

# **e-Business Networks**

**406.306 Management Information Systems**

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# IT enables new forms of structures and processes

- **hierarchical** structures -> **networks** of flexible organizational forms
- **unbundling** and **reconfiguration** of traditional value chains
- diminishing importance of distance and location: opportunities for **worldwide service** delivery
- company size becomes less important
- new kinds of **communities**: knowledge networks, virtual communities, agile enterprises, new trading forms, ...
- tendency towards **self organization** and **decentralization**

# requirement for flexible network organizations

- interplay of **IT, organizational and interorganizational structures, and BPs**
- IT
  - facilitates new business processes and strategies
  - helps set up and supports new exchange forms
  - stretches organizational boundaries
- new BPs, strategies, and exchange forms
  - require new organizational and interorganizational forms and governing structures
- organizational forms, governing structures, and strategies
  - require IT solutions for their information exchange and coordination

# motivations for network organizations

- combining competencies
- benefiting from economies of scale
- achieving overall supply chain benefits
- sharing know-how
- combining power
- etc

# network organizations

- network: intermediary organizational forms between markets and hierarchies
- **virtual partnerships** formed by separate companies to enable them to
- operate as integral elements of a greater organization while retaining their own authority in major budgeting and pricing matters
- synonyms: modular organization, virtual corporation, organic network, value-adding partnership, ...
- characteristics of inter-company networks
  - links between network participants are based on **various types exchange** (e.g., goods, money, information, ...)
  - networks have a distinct **boundary** with their environments
  - network participants pursue a **common goal**
  - all network participants have their own diverse, specific goals
  - networks consist of relationships characterized by mutual investments and interdependences



# desirable features of NWOs

- networks consist of nodes (organizations) and relationships (exchanges)
- an organizational form to manage interdependence between companies, based on purposeful collaboration and specific communication patterns
- vary with respect to goals, boundaries, processes, and structures.

# classifying networks

- based on the business objectives
  - strategic networks: to gain competitive advantage
  - operative networks: to rationalize information exchange w.r.t. routine operations
- based on the functionality
  - operational networks: short-term collaboration on an operational level
    - e.g., to lower inventory levels, to improve service quality
  - collaborative networks: long-term collaboration on a strategic level
    - to strengthen market positions
  - innovative networks
    - to reduce the participants' risks and costs by joining their R & D activities and sharing knowledge and know-how
  - interest group networks
    - to defend their participants' interests and help them gain a stronger position

# network characteristics

- stable or dynamic
  - stable: long-term, stable relationships between limited numbers of carefully selected suppliers, producers, and distributors
  - dynamic: temporary alliances between organizations in order to respond to actual market forces
- thick or thin networks
  - thick: involves intensive relationships and communication patterns, and presupposes close collaboration
  - thin: involve much less integration
- tightly or loosely coupled networks
  - tightly coupled: share planning and control cycles, involve predefined interaction patterns such as trading protocols
  - loosely coupled: trading partners preserve their independence



# classification scheme for business networks

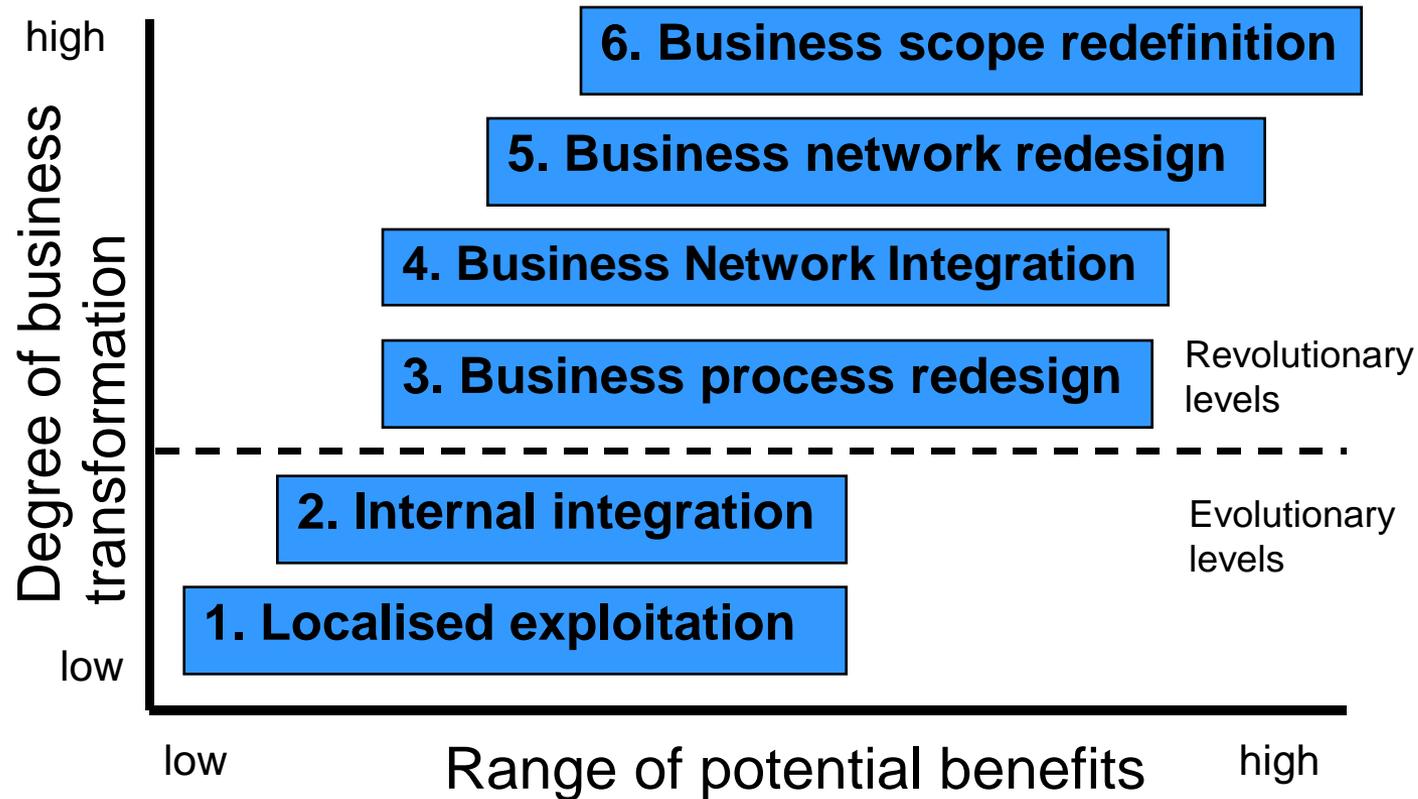
Network properties	Stable/ Dynamic	Tightly/ Loosely coupled	Thick/Thin
Types of Networks			
Operational NW			
Collaborative NW			
Innovative NW			
Interest Group NW			



# interorganizational IS

- **automate** the flow of information across organizational boundaries and EIS, and **link** an organization to suppliers, customers, and possibly other organizations
- **extensions of multilayered architecture** for developing web-based applications where **ASs are interconnected** in order to integrate e-business applications and their underlying EISs

# 5 levels of IT-induced business transformation



# 5 levels of IT-induced business transformation

- localized exploitation: ISs used within departmental or group boundaries
- internal integration: interdepartmental integration of ISs
- BP redesign: combining the integration between departments with the reorganization and optimization of their processes
- business network redesign: includes internal BPs of other companies as well to establish interorganizational BPs
- business scope redefinition: identifying organizations that are evaluating the use of existing situations to benefit from new situations

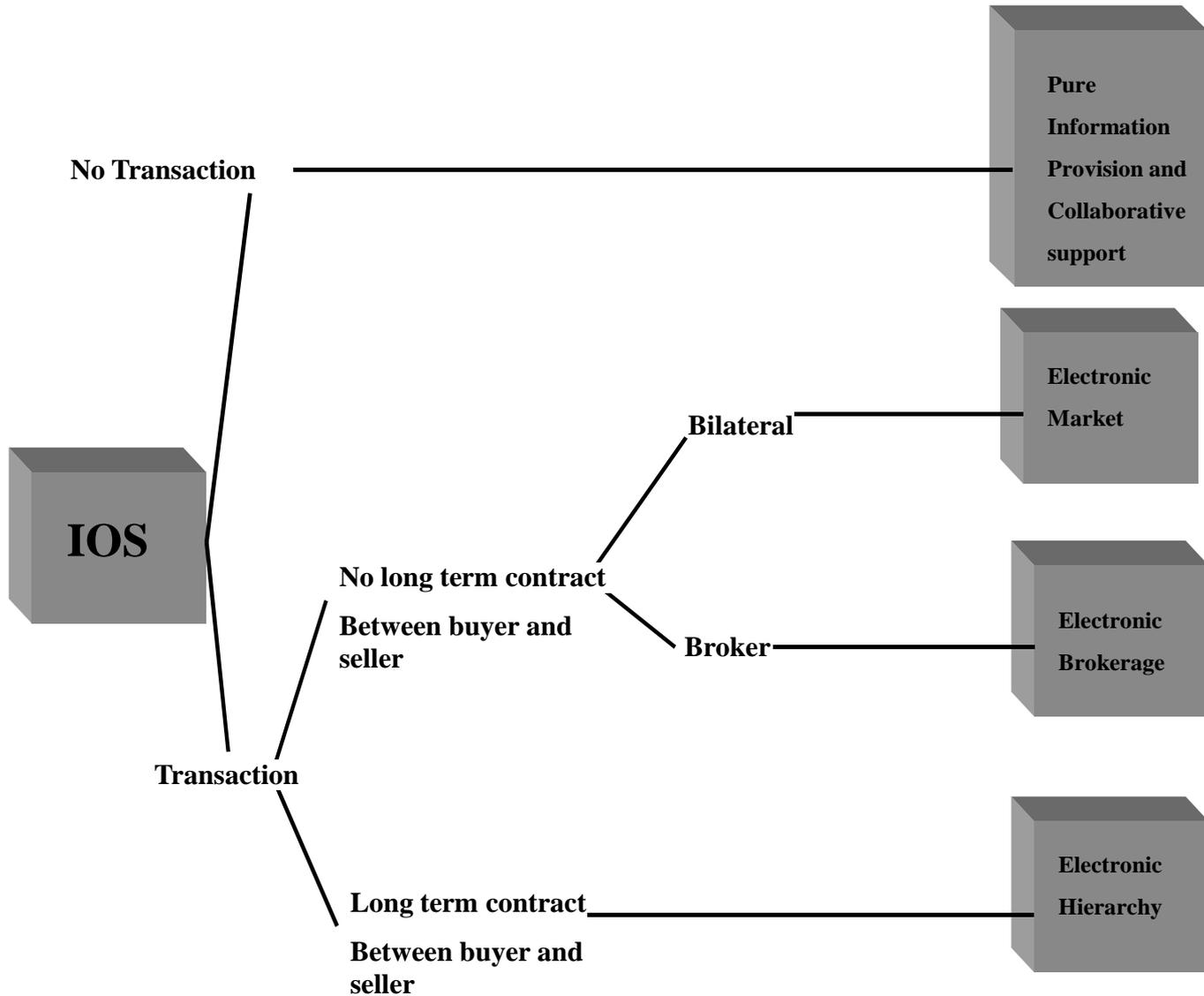


# interoperability: a matter of standards

- an ability to communicate and work with other systems and interact with people
- requires standardization in
  - technology: middleware, protocols, security, etc.
  - syntax: structure or language of messages exchanged
  - semantics: meaning of terms
  - pragmatics: agreements on practices and protocols triggered by specific messages
- types of IT supported communication
  - system-to-system
    - full standardization is needed in the above four areas
  - person-to-person
    - technology and syntax standards suffice



# functionalities of IOSs

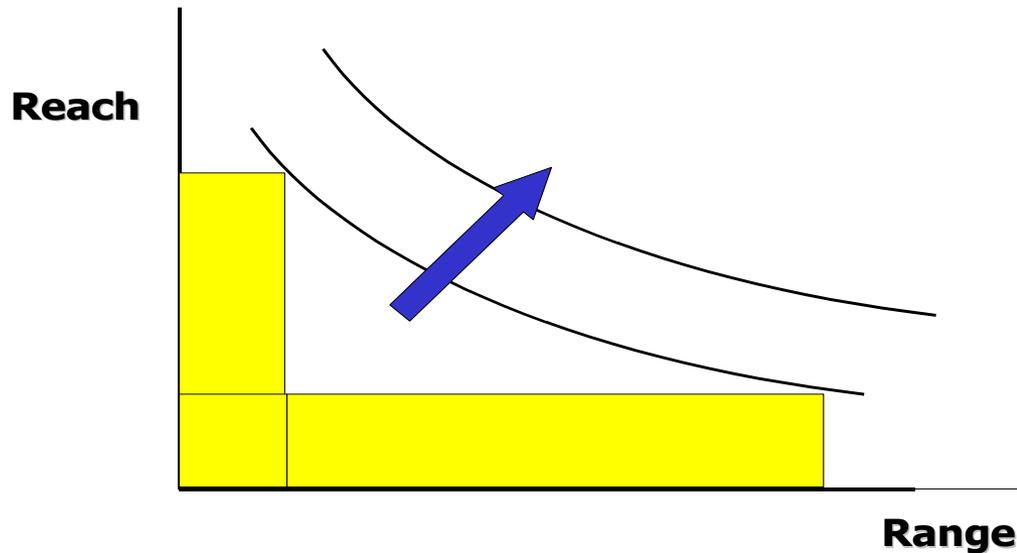


# functionalities of IOSs

- transaction-oriented: e.g., e-procurement, WfMSs, ...
  - electronic markets
    - bilateral transactions without long-term relationships
    - industry-wide standards for messages are prerequisites
  - electronic brokerage
    - transactions are carried out via an **intermediate 3rd party** without long-term relationships
  - electronic hierarchy
    - long-term contracts to align their internal processes with those of partners
    - may use proprietary messages
- non-transaction-oriented: e.g., DBs, email, groupware, ...
  - pure information provision systems
    - store data in a central DB and make it available to the participating companies
    - e.g., Nielsen marketing data

# limits to the reach of network organizations

- trade-off between richness (range) and reach
  - reach: locations and people whom the network is capable of connecting
  - range: functionality of ISs in terms of business activities that can be completed and shared automatically and seamlessly
  - the richer the information, the more limited the reach, and the more difficult to agree on standardization
- consequence: network organizations are limited in size, and the character of the exchanges in the network determines how large or small the group of companies may be



# SCM

- before the SCM: many manufacturers routinely **competed for suppliers of raw materials on price alone**, without looking at the longer-term implications of quality, or considering critical factors such as shipping
- after the SCM: enterprises are involved in managing the network of all upstream companies as well as the network of all downstream companies

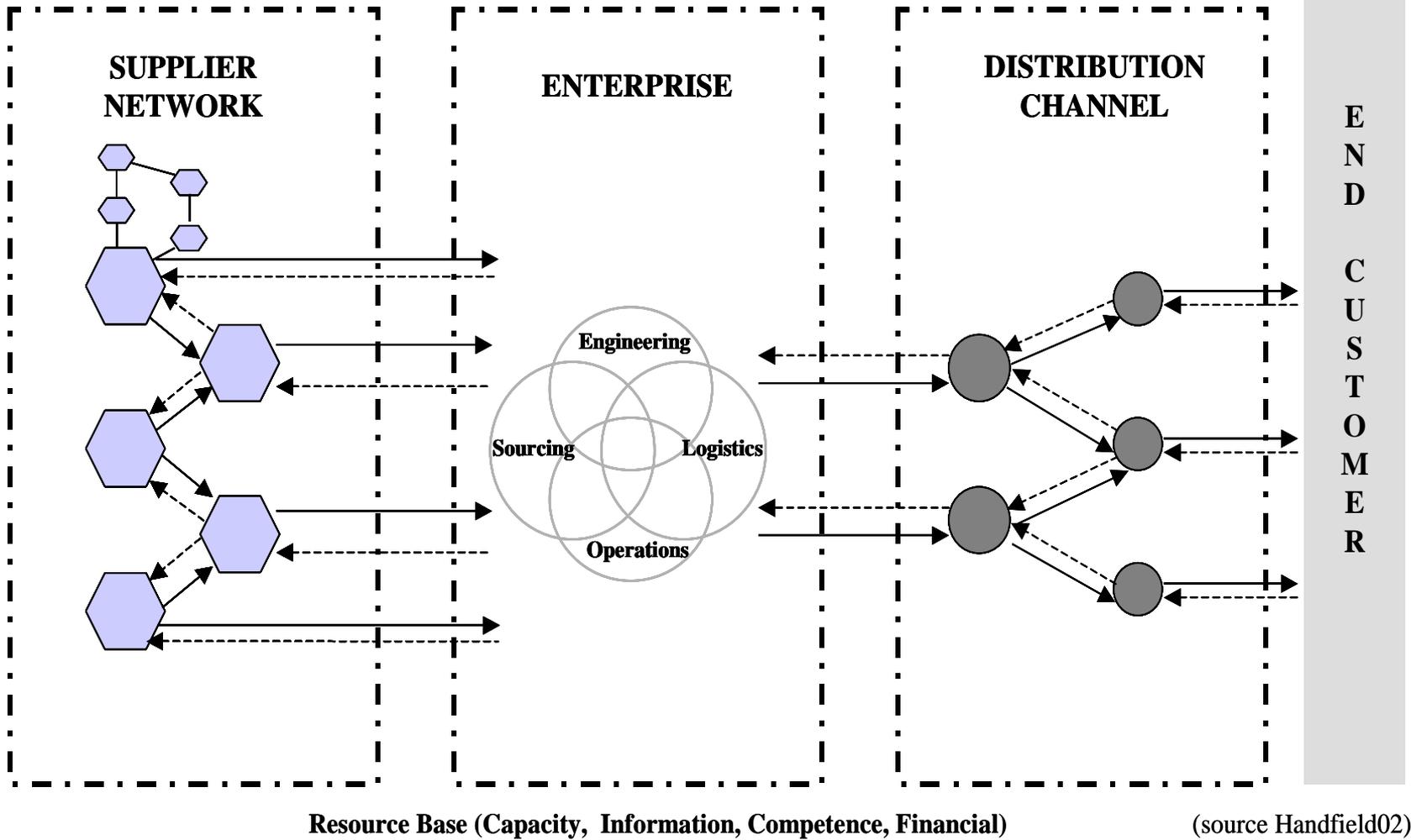
# supply chains

- network that encompasses all the organisations and activities associated with the flow and transformation of goods from the raw materials stage through to the end user, as well as the associated information flows
- comprised of geographically dispersed facilities and capabilities, including sources of raw materials, product design, engineering organizations, manufacturing plants, distribution centers, retail outlets, customers, and transportation and communication links
- manages EISs, sourcing and procurement, production scheduling, order processing, inventory management, warehousing, customer service, after-market disposition



# Relationship Management

Flows of Information, Products, Services, Knowledge & Funds



# focus on flows

- logistics
  - originally a military term
  - material flows involved in supplying a final customer with a product or service, all the way from the acquisition of raw materials to the product's or service's delivery
- two forms of logistics
  - optimizes a steady flow of material through a network of transportation links and storage nodes
  - coordinates a sequence of resources to carry out some project
- logistics management: considering the interdependence between all decisions concerning goods, services, and information flows

# current logistic challenge

- traditional focus on **products** is being replaced by a **customer focus**
- customers are perceived to be looking for solutions rather than for individual products
  - e.g., selling cars: not about cars, but about realizing the customer's mobility
- the customer focus causes offerings to be made that are composed of a great variety of products and services, requiring **links across different value systems**

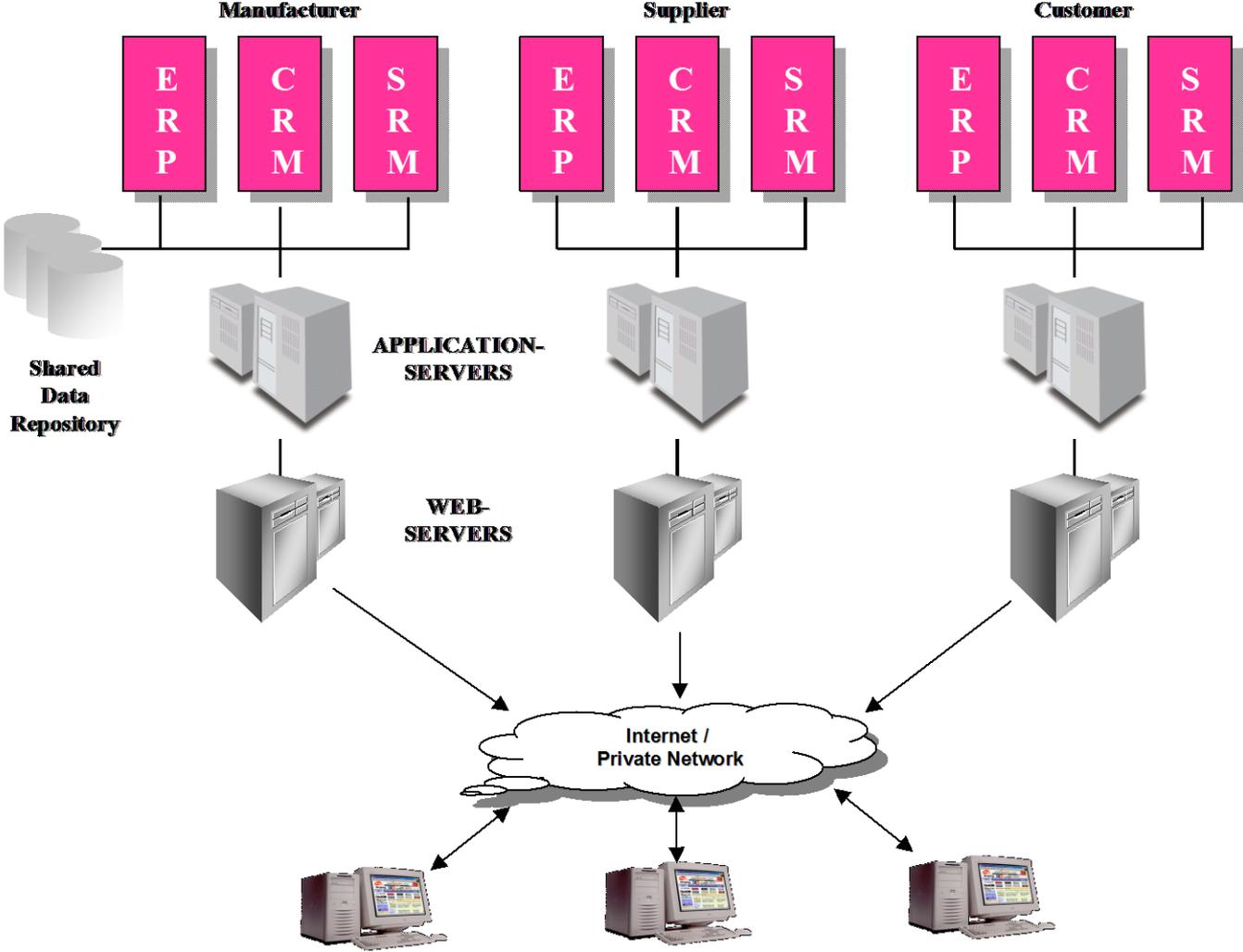


# supply chain management

- SCM
  - management of upstream and downstream relations with suppliers and customers to deliver superior value at less cost to the supply chain as a whole
  - integration and management of organizations and activities through cooperative organizational relationships, effective BPs, and high-levels of information sharing in order to create high-performing value systems that provide the organizations in a supply chain with a sustainable competitive advantage
- two models
  - push model: production, assembly and distributions are based on forecasts
  - pull model: products are built in response to customer orders, requires closer collaborations
- implementation techniques
  - long term relationships with supply chain partners
  - working cooperatively with fewer suppliers to reduce chain-wide inventory levels and cycle times
  - information sharing with supply chain members



# technology solutions for supply chains

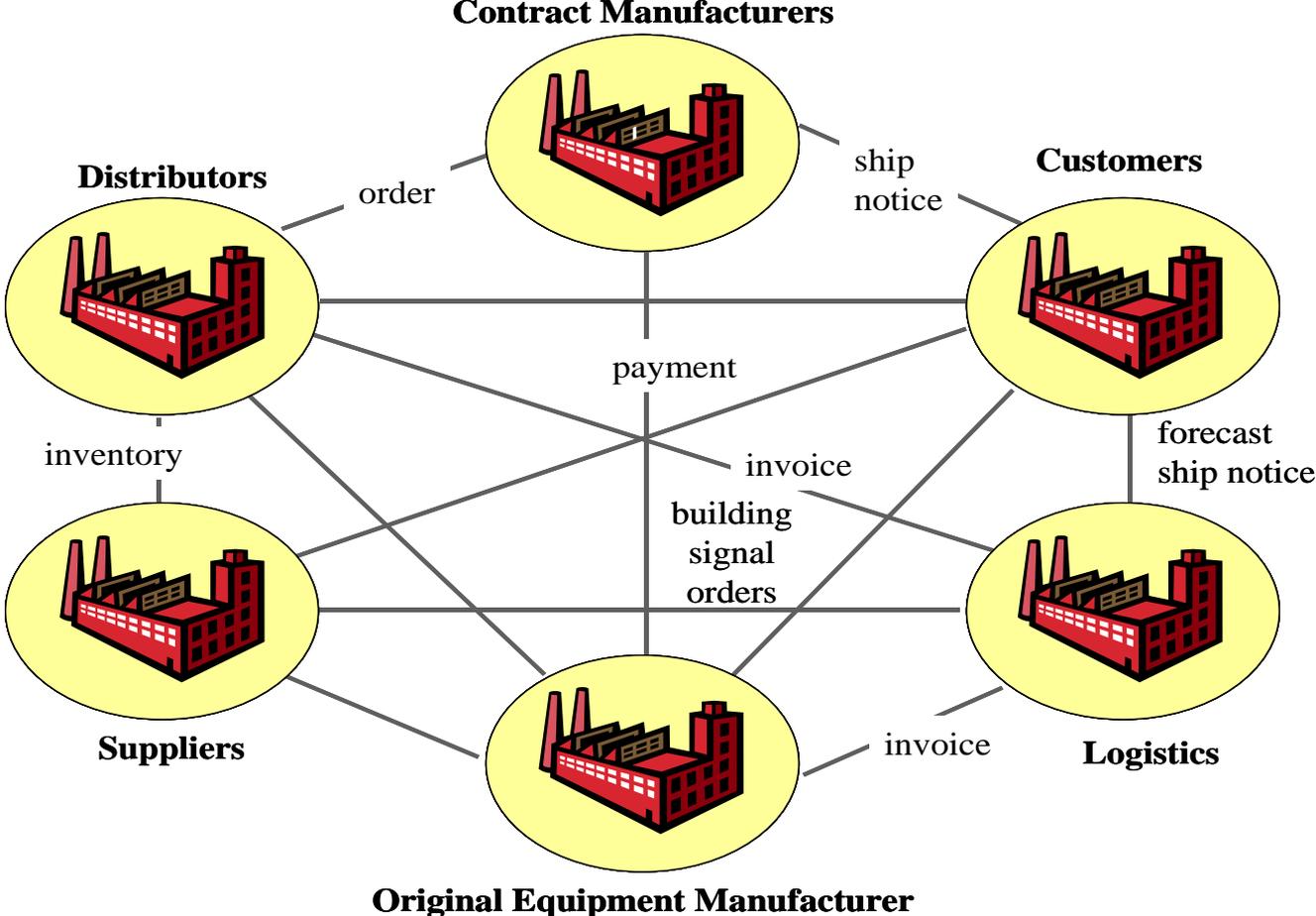


# web services as a means for integration in SC

- check inventory levels in various DBs on the supply network
- compare that with orders for product that use that inventory
- check orders already placed with the supplier to replenish existing inventory
- determine the difference
- automatically place orders directly with the supplier's systems



# an extended supply chain



# integrated supply chains

- supply chain integration: the process by which multiple enterprises within a shared market segment collaboratively plan, implement and monitor the flow of goods and services, and information along the value system in a way that increases customer-perceived value and optimizes the efficiency of the chain
- the focus of competition: from individual companies -> business networks
- impact
  - reduced inventories, cost savings, improved value-added goods and services to customers, tighter links with business partners
  - EISs span networks of enterprises, incorporating systems of trading and distribution partners as well as customers

# characteristics of virtual enterprises

- processes transcend the boundaries of a single firm and are not controlled by a single organization
- production processes are flexible with different parties involved at different times
- parties involved in the production of a single product are often geographically dispersed
- coordination is heavily dependent on suitable IT infrastructure and telecommunication networks

# essential requirements of integrated supply chains

- e-business enabling
  - reconceptualizing the company as a collection of business operations and processes, by reshaping corporate structures around BPs, and by making their internal processes align with and support the integrated value chain
- end-to-end integration and interoperation
  - structural and semantic system incompatibilities need to be overcome
  - BPs and ISs not only harmonize but are also combined with legacy assets to accommodate a broader range of BP variability and evolution
  - should rely on accepted open standards for interoperation