

GAMA

Retail Domain Academy Level 2

Supply Chain Management – Course 1



Supply Chain Management Course 1 - Topics

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Supply Chain

What is a Supply Chain?

- Supply Chain refers to the flow of materials, information, money, and services from raw material suppliers, through factories and warehouses, to the end consumer
- A supply chain is actually a complex and dynamic supply and demand network
- A supply chain is a system of organizations, people, technology, activities, information and resources involved in moving a product or service from supplier to customer. Supply chain activities transform natural resources, raw materials and components into a finished product that is delivered to the end customer
- The supply chain, which is also referred to as the **logistics network**, consists of suppliers, manufacturing centers, warehouses, distribution centers, and retail outlets, as well as raw materials, work-in-process inventory, and finished products that flow between the facilities
- Simply stated, *"the supply chain encompasses all of those activities associated with moving goods from the raw-materials stage through to the end user."*

Supply Chain - Definitions

Anderson, Britt, and Favre Definition

"A supply chain consists of organizations involved in management of the flow of products, services, and information. The supply chain includes all the links involved in managing the flow of products, services, and information from their supplier's suppliers to their customer's customers."

Anderson, Britt, and Favre's definition emphasizes the multi-company nature of the supply chain

Smil Chopra, Peter Meindl Definition

"A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request. The supply chain not only includes the manufacturer and suppliers, but also transporters, warehouses, retailers, and customers themselves. Within each organization, such as a manufacturer, the supply chain includes all functions involved in receiving and filling a customer request. These functions include, but are not limited to, new product development, marketing, operations, distribution, finance, and customer service."

The Chopra and Meindl definition is more specific about the types of activities, particularly those internal to the company, and types of organizations involved in the supply chain

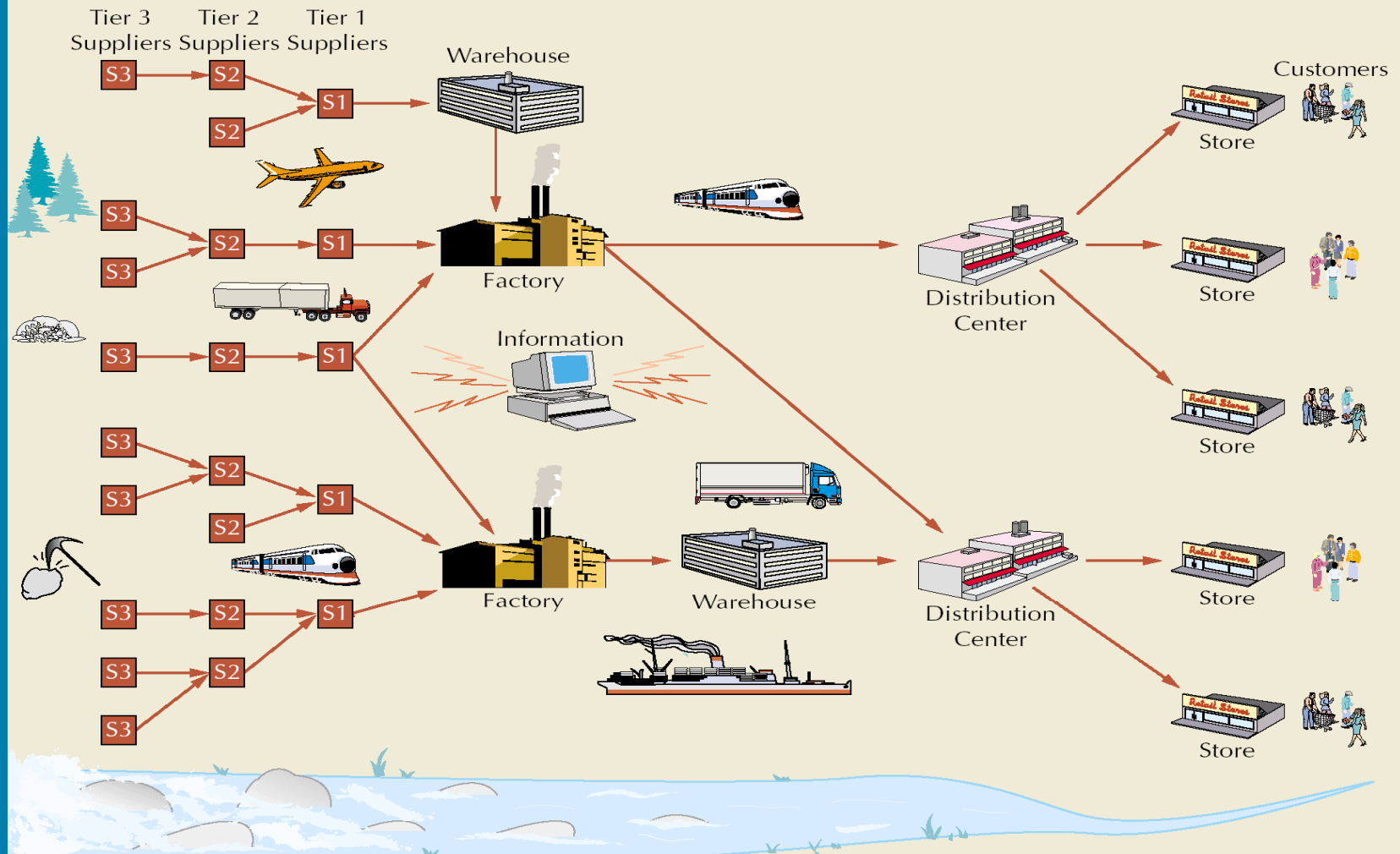
Supply Chain - Definitions

Mentzer Definition

"A basic supply chain consists of a company, an immediate supplier, and an immediate customer directly linked by one or more of the upstream and downstream flow of products, services, finances, and information. An ultimate supply chain includes all the companies involved in all the upstream and downstream flow of products, services, finances, and information from the initial supplier to the ultimate customer."

The Mentzer definition emphasizes the nature of flow within the supply chain as well as the multi-company character of a supply chain. Mentzer includes a supply chain component that was not explicitly stated in the previous definitions: the flow of money or financials.

Supply Chain - Illustration



Supply Chain - Stages

Supply chain activities begin with a customer order and end when a satisfied customer has paid for his or her purchase

A supply chain consists of all stages involved, directly or indirectly, in fulfilling a customer request. Each stage of the supply chain performs different processes and interacts with other stages of the supply chain

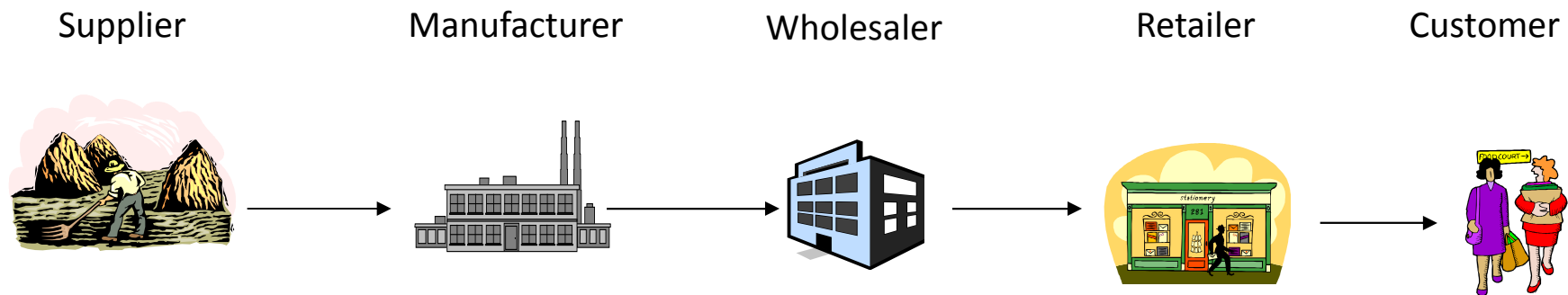
A typical supply chain may involve a variety of stages:

- Component/Raw Material Supplier
- Manufacturer - One who is involved in production of goods with the help of machines, labor and raw materials
- Wholesaler - One who purchases the goods from the manufacturers and sells to the retailers in large numbers but at a lower price. A wholesaler never sells goods directly to the end users
- Retailer - A retailer comes at the end of the supply chain who sells the products in small quantities to the end users as per their requirement and need
- The end user (consumer, customer) goes to the retailer to buy the goods (products) in small quantities to satisfy his needs and demands

Supply Chain – Stages (Contd.)

Each stage need not be present in a supply chain. The appropriate design of the supply chain will depend on both the customer's needs and the roles of the stages involved

- Example: Dell, a computer manufacturer fills customer orders directly. Dell builds-to-order; a customer order initiates manufacturing at Dell. Dell does not have a retailer, wholesaler or distributor in its supply chain



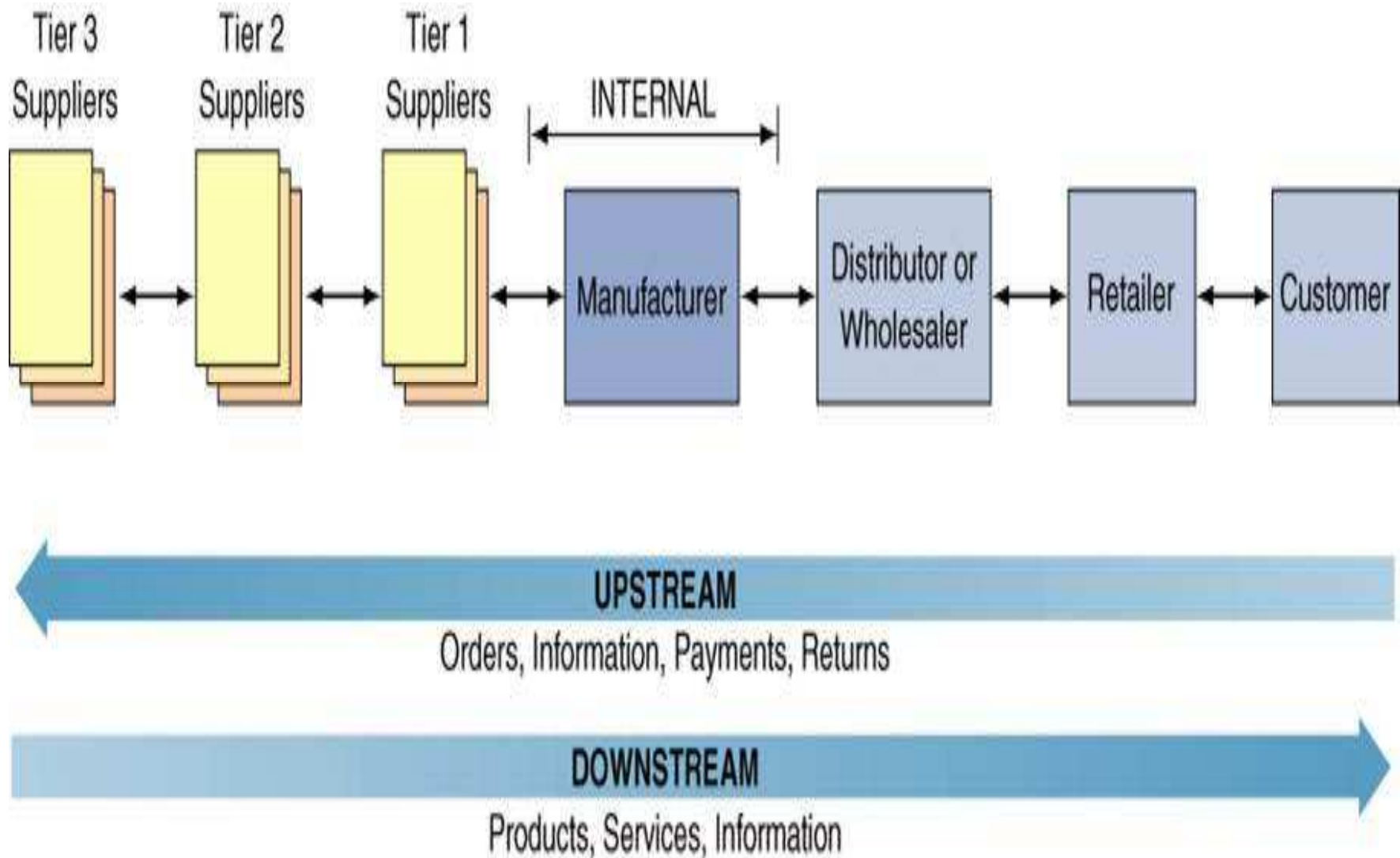
Supply chain profitability is the total profit to be shared across all supply chain stages. The higher the supply chain profitability, the more successful the supply chain

Supply Chain - Flows

A supply chain is dynamic and involves the constant flow of product, information and funds between different stages *in both directions*

- **Material/Product and Services Flow** - includes the movement of goods from a supplier to a customer, as well as any customer returns or service needs ('reverse flow' of material)
- **Information Flow** - involves transmitting orders and updating the status of delivery. Information reduces uncertainty, which reduces the quantity of goods required at any stage in the supply chain. Examples: sales records, customer orders, Point of Sale (POS) information
- **Finance Flow** - consists of credit terms, payment schedules, and consignment and title ownership arrangements

Supply Chain – Illustration of Stages & Flows

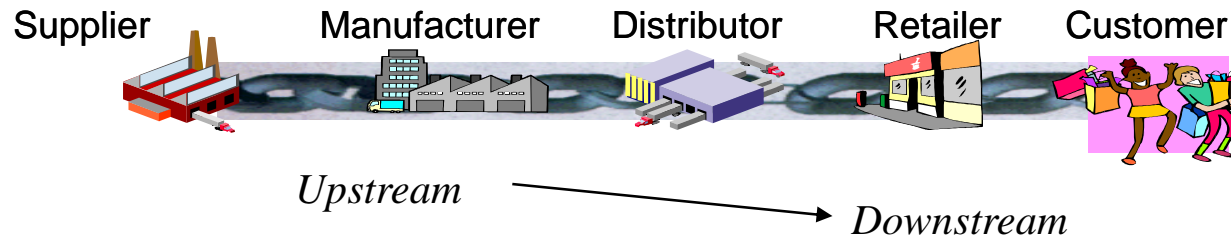


Characteristics of a Supply Chain

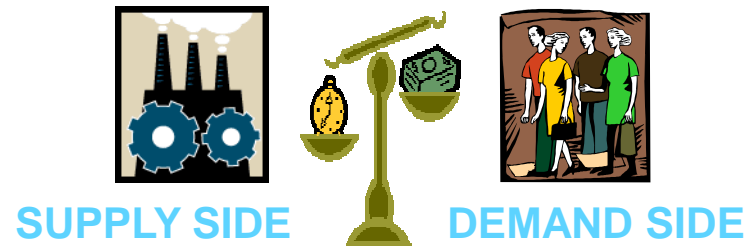
- Dynamic - constant flow of information, products, funds and even the parts involved
- Runs across several stages - e.g. raw materials supplier - manufacturer - distributor - retailer - customer; in some supply chains some stages have been left out, leading to the simplification and the performance of the whole supply chain
- Flows in both directions
- Has a cost and a capacity
- Has as objective the maximization of its value - the difference between the revenue generated from the customer and the overall cost of the supply chain
- Its success or failure is determined by its design and management

Supply Chain in nutshell

A supply chain consists of



- aims to match Supply and Demand, profitably for products and services



- achieves



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Supply Chain Management

Supply Chain Management (SCM)

Supply Chain Management (SCM) involves the management of flows between and among stages in a supply chain to maximize total profitability. According to Gartner, the worldwide economy spent some USD 6.2 billion on SCM.

Supply Chain Management is defined as the management of material and information flow in a supply chain to provide the ***highest degree of customer satisfaction at the lowest possible cost***

SCM is the delivery of enhanced customer and economic value through synchronized management of the flow of physical goods and associated information ***from sourcing to consumption***

In essence, Supply Chain Management integrates supply and demand management within and across companies

***** The term supply chain management was coined by consultant Keith Oliver, of strategy consulting firm Booz Allen Hamilton in 1982***

SCM - Definitions

- Supply chain management (SCM) is the process of planning, implementing, and controlling the operations of the supply chain with the purpose to satisfy customer requirements as efficiently as possible. Supply chain management spans all movement and storage of raw materials, work-in-process inventory, and finished goods ***from point-of-origin to point-of-consumption***.
- Supply chain management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to ***minimize system-wide costs*** while ***satisfying service level requirements***.
- Supply chain management is typically viewed to lie between fully vertically integrated firms, where the entire material flow is owned by a single firm, and those where each channel member operates independently. Therefore ***coordination between the various players*** in the chain is key in its effective management.

Compare supply chain management to a well-balanced and well-practiced relay team. Such a team is more competitive when each player knows how to be positioned for the hand-off. The relationships are the strongest between players who directly pass the baton, but the entire team needs to make a coordinated effort to win the race.

SCM as defined by CSCMP

Supply Chain Management (SCM) as defined by the Council of Supply Chain Management Professionals (CSCMP): “Supply Chain Management encompasses the planning and management of all activities involved in ***sourcing and procurement, conversion, and all logistics management*** activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, supply chain management ***integrates supply and demand management*** within and across companies. Supply Chain Management is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model. It includes all of the logistics management activities noted above, as well as manufacturing operations, and it drives coordination of processes and activities with and across marketing, sales, product design, finance and information technology”

SCM Vs. Logistics

The boundary between the logistics and supply chain management terms is fuzzy. Logistics and Supply Chain functions can overlap. Different companies define them in their own ways.

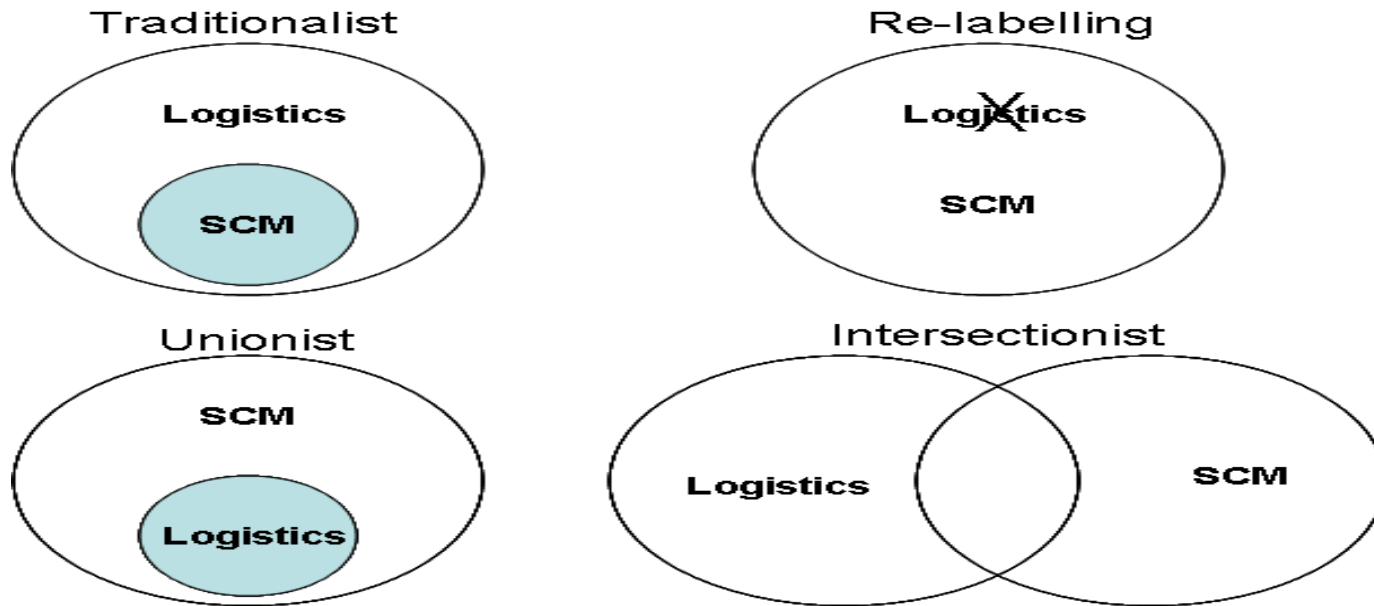
Logistics is generally concerned with strategy and **coordination** of flows between marketing and production (i.e. transportation and distribution). However, it cuts across many functions such as Supply Chain.

Logistics is generally viewed as within one company, although it manages flows between the company and its suppliers and customers. Supply chain management includes the logistical flows, the customer order management and production processes and the information flows necessary to monitor all the activities at the supply chain nodes.

In short evidence suggests that logistics is largely viewed as effectively a subset of SC.

** Terms 'Value chain' and Supply chain are also used interchangeably.*

SCM Vs. Logistics – Conceptual Perspectives



1. **Traditionalist** - SCM in logistics, i.e. SCM is just one small part of logistics
2. **Re-labeling** perspective simply renames logistics: what was logistics is now SCM
3. **Unionist** perspective treats logistics as a part of SCM: SCM completely subsumes logistics
4. **Intersectionist** perspective suggests SCM is not the union of logistics, marketing operations management, purchasing and other functional areas. Rather, it includes strategic, integrative elements from all of these disciplines

SCM – Functions and Activities

The supply chain is composed of different segments that are related to different activities.

- **Procurement** - Activities related to the purchasing of all goods and services required by a specific company to operate their business.
- **Order processing** - Functions needed to capture customers' orders, such as order receipt, order picking, and order shipment.
- **Demand & Supply Planning** - Process of forecasting customer demand, actual sales, and current **inventory levels** on stock.
- **Inventory Management** - Expands through different activities in order to track stock levels – including forecasting, positioning of stock, and the tracking of product age and availability.
- **Warehousing** - The keeping of goods with an emphasis on moving product into, through, and out of warehouses in a timely and accurate manner.
- **Transportation** - Movement of products from one destination to another. Transportation can involve different transport methods, depending on the business, market and infrastructure specifics.
- **Customer service** - Includes all sales or after-sales related activities that occur between the buyer and seller. These functions include order status, post-sale support, etc.

All these processes within supply chain can be mapped to and associated with the majority of the five components of the supply chain (suppliers, manufacturers, distributors, retailers, and consumers). Still, for most, there are a few components that are more closely tied with that particular activity.

SCM Managers

People at various levels of the organization who are responsible for managing supply and demand both within and across business organizations.

Involved with planning and coordinating activities

- Sourcing and procurement of materials and services
- Transformation activities
- Logistics

Goals of SCM

Mission: Enhancing the customer's experience through excellence in delivering the ***right products, services, resources and information*** seamlessly to the ***right place*** at the ***right time***!

- Synchronization of activities required to achieve maximum competitive benefits
- Coordination, cooperation and communication and timing among Supply Chain members
- Ensuring rapid flow of information among members
- Linking the market, distribution channels, processes and suppliers so that market demand is met as effectively as possible across the chain
- Matching supply and demand at each stage of the chain
- ***Achieving customer satisfaction***

The goal of SCM is to match supply to demand as effectively and efficiently as possible

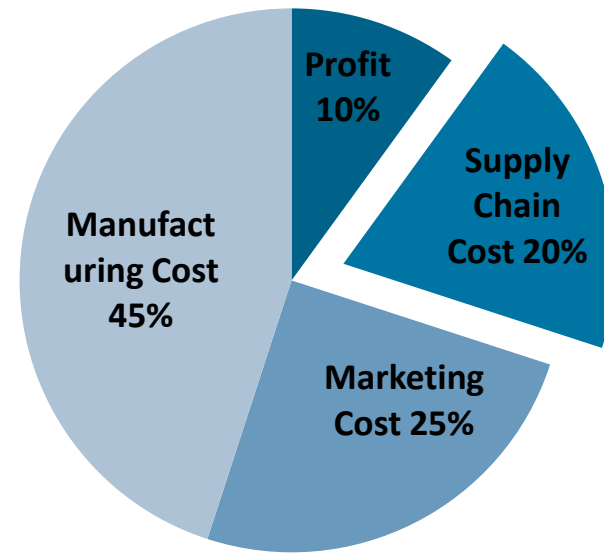
*The ultimate goal of any effective supply chain management system is to **reduce inventory** (with the assumption that products are available when needed)*

Benefits of SCM

Benefits of SCM:

- Lower inventories
- Higher productivity
- Greater agility
- Shorter lead times
- Higher profits
- Greater customer loyalty

Cost breakdown of a manufactured good



Campbell Soup

- Doubled Inventory Turnover Rate

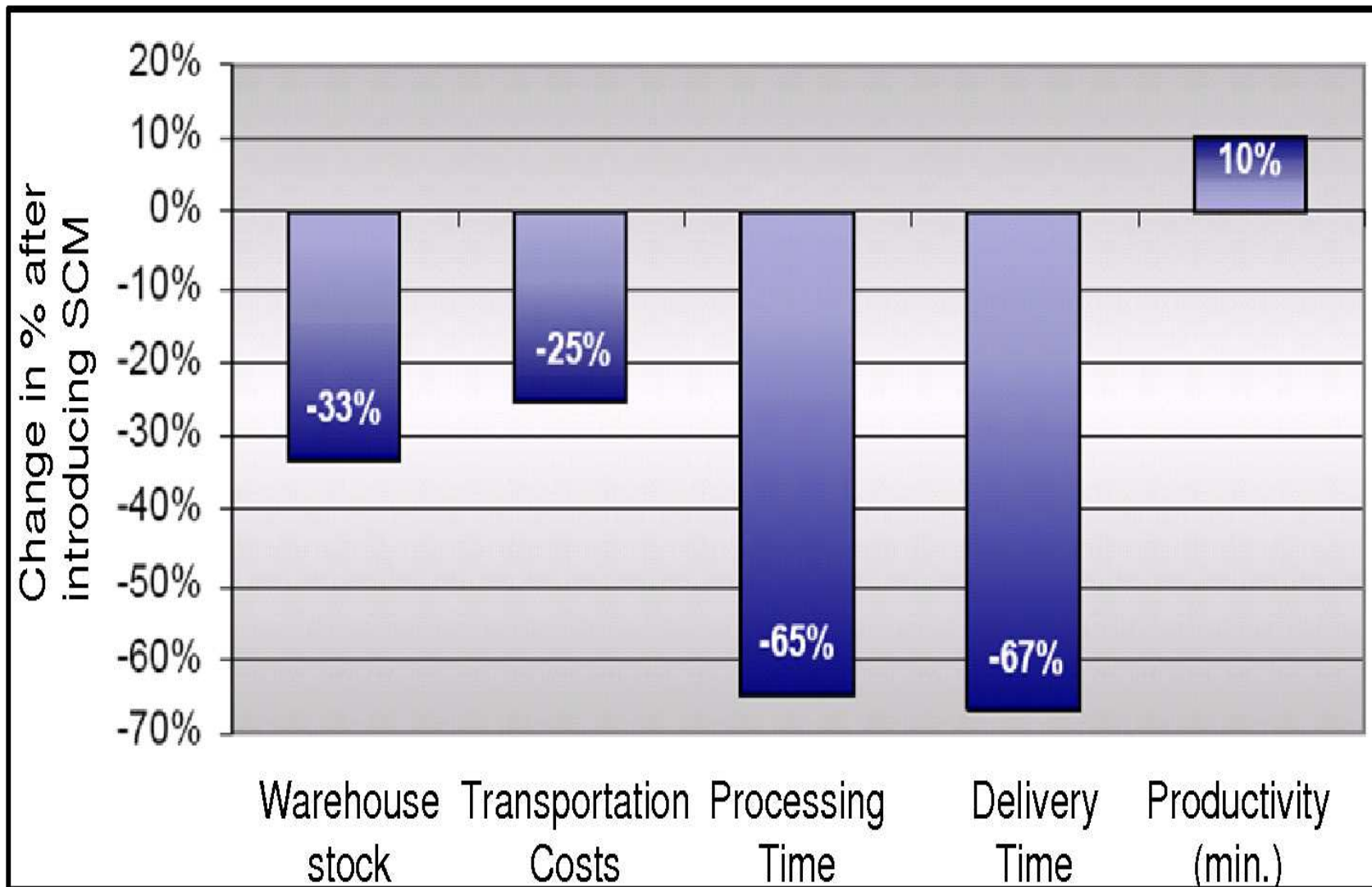
Hewlett Packard

- Cut supply costs 75%

Walmart

- Walmart has the highest sales per square foot, inventory turnover and operating profit of any discount retailer
- The phenomenal growth of Walmart is attributed to its continued focus on customer needs and reducing cost through efficient **supply chain management practices**

Results of introducing SCM



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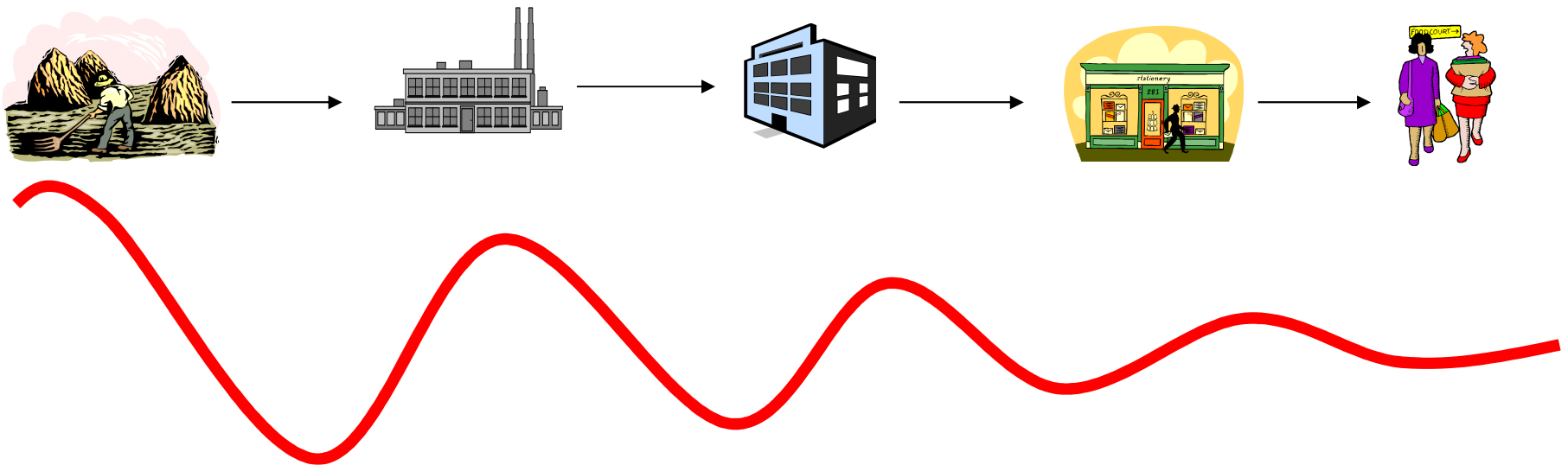
Supply Chain – Bullwhip Effect

Managing a Supply Chain is not easy

Poor coordination about supply chain partners in the US food industry wastes about \$30 billion per year.

- Geographically dispersed complex network
- Conflicting objectives across the supply chain
- Uncertainty and risk factors resulting from natural calamities, port strike etc.
- Information distortion -> **Bullwhip Effect**

Supplier Manufacturer Wholesaler Retailer Customer



Bullwhip Effect

The Bullwhip effect is the uncertainty caused from distorted information flowing up and down the supply chain. Since the oscillating demand magnification upstream a supply chain reminds someone of a cracking whip it became famous as the Bullwhip Effect.

The bullwhip effect (aka ***whiplash effect***) can be explained as an occurrence detected by the supply chain where orders sent to the manufacturer and supplier create larger variance than the sales to the end customer. These irregular orders in the lower part of the supply chain develop to be more distinct higher up in the supply chain. This variance can interrupt the smoothness of the supply chain process as each link in the supply chain will over or underestimate the product demand resulting in exaggerated fluctuations.

The bullwhip effect on the supply chain occurs when changes in consumer demand causes the companies in a supply chain to order more goods to meet the new demand.

What causes Bullwhip Effect?

There are many factors that causes the bullwhip effect in supply chains; the following list names a few:

- **Disorganization** between each supply chain link; with ordering larger or smaller amounts of a product than is needed due to an over or under reaction to the supply chain beforehand
- **Lack of communication** between each link in the supply chain makes it difficult for processes to run smoothly
- **Free return policies**; customers may intentionally overstate demands due to shortages and then cancel when the supply becomes adequate again, without return forfeit retailers will continue to exaggerate their needs and cancel orders; resulting in excess material
- **Order batching**; companies may not immediately place an order with their supplier; often accumulating the demand first. Companies may order weekly or even monthly. This creates variability in the demand as there may for instance be a surge in demand at some stage followed by no demand after

What causes Bullwhip Effect? (Contd.)

- **Price variations** – special discounts and other cost changes can upset regular buying patterns; buyers want to take advantage on discounts offered during a short time period, this can cause uneven production and distorted demand information
- **Demand information** – relying on past demand information to estimate current demand information of a product does not take into account any fluctuations that may occur in demand over a period of time

Understanding the causes of the bullwhip effect can help managers find strategies to alleviate the effect.

Results of Bullwhip Effect

Results of bullwhip effect

- Excess inventory
- Problems with quality
- Increased raw material costs
- Overtime expenses
- Increased shipping costs
- Lost customer service
- Lengthened *lead time**
- Lost sales
- Unnecessary adjusted capacity

***Lead time** is the time from the moment the customer places an order to the moment it is received by the customer

Solutions to bullwhip effect include: improved information flow between firms along the supply chain, stable pricing, small order increments, focused demand on EDI or POS systems and removal of sales incentives

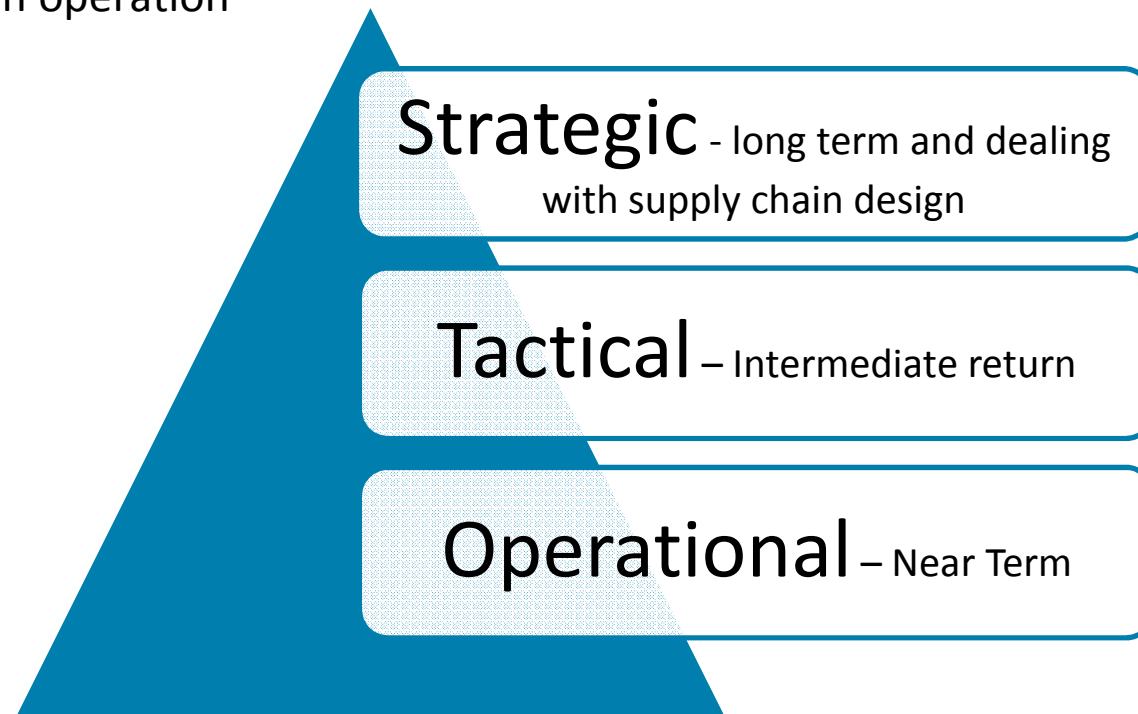
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Supply Chain – Decisions

Decision Phases in a Supply Chain

Successful supply chain management requires decisions on the flow of information, product, and funds that fall into three decision phases. These decisions play a significant role in the success or failure of a firm.

- Supply chain strategy or design
- Supply chain planning
- Supply chain operation



Supply Chain – Typical Decisions

Decision Phase	Timeframe	Typical Decisions
Strategic	Years	<ul style="list-style-type: none"> • Make or buy decisions • Supply chain network design (How many plants?, Location and capacities of plants and warehouses) • Supply chain strategies (Sell direct or through retailers, Outsource or in-house, Focus on cost or customer service) • Product mix at each plant
Tactical	3 months – 1 year	<ul style="list-style-type: none"> • Workforce & Production planning • Inventory policies (safety stock level) • Which locations supply which markets • Transportation strategies • Quality related decisions
Operational	Daily	<ul style="list-style-type: none"> • Decisions regarding individual orders • Place replenishment orders • Production planning and control decisions • Goods and service delivery scheduling • Some make or buy decisions

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Supply Chain – Process View

Process View of a Supply Chain

The supply chain process occurs in two ways:

1. Cycle View

The processes in a supply chain are divided into a series of cycle, each performed at the interface between two successive stages of a supply chain. Cycle view of supply chain process includes:

- Customer order cycle
- Replenishment cycle
- Manufacturing cycle
- Procurement cycle

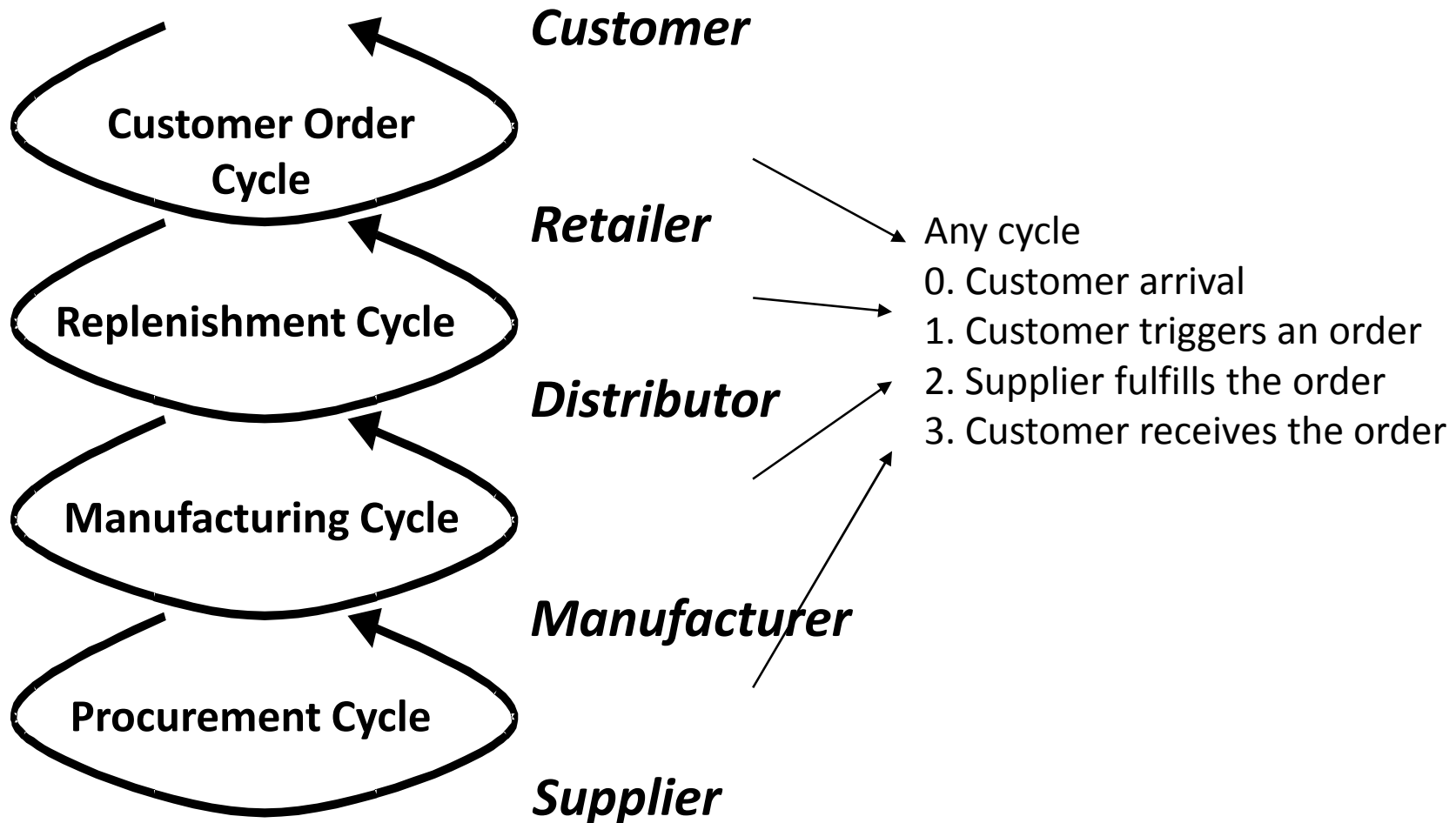
2. Push/Pull view

The processes in a supply chain are divided into two categories depending on whether they are executed in response to a customer order or in anticipation of customer orders. Pull process are initiated by a customer order, whereas push process are initiated and performed in anticipation of customer orders.

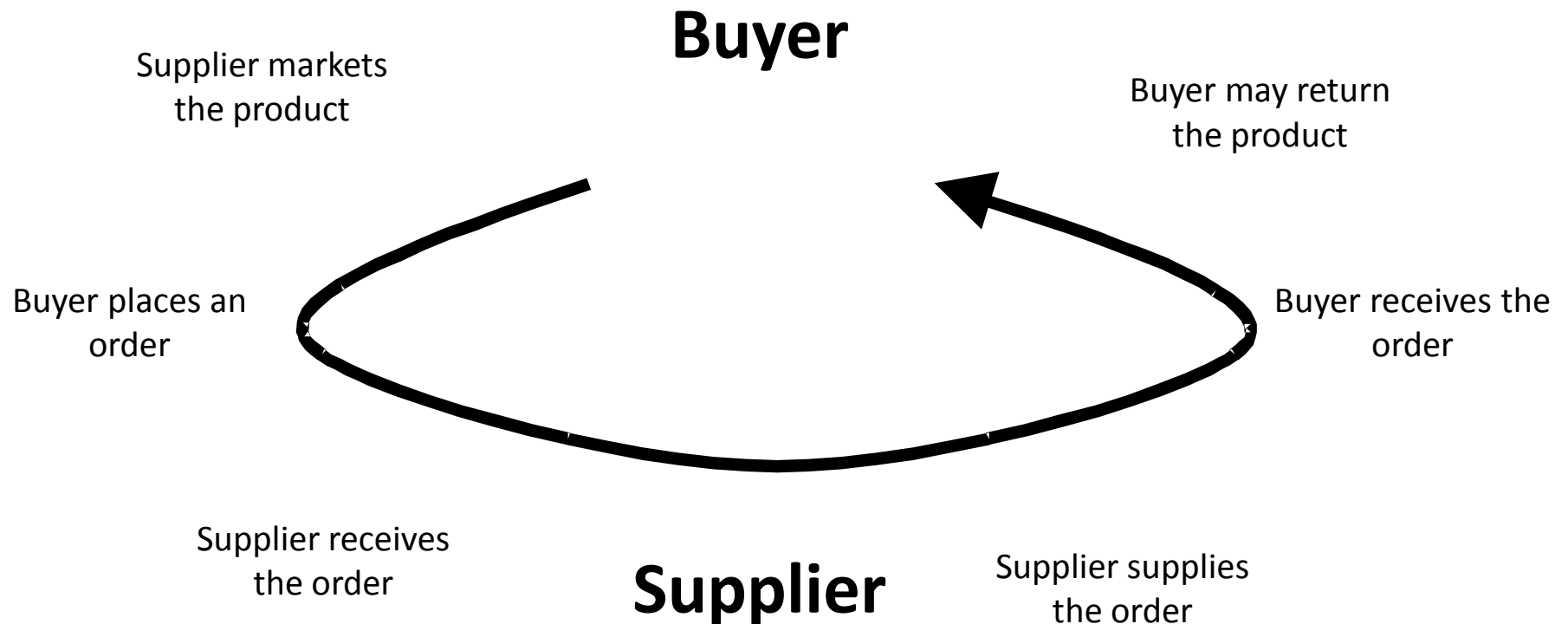
Cycle View of a Supply Chain

- Each cycle occurs at the interface between two successive stages
 - Customer order cycle (customer-retailer)
 - Replenishment cycle (retailer-distributor)
 - Manufacturing cycle (distributor-manufacturer)
 - Procurement cycle (manufacturer-supplier)
- The cycles share the same type of communication, since there will always be a buyer and a supplier
- Cycle view clearly defines processes involved and the owners of each process
- Specifies the roles and responsibilities of each member and the desired outcome of each process
- The further we go from the customer, the bigger the scale of the transactions
- The cycle that surely presents uncertainty to the supply chain is the customer cycle, since it contains an external buyer agent (the customer)

Cycle View of a Supply Chain - Illustration



Sub Processes in each cycle



Within each cycle, the goal of the buyer is to ensure product availability and to achieve economies of scale in ordering

Push/Pull View of a Supply Chain

Supply chain processes fall into one of two categories depending on the timing of their execution relative to timing of customer order.

1. Pull: execution is initiated in response to a customer order (*reactive*)
2. Push: execution is initiated in anticipation of customer orders (*speculative*)

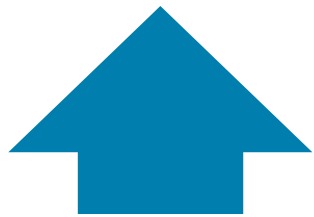
A supply chain is almost always a combination of both push and pull, where the interface between the push-based stages and the pull-based stages is known as the ***push–pull boundary or decoupling point***.

The key difference is the uncertainty during the two phases

- At the time of execution of a pull process customer demand is known
 - This may cause long delivery lead times
- At the time of execution of a push process customer demand is not known (and must be forecasted)
 - Keeps inventory to meet actual demand

Even when we are dealing with pull processes, there is still no guarantee that demand will be fulfilled, since they are constrained by the decisions made in the push phase (stock policy, transport policy, warehouse capacity etc.).

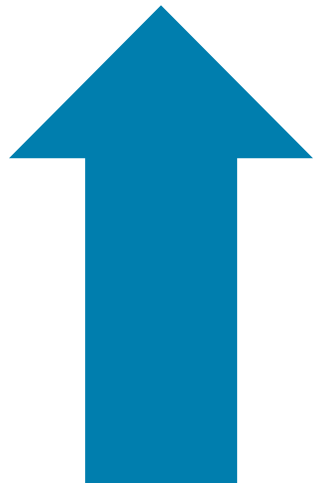
Push/Pull View of a Supply Chain



***PULL
PROCESSES***

Execution is initiated in response to customer orders (**reactive**)

— — — — — Customer order arrives — — — — —



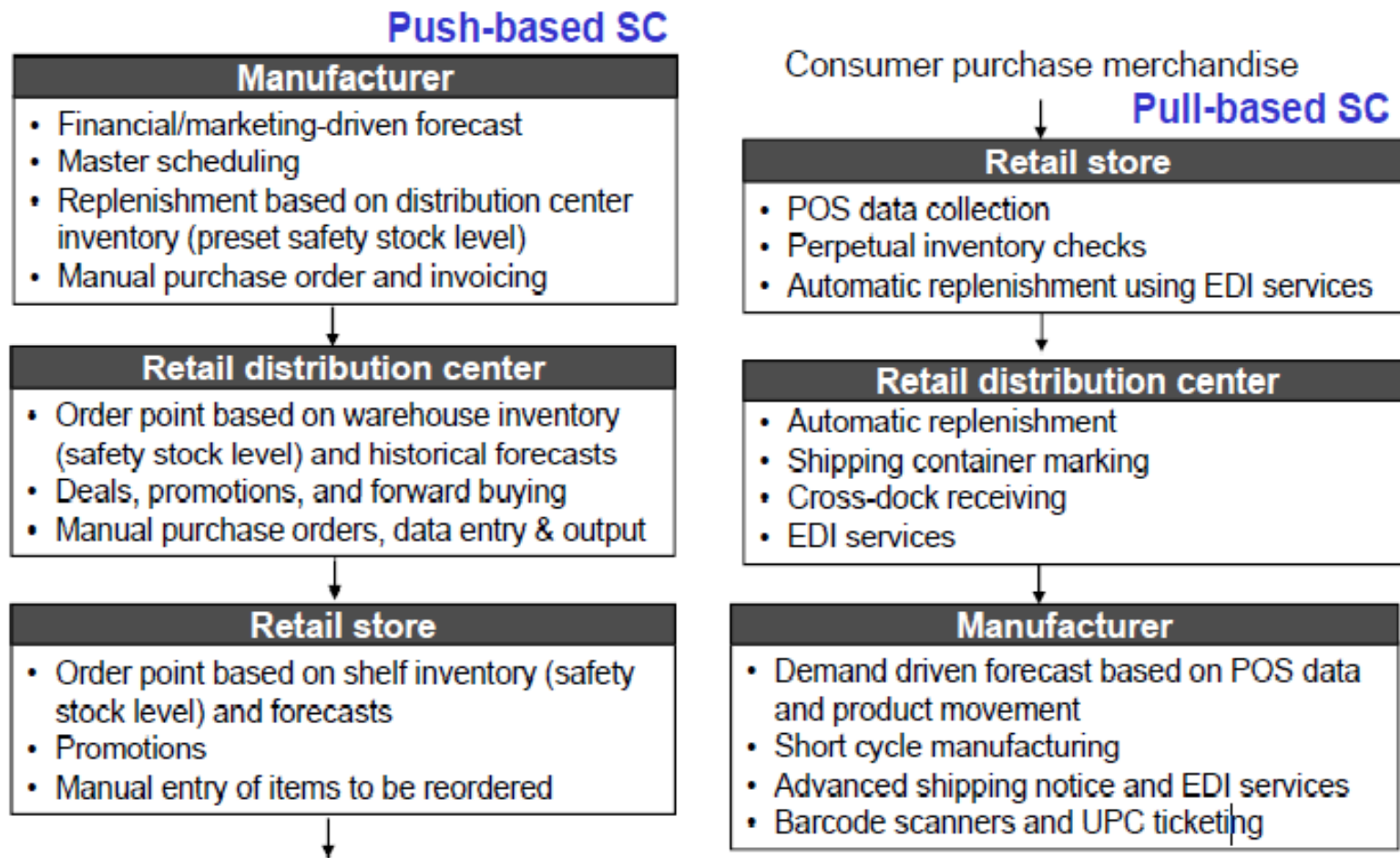
***PUSH
PROCESSES***

Execution is initiated in anticipation of customer orders (**speculative**)

Processes are divided based on the timing of their execution relative to a customer order

Push Vs. Pull based Supply Chain

Push-based vs. Pull-based Supply Chain



Additional References

- Glossary of terms <http://cscmp.org/digital/glossary/document.pdf>
- Supply Chain and Logistics Terms and Glossary
<http://www.logisticsservicelocator.com/resources/glossary03.pdf>
- The Gartner Supply Chain Top 25 for 2011
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Thank You

