

LECTURE 10: INFORMATION SYSTEM IN SUPPLY CHAIN MANAGEMENT

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OUTLINE

- 1 WHY SCM NEEDS IT?
- 2 INTRO TO INFORMATION SYSTEM
- 3 INTRO TO ERP/WMS/TMS
- 4 SAP IMPLEMENTATION CASE STUDY AT BOONTHAVORN
- 5 FUTURE INFORMATION TECHNOLOGY AND THAILAND

source: General references [?, ?, ?, ?]

BRIEF & QUICK: SCM TIMELINE



**Basic
Transportation**

- 1970s
- cost-service focus
- paper
- month
- leveraging



**Emerging
Logistics**

- 1980s
- cost@quality
- Barcode/LAN
- week
- partnering LSP, KPI, branding



**World-Class
SCM**

- 1990s-2000s
- core competency
- ERP/internet
- day
- global, mix mode relationship, agile



**Collaborative
Demand Network**

- 2000s-present
- platform/ on-live
- mobile/5G/ data
- hour
- meme/ lagile

source: Mamun Habib. "Supply Chain Management-Applications and Simulations"

SCM TODAY: SEARCHING FOR VALUE

BACKGROUND

- Companies focus on **core competencies** (Apple – designed in CA)
- Companies are managed by **profit centers** (CP ALL – Dynamics Mgt)
- **Information system** changes **global trade** (Netflix –global-local model)
- People move to **cities** with **high pay** jobs (Lazada –online global market)

EFFECTS ON SCM

- **Raise of specialist:** assets and knowledge/ differentiate/ outsourcing (DHL)
- **Fragmented Supply Chain:** individual goals, no resilient (Flood 2011)
- **Raise of Modern Trade:** large retailers dictated customer (THD/WMT)
- **Computerized Operation:** data collection (LCD price), big data (Grab)

WHY SCM NEEDS IT?

Type of IT use in SCM

Transaction Process

SC Planning & Collaboration

Order Tracking & Delivery

Automation

Main Drivers of using IT

cost reduction

large volume of transaction

speed of data exchange/ transfer

eliminating human errors

unpredictability of demand

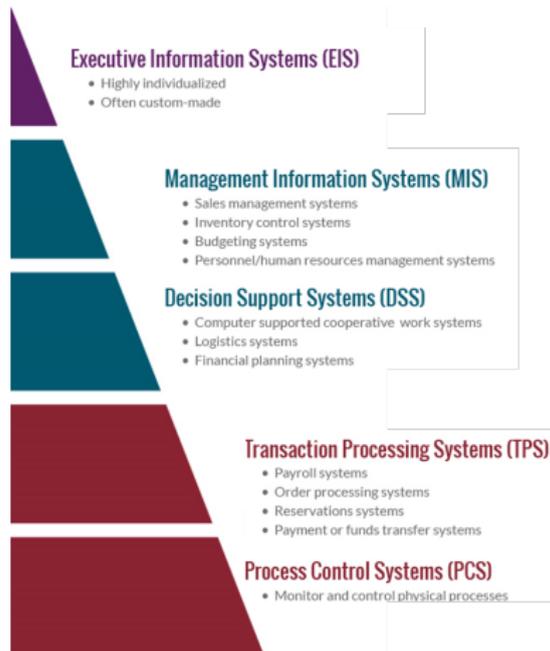
project/business coordination

consolidation

labor shortage

source: Jaana Auramo et al. "The roles of information technology in supply chain management"

EVALUATION AND STRUCTURE OF ERP



Type	Input Data	Processing
ESS	External data + Aggr. internal	graphic → dashboard
DSS	Massive DB → Complex model	interactive → decision
MIS	Summary → Simple model	report → knowledge
TPS	Transaction	tabular
PCS	Event log	status

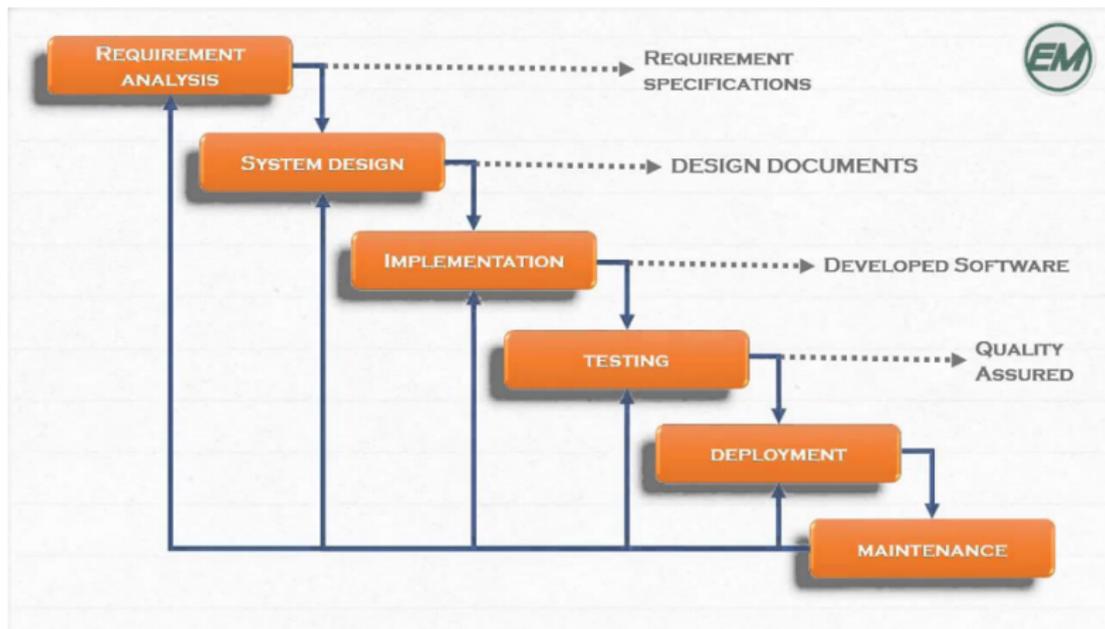
source: www.arhum.com

source: Motiwalla, L. and Thompson, J. "Enterprise Systems for Management "

TYPES OF INFORMATION SYSTEM

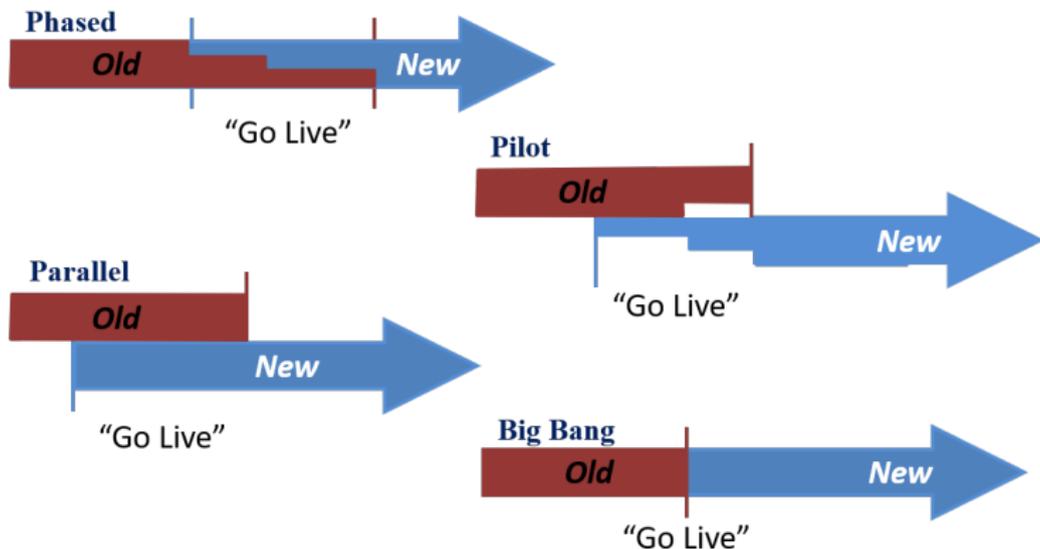
- **Office [Automation] System:** processing **flexibly personal** and organizational business, e.g. Excel, gDrive
- **Knowledge Work System:** interacting and **leveraging professional knowledge**, e.g., AutoCAD, MRI, Matlab
- **Process Control System:** **monitoring & controlling** industrial processes, PLC, SCADA,
- **Transaction Processing System:** **collecting & storing** business **transaction** data, e.g., POS, EDI, barcode
- **Management Information System:** converting data for **monitoring & managing**, e.g., Power BI
- **Decision Support System:** reporting and **assisting** in **decisions**, e.g., Kuebix, Manhattan
- **Executive Support System:** creating and maintaining data **across business** for executive, e.g., SAP

SYSTEM DEVELOPMENT LIFE CYCLE



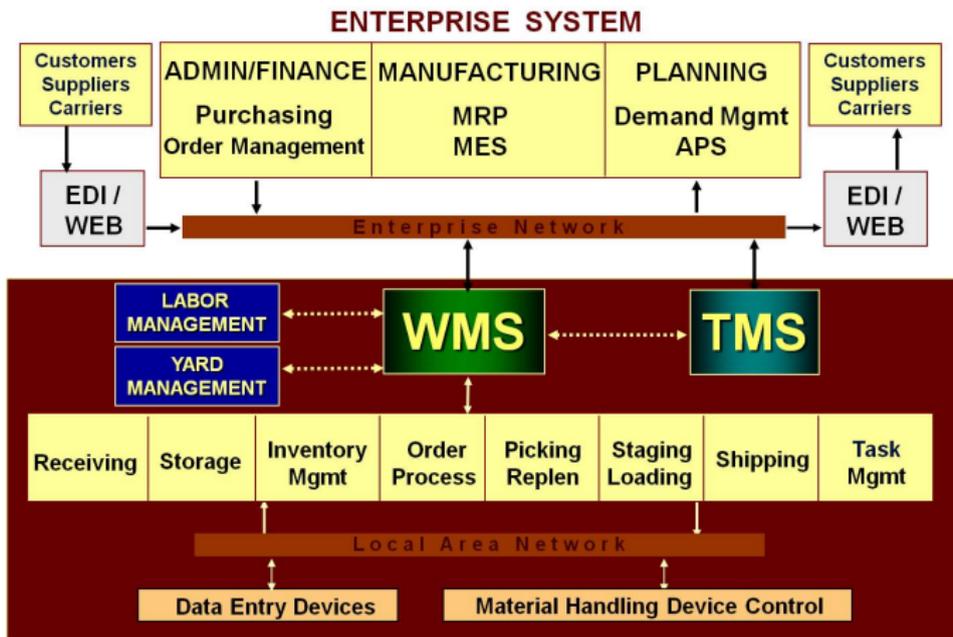
source: Motiwalla, L. and Thompson, J. "Enterprise Systems for Management "

IMPLANTATION METHOD



source: Motiwalla, L. and Thompson, J. "Enterprise Systems for Management "

SCM SYSTEM: ERP/WMS/TMS/LMS



source: John Hill. "Supply Chain Execution Systems"

WHAT IS ERP?

- **Stand for:** Enterprise Resources Planning
- **Information System:** IT/IS for transaction in company
- **Integration:** collect, analyze, & report all transaction
- **Important:** backbone of business
- **Industry:** complex, retail, education
- **Standard Function:** order mgt, sale, demand/material planning, HR, finance
- **Advance Function:** inventory control, report, document control, rule-based
- **Ex. Vendor:** SAP, ORACLE, Infor/Syteline, MS Dyn/ Navision, Sage, Epicor

WHAT IS WMS?

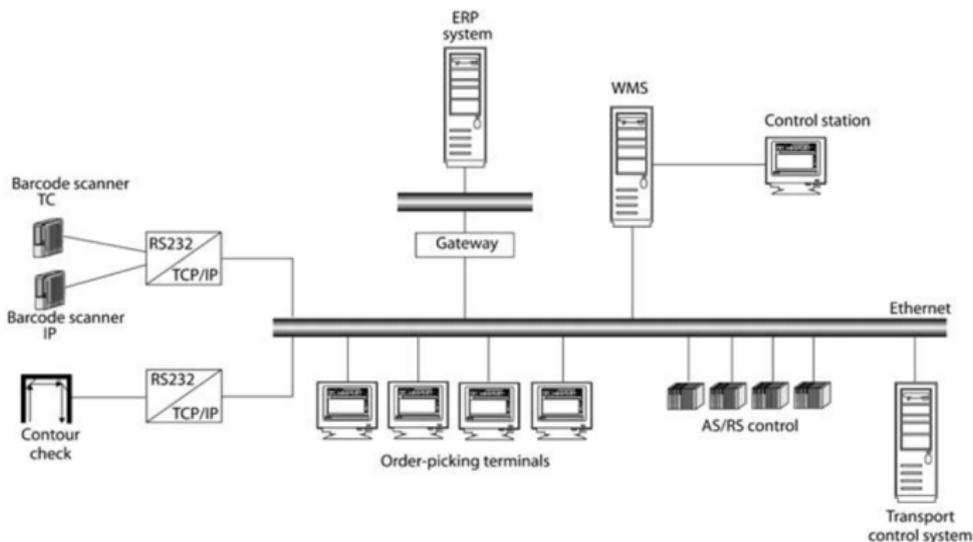
- **Stand for:** Warehouse Management System
- **Information System:** IT/IS for operational in warehouse
- **Integration:** collect, analyze, & report all activities
- **Important:** strategic decision to modernize WH
- **Industry:** high transaction, require tracking, computerize MHE
- **Standard Function:** search & track SKU, batch processing, individual report
- **Advance Function:** cycle count, profiling, RF, data transfer, WCS
- **Ex. Vendor:** WM(SAP), SCM (MS Dyn) (ORACLE), LOgiWa, Manhattan WMS, SphereWMS, WareNavi (DFK)

WMS WORKFLOW



source: ten Hompel & Schmidt. "Structure of a WMS from the Example of myWMS" [?]

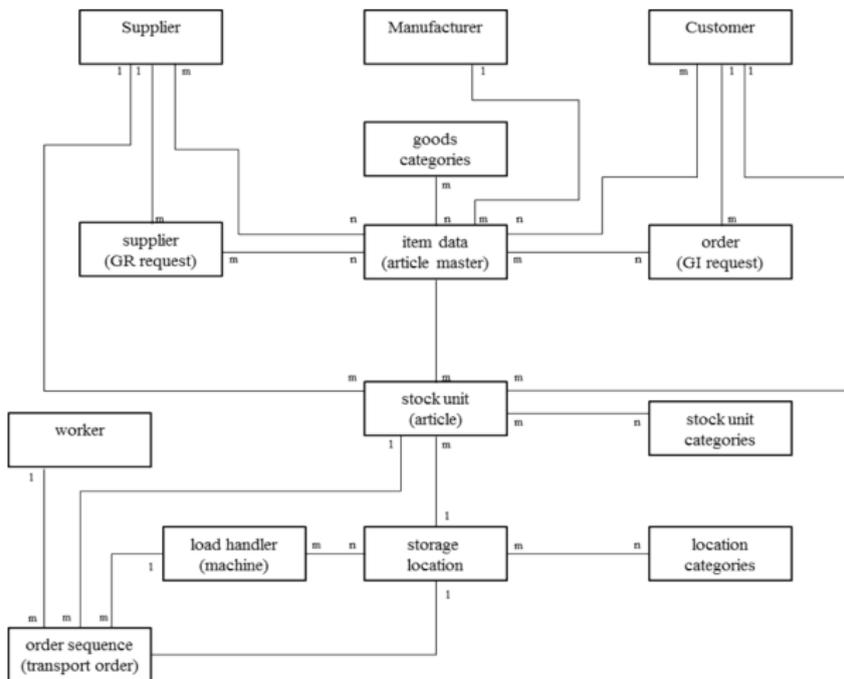
WORLD OF WMS



source: ten Hompel & Schmidt. "Structure of a WMS from the Example of myWMS" [?]

- WMS market is **niche IT market** ↔ equipment, trading, data sharing
- In US, ∃ many new & extinct vendors
- Thailand limited in big company, high volume

ER DIAGRAM OF WMS



source: ten Hompel & Schmidt. "Structure of a WMS from the Example of myWMS" [?]

WMS COST BREAKDOWN

Components	% Total Costs
Hardware	
Computer	6
RF Data Comm	24
Bar Code Applicator	8
Software	
WMS Licence	8
WMS Enhancements	10
Host Interface	6
Other Software Licence	4
Implementation	
Location Labels	6
WMS Installation Service	21
Project Team Cost	6

SIGNS FOR WMS CONSIDERATION

- **Complaints:** ship inaccuracy, ↑ # checker, regulation
- **Data management:** cycle count, multi-crowded, picker KPIs, batch mgt
- **Productivity:** 120 lines/ man-hr
- **Cycle time:** hot released, Wave picking
- **Business:** high turnover, high value

WHAT IS TMS?

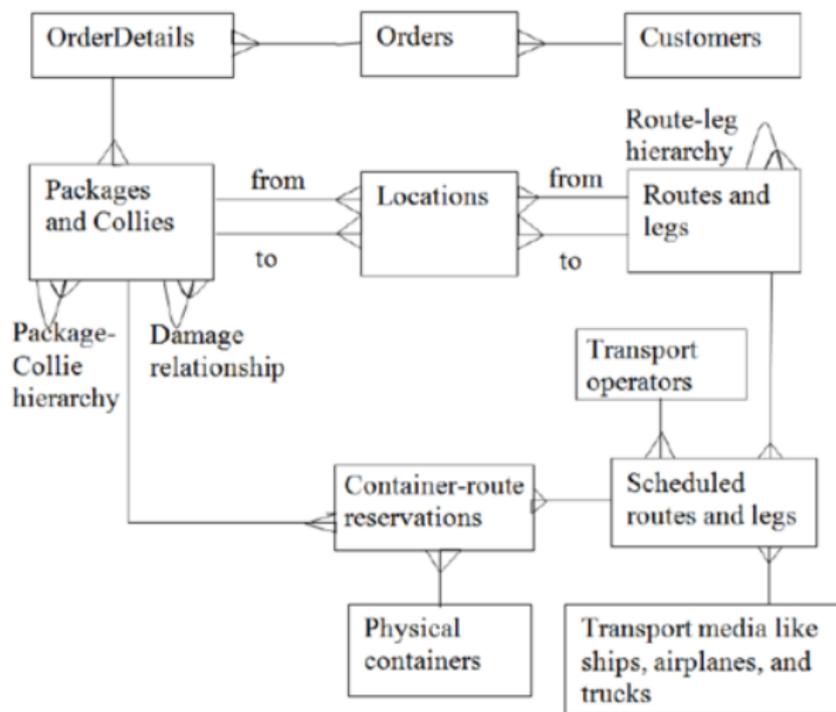
- **Stand for:** **Transportation** Management System
- **Information System:** IT/IS for operational for transportation
- **Integration:** collect, tracking, activity, & **visualization**
- **Important:** strategic tool to 3PL/ LSP
- **Industry:** flexible workflow, high volume, require monitoring (CashVan)
- **Standard Function:** order & workflow, freight costing, fleet resources mgt, scheduling
- **Advance Function:** BI, rate mgt/negotiation, route planning, navigation, access control, warnings
- **Ex. Vendor:** TM(SAP), ORACLE TMS, Tranplace, Manhattan TMS, Kuebix

TMS WORKFLOW



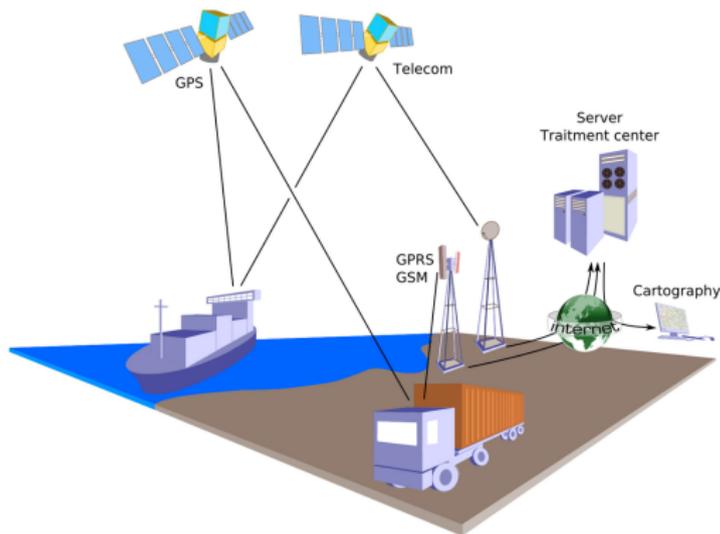
source: Daithankar. "Transportation Management with SAP TM 9"

ER DIAGRAM OF TMS



source: L. Frank & R. Pedersen. "Integrated Distributed/Mobile Logistics Management"

WORLD OF TMS



source: ten Hompel & Schmidt. "Structure of a WMS from the Example of myWMS" [?]

- TMS market is **niche IT market** ↔ high growth
- In US, TMS offers **large** saving potential
- Thailand limited in 3PL and LSP and typically customized

CHOOSING PROVIDERS/ VENDORS

- **Package:** limited target group, special functions in modules
- **Technology:** text-interface **VS** GUI, web-browser, shorter life cycle
- **Implementation:** adjustable parameters, experienced consultants
- **Customer Base:** recommendation, match with equipments or operations, 'best practice', **site ref.**
- **Professional:** trustworthy, partnership, **after-sale service**, stay in business

source: Jeroen van den Berg Consulting. 2002

WMS/TMS TRENDS

BETTER INTEGRATION:

- **Connectivity:** RFID, **sensor**, VR, Robotic, IoT
- **Cloud Computing:** SaaS, scalability, more collaboration
- **Sharing data:** accessing by others, iDevice, **consumers**

MORE CAPABILITY:

- **Profiling:** **facilitate** re-layout & inventory slotting, dynamic route, support sustainability
- **Finance:** dynamic pricing, on-demand/activity based costing, platform, e.g. freight matching
- **Leveraging:** spinning products (in-store picking), become 3PL, FlexDriver

BOONTHAVORN GROUP

Boonthavorn Group



Boonthavorn Ceramic Co.,Ltd.

World Ceramic Center Co.,Ltd.

Wattana Ceramic Co.,Ltd.

Creation Furniture Industry Co.,Ltd.



Country Road Transport Co.,Ltd.

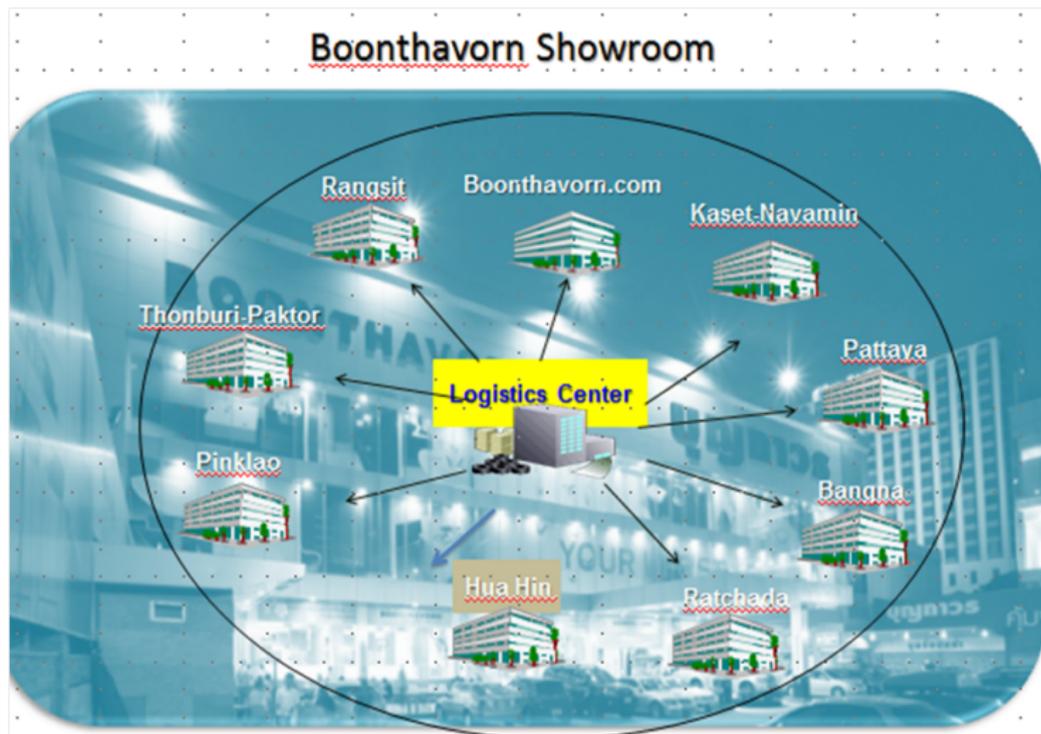
Boonthavorn Development Co.,Ltd.

Max Q House Co.,Ltd.



Boonthavorn Training Center and
Skill Development Co.,Ltd.

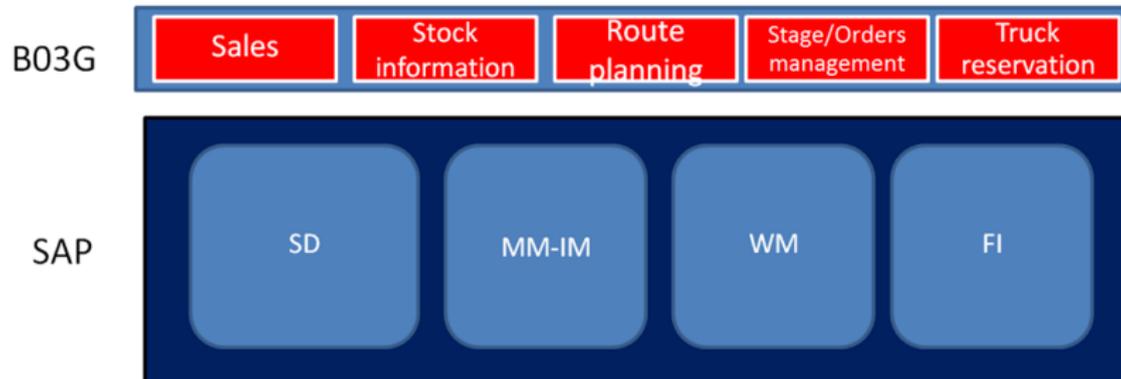
BOONTHAVORN'S DISTRIBUTION NETWORK



source: Skooleiampaibool, P. 2010. Boonthavorn

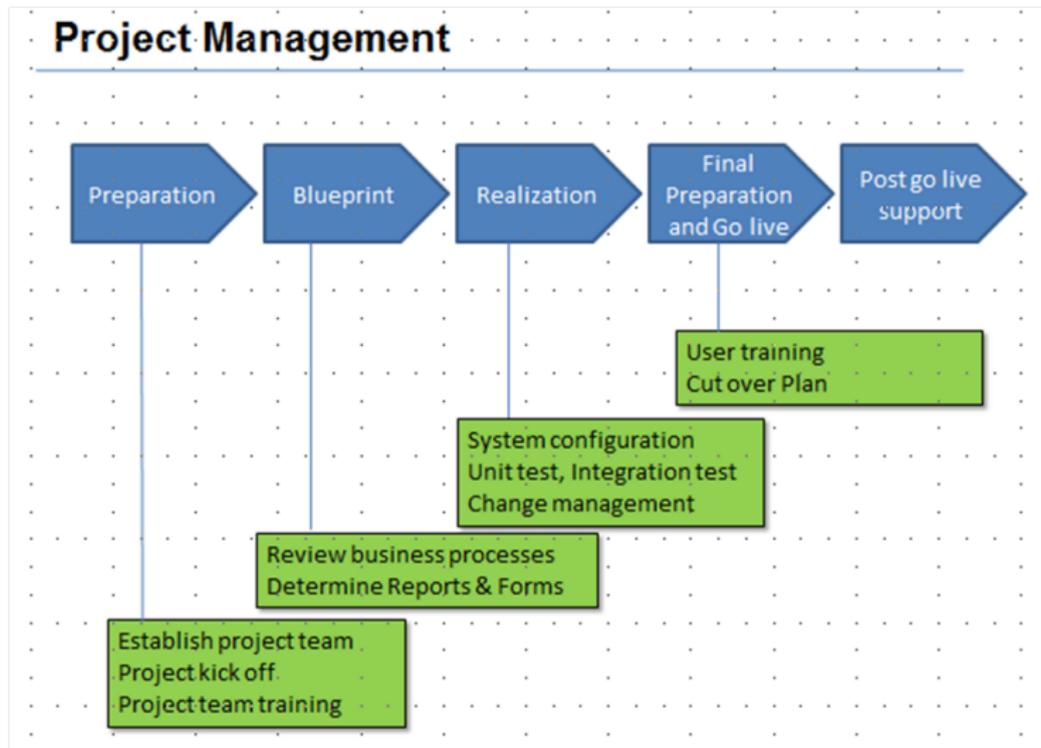
SAP & B03G

Boonthavorn's Application



source: Skooleiampaibool, P. 2010. Boonthavarn

PROJECT MANAGEMENT



source: Skooleiampaibool, P. 2010. Boonthavarn

IMPLEMENTATION PROBLEMS

ปัญหาที่พบ

- ความถูกต้องและครบถ้วนของข้อมูล เช่น Article master
- ผลกระทบต่อหน่วยงานอื่น ถ้า Transaction ผิดพลาด เช่น โปรโมชัน
- กรณีต้องการแก้ไข ค่าใช้จ่ายสูง
- ทรัพยากรบุคคลที่ทำการสร้างระบบ สำคัญมาก

source: Skooleiampaibool, P. 2010. Boonthavarn

LAST WORD: IT PROJECT EXPERIENCE

- Work on **what you have**, not what you dream. There is no perfect IT/IS.
- Systems cannot cover all cases, but we must **have solution** for them.
- Good IT/IS emerge from good **understanding** of operations
- Ask more from **your vendors**, they are excellent sources of information
- Do not accept status quo, find the most valuable and/or highest impact area
- Any IT/IS depends on **executive support**, your find IT champion

FUTURE INFORMATION TECHNOLOGY IN SCM

- **Robotic Process Automation:** www.tinyurl.com/scmTecho01f (KIVA)
- **Vision Picking:** <https://tinyurl.com/SCMTecho02> (Sumsung & UniMax)
- **Secure Digitizing Document:** www.tinyurl.com/scmTecho03 (TradeLanes)
www.tinyurl.com/scmTecho08 blockchain background
- **Independent Delivery:** www.tinyurl.com/scmTecho04 (amazon flex)
- **Automatic Seaport:** www.tinyurl.com/scmTecho05 (APM Terminals MVII)
- **Drone Delivery:** www.tinyurl.com/scmTecho06 (google wing)
www.tinyurl.com/scmTecho09 drone medical delivery

INSTRUCTION

Research 30 minutes and present your findings, particularly answers these questions

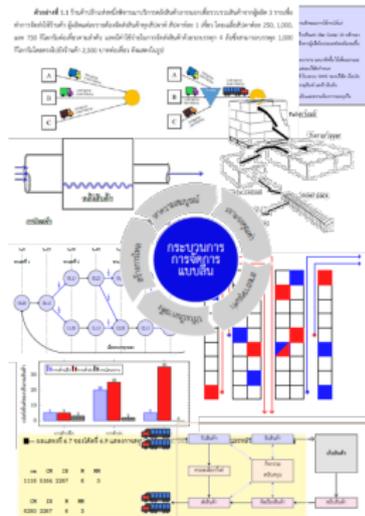
QUESTIONS

- What are IT/IS behind the application?
- What are benefits and controversy around the application?
- How should it to implement in Thailand?

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Structure of a wms from the example of mywms.
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WH WHS MGT TEXTBOOK



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