries

Experiences	
HE.0068	Delivery Scheduling
HE.0131	Inventory Management

Trainings	
HT.0025	Communicating Customer & Supplier Information
HT.0154	Vendor Managed Inventory
HT.0158	APICS Principles of Inventory Management

HS.0155 Verification Strategies

Experience of and familiarity with Verification Strategies in various aspects of the Source function is required e.g. Supplier service, quality, cost etc.

Processes	
sS1.3	Verify Product
sS2.3	Verify Product
sS3.5	Verify Product

Experiences	
HE.0217	Requirements management system

HS.0156 Vendor Management Inventory (VMI) planning and management

The process of using a logical, systematic search for the source of a problem so that it can be solved, and so the product or process can be made operational again.

Processes	
sP4.1	Identify, Prioritize and Aggregate Delivery Requirements
sP4.4	Establish Delivery Plans
sP5.1	Assess and Aggregate Return Requirements

Experiences	
HE.0083	Enterprise Resource Planning (ERP)
HE.0131	Inventory Management
HE.0152	Management of service Strategy agreements with customers
HE.0159	Master Data/Document Management
HE.0163	Modeling Techniques
HE.0165	MS Office (Excel, PowerPoint, Word, Access)
HE.0230	Sales and Operations Planning (S&OP)
HE.0247	Spreadsheet Management

Trainings	
HT.0158	APICS Principles of Inventory Management

Practices	
BP.139	Vendor Managed Inventory (VMI)

HS.0157 Warranty process and policy

Actions, processes, rules aiming at regulating the commitment of a party about the performance/ quality features of its products and services to its customers.

Processes	
sSR1.1	Identify Defective Product Condition
sSR2.2	Disposition MRO Product
sDR2.1	Authorize MRO Product Return
sDR2.3	Receive MRO Product
sSR3.1	Identify Excess Product Condition
sE1.3	Document Business Rule
sE8	Manage Regulatory Compliance

Experiences	
HE.0202	Product/Supplier Knowledge
HE.0208	Quality Management Systems
HE.0216	Regulatory Policies/Compliance

Practices	
BP.025	Self-Service Warranty Claim Submittal
BP.168	Rotable Spares Pool

HS.0158 Warranty Return and Repair

The ability to understand, coordinate and execute the Return processes for the return of products or materials covered under contractual Warranty Return and Repair terms and conditions, including proper preparation of return authorization documentation and, the coordination for any packaging/ crating and transportation required. This may require coordination with other organizations within the enterprise for shipment or for on-location repair by the supplier.

Processes	
sS2.1	Schedule Product Deliveries
sS2.5	Authorize Supplier Payment
sS3.1	Identify Sources of Supply
sS3.2	Select Final Supplier and Negotiate
sS3.3	Schedule Product Deliveries
sS3.7	Authorize Supplier Payment

Experiences	
HE.0039	Contract Administration/Management
HE.0041	Contractual Terms & Conditions
HE.0208	Quality Management Systems
HE.0274	Technical Collaboration

Practices	
BP.143	Preventive Returns
BP.025	Self-Service Warranty Claim Submittal
BP.115	Transportation Management System
BP.168	Rotable Spares Pool
BP.169	Beyond Economic Repair (BER) Management

HS.0160 Waste Management

The process of collecting, transporting, processing, recycling or disposing, and monitoring of waste materials in accordance with federal, state and local laws and company guidelines.

Processes	
sM1.7	Waste Disposal
sM2.2	Issue Sourced/In-Process Product
sM2.7	Waste Disposal
sM3.8	Waste Disposal
sE8	Manage Regulatory Compliance

Experiences	
HE.0009	Bar Coding/RFID
HE.0012	Bills of Material/Specs/Fabrication Methodology
HE.0075	DOT/EPA
HE.0078	Electronic Data Interchange (EDI) Systems
HE.0083	Enterprise Resource Planning (ERP)
HE.0100	Financial Accounting
HE.0113	Hazardous Waste Disposal Guidelines
HE.0119	Industrial engineering
HE.0144	Lean Manufacturing
HE.0160	Material Resource Planning (MRP)
HE.0161	Materials Management
HE.0178	OSHA
HE.0244	Six Sigma
HE.0264	Supplier Relationship Management (SRM)
HE.0280	Trade Off Analysis
HE.0307	Waste Disposal Procedure
HE.0309	WIP Methodology
HE.0311	Written/Verbal Communication

HS.0161 Wave/batch picking

An order management process used in distribution centers by which the picking workload is divided for the day into a series of relatively comparable intervals. Wave data includes the workload by order or function (case picking, repack pick). Within a wave, normally orders are consolidated for enabling efficient picking by product.

Processes	
sD1.9	Pick Product
sD2.9	Pick Product
sD3.9	Pick Product

Experiences	
HE.0066	Data/Document Management
HE.0131	Inventory Management
HE.0202	Product/Supplier Knowledge
HE.0305	Warehouse/Distribution Management

Practices	
BP.089	Perfect Pick Put away

HS.0162 Analytical Skills

Knowledge and experience in visualizing, articulating, conceptualizing and solving simple, complex and complicated problems by making decisions that are logical and reasonable given the available information.

Processes	
SE2.1	Initiate Reporting
SE2.2	Analyze Reports
SE2.3	Find Root Causes
SE2.4	Prioritize Root Causes
SE2.5	Develop Corrective Actions

Experiences	
HE.0042	Cost Analysis
HE.0046	Cost/Benefit Analysis
HE.0047	Cost/Price Analysis
HE.0120	Industry Analysis of Supply Markets
HE.0133	Inventory Valuation/Financial Analysis
HE.0150	Make/Buy decision analysis
HE.0222	Risk Analysis
HE.0225	Root cause analysis
HE.0246	Spend & Supply Demand Analysis
HE.0251	Statistical Modeling/Analysis
HE.0280	Trade Off Analysis

Trainings	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0033	Cost/Price Analysis
HT.0037	APICS CLTD
HT.0084	Lean Manufacturing Training
HT.0132	Six Sigma Certification

HS.0162 Analytical Skills

Practices	
BP.014	Demand Planning & Forecasting
BP.031	Stock keeping Unit (SKU) Rationalization/Cost of Sales Analysis
BP.068	Supplier Delivery Performance Analysis
BP.082	Continuous Improvement
BP.138	Theory of Constraints
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis Lean
BP.160	Lean
BP.161	Enterprise Level Spend Analysis
BP.165	Convergence of SCOR with Lean and Six Sigma

HS.0163 Auditing

Knowledge and experience in conducting objective comparison of actions to policies and plans.

Processes	
SE5.7	Inspect Maintenance
SE6.4	Review Contractual Performance
SE8.3	Identify Regulatory Deficiencies

Experiences	
HE.0023	Carrier selection & qualification
HE.0092	Establishing Source and Evaluation Criteria
HE.0118	Inbound quality management
HE.0133	Inventory Valuation/Financial Analysis
HE.0208	Quality Management Systems

Trainings	
HT.0054	Evaluating Quality Management Process
HT.0114	Quality Management Systems
HT.0150	Total Quality Management (TQM)

Practices	
BP.055	Freight Carrier Delivery Performance Evaluation
BP.095	Bill of Material Audit/Control
BP.134	Supplier Evaluation using Robust Evaluation Tool
BP.155	Standard Operating Procedures

HS.0164 Automation

Understanding of means, methods and technologies which facilitates the substitution of machine work for human physical and mental work, or the use of machines for work not otherwise able to be accomplished, entailing a less continuous interaction with humans than previous equipment used for similar tasks.

Processes	
SE1.1	Gather business rule requirements
SE1.2	Interpret business rule requirement
SE1.3	Document business rule
SE1.4	Communicate Business rule
SE1.5	Release/Publish Business Rule

Experiences	
HE.0086	ERP Software Specific Experience
HE.0174	Optimization software

Trainings	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0008	Automation Tools
HT.0037	APICS CLTD
HT.0135	Software training programs (depends on software)

Practices	
BP.023	Business Rule Management
BP.035	Business Rule Review
BP.105	Task Manager
BP.152	Automated Data Capture

HS.0165 Change Management

Knowledge and experience in coordinating and monitoring changes to the business processes, applications, equipment, resources, operating systems and procedures in order to minimize the risk of problems that affect the operating environment and service delivery to the users.

Processes	
SE2.5	Develop Corrective Actions
SE6.7	Select, Prioritize and Distribute Resolutions
SP1.4	Establish and Communicate Supply Chain Plans
SE2.4	Establish Sourcing Plans
SP3.4	Establish Production Plans
SP4.4	Establish Delivery Plan
SP5.4	Establish and Communicate Return Plans
SP7.7	Develop Change Program
SP7.8	Launch Change Program

Experiences	
HE.0027	Change management system
HE.0034	Conflict Resolution
HE.0038	Continuous learning
HE.0167	Negotiation
HE.0186	Planning
HE.0274	Technical Collaboration
HE.0296	Utilizing Company Specific Business Systems

Trainings	
HT.0003	Advanced Negotiations/Collaborative Planning
HT.0102	Negotiation Skills
HT.0112	Project Management
HT.0126	SCOR
HT.0147	Team skills training
HT.0159	APICS Principles of Managing Operations

Practices	
BP.082	Continuous Improvement
BP.113	Cross functional teams
BP.138	Theory of Constraints
BP.160	Lean
BP.165	Convergence of SCOR with Lean and Six Sigma

HS.0166 Classification

Knowledge and experience in the categorization of inventory in the warehouse or supply chain in general to make decisions based on the type of inventory.

Processes	
SP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
SP2.1	Identify, Prioritize & Aggregate Product Requirements
SP3.1	Identify, Prioritize & Aggregate Production Requirements
SP4.1	Identify, Prioritize & Aggregate Delivery Requirements
SP5.1	Identify, Prioritize & Aggregate Return Requirements

Experiences	
HE.0001	ABC Accounting
HE.0131	Inventory Management
HE.0132	Inventory strategy
HE.0133	Inventory Valuation/Financial Analysis

Trainings	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0011	Basic Inventory Concepts
HT.0037	APICS CLTD
HT.0076	Inventory Management

Practices	
BP.018	ABC Inventory Classification
BP.087	ABC Inventory Classification System

HS.0167 Contingency Planning

Knowledge and experience in creating a document that specifies alternative plans to facilitate project success if certain risk events occur.

Processes	
SE1	Manage supply chain business rules
SE2	Manage Performance
SE8	Manage regulatory compliance
SE9.1	Establish Context
SE9.2	Identify Risk Events
SE9.3	Quantify Risks
SE9.4	Evaluate Risks
SE9.5	Mitigate Risks

Experiences	
HE.0038	Continuous learning
HE.0222	Risk Analysis
HE.0224	Risk Management

Trainings	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0020	Capability & Organization Risks
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0031	Corporate Strategy
HT.0037	APICS CLTD
HT.0092	Managing Supply Risk - AMR
HT.0120	Risk Management

Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.002	Risk Management Strategies
BP.004	Network Prioritization for Risk Identification
BP.081	Bowtie Risk Management
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.150	Maintain Supply Chain Risk Register
BP.155	Standard Operating Procedures
BP.173	Supply Chain Risk Monitoring
BP.174	Supply Chain Risk Assessment

HS.0168 Corporate Strategy

Understanding of the overall scope and direction of the company and the way in which its various business functions and operations work together to achieve corporate goals.

Processes	
SE1.1	Gather Business Rule Requirement
SE4.1	Identify Skills/Resource Requirement
SE7.2	Gather and Input Data
SP1.1	Identify, Prioritize & Aggregate Supply Chain Requirements
SP2.1	Identify, Prioritize & Aggregate Product Requirements
SP3.1	Identify, Prioritize & Aggregate Production Requirements
SP4.1	Identify, Prioritize & Aggregate Delivery Requirements
SP5.1	Identify, Prioritize & Aggregate Return Requirements

Experiences	
HE.0006	Allocation rules and strategy
HE.0059	Customer Service Strategy Agreements
HE.0149	Logistics sourcing strategy and contract management
HE.0152	Management of service Strategy agreements with customers
HE.0265	Supplier Service Strategy Agreements

Training	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0031	Corporate Strategy
HT.0037	APICS CLTD

Practices	
BP.002	Risk Management Strategies
BP.040	MTO Order Fulfillment Strategy
BP.101	Purchasing/Procurement Strategy
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis

HS.0169 Cost to Serve

Knowledge and experience in analyzing how costs are consumed throughout the supply chain by a product, service or customer in order to determine which products, services or customers contribute most to the company's profit and those that erode it.

Processes	
SP1	Plan Supply Chain
SP2	Plan Source
SP3	Plan Make
SP4	Plan Deliver
SP5	Plan Return

Experiences	
HE.0004	Advanced Financial Accounting Principles
HE.0010	Basic Finance
HE.0099	Finance
HE.0100	Financial Accounting
HE.0298	Utilizing Finance Systems

Training	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0010	Basic and Advanced Finance
HT.0014	Basic Supply Chain Finance
HT.0037	APICS CLTD
HT.0057	Financial Accounting

Practices	
BP.031	Stock keeping Unit (SKU) Rationalization/Cost of Sales Analysis
BP.068	Supplier Delivery Performance Analysis
BP.161	Enterprise Level Spend Analysis

HS.0170 Customer Expectation

Knowledge of gathering and understanding information regarding the perceived value customers seek from the purchase of a product or service.

Processes	
SE6	Manage Supply Chain Contracts
SE7	Manage Supply Chain Network
SP1.1	Identify, Prioritize & Aggregate Supply Chain Requirements
SP2.1	Identify, Prioritize & Aggregate Product Requirements
SP3.1	Identify, Prioritize & Aggregate Production Requirements
SP4.1	Identify, Prioritize & Aggregate Delivery Requirements
SP5.1	Identify, Prioritize & Aggregate Return Requirements

Experiences	
HE.0057	Customer Relationship Management (CRM)
HE.0058	Customer Requirements Management
HE.0140	Knowledge of business rules concerning customer
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0152	Management of service Strategy agreements with customers
HE.0266	Supply Chain Collaboration & Partnerships
HE.0297	Utilizing Customer Relationship Management System

Trainings	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0025	Communicating Customer & Supplier Information
HT.0037	APICS CLTD

Practices	
BP.014	Demand Planning & Forecasting
BP.019	Demand Planning
BP.020	Demand Management

HS.0171 Customer Segmentation

Understanding of the practice of dividing a customer base into groups of individuals that are similar in terms of demography, psychographic profiles, geography, behavioral etc.

Processes	
SP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
SP2.1	Identify, Prioritize & Aggregate Product Requirements
SP3.1	Identify, Prioritize & Aggregate Production Requirements
SP4.1	Identify, Prioritize & Aggregate Delivery Requirements
SP5.1	Identify, Prioritize & Aggregate Return Requirements

Experiences	
HE.0127	Internal market/SKU segmentation logic
HE.0272	Supply Demand Segmentation

Training	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0031	Corporate Strategy
HT.0037	APICS CLTD

Practices	
BP.014	Demand Planning & Forecasting
BP.019	Demand Planning
BP.020	Demand Management

HS.0172 Expectation Management

Knowledge and experience in identifying and handling cases that deviate from the norm (such as supplier nonperformance, strikes etc.).

Processes	
SE1	Manage supply chain business rules
SE2.1	Analyze Reports
SE2.3	Find Root Causes
SE2.4	Prioritize Root Causes
SE2.5	Develop Corrective Actions
SE2.6	Approve & Launch
SE8	Manage regulatory compliance
SE9	Manage Supply Chain Risks

Experiences	
HE.0038	Continuous learning
HE.0094	Exception management tool usage/experience
HE.0222	Risk Analysis
HE.0224	Risk Management

Training	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0020	Capability & Organization Risks
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0031	Corporate Strategy
HT.0037	APICS CLTD
HT.0055	Exception Management
HT.0092	Managing Supply Risk - AMR
HT.0120	Risk Management

Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.004	Network Prioritization for Risk Identification
BP.018	ABC Inventory Classification System
BP.081	Bowtie Risk Management
BP.090	Days of Supply Based MRP Proposal Management
BP.155	Standard Operating Procedures
BP.156	Collaborative Planning, Forecasting & Replenishment (CPRF)
BP.173	Supply Chain Risk Monitoring
BP.174	Supply Chain Risk Assessment

HS.0173 Financial Management

Knowledge of the function concerned with ensuring the availability of funds for research and development, operations, and marketing.

Processes	
SE2	Manage Performance
SE3	Manage Data and Information
SE9	Manage supply chain risk

Experiences	
HE.0004	Advanced Financial Accounting Principles
HE.0100	Financial Accounting
HE.0101	Financial Collaboration
HE.0102	Financial Planning
HE.0130	International Financial Reporting Standards
HE.0133	Inventory Valuation/Financial Analysis

Training	
HT.0010	Basic and Advanced Finance
HT.0014	Basic Supply Chain Finance
HT.0057	Financial Accounting

Practices	
BP.023	Business Rule Management
BP.026	Improve SOP Process
BP.031	Stock keeping Unit (SKU) Rationalization/Cost of Sales Analysis
BP.032	Reduce / Write-off Slow Moving Inventory
BP.035	Business Rule Review
BP.155	Standard Operating Procedures
BP.161	Enterprise Level Spend Analysis

HS.0174 Financial Modeling

Knowledge of the task of building an abstract representation (a model) of a real world financial situation. Such as: performance of a financial asset or portfolio of a business, project, or any other investment.

Processes	
SE2	Manage Performance
SE3	Manage Data and Information
SE7	Manage supply chain network
SE9	Manage supply chain risk

Experiences	
HE.0004	Advanced Financial Accounting Principles
HE.0100	Financial Accounting
HE.0101	Financial Collaboration
HE.0102	Financial Planning
HE.0130	International Financial Reporting Standards
HE.0133	Inventory Valuation/Financial Analysis
HE.0163	Modeling Techniques
HE.0251	Statistical Modeling/Analysis

Training	
HT.0010	Basic and Advanced Finance
HT.0014	Basic Supply Chain Finance
HT.0057	Financial Accounting
HT.0097	Modeling Techniques

Practices	
BP.023	Business Rule Management
BP.024	Supply Chain Optimization (SCO)
BP.031	Stock keeping Unit (SKU) Rationalization/Cost of Sales Analysis
BP.035	Business Rule Review
BP.150	Maintain Supply Chain Risk Register
BP.155	Standard Operating Procedures
BP.161	Enterprise Level Spend Analysis
BP.174	Supply Chain Risk Assessment

HS.0175 Fleet/Carrier Capabilities

Knowledge and experience in researching and comprehending the abilities of Fleet/Carrier performance as it relates to transit time average and reliability, equipment availability and capacity, geographic coverage, product protection, freight rates etc.

Processes	
SD1.7	Select Carriers and Rate Shipments
SD2.7	Select Carriers and Rate Shipments
SD3.7	Select Carriers and Rate Shipments

Experiences	
HE.0020	Carrier Agreement Implementation
HE.0021	Carrier performance management
HE.0022	Carrier rating / routing guides usage
HE.0023	Carrier selection & qualification
HE.0149	Logistics sourcing strategy and contract management
HE.0293	Transportation/Warehouse Management systems (TMS/WMS

Training	
HT.0037	APICS CLTD
HT.0152	Transportation planning
HT.0153	Transportation/Logistics

Practices	
BP.041	Transportation Optimization
BP.055	Freight Carrier Delivery Performance Evaluation
BP.115	Transportation Management System

HS.0176 Geopolitics

Knowledge of politics, especially international relations, as influenced by geographical factors.

Processes	
SE7	Manage supply chain network
SE8	Manage regulatory compliance
SE9	Manage supply chain risks

Experiences	
HE.0129	International business
HE.0130	International Financial Reporting Standards
HE.0148	Local/national/global transportation guidelines
HE.0222	Risk Analysis
HE.0224	Risk Management

Training	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0037	APICS CLTD
HT.0056	Federal/National/International Regulatory Compliance
HT.0062	Fundamentals of International Trade

Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.002	Risk Management Strategies
BP.004	Network Prioritization for Risk Identification
BP.081	Bowtie Risk Management
BP.150	Maintain Supply Chain Risk Register
BP.155	Standard Operating Procedures
BP.173	Supply Chain Risk Monitoring
BP.174	Supply Chain Risk Assessment

HS.0177 Heuristics

Knowledge and experience in solving problems by utilizing results or rules that have been determined by experience or intuition instead of by optimization. Heuristics can be used in such areas as forecasting; lot sizing; determining production, staff or inventory levels; distribution center locations etc.

Processes	
SE2	Manage Performance
SE7.3	Develop Scenarios
SE7.4	Model/Simulate Scenarios

Experiences	
HE.0121	Industry specific domain knowledge
HE.0122	Industry Specific Knowledge and Experience
HE.0128	Internal organizational vs functional knowledge
HE.0156	Market Knowledge
HE.0188	PLM/PDM knowledge
HE.0202	Product/Supplier Knowledge
HE.0245	Specific Systems knowledge

Training	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0037	APICS CLTD
HT.0084	Lean Manufacturing Training
HT.0097	Modeling Techniques
HT.0132	Six Sigma Certification

Practices	
BP.014	Demand Planning & Forecasting
BP.015	Safety Stock Planning
BP.017	Distribution Planning
BP.086	Supply Network Planning
BP.096	Logistics & Warehouse Planning
BP.104	Facility Master Planning

HS.0178 Inventory Policy

Knowledge and understanding of goals and approach to the management of inventories.

Processes	
SE1	Manage supply chain business rules
SE7	Manage Supply chain network
SP1.3	Balance supply chain resources with SC requirements
SP2.3	Balance Product resources with product requirements
SP3.3	Balance production resources with production requirements
SP4.3	Balance delivery resources and capabilities with delivery requirements
SP5.3	Balance return resources with return requirements

Experiences	
HE.0131	Inventory Management
HE.0132	Inventory strategy
HE.0133	Inventory Valuation/Financial Analysis
HE.0138	Just-In-Time Inventory
HE.0209	Quality processes related to inventory management (test times, shelf life)
HE.0302	Vendor Managed Inventory

Training	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0011	Basic Inventory Concepts
HT.0037	APICS CLTD
HT.0074	Inventory Centralization
HT.0076	Inventory Management
HT.0154	Vendor Managed Inventory

Practices	
BP.006	Consignment Inventory
BP.015	Safety Stock Planning
BP.028	Inventory Optimization
BP.048	Inventory incentives / promotions for customers
BP.051	Embed Inventory Management Goals
BP.139	Vendor Managed Inventory (VMI)
BP.168	Rotable Spares Pool

HS.0179 Key Performance Indicator (KPI)

Knowledge, experience and understanding of financial or nonfinancial measure, either strategic or tactical that is linked to specific strategic goals and objectives.

Processes	
SE2.1	Initiate Reporting
SE2.2	Analyze Reports
SE7.2	Gather Input and Data

Experiences	
HE.0096	Existing internal metrics and relationships
HE.0171	On time-shipping and delivery metric logic/calculation
HE.0238	Service level calculation tools and metrics
HE.0269	Supply Chain Performance Management/Metrics
HE.0294	Unit of Measure Understanding

Training	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0037	APICS CLTD
HT.0084	Lean Manufacturing Training
HT.0132	Six Sigma Certification
HT.0143	Supply Chain Performance Measurements

Practices	
BP.068	Supplier Delivery Performance Analysis
BP.074	Process/Metrics Alignment
BP.082	Continuous Improvement
BP.126	Supply Chain Visibility System

HS.0180 Material Classification

Knowledge of categorizing materials to appropriately describe and label them and using the right packaging, storage and mode of transportation.

Processes	
SD2.4	Consolidate Order
SD2.10	Pack Product
SD2.11	Load product & generate shipping documents
SD3.10	Pack Product
SD3.11	Load product & generate shipping documents

Experiences	
HE.0022	Carrier rating / routing guides usage
HE.0023	Carrier selection & qualification
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0149	Logistics sourcing strategy and contract management
HE.0180	Packaging Configuration and Palletizing

Training	
HT.0037	APICS CLTD
HT.0106	Packaging and palletizing
HT.0152	Transportation planning
HT.0153	Transportation/Logistics

Practices	
BP.018	ABC Inventory Classification System
BP.076	Bar Coding for Returned Materials
BP.087	ABC Inventory Classification
BP.117	Embed Specialized Services
BP.121	Digital Packaging on Demand
BP.136	Outsourced Reverse Logistics
BP.153	Bar Coding/RFID
BP.171	Receiving Goods Inspection

HS.0181 Negotiation

Knowledge and experience in conducting discussions aimed at agreeing on the conditions surrounding the purchase of a product or service.

Processes	
SE6.5	Identify performance issues/opportunities
SP6.6	Identify resolutions/improvement
SP6.7	Select, prioritize and distribute resolutions
SE7.7	Develop Change Program
SE7.8	Launch Change Program

Experiences	
HE.0167	Negotiation
HE.0255	Root Cause analysis
HE.0266	Supply Chain Collaboration & Partnership
HE.0274	Technical Collaboration

Training	
HT.0003	Advanced Negotiations/Collaborative Planning
HT.0029	Contract Negotiation
HT.0102	Negotiation Skills
HT.0158	APICS Principles of Inventory Management

Practices	
BP.074	Process/Metrics Alignment
BP.082	Continuous Improvement
BP.100	Strategic Sourcing
BP.126	Supply Chain Visibility System
BP.145	Vendor Collaboration

HS.0182 Network Design

Knowledge and experience in determining the physical configuration and infrastructure of the supply chain as it relates to number, locations, and size of manufacturing plants and warehouses, the assignment of retail outlets to warehouses, etc.

Processes	
SE7	Manage Supply Chain Network
SE8	Manage Regulatory Compliance
SE9	Manage Supply Chain Risks

Experiences	
HE.0169	Network Optimization
HE.0266	Supply Chain Collaboration & Partnerships
HE.0268	Supply Chain Management
HE.0270	Supply chain planning
HE.0271	Supply Chain Requirements
HE.0272	Supply Demand Segmentation

Training	
HT.0007	APICS CSCP
HT.0037	APICS CLTD
HT.0072	Integrated Supply Chain Management
HT.0141	Supply Chain Leadership
HT.0142	Supply Chain Management
HT.0144	Supply chain planning
HT.0157	APICS Principles of Distribution and Logistics

Practices	
BP.004	Network Prioritization for Risk Identification
BP.016	Supply Network Planning
BP.017	Distribution Planning
BP.029	Inventory Management Using Supply Chain Network Optimization
BP.037	Manufacturing Direct/Drop Shipment
BP.096	Logistics & Warehouse Planning

HS.0183 Process Mapping

Knowledge and experience in creating a concise picture of the sequence of tasks needed to bring a product or service from inception to completion.

Processes	
SE1.1	Gather Business Rule Requirements
SE1.2	Interpret Business Rule Requirement
SE1.3	Document Business Rule
SE1.4	Communicate Business Rule
SE1.5	Release/Publish Business Rule
SE1.6	Retire Business Rule
SE7.1	Select Scope and Organization

Experiences	
HE.0192	Process Engineering
HE.0193	Process Improvement
HE.0194	Process Management

Training	
HT.0008	Automation Tools
HT.0084	Lean Manufacturing Training
HT.0132	Six Sigma Certification

Practices	
BP.023	Business Rule Management
BP.035	Business Rule Review
BP.105	Task Management

HS.0184 Reconciliation

Knowledge and experience in using two or more sets of records to ensure figures are accurate and in agreement. As an example, inventory reconciliation involves comparing physical inventory figures with the perpetual inventory record and making any necessary corrections.

Processes	
SD1.15	Invoice
SD2.15	Invoice
SD3.15	Invoice
SS1.5	Authorized Supplier Payment

Experiences	
HE.0009	Bar Coding/RFID
HE.0078	Electronic Data Interchange (EDI) systems
HE.0083	Enterprise Resource Planning (ERP)
HE.0100	Financial Accounting
HE.0160	Material Resource Planning (MRP)

Training	
HT.0006	APICS CPIM
HT.0012	Basic legal process (embargo, black list)
HT.0014	Basic Supply Chain finance
HT.0016	Business Ethics/Conduct Training
HT.0035	Credit Management
HT.0037	APICS CLTD
HT.0052	ERP Systems Training
HT.0055	Exception Management
HT.0082	Language Skills
HT.0109	Product Specific Training
HT.0145	Supply Chain Security

Practices	
BP.022	MRP 1
BP.148	3-Way Delivery Verification
BP.153	Bar coding/RFID
BP.159	Electronic Data Interchange (EDI)

HS.0185 Research

Knowledge and experience in conducting systematic empirical investigation of quantitative or qualitative factors affecting the performance of logistics or supply chain strategy.

Processes	
SE1	Manage supply chain business rules
SE2	Manage performance
SE7	Manage supply chain network
SE8	Manage regulatory compliance
SE9	Manage supply chain risks

Experiences	
HE.0017	Business Rules/Regulatory Policy/Company Return Policy
HE.0121	Industry specific domain knowledge
HE.0122	Industry Specific Knowledge and Experience
HE.0123	Industry Specific Regulatory Knowledge
HE.0128	Internal organizational vs functional knowledge
HE.0140	Knowledge of business rules concerning customer
HE.0141	Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0148	Local/national/global transportation guidelines
HE.0156	Market Knowledge
HE.0188	PLM/PDM knowledge
HE.0202	Product/Supplier Knowledge
HE.0214	Regulatory and company return policy
HE.0216	Regulatory Policies/Compliance
HE.0245	Specific Systems knowledge

Training	
HT.0007	APICS CSCP
HT.023	Business Rule Management
HT.035	Business Rule Review
HT.0056	Federal/National/International Regulatory Compliance
HT.0070	Industry specific regulatory certification
HT.0116	Regulatory Compliance

Practices	
BP.097	Supplier Research
BP.155	Standard Operating Procedures

HS.0186 Sales Strategy

Knowledge of the plan that positions a company's brand or product to gain a competitive advantage.

Processes	
SE1	Manage supply chain business rules
SE7	Manage Supply Chain Network
SP1.3	Balance supply chain resources with SC requirements
SP2.3	Balance Product resources with product requirements
SP3.3	Balance production resources with production requirements
SP4.3	Balance delivery resources and capabilities with delivery requirements
SP5.3	Balance return resources with return requirements

Experiences	
HE.0014	Business model and sales channel
HE.0059	Customer Service Strategy Agreements
HE.0132	Inventory strategy
HE.0149	Logistics sourcing strategy and contract management
HE.0152	Management of service Strategy agreements with customers
HE.0230	Sales and Operations Planning (S&OP)

Training	
HT.0017	Business model and sales channel
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0031	Corporate Strategy
HT.0124	Sales and Operations Planning

Practices	
BP.002	Risk Management Strategies
BP.040	MTO Order Fulfillment Strategy
BP.048	Inventory incentives / promotions for customers
BP.050	Customer Incentives / Promotions for Large Inventory Purchases
BP.114	Order Quotation System
BP.149	Supply Chain Risk Management Strategy Implementation and Analysis
BP.168	Rotable Spares Pool

HS.0187 Stakeholder Management

Knowledge and experience in creating positive relationships with stakeholders through the appropriate management of their expectations and agreed objectives.

Processes	
SE6	Manage Supply Chain Contracts
SE7	Manage Supply Chain Network
SE8	Manage Regulatory Compliance
SE9	Manage Supply Chain Risks

Experiences	
HE.0224	Risk Management
HE.0248	Stakeholder Management
HE.0266	Supply Chain Collaboration & Partnerships

Training	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0020	Capability & Organization Risks
HT.0037	APICS CLTD
HT.0092	Managing Supply Risk - AMR
HT.0120	Risk Management

Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.023	Business Rule Management
BP.035	Business Rule Review

HS.0188 Stock Strategy

Knowledge of different models of inventory strategies (JIT, MRP, EOQ etc.) that best meets the business needs of cost, risk and customer satisfaction

Processes	
SP1.1	Identify, Prioritize and Aggregate Supply Chain Requirements
SP2.1	Identify, Prioritize & Aggregate Product Requirements
SP3.1	Identify, Prioritize & Aggregate Production Requirements
SP4.1	Identify, Prioritize & Aggregate Delivery Requirements
SP5.1	Identify, Prioritize & Aggregate Return Requirements

Experiences	
HE.0061	Customer Stocking Agreements Management
HE.0131	Inventory Management
HE.0132	Inventory strategy
HE.0133	Inventory Valuation/Financial Analysis
HE.0229	Safety Stock Management
HE.0253	Stocking plan management

Training	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0011	Basic Inventory Concepts
HT.0019	Calculating Safety Stock
HT.0037	APICS CLTD
HT.0076	Inventory Management

Practices	
BP.006	Consignment Inventory
BP.018	ABC Inventory Classification System
BP.064	Safety Stock Reduction
BP.085	Safety Stock Planning
BP.087	ABC Inventory Classification
BP.139	Vendor Management Inventory
BP.157	Just in Time Production
BP.160	Lean

HS.0189 Supply Chain Mapping

Knowledge and experience in engaging across companies and suppliers to document the exact source of every material, every process and every shipment involved in bringing goods to market.

Processes	
SE1	Manage Supply Chain Business Rules
SE7	Manage Supply Chain Network
SE8	Manage regulatory compliance
SE9	Manage supply chain risk

Experiences	
HE.0169	Network Optimization
HE.0266	Supply Chain Collaboration & Partnerships
HE.0268	Supply Chain Management
HE.0270	Supply Chain Planning
HE.0271	Supply Chain Requirements
HE.0272	Supply Chain Requirements

Training	
HT.0007	APICS CSCP
HT.0037	APIS CLTD
HT.0072	Integrated Supply Chain Management
HT.0141	Supply Chain Leadership
HT.0142	Supply Chain Management
HT.0144	Supply chain planning

Practices	
BP.004	Network Prioritization for Risk Identification
BP.016	Supply Network Planning
BP.017	Distribution Planning
BP.023	Business Rule Management
BP.029	Inventory Management Using Supply Chain Network Optimization
BP.035	Business Rule Review
BP.037	Manufacturing Direct/Drop Shipment
BP.096	Logistics & Warehouse Planning

HS.0190 Trend Analysis

Knowledge and experience in the analyzing data to determine whether trend (general upward or downward change) exists.

Processes	
SE2.1	Initiate Reporting
SE2.2	Analyze Reports

Experiences	
HE.0096	Existing internal metrics and relationships
HE.0171	On time-shipping and delivery metric logic/calculation
HE.0238	Service level calculation tools and metrics
HE.0246	Spend & Supply Demand Analysis
HE.0251	Statistical Modeling/Analysis
HE.0269	Supply Chain Performance Management/Metrics
HE.0294	Unit of Measure Understanding

Training	
HT.0002	Advanced Excel Techniques
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0037	APICS CLTD
HT.0084	Lean Manufacturing Training
HT.0132	Six Sigma Certification
HT.0143	Supply Chain Performance Measurements

Practices	
BP.007	Baseline Inventory Monitoring
BP.055	Freight Carrier Delivery Performance Evaluation
BP.068	Supplier Delivery Performance Analysis
BP.091	Work Center Load Evaluation
BP.132	Inventory Financing Evaluation
BP.134	Supplier Evaluation using Robust Evaluation Tool

HS.0191 Triple Bottom Line

Knowledge and experience in measuring the economic, social, and environmental consequences of a firm's activities.

Processes	
SE1	Manage supply chain business
SE2	Manage Performance
SE6	Manage Supply Chain Contracts
SE7	Manage Supply Chain Network
SE8	Manage Regulatory Compliance
SE9	Manage Supply Chain Risks
SR	Return

Experiences	
HE.0038	Risk Management Continuous learning
HE.0094	Exception management tool usage/experience
HE.0224	Risk Management

Training	
HT.0006	APICS CPIM
HT.0007	APICS CSCP
HT.0026	Company Policies, Mission and Strategy, Business Conduct
HT.0031	Corporate Strategy
HT.0037	APICS CLTD
HT.0055	Exception Management
HT.0120	Risk Management

Practices	
BP.001	Supply Chain Risk Management (SCRM)
BP.026	Improve S&OP process
BP.028	Inventory Optimization
BP.029	Inventory Management Using Supply Chain Network Optimization
BP.034	Extend Inventory Planning using Collaboration (Key Suppliers)
BP.047	Finished Goods Inventory Postponement
BP.100	Strategic Sourcing
BP.126	Supply Chain Visibility System
BP.133	Total Preventative Maintenance Program
BP.137	Carcass Disassembly
BP.143	Preventive Returns
BP.145	Vendor Collaboration
BP.173	Supply Chain Risk Monitoring

HS.0192 Warehouse Management Systems (WMS)

Understanding and experience of using a system that manages all processes (including receiving, picking and shipping) that a warehouse carries out.

Processes	
SD1.12	Ship Product
SD1.9	Pick Product
SD2.12	Ship Product
SD2.9	Pick Product
SD3.12	Ship Product
SD3.9	Pick Product
SD4.2	Receive Product at Store
SD4.3	Pick product from backroom
SS1.2	Receive Product
SS2.2	Receive Product
SS3.4	Receive Product

Experiences	
HE.0086	ERP Software Specific Experience
HE.0174	Optimization software
HE.0293	Transportation/Warehouse Management systems (TMS/WMS)
HE.0300	Utilizing Warehouse Management Systems
HE0304	Warehouse Experience
HE.0305	Warehouse/Distribution Management
HE.0306	Warehousing Min/Max Shelf Life

Training	
HT.0007	APICS CSCP
HT.0037	APICS CLTD
HT.0042	Distribution and warehousing policies
HT.0135	Software training programs (depends on software)
HT.0155	Warehouse Management
HT.0157	APICS Principles of Distribution and Logistics

Practices	
BP.029	Inventory Management Using Supply Chain Network Optimization
BP.052	Design for Logistics (DFL) Management
BP.096	Logistics & Warehouse Planning
BP.105	Task Management
BP.122	Vendor Managed Inventory (VMI)
BP.146	Cross-Docking
BP.147	Receiving Goods Inspection
BP.168	Rotable Spares Pool

HS.0193 Yard Management (YMS)

Understanding and experience of using a system that organizes and directs the traffic of all vehicles in the parking yards located at various industrial buildings like warehouses, distribution centers and manufacturing plants.

Processes	
SD1.4	Consolidate Orders
SD1.5	Build Loads
SD1.6	Route Shipments
SD1.7	Select Carriers and Rate Shipments
SD2.4	Consolidate Orders
SD2.5	Build Loads
SD2.6	Route Shipments
SD2.7	Select Carriers and Rate Shipments
SD3.5	Build Loads
SD3.6	Route Shipments
SD3.7	Select Carriers and Rate Shipments

Experiences	
HE.0086	ERP Software Specific Experience
HE.0174	Optimization software
HE.0241	Shipment Planning/ Order Backlog Manipulation
HE.0293	Transportation/Warehouse Management systems (TMS/WMS)
HE.0304	Warehouse Experience

Training	
HT.0007	APICS CSCP
HT.0037	APICS CLTD
HT.0042	Distribution and warehousing policies
HT.0135	Software training programs (depends on software)
HT.0152	Transportation planning
HT.0153	Transportation/Logistics
HT.0155	Warehouse Management

HS.0193 Yard Management

Practices	
BP.029	Inventory Management Using Supply Chain Network Optimization
BP.037	Manufacturing Direct/Drop Shipment
BP.045	Delay Inbound Supplier Shipments
BP.046	Expedite Outbound Customer Shipments
BP.052	Design for Logistics (DFL) Management
BP.096	Logistics & Warehouse Planning
BP.104	Facility Master Planning
BP.116	Expedited Logistics
BP.146	Cross-Docking

Experiences

ABC Accounting	HE.0001
Accounting	HE.0002
Accounts Receivable	HE.0003
Advanced Financial Accounting Principles	HE.0004
Advanced Procurement	HE.0005
Allocation rules and strategy	HE.0006
Asset Management	HE.0007
ATP logic/calculation	HE.0008
Bar Coding/RFID	HE.0009
Basic Finance	HE.0010
Basic Procurement	HE.0011
Bills of Material/Specs/Fabrication Methodology	HE.0012
Bundling practices	HE.0013
Business model and sales channel	HE.0014
Business Performance Management	HE.0015
Business plans	HE.0016
Business Rules/Regulatory Policy/Company Return Policy	HE.0017
Capacity planning	HE.0018
Capital planning	HE.0019
Carrier Agreement Implementation	HE.0020
Carrier performance management	HE.0021
Carrier rating / routing guides usage	HE.0022
Carrier selection & qualification	HE.0023
Cash Application	HE.0024
CDR	HE.0025
Change management system	HE.0027
Collaborative Planning, Forecasting and Replenishment (CPFR)	HE.0028
Collections	HE.0029
Company Pricing/Margin Policy	HE.0030
Company terms and conditions	HE.0031
Computer Literate	HE.0032
Configuration Management	HE.0033
Conflict Resolution	HE.0034
Consignment practices	HE.0035
Construction reasoning	HE.0036
Container optimization	HE.0037
Continuous learning	HE.0038
Contract Administration/Management	HE.0039
Contractual Terms & Conditions	HE.0041
Cost Analysis	HE.0042
Cost Effectiveness	HE.0043
Cost Management	HE.0044
Cost Reduction Efforts	HE.0045
Cost/Benefit Analysis	HE.0046
Cost/Price Analysis	HE.0047
Cost/Service Modeling	HE.0048
Creating and Management of Business Rules	HE.0049
Creating/Reviewing/Updating Company Policies	HE.0050
Credit Management	HE.0051
Critical Path	HE.0052
CRM Methods and Tools	HE.0053
Cross Docking	HE.0054
Cross training	HE.0055

Customer Relationship Management (CRM)	HE.0057
Customer Requirements Management	HE.0058
Customer Service Strategy Agreements	HE.0059
Customer Site Readiness Verification	HE.0060
Customer Stocking Agreements Management	HE.0061
Cycle Counting	HE.0063
D & B Reports Review	HE.0064
Data Collection/Input	HE.0065
Data/Document Management	HE.0066
Defective product handling	HE.0067
Delivery Scheduling	HE.0068
Demand Management	HE.0069
Diagram Reading	HE.0070
Dispatch procedures	HE.0071
Disposition Resolution	HE.0072
Dispute Management	HE.0073
DOT/EPA	HE.0075
Economic Repair Assessment	HE.0076
Electrical/ pneumatic/hydro etc.	HE.0077
Electronic Data Interchange (EDI) Systems	HE.0078
Enforcing Company Policies	HE.0079
Engineering Capacity Management	HE.0080
Engineering/Design Management	HE.0081
Enterprise Business Process	HE.0082
Enterprise Resource Planning (ERP)	HE.0083
Environmental, Health and Safety Systems	HE.0084
EOQ management	HE.0085
ERP Software Specific Experience	HE.0086
Establishing Commercial Requirements	HE.0087
Establishing Effective SOW, Specifications, and Evaluation Criteria	HE.0088
Establishing Engineering and Product Design	HE.0089
Establishing Product Life Cycle	HE.0090
Establishing Quality Requirements	HE.0091
Establishing Source and Evaluation Criteria	HE.0092
Establishing Technical/Contracts Team	HE.0093
Exception management tool usage/experience	HE.0094
Excess product handling	HE.0095
Existing internal metrics and relationships	HE.0096
External Supplier Systems Interface	HE.0097
Fast track, partial delivery	HE.0098
Finance	HE.0099
Financial Accounting	HE.0100
Financial Collaboration	HE.0101
Financial Planning	HE.0102
Flow Manufacturing	HE.0103
Forecasting	HE.0104
Forklift or Other Material Handling Equipment Experience	HE.0105
Forwarder management	HE.0106
Freight Management	HE.0107
Fuel Price Hedging Strategy	HE.0108
Funnel update/ management	HE.0109
Government Regulations	HE.0110
Handling Management	HE.0111
Hazardous Materials Handling	HE.0112

Hazardous Waste Disposal Guidelines	HE.0113
Hoshin Kanri	HE.0114
Identification methodologies	HE.0115
Import/Export Logistics	HE.0116
Import/Export Regulations	HE.0117
Inbound quality management	HE.0118
Industrial engineering	HE.0119
Industry Analysis of Supply Markets	HE.0120
Industry specific domain knowledge	HE.0121
Industry Specific Knowledge and Experience	HE.0122
Industry Specific Regulatory Knowledge	HE.0123
Industry/product-specific installation experience	HE.0125
Intellectual Property Reporting & Restrictions	HE.0126
Internal market/SKU segmentation logic	HE.0127
Internal organizational vs functional knowledge	HE.0128
International business	HE.0129
International Financial Reporting Standards	HE.0130
Inventory Management	HE.0131
Inventory strategy	HE.0132
Inventory Valuation/Financial Analysis	HE.0133
ISO Compliance	HE.0134
Item crib management	HE.0135
Item Master	HE.0136
Just-In-Time Inventory	HE.0138
Kanban System	HE.0139
Knowledge of business rules concerning customer	HE.0140
Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations	HE.0141
Lead time management	HE.0142
Lean Manufacturing	HE.0144
Legal Impact	HE.0146
Load building process and control	HE.0147
Local/national/global transportation guidelines	HE.0148
Logistics sourcing strategy and contract management	HE.0149
Make/Buy decision analysis	HE.0150
Management of service Strategy agreements with customers	HE.0152
Managing and Measuring Performance	HE.0153
Manufacturing engineering	HE.0154
Manufacturing Management	HE.0155
Market Knowledge	HE.0156
Marketing	HE.0157
Master build plan	HE.0158
Master Data/Document Management	HE.0159
Material Resource Planning (MRP)	HE.0160
Materials Management	HE.0161
Materials portfolio and specifications	HE.0162
Modeling Techniques	HE.0163
MRO management	HE.0164
MS Office (Excel, PowerPoint, Word, Access)	HE.0165
Negotiation	HE.0167
Network Optimization	HE.0169
Off-shore contracting	HE.0170
On time-shipping and delivery metric logic/calculation	HE.0171
Operations	HE.0172

Optimization software	HE.0174
Order Management	HE.0175
Order Processing System/Enterprise Resource Planning Systems Usage (ERP) System	HE.0176
Order-to-cash process	HE.0177
OSHA	HE.0178
Outsourcing	HE.0179
Packaging Configuration and Palletizing	HE.0180
Payment methods	HE.0181
PDR	HE.0182
Performance Reporting Systems Development/Use	HE.0183
Performance/Cost Trade-offs	HE.0184
Performance Reporting System/ERP System	HE.0185
Planning	HE.0186
Planogram tool usage	HE.0187
PLM/PDM knowledge	HE.0188
Point of Use Storage	HE.0190
Preventative Maintenance	HE.0191
Process Engineering	HE.0192
Process Improvement	HE.0193
Process management	HE.0194
Procurement experience	HE.0195
Product display management	HE.0196
Product Identification System	HE.0197
Product Life Cycle Management	HE.0198
Product Portfolio understanding	HE.0199
Product Profitability	HE.0200
Product Structure	HE.0201
Product/Supplier Knowledge	HE.0202
Production build process	HE.0203
Production Planning/Scheduling	HE.0204
Project Management	HE.0205
Pull Systems	HE.0206
Quality Management Systems	HE.0208
Quality processes related to inventory management (test times, shelf life)	HE.0209
Quotation/CRM tool	HE.0210
Reading Maps/Using Navigator	HE.0211
Receiving and Verifying Product	HE.0212
Reducing Total Cost of Ownership	HE.0213
Regulatory and company return policy	HE.0214
Regulatory Policies/Compliance	HE.0216
Requirements management system	HE.0217
Requirements verification methods & tools	HE.0218
Resource and Installation Material Organization	HE.0219
Retail payment management	HE.0220
Return Process	HE.0221
Risk Analysis	HE.0222
Risk Management	HE.0224
Root cause analysis	HE.0225
Routing tool usage	HE.0226
Safety Requirements	HE.0227
Safety Stock Management	HE.0229
Sales and Operations Planning (S&OP)	HE.0230
Sampling methods	HE.0231

Sarbanes Oxley	HE.0232
SCOR	HE.0233
Scrapping procedure	HE.0234
Security and compliance	HE.0235
Selecting & Scheduling Modes of Transportation	HE.0236
Service / Installation Management	HE.0237
Service level calculation tools and metrics	HE.0238
Service Provider Agreements	HE.0239
Shelf Life Management	HE.0240
Shipment Planning/ Order Backlog Manipulation	HE.0241
Shipping Document Creation/Management	HE.0242
Single Minute Exchange of Dies	HE.0243
Six Sigma	HE.0244
Specific Systems knowledge	HE.0245
Spend & Supply Demand Analysis	HE.0246
Spreadsheet Management	HE.0247
Stakeholder Management	HE.0248
Standards and testing	HE.0249
Statistical control techniques	HE.0250
Statistical Modeling/Analysis	HE.0251
Statistical Principles	HE.0252
Stocking plan management	HE.0253
Strategic Planning	HE.0254
Subcontracting	HE.0255
Supervisory/Management	HE.0256
Supplier & shipping agreements	HE.0257
Supplier Certification	HE.0258
Supplier Data Exchange	HE.0259
Supplier Identification, Qualification	HE.0260
Supplier management	HE.0261
Supplier Performance Assessment	HE.0262
Supplier production and lead time capabilities	HE.0263
Supplier Relationship Management (SRM)	HE.0264
Supplier Service Strategy Agreements	HE.0265
Supply Chain Collaboration & Partnerships	HE.0266
Supply Chain Leadership	HE.0267
Supply Chain Management	HE.0268
Supply Chain Performance Management/Metrics	HE.0269
Supply Chain Planning	HE.0270
Supply Chain Requirements	HE.0271
Supply Demand Segmentation	HE.0272
Technical Collaboration	HE.0274
Technical Data Understanding	HE.0275
Technical Interface	HE.0276
Technical Requirements Understanding	HE.0277
Technical Specifications	HE.0278
Technical writing of requirements deliverables	HE.0279
Trade Off Analysis	HE.0280
Transport Outsourcing	HE.0281
Transportation Inbound/Outbound	HE.0282
Transportation Consolidation	HE.0283
Transportation Management - Mode Capabilities/Capacities/Lead Times	HE.0284
Transportation Paperwork	HE.0285
Transportation planning	HE.0286

Transportation Rating/Pricing	HE.0287
Transportation Regulations	HE.0288
Transportation Scheduling	HE.0289
Transportation Tracking	HE.0290
Transportation/Freight Management	HE.0292
Transportation/Warehouse Management systems (TMS/WMS)	HE.0293
Unit of Measure Understanding	HE.0294
Utilizing Company Specific Business Systems	HE.0296
Utilizing Customer Relationship Management System	HE.0297
Utilizing Finance Systems	HE.0298
Utilizing Transportation Management Systems	HE.0299
Utilizing Warehouse Management Systems	HE.0300
Value Stream Mapping	HE.0301
Vendor Managed Inventory	HE.0302
Vendor Rating System	HE.0303
Warehouse Experience	HE.0304
Warehouse/Distribution Management	HE.0305
Warehousing Min/Max Shelf Life	HE.0306
Waste Disposal Procedure	HE.0307
Water Spider	HE.0308
WIP Methodology	HE.0309
WIP Reporting	HE.0310
Written/Verbal Communication	HE.0311

Trainings

Advanced Accounting principles	HT.0001
Advanced Excel Techniques	HT.0002
Advanced Negotiations/Collaborative Planning	HT.0003
Advertising Methodologies	HT.0004
Agreement construct/Legal requirements	HT.0005
APICS CLTD – Certified in Logistics, Transportation and Distribution	HT.0037
APICS CPIM - Certified in Production and Inventory Management	HT.0006
APICS CSCP – Certified Supply Chain Professional	HT.0007
APICS Principles of Distribution and Logistics	HT.0157
APICS Principles of Inventory Management	HT.0158
APICS Principles of Managing Operations	HT.0159
APICS Principles of Manufacturing Management	HT.0160
APICS Principles of Operations Planning	HT.0161
Automation Tools	HT.0008
Basic and Advanced Business	HT.0009
Basic and Advanced Finance	HT.0010
Basic Inventory Concepts	HT.0011
Basic legal process (embargo, black list)	HT.0012
Basic Science	HT.0013
Basic Supply Chain Finance	HT.0014
Blanket Purchase Agreements	HT.0015
Business Ethics/Conduct training	HT.0016
Business model and sales channel	HT.0017
Calculating Safety Stock	HT.0019
Capability & Organization Risks	HT.0020
Capacity Management (Aggregate Planning)	HT.0021
CAPS	HT.0022
Cellular Manufacturing	HT.0023
Certification Schemes	HT.0024
Communicating Customer & Supplier Information	HT.0025
Company Policies, Mission and Strategy, Business Conduct	HT.0026
Conflict Resolution	HT.0027
Contract Management	HT.0028
Contract Negotiation	HT.0029
Contracting for Supply Professionals	HT.0030
Corporate Strategy	HT.0031
Cost Reduction Efforts	HT.0032
Cost/Price Analysis	HT.0033
CPFR	HT.0034
Credit Management	HT.0035
Cross Docking	HT.0036
CTL	HT.0038
CTPAT	HT.0039
Disposal procedure and environmental rules	HT.0040
Disposition Resolution	HT.0041
Distribution and warehousing policies	HT.0042
Electronic Data Exchange Systems	HT.0043
Electronic Identification Systems	HT.0044
Enabling Technology	HT.0045
Engineering	HT.0046
Enterprise & Material Resource Planning Systems	HT.0047
Enterprise Optimization	HT.0048

Enterprise Strategic Business Rules	HT.0049
Environmental regulation	HT.0050
Equipment & Machine usage certification (trucks & lifting equipment)	HT.0051
ERP Systems Training	HT.0052
Evaluating Performance of Production Operations	HT.0053
Evaluating Quality Management Process	HT.0054
Exception Management	HT.0055
Federal/National/International Regulatory Compliance	HT.0056
Financial Accounting	HT.0057
Forecasting Techniques	HT.0060
Fork Truck Licensing	HT.0061
Fundamentals of International Trade	HT.0062
General Accounting	HT.0063
General Procurement & Subcontracting	HT.0064
Green Procurement	HT.0065
Green systems engineering	HT.0066
IBF Certification	HT.0067
IFRS/US GAAP revenue recognition	HT.0068
Import/Export Regulations	HT.0069
Industry specific regulatory certification	HT.0070
Industry Specific Test Stand Certification	HT.0071
Integrated Supply Chain Management	HT.0072
Introduction to Supply Chain	HT.0073
Inventory Centralization	HT.0074
Inventory Management	HT.0076
IP, Technology patents and copyrights	HT.0078
ISO Certification	HT.0080
Just - In - Time (JIT)	HT.0081
Language skills	HT.0082
Lean Manufacturing Training	HT.0084
Legal Rules	HT.0087
Load building and Planning	HT.0088
Logistics Management	HT.0089
Logistics Operations	HT.0090
Managing Hazardous Materials	HT.0091
Managing Supply Risk - AMR	HT.0092
Material Planning Process	HT.0094
Mechanic Certification	HT.0095
Microsoft Project	HT.0096
Modeling Techniques	HT.0097
MRP Systems training	HT.0098
MS Office (Excel, PowerPoint, Word, Access)	HT.0099
NDT	HT.0101
Negotiation Skills	HT.0102
Occupational Safety & Health	HT.0104
Outsourcing	HT.0105
Packaging and palletizing	HT.0106
Physical Distribution Systems	HT.0107
Procurement/Subcontracting On Job Training	HT.0108
Product Specific Training	HT.0109
Production Plan	HT.0111
Project Management	HT.0112
Push Systems	HT.0113
Quality Management Systems	HT.0114

Regulatory Compliance	HT.0116
Requirements traceability	HT.0117
Return Scheduling	HT.0118
Reverse Logistics	HT.0119
Risk Management	HT.0120
Routing and rating	HT.0121
S&OP training (Oliver Wight, Tom Wallace or equivalent)	HT.0122
Safety and Environmental Management (industry specific, company specific and country specific)	HT.0123
Sales and Operations Planning	HT.0124
SCC SCRM using SCOR	HT.0125
SCOR	HT.0126
SCOR-P Certification	HT.0127
SCORmark	HT.0128
Scrap Re-Selling	HT.0129
Shop Floor-system specific	HT.0130
Six Sigma Certification	HT.0132
Six Sigma Greenbelt	HT.0133
Six Sigma Yellow belt	HT.0134
Software training programs (depends on software)	HT.0135
Statistics	HT.0136
Strategic Issues	HT.0137
Strategic Planning	HT.0138
Subcontracting Management	HT.0139
Supplier Relationship Management (SRM)	HT.0140
Supply Chain Leadership	HT.0141
Supply Chain Management	HT.0142
Supply Chain Performance Measurements	HT.0143
Supply chain planning	HT.0144
Supply Chain Security	HT.0145
Taxes/Duties Education	HT.0146
Team skills training	HT.0147
Techniques of Detailed Capacity Planning Process	HT.0149
Total Quality Management (TQM)	HT.0150
Trade-offs in Logistics Costs	HT.0151
Transportation planning	HT.0152
Transportation/Logistics	HT.0153
Vendor Managed Inventory	HT.0154
Warehouse Management	HT.0155
Warranty Policy Training	HT.0156

Special Applications

Introduction to SustainableSCOR

Sustainable business models and environmental accounting are growing business concerns. The SCOR model, which is a proven framework for defining supply chain scope and process operations as well as measuring supply chain performance, provides an excellent foundation for environmental accounting in the supply chain. In that regard, APICS is proposing a set of strategic environmental metrics that can be added to the SCOR Model to effectively allow the SCOR Model to be used as a framework for environmental accounting.

These metrics are closely aligned with the GRI (Global Reporting Initiative) Standards. GRI has emerged as the go-to standard for corporate sustainability reporting. The GRI standards create a common language for organization and stakeholders, with which the economic, environmental, and social impacts of organizations can be communicated and understood. The Standards are designed to enhance the global comparability and quality of information on these impacts, thereby enabling greater transparency and accountability of organizations.

SCOR Sustainability uses the GRI definitions and measures when dealing with the sustainability environmental topics (GRI 300 series Topic-Specific Standards). This approach is being used to help supply chain professionals gain visibility of the environmental topics that are in their supply chain network and value chain network, and enable them to model and manage these impacts. A value chain covers the full range of an organization's upstream and downstream activities, which encompass the full life cycle of a product or service, from its conception to its end use.

Only GRI metrics that are within the realm of supply chain management, sourcing, and managing the risk related to supply chain operations will be included in the scope of the SCOR model.

When the SCOR model uses an element that aligns with a GRI disclosure, the specific GRI disclosure number will be cross-referenced at the bottom of the Sustainable SCOR metric page. Please note that the GRI reporting rules shall be followed when making any reporting claims by organizations.

GRI Standards are free to use and are available at www.globalreporting.org/standards.

GRI Standard	Category	Metric	Units	Basis
301	Materials	Materials used	Weight or volume	Total weight or volume of materials that are used to produce and package the organization's primary products and services.
	Recycled inputs	Percent recycled input materials	Percent	The percent of recycled input materials used to manufacture the organization's primary products and services.
	Reclaimed inputs	Percent reclaimed input materials	Percent	The percent of reclaimed input materials used to manufacture the organization's primary products and services.

GRI Standard	Category	Metric	Units	Basis
302	Energy	Energy consumed	Joules, Watt-hours or multiples	
		Energy intensity ratio	Ratio	The energy required per unit of activity, output or any other organization-specific metric.
		Reduction of energy consumption	Joules, Watt-hours or multiples	The amount of reductions in energy consumption achieved as a direct result of conservation and efficiency initiatives, in joules or multiples. .
303	Water	Water volume withdrawn	Gallons, liters or multiples	
		Water intensity ratio	Ratio	The water withdrawal required per unit of activity, output or any other organization-specific metric.
		Water recycled and reused	Gallons, liters or multiples	The rate of water reuse and recycling is a measure of efficiency and demonstrates success in reducing total water withdrawals and discharges.
305	Emissions	Air emissions	Metric tons or equivalents	Emissions into the air, which are the discharge of substances from a source into the atmosphere.
		GHG emissions intensity	Ratio	The amount of GHG emissions per unit of activity, output, or any other organization-specific metric.
		Reduction of GHG emissions	Metric tons or equivalents	The amount of reductions in GHG emissions achieved as a direct result of elements or activities designed to reduce GHG emissions, such as carbon storage.
306	Effluents and Waste	Liquid and solid wastes	Gallons, Liters or Multiples, Weight or Volume	The amount of effluents and waste generated by an organization to produce and package the organization's primary products and services. This includes water discharges, hazardous and non-hazardous waste.

SustainableSCOR metrics can be measured for each of the SCOR level-3 processes and then aggregated to create a level-2 and level-1 metric. SustainableSCOR metrics are readily available for most organizations that are measuring and reporting upon GRI material topics. Environmental agencies and industry associations have developed emissions factors based on process throughput, energy consumption, etc. for calculating emissions. Alternatively, emissions values can be directly collected through monitoring programs or common documents (e.g., regulatory reports, waste shipping documents, environmental permits, etc.).

While many businesses are making progress optimizing their operations and improving their sustainability-related performance, if they remain reliant on an inefficient value chain, in the long run they will not be competitive. Developing value chain insights is an essential survival tool for businesses to avoid the risks and maximize on the opportunities from a resource constrained future.

By adding SustainableSCOR metrics to the SCOR Model, an organization can use the existing SCOR based methods for defining supply chain scope and configuration. Once this process is complete, SustainableSCOR metrics allow for targeted, structured data collection and calculation of metrics which ultimately provide a total view of supply chain environmental performance.

Using the SCOR Model as an environmental accounting framework has additional benefits as well. First, the framework clearly ties the various emissions to the originating processes. This provides a structure for not just measuring performance, but identifying where action can be taking to improve performance.

The hierarchal nature of the SCOR Model allows for strategic environmental footprint goals to be easily translated to targets in specific activities. Likewise, when strategic goals are not being met, the framework provides a structure for root cause analysis as well as end-to-end supply chain and value chain network optimization around environmental performance.

Lastly, as with other SCOR Model metrics, these metrics have clear definitions and a tie to process activities that provide a foundation for effective benchmarking. This capability allows companies to compare environmental performance of their supply chain using the same methods currently used for comparing business performance. Through benchmarking, managers can go beyond measuring environmental performance and understand that performance in the context of their industry peers' performance.

The remainder of this appendix details these environmental metrics and their decomposition levels in the same format used elsewhere in the SCOR Model.

APICS believes that this metrics structure provides an effective tool for environmental supply chain and value chain accounting. However, this approach is not currently in use, therefore, these metrics are not included as fully approved SCOR metrics. Please provide feedback to APICS on the effectiveness of this metrics structure as it is applied to your supply chain operations.

SustainableSCOR

Total Supply Chain Materials Used	SS.1.001
Plan Materials Used	SS.2.001
Source Materials Used	SS.2.002
Make Materials Used	SS.2.003
Deliver Materials Used	SS.2.004
Return Materials Used	SS.2.005
Total Supply Chain Materials Intensity Ratio	SS.1.002
Total Supply Chain Non-Renewable Materials Used	SS.1.003
Plan Non-Renewable Materials Used	SS.2.006
Source Non-Renewable Materials Used	SS.2.007
Make Non-Renewable Materials Used	SS.2.008
Deliver Non-Renewable Materials Used	SS.2.009
Return Non-Renewable Materials Used	SS.2.010
Total Supply Chain Renewable Materials Used	SS.1.004
Plan Renewable Materials Used	SS.2.003
Source Renewable Materials Used	SS.2.004
Make Renewable Materials Used	SS.2.005
Deliver Renewable Materials Used	SS.2.006
Return Renewable Materials Used	SS.2.007
Total Supply Chain % of Recycled Input Materials Used	SS.1.005
Plan % of Recycled Input Materials Used	SS.2.008
Source % of Recycled Input Materials Used	SS.2.009
Make % of Recycled Input Materials Used	SS.2.010
Deliver % of Recycled Input Materials Used	SS.2.011
Return % of Recycled Input Materials Used	SS.2.012
Total Supply Chain % of Reclaimed Products and Their Packaging Materials	SS.1.006
Plan % Products and their Packaging Materials Reclaimed	SS.2.013
Source % of Products and their Packaging Materials Reclaimed	SS.2.014
Make % of Products and their Packaging Materials Reclaimed	SS.2.015
Deliver % of Products and their Packaging Materials Reclaimed	SS.2.016
Return % of Products and their Packaging Materials Reclaimed	SS.2.017
Total Supply Chain Energy Consumed	SS.1.007
Plan Energy Consumed	SS.2.018
Source Energy Consumed	SS.2.019
Make Energy Consumed	SS.2.020
Deliver Energy Consumed	SS.2.021
Return Energy Consumed	SS.2.022
Total Supply Chain Non-Renewable Energy Consumed	SS.1.008
Plan Non-Renewable Energy Consumed	SS.2.023
Source Non-Renewable Energy Consumed	SS.2.024
Make Non-Renewable Energy Consumed	SS.2.025
Deliver Non-Renewable Energy Consumed	SS.2.026
Return Non-Renewable Energy Consumed	SS.2.027
Total Supply Chain Renewable Sourced Energy Consumed	SS.1.009
Plan Renewable Sourced Energy Consumed	SS.2.028
Source Renewable Sourced Energy Consumed	SS.2.029
Make Renewable Sourced Energy Consumed	SS.2.030
Deliver Renewable Sourced Energy Consumed	SS.2.031
Return Renewable Sourced Energy Consumed	SS.2.032
Total Supply Chain Energy Intensity Ratio	SS.1.010
Total Supply Chain Reduction of Energy Consumption	SS.1.011

Total Supply Chain Water Withdrawn	SS.1.012
Plan Water Withdrawn	SS.2.033
Source Water Withdrawn	SS.2.034
Make Water Withdrawn	SS.2.035
Deliver Water Withdrawn	SS.2.036
Return Water Withdrawn	SS.2.037
Total Supply Chain Water Reused or Recycled	SS.1.013
Plan Water Reused or Recycled	SS.2.038
Source Water Reused or Recycled	SS.2.039
Make Water Reused or Recycled	SS.2.040
Deliver Water Reused or Recycled	SS.2.041
Return Water Reused or Recycled	SS.2.042
Total Supply Chain Water Intensity Ratio	SS.1.014
Total Supply Chain GHG Emissions	SS.1.015
Total Supply Chain Direct (Scope 1) GHG Emissions	SS.1.016
Plan Direct (Scope 1) GHG Emissions	SS.2.043
Plan Supply Chain Direct (Scope 1) GHG Emissions	SS.3.001
Plan Source Direct (Scope 1) GHG Emissions	SS.3.002
Plan Make Direct (Scope 1) GHG Emissions	SS.3.003
Plan Deliver Direct (Scope 1) GHG Emissions	SS.3.004
Plan Return Direct (Scope 1) GHG Emissions	SS.3.005
Source Direct (Scope 1) GHG Emissions	SS.2.044
Supplier Management Direct (Scope 1) GHG Emissions	SS.3.006
Material Acquisition Management Direct (Scope 1) GHG Emissions	SS.3.007
Make (Production-related) Direct (Scope 1) GHG Emissions	SS.2.045
Deliver Direct (Scope 1) GHG Emissions	SS.2.046
Sales Order Management Direct (Scope 1) GHG Emissions	SS.3.008
Customer Management Direct (Scope 1) GHG Emissions	SS.3.009
Return Direct (Scope 1) GHG Emissions	SS.2.047
Source Return Direct (Scope 1) GHG Emissions	SS.3.010
Deliver Return Direct (Scope 1) GHG Emissions	SS.3.011
Total Supply Chain Energy Indirect (Scope 2) GHG Emissions	SS.1.017
Plan Energy Indirect (Scope 2) GHG Emissions	SS.2.048
Plan Supply Chain Energy Indirect (Scope 2) GHG Emissions	SS.3.012
Plan Source Energy Indirect (Scope 2) GHG Emissions	SS.3.013
Plan Make Energy Indirect (Scope 2) GHG Emissions	SS.3.014
Plan Deliver Energy Indirect (Scope 2) GHG Emissions	SS.3.015
Plan Return Energy Indirect (Scope 2) GHG Emissions	SS.3.016
Source Energy Indirect (Scope 2) GHG Emissions	SS.2.049
Supplier Management Energy Indirect (Scope 2) GHG Emissions	SS.3.017
Material Acquisition Management Energy Indirect (Scope 2) GHG Emissions	SS.3.018
Make Energy Indirect (Scope 2) GHG Emissions	SS.2.050
Deliver Energy Indirect (Scope 2) GHG Emissions	SS.2.051
Sales Order Management Energy Indirect (Scope 2) GHG Emissions	SS.3.019
Customer Management Energy Indirect (Scope 2) GHG Emissions	SS.3.020
Return Energy Indirect (Scope 2) GHG Emissions	SS.2.052
Source Return Energy Indirect (Scope 2) GHG Emissions	SS.3.021
Deliver Return Energy Indirect (Scope 2) GHG Emissions	SS.3.022
Total Supply Chain Other Indirect (Scope 3) GHG Emissions	SS.1.018
Plan Other Indirect (Scope 3) GHG Emissions	SS.2.053
Plan Supply Chain Other Indirect (Scope 3) GHG Emissions	SS.3.023

Material Acquisition Management Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.051
Make Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.2.065
Deliver Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.2.066
Sales Order Management Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.052
Customer Management Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.053
Return Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.2.067
Source Return Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.054
Deliver Return Nitrogen oxides, sulfur oxides, and other significant air emissions	SS.3.055
Total Supply Chain Air Emissions	SS.1.023
Total Supply Chain Water Discharge	SS.1.024
Plan Water Discharge	SS.2.068
Source Water Discharge	SS.2.069
Make Water Discharge	SS.2.070
Deliver Water Discharge	SS.2.071
Return Water Discharge	SS.2.072
Total Supply Chain Non-Hazardous Waste	SS.1.025
Plan Non-Hazardous Waste	SS.2.073
Source Non-Hazardous Waste	SS.2.074
Make Non-Hazardous Waste	SS.2.075
Deliver Non-Hazardous Waste	SS.2.076
Return Non-Hazardous Waste	SS.2.077
Total Supply Chain Hazardous Waste	SS.1.026
Plan Hazardous Waste	SS.2.078
Source Hazardous Waste	SS.2.079
Make Hazardous Waste	SS.2.080
Deliver Hazardous Waste	SS.2.081
Return Hazardous Waste	SS.2.082

SustainableSCOR

SS.1.001 Total Supply Chain Materials Used

The Sum of all materials used in the level 2 processes to Plan, Source, Make, Deliver and Return.

Calculation

Total Supply Chain Materials Used = Plan Materials Used + Source Materials Used + Make Materials Used + Deliver Materials Used + Return Materials Used.

Data collection

The amount of materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.001	Plan Materials Used
SS.2.002	Source Materials Used
SS.2.003	Make Materials Used
SS.2.004	Deliver Materials Used
SS.2.005	Return Materials Used

Reference: GRI 301-1: Materials 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.001 Plan Materials Used

The Sum of all materials used in the level 2 processes to Plan.

Calculation

Plan Materials Used = Sum of Plan Materials Used.

Data collection

The amount of materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.002 Source Materials Used

The Sum of all materials used in the level 2 processes to Source.

Calculation

Source Materials Used = Sum of Source Materials Used.

Data collection

The amount of materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.003 Make Materials Used

The Sum of all materials used in the level 2 processes to Make.

Calculation

Make Materials Used = Sum of Make Materials Used.

Data collection

The amount of materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.004 Deliver Materials Used

The Sum of all materials used in the level 2 processes to Deliver.

Calculation

Deliver Materials Used = Sum of Deliver Materials Used.

Data collection

The amount of materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.005 Return Materials Used

The Sum of all materials used in the level 2 processes to Return.

Calculation

Return Materials Used = Sum of Return Materials Used.

Data collection

The amount of materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.002 Total Supply Chain Materials Intensity Ratio

The total supply chain materials used divided by the organization-specific metric.

Calculation

Total Supply Chain Materials Intensity Ratio = Total Supply Chain Materials used / Organization Specific Metric.

Data collection

The materials intensity ratio defines materials used in the context of an organization-specific metric. The ratio expresses the materials required per unit of activity, output, or any other organization-specific metric. Intensity ratios are often called normalized environmental impact data. Organization-specific metrics (denominators) can include: units of product, production volume, size, number of full-time employees, or monetary units. This measure is an indicator of how material efficient an organization is in comparison of the value created for the materials used.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.003 Total Supply Chain Non-Renewable Materials Used

The Sum of all Non-Renewable materials used in the level 2 processes to Plan, Source, Make, Deliver and Return. Non-renewable material (as defined by GRI) is a resource that does not renew in short time periods Examples of non-renewable materials can include minerals, metals, oil, gas, or coal.

Calculation

Total Supply Chain Non-Renewable Materials Used = Plan Non-Renewable Materials Used + Source Non-Renewable Materials Used + Make Non-Renewable Materials Used + Deliver Non-Renewable Materials Used + Return Non-Renewable Materials Used.

Data collection

The amount of Non-Renewable materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.006	Plan Non-Renewable Materials Used
SS.2.007	Source Non-Renewable Materials Used
SS.2.008	Make Non-Renewable Materials Used
SS.2.009	Deliver Non-Renewable Materials Used
SS.2.010	Return Non-Renewable Materials Used

Reference: GRI 301-1: Materials 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.006

Plan Non-Renewable Materials Used

The Sum of all Non-Renewable materials used in the level 2 processes to Plan. Non-renewable material (as defined by GRI) is a resource that does not renew in short time periods Examples of non-renewable materials can include minerals, metals, oil, gas, or coal.

Calculation

Plan Non-Renewable Materials Used = Sum of Plan Non-Renewable Materials Used.

Data collection

The amount of Non-Renewable materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.007 Source Non-Renewable Materials Used

The Sum of all Non-Renewable materials used in the level 2 processes to Source. Non-renewable material (as defined by GRI) is a resource that does not renew in short time periods Examples of non-renewable materials can include minerals, metals, oil, gas, or coal.

Calculation

Source Non-Renewable Materials Used = Sum of Source Non-Renewable Materials Used.

Data collection

The amount of Non-Renewable materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.008

Make Non-Renewable Materials Used

The Sum of all Non-Renewable materials used in the level 2 processes to Make. Non-renewable material (as defined by GRI) is a resource that does not renew in short time periods Examples of non-renewable materials can include minerals, metals, oil, gas, or coal.

Calculation

Make Non-Renewable Materials Used = Sum of Make Non-Renewable Materials Used.

Data collection

The amount of Non-Renewable materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.009 Deliver Non-Renewable Materials Used

The Sum of all Non-Renewable materials used in the level 2 processes to Deliver. Non-renewable material (as defined by GRI) is a resource that does not renew in short time periods Examples of non-renewable materials can include minerals, metals, oil, gas, or coal.

Calculation

Deliver Non-Renewable Materials Used = Sum of Deliver Non-Renewable Materials Used.

Data collection

The amount of Non-Renewable materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.010 Return Non-Renewable Materials Used

The Sum of all Non-Renewable materials used in the level 2 processes to Return. Non-renewable material (as defined by GRI) is a resource that does not renew in short time periods Examples of non-renewable materials can include minerals, metals, oil, gas, or coal.

Calculation

Return Non-Renewable Materials Used = Sum of Return Non-Renewable Materials Used.

Data collection

The amount of Non-Renewable materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.004 Total Supply Chain Renewable Materials Used

The Sum of all Renewable materials used in the level 2 processes to Plan, Source, Make, Deliver and Return. Renewable material (as defined by GRI) is a material that is derived from plentiful resources that are quickly replenished by ecological cycles or agricultural processes, so that the services provided by these and other linked resources are not endangered and remain available for the next generation.

Calculation

Total Supply Chain Renewable Materials Used = Plan Renewable Materials Used + Source Renewable Materials Used + Make Renewable Materials Used + Deliver Renewable Materials Used + Return Renewable Materials Used.

Data collection

The amount of Renewable materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.003	Plan Renewable Materials Used
SS.2.004	Source Renewable Materials Used
SS.2.005	Make Renewable Materials Used
SS.2.006	Deliver Renewable Materials Used
SS.2.007	Return Renewable Materials Used

Reference: GRI 301-1: Materials 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.003 Plan Renewable Materials Used

The Sum of all Renewable materials used in the level 2 processes to Plan. Renewable material (as defined by GRI) is a material that is derived from plentiful resources that are quickly replenished by ecological cycles or agricultural processes, so that the services provided by these and other linked resources are not endangered and remain available for the next generation.

Calculation

Plan Renewable Materials Used = Sum of Plan Renewable Materials Used.

Data collection

The amount of Renewable materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.004 Source Renewable Materials Used

The Sum of all Renewable materials used in the level 2 processes to Source. Renewable material (as defined by GRI) is a material that is derived from plentiful resources that are quickly replenished by ecological cycles or agricultural processes, so that the services provided by these and other linked resources are not endangered and remain available for the next generation.

Calculation

Source Renewable Materials Used = Sum of Source Renewable Materials Used.

Data collection

The amount of Renewable materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.005

Make Renewable Materials Used

The Sum of all Renewable materials used in the level 2 processes to Make. Renewable material (as defined by GRI) is a material that is derived from plentiful resources that are quickly replenished by ecological cycles or agricultural processes, so that the services provided by these and other linked resources are not endangered and remain available for the next generation.

Calculation

Make Renewable Materials Used = Sum of Make Renewable Materials Used.

Data collection

The amount of Renewable materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.006 Deliver Renewable Materials Used

The Sum of all Renewable materials used in the level 2 processes to Deliver. Renewable material (as defined by GRI) is a material that is derived from plentiful resources that are quickly replenished by ecological cycles or agricultural processes, so that the services provided by these and other linked resources are not endangered and remain available for the next generation.

Calculation

Deliver Renewable Materials Used = Sum of Deliver Renewable Materials Used.

Data collection

The amount of Renewable materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.007 Return Renewable Materials Used

The Sum of all Renewable materials used in the level 2 processes to Return. Renewable material (as defined by GRI) is a material that is derived from plentiful resources that are quickly replenished by ecological cycles or agricultural processes, so that the services provided by these and other linked resources are not endangered and remain available for the next generation.

Calculation

Return Renewable Materials Used = Sum of Return Renewable Materials Used.

Data collection

The amount of Renewable materials used should include the following material types in the calculation of total materials used: raw materials, associated process materials, semi-manufactured goods or parts and materials for packaging purposes.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.005 Total Supply Chain % of Recycled Input Materials Used

The Percentage of recycle input materials used to manufacture the organization's primary products and services associated with the SCOR level-2 processes to plan, source, make, deliver and return. Recycled material input (as defined by GRI): material that replaces virgin materials, which are purchased or obtained from internal or external sources, and that are not by-products and non-product outputs (NPO) produced by the organization. Care should be taken to ensure a consistent definition of recycled material input is applied throughout the supply chain.

Calculation

(Total Supply Chain recycled input materials used / Total Supply Chain input materials used) x 100.

Data collection

The calculation shall use the total weigh or volume of materials used.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.008	Plan % of Recycled Input Materials Used
SS.2.009	Source % of Recycled Input Materials Used
SS.2.010	Make % of Recycled Input Materials Used
SS.2.011	Deliver % of Recycled Input Materials Used
SS.2.012	Return % of Recycled Input Materials Used

Reference: GRI 301-2: Materials 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.008

Plan % of Recycled Input Materials Used

The Percentage of recycle input materials used to manufacture the organization's primary products and services associated with the SCOR level-2 processes to plan. Recycled material input (as defined by GRI): material that replaces virgin materials, which are purchased or obtained from internal or external sources, and that are not by-products and non-product outputs (NPO) produced by the organization. Care should be taken to ensure a consistent definition of recycled material input is applied throughout the supply chain.

Calculation

Plan % of Recycled Input Materials Used = Sum of Plan Percentage of Recycled Input Materials Used.

Data collection

The calculation shall use the total weigh or volume of materials used.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.009

Source % of Recycled Input Materials Used

The Percentage of recycle input materials used to manufacture the organization's primary products and services associated with the SCOR level-2 processes to source. Recycled material input (as defined by GRI): material that replaces virgin materials, which are purchased or obtained from internal or external sources, and that are not by-products and non-product outputs (NPO) produced by the organization. Care should be taken to ensure a consistent definition of recycled material input is applied throughout the supply chain.

Calculation

Source % of Recycled Input Materials Used = Sum of Source Percentage of Recycled Input Materials Used.

Data collection

The calculation shall use the total weigh or volume of materials used.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.010

Make % of Recycled Input Materials Used

The Percentage of recycle input materials used to manufacture the organization's primary products and services associated with the SCOR level-2 processes to make. Recycled material input (as defined by GRI): material that replaces virgin materials, which are purchased or obtained from internal or external sources, and that are not by-products and non-product outputs (NPO) produced by the organization. Care should be taken to ensure a consistent definition of recycled material input is applied throughout the supply chain.

Calculation

Make % of Recycled Input Materials Used = Sum of Make Percentage of Recycled Input Materials Used.

Data collection

The calculation shall use the total weigh or volume of materials used.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.011

Deliver % of Recycled Input Materials Used

The Percentage of recycle input materials used to manufacture the organization's primary products and services associated with the SCOR level-2 processes to deliver. Recycled material input (as defined by GRI): material that replaces virgin materials, which are purchased or obtained from internal or external sources, and that are not by-products and non-product outputs (NPO) produced by the organization. Care should be taken to ensure a consistent definition of recycled material input is applied throughout the supply chain.

Calculation

Deliver % of Recycled Input Materials Used = Sum of Deliver Percentage of Recycled Input Materials Used.

Data collection

The calculation shall use the total weigh or volume of materials used.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.012 Return % of Recycled Input Materials Used

The Percentage of recycle input materials used to manufacture the organization's primary products and services associated with the SCOR level-2 processes to return. Recycled material input (as defined by GRI): material that replaces virgin materials, which are purchased or obtained from internal or external sources, and that are not by-products and non-product outputs (NPO) produced by the organization. Care should be taken to ensure a consistent definition of recycled material input is applied throughout the supply chain.

Calculation

Return % of Recycled Input Materials Used = Sum of Return Percentage of Recycled Input Materials Used.

Data collection

The calculation shall use the total weigh or volume of materials used.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.006 Total Supply Chain % of Reclaimed Products and Their Packaging Materials

The overall Supply Chain Percentage of reclaimed products and their packaging materials that are used to manufacture the organization's primary products and services associated with the SCOR level-2 processes to plan, source, make, deliver and return. Reclaimed (as defined by GRI) refers to collecting, reusing, or recycling products and their packaging materials at the end of their useful lives. Collection and treatment can be carried out by the manufacturer of the product or by a contractor. Reclaimed items can include products and their packaging materials that are collected by or on behalf of the organization; separated into raw materials (such as steel, glass, paper, some kinds of plastic) or components; and/or used by the organization or other users. Care should be taken to ensure a consistent definition of reclaimed is applied throughout the supply chain.

Calculation

(Total Supply Chain Products and Their Packaging Materials Reclaimed within the reporting period/ Total Supply Chain Products Sold within the reporting period) x 100.

Data collection

Products and their packaging materials reclaimed during the period divided by the products sold within the same period.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.013	Plan % Products and their Packaging Materials Reclaimed
SS.2.014	Source % of Products and their Packaging Materials Reclaimed
SS.2.015	Make % of Products and their Packaging Materials Reclaimed
SS.2.016	Deliver % of Products and their Packaging Materials Reclaimed
SS.2.017	Return % of Products and their Packaging Materials Reclaimed

Reference: GRI 301-3: Materials 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.013 Plan % of Products and their Packaging Materials Reclaimed

The Percentage of reclaimed products and their packaging materials that are used to manufacture the organization's primary products and services associated with the SCOR level-2 processes to plan. Reclaimed (as defined by GRI) refers to collecting, reusing, or recycling products and their packaging materials at the end of their useful lives. Collection and treatment can be carried out by the manufacturer of the product or by a contractor. Reclaimed items can include products and their packaging materials that are collected by or on behalf of the organization; separated into raw materials (such as steel, glass, paper, some kinds of plastic) or components; and/or used by the organization or other users. Care should be taken to ensure a consistent definition of reclaimed is applied throughout the supply chain.

Calculation

Plan % of Products and their Packaging Materials Reclaimed within the reporting period = Sum of Plan Percentage of Products and their Packaging Materials Reclaimed within the reporting period.

Data collection

Products and their packaging materials reclaimed during the period divided by the products sold within the same period.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.014 Source % of Products and their Packaging Materials Reclaimed

The Percentage of reclaimed products and their packaging materials that are used to manufacture the organization's primary products and services associated with the SCOR level-2 processes to source. This can be carried out by the manufacturer of the product or by a contractor. Reclaimed (as defined by GRI) refers to collecting, reusing, or recycling products and their packaging materials at the end of their useful lives. Collection and treatment can be carried out by the manufacturer of the product or by a contractor. Reclaimed items can include products and their packaging materials that are collected by or on behalf of the organization; separated into raw materials (such as steel, glass, paper, some kinds of plastic) or components; and/or used by the organization or other users. Care should be taken to ensure a consistent definition of reclaimed is applied throughout the supply chain.

Calculation

Source % of Products and their Packaging Materials Reclaimed within the reporting period = Sum of Source Percentage of Products and their Packaging Materials Reclaimed within the reporting period.

Data collection

Products and their packaging materials reclaimed during the period divided by the products sold within the same period.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.015 Make % of Products and their Packaging Materials Reclaimed

The Percentage of reclaimed products and their packaging materials that are used to manufacture the organization's primary products and services associated with the SCOR level-2 processes to make. This can be carried out by the manufacturer of the product or by a contractor. Reclaimed (as defined by GRI) refers to collecting, reusing, or recycling products and their packaging materials at the end of their useful lives. Collection and treatment can be carried out by the manufacturer of the product or by a contractor. Reclaimed items can include products and their packaging materials that are collected by or on behalf of the organization; separated into raw materials (such as steel, glass, paper, some kinds of plastic) or components; and/or used by the organization or other users. Care should be taken to ensure a consistent definition of reclaimed is applied throughout the supply chain.

Calculation

Make % of Products and their Packaging Materials Reclaimed within the reporting period = Sum of Make Percentage of Products and their Packaging Materials Reclaimed within the reporting period.

Data collection

Products and their packaging materials reclaimed during the period divided by the products sold within the same period.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.016 Deliver % of Products and their Packaging Materials Reclaimed

The Percentage of reclaimed products and their packaging materials that are used to manufacture the organization's primary products and services associated with the SCOR level-2 processes to deliver. This can be carried out by the manufacturer of the product or by a contractor. Reclaimed (as defined by GRI) refers to collecting, reusing, or recycling products and their packaging materials at the end of their useful lives. Collection and treatment can be carried out by the manufacturer of the product or by a contractor. Reclaimed items can include products and their packaging materials that are collected by or on behalf of the organization; separated into raw materials (such as steel, glass, paper, some kinds of plastic) or components; and/or used by the organization or other users. Care should be taken to ensure a consistent definition of reclaimed is applied throughout the supply chain.

Calculation

Deliver % of Products and their Packaging Materials Reclaimed within the reporting period = Sum of Deliver Percentage of Products and their Packaging Materials Reclaimed within the reporting period.

Data collection

Products and their packaging materials reclaimed during the period divided by the products sold within the same period.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.017 Return % of Products and their Packaging Materials Reclaimed

The Percentage of reclaimed products and their packaging materials that are used to manufacture the organization's primary products and services associated with the SCOR level-2 processes to return. This can be carried out by the manufacturer of the product or by a contractor. Reclaimed (as defined by GRI) refers to collecting, reusing, or recycling products and their packaging materials at the end of their useful lives. Collection and treatment can be carried out by the manufacturer of the product or by a contractor. Reclaimed items can include products and their packaging materials that are collected by or on behalf of the organization; separated into raw materials (such as steel, glass, paper, some kinds of plastic) or components; and/or used by the organization or other users. Care should be taken to ensure a consistent definition of reclaimed is applied throughout the supply chain.

Calculation

Return % of Products and their Packaging Materials Reclaimed within the reporting period = Sum of Return Percentage of Products and their Packaging Materials Reclaimed within the reporting period.

Data collection

Products and their packaging materials reclaimed during the period divided by the products sold within the same period.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.007 Total Supply Chain Energy Consumed

The Sum of all energy consumed in the level 2 processes to Plan, Source, Make, Deliver and Return.

Calculation

Total Supply Chain Energy Consumed = Plan Energy Consumed + Source Energy Consumed + Make Energy Consumed + Deliver Energy Consumed + Return Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.018	Plan Energy Consumed
SS.2.019	Source Energy Consumed
SS.2.020	Make Energy Consumed
SS.2.021	Deliver Energy Consumed
SS.2.022	Return Energy Consumed

Reference: GRI 302-1: Energy 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.018

Plan Energy Consumed

The Sum of all energy consumed in the level 2 processes to Plan.

Calculation

Plan Energy Consumed = Sum of Plan Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.019 Source Energy Consumed

The Sum of all energy consumed in the level 2 processes to Source.

Calculation

Source Energy Consumed = Sum of Source Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.020

Make Energy Consumed

The Sum of all energy consumed in the level 2 processes to Make.

Calculation

Make Energy Consumed = Sum of Make Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.021 Deliver Energy Consumed

The Sum of all energy consumed in the level 2 processes to Deliver.

Calculation

Deliver Energy Consumed = Sum of Deliver Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.022 Return Energy Consumed

The Sum of all energy consumed in the level 2 processes to Return.

Calculation

Return Energy Consumed = Sum of Return Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.008 Total Supply Chain Non-Renewable Energy Consumed

The Sum of all Non-Renewable energy consumed in the level 2 processes to Plan, Source, Make, Deliver and Return. Non-renewable energy source (as defined by GRI) is an energy source that cannot be replenished, reproduced, grown or generated in a short time period through ecological cycles or agricultural processes. Non-renewable energy sources can include fuel distilled from petroleum or crude oil, such as gasoline, diesel fuel, jet fuel, and heating oil; natural gas, such as compressed natural gas (CNG), and liquefied natural gas (LNG); fuels extracted from natural gas processing and petroleum refining, such as butane, propane, and liquefied petroleum gas (LPG); coal; and nuclear power.

Calculation

Total Supply Chain Non-Renewable Energy Consumed = Plan Non-Renewable Energy Consumed + Source Non-Renewable Energy Consumed + Make Non-Renewable Energy Consumed + Deliver Non-Renewable Energy Consumed + Return Non-Renewable Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.023	Plan Non-Renewable Energy Consumed
SS.2.024	Source Non-Renewable Energy Consumed
SS.2.025	Make Non-Renewable Energy Consumed
SS.2.026	Deliver Non-Renewable Energy Consumed
SS.2.027	Return Non-Renewable Energy Consumed

Reference: GRI 302-1: Energy 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.023

Plan Non-Renewable Energy Consumed

The Sum of all Non-Renewable energy consumed in the level 2 processes to Plan. Non-renewable energy source (as defined by GRI) is an energy source that cannot be replenished, reproduced, grown or generated in a short time period through ecological cycles or agricultural processes. Non-renewable energy sources can include fuel distilled from petroleum or crude oil, such as gasoline, diesel fuel, jet fuel, and heating oil; natural gas, such as compressed natural gas (CNG), and liquefied natural gas (LNG); fuels extracted from natural gas processing and petroleum refining, such as butane, propane, and liquefied petroleum gas (LPG); coal; and nuclear power.

Calculation

Plan Non-Renewable Energy Consumed = Sum of Plan Non-Renewable Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.024 Source Non-Renewable Energy Consumed

The Sum of all Non-Renewable energy consumed in the level 2 processes to Source. Non-renewable energy source (as defined by GRI) is an energy source that cannot be replenished, reproduced, grown or generated in a short time period through ecological cycles or agricultural processes. Non-renewable energy sources can include fuel distilled from petroleum or crude oil, such as gasoline, diesel fuel, jet fuel, and heating oil; natural gas, such as compressed natural gas (CNG), and liquefied natural gas (LNG); fuels extracted from natural gas processing and petroleum refining, such as butane, propane, and liquefied petroleum gas (LPG); coal; and nuclear power.

Calculation

Source Non-Renewable Energy Consumed = Sum of Source Non-Renewable Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.025 Make Non-Renewable Energy Consumed

The Sum of all Non-Renewable energy consumed in the level 2 processes to Make. Non-renewable energy source (as defined by GRI) is an energy source that cannot be replenished, reproduced, grown or generated in a short time period through ecological cycles or agricultural processes. Non-renewable energy sources can include fuel distilled from petroleum or crude oil, such as gasoline, diesel fuel, jet fuel, and heating oil; natural gas, such as compressed natural gas (CNG), and liquefied natural gas (LNG); fuels extracted from natural gas processing and petroleum refining, such as butane, propane, and liquefied petroleum gas (LPG); coal; and nuclear power.

Calculation

Make Non-Renewable Energy Consumed = Sum of Make Non-Renewable Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.026 Deliver Non-Renewable Energy Consumed

The Sum of all Non-Renewable energy consumed in the level 2 processes to Deliver. Non-renewable energy source (as defined by GRI) is an energy source that cannot be replenished, reproduced, grown or generated in a short time period through ecological cycles or agricultural processes. Non-renewable energy sources can include fuel distilled from petroleum or crude oil, such as gasoline, diesel fuel, jet fuel, and heating oil; natural gas, such as compressed natural gas (CNG), and liquefied natural gas (LNG); fuels extracted from natural gas processing and petroleum refining, such as butane, propane, and liquefied petroleum gas (LPG); coal; and nuclear power.

Calculation

Deliver Non-Renewable Energy Consumed = Sum of Deliver Non-Renewable Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.027 Return Non-Renewable Energy Consumed

The Sum of all Non-Renewable energy consumed in the level 2 processes to Return. Non-renewable energy source (as defined by GRI) is an energy source that cannot be replenished, reproduced, grown or generated in a short time period through ecological cycles or agricultural processes. Non-renewable energy sources can include fuel distilled from petroleum or crude oil, such as gasoline, diesel fuel, jet fuel, and heating oil; natural gas, such as compressed natural gas (CNG), and liquefied natural gas (LNG); fuels extracted from natural gas processing and petroleum refining, such as butane, propane, and liquefied petroleum gas (LPG); coal; and nuclear power.

Calculation

Return Non-Renewable Energy Consumed = Sum of Return Non-Renewable Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.009 Total Supply Chain Renewable Sourced Energy Consumed

The Sum of all Renewable energy consumed in the level 2 processes to Plan, Source, Make, Deliver and Return. Renewable energy source (as defined by GRI) is an energy source that is capable of being replenished in a short time through ecological cycles or agricultural processes. Renewable energy sources can include geothermal, wind, solar, hydro, and biomass.

Calculation

Total Supply Chain Renewable Sourced Energy Consumed = Plan Renewable Sourced Energy Consumed + Source Renewable Sourced Energy Consumed + Make Renewable Sourced Energy Consumed + Deliver Renewable Sourced Energy Consumed + Return Renewable Sourced Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.028	Plan Renewable Sourced Energy Consumed
SS.2.029	Source Renewable Sourced Energy Consumed
SS.2.030	Make Renewable Sourced Energy Consumed
SS.2.031	Deliver Renewable Sourced Energy Consumed
SS.2.032	Return Renewable Sourced Energy Consumed

Reference: GRI 302-1: Energy 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.028

Plan Renewable Sourced Energy Consumed

The Sum of all Renewable energy consumed in the level 2 processes to Plan. Renewable energy source (as defined by GRI) is an energy source that is capable of being replenished in a short time through ecological cycles or agricultural processes. Renewable energy sources can include geothermal, wind, solar, hydro, and biomass.

Calculation

Plan Renewable Sourced Energy Consumed = Sum of Plan Renewable Sourced Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.029 Source Renewable Sourced Energy Consumed

The Sum of all Renewable energy consumed in the level 2 processes to Source. Renewable energy source (as defined by GRI) is an energy source that is capable of being replenished in a short time through ecological cycles or agricultural processes. Renewable energy sources can include geothermal, wind, solar, hydro, and biomass.

Calculation

Source Renewable Sourced Energy Consumed = Sum of Source Renewable Sourced Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.030 Make Renewable Sourced Energy Consumed

The Sum of all Renewable energy consumed in the level 2 processes to Make. Renewable energy source (as defined by GRI) is an energy source that is capable of being replenished in a short time through ecological cycles or agricultural processes. Renewable energy sources can include geothermal, wind, solar, hydro, and biomass.

Calculation

Make Renewable Sourced Energy Consumed = Sum of Make Renewable Sourced Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.031 Deliver Renewable Sourced Energy Consumed

The Sum of all Renewable energy consumed in the level 2 processes to Deliver. Renewable energy sources can include geothermal, wind, solar, hydro, and biomass.

Calculation

Deliver Renewable Sourced Energy Consumed = Sum of Deliver Renewable Sourced Energy Consumed.

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.032 Return Renewable Sourced Energy Consumed

The Sum of all Renewable energy consumed in the level 2 processes to Return. Renewable energy sources can include geothermal, wind, solar, hydro, and biomass.

Calculation

Return Renewable Sourced Energy Consumed = Sum of Return Renewable Sourced Energy Consumed

Data collection

The calculation shall be in joules, watt-hours or multiples and include electricity, heating, cooling and steam consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.010 Total Supply Chain Energy Intensity Ratio

The total supply chain absolute energy consumption divided by the organization-specific metric.

Calculation

Total Supply Chain Energy Intensity Ratio = Total Supply Chain Absolute Energy Consumption / Organization Specific Metric.

Data collection

The energy intensity ratio defines energy consumption in the context of an organization-specific metric. The ratio expresses the energy required per unit of activity, output, or any other organization-specific metric. Intensity ratios are often called normalized environmental impact data. Organization-specific metrics (denominators) can include: units of product, production volume, size, number of full-time employees, or monetary units. This measure is an indicator of how energy efficient an organization is in comparison of the value created for the energy consumed.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Reference: GRI 302-3: Energy 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.1.011 Total Supply Chain Reduction of Energy Consumption

The total supply chain reduction of energy consumption from baseline year.

Calculation

Total Supply Chain Reduction of Energy Consumption = Baseline Year Total Supply Chain Absolute Energy Consumption - Total Supply Chain Absolute Energy Consumption.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Reference: GRI 302-4: Energy 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.1.012 Total Supply Chain Water Withdrawn

The total supply chain water withdrawn associated with the SCOR level-1 processes for plan, source, make, deliver and return. Water withdrawn (as used in GRI) may include surface water, including water from wetlands, rivers, lakes, and oceans; Ground water; Rainwater collected directly and stored by the organization; Waste water from another organization; Municipal water supplies or other public or private water utilities. GRI disclosure 303-2, Water sources significantly affected by withdrawal of water, would be taken into consideration in the supply chain risk process sE9.

Calculation

Total Supply Chain Water Withdrawn = Plan Water Withdrawn + Source Water Withdrawn + Make Water Withdrawn + Deliver Water Withdrawn + Return Water Withdrawn.

Data collection

Total volume of water withdrawn shall include: surface water, ground water, rainwater collected and stored by the organization, waste water from another organization, municipal water supplies or public or private water utilities and should include the abstraction of cooling water and be in gallons, liters, or multiples.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.033	Plan Water Withdrawn
SS.2.034	Source Water Withdrawn
SS.2.035	Make Water Withdrawn
SS.2.036	Deliver Water Withdrawn
SS.2.037	Return Water Withdrawn

Reference: GRI 303-1: Water 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.033 Plan Water Withdrawn

The total supply chain water withdrawn associated with the SCOR level-1 processes for plan. Water withdrawn (as used in GRI) may include surface water, including water from wetlands, rivers, lakes, and oceans; Ground water; Rainwater collected directly and stored by the organization; Waste water from another organization; Municipal water supplies or other public or private water utilities. GRI disclosure 303-2 Water sources significantly affected by withdrawal of water would be taken into consideration in supply chain risk process sE9.

Calculation

Plan Water Withdrawn = Sum of Plan Water Withdrawn.

Data collection

Total volume of water withdrawn shall include: surface water, ground water, rainwater collected and stored by the organization, waste water from another organization, municipal water supplies or public or private water utilities and should include the abstraction of cooling water and be in gallons, liters, or multiples.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.034

Source Water Withdrawn

The total supply chain water withdrawn associated with the SCOR level-1 processes for source. Water withdrawn (as used in GRI) may include surface water, including water from wetlands, rivers, lakes, and oceans; Ground water; Rainwater collected directly and stored by the organization; Waste water from another organization; Municipal water supplies or other public or private water utilities. GRI disclosure 303-2, Water sources significantly affected by withdrawal of water, would be taken into consideration in the supply chain risk process sE9.

Calculation

Source Water Withdrawn = Sum of Source Water Withdrawn.

Data collection

Total volume of water withdrawn shall include: surface water, ground water, rainwater collected and stored by the organization, waste water from another organization, municipal water supplies or public or private water utilities and should include the abstraction of cooling water and be in gallons, liters, or multiples.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.035 Make Water Withdrawn

The total supply chain water withdrawn associated with the SCOR level-1 processes for make. Water withdrawn (as used in GRI) may include surface water, including water from wetlands, rivers, lakes, and oceans; Ground water; Rainwater collected directly and stored by the organization; Waste water from another organization; Municipal water supplies or other public or private water utilities. GRI disclosure 303-2, Water sources significantly affected by withdrawal of water, would be taken into consideration in the supply chain risk process sE9.

Calculation

Make Water Withdrawn = Sum of Make Water Withdrawn.

Data collection

Total volume of water withdrawn shall include: surface water, ground water, rainwater collected and stored by the organization, waste water from another organization, municipal water supplies or public or private water utilities and should include the abstraction of cooling water and be in gallons, liters, or multiples.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.036

Deliver Water Withdrawn

The total supply chain water withdrawn associated with the SCOR level-1 processes for deliver. Water withdrawn (as used in GRI) may include surface water, including water from wetlands, rivers, lakes, and oceans; Ground water; Rainwater collected directly and stored by the organization; Waste water from another organization; Municipal water supplies or other public or private water utilities. GRI disclosure 303-2, Water sources significantly affected by withdrawal of water, would be taken into consideration in the supply chain risk process sE9.

Calculation

Deliver Water Withdrawn = Sum of Deliver Water Withdrawn.

Data collection

Total volume of water withdrawn shall include: surface water, ground water, rainwater collected and stored by the organization, waste water from another organization, municipal water supplies or public or private water utilities and should include the abstraction of cooling water and be in gallons, liters, or multiples.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.037 Return Water Withdrawn

The total supply chain water withdrawn associated with the SCOR level-1 processes for return. Water withdrawn (as used in GRI) may include surface water, including water from wetlands, rivers, lakes, and oceans; Ground water; Rainwater collected directly and stored by the organization; Waste water from another organization; Municipal water supplies or other public or private water utilities. GRI disclosure 303-2, Water sources significantly affected by withdrawal of water, would be taken into consideration in the supply chain risk process sE9.

Calculation

Return Water Withdrawn = Sum of Return Water Withdrawn.

Data collection

Total volume of water withdrawn shall include: surface water, ground water, rainwater collected and stored by the organization, waste water from another organization, municipal water supplies or public or private water utilities and should include the abstraction of cooling water and be in gallons, liters, or multiples.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.013 Total Supply Chain Water Reused or Recycled

The total supply chain water recycled and reused by the organization associated with the SCOR level-1 processes for plan, source, make, deliver and return. Water recycling and reuse (as defined by GRI) is the act of processing used water and wastewater through another cycle before discharge to final treatment and discharge to the environment. Water recycling and reuse can include wastewater recycled back in the same process or higher use of recycled water in the process cycle; wastewater recycled and reused in a different process, but within the same facility; and wastewater reused at another of the organization's facilities.

Calculation

Total Supply Chain Water Reused or Recycled = Plan Water Reused or Recycled + Source Water Reused or Recycled + Make Water Reused or Recycled + Deliver Water Reused or Recycled + Return Water Reused or Recycled.

Data collection

The rate of water reuse and recycling is a measure of efficiency and demonstrates the success of an organization in reducing total water withdrawals and discharges. Increased reuse and recycling can reduce water consumption, treatment, and disposal costs. Reducing water consumption over time through reuse and recycling also contributes to local, national, or regional goals for managing water supplies.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.038	Plan Water Reused or Recycled
SS.2.039	Source Water Reused or Recycled
SS.2.040	Make Water Reused or Recycled
SS.2.041	Deliver Water Reused or Recycled
SS.2.042	Return Water Reused or Recycled

Reference: GRI 303-3: Water 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.038 Plan Water Reused or Recycled

The total supply chain water recycled and reused by the organization associated with the SCOR level-1 processes for plan. Water recycling and reuse (as defined by GRI) is the act of processing used water and wastewater through another cycle before discharge to final treatment and discharge to the environment. Water recycling and reuse can include wastewater recycled back in the same process or higher use of recycled water in the process cycle; wastewater recycled and reused in a different process, but within the same facility; and wastewater reused at another of the organization's facilities.

Calculation

Plan Water Reused or Recycled = Sum of Plan Water Reused or Recycled.

Data collection

The rate of water reuse and recycling is a measure of efficiency and demonstrates the success of an organization in reducing total water withdrawals and discharges. Increased reuse and recycling can reduce water consumption, treatment, and disposal costs. Reducing water consumption over time through reuse and recycling also contributes to local, national, or regional goals for managing water supplies.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.039 Source Water Reused or Recycled

The total supply chain water recycled and reused by the organization associated with the SCOR level-1 processes for source. Water recycling and reuse (as defined by GRI) is the act of processing used water and wastewater through another cycle before discharge to final treatment and discharge to the environment. Water recycling and reuse can include wastewater recycled back in the same process or higher use of recycled water in the process cycle; wastewater recycled and reused in a different process, but within the same facility; and wastewater reused at another of the organization's facilities.

Calculation

Source Water Reused or Recycled = Sum of Source Water Reused or Recycled.

Data collection

The rate of water reuse and recycling is a measure of efficiency and demonstrates the success of an organization in reducing total water withdrawals and discharges. Increased reuse and recycling can reduce water consumption, treatment, and disposal costs. Reducing water consumption over time through reuse and recycling also contributes to local, national, or regional goals for managing water supplies.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.040 Make Water Reused or Recycled

The total supply chain water recycled and reused by the organization associated with the SCOR level-1 processes for make. Water recycling and reuse (as defined by GRI) is the act of processing used water and wastewater through another cycle before discharge to final treatment and discharge to the environment. Water recycling and reuse can include wastewater recycled back in the same process or higher use of recycled water in the process cycle; wastewater recycled and reused in a different process, but within the same facility; and wastewater reused at another of the organization's facilities.

Calculation

Make Water Reused or Recycled = Sum of Make Water Reused or Recycled.

Data collection

The rate of water reuse and recycling is a measure of efficiency and demonstrates the success of an organization in reducing total water withdrawals and discharges. Increased reuse and recycling can reduce water consumption, treatment, and disposal costs. Reducing water consumption over time through reuse and recycling also contributes to local, national, or regional goals for managing water supplies.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.041 Deliver Water Reused or Recycled

The total supply chain water recycled and reused by the organization associated with the SCOR level-1 processes for deliver. Water recycling and reuse (as defined by GRI) is the act of processing used water and wastewater through another cycle before discharge to final treatment and discharge to the environment. Water recycling and reuse can include wastewater recycled back in the same process or higher use of recycled water in the process cycle; wastewater recycled and reused in a different process, but within the same facility; and wastewater reused at another of the organization's facilities.

Calculation

Deliver Water Reused or Recycled = Sum of Deliver Water Reused or Recycled.

Data collection

The rate of water reuse and recycling is a measure of efficiency and demonstrates the success of an organization in reducing total water withdrawals and discharges. Increased reuse and recycling can reduce water consumption, treatment, and disposal costs. Reducing water consumption over time through reuse and recycling also contributes to local, national, or regional goals for managing water supplies.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.042 Return Water Reused or Recycled

The total supply chain water recycled and reused by the organization associated with the SCOR level-1 processes for return. Water recycling and reuse (as defined by GRI) is the act of processing used water and wastewater through another cycle before discharge to final treatment and discharge to the environment. Water recycling and reuse can include wastewater recycled back in the same process or higher use of recycled water in the process cycle; wastewater recycled and reused in a different process, but within the same facility; and wastewater reused at another of the organization's facilities.

Calculation

Return Water Reused or Recycled = Sum of Return Water Reused or Recycled.

Data collection

The rate of water reuse and recycling is a measure of efficiency and demonstrates the success of an organization in reducing total water withdrawals and discharges. Increased reuse and recycling can reduce water consumption, treatment, and disposal costs. Reducing water consumption over time through reuse and recycling also contributes to local, national, or regional goals for managing water supplies.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.014 Total Supply Chain Water Intensity Ratio

The total supply chain absolute water withdrawn divided by the organization-specific metric.

Calculation

Total Supply Chain Water Intensity Ratio = Total Supply Chain Water Withdrawn / Organization Specific Metric.

Data collection

The water intensity ratio defines water withdrawn in the context of an organization-specific metric. The ratio expresses the water required per unit of activity, output, or any other organization-specific metric. Intensity ratios are often called normalized environmental impact data. Organization-specific metrics (denominators) can include: units of product, production volume, size, number of full-time employees, or monetary units. This measure is an indicator of how water efficient an organization is in comparison of the value created for the water withdrawn.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.015 Total Supply Chain GHG Emissions

The sum of GHG emissions associated with the SCOR Level 2 processes to plan, source, make, deliver and return.

Calculation

Total Supply Chain Direct (Scope 1) GHG Emissions + Total Energy indirect (Scope 2) GHG Emissions + Other indirect (Scope 3) GHG Emissions.

Data collection

Include Gross direct (Scope 1) GHG emissions in metric tons of CO2 equivalent. List gases included in the calculation; whether CO2, CH4, N2O, HFCs, PFCs, SF6, NF3, or all and biogenic CO2 emissions in metric tons of CO2 equivalent.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.1.016	Total Supply Chain Direct (Scope1) GHG Emissions
SS.1.017	Total Energy Indirect (Scope 2) GHG Emissions
SS.1.018	Total Other Indirect (Scope 3) GHG Emissions

SS.1.016 Total Supply Chain Direct (Scope 1) GHG Emissions

The sum of Plan Direct (Scope 1) GHG emissions plus Source Direct (Scope 1) GHG emissions plus Make (production-related Direct (Scope 1) GHG emissions plus Deliver Direct (Scope 1) GHG Emissions plus Return Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to plan, source, make, deliver and return.

Calculation

Total Supply Chain Direct (Scope 1) GHG Emissions = Plan Direct (Scope 1) GHG Emissions + Source Direct (Scope 1) GHG Emissions + Make Direct (Scope 1) GHG Emissions + Deliver Direct (Scope 1) GHG Emissions + Return Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.043	Plan Direct (Scope 1) GHG Emissions
SS.2.044	Source Direct (Scope 1) GHG Emissions
SS.2.045	Make (Production-related) Direct (Scope 1) GHG Emissions
SS.2.046	Deliver Direct (Scope 1) GHG Emissions
SS.2.047	Return Direct (Scope 1) GHG Emissions

Reference: GRI 305-1: Emissions 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.043 Plan Direct (Scope 1) GHG Emissions

The sum of Plan Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Direct (Scope 1) GHG Emissions = Sum of Plan Direct (Scope 1) GHG Emissions (for Plan Supply Chain + Plan Source + Plan Make + Plan Deliver + Plan Return)

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.001	Plan Supply Chain Direct (Scope 1) GHG Emissions
SS.3.002	Plan Source Direct (Scope 1) GHG Emissions
SS.3.003	Plan Make Direct (Scope 1) GHG Emissions
SS.3.004	Plan Deliver Direct (Scope 1) GHG Emissions
SS.3.005	Plan Return Direct (Scope 1) GHG Emissions

SS.3.001 Plan Supply Chain Direct (Scope 1) GHG Emissions

The sum of Plan Supply Chain Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Supply Chain Direct (Scope 1) GHG Emissions = Sum of Plan Supply Chain Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.002 Plan Source Direct (Scope 1) GHG Emissions

The sum of Plan Source Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Source Direct (Scope 1) GHG Emissions = Sum of Plan Source Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.003 Plan Make Direct (Scope 1) GHG Emissions

The sum of Plan Make Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Make Direct (Scope 1) GHG Emissions = Sum of Plan Make Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.004 Plan Deliver Direct (Scope 1) GHG Emissions

The sum of Plan Deliver Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Deliver Direct (Scope 1) GHG Emissions = Sum of Plan Deliver Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.005 Plan Return Direct (Scope 1) GHG Emissions

The sum of Plan Return Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Return Direct (Scope 1) GHG Emissions = Sum of Plan Return Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.044 Source Direct (Scope 1) GHG Emissions

The sum of Source Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to source.

Calculation

Source Direct (Scope 1) GHG Emissions = Sum of Direct (Scope 1) GHG Emissions for Supplier Management + Direct (Scope 1) GHG Emissions for Material Acquisition Management.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.006	Supplier Management Direct (Scope 1) GHG Emissions
SS.3.007	Material Acquisition Management Direct (Scope 1) GHG Emissions

SS.3.006

Supplier Management Direct (Scope 1) GHG Emissions

The sum of Supplier Management Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to source.

Calculation

Supplier Management Direct (Scope 1) GHG Emissions = Sum of Supplier Management Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.007 Material Acquisition Management Direct (Scope 1) GHG Emissions

The sum of Material Acquisition Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to source.

Calculation

Material Acquisition Management Direct (Scope 1) GHG Emissions = Sum of Material Acquisition Management Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.045 Make (Production-related) Direct (Scope 1) GHG Emissions

The sum of Make (Production-related) Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to make.

Calculation

Make (Production-related) Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.046 Deliver Direct (Scope 1) GHG Emissions

The sum of Deliver Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to deliver.

Calculation

Deliver Direct (Scope 1) GHG Emissions = Sum of Direct (Scope 1) GHG Emissions for Sales Order Management + Direct (Scope 1) GHG Emissions for Customer Management.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.008	Sales Order Management Direct (Scope 1) GHG Emissions
SS.3.009	Customer Management Direct (Scope 1) GHG Emissions

SS.3.008 Sales Order Management Direct (Scope 1) GHG Emissions

The sum of Sales Order Management Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to deliver.

Calculation

Sales Order Management Direct (Scope 1) GHG Emissions = Sum of Sales Order Management Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.009

Customer Management Direct (Scope 1) GHG Emissions

The sum of Customer Management Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to deliver.

Calculation

Customer Management Direct (Scope 1) GHG Emissions = Sum of Customer Management Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.047 Return Direct (Scope 1) GHG Emissions

The sum of Return Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to return.

Calculation

Cost to Return = Sum of Direct (Scope 1) GHG Emissions for Source Returns + Direct (Scope 1) GHG Emissions for Customer Returns.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.010	Source Return Direct (Scope 1) GHG Emissions
SS.3.011	Deliver Return Direct (Scope 1) GHG Emissions

SS.3.010 Source Return Direct (Scope 1) GHG Emissions

The sum of Source Return Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to return.

Calculation

Source Return Direct (Scope 1) GHG Emissions = Sum of Source Return Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.011 Deliver Return Direct (Scope 1) GHG Emissions

The sum of Deliver Return Direct (Scope 1) GHG emissions associated with the SCOR Level 2 processes to return.

Calculation

Deliver Return Direct (Scope 1) GHG Emissions = Sum of Deliver Return Direct (Scope 1) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.017 Total Supply Chain Energy Indirect (Scope 2) GHG Emissions

The sum of Plan indirect (Scope 2) GHG emissions plus Source indirect (Scope 2) GHG emissions plus Make (production-related indirect (Scope 2) GHG emissions plus Deliver indirect (Scope 2) GHG Emissions plus Return indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to plan, source, make, deliver and return.

Calculation

Total Supply Chain Energy indirect (Scope 2) GHG Emissions = Plan Energy indirect (Scope 2) GHG Emissions + Source Energy indirect (Scope 2) GHG Emissions + Make Energy indirect (Scope 2) GHG Emissions + Deliver Energy indirect (Scope 2) GHG Emissions + Return Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.048	Plan Energy Indirect (Scope 2) GHG Emissions
SS.2.049	Source Energy Indirect (Scope 2) GHG Emissions
SS.2.050	Make Energy Indirect (Scope 2) GHG Emissions
SS.2.051	Deliver Energy Indirect (Scope 2) GHG Emissions
SS.2.052	Return Energy Indirect (Scope 2) GHG Emissions

Reference: GRI 305-2: Emissions 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.048 Plan Energy Indirect (Scope 2) GHG Emissions

The sum of Plan energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Energy indirect (Scope 2) GHG Emissions = Sum of Plan Energy indirect (Scope 2) GHG Emissions (for Plan Supply Chain + Plan Source + Plan Make + Plan Deliver + Plan Return).

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.012	Plan Supply Chain Energy Indirect (Scope 2) GHG Emissions
SS.3.013	Plan Source Energy Indirect (Scope 2) GHG Emissions
SS.3.014	Plan Make Energy Indirect (Scope 2) GHG Emissions
SS.3.015	Plan Deliver Energy Indirect (Scope 2) GHG Emissions
SS.3.016	Plan Return Energy Indirect (Scope 2) GHG Emissions

SS.3.012 Plan Supply Chain Energy Indirect (Scope 2) GHG Emissions

The sum of Plan Supply Chain energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Supply Chain Energy indirect (Scope 2) GHG Emissions = Sum of Plan Supply Chain Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.013 Plan Source Energy Indirect (Scope 2) GHG Emissions

The sum of Plan Source energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Source Energy indirect (Scope 2) GHG Emissions = Sum of Plan Source Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.014 Plan Make Energy Indirect (Scope 2) GHG Emissions

The sum of Plan Make energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Make Energy indirect (Scope 2) GHG Emissions = Sum of Plan Make Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.015 Plan Deliver Energy Indirect (Scope 2) GHG Emissions

The sum of Plan Deliver energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Deliver Energy indirect (Scope 2) GHG Emissions = Sum of Plan Deliver Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.016 Plan Return Energy Indirect (Scope 2) GHG Emissions

The sum of Plan Return energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Return Energy indirect (Scope 2) GHG Emissions = Sum of Plan Return Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.049 Source Energy Indirect (Scope 2) GHG Emissions

The sum of Source energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to source.

Calculation

Source Energy indirect (Scope 2) GHG Emissions = Sum of Energy indirect (Scope 2) GHG Emissions for Supplier Management + Energy indirect (Scope 2) GHG Emissions for Material Acquisition Management.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.017	Supplier Management Energy Indirect (Scope 2) GHG Emissions
SS.3.018	Material Acquisition Management Energy Indirect (Scope 2) GHG Emissions

SS.3.017 Supplier Management Energy Indirect (Scope 2) GHG Emissions

The sum of Supplier Management energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to source.

Calculation

Supplier Management Energy indirect (Scope 2) GHG Emissions = Sum of Supplier Management Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.018

Material Acquisition Management Energy Indirect (Scope 2) GHG Emissions

The sum of Material Acquisition energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to source.

Calculation

Material Acquisition Management Energy indirect (Scope 2) GHG Emissions = Sum of Material Acquisition Management Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.050

Make Energy indirect (Scope 2) GHG Emissions

The sum of Make (Production-related) energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to make.

Calculation

Make Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.051 Deliver Energy Indirect (Scope 2) GHG Emissions

The sum of Deliver energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to deliver.

Calculation

Deliver Energy indirect (Scope 2) GHG Emissions = Sum of Energy indirect (Scope 2) GHG Emissions for Sales Order Management + Energy indirect (Scope 2) GHG Emissions for Customer Management.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.019	Sales Order Management Energy Indirect (Scope 2) GHG Emissions
SS.3.020	Customer Management Energy Indirect (Scope 2) GHG Emissions

SS.3.019 Sales Order Management Energy Indirect (Scope 2) GHG Emissions

The sum of Sales Order Management energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to deliver.

Calculation

Sales Order Management Energy indirect (Scope 2) GHG Emissions = Sum of Sales Order Management Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.020 Customer Management Energy Indirect (Scope 2) GHG Emissions

The sum of Customer Management energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to deliver.

Calculation

Customer Management Energy indirect (Scope 2) GHG Emissions = Sum of Customer Management Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.052 Return Energy Indirect (Scope 2) GHG Emissions

The sum of Source Return energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to return.

Calculation

Cost to Return = Sum of Energy indirect (Scope 2) GHG Emissions for Source Returns + Energy indirect (Scope 2) GHG Emissions for Customer Returns.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.021	Source Return Energy Indirect (Scope 2) GHG Emissions
SS.3.022	Deliver Return Energy Indirect (Scope 2) GHG Emissions

SS.3.021 Source Return Energy Indirect (Scope 2) GHG Emissions

The sum of Source Return energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to return.

Calculation

Source Return Energy indirect (Scope 2) GHG Emissions = Sum of Source Return Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.022 Deliver Return Energy Indirect (Scope 2) GHG Emissions

The sum of Deliver Return energy indirect (Scope 2) GHG emissions associated with the SCOR Level 2 processes to return.

Calculation

Deliver Return Energy indirect (Scope 2) GHG Emissions = Sum of Deliver Return Energy indirect (Scope 2) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.018 Total Supply Chain Other Indirect (Scope 3) GHG Emissions

The sum of Plan other indirect (Scope 3) GHG emissions plus Source other indirect (Scope 3) GHG emissions plus Make (production-related other indirect (Scope 3) GHG emissions plus Deliver other indirect (Scope 3) GHG Emissions plus Return other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to plan, source, make, deliver and return.

Calculation

Total Supply Chain Other indirect (Scope 3) GHG Emissions = Plan Other indirect (Scope 3) GHG Emissions + Source Other indirect (Scope 2) GHG Emissions + Make Other indirect (Scope 3) GHG Emissions + Deliver Other indirect (Scope 3) GHG Emissions + Return Other indirect (Scope 3) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.053	Plan Other Indirect (Scope 3) GHG Emissions
SS.2.054	Source Other Indirect (Scope 3) GHG Emissions
SS.2.055	Make Other Indirect (Scope 3) GHG Emissions
SS.2.056	Deliver Other Indirect (Scope 3) GHG Emissions
SS.2.057	Return Other Indirect (Scope 3) GHG Emissions

Reference: GRI 305-3: Emissions 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.053 Plan Other Indirect (Scope 3) GHG Emissions

The sum of Plan other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Other indirect (Scope 3) GHG Emissions = Sum of Plan Other indirect (Scope 3) GHG Emissions (for Plan Supply Chain + Plan Source + Plan Make + Plan Deliver + Plan Return).

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.023	Plan Supply Chain Other Indirect (Scope 3) GHG Emissions
SS.3.024	Plan Source Other Indirect (Scope 3) GHG Emissions
SS.3.025	Plan Make Other Indirect (Scope 3) GHG Emissions
SS.3.026	Plan Deliver Other Indirect (Scope 3) GHG Emissions
SS.3.027	Plan Return Other Indirect (Scope 3) GHG Emissions

SS.3.023 Plan Supply Chain Other Indirect (Scope 3) GHG Emissions

The sum of Plan Supply Chain other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Supply Chain Other indirect (Scope 3) GHG Emissions = Sum of Plan Supply Chain Other indirect (Scope 3) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.024 Plan Source Other indirect (Scope 3) GHG Emissions

The sum of Plan Source other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Source Other indirect (Scope 3) GHG Emissions = Sum of Plan Source Other indirect (Scope 3) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.025

Plan Make Other Indirect (Scope 3) GHG Emissions

The sum of Plan Make other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Make Other indirect (Scope 3) GHG Emissions = Sum of Plan Make Other indirect (Scope 3) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.026

Plan Deliver Other Indirect (Scope 3) GHG Emissions

The sum of Plan Deliver other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Deliver Other indirect (Scope 3) GHG Emissions = Sum of Plan Deliver Other indirect (Scope 3) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.027

Plan Return Other Indirect (Scope 3) GHG Emissions

The sum of Plan Return other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to plan.

Calculation

Plan Return Other indirect (Scope 3) GHG Emissions = Sum of Plan Return Other indirect (Scope 3) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.054 Source Other Indirect (Scope 3) GHG Emissions

The sum of Source other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to source.

Calculation

Source Other indirect (Scope 3) GHG Emissions = Sum of Other indirect (Scope 3) GHG Emissions for Supplier Management + Other indirect (Scope 3) GHG Emissions for Material Acquisition Management.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.028	Supplier Management Other Indirect (Scope 3) GHG Emissions
SS.3.029	Material Acquisition Management Other Indirect (Scope 3) GHG Emissions

SS.3.028 Supplier Management Other Indirect (Scope 3) GHG Emissions

The sum of Supplier Management other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to source.

Calculation

Supplier Management Other indirect (Scope 3) GHG Emissions = Sum of Supplier Management Other indirect (Scope 3) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.029

Material Acquisition Management Other Indirect (Scope 3) GHG Emissions

The sum of Material Acquisition other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to source.

Calculation

Material Acquisition Management Other indirect (Scope 3) GHG Emissions = Sum of Material Acquisition Management Other indirect (Scope 3) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.055

Make Other Indirect (Scope 3) GHG Emissions

The sum of Make (Production-related) other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to make.

Calculation

Make Other indirect (Scope 3) GHG Emissions = Sum of Other indirect (Scope 3) GHG Emissions for Direct Production + Other indirect (Scope 3) GHG Emissions for Indirect Production-related.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.056 Deliver Other Indirect (Scope 3) GHG Emissions

The sum of Deliver other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to deliver.

Calculation

Deliver Other indirect (Scope 3) GHG Emissions = Sum of Other indirect (Scope 3) GHG Emissions for Sales Order Management + Other indirect (Scope 3) GHG Emissions for Customer Management.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.030	Sales Order Management Other Indirect (Scope 3) GHG Emissions
SS.3.031	Customer Management Other Indirect (Scope 3) GHG Emissions

SS.3.030

Sales Order Management Other Indirect (Scope 3) GHG Emissions

The sum of Sales Order Management other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to deliver.

Calculation

Sales Order Management Other indirect (Scope 3) GHG Emissions = Sum of Sales Order Management Other indirect (Scope 3) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.031 Customer Management Other Indirect (Scope 3) GHG Emissions

The sum of Customer Management other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to deliver.

Calculation

Customer Management Other indirect (Scope 3) GHG Emissions = Sum of Customer Management Other indirect (Scope 3) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.057 Return Other Indirect (Scope 3) GHG Emissions

The sum of Return other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to return.

Calculation

Cost to Return = Sum of Other indirect (Scope 3) GHG Emissions for Source Returns + Other indirect (Scope 3) GHG Emissions for Customer Returns.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.032	Source Return Other Indirect (Scope 3) GHG Emissions
SS.3.033	Deliver Return Other Indirect (Scope 3) GHG Emissions

SS.3.032 Source Return Other Indirect (Scope 3) GHG Emissions

The sum of Source Return other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to return.

Calculation

Source Return Other indirect (Scope 3) GHG Emissions = Sum of Source Return Other indirect (Scope 3) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.033 Deliver Return Other Indirect (Scope 3) GHG Emissions

The sum of Deliver Return other indirect (Scope 3) GHG emissions associated with the SCOR Level 2 processes to return.

Calculation

Deliver Return Other indirect (Scope 3) GHG Emissions = Sum of Deliver Return Other indirect (Scope 3) GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.019

Total Supply GHG Emissions Intensity Ratio

The sum of all supply chain GHG emissions divided by the organization-specific metric.

Calculation

Total Supply Chain GHG Emissions intensity ratio = Total Supply Chain GHG Emissions / organization specific metric.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Reference: GRI 305-4: Emissions 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.1.020 Reduction of GHG Emissions

The baseline sum of GHG emissions associated with the SCOR Level 2 processes to plan, source, make, deliver and return minus the GHG emissions reduced as a direct result of reduction initiatives.

Calculation

Baseline Total Supply Chain GHG Emissions - Total Supply Chain GHG Emissions.

Data collection

GHG emissions are a major contributor to climate change and are governed by the United Nations (UN) 'Framework Convention on Climate Change' and the subsequent UN 'Kyoto Protocol'.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Reference: GRI 305-5: Emissions 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.1.021 Total Supply GHG Emissions of ozone-depleting substances (ODS)

The total sum of Supply Chain Emissions of ozone-depleting substances (ODS) associated with the SCOR Level 2 processes to plan, source, make, deliver and return.

Calculation

Total Supply Chain Emissions of ozone-depleting substances (ODS) = Plan Emissions of ozone-depleting substances (ODS)+ Source Other indirect (Scope 2) GHG Emissions + Make Emissions of ozone-depleting substances (ODS)+ Deliver Emissions of ozone-depleting substances (ODS)+ Return Other indirect (Scope 3) GHG Emissions.

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.058	Plan Emissions of ozone-depleting substances (ODS)
SS.2.059	Source Emissions of ozone-depleting substances (ODS)
SS.2.060	Make Emissions of ozone-depleting substances (ODS)
SS.2.061	Deliver Emissions of ozone-depleting substances (ODS)
SS.2.062	Return Emissions of ozone-depleting substances (ODS)

Reference: GRI 305-6: Emissions 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.058 Plan Emissions of ozone-depleting substances (ODS)

The total sum of Plan Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to plan.

Calculation

Plan Emissions of ozone-depleting substances (ODS) = Sum of Plan Emissions of ozone-depleting substances (ODS) (for Plan Supply Chain + Plan Source + Plan Make + Plan Deliver + Plan Return).

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.034	Plan Supply Chain Emissions of ozone-depleting substances (ODS)
SS.3.035	Plan Source Emissions of ozone-depleting substances (ODS)
SS.3.036	Plan Make Emissions of ozone-depleting substances (ODS)
SS.3.037	Plan Deliver Emissions of ozone-depleting substances (ODS)
SS.3.038	Plan Return Emissions of ozone-depleting substances (ODS)

SS.3.034 Plan Supply Chain Emissions of ozone-depleting substances (ODS)

The total sum of Plan Supply Chain Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to plan

Calculation

Plan Supply Chain Emissions of ozone-depleting substances (ODS) = Sum of Plan Supply Chain Emissions of ozone-depleting substances (ODS).

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.035 Plan Source Emissions of ozone-depleting substances (ODS)

The total sum of Plan Source Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to plan

Calculation

Plan Source Emissions of ozone-depleting substances (ODS) = Sum of Plan Source Emissions of ozone-depleting substances (ODS).

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.036

Plan Make Emissions of ozone-depleting substances (ODS)

The total sum of Plan Make Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to plan

Calculation

Plan Make Emissions of ozone-depleting substances (ODS) = Sum of Plan Make Emissions of ozone-depleting substances (ODS).

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.037

Plan Deliver Emissions of ozone-depleting substances (ODS)

The total sum of Plan Deliver Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to plan

Calculation

Plan Deliver Emissions of ozone-depleting substances (ODS) = Sum of Plan Deliver Emissions of ozone-depleting substances (ODS).

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.038

Plan Return Emissions of ozone-depleting substances (ODS)

The total sum of Plan Return Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to plan

Calculation

Plan Return Emissions of ozone-depleting substances (ODS) = Sum of Plan Return Emissions of ozone-depleting substances (ODS).

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.059 Source Emissions of ozone-depleting substances (ODS)

The total sum of Source Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to source

Calculation

Source Emissions of ozone-depleting substances (ODS) = Sum of Emissions of ozone-depleting substances (ODS) for Supplier Management + Emissions of ozone-depleting substances (ODS) for Material Acquisition Management.

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.039	Supplier Management Emissions of ozone-depleting substances (ODS)
SS.3.040	Material Acquisition Management Emissions of ozone-depleting substances (ODS)

SS.3.039 Supplier Management Emissions of ozone-depleting substances (ODS)

The total sum of Supplier Management Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to source

Calculation

Supplier Management Emissions of ozone-depleting substances (ODS) = Sum of Supplier Management Emissions of ozone-depleting substances (ODS).

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.040 Material Acquisition Management Emissions of ozone-depleting substances (ODS)

The total sum of Material Acquisition Management Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to source

Calculation

Material Acquisition Management Emissions of ozone-depleting substances (ODS) = Sum of Material Acquisition Management Other indirect (Scope 3) GHG Emissions.

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.060

Make Emissions of ozone-depleting substances (ODS)

The total sum of Make Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to make

Calculation

Make Emissions of ozone-depleting substances (ODS) = Sum of Make Emissions of ozone-depleting substances (ODS) for Sales Order Management.

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.061 Deliver Emissions of ozone-depleting substances (ODS)

The total sum of Deliver Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to deliver

Calculation

Deliver Emissions of ozone-depleting substances (ODS) = Sum of Emissions of ozone-depleting substances (ODS) for Sales Order Management + Emissions of ozone-depleting substances (ODS) for Customer Management.

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.041	Sales Order Management Emissions of ozone-depleting substances (ODS)
SS.3.042	Customer Management Emissions of ozone-depleting substances (ODS)

SS.3.041 Sales Order Management Emissions of ozone-depleting substances (ODS)

The total sum of Sales Order Management Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to deliver

Calculation

Sales Order Management Emissions of ozone-depleting substances (ODS) = Sum of Sales Order Management Emissions of ozone-depleting substances (ODS).

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.042 Customer Management Emissions of ozone-depleting substances (ODS)

The total sum of Customer Management Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to deliver

Calculation

Customer Management Emissions of ozone-depleting substances (ODS) = Sum of Customer Management Emissions of ozone-depleting substances (ODS).

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.062 Return Emissions of ozone-depleting substances (ODS)

The total sum of Return Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to return

Calculation

Cost to Return = Sum of Emissions of ozone-depleting substances (ODS) for Source Returns + Emissions of ozone-depleting substances (ODS) for Customer Returns.

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.043	Source Return Emissions of ozone-depleting substances (ODS)
SS.3.044	Deliver Return Emissions of ozone-depleting substances (ODS)

SS.3.043 Source Return Emissions of ozone-depleting substances (ODS)

The total sum of Source Return Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to return

Calculation

Source Return Emissions of ozone-depleting substances (ODS) = Sum of Source Return Emissions of ozone-depleting substances (ODS).

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.044 Deliver Return Emissions of ozone-depleting substances (ODS)

The total sum of Deliver Return Emissions of ozone-depleting substances (ODS) for associated with the SCOR Level 2 processes to return

Calculation

Deliver Return Emissions of ozone-depleting substances (ODS) = Sum of Deliver Return Emissions of ozone-depleting substances (ODS).

Data collection

Production of ODS = ODS produced minus ODS destroyed by approved technologies minus ODS entirely used as a feedstock in the manufacture of other chemicals. Measuring ODS production, imports, and exports helps to indicate how an organization complies with legislation. This is particularly relevant if the organization produces or uses ODS in its processes, products and services and is subject to phase-out commitments. Results on ODS phase-out help to indicate the organization's position in any markets affected by regulation on ODS.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.022 Total Supply Chain GHG Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Supply Chain emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to plan, source, make, deliver and return.

Calculation

Total Supply Chain Nitrogen oxides, sulfur oxides, and other significant air emissions = Plan Nitrogen oxides, sulfur oxides, and other significant air emissions+ Source Nitrogen oxides, sulfur oxides, and other significant air emissions+ Make Nitrogen oxides, sulfur oxides, and other significant air emissions + Deliver Nitrogen oxides, sulfur oxides, and other significant air emissions+ Return Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.063	Plan Nitrogen oxides, sulfur oxides, and other significant air emissions
SS.2.064	Source Nitrogen oxides, sulfur oxides, and other significant air emissions
SS.2.065	Make Nitrogen oxides, sulfur oxides, and other significant air emissions
SS.2.066	Deliver Nitrogen oxides, sulfur oxides, and other significant air emissions

Reference: GRI 305-7: Emissions 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.063 Plan Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Plan emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to plan.

Calculation

Plan Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Plan Nitrogen oxides, sulfur oxides, and other significant air emissions (for Plan Supply Chain + Plan Source + Plan Make + Plan Deliver + Plan Return).

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.045	Plan Supply Chain Nitrogen oxides, sulfur oxides, and other significant air emissions
SS.3.046	Plan Source Nitrogen oxides, sulfur oxides, and other significant air emissions
SS.3.047	Plan Make Nitrogen oxides, sulfur oxides, and other significant air emissions
SS.3.048	Plan Deliver Nitrogen oxides, sulfur oxides, and other significant air emissions
SS.3.049	Plan Return Nitrogen oxides, sulfur oxides, and other significant air emissions

SS.3.045 Plan Supply Chain Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Plan Supply Chain emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to plan.

Calculation

Plan Supply Chain Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Plan Supply Chain Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.046 Plan Source Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Plan Source emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to plan.

Calculation

Plan Source Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Plan Source Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.047 Plan Make Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Plan Make emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to plan.

Calculation

Plan Make Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Plan Make Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.048 Plan Deliver Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Plan Deliver emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to plan.

Calculation

Plan Deliver Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Plan Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.049 Plan Return Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Plan Return emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to plan.

Calculation

Plan Return Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Plan Return Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.064 Source Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Source emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to source.

Calculation

Source Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Nitrogen oxides, sulfur oxides, and other significant air emissions for Supplier Management + Nitrogen oxides, sulfur oxides, and other significant air emissions for Material Acquisition Management.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.050	Supplier Management Nitrogen oxides, sulfur oxides, and other significant air emissions
SS.3.051	Material Acquisition Management Nitrogen oxides, sulfur oxides, and other significant air emissions

SS.3.050 Supplier Management Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Supplier Management emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to source.

Calculation

Supplier Management Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Supplier Management Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.051 Material Acquisition Management Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Material Acquisition Management emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to source.

Calculation

Material Acquisition Management Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Material Acquisition Management Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.065 Make Acquisition Management Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Make emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to make.

Calculation

Make Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Make Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.066 Deliver Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Deliver emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to deliver.

Calculation

Deliver Nitrogen oxides, sulfur oxides, and other significant air emissions = Sales Order Management Nitrogen oxides, sulfur oxides, and other significant air emissions + Customer Management Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement. .

Hierarchy	
SS.3.052	Sales Order Management Nitrogen oxides, sulfur oxides, and other significant air emissions
SS.3.053	Customer Management Nitrogen oxides, sulfur oxides, and other significant air emissions

SS.3.052 Sales Order Management Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Sales Order Management emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to deliver.

Calculation

Sales Order Management Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Sales Order Management Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.053 Customer Management Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Customer Management emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to deliver.

Calculation

Customer Management Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Customer Management Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.067 Return Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Return emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to return.

Calculation

Cost to Return = Sum of Nitrogen oxides, sulfur oxides, and other significant air emissions for Source Returns + Nitrogen oxides, sulfur oxides, and other significant air emissions for Customer Returns.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.3.054	Source Return Nitrogen oxides, sulfur oxides, and other significant air emissions
SS.3.055	Deliver Return Nitrogen oxides, sulfur oxides, and other significant air emissions

SS.3.054 Source Return Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Source Return emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to return.

Calculation

Source Return Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Source Return Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.3.055 Deliver Return Nitrogen oxides, sulfur oxides, and other significant air emissions

Total sum of Deliver Return emissions of Nitrogen oxides, sulfur oxides, and other significant air emissions associated with the SCOR level to processes to return.

Calculation

Deliver Return Nitrogen oxides, sulfur oxides, and other significant air emissions = Sum of Deliver Return Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Significant air emissions, in kilograms or multiples, for each of the following substances: NOX, SOX, Persistent organic pollutants (POP), Volatile organic compounds (VOC), Hazardous air pollutants (HAP), Particulate matter (PM), and other standard categories of air emissions identified in relevant regulations.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.023 Total Supply Chain Emissions

The sum of all supply chain air emissions associated with the level 2 SCOR processes to plan, source, make, deliver and return.

Calculation

Total Supply Chain Air Emissions = Total Supply Chain GHG Emissions + Total Supply Chain Emissions of ozone-depleting substances (ODS)+ Total Supply Chain Nitrogen oxides, sulfur oxides, and other significant air emissions.

Data collection

Environmental sustainability concerns an organization's impacts on living and non-living natural systems, including land, air, water and ecosystems. Supply Chain emissions into air are the discharge of substances from a source into the atmosphere. Types of emissions include: greenhouse gas (GHG), ozone-depleting substances (ODS), and nitrogen oxides (NOX) and sulfur oxides (SOX), among other significant air emissions.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.1.015	Total Supply Chain GHG Emissions
SS.1.021	Total Supply Chain Emissions of Ozone-depleting Substances
SS.1.022	Total Supply Chain Nitrogen Oxides, Sulfur Oxides, and Other

SS.1.024 Total Supply Chain Water Discharge

Total Supply Chain water discharge associated from all level 2 SCOR processes for plan, source, make, deliver, and return. Water discharge (as used in GRI) includes water effluents discharged over the course of the reporting period. These effluents can be discharged to subsurface waters, surface waters, sewers that lead to rivers, oceans, lakes, wetlands, treatment facilities, and ground water, either: through a defined discharge point (point source discharge); over land in a dispersed or undefined manner (non-point source discharge); as wastewater removed from the organization via truck. Discharge of collected rainwater and domestic sewage is not considered to be water discharge. The specific choice of water quality parameters can vary depending on the organization's products, services, and operations. Water quality metrics can vary depending on national or regional regulations. Water bodies affected by water discharges and/or runoff should be included in evaluating supply chain risk. See GRI disclosure 306-5 for more information.

Calculation

Total Supply Chain Water Discharge = Plan Water Discharge + Source Water Discharge + Make Water Discharge + Deliver Water Discharge + Return Water Discharge.

Data collection

Total volume of planned and unplanned water discharges by: destination, quality of the water, including treatment method, whether the water was reused by another organization. Exclude collected rainwater and domestic sewage from the volume of planned and unplanned water discharges. If not, metered, estimate the volume of planned and unplanned water discharges by subtracting the approximate volume consumed on-site from the volume withdrawn as specified in Disclosure 303-1 of GRI 303: Water.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.068	Plan Water Discharge
SS.2.069	Source Water Discharge
SS.2.070	Make Water Discharge
SS.2.071	Deliver Water Discharge
SS.2.072	Return Water Discharge

Reference: GRI 306-1: Effluents and Waste 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.068

Plan Water Discharge

Total Supply Chain water discharge associated from all level 2 SCOR processes for plan. Water discharge (as used in GRI) includes water effluents discharged over the course of the reporting period. These effluents can be discharged to subsurface waters, surface waters, sewers that lead to rivers, oceans, lakes, wetlands, treatment facilities, and ground water, either: through a defined discharge point (point source discharge); over land in a dispersed or undefined manner (non-point source discharge); as wastewater removed from the organization via truck. Discharge of collected rainwater and domestic sewage is not considered to be water discharge. The specific choice of water quality parameters can vary depending on the organization's products, services, and operations. Water quality metrics can vary depending on national or regional regulations. Water bodies affected by water discharges and/or runoff should be included in the supply chain risk process sE9.See GRI disclosure 306-5 for more information.

Calculation

Plan Water Discharge = Sum of Plan Water Discharge.

Data collection

Total volume of planned and unplanned water discharges by: destination, quality of the water, including treatment method, whether the water was reused by another organization. Exclude collected rainwater and domestic sewage from the volume of planned and unplanned water discharges. If not, metered, estimate the volume of planned and unplanned water discharges by subtracting the approximate volume consumed on-site from the volume withdrawn as specified in Disclosure 303-1 of GRI 303: Water.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.069 Source Water Discharge

Total Supply Chain water discharge associated from all level 2 SCOR processes for source. Water discharge (as used in GRI) includes water effluents discharged over the course of the reporting period. These effluents can be discharged to subsurface waters, surface waters, sewers that lead to rivers, oceans, lakes, wetlands, treatment facilities, and ground water, either: through a defined discharge point (point source discharge); over land in a dispersed or undefined manner (non-point source discharge); as wastewater removed from the organization via truck. Discharge of collected rainwater and domestic sewage is not considered to be water discharge. The specific choice of water quality parameters can vary depending on the organization's products, services, and operations. Water quality metrics can vary depending on national or regional regulations. Water bodies affected by water discharges and/or runoff should be included in the supply chain risk process sE9.See GRI disclosure 306-5 for more information.

Calculation

Source Water Discharge = Sum of Source Water Discharge.

Data collection

Total volume of planned and unplanned water discharges by: destination, quality of the water, including treatment method, whether the water was reused by another organization. Exclude collected rainwater and domestic sewage from the volume of planned and unplanned water discharges. If not, metered, estimate the volume of planned and unplanned water discharges by subtracting the approximate volume consumed on-site from the volume withdrawn as specified in Disclosure 303-1 of GRI 303: Water.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.070

Make Water Discharge

Total Supply Chain water discharge associated from all level 2 SCOR processes for make. Water discharge (as used in GRI) includes water effluents discharged over the course of the reporting period. These effluents can be discharged to subsurface waters, surface waters, sewers that lead to rivers, oceans, lakes, wetlands, treatment facilities, and ground water, either: through a defined discharge point (point source discharge); over land in a dispersed or undefined manner (non-point source discharge); as wastewater removed from the organization via truck. Discharge of collected rainwater and domestic sewage is not considered to be water discharge. The specific choice of water quality parameters can vary depending on the organization's products, services, and operations. Water quality metrics can vary depending on national or regional regulations. Water bodies affected by water discharges and/or runoff should be included in the supply chain risk process sE9.See GRI disclosure 306-5 for more information.

Calculation

Make Water Discharge = Sum of Make Water Discharge.

Data collection

Total volume of planned and unplanned water discharges by: destination, quality of the water, including treatment method, whether the water was reused by another organization. Exclude collected rainwater and domestic sewage from the volume of planned and unplanned water discharges. If not, metered, estimate the volume of planned and unplanned water discharges by subtracting the approximate volume consumed on-site from the volume withdrawn as specified in Disclosure 303-1 of GRI 303: Water.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.071

Deliver Water Discharge

Total Supply Chain water discharge associated from all level 2 SCOR processes for deliver. Water discharge (as used in GRI) includes water effluents discharged over the course of the reporting period. These effluents can be discharged to subsurface waters, surface waters, sewers that lead to rivers, oceans, lakes, wetlands, treatment facilities, and ground water, either: through a defined discharge point (point source discharge); over land in a dispersed or undefined manner (non-point source discharge); as wastewater removed from the organization via truck. Discharge of collected rainwater and domestic sewage is not considered to be water discharge. The specific choice of water quality parameters can vary depending on the organization's products, services, and operations. Water quality metrics can vary depending on national or regional regulations. Water bodies affected by water discharges and/or runoff should be included in the supply chain risk process sE9.See GRI disclosure 306-5 for more information.

Calculation

Deliver Water Discharge = Sum of Deliver Water Discharge.

Data collection

Total volume of planned and unplanned water discharges by: destination, quality of the water, including treatment method, whether the water was reused by another organization. Exclude collected rainwater and domestic sewage from the volume of planned and unplanned water discharges. If not, metered, estimate the volume of planned and unplanned water discharges by subtracting the approximate volume consumed on-site from the volume withdrawn as specified in Disclosure 303-1 of GRI 303: Water.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.072 Return Water Discharge

Total Supply Chain water discharge associated from all level 2 SCOR processes for return. Water discharge (as used in GRI) includes water effluents discharged over the course of the reporting period. These effluents can be discharged to subsurface waters, surface waters, sewers that lead to rivers, oceans, lakes, wetlands, treatment facilities, and ground water, either: through a defined discharge point (point source discharge); over land in a dispersed or undefined manner (non-point source discharge); as wastewater removed from the organization via truck. Discharge of collected rainwater and domestic sewage is not considered to be water discharge. The specific choice of water quality parameters can vary depending on the organization's products, services, and operations. Water quality metrics can vary depending on national or regional regulations. Water bodies affected by water discharges and/or runoff should be included in the supply chain risk process sE9.See GRI disclosure 306-5 for more information.

Calculation

Return Water Discharge = Sum of Return Water Discharge.

Data collection

Total volume of planned and unplanned water discharges by: destination, quality of the water, including treatment method, whether the water was reused by another organization. Exclude collected rainwater and domestic sewage from the volume of planned and unplanned water discharges. If not, metered, estimate the volume of planned and unplanned water discharges by subtracting the approximate volume consumed on-site from the volume withdrawn as specified in Disclosure 303-1 of GRI 303: Water.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.025 Total Supply Chain Non-Hazardous Waste

Total Supply Chain Non-Hazardous waste associated from all level 2 SCOR processes for plan, source, make, deliver, and return.

Calculation

Total Supply Chain Non-Hazardous Waste = Plan Non-Hazardous Waste + Source Non-Hazardous Waste + Make Non-Hazardous Waste + Deliver Non-Hazardous Waste + Return Non-Hazardous Waste.

Data collection

Identify hazardous waste as defined by national legislation at the point of generation. Provide a breakdown of the following disposal methods where applicable: reuse, recycling, composting, recovery (including energy recovery), incineration, deep well injection, landfill, on-site storage, other. Report disposal method: disposed directly by the organization, information provided by waste disposal contractor, organizational defaults of the waste disposal contractor.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.073	Plan Non-Hazardous Waste
SS.2.074	Source Non-Hazardous Waste
SS.2.075	Make Non-Hazardous Waste
SS.2.076	Deliver Non-Hazardous Waste
SS.2.077	Return Non-Hazardous Waste

Reference: GRI 306-2: Effluents and Waste 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.073 Plan Non-Hazardous Waste

Total Supply Chain Non-Hazardous waste associated from all level 2 SCOR processes for plan.

Calculation

Plan Non-Hazardous Waste = Sum of Plan Non-Hazardous Waste.

Data collection

Identify hazardous waste as defined by national legislation at the point of generation. Provide a breakdown of the following disposal methods where applicable: reuse, recycling, composting, recovery (including energy recovery), incineration, deep well injection, landfill, on-site storage, other. Report disposal method: disposed directly by the organization, information provided by waste disposal contractor, organizational defaults of the waste disposal contractor.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.074 Source Non-Hazardous Waste

Total Supply Chain Non-Hazardous waste associated from all level 2 SCOR processes for source.

Calculation

Source Non-Hazardous Waste = Sum of Source Non-Hazardous Waste.

Data collection

Identify hazardous waste as defined by national legislation at the point of generation. Provide a breakdown of the following disposal methods where applicable: reuse, recycling, composting, recovery (including energy recovery), incineration, deep well injection, landfill, on-site storage, other. Report disposal method: disposed directly by the organization, information provided by waste disposal contractor, organizational defaults of the waste disposal contractor.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.075 Make Non-Hazardous Waste

Total Supply Chain Non-Hazardous waste associated from all level 2 SCOR processes for make.

Calculation

Make Non-Hazardous Waste = Sum of Make Non-Hazardous Waste.

Data collection

Identify hazardous waste as defined by national legislation at the point of generation. Provide a breakdown of the following disposal methods where applicable: reuse, recycling, composting, recovery (including energy recovery), incineration, deep well injection, landfill, on-site storage, other. Report disposal method: disposed directly by the organization, information provided by waste disposal contractor, organizational defaults of the waste disposal contractor.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.076 Deliver Non-Hazardous Waste

Total Supply Chain Non-Hazardous waste associated from all level 2 SCOR processes for deliver.

Calculation

Deliver Non-Hazardous Waste = Sum of Deliver Non-Hazardous Waste.

Data collection

Identify hazardous waste as defined by national legislation at the point of generation. Provide a breakdown of the following disposal methods where applicable: reuse, recycling, composting, recovery (including energy recovery), incineration, deep well injection, landfill, on-site storage, other. Report disposal method: disposed directly by the organization, information provided by waste disposal contractor, organizational defaults of the waste disposal contractor.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.077 Return Non-Hazardous Waste

Total Supply Chain Non-Hazardous waste associated from all level 2 SCOR processes for return.

Calculation

Return Non-Hazardous Waste = Sum of Return Non-Hazardous Waste.

Data collection

Identify hazardous waste as defined by national legislation at the point of generation. Provide a breakdown of the following disposal methods where applicable: reuse, recycling, composting, recovery (including energy recovery), incineration, deep well injection, landfill, on-site storage, other. Report disposal method: disposed directly by the organization, information provided by waste disposal contractor, organizational defaults of the waste disposal contractor.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.1.026 Total Supply Chain Hazardous Waste

Total Supply Chain Hazardous waste associated from all level 2 SCOR processes for plan, source, make, deliver, and return. Hazardous waste is defined by national legislation at the point of generation. Further information on hazardous waste can be found under the terms of the Basel Convention Annex I, II, III, and VIII and covers hazardous waste transported by or on behalf of a reporting organization. See GRI disclosure 306-4 for more information on the transport of hazardous waste. The transport of hazardous waste would be included in the supply chain risk process sE9.

Calculation

Total Supply Chain Hazardous Waste = Plan Hazardous Waste + Source Hazardous Waste + Make Hazardous Waste + Deliver Hazardous Waste + Return Hazardous Waste.

Data collection

Identify hazardous waste as defined by national legislation at the point of generation. Provide a breakdown of the following disposal methods where applicable: reuse, recycling, composting, recovery (including energy recovery), incineration, deep well injection, landfill, on-site storage, other. Report disposal method: disposed directly by the organization, information provided by waste disposal contractor, organizational defaults of the waste disposal contractor.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

Hierarchy	
SS.2.078	Plan Hazardous Waste
SS.2.079	Source Hazardous Waste
SS.2.080	Make Hazardous Waste
SS.2.081	Deliver Hazardous Waste
SS.2.082	Return Hazardous Waste

Reference: GRI 306-2: Effluents and Waste 2016; GRI Standards are free to use and are available at www.globalreporting.org/standards.

SS.2.078 Plan Hazardous Waste

Total Supply Chain Hazardous waste associated from all level 2 SCOR processes for plan. Hazardous waste is defined by national legislation at the point of generation. Further information on hazardous waste can be found under the terms of the Basel Convention Annex I, II, III, and VIII and covers hazardous waste transported by or on behalf of a reporting organization. See GRI disclosure 306-4 for more information on the transport of hazardous waste. The transport of hazardous waste would be included in the supply chain risk process sE9.

Calculation

Plan Hazardous Waste = Sum of Plan Hazardous Waste.

Data collection

Identify hazardous waste as defined by national legislation at the point of generation. Provide a breakdown of the following disposal methods where applicable: reuse, recycling, composting, recovery (including energy recovery), incineration, deep well injection, landfill, on-site storage, other. Report disposal method: disposed directly by the organization, information provided by waste disposal contractor, organizational defaults of the waste disposal contractor.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.079 Source Hazardous Waste

Total Supply Chain Hazardous waste associated from all level 2 SCOR processes for source. Hazardous waste is defined by national legislation at the point of generation. Further information on hazardous waste can be found under the terms of the Basel Convention Annex I, II, III, and VIII and covers hazardous waste transported by or on behalf of a reporting organization. See GRI disclosure 306-4 for more information on the transport of hazardous waste. The transport of hazardous waste would be included in the supply chain risk process sE9.

Calculation

Source Hazardous Waste = Sum of Source Hazardous Waste.

Data collection

Identify hazardous waste as defined by national legislation at the point of generation. Provide a breakdown of the following disposal methods where applicable: reuse, recycling, composting, recovery (including energy recovery), incineration, deep well injection, landfill, on-site storage, other. Report disposal method: disposed directly by the organization, information provided by waste disposal contractor, organizational defaults of the waste disposal contractor.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.080 Make Hazardous Waste

Total Supply Chain Hazardous waste associated from all level 2 SCOR processes for make. Hazardous waste is defined by national legislation at the point of generation. Further information on hazardous waste can be found under the terms of the Basel Convention Annex I, II, III, and VIII and covers hazardous waste transported by or on behalf of a reporting organization. See GRI disclosure 306-4 for more information on the transport of hazardous waste. The transport of hazardous waste would be included in the supply chain risk process sE9.

Calculation

Make Hazardous Waste = Sum of Make Hazardous Waste.

Data collection

Identify hazardous waste as defined by national legislation at the point of generation. Provide a breakdown of the following disposal methods where applicable: reuse, recycling, composting, recovery (including energy recovery), incineration, deep well injection, landfill, on-site storage, other. Report disposal method: disposed directly by the organization, information provided by waste disposal contractor, organizational defaults of the waste disposal contractor.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.081 Deliver Hazardous Waste

Total Supply Chain Hazardous waste associated from all level 2 SCOR processes for deliver. Hazardous waste is defined by national legislation at the point of generation. Further information on hazardous waste can be found under the terms of the Basel Convention Annex I, II, III, and VIII and covers hazardous waste transported by or on behalf of a reporting organization. See GRI disclosure 306-4 for more information on the transport of hazardous waste. The transport of hazardous waste would be included in the supply chain risk process sE9.

Calculation

Deliver Hazardous Waste = Sum of Deliver Hazardous Waste.

Data collection

Identify hazardous waste as defined by national legislation at the point of generation. Provide a breakdown of the following disposal methods where applicable: reuse, recycling, composting, recovery (including energy recovery), incineration, deep well injection, landfill, on-site storage, other. Report disposal method: disposed directly by the organization, information provided by waste disposal contractor, organizational defaults of the waste disposal contractor.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

SS.2.082 Return Hazardous Waste

Total Supply Chain Hazardous waste associated from all level 2 SCOR processes for return. Hazardous waste is defined by national legislation at the point of generation. Further information on hazardous waste can be found under the terms of the Basel Convention Annex I, II, III, and VIII and covers hazardous waste transported by or on behalf of a reporting organization. See GRI disclosure 306-4 for more information on the transport of hazardous waste. The transport of hazardous waste would be included in the supply chain risk process sE9.

Calculation

Return Hazardous Waste = Sum of Return Hazardous Waste.

Data collection

Identify hazardous waste as defined by national legislation at the point of generation. Provide a breakdown of the following disposal methods where applicable: reuse, recycling, composting, recovery (including energy recovery), incineration, deep well injection, landfill, on-site storage, other. Report disposal method: disposed directly by the organization, information provided by waste disposal contractor, organizational defaults of the waste disposal contractor.

Discussion

Often, a supply chain represents a partial use of a facility, production line, vehicle, etc. Therefore, the metrics from this infrastructure must be carefully analyzed and apportioned based on the proportional use of the supply chain. Also, not all metrics will provide direct, actionable information and may need to be combined with other indicators and information to help drive supply chain sustainability improvement.

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