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# **Supply Chain Management and Enterprise Resource Planning**



# Chapter Objectives

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- Understand the concept of the supply chain, its importance, and management.
- Describe the problems of managing the supply chain and some innovative solutions.
- Trace the evolution of software that supports activities along the supply chain and describe the need for software integration
- Describe ERP and understand the relationships between ERP and SCM software.
- Describe order fulfillment problems and solutions in e-commerce and how EC solves other supply chain problems.
- Describe the process and activities of partner relationship management.
- Understand the process and issues of global supply chain management.

# Supply and Value Chains

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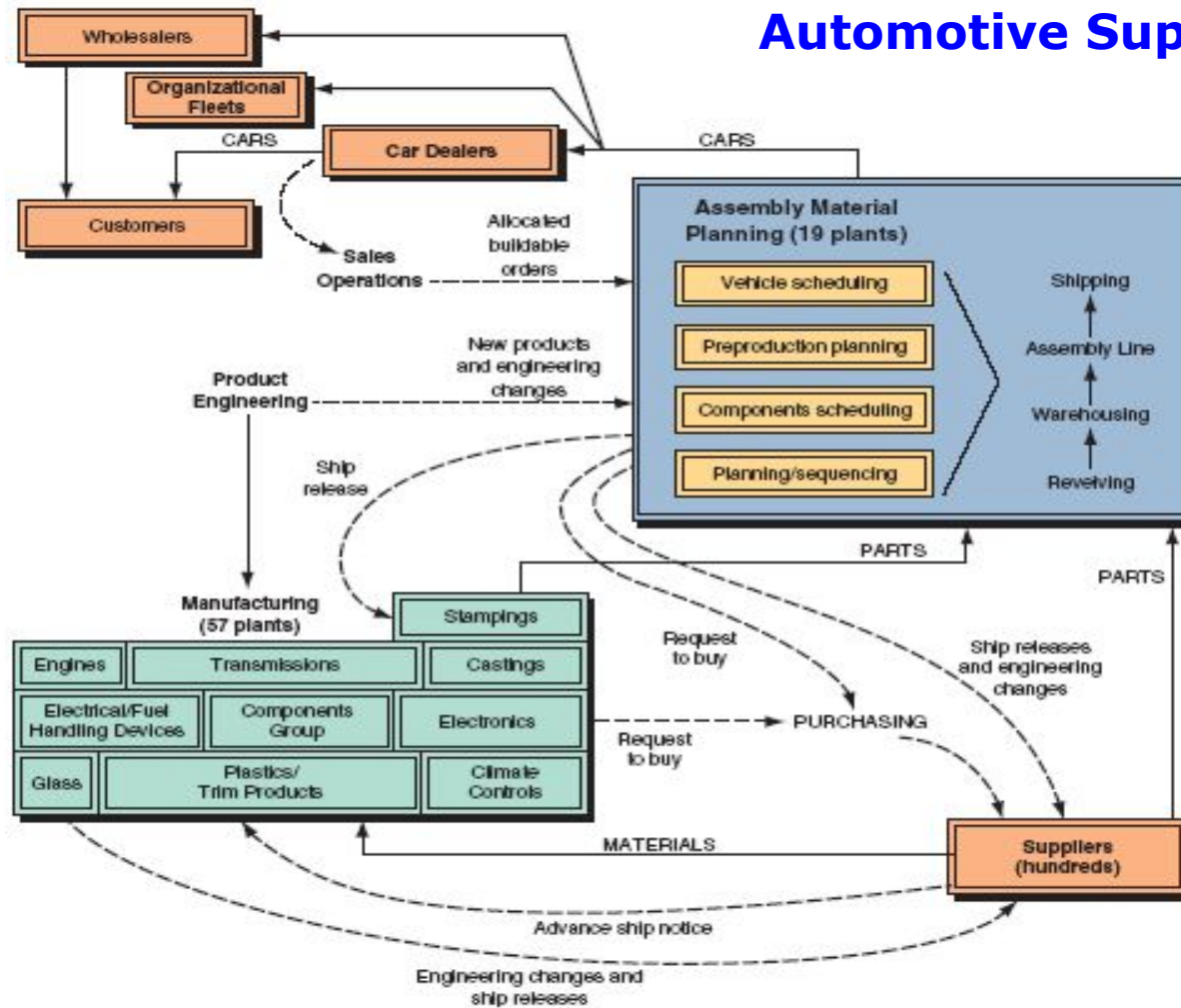
**Supply chain** refers to the flow of materials, information, payments, and services from raw material suppliers, through factories and warehouses (*Value Chain*), to the final consumer (*Demand Chain*). It includes tasks such as purchasing, payment flow, materials handling, production planning & control, logistics & warehousing, inventory control, and distribution. When it is managed electronically it is referred to as an **e-supply chain**.

- Supply Chain Flows
  - **Materials flows are all** physical products, new materials, and supplies that flow along the chain.
  - **Information flows relates to all** data associated with demand, shipments, orders, returns and schedules.
  - **Financial flows** include all transfers of money, payments, credit card information, payment schedules, e-payments and credit-related data.

**Supply Chains** contribute to increased profitability and competitiveness

# Supply and Value Chains

## Automotive Supply Chain



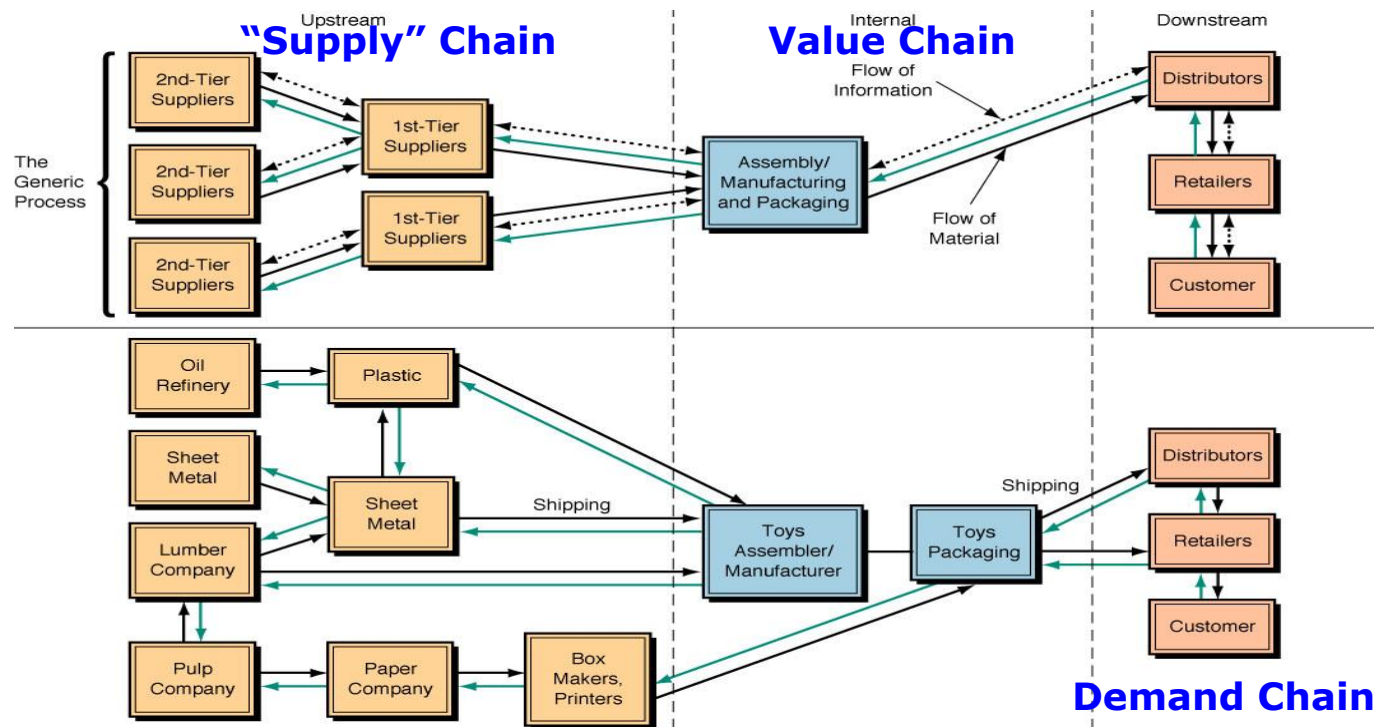
# Supply Chains Components

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- The supply chain involves three segments:
  - **Upstream**, where sourcing or procurement from external suppliers occur
  - **Internal**, where packaging, assembly, or manufacturing take place
  - **Downstream**, where distribution or dispersal take place, frequently by external distributors.
- It also includes the movement of information and money and the procedures that support the movement of a product or a service.
- Organizations and individuals are also part of the chain.

# Supply Chains Classifications

- There are several major types of supply chain
  - Integrated make-to-stock
  - Continuous replenishment
  - Build-to-order
  - Channel assembly.





# Supply Chain Problems

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Adding value along the chain is essential for competitiveness, however problems exist especially in complex or long chains and in cases where many business partners are involved. These problems are due to uncertainties and the need to coordinate several activities, internal units, and business partners.

- Demand forecasts are a major source of uncertainties
  - Competition
  - Prices
  - Weather conditions
  - Technological development
  - Customer confidence
- Uncertainties exist in delivery times
  - Machine failures
  - Road conditions
  - Shipments
- Quality problems may also create production delays

# Supply Chain Problems continued

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The **bullwhip effect** refers to erratic shifts in orders up and down the supply chain because of poor demand forecasting, price fluctuation, order batching, and rationing within the chain. Even slight demand uncertainties and variability become magnified if each distinct entity, on the chain, makes ordering and inventory decisions with respect to its own interest above those of the chain. Distorted information can lead to tremendous inefficiencies, excessive inventories, poor customer service, lost revenues, ineffective shipments, and missed production schedules.

A common way to solve the bullwhip problem is by sharing information along the supply chain through EDI, extranets, and groupware technologies. For example employing a **vendor-managed inventory (VMI) strategy**, the vendor monitors inventory levels and when it falls below the threshold for each product this automatically triggers an immediate shipment.



# Supply Chain Solutions

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Information sharing among supply chain partners (*c-commerce*) sometimes referred to as the collaboration supply chain is one method to overcome problems in the flow. Others are:

- Optimal Inventory Levels
- Supply Chain Coordination and Collaboration
- Supply Chain Teams
- Performance Measurement and Metrics
- Various IT-Assisted Solutions
  - wireless technology
  - optimal shipping plans
  - strategic partnerships with suppliers
  - just-in-time

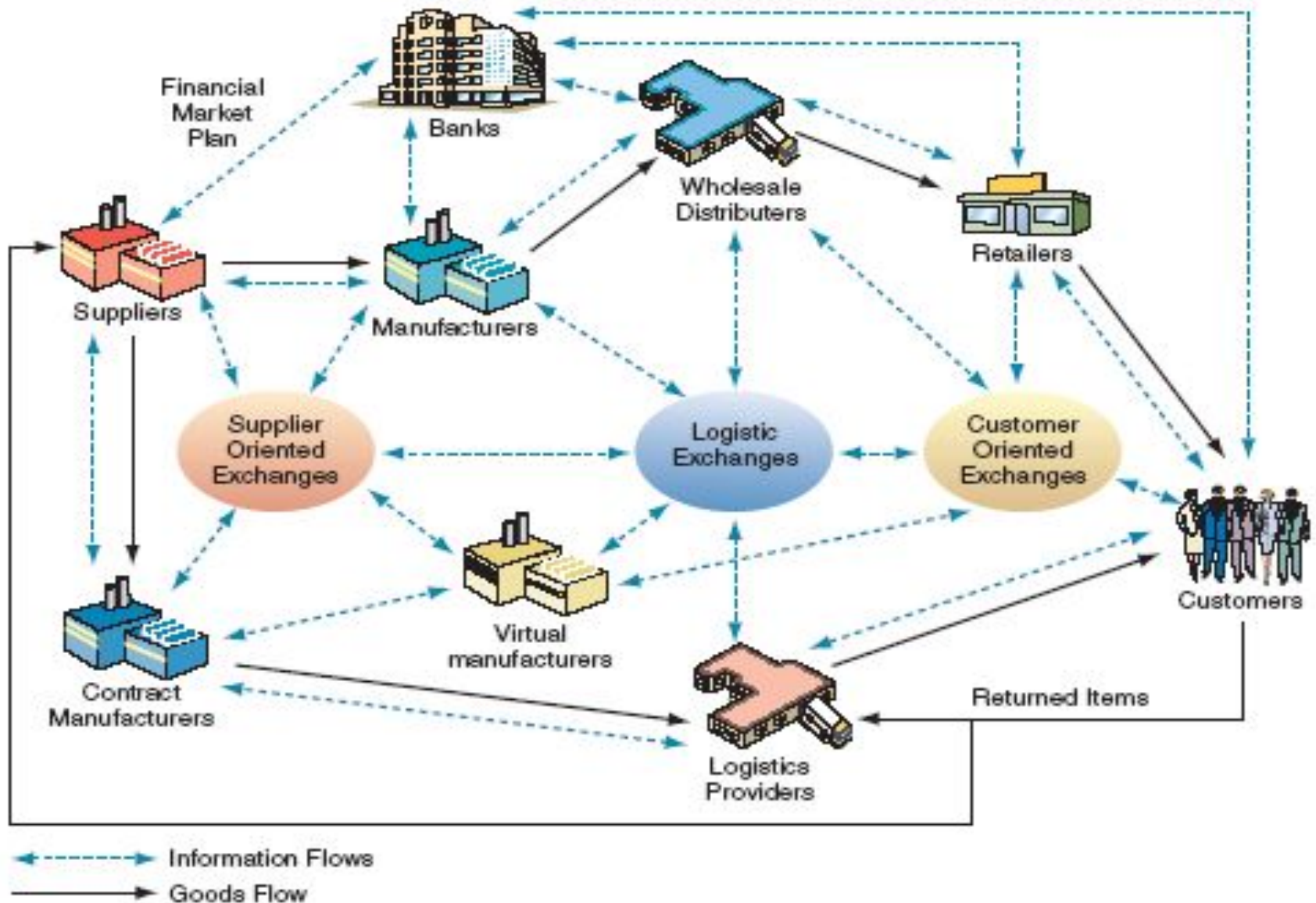
# Computerized Supply Chains

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The supply chain process is intertwined with the computerization of its activities. People have wanted to automate the processes along the chain to reduce cost, expedite processing, and reduce errors.

- **Material requirements planning (MRP)** essentially integrates production, purchasing, and inventory management of interrelated products.
- **Manufacturing resource planning (MRP II)**, enhanced MRP methodology by adding labor requirements and financial planning.
- **Enterprise resource planning (ERP)** further integrates the transaction processing as well as other routine activities in the entire enterprise.
- Integrations continues along several paths
  - functional areas
  - Combining transaction processing and decision support
  - Business intelligence
  - CRM software

# Computerized Supply Chains



# Supply Chains Benefits

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There are many benefits to integrating functional systems.

- *Tangible benefits:*
  - Inventory reduction
  - Personnel reduction
  - Productivity improvement
  - Order management improvement
  - Financial-close cycle improvements
  - IT cost reduction
  - Procurement cost reduction
  - Cash management improvements
  - Revenue/profit increases
  - Transportation logistics cost reduction
  - Maintenance reduction
  - On-time delivery improvement.

# Supply Chains Benefits Continued

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- *Intangible benefits:*
  - Information visibility
  - New/improved processes
  - Customer responsiveness
  - Standardization
  - Flexibility
  - Globalization
  - Business performance
  - Reduction in duplication of entries
  - controls and reconciliation are enhanced
  - rapid assimilation of data into the organization

**Systems** can be integrated internally and externally. **Internal integration** refers to integration between applications inside a company, whereas **external integration** refers to integration of applications among business partners.



## Enterprise Resource Planning

# ERP and Supply Chains

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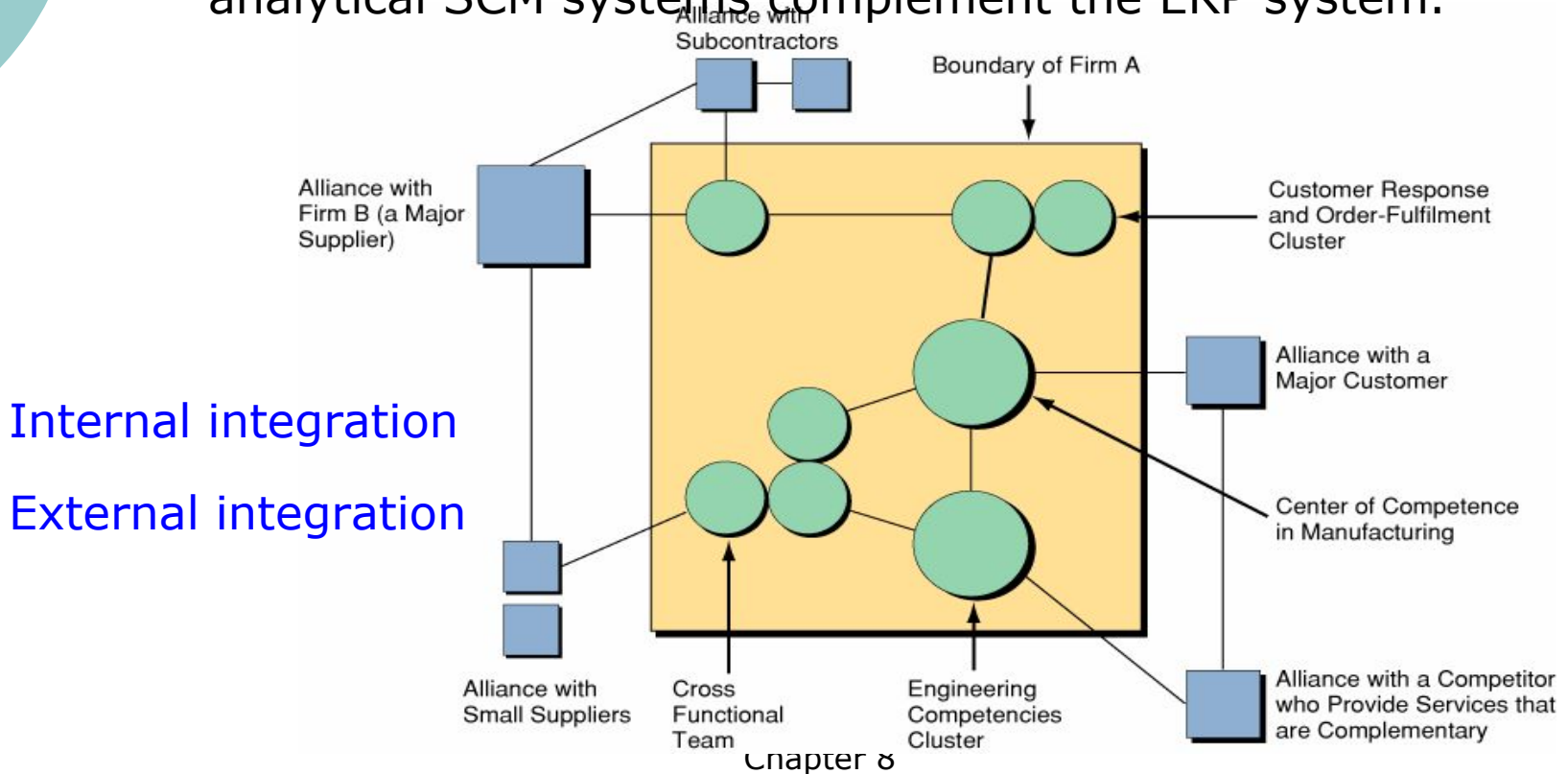
**ERP** or **enterprise systems** control all major business processes with a single software architecture in real time.

- It is comprised of a set of applications that automate routine back-end operations:
  - such as financial management
  - inventory management
  - Scheduling
  - order fulfillment
  - cost control
  - accounts payable and receivable,
- It includes front-end operations such as:
  - POS
  - Field Sales
  - Service
- It also increases efficiency, improves quality, productivity, and profitability.

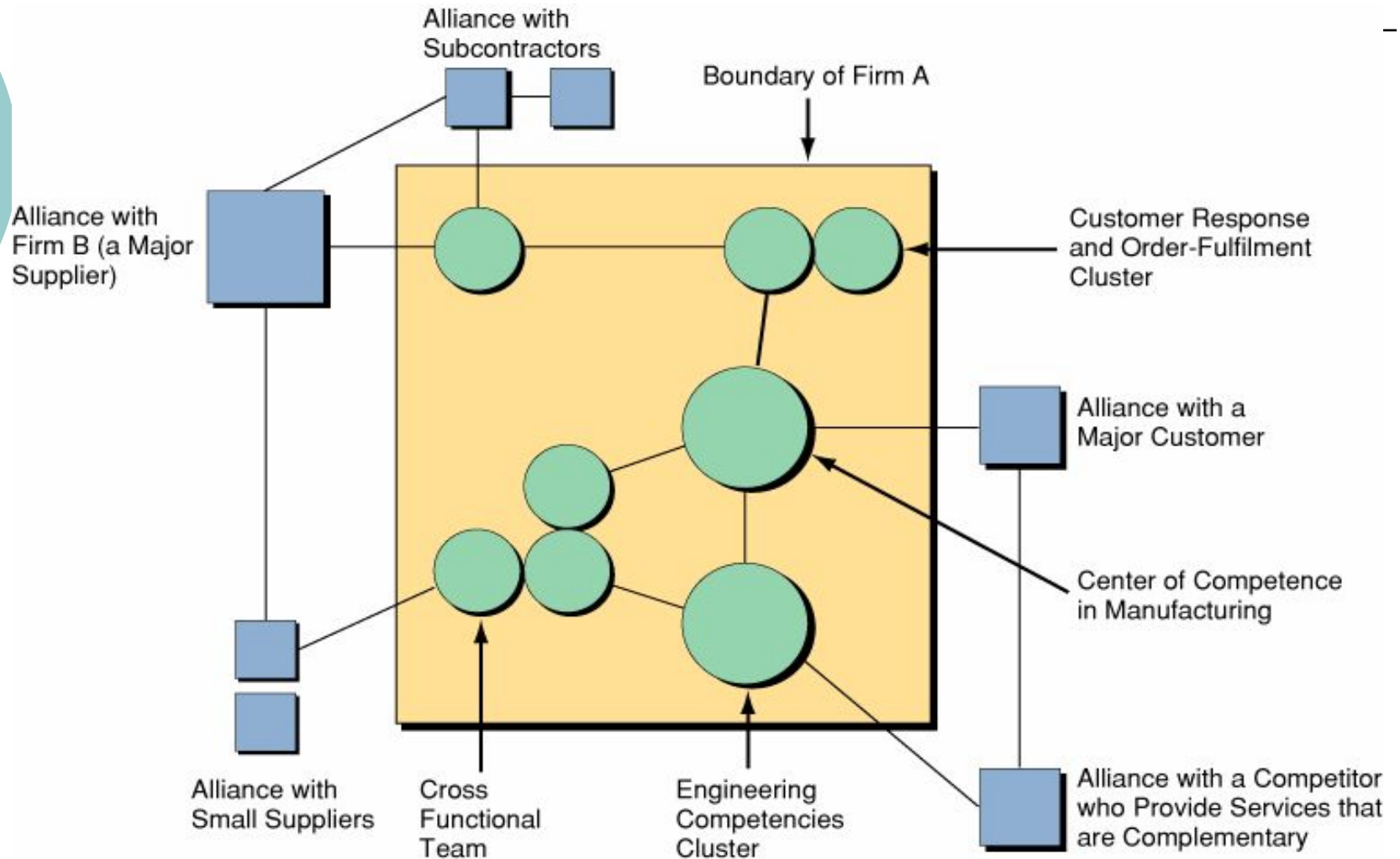
## Enhances the Supply Chain

# Integrating – ERP and SCM

Creating an **ERP/SCM integration** model allows companies to quickly assess the impact of their actions on the entire supply chain, including customer demand. By providing intelligent decision support and business intelligence capabilities, the analytical SCM systems complement the ERP system.



# Integrating - ERP and SCM





# E-Commerce and Supply Chains

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E-commerce is emerging as a superb tool for providing solutions to problems along the supply chain. Many supply chain activities, from taking customers' orders to procurement, can be conducted electronically.

- E-commerce
  - can digitize some products
  - can replace all paper documents
  - can replace faxes and telephone calls with electronic messaging
  - Enhances collaboration and information sharing
  - typically shortens the supply chain and minimizes inventories
  - facilitates customer service
  - introduces efficiencies into buying and selling
  - enables faster, cheaper, and better communication, collaboration, and discovery of information

# E-Commerce and Supply Chains

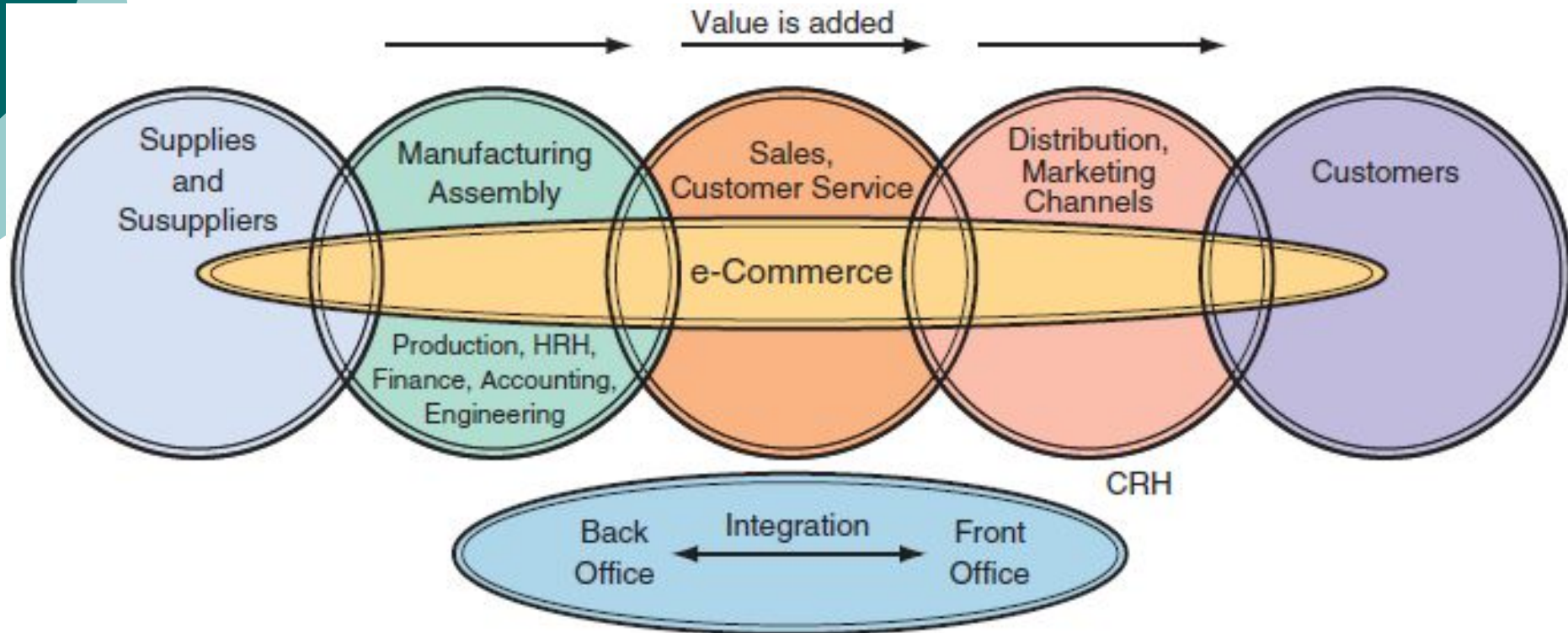
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A major role of EC is to facilitate buying and selling along all segments of the supply chain.

- **Upstream Activities** improve the upstream supply chain through *e-procurement*
- **Internal Supply Activities** from entering purchase orders, to recording sales, to order fulfillment, to tracking shipments, are usually conducted over a corporate intranet
- **Downstream Activities** enhance the activity downstream activities by providing online ordering
- **Vertical exchanges** combine upstream and downstream EC supply chain activities. These *B2B exchanges*, provide a medium where buyers and sellers can meet.

# E-Commerce and Supply Chains

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# Partner Relationship Management

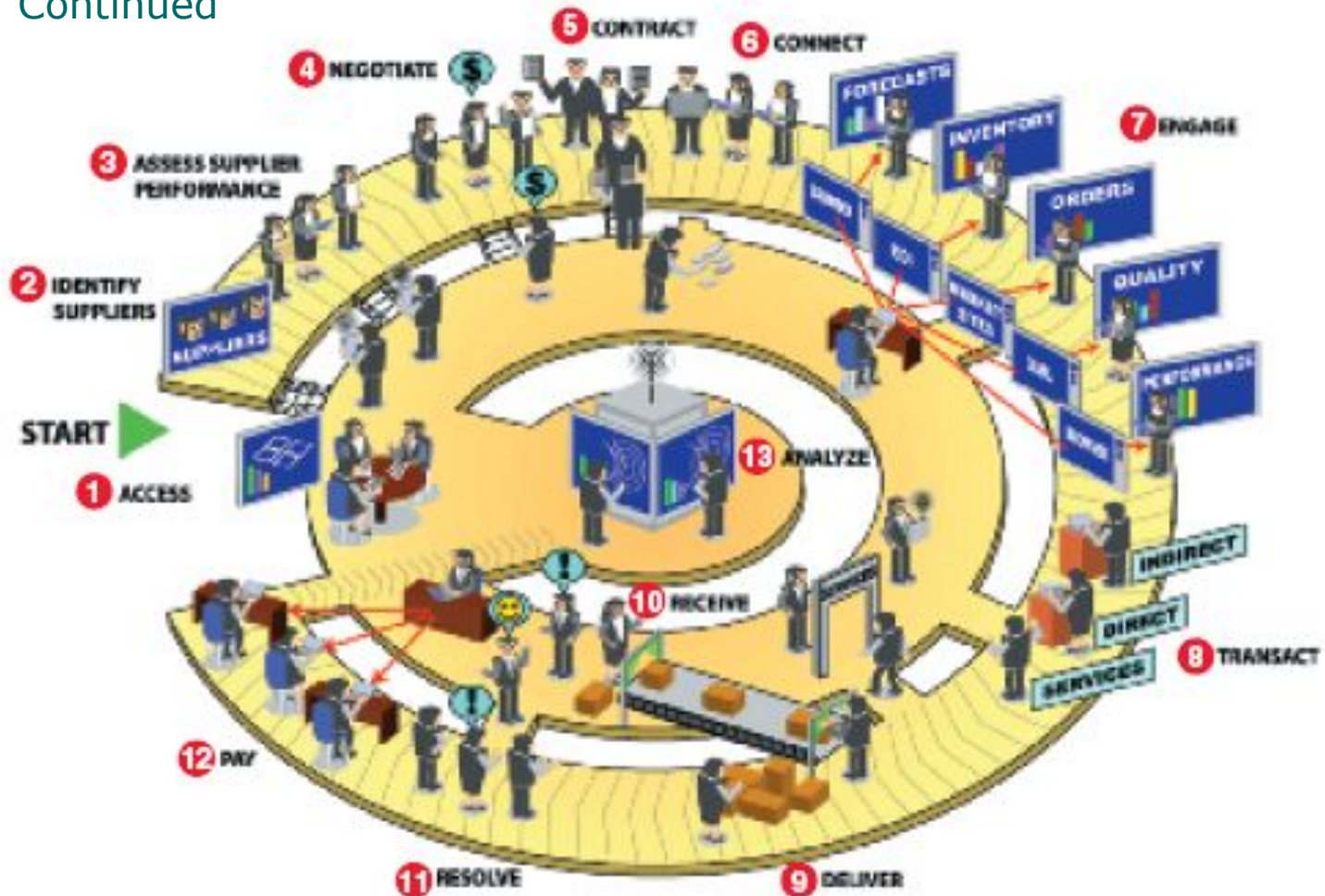
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Every company that has business partners has to manage the relationships with them. Information needs to flow between the firms and constantly updated and shared.

- Manual methods include; phone, fax, and mail
- EDI is typically used by large corporations
- EC PRM functions include:
  - partner profiles
  - partner communications
  - lead management (of clients)
  - targeted information distribution
  - connecting the extended enterprise
  - partner planning
  - centralized forecasting
  - group planning
  - e-mail
  - price lists

# Partner Relationship Management

Continued



# Global Supply Chains

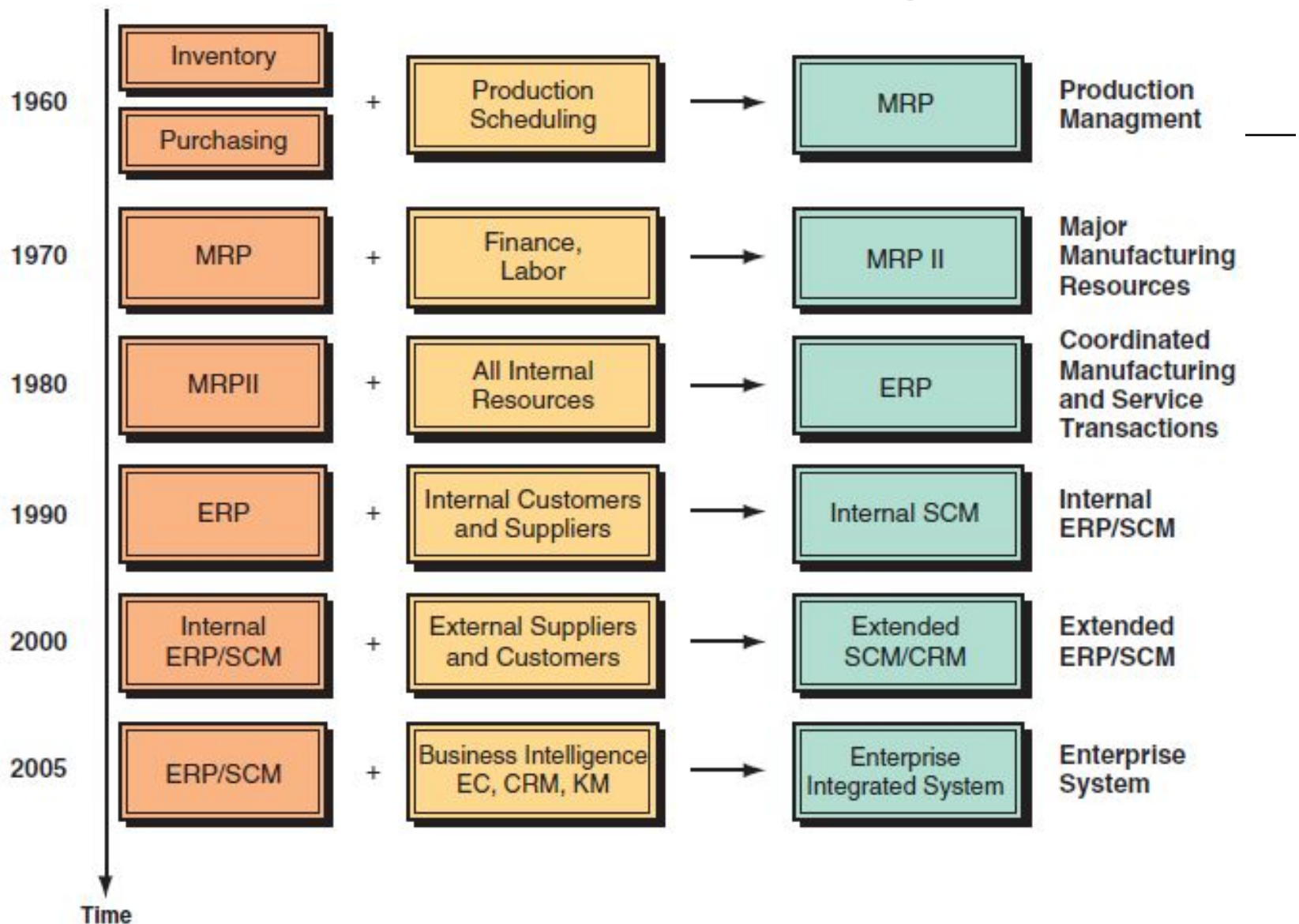
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Supply chains that involve suppliers and/or customers in other countries are referred to as **global supply chains**.

- Companies go global (*disperse the value chain*) for a variety of reasons.
  - lower costs of materials, products, services and labor
  - availability of products that are unavailable domestically
  - the firm's global strategy
  - technology available in other countries
  - high quality of products
  - intensification of global competition
  - the need to develop a foreign presence to increase sales
  - fulfillment of counter trade.

Global supply chains are usually **longer** than domestic ones, and **more** complex. Therefore, additional uncertainties are likely.

# Evolution Is Continuing



# MANAGERIAL ISSUES

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- **Ethical issues.** Conducting a supply chain management project may result in the need to lay off, retrain, or transfer employees. Should management notify the employees in advance regarding such possibilities? And what about those older employees who are difficult to retrain? Other ethical issues may involve sharing of personnel information, which may be required for a collaborative organizational culture.
- **How much to integrate?** While companies should consider extreme integration projects, including ERP, SCM, and e-commerce, they should recognize that integrating long and complex supply chain segments may result in failure. Therefore, many times companies tightly integrate the upstream, inside-company, and downstream activities, each part by itself, and loosely connect the three.
- **Role of IT.** Almost all major SCM projects use IT. However, it is important to remember that in most cases the technology plays a supportive role, and the primary role is organizational and managerial in nature. On the other hand, without IT, most SCM efforts do not succeed.
- **Organizational adaptability.** To adopt ERP, organization processes must, unfortunately conform to the software, not the other way around. When the software is changed, in a later version for example, the organizational processes must change also. Some organizations are able and willing to do so; others are not.
- **Going global.** EC provides an opportunity to expand markets globally. However, it may create long and complex supply chains. Therefore, it is necessary to first check the logistics along the supply chain as well regulations and payment issues.



# Chapter 8

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