Ch 11 Supply Chain Management Part 2

19 October 2022

Objectives

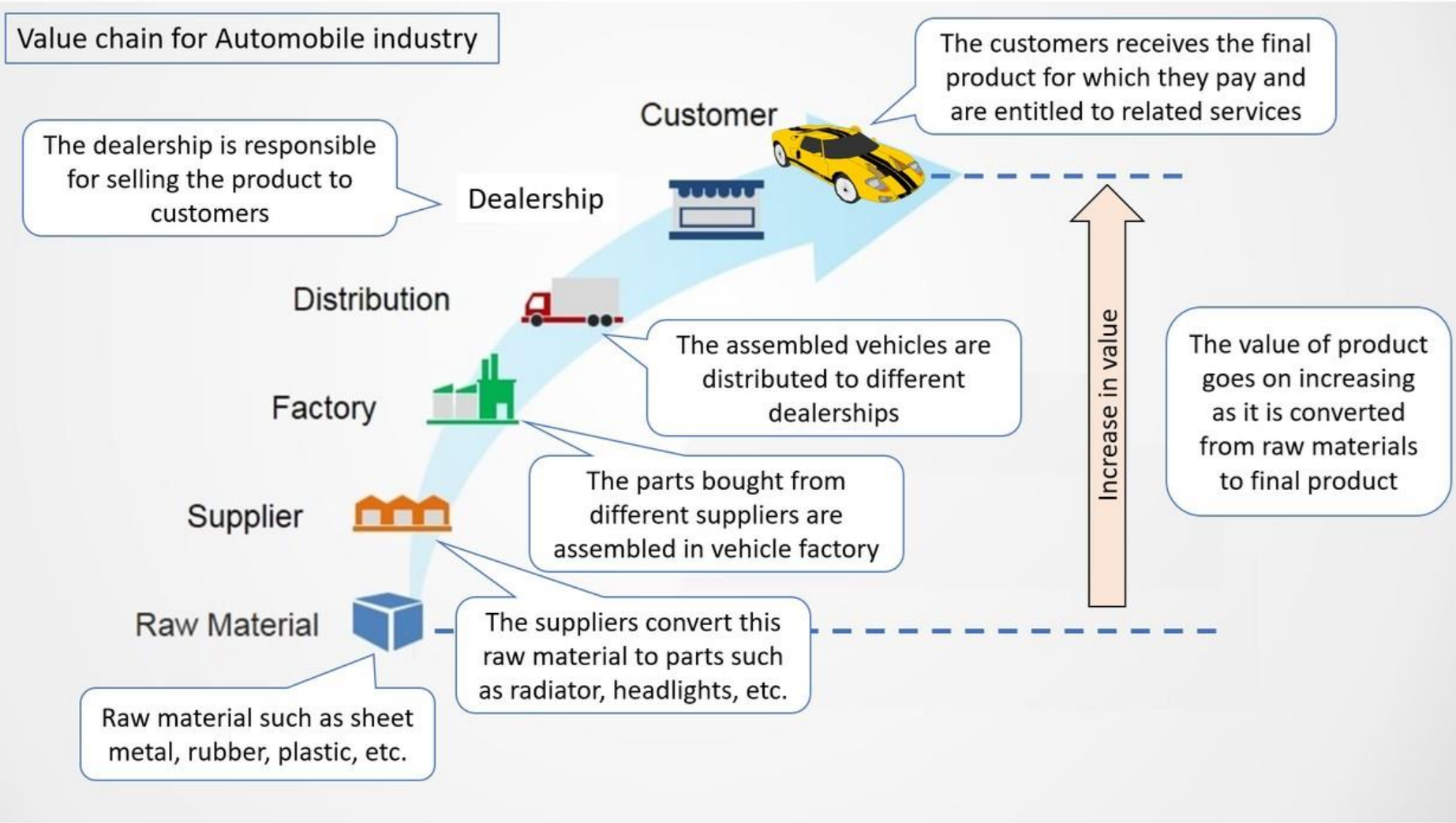
At end of lesson, you should be able to

1. **Explain** the strategic importance of SCM
2. **Identify** 6 sourcing strategies
3. **Explain** supply chain risks and mitigation tactics
4. **Evaluate** issues for an Integrated Supply Chain

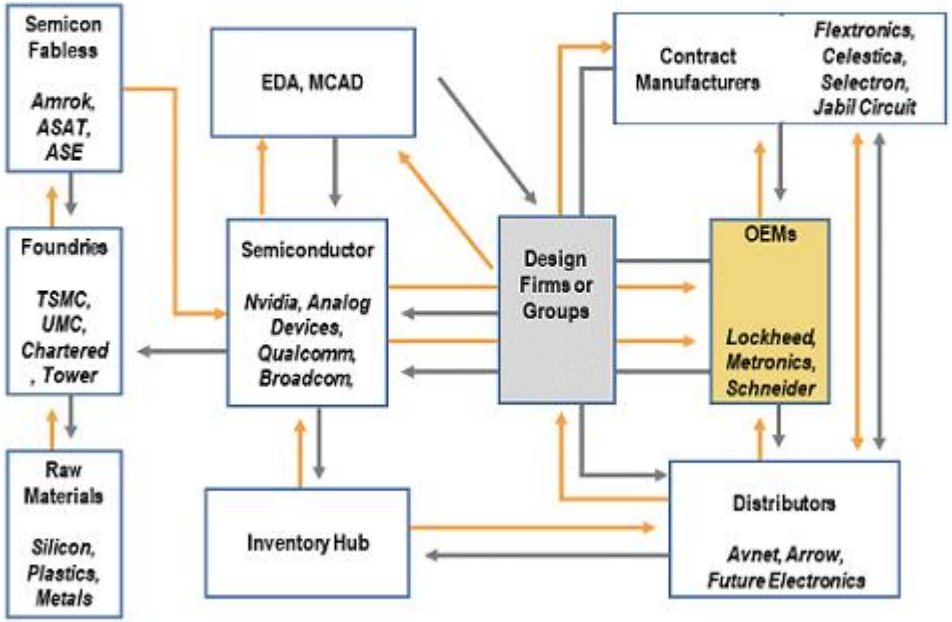
Last week

5. **Describe** steps in supplier selection
6. **Explain** major issues in Logistics Management
7. **Measure** Supply Chain Performance

This week


Value chain for Automobile industry
Customer
The customers receives the final product for which they pay and are entitled to related services
The dealership is responsible for selling the product to customers
Dealership
Distribution
The assembled vehicles are distributed to different dealerships
Factory
The parts bought from different suppliers are assembled in vehicle factory
Supplier
Raw Material
The suppliers convert this raw material to parts such as radiator, headlights, etc.
Raw material such as sheet metal, rubber, plastic, etc.
Increase in value
The value of product goes on increasing as it is converted from raw materials to final product

Electronics Supply Chain



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Building the Supplier Base
- Steps in supplier selection process

Suppliers (also known as vendors) must be **selected and managed**

Numerous factors - supplier fit, supplier competence, delivery capability, quality performance

Selection is challenging

Need procurement policies - single sourcing or multisourcing

(See slide 37)

4 Stage Process in Supplier selection

1. **What is the first stage process called?**

Finding potential suppliers and to determine chances of becoming good suppliers
-Long term partnership -

What are some of the criteria used in evaluating suppliers?

What method can be used to evaluate suppliers?

1. **Supplier Evaluation**

Supply certification such as ISO 9000, ISO 14000 used to pre-qualify suppliers

(See Slides 37)

2nd stage - Supplier development

How to integrate suppliers into buyer’s system?

Supplier development activities include

1. Training
2. _____
3. _____

(see slide 38)

3. Negotiations

- significant element in purchasing
- need skills

Cost-based price model

Supplier opens books

Market-based price model

Based on published, auction, or indexed prices

Competitive bidding

Common policy for many purchases

Does not generally foster long-term relationships

(See slides 39 - 41)

4. Contracting

- Contracts designed to share risks, benefits, create incentive structures optimal for supply chain members- features of contracts quantity discounts, buybacks of unsold units, revenue sharing

Centralized Purchasing benefits :

- Leverage volume
- Develop specialized staff
- Develop supplier relationships
- Maintain professional control
- Devote resources to selection and negotiation
- Reduce duplication of tasks
- Promote standardization

E-procurement - Speeds purchasing, reduces costs, integrates supply chain

(See slides 39 - 41)

Question 1

1. **What are the four stages of supplier selection?**

A) supplier evaluation, supplier development, negotiations, and contracting

B) supplier evaluation, negotiations, supplier acquisition, and supplier development

C) introduction, growth, maturity, and decline

D) supplier evaluation, supplier development, negotiations, and purchasing

E) negotiations, contracting, centralized purchasing, and E-procurement

Question 2

2. **What are the three classic types of negotiation strategies?**

A) supplier evaluation, supplier development, and supplier selection

B) Theory X, Theory Y, and Theory Z

C) many suppliers, few suppliers, and *keiretsu*

D) cost-based price model, market-based price model, and competitive bidding

E) traditional auctions, reverse auctions, and online exchanges

Logistics Management

What is logistics system?

Procurement / Delivery of products require shipping, warehousing, and inventory activities = logistics system

Purpose of Logistics Management - integrated and efficient material acquisition, movement, and storage activities.

Outsourcing logistics function = logistics specialist
Track delivery using technology, meet schedules and delivery times
Competitive advantage = reduced costs and improved customer service

(see slide 42)

Shipping systems

25% of costs of goods = Costs of transportation of goods to and from their facilities = need to evaluate shipping modes/methods

What are **6 common shipping systems**?

1. Trucking
2. Railroads
3. Airfreight
4. Waterways
5. Pipelines
6. Multimodal - combined

(see slide 43 - 46)

Warehousing

Often adds 8-10% of cost of product = warehousing

What is fundamental purpose of warehouse ?

Also serve as
Consolidation point -gather shipments from multiple sources and outbound in one cheaper, fully loaded truck
Break bulk function - accepting cheaper full truckload shipment and dividing for distribution to individual sites
Cross-docking (similar to airport hub) - accepting shipments from variety of sources and recombining for distribution to variety destinations,
Postponement point - providing final customer-specific value added processing

(see slide 47)

Third party Logistics (3PL)

Outsource logistics process

What is 3PL company?

Google and tell me one 3PL company in Malaysia / or Japan

(see slide 48)

Third party Logistics (3PL)

What is 3PL company?

Outsource logistics process

1. Reduce inventory investment
2. Lower delivery costs
3. Delivery reliability and speed

Google and tell me one 3PL company in Malaysia / or Japan

1. Ceva Logistics Malaysia
2. Sagawa Limited
3. Kokusai Express
4. Hock Cheong
5. Hitachi Transport System

(see slide 48)

Distribution Management

Focus on outbound flow of products

Designing distribution networks to meet customer expectations need 3 criteria

1. Rapid response
2. Product choice
3. Service

Analysis of Number of Facilities in Distribution Network - using 3 costs - facility, inventory, and transportation (see Figure 11.3)

(See Slides 49 - 52)

Ethics in SCM

- Personal ethics
  - Critical to long term success of an organization
  - Supply chains particularly susceptible - salespeople become friends to suppliers
  - Institute for Supply Management ISM Principles and Code of conduct
- Ethics within the supply chain - standards apply across all players / vendors - safety issues less developed countries
- Ethical behavior regarding the environment - supports conservation and renewal of resources

(see slides 53-58)

Establishing Sustainability in SC

Reverse logistics **CIRCULAR ECONOMY**

Send back after use - end of life - reuse, repair, resale, remanufacture, recycling, or disposal

Limit burning and burying in landfills

Closed-loop supply chain

Proactive design of a supply chain that tries to optimize all forward and reverse flows

Prepares for returns prior to product introduction

(see slides 59-60)

3) In supply chain management, ethical issues:

A) are particularly important because of the enormous opportunities for abuse.

B) may be guided by company rules and codes of conduct.

C) become more complex the more global is the supply chain.

D) may be guided by the principles and standards of the Institute for Supply Management.

E) All of the above are true.

Measuring Supply Chain Performance

SC Managers need metric to measure performance

Financial-based inventory metrics

1. Percentage invested in inventory
2. Inventory turnover

(see slides 61-66)

Example of Percentage invested in inventory.

$$\text{Percentage invested in inventory} = (\text{Average inventory investment}/\text{Total assets}) \times 100 \quad (11\text{-}1)$$

Example 2

TRACKING HOME DEPOT'S INVENTORY INVESTMENT

Home Depot's management wishes to track its investment in inventory as one of its performance measures. Recently, Home Depot had $11.4 billion invested in inventory and total assets of $44.4 billion.

APPROACH ▶ Determine the investment in inventory and total assets and then use Equation (11-1).

SOLUTION ▶ Percent invested in inventory $= (11.4/44.4) \times 100 = 25.7\%$

INSIGHT ▶ Over one-fourth of Home Depot assets are committed to inventory.

LEARNING EXERCISE ▶ If Home Depot can drive its investment down to 20% of assets, how much money will it free up for other uses? [Answer: $11.4 - (44.4 \times 0.2) = \$2.52$ billion.]

RELATED PROBLEMS ▶ 11.5b, 11.6b

Typical Inventory Investment - as percent of total asset

TABLE 11.5

Inventory as Percentage of Total Assets (with examples of exceptional performance)

Manufacturer (Toyota 5%)	15%
Wholesale (Coca-Cola 2.9%)	34%
Restaurants (McDonald's .05%)	2.9%
Retail (Home Depot 25.7%)	27%

% varies between industry depend on specific business model, business cycle and management (see Table 11.5)

Inventory Turnover

$$\text{Inventory turnover} = \text{Cost of goods sold} / \text{Average inventory investment} \qquad (11\text{-}2)$$

Cost of goods sold is the cost to produce the goods or services sold for a given period. Inventory investment is the average inventory value for the same period. This may be the average of several periods of inventory or beginning and ending inventory added together and divided by 2. Often, average inventory investment is based on nothing more than the inventory investment at the end of the period—typically at year-end.[1]

In Example 3, we look at inventory turnover applied to PepsiCo.

Example of Inventory Turnover calculation

Example 3

INVENTORY TURNOVER AT PEPSICO, INC.

PepsiCo, Inc., manufacturer and distributor of drinks, Frito-Lay, and Quaker Foods, provides the following in a recent annual report (shown here in $ billions). Determine PepsiCo's turnover.

Net revenue		$32.5
Cost of goods sold		$14.2
Inventory:		
Raw material inventory	$.74	
Work-in-process inventory	$.11	
Finished goods inventory	$.84	
Total average inventory investment		$1.69

APPROACH ▶ Use the inventory turnover computation in Equation (11-2) to measure inventory performance. Cost of goods sold is $14.2 billion. Total inventory is the sum of raw material at $.74 billion, work-in-process at $.11 billion, and finished goods at $.84 billion, for total average inventory investment of $1.69 billion.

SOLUTION ▶ Inventory turnover = Cost of goods sold/Average inventory investment

$$= 14.2/1.69$$

$$= 8.4$$

INSIGHT ▶ We now have a standard, popular measure by which to evaluate performance.

LEARNING EXERCISE ▶ If Coca-Cola's cost of goods sold is $10.8 billion and inventory investment is $.76 billion, what is its inventory turnover? [Answer: 14.2.]

RELATED PROBLEMS ▶ 11.5a, 11.6c, 11.7

Weeks of Supply

Weeks of supply, as shown in Example 4, may have more meaning in the wholesale and retail portions of the service sector than in manufacturing. It is computed below as the reciprocal of inventory turnover:

Weeks of supply = Average inventory investment/(Annual cost of goods sold/52 weeks) (11-3)

Example 4

DETERMINING WEEKS OF SUPPLY AT PEPSICO

Using the PepsiCo data in Example 3, management wants to know the weeks of supply.

APPROACH ▶ We know that inventory investment is $1.69 billion and that weekly sales equal annual cost of goods sold ($14.2 billion) divided by 52 = $14.2/52 = $.273 billion.

SOLUTION ▶ Using Equation (11-3), we compute weeks of supply as:

Weeks of supply = (Average inventory investment/Average weekly cost of goods sold)
= 1.69/.273 = 6.19 weeks

INSIGHT ▶ We now have a standard measurement by which to evaluate a company's continuing performance or by which to compare companies.

LEARNING EXERCISE ▶ If Coca-Cola's average inventory investment is $.76 billion and its average weekly cost of goods sold is $.207 billion, what is the firm's weeks of supply? [Answer: 3.67 weeks.]

RELATED PROBLEMS ▶ 11.6a, 11.8

Supply Chain Operations Reference

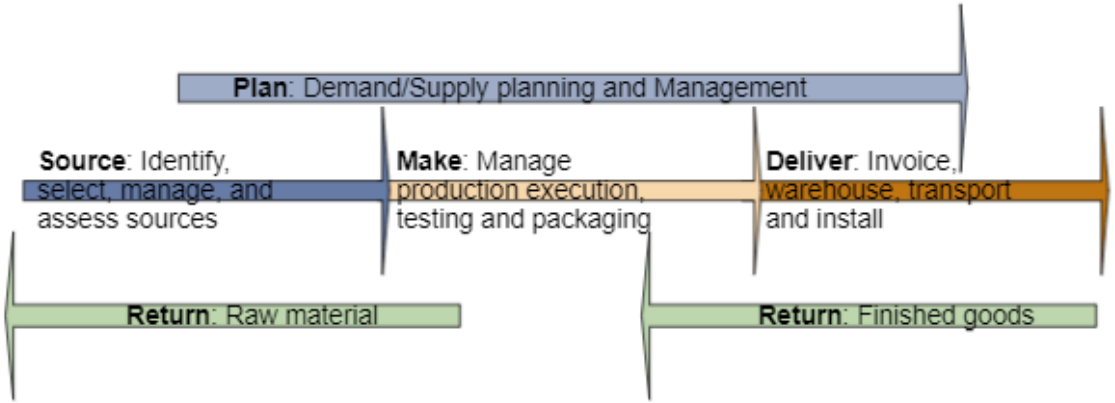
Defines 200 process elements
550 measurable metrics
500 best practices

Combines with Performance Attributes (Table 11.8) to compare with companies

The SCOR Model

- Processes, metrics and best practices

Figure 11.4



The SCOR Model

TABLE 11.8	**SCOR Model Metrics to Help Firms Benchmark Performance Against the Industry**	
PERFORMANCE ATTRIBUTE	**SAMPLE METRIC**	**CALCULATION**
Supply chain reliability	Perfect order fulfillment	(Total perfect orders) / (Total number of orders)
Supply chain responsiveness	Average order fulfillment cycle time	(Sum of actual cycle times for all orders delivered) / (Total number of orders delivered)
Supply chain agility	Upside supply chain flexibility	Time required to achieve an unplanned 20% increase in delivered quantities
Supply chain costs	Supply chain management costs	Cost to plan + Cost to source + Cost to deliver + Cost to return
Supply chain asset management	Cash-to-cash cycle time	Inventory days of supply + Days of receivables outstanding – Days of payables outstanding

Exercise

••••11.3 Kamal Fatehl, production manager of Kennesaw Manufacturing, finds his profit at $15,000 (as shown in the statement below)—inadequate for expanding his business. The bank is insisting on an improved profit picture prior to approval of a loan for some new equipment. Kamal would like to improve the profit line to $25,000 so he can obtain the bank's approval for the loan.

		% OF SALES
Sales	$250,000	100%
Cost of supply chain purchases	175,000	70%
Other production costs	30,000	12%
Fixed costs	30,000	12%
Profit	15,000	6%

a) What percentage improvement is needed in a *supply chain strategy* for profit to improve to $25,000? What is the cost of material with a $25,000 profit?

b) What percentage improvement is needed in a *sales strategy* for profit to improve to $25,000? What must sales be for profit to improve to $25,000? (*Hint:* See Example 1.)

Exercise

Consider a firm with an annual net income of $20 million, revenue of $60 million and cost of goods sold of $25 million. If the balance sheet amounts show $2 million of inventory and $500,000 of property, plant & equipment, what is the inventory turnover?

A) 12.50

B) 10.00

C) 42.00

D) 4.16

E) 20.00