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Content module 2. Management of operations system

Lecture 5. Supply Chain Design

References

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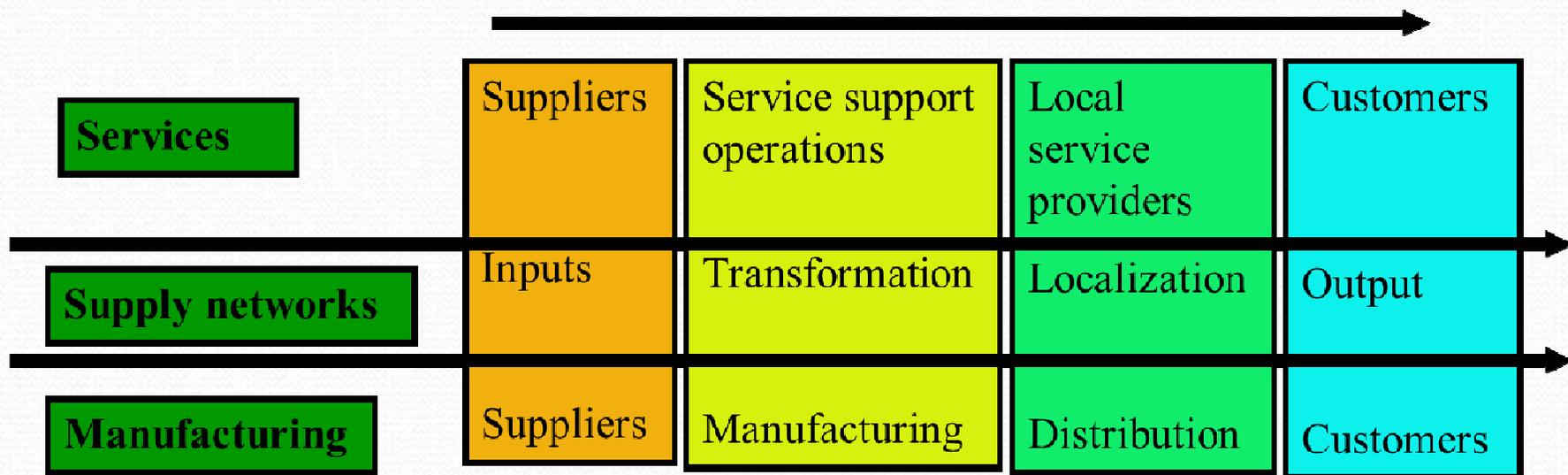
Issues to be discussed

- Supply-Chain Management
- Measuring Supply-Chain Performance
- Bullwhip Effect
- Outsourcing
- Value Density
- Mass Customization

What is a Supply Chain?

Supply-chain is a term that describes how organizations (suppliers, manufacturers, distributors, and customers) are linked together.

Services	Suppliers	Service support operations	Local service providers	Customers
Supply networks	Inputs	Transformation	Localization	Output
Manufacturing	Suppliers	Manufacturing	Distribution	Customers

What is Supply Chain Management?

Supply-chain management is a total system approach to managing the entire flow of information, materials, and services from raw-material suppliers through factories and warehouses to the end customer.

Formulas for Measuring Supply-Chain Performance

One of the most commonly used measures in all of operations management is "Inventory Turnover".

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average aggregate inventory value}}$$

The *cost of goods sold* is the annual cost for a company to produce the goods or services provided to customers; it is sometimes referred to as the *cost of revenue*.

The *average aggregate inventory* value is the total value of all items held in inventory for the firm valued at cost.

Formulas for Measuring Supply-Chain Performance (Continued)

In situations where distribution inventory is dominant, "Weeks of Supply" is preferred and measures how many weeks' worth of inventory is in the system at a particular time

$$\text{Weeks of supply} = \left(\frac{\text{Average aggregate inventory value}}{\text{Cost of goods sold}} \right) 52 \text{ weeks}$$

Bullwhip Effect

The magnification of variability in orders in the supply-chain
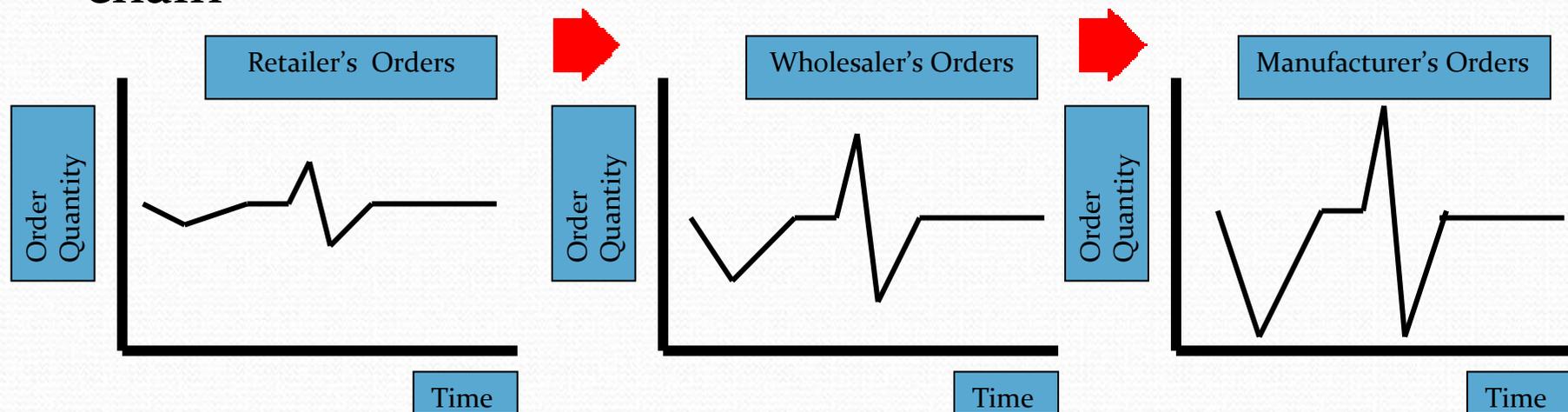
**A lot of retailers each with little variability in their orders….**

…can lead to greater variability for a fewer number of wholesalers, and…

…can lead to even greater variability for a single manufacturer.

What is Outsourcing?

Outsourcing is defined as the act of moving a firm's internal activities and decision responsibility to outside providers. The terms of the agreement are established in a contract.

Reasons to Outsource

- Organizationally-driven
- Improvement-driven
- Financially-driven
- Revenue-driven
- Cost-driven
- Employee-driven
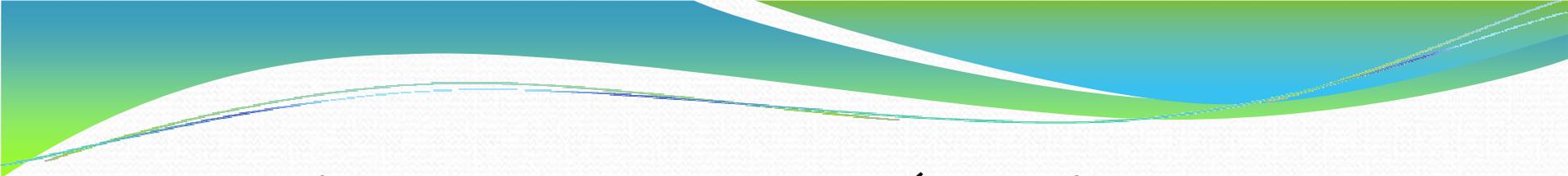
Value Density (Value per Unit of Weight)

Value density is defined as the value of an item per pound of weight.

It is used as an important measure when deciding where items should be stocked geographically and how they should be shipped.

Mass Customization

Mass customization is a term used to describe the ability of a company to deliver highly customized products and services to different customers.

The key to mass customization is effectively postponing the tasks of differentiating a product for a specific customer until the latest possible point in the supply-chain network.

Thank you for your attention!