

Supply Chain Management: an Introduction

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Value Chain vs Value System

- None of the companies are self sufficient and self contained.

The value system

Supplier
Value
Chain

Company
Value
Chains

Channel
Value
Chains

Buyer
Value
Chains

Single – Industry Firm

To gain competitive advantage a firm may choose to configure its activities and operations so that it can produce products or services that are viewed as being of comparable value to those of competitors, but to do so at less cost.

Consider the components of the value chain. Do any provide the potential to generate competitive advantage?

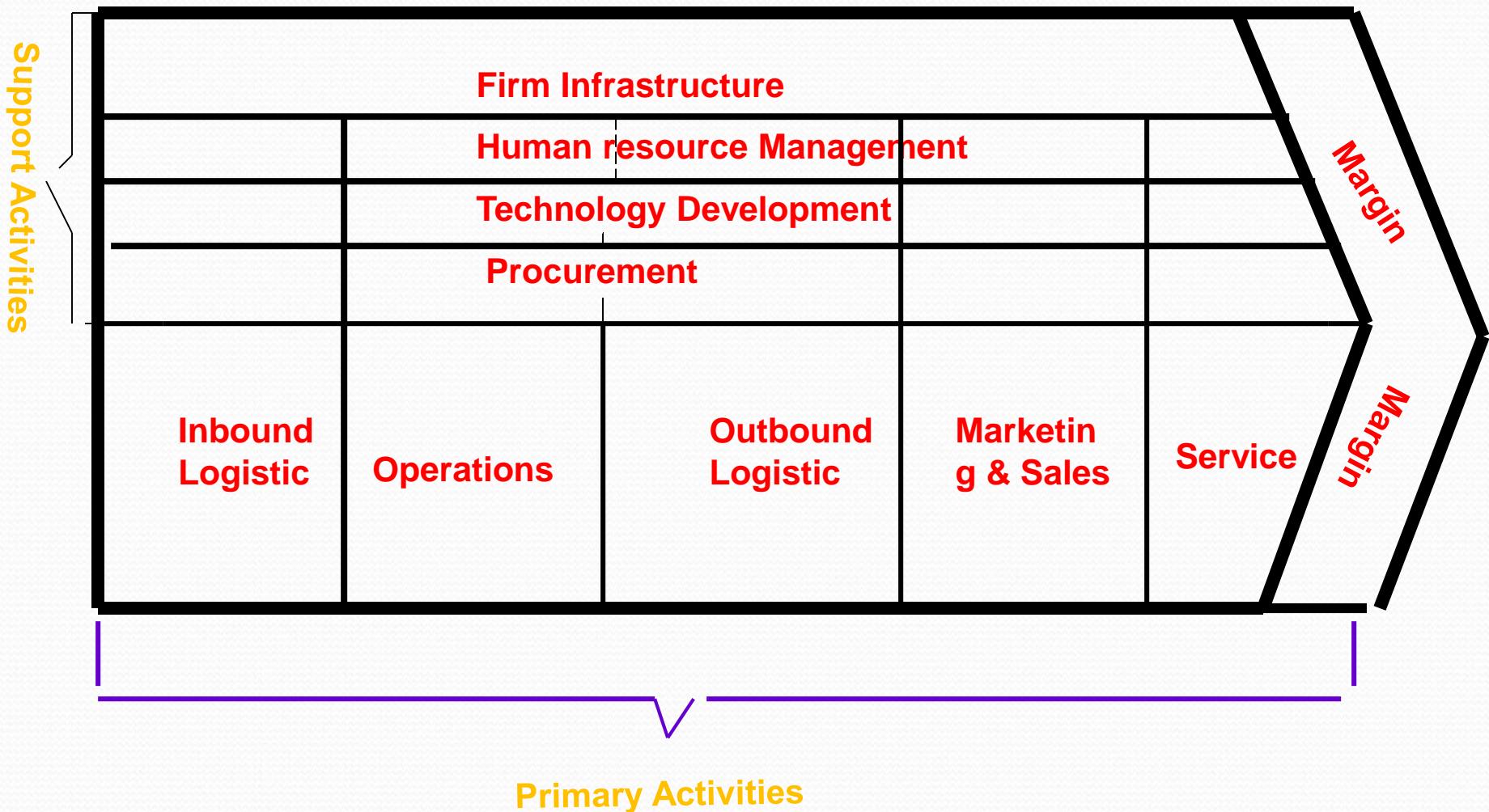
The Value Chain Model developed by *Michael Porter* can be used to identify significant value added components. A value chain is a systematic way of viewing the series of activities a firm performs to provide a product to its customers.

The value chain disaggregates a firm into its strategically relevant activities in order to understand the behaviour of the firm's cost and its existing or potential sources of differentiation.

A firm gains competitive advantage by performing these strategically important activities (Key external factors) more cheaply or better than competitors

Every firm can be viewed as a collection of value activities that are performed to design, produce, market, deliver, and support its product.

The Value Chain Model



These activities can be grouped into nine basic categories .

Within each category of activity, a firm typically performs a number of discrete activities that may represent key Ss and Ws for the firm.

Through the systematic identification of these discrete activities, managers using the value chain approach can target potential Ss & Ws for further evaluation.

The basic categories of activities can be grouped into two broad types

Primary Activities: Activities involved in the physical creation of the firm's product or services, its delivery and marketing to the buyer and its after sale support.

* **Inbound Logistics :** Activities associated with receiving, storing, and disseminating inputs to the product, such as material handling, warehousing, inventory control, vehicle scheduling and returns to suppliers.

* **Operations:** Activities associated with transforming inputs into the final product form such as machining, packaging, assembly, equipment maintenance, testing, printing and facility operations.

Outbound logistics : Activities associated with collecting, storing, and physically distributing the product to buyers such as finished goods warehousing, material handling, delivery vehicle operation, order processing, and scheduling.

Marketing and sales : Activities associated with providing a means by which buyers can purchase the product and inducing them to do so.

Services : Activities associated with providing service to enhance or maintain the values of the product such as installation, repair. Training, parts supply, and product adjustment.

Support Activities : Provide inputs or infrastructure allowing the primary activities to take place on an on going basis.

Procurement: Activities involved in obtaining purchased inputs, whether raw materials, purchased services, machinery, or so on .

Technology development : Activities involved in designing the product as well as in creating and improving the way the various activities in the value chain are performed.

Human resources Management: Activities necessary to ensure the recruiting, training and development of personnel. Every activity involves human resources.

Firm Infrastructure: Such activities as general Management, accounting, legal finance, strategic planning, and all others decoupled from specific primary or support activities but essential to the entire chain's operation

Not all of the value chain activities are important to competitive advantage in every industry.

A very important component of the value chain concept is the notion of linkages. The value chain of a firm is composed of a networked system of interdependent activities connected by linkages. Whenever an activity affects the cost or effectiveness of another activity, linkage between the two activities occurs.

Whenever linkage occurs, coordination between the activities is necessary and trade offs between the two activities will be needed to optimize the outcome.

An important key to competitive advantage lies in a firm's ability to perceive its activities as a system, rather than a collection of independent activities and its ability to manage its value chain as a system.

Logistics vs Supply Chain Management

- Does logistics different from SCM?
- Which concept is much more broader?
- Which concept is more modern?
- Which concept is salient?

Logistics vs SCM

Origin of Logistics

The concept of “**Logistics**” started many years before Christ and was used by **Greek generals** (Leon the Wise, Alexander the Great) in order to **describe all the procedures for the army’s procurement on food, clothing, ammunition, etc.**

Alexander the Great was a big fan of **the mobility of his troops** and he didn’t want his troops to stay in one place waiting for supplies from Macedonia. Thus, he tried to **resolve the issues of supplies by using supplies from the local resources of his defeated enemies.**

Logistics vs SCM

Origin of Logistics

For many years, logistics were always **an issue in war affairs**. Kingdoms and generals with strategic planning on logistics were those who won the war.

World War II was the major motivation of logistics to increase recognition and emphasis

Starting from the **early '60s**, many factors, such as **deregulation, competitive pressures, information technology, globalization, profit leverage**, etc., contributed to the increase of logistics science in the form we know it today.

Logistics vs SCM

Logistics management tries to have the “right product”, in the “right quantity”, at the “right place”, at the “right time”, with the “right cost”

One quite widely accepted view shows the relationship as shows:

Logistics = Supply + Materials management + Distribution

Logistics vs SCM

○ Logistics Management

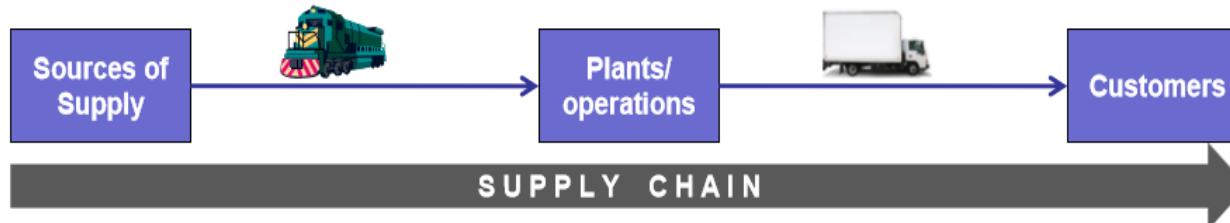
The Process of planning, implementing and controlling the efficient, cost-effective flow and storage of raw materials, in-process inventory, finished goods, and related information flow from point-of-origin to point-of-consumption for the purpose of conforming to customer requirements

Council of Logistics Management – the leading-edge professional organization

Logistics vs SCM

What is Supply Chain Management

The '*supply chain*' encompasses all activities associated with the flow and transformation of goods from the raw materials stage to the end user (along with the associated information flow).



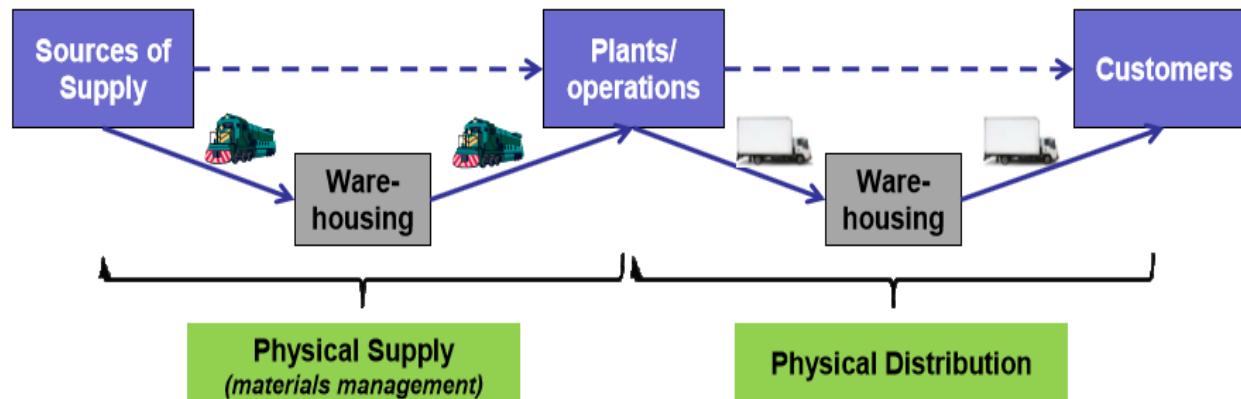
Supply Chain Management is the...

"integration of these activities, through improved supply chain relationships, to achieve a sustainable competitive advantage"

Robert B. Hanfield & ernest L. Nichols Jr., Introduction to Supply Chain Management

Logistics vs SCM

Supply & Distribution Logistics



- ❑ The '**physical supply channel**' refers to the time and space gap between a firm's immediate material sources and its processing points.
- ❑ The '**physical distribution channel**' refers to the time and space gap between a firm's processing points and its customers

Four (4) KEY PLAYERS

1. Suppliers - Vendors
2. Manufacturers
3. Wholesalers (& Retailers)
4. Customers

Logistics and SCM

- **SCM** is

the integration of business processes from end user through original suppliers, that provide products, services, and information that add value for customers

- An integrated group of processes to “source,” “make,” and “deliver” products

Logistics and SCM

Supply Chain Management

The activities involved in Supply chain are

- i. Purchasing
- ii. Manufacturing
- iii. Logistics
- iv. Marketing
- v. Order processing
- vi. Servicing and warranty,
- vii. Wholesaling and
- viii. Retailing

Main aspects of SCM and Global Logistics

SCM

1. Supply chain as a **cross-functional entity**
2. Supply chain as the **integrator and coordinator of production and logistics activities**

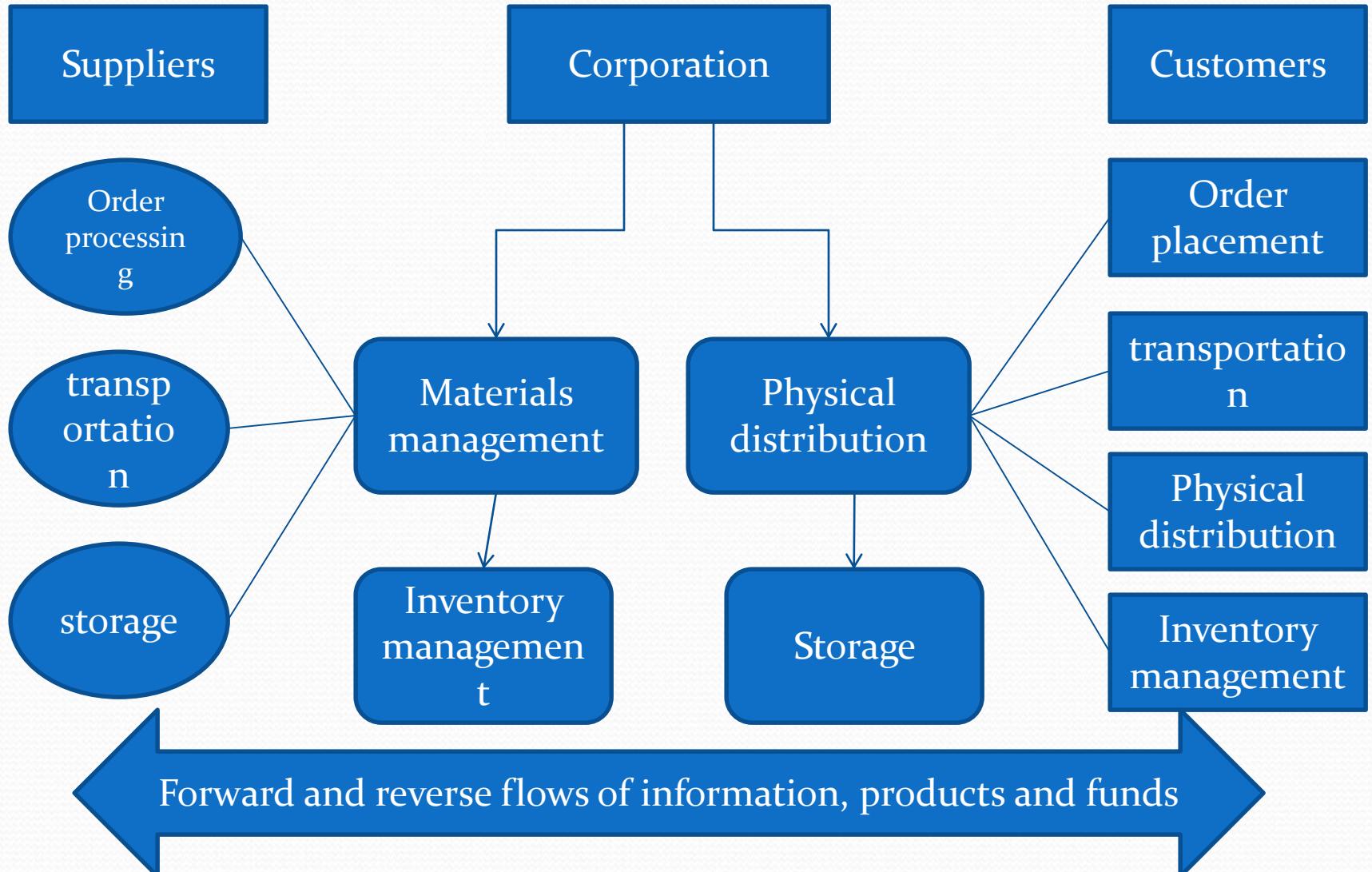
Global Logistics

- i. Global **sourcing** and
- ii. Global **distribution**

Areas to be considered while moving from domestic to International supply chain

1. Substantial **geographical distances**
2. **Forecasting problems**/difficulties in foreign markets
3. Fluctuations in **exchange rates** for different currencies
4. Demand for **great variety of products**
5. **Inadequate infrastructures** such as
 - labor skills,
 - *Availability of supply*
 - *Supplier quality*
 - *Lack of local process equipments and technologies*
 - *Inadequate transportation facilities and*
 - *Inadequate telecommunication facilities*

Global Supply Chain



Globalization has changed the way firms do business...

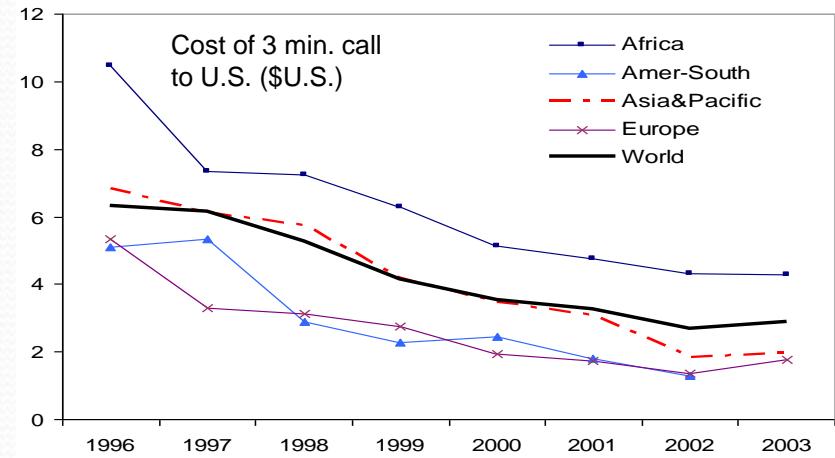
- Since the end of WWII, **the importance of trade and international investment** has grown steadily.
- **Large multinational firms** have become the main players in all major sectors.
- Through **FDI and international mergers and acquisitions**, they were able to jump tariff barriers and tap into natural resources, labour, and technology, around the world.
- Production chains were **traditionally vertically integrated**, i.e. multinational firms owned an entire production process.

But recent phenomena are fundamentally changing the way global firms operate.

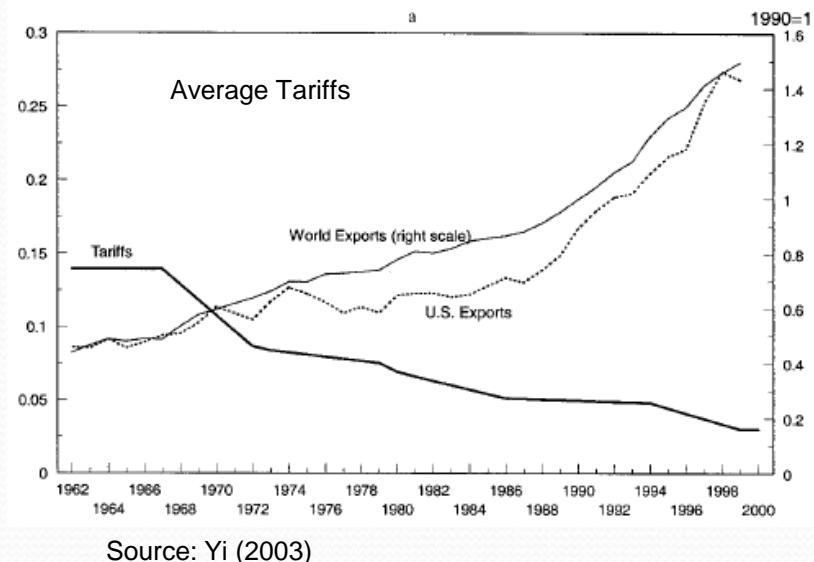
... driven by key factors

- **Rapid technical progress**
 - Low and falling telecommunication costs
 - Technological advances
 - Falling transportation costs
- The adoption by a large number of countries of **more open economic policies**
 - (e.g. lower tariffs, lower FDI restrictions)
- The emergence of **developing, low wages economies**

Goods and services can be delivered globally at lower cost.



Source: IFS V5.28, WDI CD 05.



Source: Yi (2003)

GSCs are becoming increasingly important – a vedio

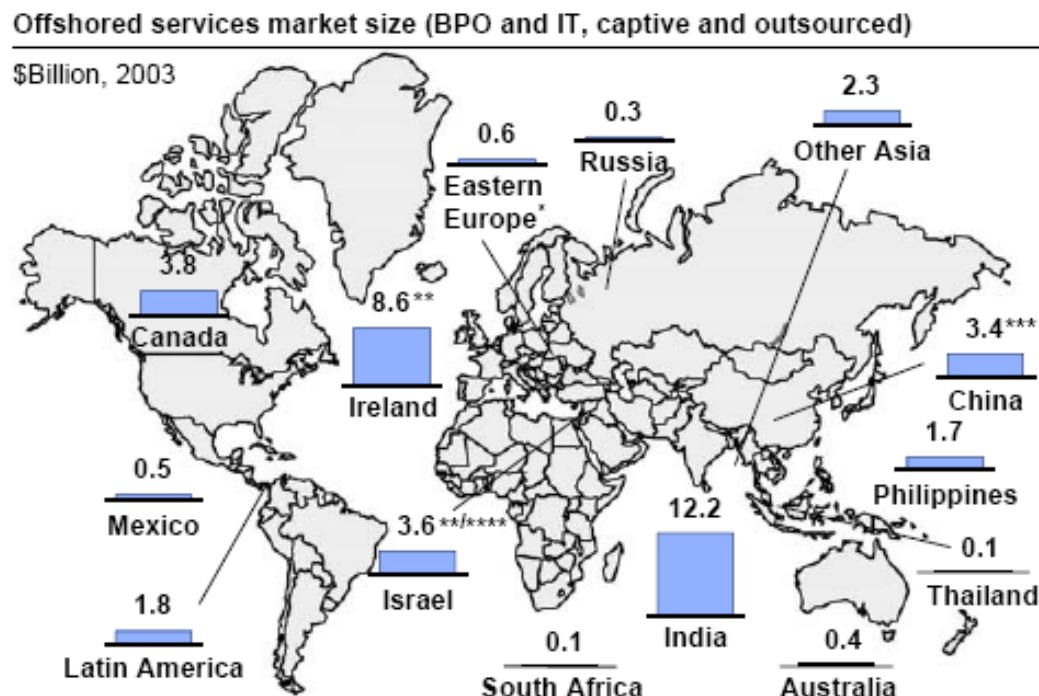
- GSCs have existed as long as trade in intermediate products has taken place, but they are now increasingly important.
- World exports and FDI outward stock has been growing faster than global GDP
- Foreign affiliates (FA) no longer only engage in serving local markets in host countries but often export more than host country domestic firms

... giving rise to GSCs as a more established way of doing business.

- In recent years, we have seen **a change in how firms organize their production into global supply chains:**
 - Firms are increasingly outsourcing some of their activities to third-parties.
- They are locating **parts of their supply chain outside their home country** (offshoring)
- They are increasingly partnering with other firms through **strategic alliances and joint ventures.**
- **Smaller firms and suppliers** are now becoming global
- These new business strategies have allowed firms to **specialize on “core” competencies** (vertical specialization) to sustain their competitive advantage.

Offshoring is gaining importance...

- Companies now offshore more activities, both in terms of size and scope
- Business process outsourcing (BPO) and information technology (IT) services are supplied from a large number of locations
- Some firms also offshore other high-knowledge activities such as R&D.



* Includes Poland, Romania, Hungary, Ukraine, and Czech Republic.

** Primarily composed of MNC captives.

*** Estimate, based on total Chinese BPO and IT services revenue (7.8) minus domestic demand for IT services (4.4).

**** Estimate, based on 2001 market size of 3.0 and assumed growth rate of 20% p.a.

Source: Software Associations; U.S. country commercial reports; press articles; Gartner; IDC; Country government Web sites; Ministry of Information Technology for various countries; Enterprise Ireland; NASSCOM; McKinsey Global Institute analysis

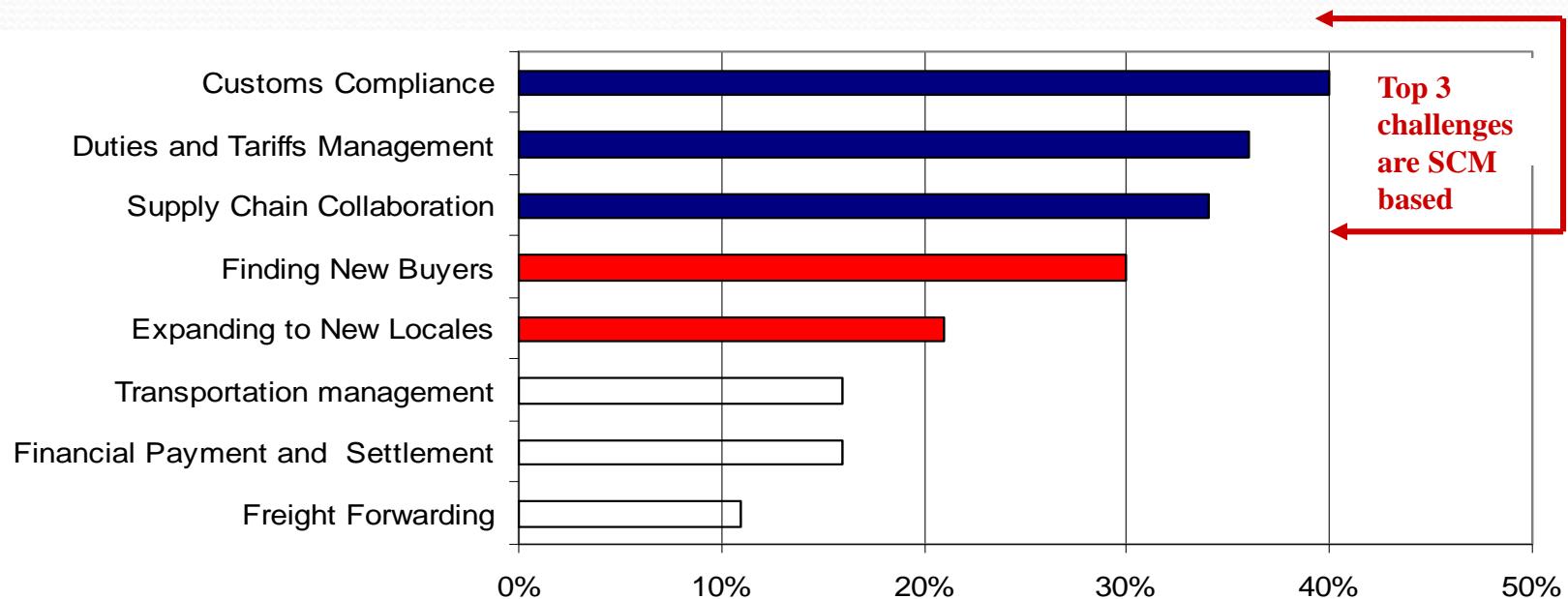
The objectives of Global Supply Chains

Two main objectives could be identified:

- **Prompt and reliable delivery of high-quality products and services at the least cost.**
- **To effectively meet rising customer expectations.**

Top 3 challenges for North American Exporters

Greatest Facing
North American Exporters



Video - Wal-Mart

Recent changes affecting Global Supply Chains

- Internet and technological change
- Proliferation of trade agreements
- Falling Trade Barriers
- Increase in international trade groups (Free Trade Zone, Common mkt, custom union, monitory union, global economy)
- New Markets

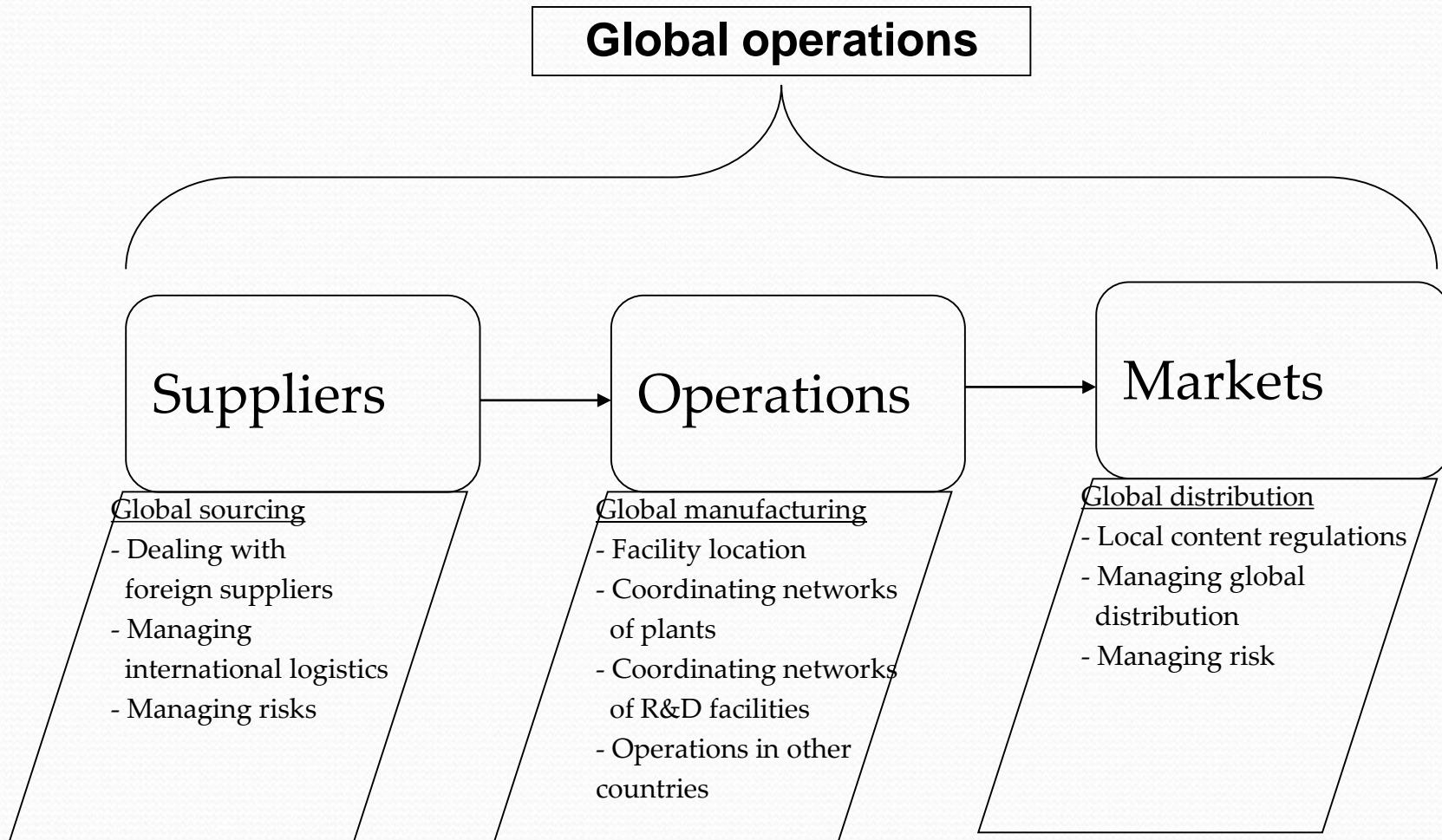
Globalization is a driver for GSCs

Today's Globalized Toy

Topper the Trick Terrier is a robotic dog that can talk and stand on its head. But the real trick is where its parts come from. This year 75,000 copies of the dog were made by Qualiman Industrial Co. in Nanhui, China for a Li & Fung American customer, the Original San Francisco Toymakers. It sells for \$29.99 in the U.S.

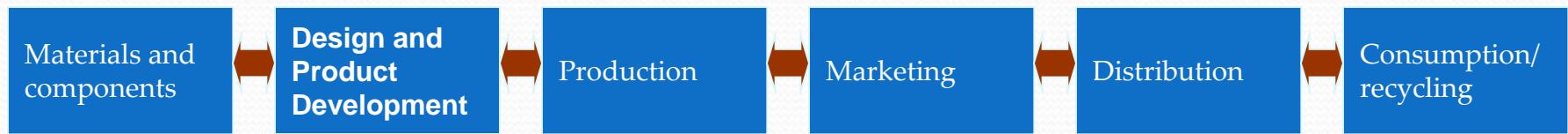


So, GSC means making operations globally



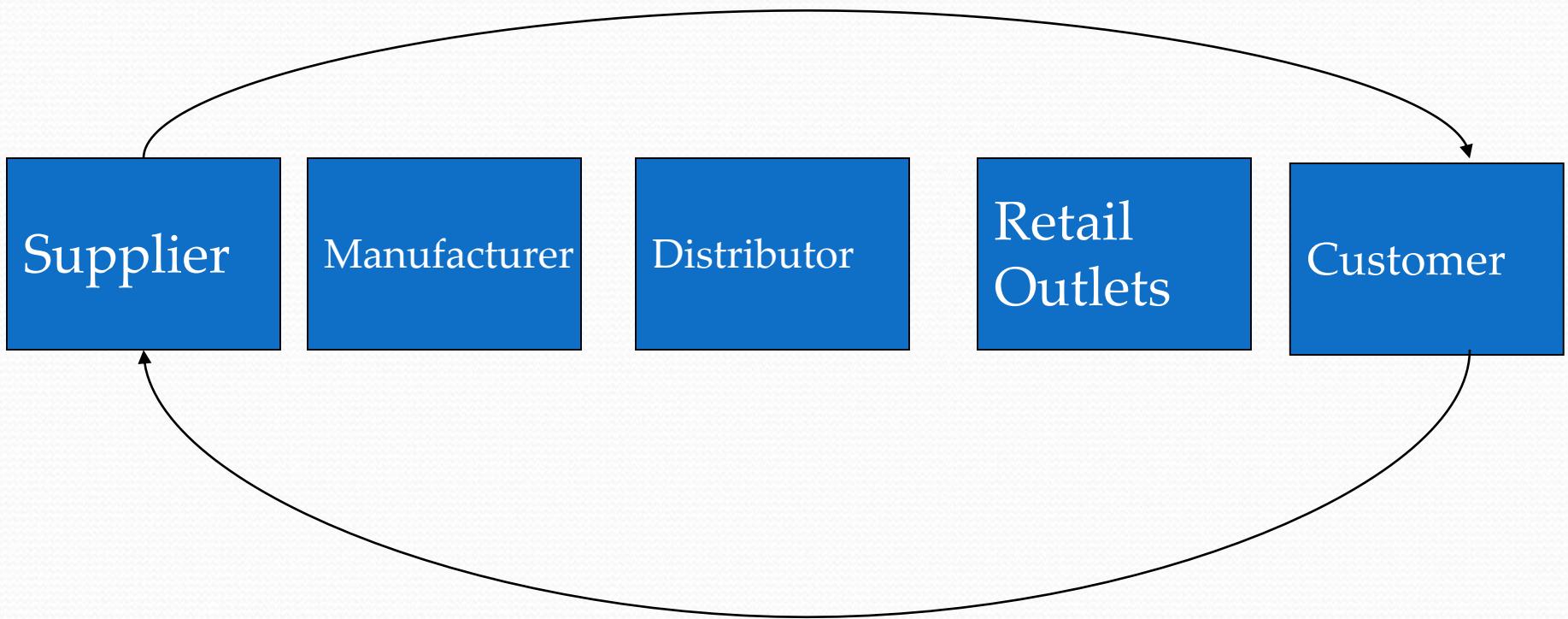
A GSC as its simplest expression

Simple Supply Chain



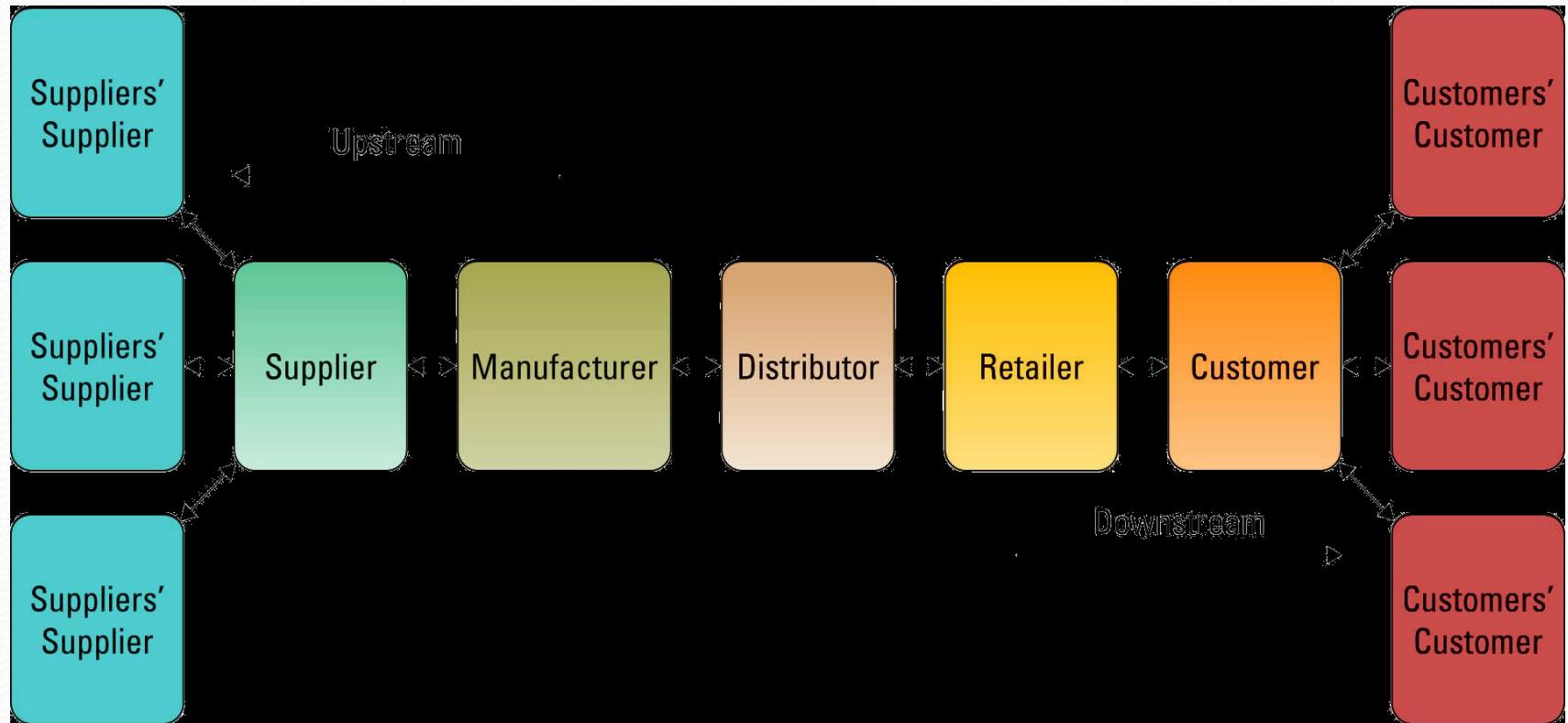
Major entities in a GSC

Capacity, inventory levels, delivery schedule, payment terms

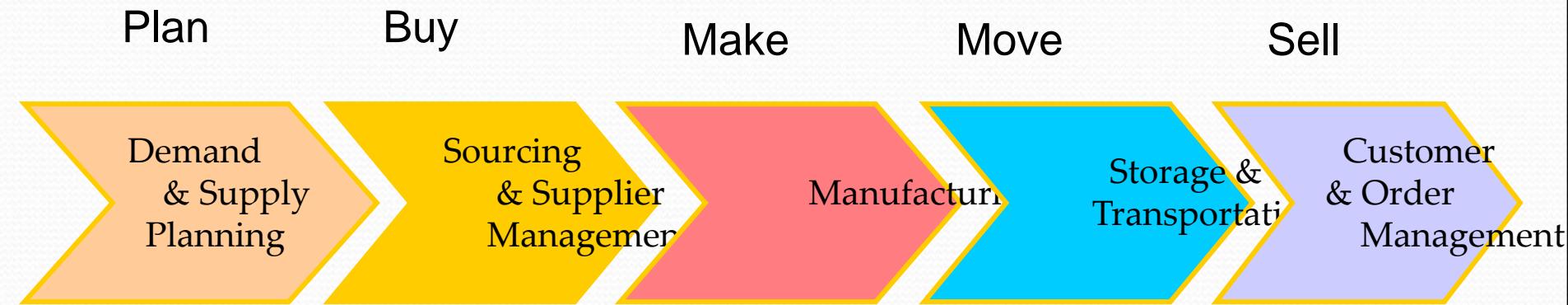


Orders, return requests, repair and service requests, payments

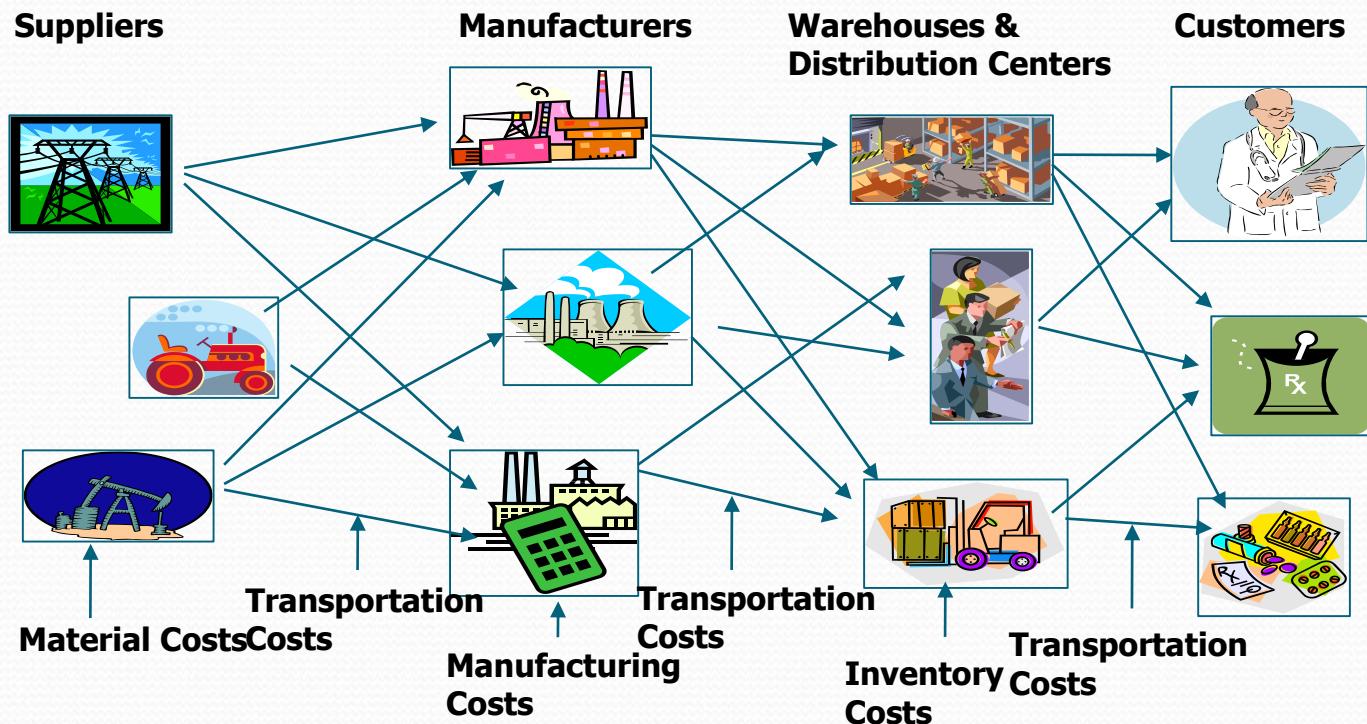
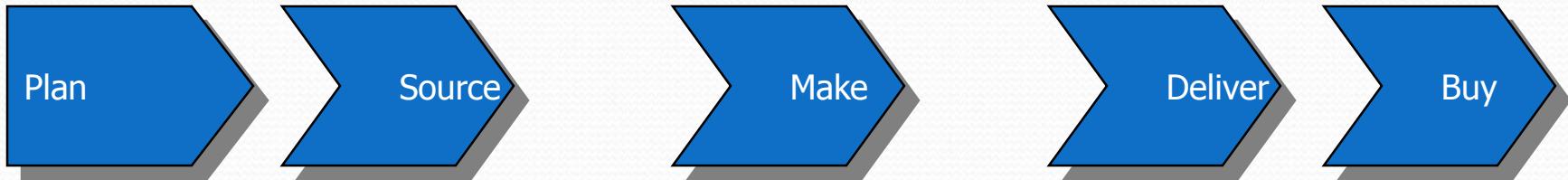
Supply chain fundamental

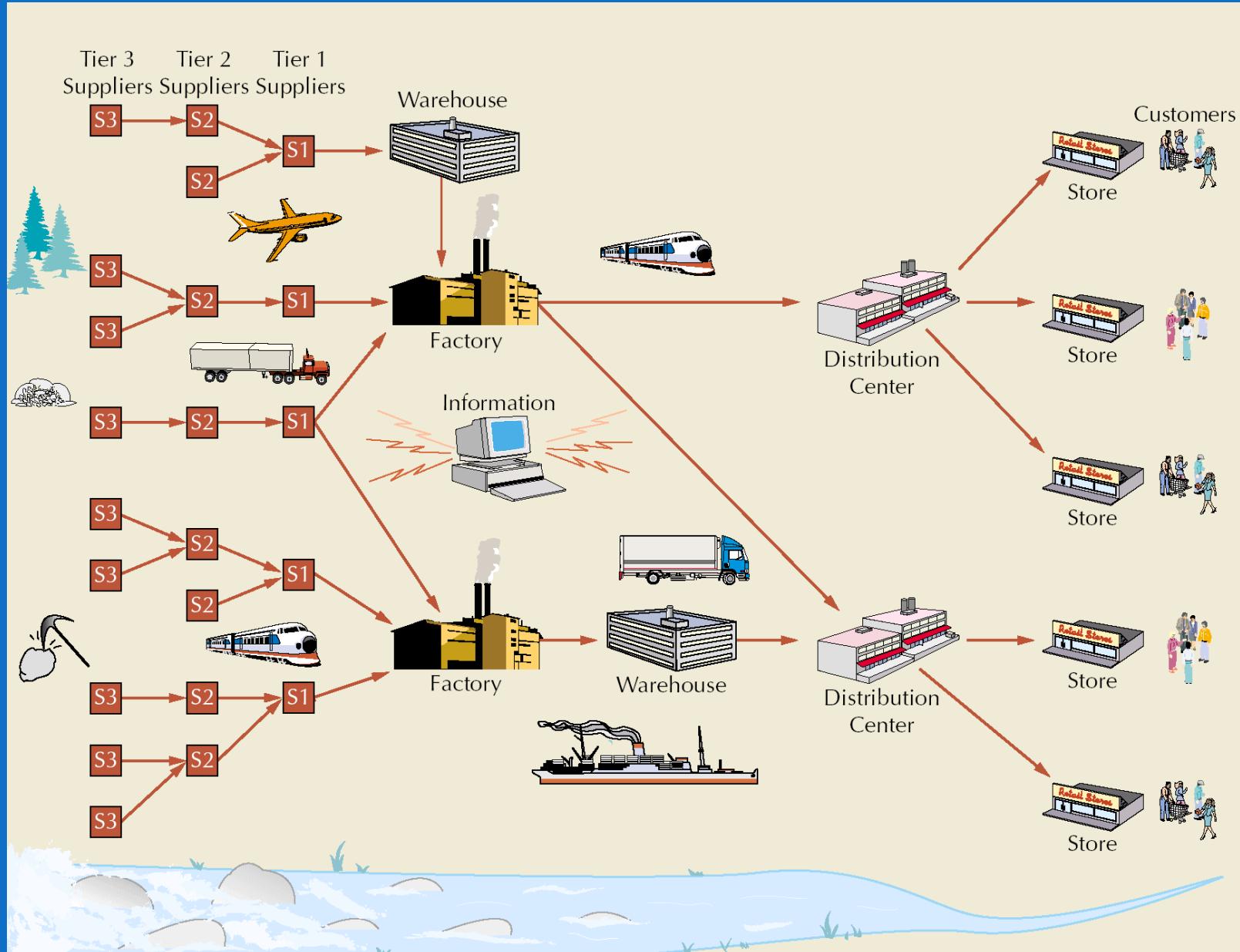


A PBMMS model...



... would look like this.



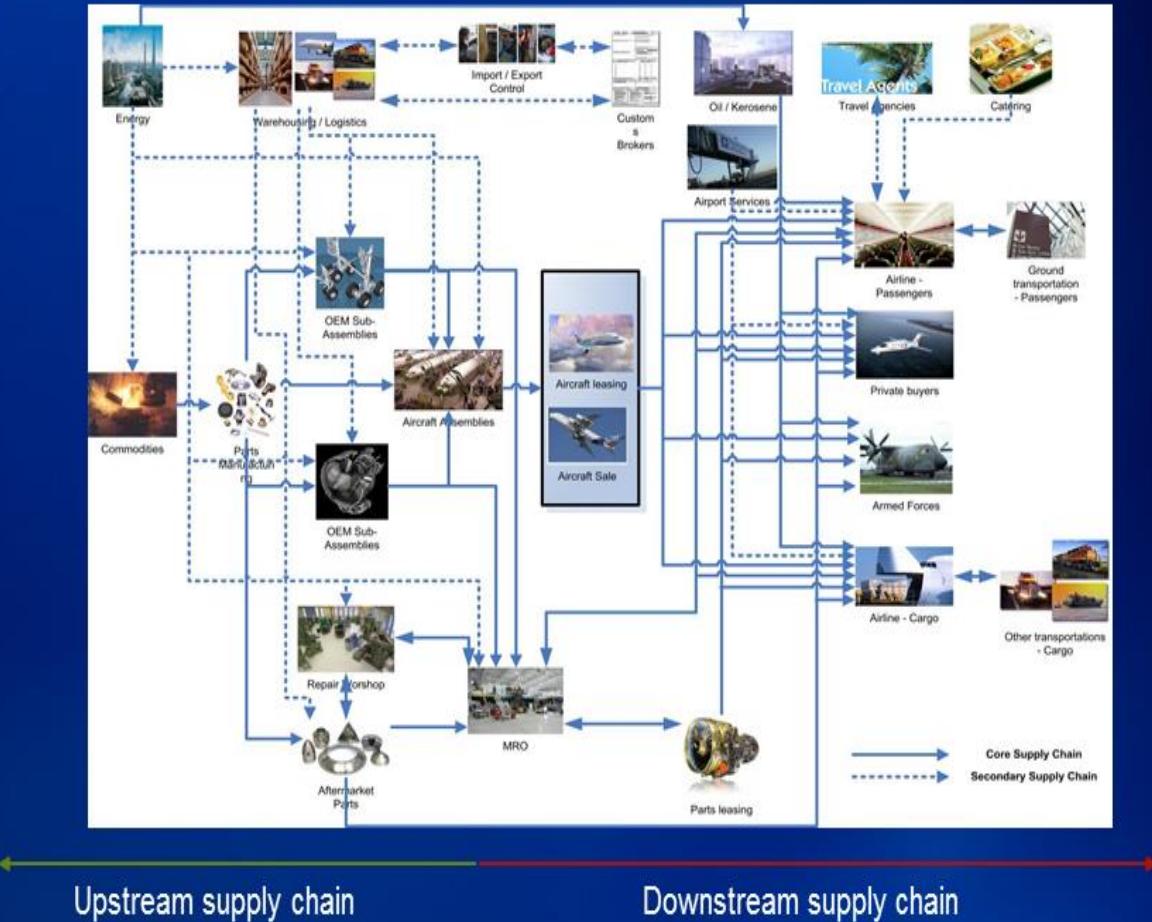


Application of a GSC

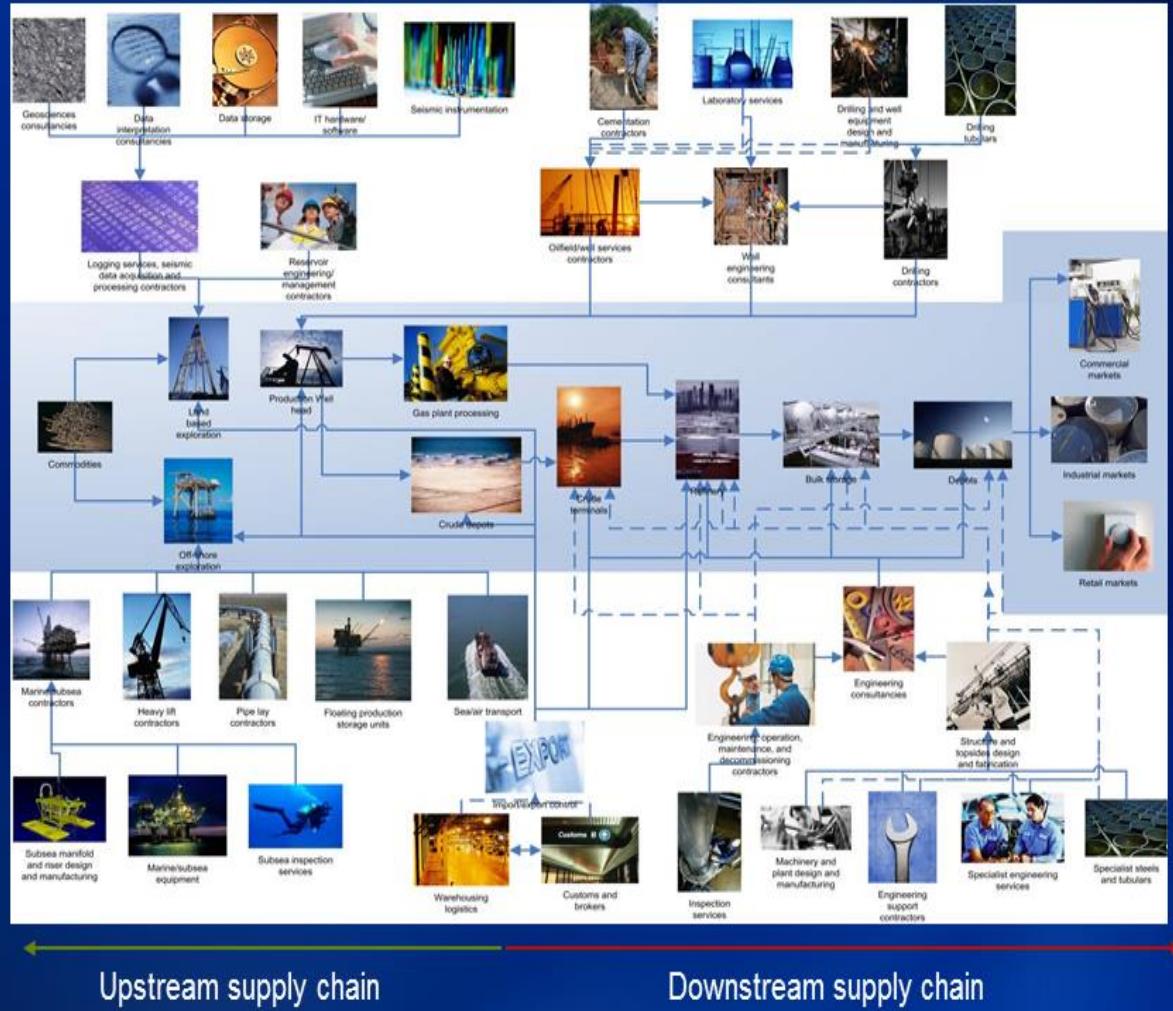


Source: Chuck Poirier (CSC Consulting), Frank Quinn (Supply Chain Management Review), "Survey of Supply Chain Progress—Best Practices and More," U-Connect 2007.

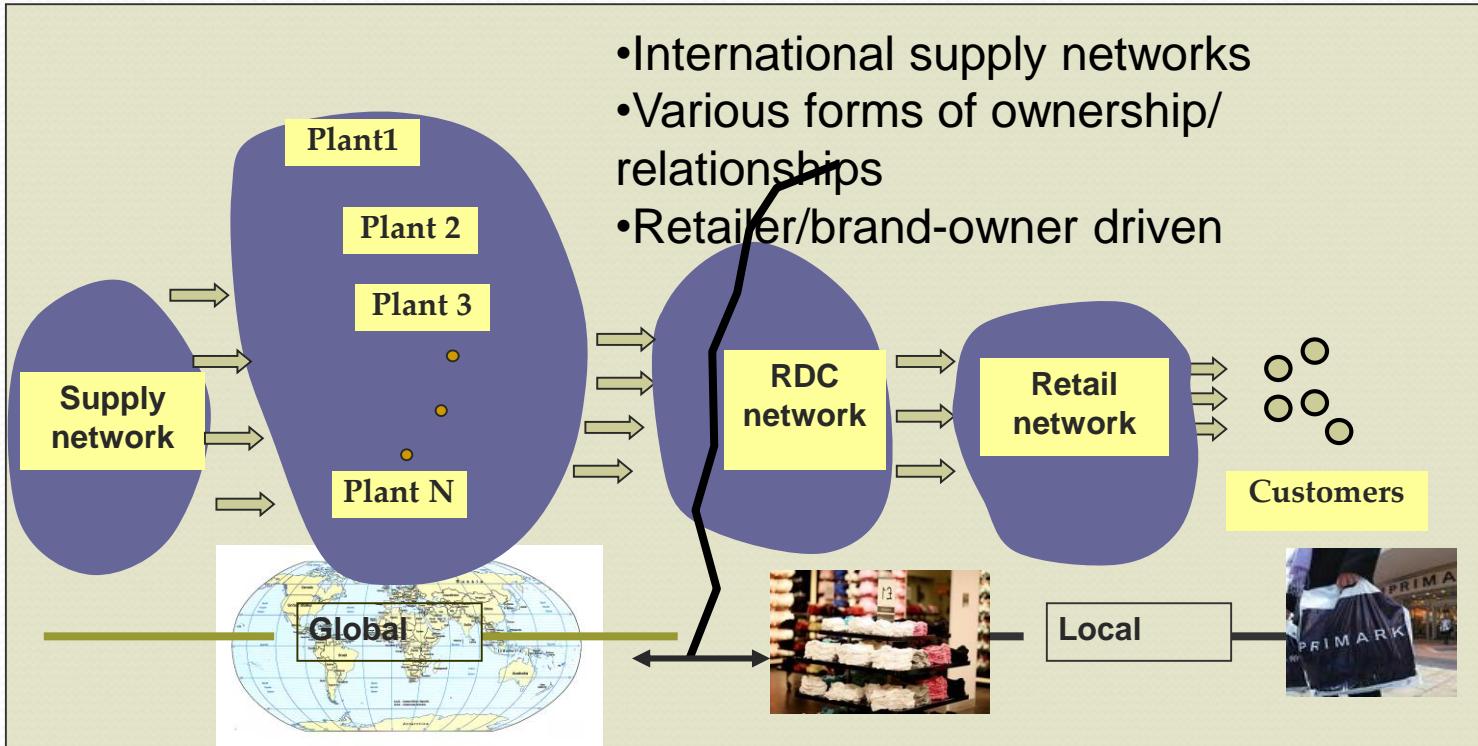
A more detailed GSCs: Aerospace supply chain



A more detailed GSCs (Oil & gas supply chain)



Types of GSC



Activity

- *Say we get an order from a European retailer to produce 10,000 garments. For this customer we might decide to buy yarn from a Korean producer but have it woven and dyed in Taiwan. So we pick the yarn and ship it to Taiwan. The Japanese have the best zippers ... so we go to YKK, a big Japanese zipper manufacturer, and we order the right zippers from their Chinese plants. ...the best place to make the garments is Thailand. So we ship everything there. ...the customer needs quick delivery, we may divide the order across five factories in Thailand. Effectively, we are customizing the value chain to best meet the customer's needs. (Interview of Victor Fung of Li & Fung in HBR, Sept-Oct 1998.)*

Supply Chain Management

- *Supply chain management* deals with linking the organizations within the supply chain in order to meet demand across the chain as efficiently as possible. In our example, *Li & Fung* is creating and managing the links. In non-brokered supply chains, one or more of the chain's organizations can provide the management function.
- Why is supply chain management so important?
 - To gain efficiencies from procurement, distribution and logistics
 - To make outsourcing more efficient
 - To reduce transportation costs of inventories
 - To meet competitive pressures from shorter development times, more new products, and demand for more customization

Supply Chain Management

- To meet the challenge of globalization and longer supply chains
- To meet the new challenges from e-commerce
- To manage the complexities of supply chains
- To manage the inventories needed across the supply chain
- Why is supply chain management difficult?
 - Different organizations in the supply chain may have different, conflicting objectives
 - Manufacturers: long run production, high quality, high productivity, low production cost
 - Distributors: low inventory, reduced transportation costs, quick replenishment capability
 - Customers: shorter order lead time, high in-stock inventory, large variety of products, low prices
 - Supply chains are dynamic - they evolve and change over time

Supply Chain Management

- Supply chains and vertical integration
 - For any organization vertical integration involves either taking on more of the supplier activities (backward) and/or taking on more of the distribution activities (forward)
 - An example of backward vertical integration would be a peanut butter manufacturer that decides to start growing peanuts rather than buying peanuts from a supplier
 - An example of forward vertical integration would be a peanut butter manufacturer that decides to start marketing their peanut butter directly to grocery stores
 - In supply chains, some of the supplying and some of the distribution might be performed by the manufacturer

Supply Chain Management

- The significance of vertical integration in the supply chain is that the activities that are performed by the manufacturer are typically more easily managed than those which are performed by other organizations
- Therefore, the degree of vertical integration can have an impact on the structure and relationships between members of a supply chain

Supply Chain Management

- Strategic, tactical and operating issues
 - Strategic - long term and dealing with supply chain design
 - Determining the number, location and capacity of facilities
 - Make or buy decisions
 - Forming strategic alliances
 - Tactical - intermediate term
 - Determining inventory levels
 - Quality-related decisions
 - Logistics decisions
 - Operating - near term
 - Production planning and control decisions
 - Goods and service delivery scheduling
 - Some make or buy decisions

Supply Chain Management

- Key issues in supply chain management include
 - Distribution network configuration
 - How many warehouses do we need?
 - Where should these warehouses be located?
 - What should the production levels be at each of our plants?
 - What should the transportation flows be between plants and warehouses?
 - Inventory control
 - Why are we holding inventory? Uncertainty in customer demand? Uncertainty in the supply process? Some other reason?
 - If the problem is uncertainty, how can we reduce it?
 - How good is our forecasting method?

Supply Chain Management

- Distribution strategies
 - Direct shipping to customers?
 - Classical distribution in which inventory is held in warehouses and then shipped as needed?
 - Cross-docking in which transshipment points are used to take stock from suppliers' deliveries and immediately distribute to point of usage?
- Supply chain integration and strategic partnering
 - Should information be shared with supply chain partners?
 - What information should be shared?
 - With what partners should information be shared?
 - What are the benefits to be gained?

Supply Chain Management

- Product design
 - Should products be redesigned to reduce logistics costs?
 - Should products be redesigned to reduce lead times?
 - Would delayed differentiation be helpful?
- Information technology and decision-support systems
 - What data should be shared (transferred)
 - How should the data be analyzed and used?
 - What infrastructure is needed between supply chain members?
 - Should e-commerce play a role?
- Customer value
 - How is customer value created by the supply chain?
 - What determines customer value? How do we measure it?
 - How is information technology used to enhance customer value in the supply chain?

Supply Chain Management

- How can you assess how well your supply chain is performing?
 - The SCOR model - Supply Chain Operations Reference Model - developed by the Supply Chain Council (<http://www.supply-chain.org/>) can be used to assess performance
 - SCOR model metrics include:
 - On-time delivery performance
 - Lead time for order fulfillment
 - Fill rate - proportion of demand met from on-hand inventory
 - Supply chain management cost
 - Warranty cost as a percentage of revenue
 - Total inventory days of supply
 - Net asset turns

Supply Chain Management

- Creating an effective supply chain
 - Develop strategic objectives and tactics
 - Integrate and coordinate activities in the internal portion of the supply chain
 - Coordinate activities with suppliers and customers
 - Coordinate planning and execution across the supply chain
 - Consider forming strategic partnerships

SCM - Inventory Management Issues

- Manufacturers would like to produce in large lot sizes because it is more cost effective to do so. The problem, however, is that producing in large lots does not allow for flexibility in terms of product mix.
- Retailers find benefits in ordering large lots such as quantity discounts and more than enough safety stock.
- The downside is that ordering/producing large lots can result in large inventories of products that are currently not in demand while being out of stock for items that are in demand.