

Procurement and Supply Chain

Prepared by Dr. Tarek Mohamed

MGM 431

Lecture 6



Sourcing and the management of suppliers

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Course Agenda

Chapter

1. Understand the role of sourcing in a supply chain.
2. Discuss factors that affect the decision to outsource a supply chain function.
3. Identify dimensions of supplier performance that affect total cost.
4. Structure successful auctions and negotiations.
5. Describe the impact of risk sharing on supplier performance and information distortion.
6. Design a tailored supplier portfolio.
7. The relationship between AI & the sourcing and management of suppliers

- **Sourcing** is the process of identifying, evaluating, selecting, and managing suppliers to obtain the goods and services required by an organization.
- It is a critical function in supply chain management because it directly affects cost, quality, delivery, and overall business performance.
- **Sourcing** is a strategic activity in supply chain management that focuses on selecting and managing suppliers to obtain the right products and services at the right cost, quality, quantity, and time.
- Effective sourcing improves supply chain performance by reducing costs, ensuring material availability, managing risks, enhancing supplier relationships, and supporting the organization's long-term business objectives.

Objectives of Sourcing

- ☐ Obtain the right quality products.
- ☐ Purchase at the right price.
- ☐ Receive materials at the right time.
- ☐ Select reliable suppliers.
- ☐ Reduce procurement risks.
- ☐ Improve operational efficiency.
- ☐ Ensure regulatory and contractual compliance.
- ☐ Build long-term supplier partnerships.

Benefits of Effective Sourcing

- ❑ Lower procurement costs
- ❑ Higher product quality
- ❑ Reliable supplier performance
- ❑ Reduced supply chain risks
- ❑ Improved customer satisfaction
- ❑ Better inventory management
- ❑ Increased operational efficiency
- ❑ Stronger supplier collaboration Enhanced competitive advantage

1. Ensures Continuous Supply of Materials

- Guarantees the availability of raw materials, components, and services needed for production.
- Prevents production delays caused by material shortages.

2. Reduces Procurement Costs

- Identifies cost-effective suppliers.
- Negotiates better prices, payment terms, and contracts.
- Helps reduce the total cost of ownership (TCO).

3. Improves Product Quality

- Selects reliable suppliers capable of meeting quality standards.
- Reduces defects and returns.
- Enhances customer satisfaction.

4. Supports On-Time Delivery

- Ensures suppliers deliver materials according to production schedules.
- Minimizes delays throughout the supply chain.

5. Manages Supply Risks

- Identifies risks such as supplier failure, natural disasters, political instability, or transportation disruptions.
- Develops contingency plans and alternative suppliers.

6. Enhances Supplier Relationships

- Builds long-term partnerships with strategic suppliers.
- Encourages collaboration, innovation, and continuous improvement.

7. Supports Business Strategy

- Aligns sourcing decisions with organizational goals such as cost leadership, quality, sustainability, or innovation.

8. Promotes Sustainability

- Selects environmentally and socially responsible suppliers.
- Encourages ethical sourcing practices and regulatory compliance.

9. Increases Supply Chain Flexibility

- Enables organizations to respond quickly to changes in customer demand and market conditions.
- Diversifies supplier sources to improve resilience.

Relationship Between Sourcing and Other Supply Chain Functions

Supply Chain Function

Procurement

Manufacturing

Inventory Management

Logistics

Demand Planning

Customer Service

Role of Sourcing

Selects and contracts suppliers

Ensures timely availability of production materials

Helps maintain optimal inventory levels

Coordinates supplier deliveries and transportation

Adjusts sourcing plans according to forecasted demand

Supports product availability and on-time delivery

Example

Company: Toyota

Toyota carefully selects suppliers based on:

- Product quality
- Cost competitiveness
- Delivery reliability
- Continuous improvement capability
- Long-term collaboration

As a result, Toyota maintains high-quality production, minimizes inventory, and improves overall supply chain efficiency.

Example

Company: P&G

- Has historically outsourced retailing of its products to others.
- The third parties increase the supply chain surplus by aggregating many products that customers need (not just P&G products) in a single retail store.
- This aggregation allows them to spread facility costs, selling costs, personnel costs, and transportation costs across many consumer goods manufacturers.
- This aggregation also allows the retailer to increase customer value by allowing them to purchase many products they need in a single visit to the store.

Company	What They Source	Sourcing Strategy	Benefits
Apple	Electronic components (chips, displays, batteries)	Sources from multiple global suppliers to ensure quality and supply continuity	High-quality products, reduced supply risk, competitive pricing
Toyota	Auto parts and components	Develops long-term partnerships with reliable suppliers and emphasizes continuous improvement	High quality, low inventory, efficient production
Starbucks	Coffee beans	Sources ethically from certified coffee farmers around the world	Sustainable supply, consistent quality, stronger brand reputation
Nike	Shoes, apparel, and accessories	Outsources manufacturing to suppliers in Asia and other regions	Lower production costs and greater manufacturing flexibility
Walmart	Consumer goods	Uses global sourcing and bulk purchasing to negotiate low prices	Lower costs and competitive retail prices
McDonald's	Beef, potatoes, vegetables, and packaging	Sources locally whenever possible while maintaining global quality standards	Fresh ingredients, reliable supply, lower transportation costs
Tesla	Batteries, lithium, semiconductors	Combines strategic partnerships with direct sourcing of key materials	Better control over critical components and supply security
IKEA	Wood, textiles, furniture components	Sources from suppliers worldwide with a strong focus on sustainability	Lower costs, environmental responsibility, and consistent quality

- **Outsourcing questions**

1. Will the third party increase the supply chain surplus relative to performing the activity in-house?
2. How much of the increase in surplus does the firm get to keep?
3. To what extent do risks grow upon outsourcing?

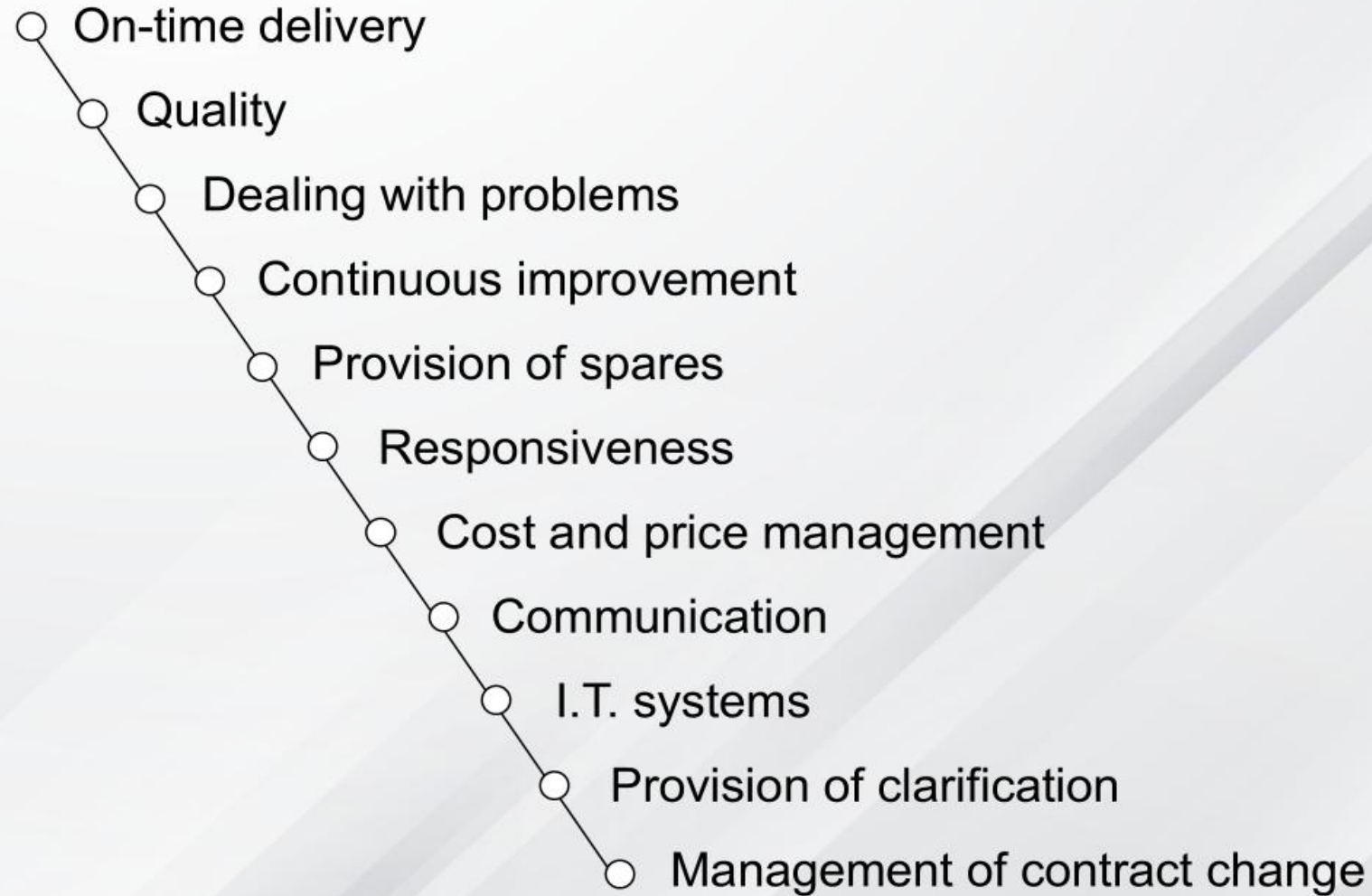
Supplier Scoring and Assessment

- Supplier performance should be compared on the basis of the supplier's impact on total cost.
- There are several other factors besides purchase price that influence total cost.

Supplier Selection

- Identify one or more appropriate suppliers
- Contract should account for all factors that affect supply chain performance
- Should be designed to increase supply chain profits in a way that benefits both the supplier and the buyer

Supplier performance – Possible factors to evaluate



Supplier evaluation factors

- Quality and process control
 - Continuous improvement
 - Facility environment
 - Customer relationship
 - Delivery
 - Inventory and warehousing
 - Ordering
 - Financial conditions
 - Certifications
 - Price

Design Collaboration

- About 80% of the cost of a product is determined during design
- Suppliers should be actively involved at this stage
- 50-70% of spending at a manufacturer comes from procurement
- 80% of the cost of a purchased part is fixed in the design phase
- Design collaboration with suppliers can result in reduced cost, improved quality, and decreased time to market
- Design for logistics, design for manufacturability
- **ESI has been defined as:**
 - A practice that brings together one or more selected suppliers with a buyer's product design team early in the product development process.
 - The objective is to utilise the supplier's expertise and experience in developing a product specification that is designed for effective and efficient product roll-out.

Sourcing Planning and Analysis

- Analyze spending across various suppliers and component categories
- Identify opportunities for decreasing the total cost
- **Cost of Goods Sold**
 - Cost of goods sold (COGS) represents well over 50 percent of sales for most major manufacturers.
 - Purchased parts a much higher fraction than in the past.

- **Increase supply chain surplus through**

1. Capacity aggregation
2. Inventory aggregation
3. Transportation aggregation by transportation intermediaries
4. Transportation aggregation by storage intermediaries
5. Warehousing aggregation
6. Procurement aggregation
7. Information aggregation
8. Receivables aggregation
9. Relationship aggregation
10. Lower costs and higher quality

Factors Influencing Growth of Surplus by a Third Party

- **Scale**

- Large scale it is unlikely that a third party can achieve further scale economies and increase the surplus

- **Uncertainty**

- If requirements are highly variable over time, third party can increase the surplus through aggregation

- **Specificity of assets**

- If assets required are specific to a firm, a third party is unlikely to increase the surplus

Factors Influencing Growth of Surplus by a Third Party

		Specificity of Assets Involved in Function	
		Low	High
Firm scale	Low	High growth in surplus	Low to medium growth in surplus
	High	Low growth in surplus	No growth in surplus unless cost of capital is lower for third party
Demand uncertainty for firm	Low	Low to medium growth in surplus	Low growth in surplus
	High	High growth in surplus	Low to medium growth in surplus

Risks of Using a Third Party

1. The process is broken
2. Underestimation of the cost of coordination
3. Reduced customer/supplier contact
4. Loss of internal capability and growth in third-party power
5. Leakage of sensitive data and information
6. Ineffective contracts
7. Loss of supply chain visibility
8. Negative reputational impact

Third- and Fourth-Party Logistics Providers

- **Third-party logistics (3PL)** providers performs one or more of the logistics activities relating to the flow of product, information, and funds that could be performed by the firm itself
- **A 4PL (fourth-party logistics)** designs, builds and runs the entire supply chain process

Third- and Fourth-Party Logistics Providers

Service Category	Basic Service	Some Specific Value-Added Services
Transportation	Inbound, outbound by ship, truck, rail, air	Tendering, track/trace, mode conversion, dispatch, freight pay, contract management
Warehousing	Storage, facilities management	Cross-dock, in-transit merge, pool distribution across firms, pick/pack, kitting, inventory control, labeling, order fulfillment, home delivery of catalog orders
Information technology	Provide and maintain advanced information/computer systems	Transportation management systems, warehousing management, network modeling and site selection, freight bill payment, automated broker interfaces, end-to-end matching, forecasting, EDI, worldwide track and trace, global visibility
Reverse logistics	Handle reverse flows	Recycling, used-asset disposition, customer returns, returnable container management, repair/refurbish
Other 3PL services		Brokering, freight forwarding, purchase-order management, order taking, loss and damage claims, freight bill audits, consulting, time-definite delivery
International		Customs brokering, port services, export crating, consolidation
Special skills/handling		Hazardous materials, temperature controlled, package/parcel delivery, food-grade facilities/equipment, bulk

Using Total Cost to Score and Assess Suppliers

Performance Category	Category Components	Quantifiable?
Supplier price	Labor, material, overhead, local taxes, and compliance costs	Yes
Supplier terms	Net payment terms, delivery frequency, minimum lot size, quantity discounts	Yes
Delivery costs	All transportation costs from source to destination, packaging costs	Yes
Inventory costs	Supplier inventory, including raw material, in process and finished goods, in-transit inventory, finished goods inventory in supply chain	Yes
Warehousing cost	Warehousing and material handling costs to support additional inventory	Yes
Quality costs	Cost of inspection, rework, product returns	Yes
Reputation	Reputation impact of quality problems	No
Other costs	Exchange rate trends, taxes, duties	Yes
Support	Management overhead and administrative support	Difficult
Supplier capabilities	Replenishment lead time, on-time performance, flexibility, information coordination capability, design coordination capability, supplier viability	To some extent

Supplier Selection – Auctions and Negotiations

- Supplier selection can be performed through competitive bids, reverse auctions, and direct negotiations
- Supplier evaluation is based on total cost of using a supplier
- Auctions:
 - **Sealed-bid first-price auctions**
 - **English auctions**
 - **Dutch auctions**
 - **Second-price (Vickery) auctions**

Supplier Selection – Auctions and Negotiations

- **Factors influence the performance of an auction**
- Is the supplier's cost structure private (not affected by factors that are common to other bidders)?
- Are suppliers symmetric or asymmetric; that is, ex ante, are they expected to have similar cost structures?
- Do suppliers have all the information they need to estimate their cost structure?
- Does the buyer specify a maximum price it is willing to pay for the supply chain?

Supplier Selection – Auctions and Negotiations

- Collusion among bidders
- Second-price auctions are particularly vulnerable
- Can be avoided with any first-price auction

Basic Principles of Negotiation

- The difference between the values of the buyer and seller is the **bargaining surplus**
- The goal of each negotiating party is to capture as much of the bargaining surplus as possible
 - Have a clear idea of your own value and as good an estimate of the third party's value as possible
 - Look for a fair outcome based on equally or equitably dividing the bargaining surplus
 - A win-win outcome

Contracts, Risk Sharing, and Supply Chain Performance

1. How will the contract affect the firm's profits and total supply chain profits?
2. Will the incentives in the contract introduce any information distortion?
3. How will the contract influence supplier performance along key performance measures?

Contracts for Product Availability and Supply Chain Profits

- Independent actions taken by two parties in a supply chain often result in profits that are lower than those that could be achieved if the supply chain were to coordinate its actions
- Three contracts that increase overall profits by making the supplier share some of the buyer's demand uncertainty are
 1. **Buyback or returns contracts**
 2. **Revenue-sharing contracts**
 3. **Quantity flexibility contracts**

Buyback Contracts

- Allows a retailer to return unsold inventory up to a specified amount at an agreed upon price
- The manufacturer specifies a wholesale price c and a buyback price b
- The manufacturer can salvage $\$s_M$ for any units that the retailer returns
- The manufacturer has a cost of v per unit produced and the retail price is p

Expected manufacturing profit = $O^* (c - v) - (b - s_M)$

□ expected overstock at retailer

- **Holding-cost subsidies**

- Manufacturers pay retailers a certain amount for every unit held in inventory over a given period
- Encourage retailers to order more

- **Price support**

- Manufacturers share the risk of product becoming obsolete
- Guarantee that in the event they drop prices they will lower prices for all current inventories

- Manufacturer charges the retailer a low wholesale price c and shares a fraction f of the retailer's revenue
 - Allows both the manufacturer and retailer to increase their profits
 - Results in lower retailer effort
 - Requires an information infrastructure
 - Information distortion results in excess inventory in the supply chain and a greater mismatch of supply and demand

Quantity Flexibility Contracts

- Allows the buyer to modify the order (within limits) after observing demand
- Better matching of supply and demand
- Increased overall supply chain profits if the supplier has flexible capacity
- Lower levels of information distortion than either buyback contracts or revenue sharing contracts

Contracts to Coordinate Supply Chain Costs

- Differences in costs at the buyer and supplier can lead to decisions that increase total supply chain costs
- A quantity discount contract may encourage the buyer to purchase a larger quantity which would result in lower total supply chain costs
- Quantity discounts lead to information distortion because of order batching

Contracts to Increase Agent Effort

- In many supply chains, agents act on behalf of a principal and the agents' efforts affect the reward for the principal
- A two-part tariff offers the right incentives for the dealer to exert the appropriate amount of effort
- Threshold contracts increase information distortion
- Offer threshold incentives over a rolling horizon

Contracts to Induce Performance Improvement

- A buyer may want performance improvement from a supplier who otherwise would have little incentive to do so
- A shared-savings contract provides the supplier with a fraction of the savings that result from performance improvement
- Effective in aligning supplier and buyer incentives when the supplier is required to improve performance and most of the benefits of improvement accrue to the buyer

The Procurement Process

- The process in which the supplier sends product in response to orders placed by the buyer
- Main categories of purchased goods
 - **Direct materials**
 - **Indirect materials**
- Procurement process for direct materials should be designed to ensure that components are available in the right place, in the right quantity, and at the right time
- Focus for indirect materials should be on reducing transaction cost

Differences Between Direct and Indirect Materials

	Direct Materials	Indirect Materials
Use	Production	Maintenance, repair, and support operations
Accounting	Cost of goods sold	Selling, general, and administrative expenses (SG&A)
Impact on production	Any delay will delay production	Less direct impact
Processing cost relative to value of transaction	Low	High
Number of transactions	Low	High

Designing a Sourcing Portfolio: Tailored Sourcing

- **Options with regard to whom and where to source from**
 - **Produce in-house or outsource to a third party**
 - **Will the source be cost efficient or responsive**
 - **Onshoring, near-shoring, and offshoring**
- **Tailor supplier portfolio based on a variety of product and market characteristics**

Designing a Sourcing Portfolio: Tailored Sourcing

	Responsive Source	Low-Cost Source
Product life cycle	Early phase	Mature phase
Demand volatility	High	Low
Demand volume	Low	High
Product value	High	Low
Rate of product obsolescence	High	Low
Desired quality	High	Low to medium
Engineering/design support	High	Low

Designing a Sourcing Portfolio: Tailored Sourcing

	Onshore	Near-shore	Offshore
Rate of innovation/product variety	High	Medium to High	Low
Demand volatility	High	Medium to High	Low
Labor content	Low	Medium to High	High
Volume or weight-to-value ratio	High	High	Low
Impact of supply chain disruption	High	Medium to High	Low
Inventory costs	High	Medium to High	Low
Engineering/management support	High	High	Low

- Inability to meet demand on time
- An increase in procurement costs
- Loss of intellectual property

Making Sourcing Decisions in Practice

1. Use multifunction teams
2. Ensure appropriate coordination across regions and business units
3. Always evaluate the total cost of ownership
4. Build long-term relationships with key suppliers

The Relationship Between AI & the Sourcing and Management of Suppliers

1. Supplier Identification and Sourcing

AI analyzes large volumes of supplier data from internal databases, online marketplaces, and industry sources to identify the most suitable suppliers.

Benefits:

- Finds qualified suppliers more quickly.
- Compares suppliers based on price, quality, location, and sustainability.
- Reduces the time required for supplier selection.

Example:

A manufacturing company uses AI to identify suppliers that offer the best balance of cost, quality, and delivery performance.

2. Supplier Selection

AI evaluates suppliers using multiple criteria rather than relying only on price.

AI considers factors such as:

- Product quality
- Delivery reliability
- Financial stability
- Production capacity
- Compliance with regulations
- Customer reviews and historical performance

Benefit:

Organizations select suppliers that provide the highest overall value.

3. Supplier Performance Management

AI continuously monitors supplier performance using real-time data and Key Performance Indicators (KPIs).

Typical KPIs include:

- On-time delivery rate
- Product quality
- Defect rate
- Order accuracy
- Response time
- Contract compliance

Benefit:

Managers can quickly identify underperforming suppliers and take corrective action.

Company AI Application in Supplier Management

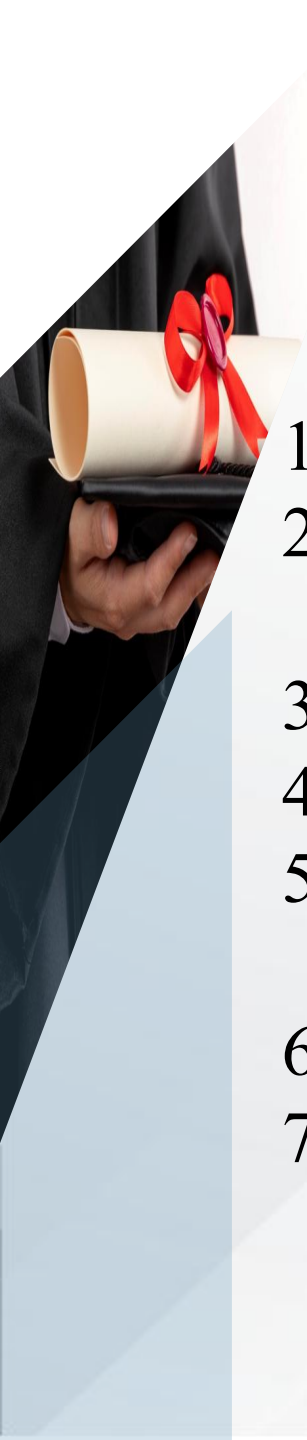
Amazon Uses AI to optimize supplier selection, inventory planning, and procurement decisions.

Walmart Uses AI to monitor supplier performance, forecast demand, and improve purchasing efficiency.

Unilever Uses AI to assess supplier risks, improve sustainability, and strengthen supplier relationships.

Siemens Uses AI for predictive supplier risk analysis and procurement automation.

Summary of Learning Objectives

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1. Understand the role of sourcing in a supply chain.
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Thank You