Chapter 8

Enterprise Systems

Information Technology For Management 6th Edition
Turban, Leidner, McLean, Wetherbe
Lecture Slides by L. Beaubien, Providence College

John Wiley & Sons, Inc.

Learning Objectives

- Understand the essentials of enterprise systems and computerized supply chain management. Understand the essentials of enterprise systems and computerized supply chain management.

- Describe the various types of supply chains.

- Describe some major problems of implementing supply chains and some innovative solutions.

- Describe the need for integrated software and how ERP does it.

Learning Objectives (Continued)

- Understand business process management and how to enhance effectiveness

- Describe the product lifecycle management stages

- Describe CRM and its support by IT

ESSENTIALS OF ENTERPRISE SYSTEMS AND SUPPLY CHAINS

ERP and Supply Chains

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.

ESSENTIALS OF ENTERPRISE SYSTEMS AND SUPPLY CHAINS

Figure 8.1 Overview of enterprise systems. (*Source:* Prepared by E. Turban and D. Amoroso.)
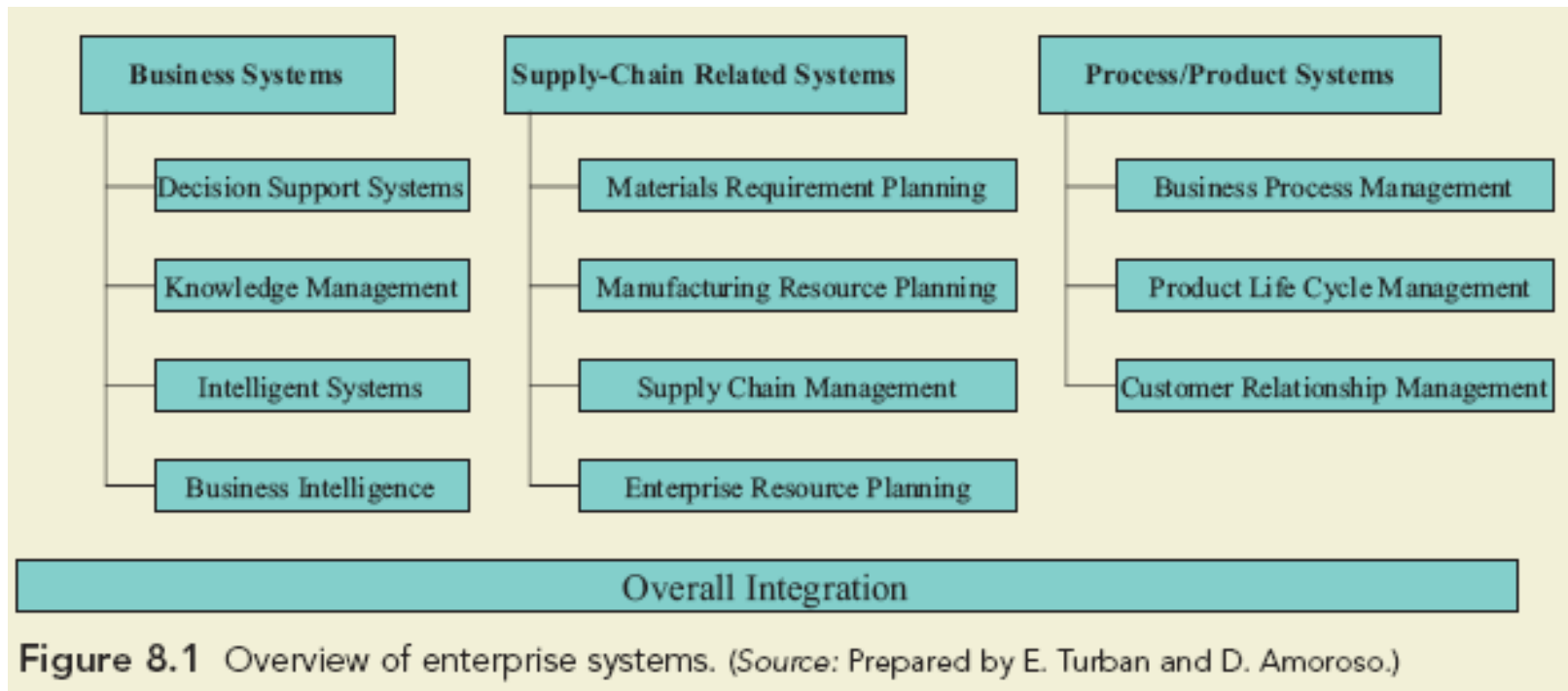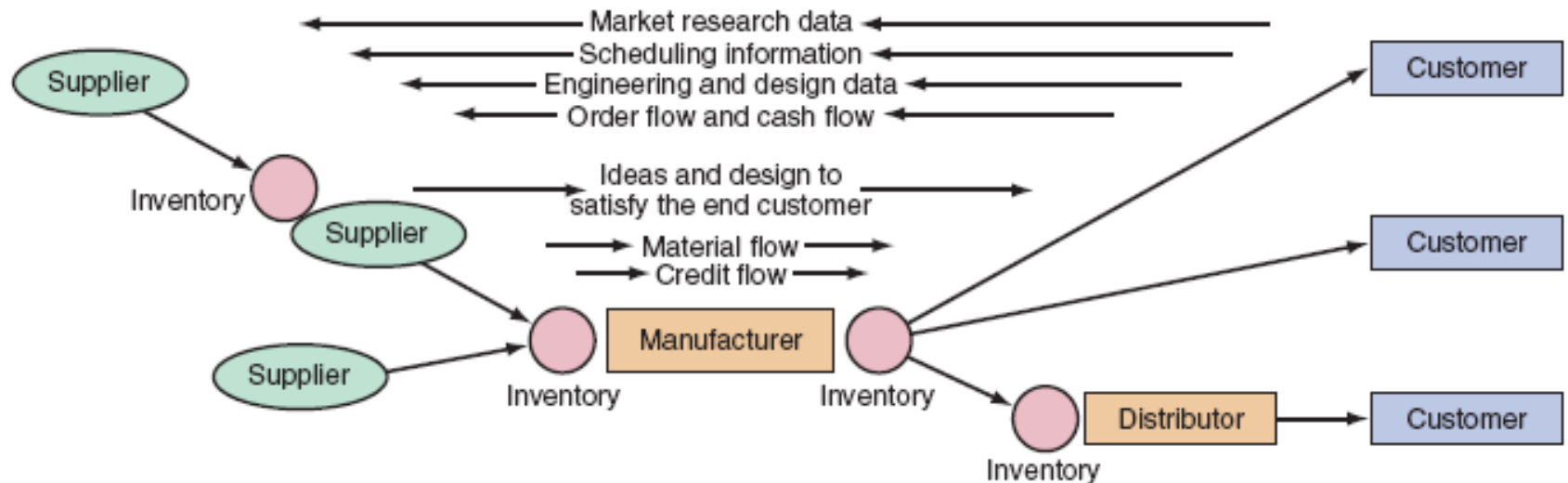
Supply Chain

Figure 8.2 The supply chain. (*Source:* Heizer and Render, 2004.)

Supply Chain Problems

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)

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

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

Supply Chain Solutions (Continued)
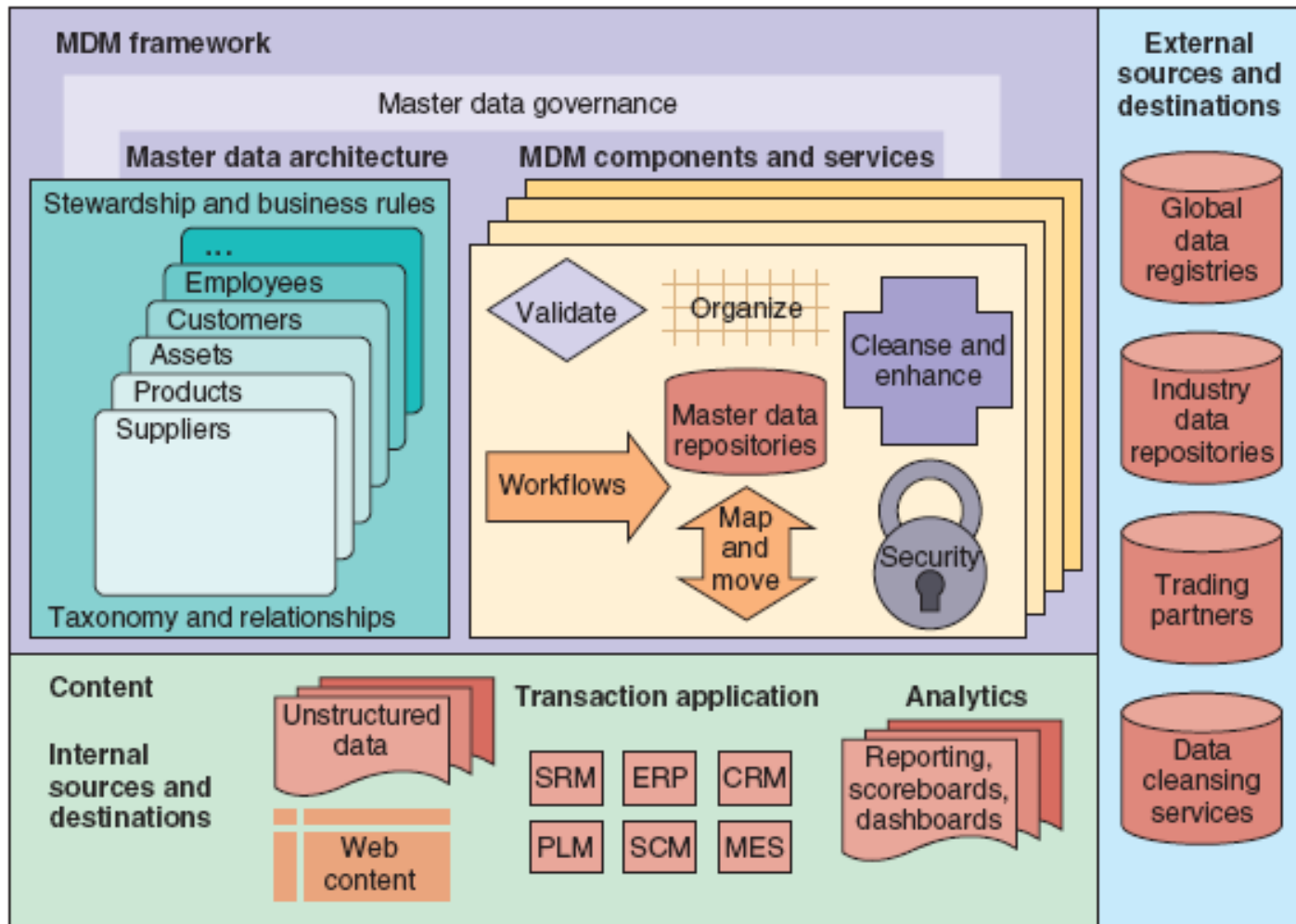
Supply Chain Collaboration Management

Every company that has business partners has to manage the relationships with them. Information needs to flow between the firms and must be 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

Global Supply Chains

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
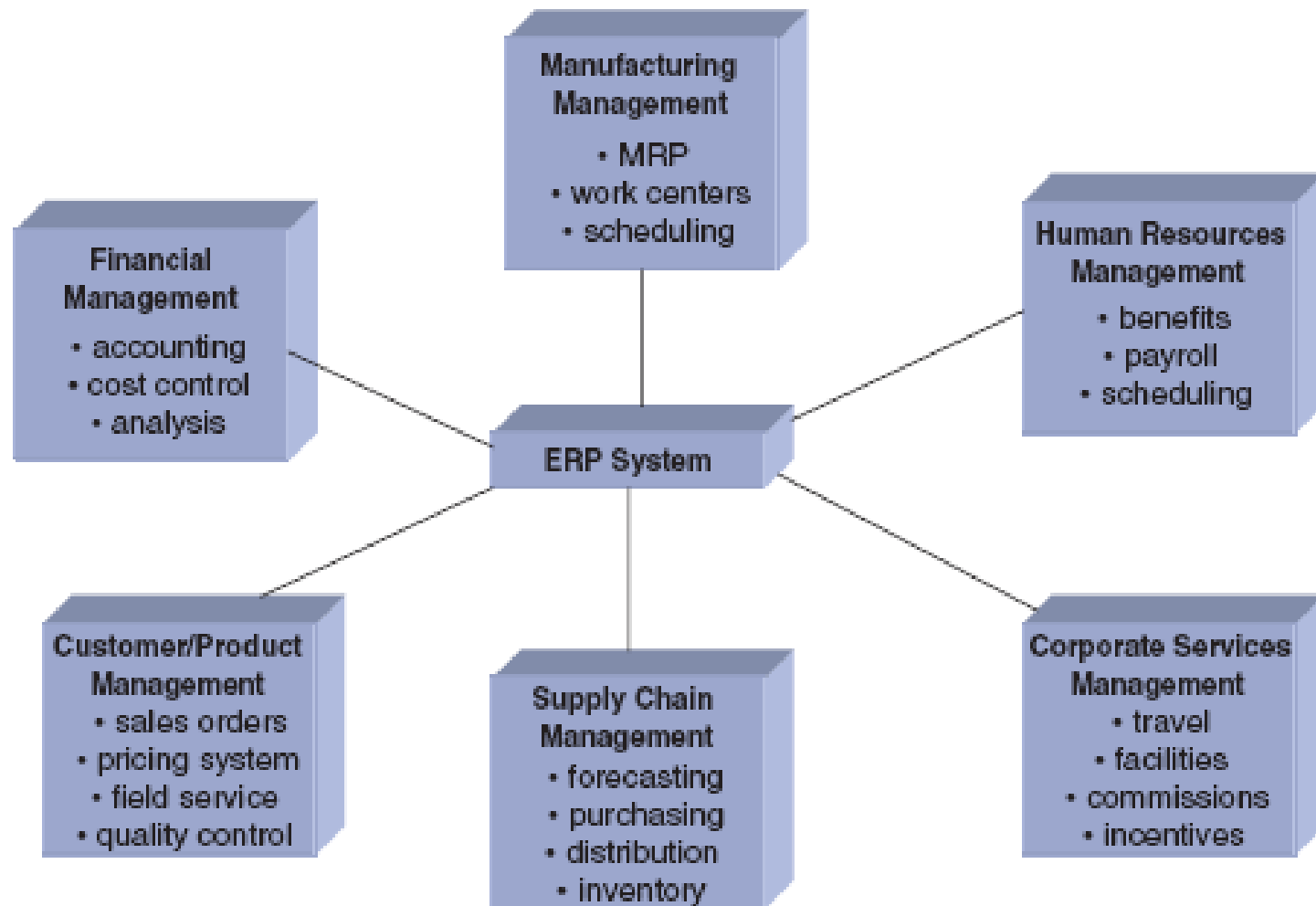 - fulfillment of counter trade.

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

Computerized Supply Chains

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 (Continued)

Manufacturing Management
- MRP
- work centers
- scheduling

Financial Management
- accounting
- cost control
- analysis

Human Resources Management
- benefits
- payroll
- scheduling

ERP System

Customer/Product Management
- sales orders
- pricing system
- field service
- quality control

Supply Chain Management
- forecasting
- purchasing
- distribution
- inventory

Corporate Services Management
- travel
- facilities
- commissions
- incentives

E-Commerce and Supply Chains

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 (Continued)

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 (Continued)

Business Units

Strategic Value Streams

Core Compentencies
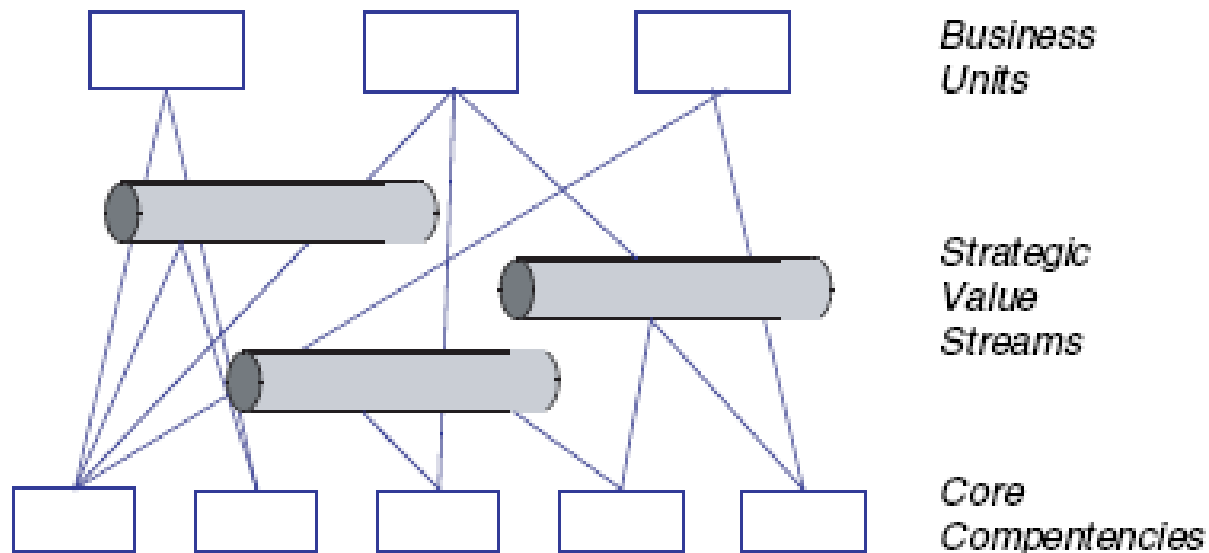
A strategic value stream of high-level processes that add value to products and/or services.

Supply Chains Benefits

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)

- *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

Product Life Cycle
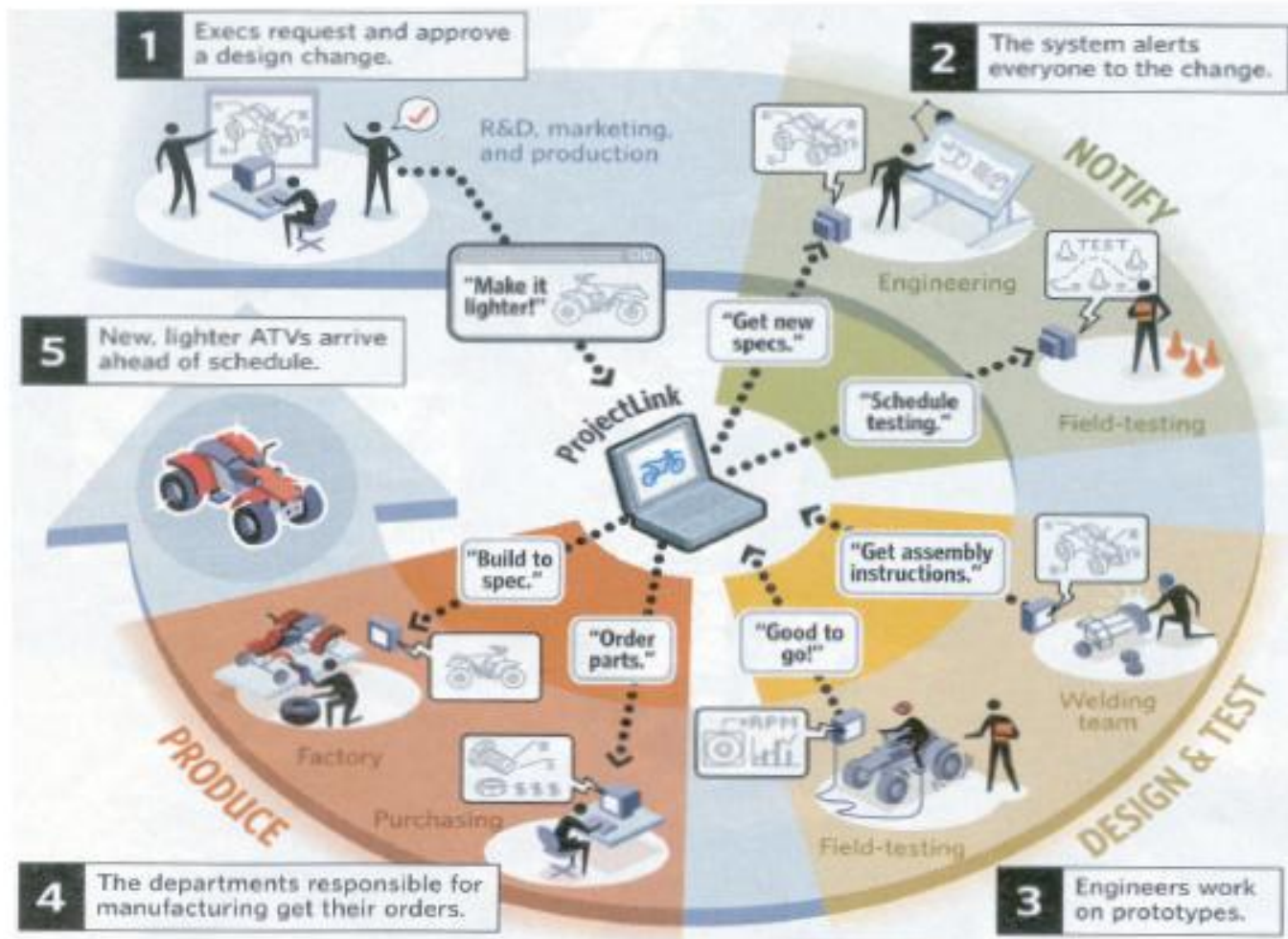
Customer Relationship Management (CRM)

CRM recognizes that customers are the core of a business and that a company's success depends on effectively managing relationships with them. It focuses on building long–term and sustainable customer relationships that add value both for the customer and the company.

- Types of CRM
  - Operational CRM
  - Analytical CRM
  - Collaborative CRM
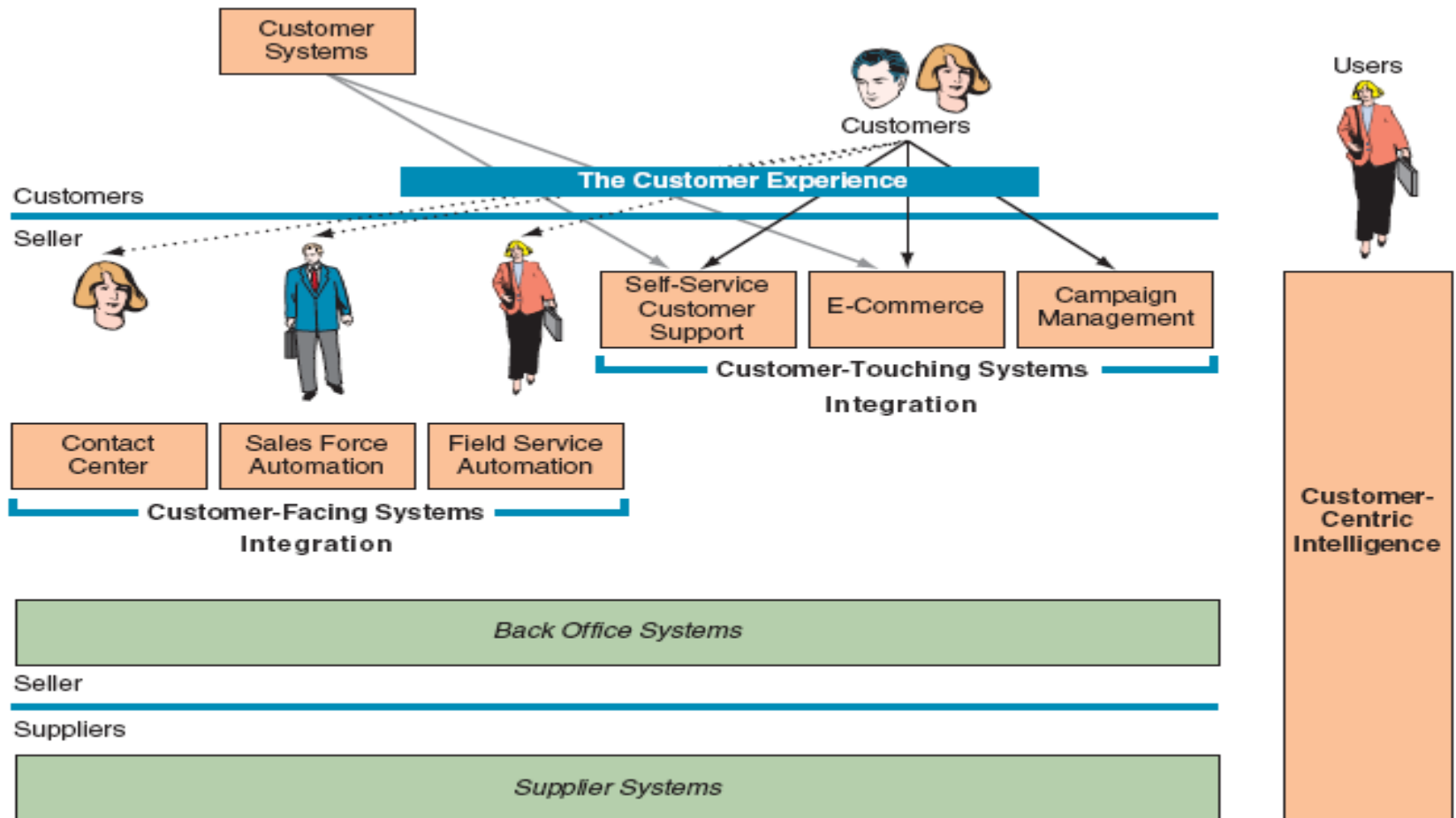
Customer Relationship Management (CRM) (Continued)

Figure 8.10 CRM applications. (*Source:* Patricia Seybold Group, *An Executive's Guide to CRM*, March 21, 2002.)

Customer Relationship Management (eCRM)

- CRM has been practiced manually by corporations for generations. However, Ecrm (electronic CRM) started in the mid-1990's ,when customers began using Web browsers, the Internet, and other electronic touch points.

  - THE SCOPE OF E-CRM. We can differentiate three levels of e-CRM:

    - Foundational service. This includes the minimum necessary services such as Website responsiveness (e.g., how quickly and accurately the service is provided), site effectiveness, and order fulfillment.

    - Customer-centered services. These services include order tracking, product configuration and customization, and security/trust. These are the services that matter the most to customers.

    - Value-added services. These are extra services such as online auctions and online training and education.

Customer Relationship Management CRM Activities

- Customer Service on the Web
  - Search and Comparison Capabilities
  - Free Products and Services
  - Technical and Other Information and Service
  - Allowing Customers to Order Products and Services Online
  - Letting Customers Track Accounts or Order Status

- Tools for Customer Service
  - Personalized Web Pages
  - FAQs
  - Chat Rooms
  - E-Mail and Automated Response
  - Call Centers
  - Troubleshooting Tools
  - Wireless CRM

Managerial Issues

- **Ethical issues**
- **How much to integrate?**
- **Role of IT**
- **Organizational adaptability**
- **Going global**
- **The Customer is king/queen**
- **Set CRM policies with care**

Chapter 8

Chapter 9

Interorganizational and Global Information Systems

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Learning Objectives

- Define and Classify Interorganizational and virtual organizations information systems
- Describe interorgnizational activities, particularly order fulfillment
- Define and classify global information systems
- Present the major issues surrounding global information systems

Learning Objectives (Continued)

- Describe Demand-driven networks and RFID as supply chain factors

- Describe B2B exchanges, hubs, and directories

- Describe Interorganizational integration issues

- Describe EDI and EDI/Internet

- Describe extranets, XML and Web services

InterOrganizational Systems (IOS)

Functions:

- Involves 2 or more organizations
- Cooperative information flows
- Facilitates efficient processing of transactions

Types of IOS

- B2B trading

- B2B support systems

- Global Systems

- EFT

- Groupware/Shared Databases

IOS activities

- On-demand enterprise

- On-Demand/Real-time

Activities
  - Buying and Selling
  - Joint Ventures
  - Collaboration
  - Other

IOS and Order Fulfillment

- Step 1: Making sure the customer will pay

- Step 2: Checking for availability

- Step 3: Arranging Shipments

- Step 4: Insurance

- Step 5: Replenishment

- Step 6: In-house production

- Step 7: Use suppliers

- Step 8: Customer contacts

- Step 9: Returns

IOS Problems

- Delays and transportation

- Human errors / misunderstanding

- Over / Under Inventories

- Misdirected Shipments

- Late / Incorrect delivery reporting

IOS Problems (Continued)

- Slow / Incorrect Billing

- Difficult / Complex Production

- Incompatibility of systems (communication)

- High cost of expenditures / shipments

Order Fulfillment and Logistics
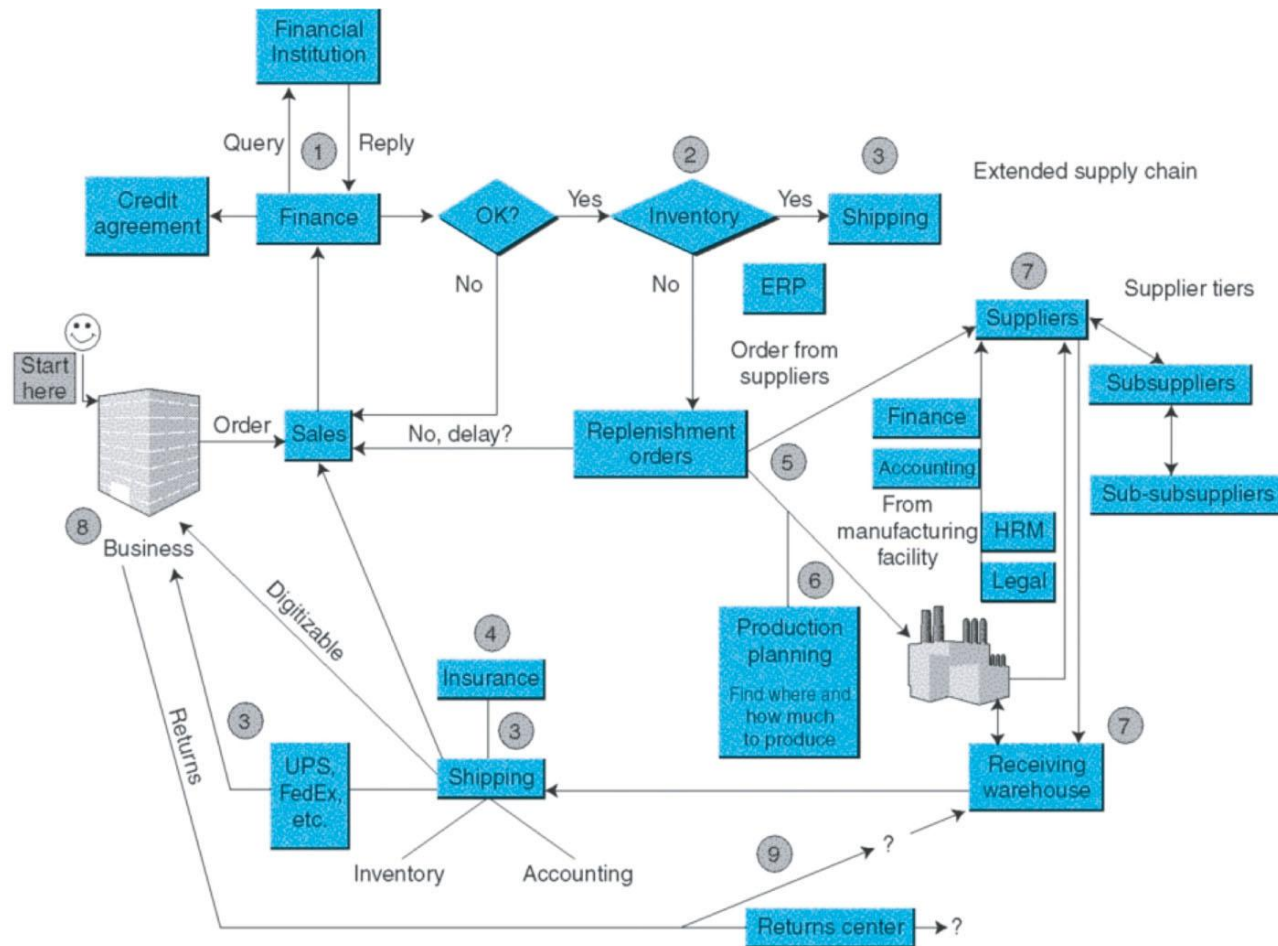
Note: Demand forecasts and accounting are conducted at various points throughout the process.

Benefits of Global IS

- Effective Communication at reasonable cost

- Collaboration: overcoming distance, time, language

- Access to larger volumes of data

Localization

- Branding and Formats

- Merchandise and Pricing

- Promotions

- Vendor, Operating, and Management Policies

- Store and Vendor Service levels

IOS and the Global audience

- Personal and Personnel issues

- Language and Culture

- Law, Politics, and Convention

- Offshoring/Outsourcing and the organization
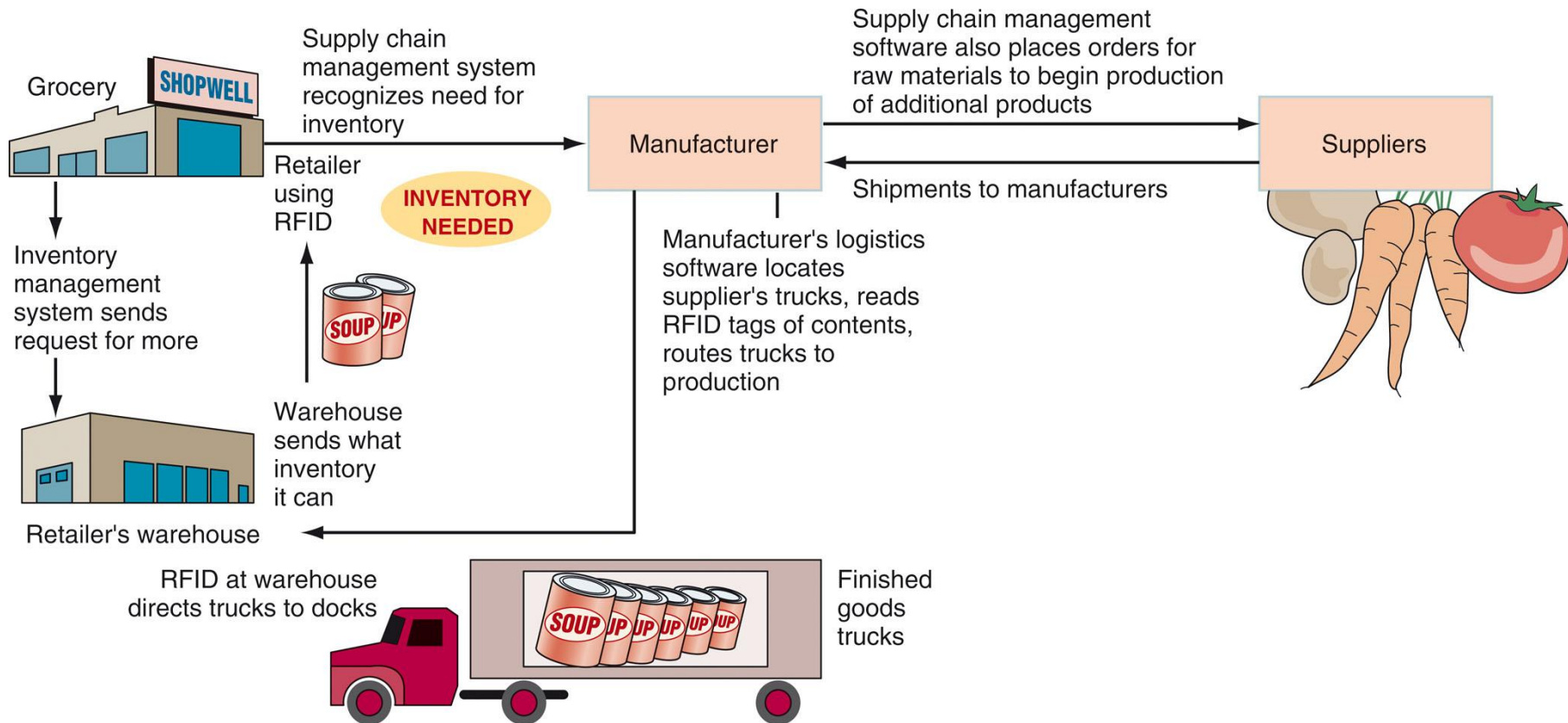
IOS: Demand Driven

- Drive the products to market

- The bullwhip effect - shifts and information

- Demand-driven supply (networks)
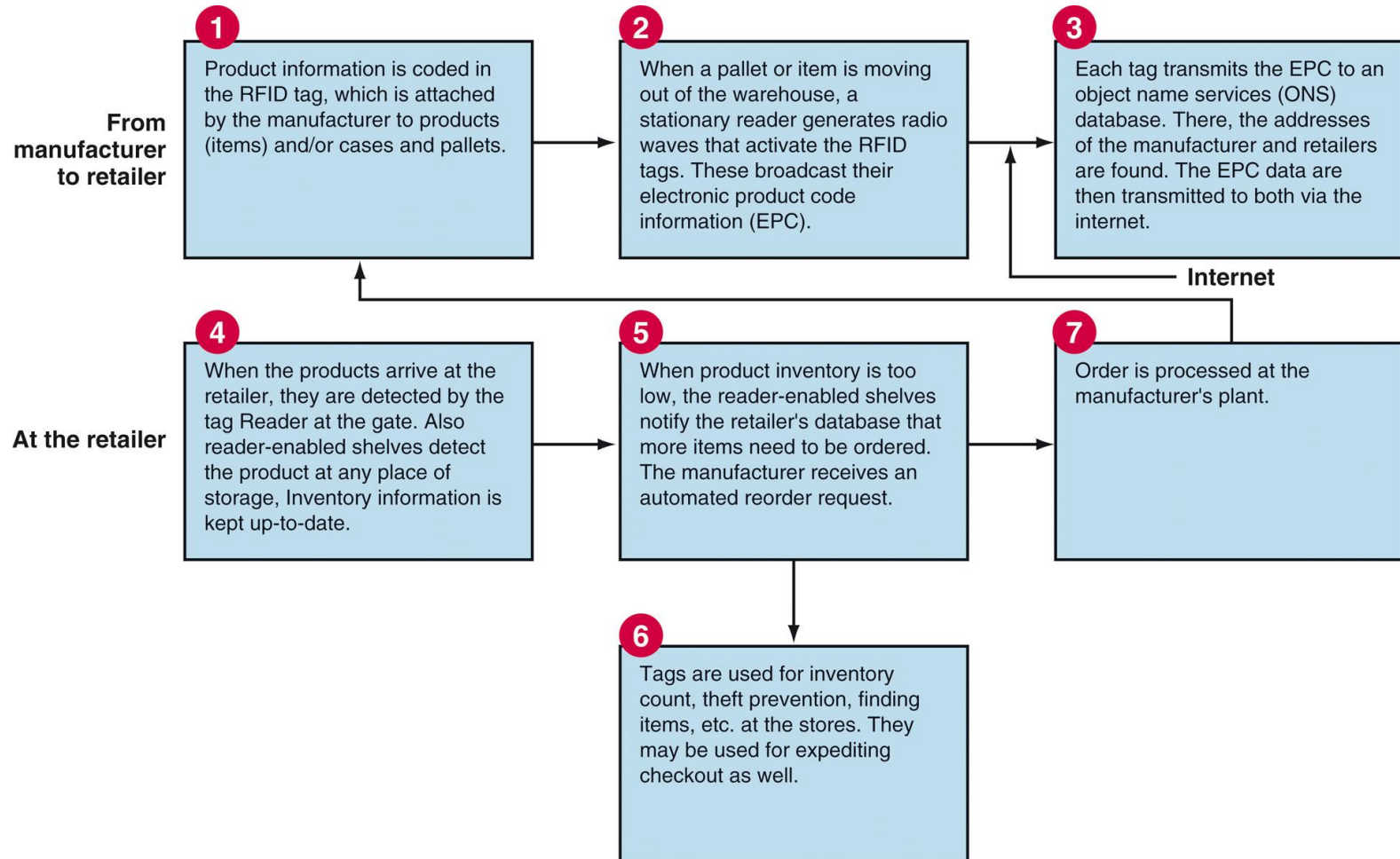 - The DDSN

IOS: Demand and DDSN

Benefits

- Agility

- Adaptability

- Alignment

IOS: Using the RFID Advantage

Grocery — SHOPWELL

Supply chain management system recognizes need for inventory

Retailer using RFID

INVENTORY NEEDED

Inventory management system sends request for more

Warehouse sends what inventory it can

Retailer's warehouse

RFID at warehouse directs trucks to docks

Finished goods trucks

Manufacturer

Supply chain management software also places orders for raw materials to begin production of additional products

Shipments to manufacturers

Manufacturer's logistics software locates supplier's trucks, reads RFID tags of contents, routes trucks to production

Suppliers

IOS: Using the RFID Advantage
(Continued)

From manufacturer to retailer

1 Product information is coded in the RFID tag, which is attached by the manufacturer to products (items) and/or cases and pallets.

2 When a pallet or item is moving out of the warehouse, a stationary reader generates radio waves that activate the RFID tags. These broadcast their electronic product code information (EPC).

3 Each tag transmits the EPC to an object name services (ONS) database. There, the addresses of the manufacturer and retailers are found. The EPC data are then transmitted to both via the internet.

Internet

At the retailer

4 When the products arrive at the retailer, they are detected by the tag Reader at the gate. Also reader-enabled shelves detect the product at any place of storage, Inventory information is kept up-to-date.

5 When product inventory is too low, the reader-enabled shelves notify the retailer's database that more items need to be ordered. The manufacturer receives an automated reorder request.

7 Order is processed at the manufacturer's plant.

6 Tags are used for inventory count, theft prevention, finding items, etc. at the stores. They may be used for expediting checkout as well.

Integrating Information

- Establish IT leadership
- Lowest integration risk possible
- Customer facing - a priority over back-office
- Retain personnel ($$$)
- Keep morale high ($$$)
- Maintain as rich communication as possible

Managerial Issues

- Selecting a system
- Partners Collaboration
- New infrastructure
- Globalization
- Using Exchanges, hubs, and other services
- Partner and supplier relationship management

Chapter 9

Chapter 10

Knowledge Management

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Learning Objectives

- Define knowledge and describe the different types of knowledge.
- Understand the concepts of organizational learning, memory, and the impact of organizational culture
- Describe the activities involved in knowledge management.
- Describe different approaches to knowledge management.
- Describe the issues associated with implementing knowledge management in organizations.

Learning Objectives (Continued)

- Describe the technologies that can be utilized in a knowledge management system.
- Describe the activities of the chief knowledge officer and others involved in knowledge management.
- Describe benefits as well as drawbacks to knowledge management initiatives.
- Understand the valuation approaches to KMS, as well as its successes and potential failures.
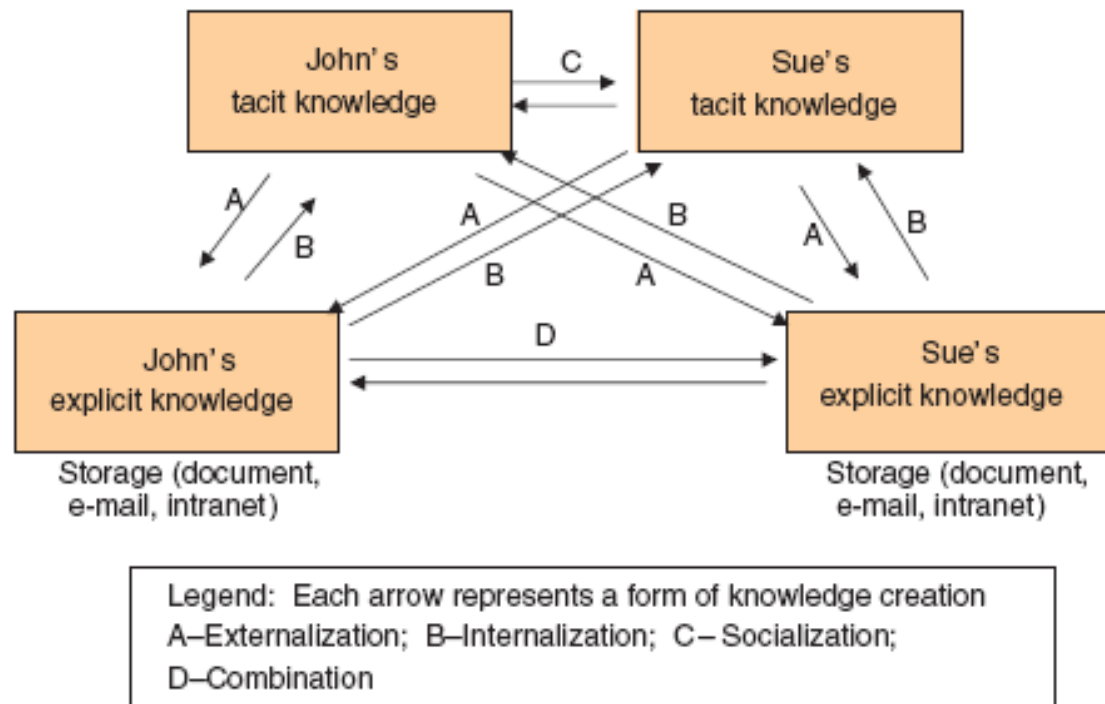
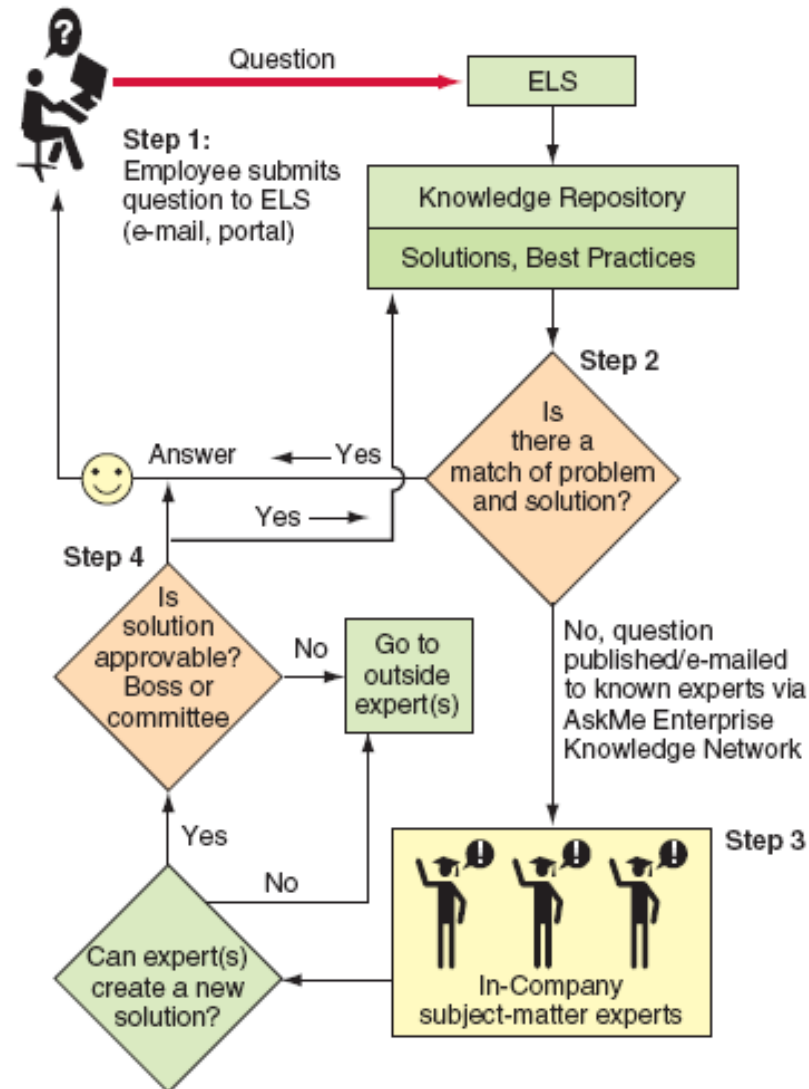# Data, Knowledge & Information

Knowledge – Knowledge Management Systems

Knowledge – Knowledge Management Systems (Continued)

- **Knowledge creation** or **knowledge acquisition** is the generation of new insights, ideas, or routines.

  - **Socialization mode** refers to the conversion of tacit knowledge to new tacit knowledge through social interactions and shared experience.

  - **Combination mode** refers to the creation of new explicit knowledge by merging, categorizing, reclassifying, and synthesizing existing explicit knowledge

  - **Externalization** refers to converting tacit knowledge to new explicit knowledge

  - **Internalization** refers to the creation of new tacit knowledge from explicit knowledge.

- **Knowledge sharing** is the exchange of ideas, insights, solutions, experiences to another individuals via knowledge transfer computer systems or other non-IS methods.

- **Knowledge seeking** is the search for and use of internal organizational knowledge.

Knowledge Management – Integration

Legend: Each arrow represents a form of knowledge creation
A–Externalization; B–Internalization; C – Socialization;
D–Combination

Expert Systems

Managerial Issues

- **Organizational culture change**

- **How to store tacit knowledge**

- **How to measure the tangible and intangible benefits of KMS. Determining the roles of the various personnel in a KM effort**

- **The lasting importance of knowledge management**

- **Implementation in the face of quickly changing technology**

Chapter 10