

Supply Chain Analytics

Lecture 10: Coordination in Supply Chain under uncertainty

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Supply Chain (Definition of)

- ✓ *The sequence of organizations- their facilities, functions, processes and activities- that are involved in producing and delivering a product or service*

Sometimes referred to as value chain

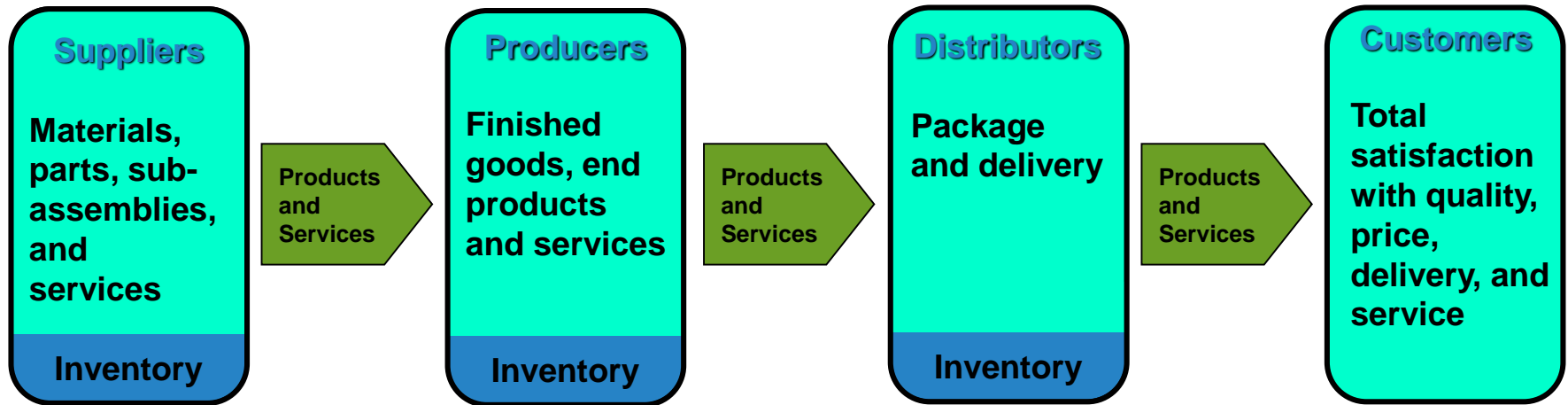
COMPONENTS OF SUPPLY (VALUE) CHAINS

Supply Component: Starts at the beginning of the SC and ends with the internal operations of the organization.

Demand Component: Starts at the point where the organization's output is delivered to its immediate customer and ends with the final customer in the chain. Demand chain is the sales and distribution portion of the value chain

The length of each component depends on where a particular organization is in the chain

THE SUPPLY CHAIN

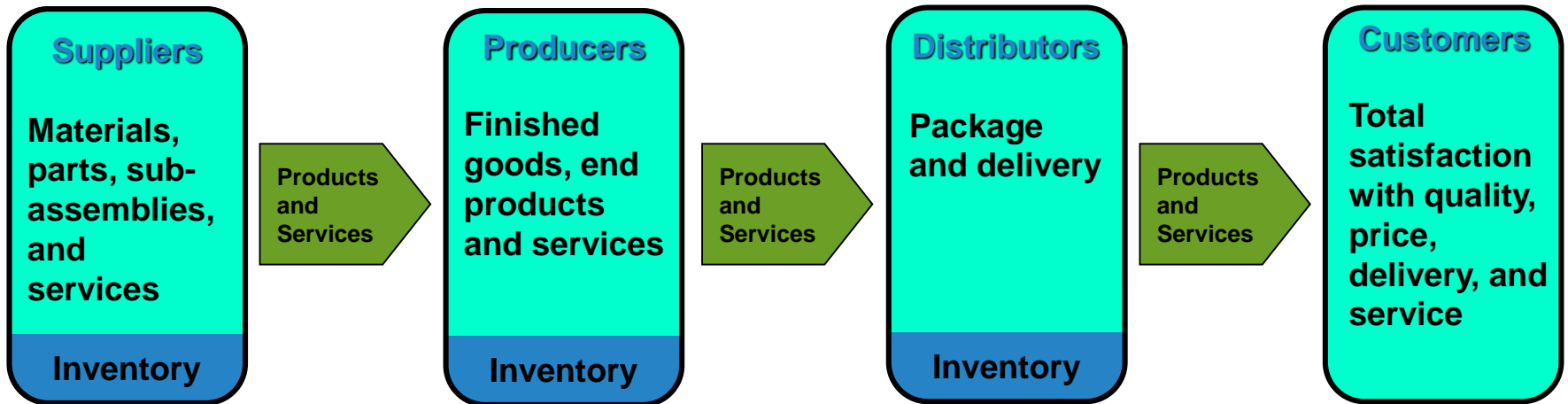


Upstream SC members

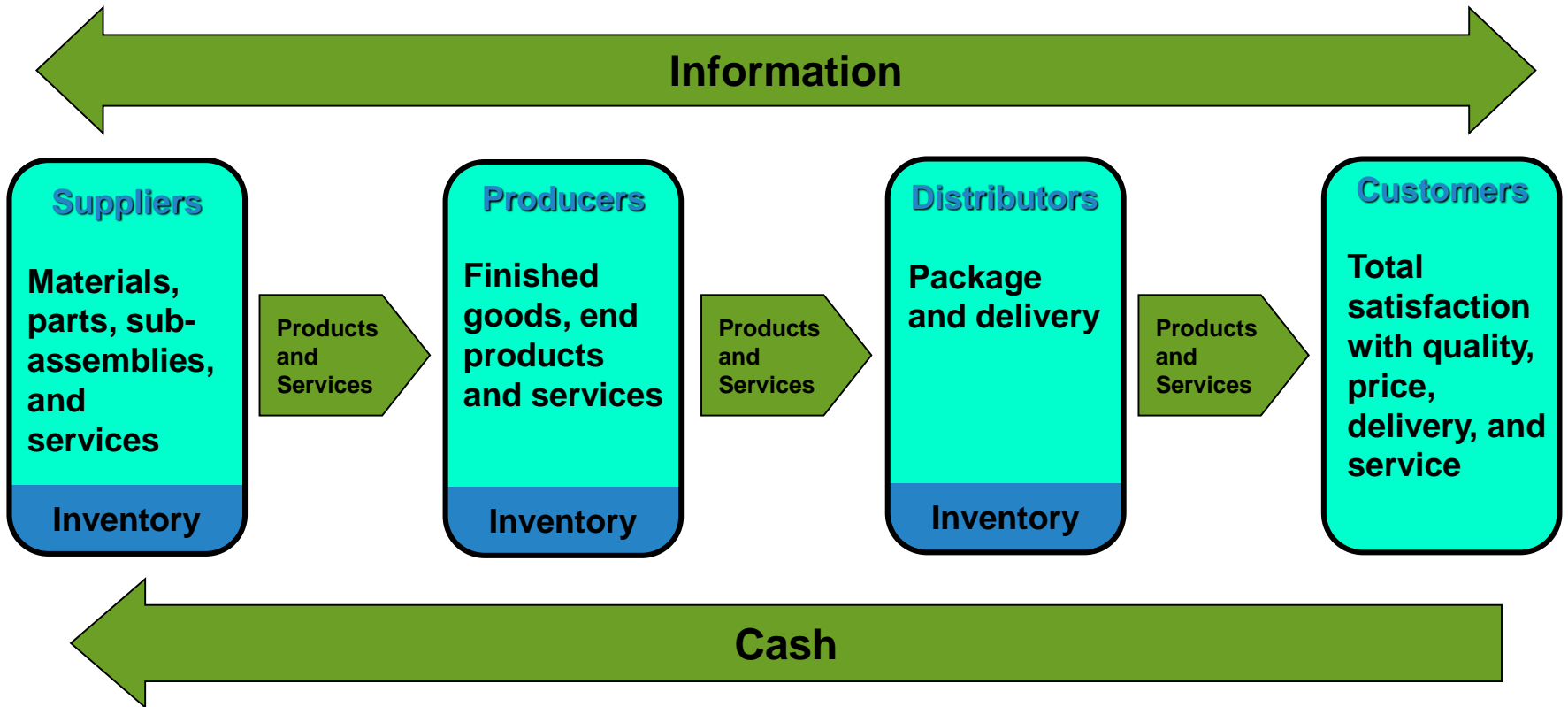
Downstream SC members

THE SUPPLY CHAIN

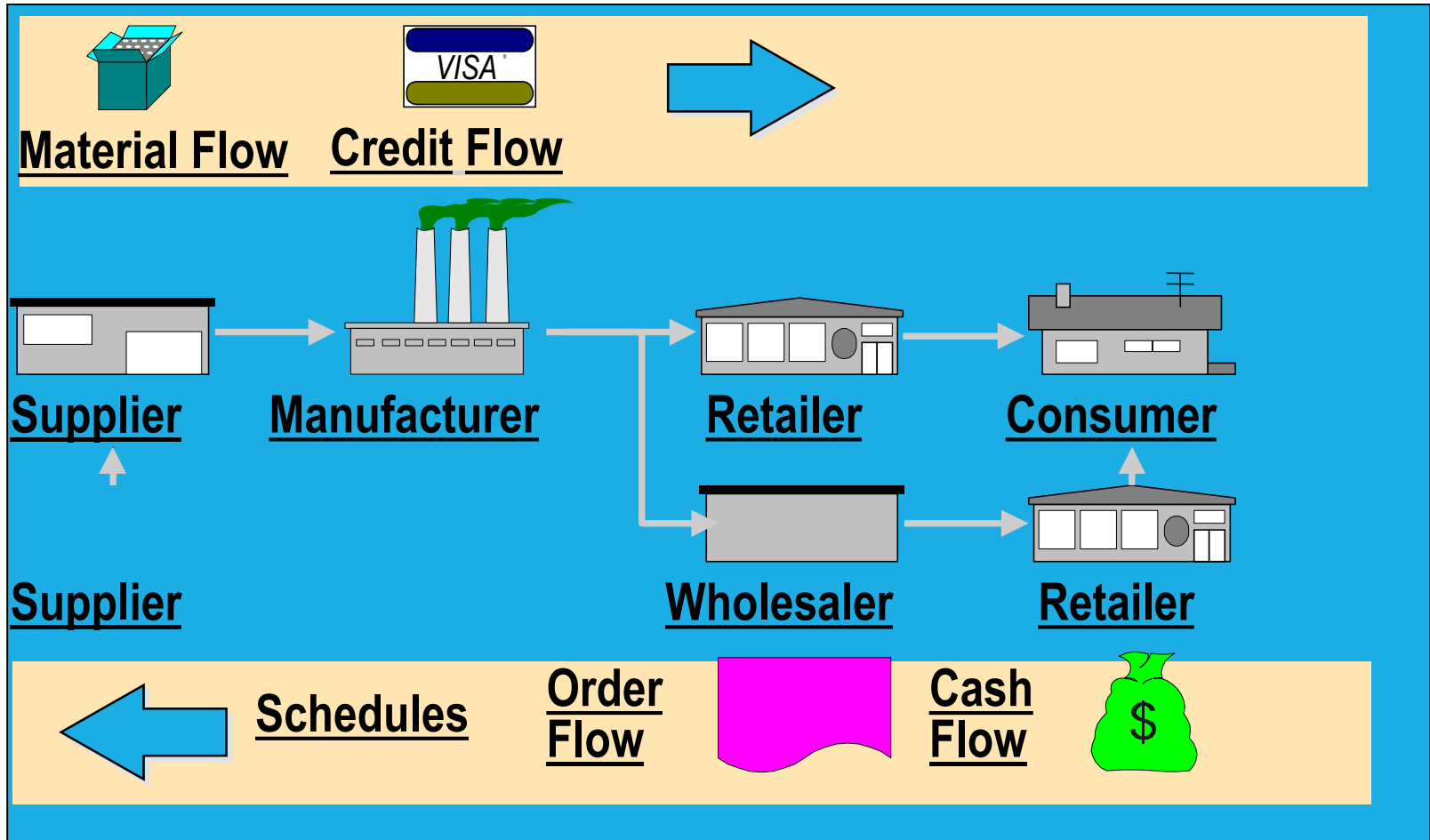
Information



THE SUPPLY CHAIN



The Supply-Chain



Flow Management

Three types of flow

– Product and service flow

- ***Involves movement of goods and services from suppliers to customers as well as handling customer service needs and product returns***

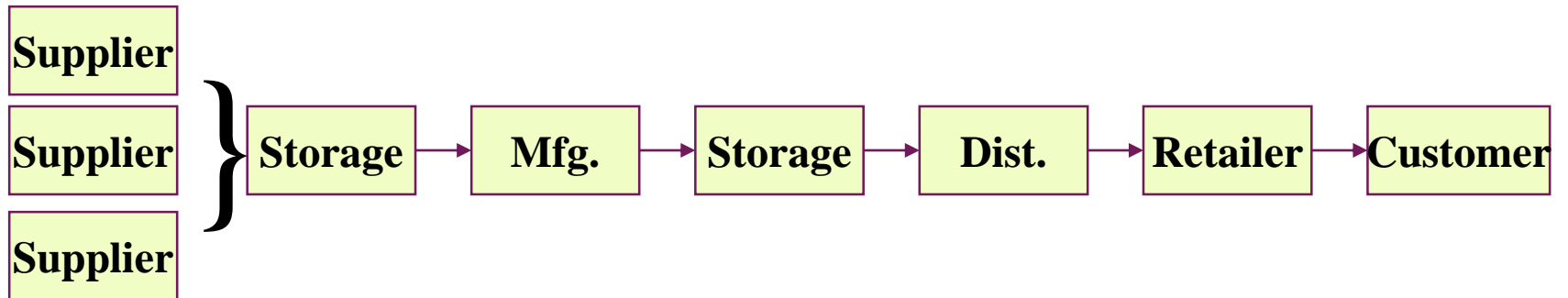
– Information flow

- ***Involves sharing forecasts and sales data, transmitting orders, tracking shipments, and updating order status***

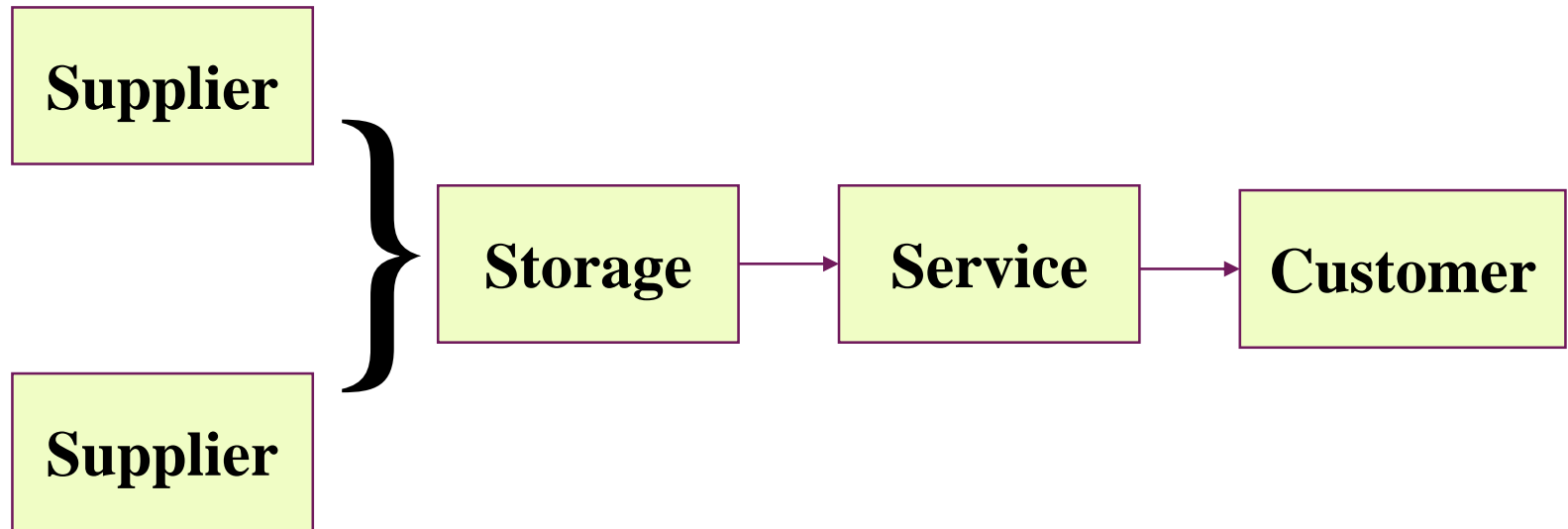
– Financial flow

- ***Involves credit terms, payments, and consignment and title ownership arrangements***

Typical Supply Chain for a Manufacturer



Typical Supply Chain for a Service



Supply Chain Management (Definition of) ***(1 of 2)***

- *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 user (planning, organizing, directing and controlling flows of materials)*
- *Managing all activities associated with the flow and transformation of goods and services from raw materials to the end user, the customer, as well as the associated information flows*



Supply Chain Management(Definition of) ***(2 of 2)***

- *The strategic coordination of business functions within a business organization and throughout its supply chain for the purpose of integrating supply and demand management*
- *The process of planning, implementing and controlling supply chain operations.*

GOALS OF SUPPLY CHAIN MANAGEMENT (1 OF 2)

- ✓ *Synchronization of activities required to achieve maximum competitive benefits*
- ✓ *Coordination, cooperation, and communication and timing among SC members*
- ✓ *Ensuring rapid flow of information among members*

Goals of Supply Chain Management

(2 of 2)

- ✓ *Linking the market, distribution channels, processes and suppliers so that market demand is met as efficiently as possible across the chain*
- ✓ *Matching supply and demand at each stage of the chain as effectively and efficiently as possible*

Ultimate goal: Achieving customer satisfaction and maximizing supply chain profits

Facilities Involved in SCM

The sequence of the supply chain begins with basic suppliers and extends all the way to the final customer

- Warehouses
- Factories
- Processing centers
- Distribution centers
- Retail outlets
- Offices



Elements of Supply Chain Management

Element	Typical Issues
Customers	Determining what customers want
Forecasting	Predicting quantity and timing of demand
Design	Incorporating customer wants, mfg., and time
Processing	Controlling quality, scheduling work
Inventory	Meeting demand while managing inventory costs
Purchasing	Evaluating suppliers and supporting operations
Suppliers	Monitoring supplier quality, delivery, and relations
Location	Determining location of facilities
Logistics	Deciding how to best move and store materials

Supply Chain Management Issues

(1 of 3)

- ***Determining what customers want***
- ***Predicting (forecasting) quantity and timing of demand***
- ***Incorporating customer wants to product design***
- ***Determining appropriate levels of outsourcing***
- ***Managing procurement (purchasing)***
- ***Managing and evaluating suppliers (monitoring supplier quality, delivery and relations)***

Supply Chain Management Issues

(2 of 3)

- ***Determining the location of facilities***
- ***Managing customer relationships***
- ***Information management***
- ***Managing supporting operations***
- ***Managing risk***
- ***Managing flows***
- ***Quality assurance and control***

Supply Chain Management Issues

(3 of 3)

- ***Production planning, scheduling and control***
- ***Inventory management (meeting demand while managing inventory costs)***
- ***Logistics***
- ***Deciding how best to move and store materials (distribution and delivery)***
- ***Customer service***
- ***Identifying problems and responding to them***

Strategic & Operational Decisions in Supply Chains

Three types of decisions in supply chain management

– design and policy

day-today activities

SUPPLY CHAIN ISSUES

<i>Strategic Issues</i>	<i>Tactical Issues</i>	<i>Operating Issues</i>
<i>Design of the supply chain, partnering</i>	<i>Inventory policies Purchasing policies Production policies Transportation policies Quality policies</i>	<i>Quality control Production planning and control</i>

STRATEGIC RESPONSIBILITIES

- Supply chain strategy alignment
- Network configuration
- Information technology
- Products and services
- Capacity planning
- Strategic partnerships
- Distribution strategy
- Uncertainty and risk reduction

Tactical Responsibilities

- *Forecasting*
- *Sourcing*
- *Operations planning*
- *Inventory policies*
- *Quality policies*
- *Transportation planning*
- *Collaborating*

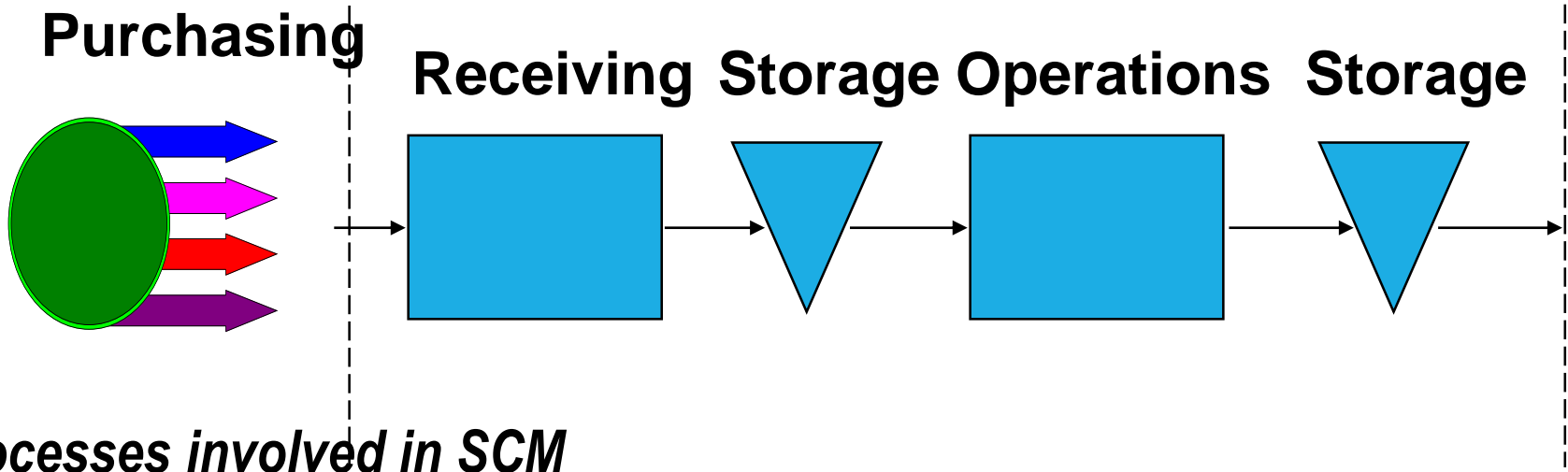
Operational Responsibilities

- *Scheduling*
- *Receiving*
- *Transforming*
- *Order fulfilling*
- *Managing inventory*
- *Shipping*
- *Information sharing*
- *Controlling*

Typical Supply Chain Activities

Production

Distribution



Processes involved in SCM

- *Acquiring customer orders*
- *Procuring materials and components from suppliers (sourcing and procurement)*
- *Producing or manufacturing products (transformation activities)*
- *Filling customer orders*
- *Logistics (the part of the SC involved with the forward and reverse flow of goods, services, cash and information)*

TRENDS IN SCM

Reevaluation of outsourcing

Risk management

Inventory management

Lean supply chains

Sustainability

As a result of these trends, organizations are likely to give serious thought to reconfiguring their supply chains to

- reduce risks,***
- improve flow,***
- increase profits and***
- increase customer satisfaction***

Supply-Chain Costs as a Percent of Sales

<u>Industry</u>	<u>Percent of Sales</u>
• <i>All industry</i>	• <i>52%</i>
• <i>Automobile</i>	• <i>67%</i>
• <i>Food</i>	• <i>60%</i>
• <i>Lumber</i>	• <i>61%</i>
• <i>Paper</i>	• <i>55%</i>
• <i>Petroleum</i>	• <i>79%</i>
• <i>Transportation</i>	• <i>62%</i>

Factors That Contribute to the Increased Need for Effective Supply Chain Management

- *need to improve operations*
- *increased levels of outsourcing*
- *increasing transportation costs*
- *competitive pressures*
- *increasing globalization*
- *increasing importance of e-commerce*
- *increasing complexity of supply chains*
- *increasing pressure to decrease inventories*

Benefits of Supply Chain Management

- *Lower inventories*
- *Lower costs*
- *Higher productivity*
- *Greater agility*
- *Shorter lead times*
- *Higher profits*
- *Greater customer loyalty*
- *Integration of separate organizations into a cohesive operating system*

Actual Benefits Gained by Supply Chain Management

<i>Organization</i>	<i>Benefit</i>
<i>Campbell Soup</i>	<i>Doubled inventory turnover rate</i>
<i>Hewlett-Packard</i>	<i>Cut supply costs 75%</i>
<i>Sport Obermeyer</i>	<i>Doubled profits and increased sales 60%</i>
<i>National Bicycle</i>	<i>Increased market share from 5% to 29%</i>
<i>Wal-Mart</i>	<i>Largest and most profitable retailer in the world</i>

Requirements of a Successful Supply Chain

- ***It begins with strategic sourcing***
 - ***Analyzing the procurement process to lower costs by reducing waste and non-value-added activities, increasing profits, reducing risks and improving supplier performance***
- ***Trust among trading partners***
- ***Effective cooperation and communications***
 - Supply chain should enable members to 1) share forecasts, 2) determine the status of orders in real time, 3) access inventory data of partners***
- ***Supply chain visibility***
- ***Inventory velocity***
- ***Event-management capability***
 - ***The ability to detect and respond to unplanned events***
- ***Measuring SC Performance: Performance metrics***

CREATING AN EFFECTIVE SUPPLY CHAIN

An Effective Supply Chain requires linking the market, distribution channels processes, and suppliers

1. Develop strategic objectives and tactics
2. Integrate and coordinate activities in the internal supply chain
3. Coordinate activities with suppliers and with distributors
4. Coordinate planning and execution across the supply chain
5. Form strategic partnerships

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