LECTURE 03:
DECISION AND DRIVERS IN SUPPLY CHAIN MANAGEMENT

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Outline

1. Driven Factors and Decisions in Supply Chain Management

2. Case Study: 7-Eleven (Japan) Supply Chain

3. Conceptual Designing of Distribution Network

4. Conceptual Distribution Design

General Reference: [JC10] [Bal07] [CM07] [Goe11]

Supply chain as Math modeling

- **Stakeholder:** retailer, shipper, consumer
- **Objective:** maximize value of every stakeholder
- **Decision:**
    - **Supply Mgt:** sourcing, strategic alliance, inventory
    - **Product Mgt:** make or buy, MRP, JIT
    - **Transportation Mgt:** location, mode-vehicle, routing
    - **Integration/Collaboration:** IT (bullwhip effect), EDI, virtual integration

- **Information:** forecasting, supplier evaluation, sales, network
- **Constraints:** law, technology-infrastructure, time-capacity, service level, quality

Decision/Driver in Supply Chain

Time Horizon
- **SC Strategy:** structure of the supply chain; long-term
- **SC Planning:** policies governing short-term operations; few months
- **SC Operation:** weekly to maximize efficiency of supply chain

Drivers in Supply Chain
- **Facilities:** location for manufacturing products and housing inventory
- **Inventory:** raw materials, WIP, F/G to smooth operations
- **Transportation:** moving products from A to B
- **Information:** data and analysis to coordinate between stages (best drivers)
- **Sourcing:** managing raw material and relationship with supplier
- **Pricing:** pricing goods and services provided by a firm to the supply chain

Example of decisions in Supply Chain

Area	Levels		
	Strategic	Tactical	Operation
Facility[$]	number, size, location		
Inventory[$]	form, policy	safety stock	qty, freq
Transportation[$]	mode	equipments	routing
Information[†]	OS, vendor	interface	process
Sourcing[†]	relationship	selection, eval contracts	purchasing
Pricing[†]	scale, M/C manuf. method	mkt position	discount

[$]　**logistic driver:** physical movement $\multimap^{direct}\to$ operation

[†]　**cross-functional driver:** indirect related to physical movement

7-Eleven Background

- **Nature of business:** food and grocery Retailer
- **Status:** largest convenience store chain in Japan
- **Owned by:** Ito-Yokado Group (IYG) → Ito-Yokado (superstores) + Seven-Eleven Japan
- **Ex-Partner:** Southland Corp
- **Growths:** 1985 → 2007
    - (519 in 1979) 2,299 → 12,304 stores
    - 386 → 2,574 Billion JPY of Sales (7% of IYG revenue)
    - 9 → 91.5 Billion JPY of Income (47% of IYG income)
    - 12.6% yearly avg revenue growth
    - 20.9% yearly net income
- **Performance:** decent even during recession (1990s) (why?)

Convenience Store Industry and 7-Eleven

Convenience Store Industry

    1991 1.2% (1991) of retailer outlet and 2.2% (1991) of annual sales

    1990s 19,600 → 42,000 of retailer outlets (one for 3,000)
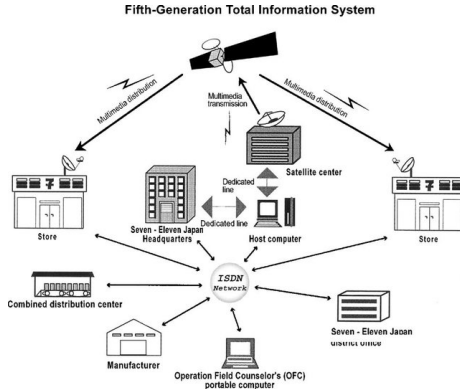
    2004 10 store chain ≈ 90%

7-Eleven

- **Big player:** 51% of convenience store outlets (2nd Lawson by Mitsubishi)
- **Big Sales:** 31.5% of total sales (30% per store higher)
- **High Growth:** accounting for 60% of industry growth
- **Focus products:** 70% of total sales is food

7-ELEVEN OPERATION

- **Franchise System:** attractive (1% awarded)
  - new store within cluster of 50-60 old stores → limited present
  - IYG got 45% of total profits (68% total revenues)
  - 3 million JPY (training, initial inventory)
- **Contents:** food items, beverage, magazine, consumer products
  - high sales per area (3,000 SKU)
  - food items ≈ 40% of total sales
  - private soft drink
- **Bill Payment Service:** convenient place to shop
  - 10 million bills in 1994
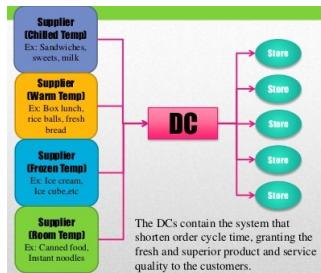 - pick-up internet order at 7-Eleven
  - utilization of IT

7-ELEVEN IT

Fifth-Generation Total Information System

source: Attaran, M. 2004 "Exploring the relationship between information technology and business process reengineering"

- **Graphic Order Terminal:** portable item analysis and order device
- **Scanner Terminal:** enable drop-off orders by drivers
- **Store computer:** processing house, link all terminals
- **POS Terminal:** record sales

7-Eleven Distribution System

The DCs contain the system that shorten order cycle time, granting the fresh and superior product and service quality to the customers.
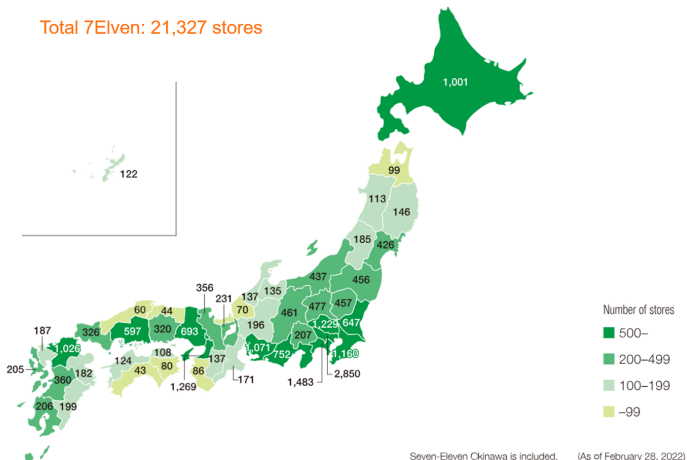
source: Jeffrey Hays 2009

- short cycle time (3 for rices, 2 for fresh food)
- customize delivery time
- cut-off-time for breakfast, lunch, dinner
- combined delivery (products & store)
- "Transfleet" provides transportation service

7-Eleven Outlet Locations

Total 7Elven: 21,327 stores

Number of stores
- 500–
- 200–499
- 100–199
- –99

Seven-Eleven Okinawa is included.   (As of February 28, 2022)

source: Seven& i HLDFS. Co   https://www.7andi.com/en/ir/library/co_financial/2022/convenience_store
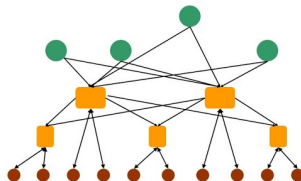
STUDY QUESTIONS

- What are natures of business and core competencies?
- What are other rapid response supply chain similar?
- How does locations, inventory, IT, transportation support 7-Eleven SC strategy?
- Why do Seven Eleven stores offer many services?
- What are similarities and differences between 7Eleven Japan and 7Eleven Thailand
- What are trade-off found in 7Eleven (comparing with Wal-mart)?
- What are concurrent issues about 7Eleven Japan?   ## out-of-scope
- PRO and CON Couche-Tard take-over?   ## out-of-scope

HOW TO DO A BUSINESS CASE STUDY

1. Examine business environment and information
2. Analyze structure and size of main business
3. Identify key issue or problem
4. Trace a chronological progression of how business responds
5. Learn successful aspects of responses as well as failures
6. Suggest alternative successes, failures, unforeseen results, and measures
7. Describe what changes you would make in business

source: How to Analyse a Case Study (http://www.wikihow.com)

Role of Distribution in Supply Chain

- Distribution $\rightarrow$ cost and customer experience; hence drives profitability
- Choice of distribution network $\rightarrow$ SC performance

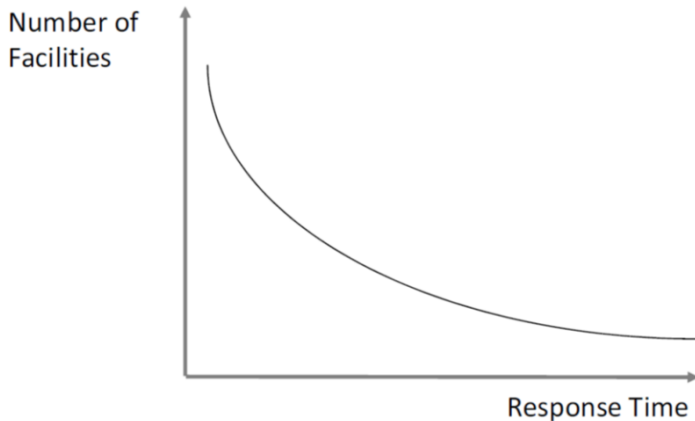 low cost $\leftrightarrow$ high responsiveness

Factors Influencing Network Design

- Customer service
- Costs provided at level of service
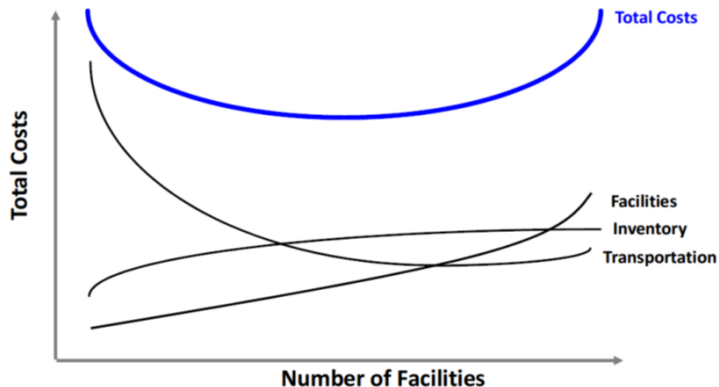
TRADE-OFF: AREAS OF INFLUENCING

Customer Service	Cost
Response time	Inventories
Product variety	Facilities & handling cost
Product availability	Transportation
Customer experience	Information
Order visibility	
Returnability	

Facility VS Responding Time

source: Chopra and Meindl. 2010. [CM07]

Cost as function of # facility
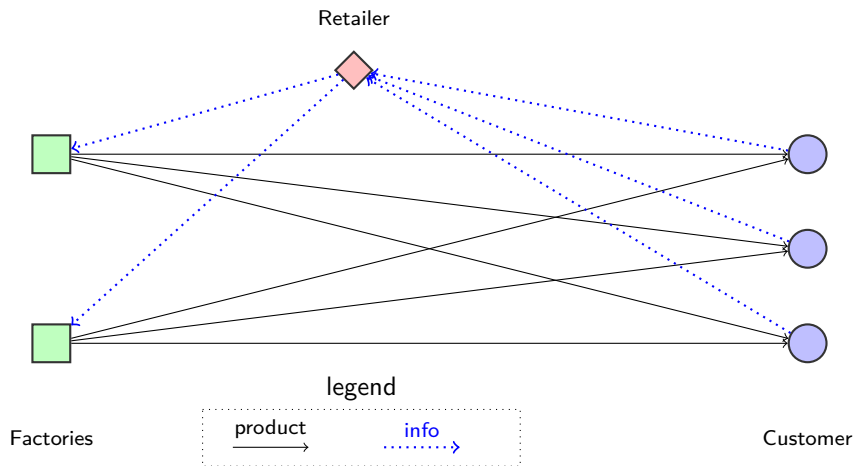

source: Chopra and Meindl. 2010. [CM07]

Distribution Design

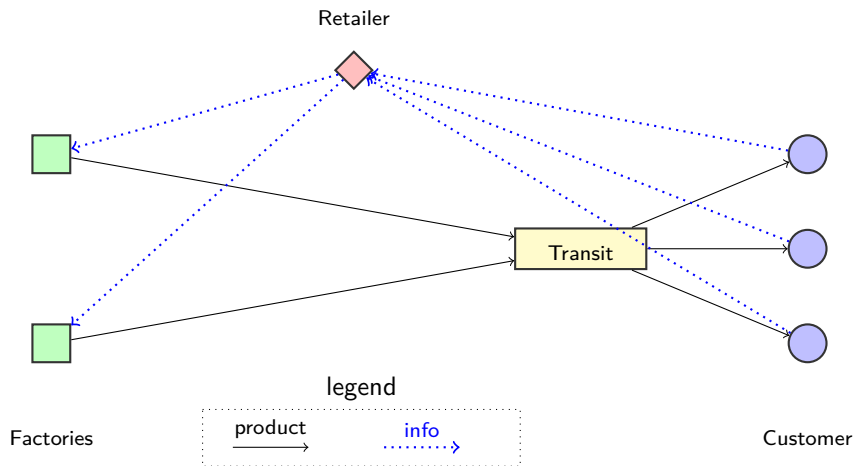## Question: How to buy and pay for these items?

- **FMCG:**: shampoo, shaving razor   anywhere
- **Hi-End Consumer:**: iPhone, lenovo X1   few place
- **Luxury Products:** ferrari, home appliance, jewelry
- **One-Of-Kinds:** machine, house, event

- **Channel of Distribution:** network of firms collaborates to provide products to consumers
- **Channel type:**
    - **distributor:** firms who provides assortment, break-bulk, finance, and inventory
    - **value added retailer (VAR):** specialists who works with manufacturers
    - **broker/agent:** individuals who represent manufacturers
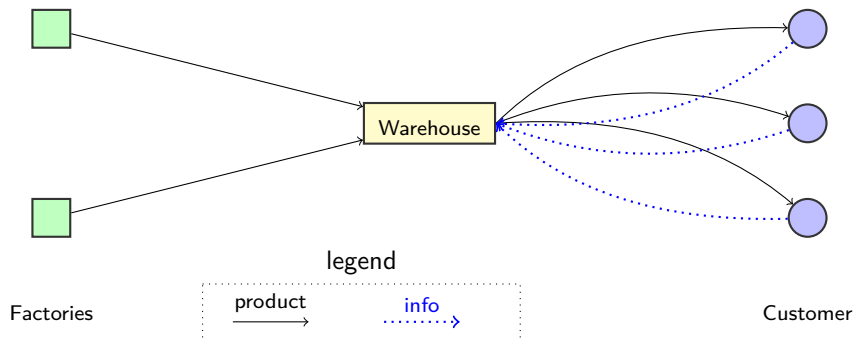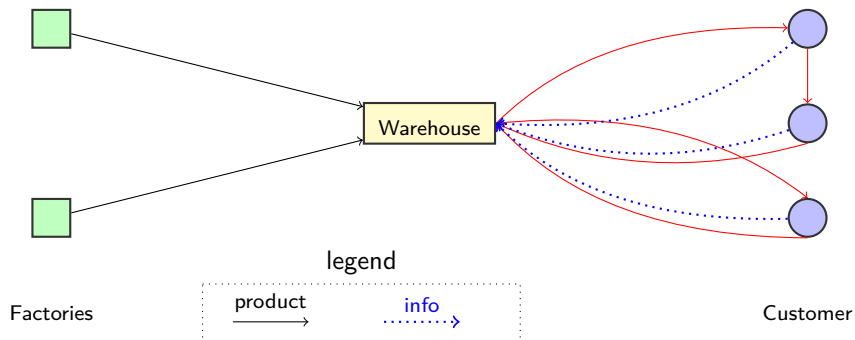- **Network:** intensive (many-in-TH) ≫ selective ≫ exclusive (1-in-TH)

DIRECT SHIPMENTS

Retailer

legend

product   info

Factories   Customer

Direct shipping with in-transit merge

Carrier delivery by distributors

legend

Factories

product

info

Customer

LAST MILE DELIVERY BY DISTRIBUTORS

CUSTOMER PICK UP

Factories

legend

product   info

Customer

REFERENCE

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         Supply chain engineering, volume 161.
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[JC10]   F Robert Jacobs and Richard B Chase.
         Operations and supply management: The core.
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