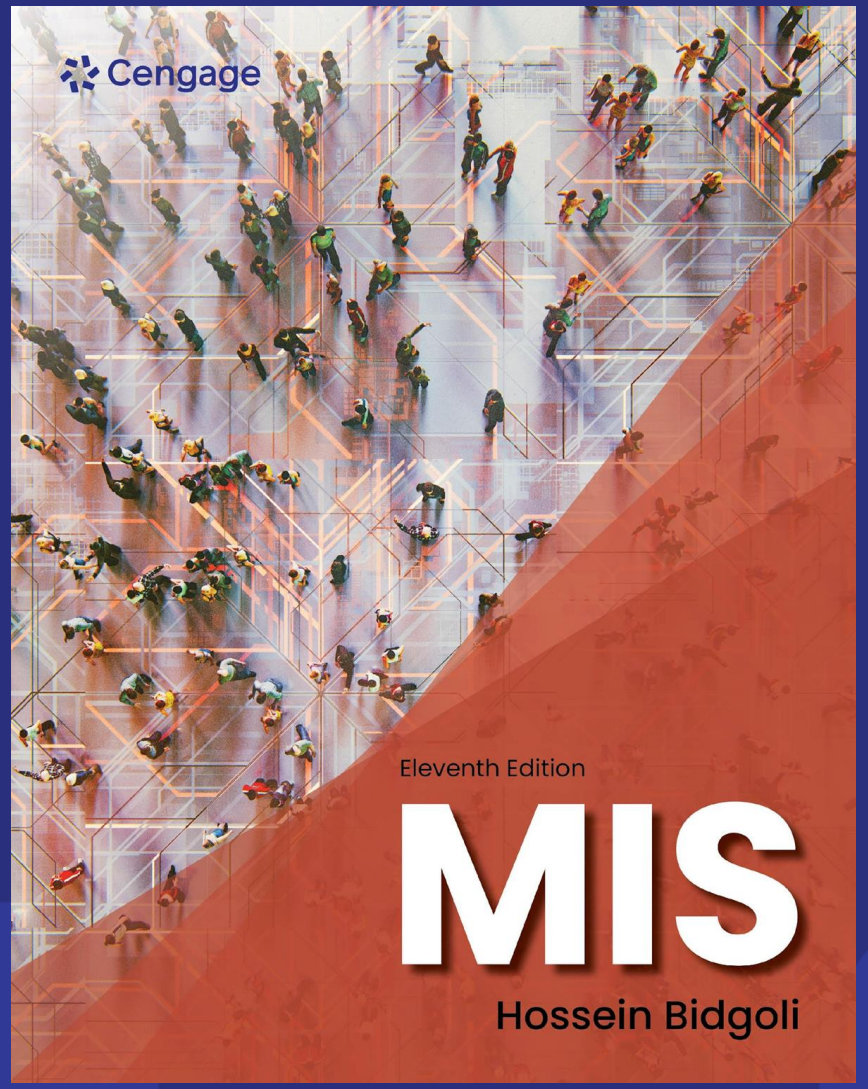


MIS, 11e

Module 11: Enterprise Systems

Module Objectives

By the end of this module, you should be able to:

11.1 Explain how supply chain management is used within an organization

11.2 Describe customer relationship management systems

11.3 Describe knowledge management systems

11.4 Describe enterprise resource planning systems

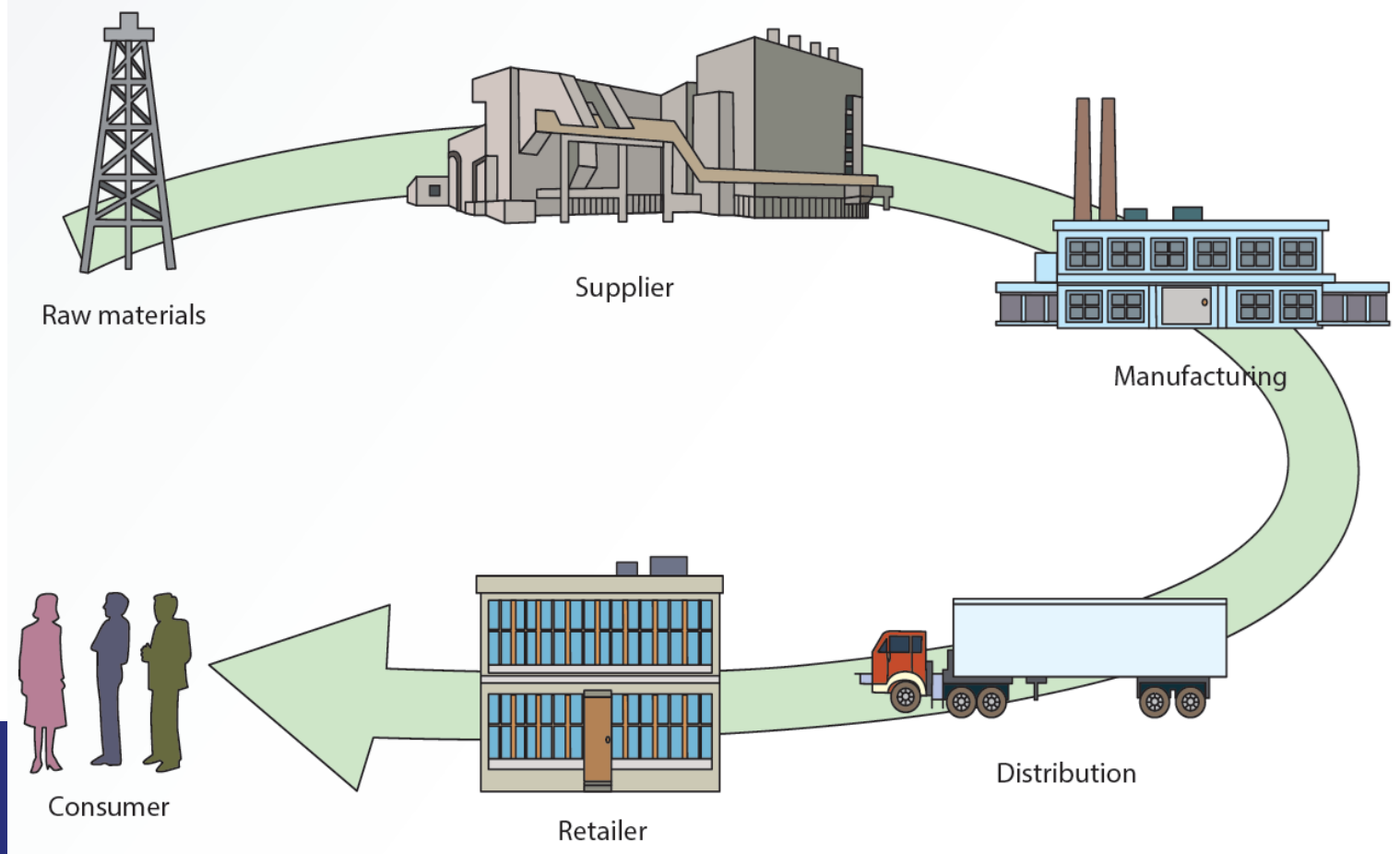
11.5 Explain advantages and disadvantages of cloud-based enterprise systems

Introduction

- Enterprise system
  - Application used in all the functions of a business
  - Supports decision making throughout the organization
  - Cloud-based enterprise systems are replacing traditional enterprise systems
- Enterprise resource planning system
  - Used to coordinate operations, resources, and decision making among manufacturing, production, marketing, and human resources

Supply Chain Management (1 of 3)

- Supply chain
  - Integrated network consisting of an organization, its suppliers, transportation companies, and brokers
  - Used to deliver goods and services to customers



Supply Chain Management

- Watch: https://www.youtube.com/watch?v=Lpp9bHtPAN0
- Supply chain management (SCM)
  - Process of working with suppliers and other partners in the supply chain
    - Aim is to improve procedures for delivering products and services
- SCM coordinates several functions
    - Procuring materials
    - Transforming materials into intermediate and finished products or services
    - Distributing finished goods to customers
- Communication in a firm's SCM system
    - Takes place among product flow, information flow, and finances flow

- Key decisions in SCM related to manufacturing
  - Location, inventory, production, and transportation
- Green logistics and green SCM
  - Includes all SCM activities while minimizing environmental impact
  - Growing trend

SCM Technologies

- Major tools in implementing an SCM system
  - Information technologies
  - The Internet

Electronic Data Interchange

- Enables business partners to exchange information on business transactions
  - Expedites the delivery of accurate information
- Traditional EDI
  - Uses proprietary protocols and networks to transmit documents
  - Cost per partner is higher when the number of partners is small
  - Reduced popularity
- Web-based EDI or Open EDI
  - Uses the Internet and Web protocols to transmit documents
  - Lowers cost of transmitting documents
  - Platform independent and easy to use

  - Watch: https://www.youtube.com/watch?v=6bdg8rFmq9Q

Internet-Enabled SCM

- Improves information sharing throughout the supply chain
  - Reduces costs for information transmission and improves customer service
- Improves several SCM activities
  - Purchasing, procurement and scheduling
  - Inventory management
  - Transportation
  - Order processing and customer service
  - Production scheduling

E-Marketplaces

- Third-party exchange (B2B model)
  - Provides a platform for buyers and sellers to interact and trade more efficiently online
- Help maintain a competitive edge
  - Provides opportunities for partnerships
  - Offers a single platform and reduces costs
  - Solves international time-constraint problems
  - Makes it easy to compare prices and products
  - Reduces marketing costs

- An e-distributor is an e-marketplace owned and operated by a third party that provides:
  - Electronic catalog of products
  - Maintenance, repair, and operations (MROs) services
  - Fast delivery of a wide selection of products and services at lower prices
  - Assistance for companies to reduce the time and expense of searching for goods

Online Auctions

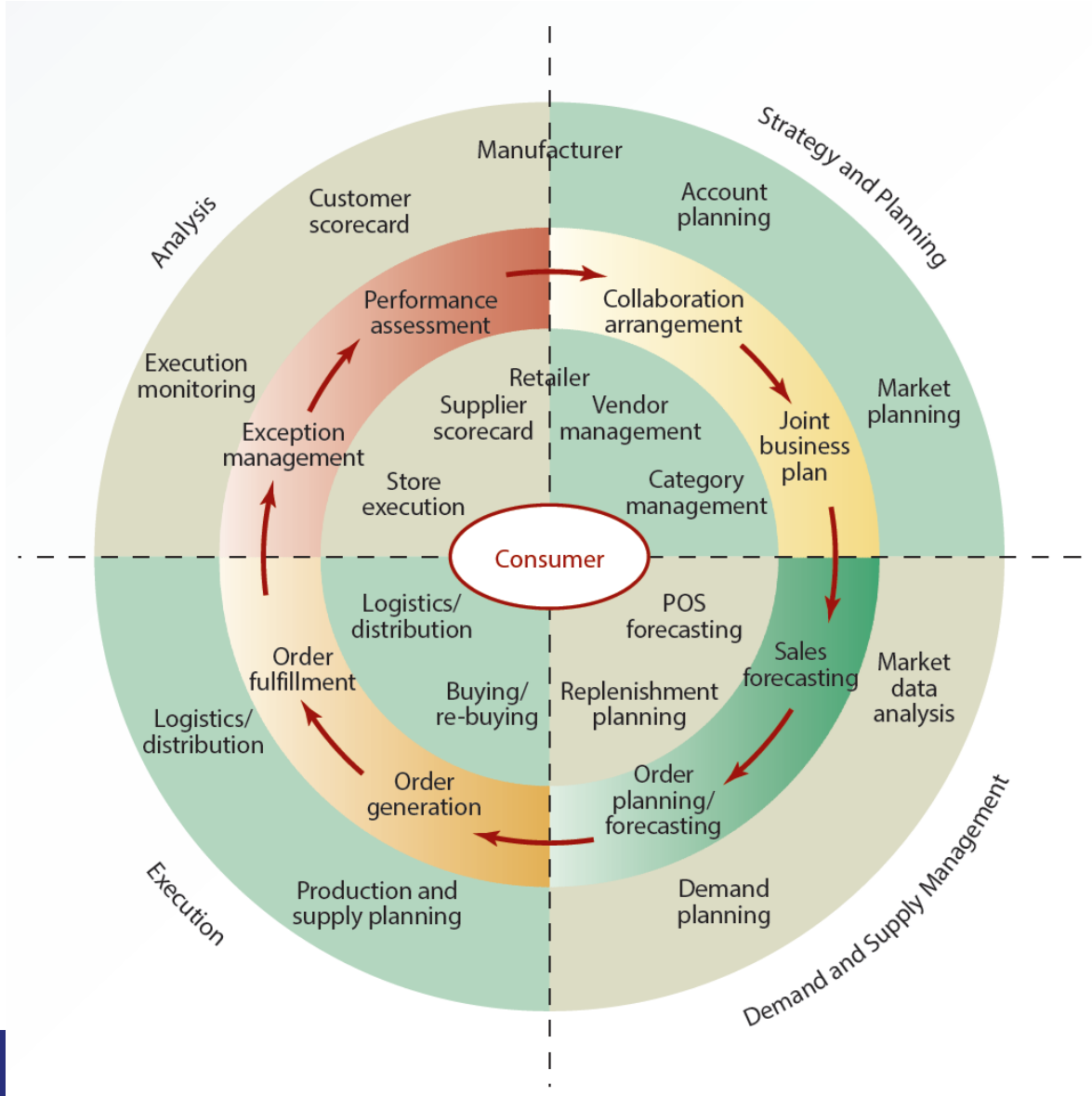
- Bring traditional auctions to customers around the globe
  - Make it possible to sell far more goods and services than at a traditional auction
  - Based on the brokerage business model
  - Cost-effective for selling excessive inventory
- Reverse auctions: sellers submit bids
  - One-to-many relationship

Collaborative Planning, Forecasting, and Replenishment (1 of 2)

- Used to coordinate supply chain members through point-of-sale (POS) data sharing and joint planning
  - Goal is to improve operational efficiency and manage inventory
- Advantage
  - Decreases merchandising, inventory, and logistics costs for all supply chain members
- Challenge
  - Coordinating supply chain can be difficult

Collaborative Planning, Forecasting, and Replenishment

- Collaboration is the agreement between all supply chain partners that establishes how:
  - Data is shared
  - Problems with overstock are solved
  - Costs are shared or minimized
- Exception management
  - Planning for handling unforeseen problems
  - Lessons learned can be used in future planning



3D Printing

- AKA additive manufacturing
  - Making an object from a three-dimensional digital model
- Plays a major role in SCM
  - Significant reduction in manufacturing times
  - Effectiveness in meeting customer demands
  - Elimination of the need to carry inventory
  - Quicker delivery of designs to market
  - Efficiency in use of materials

  - Watch: https://www.youtube.com/watch?v=Vx0Z6LplaMU

4D Printing

- Based on 3D printing
  - Able to prompt the printed object to change in response to external factors
    - Can change shape and structure based on temperature, light, and other stimuli
    - Able to self-assemble and reshape themselves
- Popular applications in aerospace, defence, medical, automotive, and consumer goods

- https://www.youtube.com/watch?v=0gMCZFHv9v8

Drones

- Specialized robots designed to fly and perform certain automated tasks
  - Available in various shapes and sizes
  - Vary in sophistication
- Several SCM uses
  - Count, carry, and deliver inventory in warehousing
  - Last-mile delivery of groceries, clothing, medications
  - Supervise animals and treat crops in agriculture
  - Performing maintenance tasks in dangerous environments
  - Inspecting infrastructure and insurance claims

Watch: https://www.youtube.com/watch?v=DOWDNBu9DkU

Internet of Things (IoTs)

- Growing number of IoT devices continues to grow
- Helps convert reactive process to a proactive process
- Helps achieve several SCM goals
  - Reduces inventory loss in warehouses or in transit
  - Reduces fuel costs
  - Ensures temperature stability during product transit
  - Manages warehouse inventory for out-of-stock inventory
  - Improves customer service and gathers BI on product usage

Radio Frequency Identification

- RFID tag provides unique identification for card or object carrying it
- Does not require contact with the scanner, can be read at a distance
- Two types of RFID tags
  - Passive tags have no internal power supply
  - Active tags have internal power supply
- Applications in tracking and identification, payment, access control, anti-counterfeiting, and health care
- Disadvantages include security and privacy issues, jamming, difficulty in removing

- Watch: https://www.youtube.com/watch?v=cJXvT2THdDE

Quick Response (QR) Codes

- Matrix barcode with large storage capacity than standard UPC codes.
- Popular as a marketing tool
- High capacity, small size, dirt resistance, omni-directional readability, Japanese character set compatibility.

Global Supply Chain Management

- Incorporates management processes around the world to integrate suppliers, manufacturers, warehouses, and retails outlets
- Requires global flow of information, materials, and finances throughout chain
- Benefits:
  - Expanded sourcing opportunities, increased markets, extended growth opportunities
- Drawbacks
  - Inventory and distribution issues, high risks, global competition, information collection, legal complexity

Customer Relationship Management (CRM)

- Watch: https://www.youtube.com/watch?v=sQD7kaZ5h0s
- The processes a company uses to track and organize its contacts with customers
  - Goal is to improve services offered to customers
- Uses customer contact information for targeted marketing
  - Helps organizations make better use of data, information, and knowledge to understand customers
- Marketing strategies focus on long-term relationships and include:
  - Identifying customer segments and a company's profitable and loyal customers
  - Improving products to meet customer needs and customer retention
- Provides a complete picture of an organization's customers
  - Complex analysis of customer data
- Activities in a CRM System: Sales automation, Order processing, Marketing, automation, Customer support, Knowledge management, Personalization technology

CRM Applications

- Implemented with one of two approaches
  - On-premises CRM
  - Web-based CRM
- Software packages available for setting up a CRM system
  - Salesforce CRM, SAP CRM, and Oracle CRM
- Features of CRM packages
  - Salesforce automation
  - eCRM or Web-based CRM
  - Survey management
  - Automated customer service

Personalization Technology (1 of 2)

- Personalization
  - Process of satisfying customers' needs, building customer relationships, and increasing profits
  - Achieved by designing goods and services that meet customers' preferences better
- Customization
  - Allows customers to modify the standard offering
  - Example: selecting a different home page to be displayed each time the Web browser is opened
- Requires gathering customer information
  - May affect customers' sense of privacy
- Implementation requires: Internet and databases, Data warehouse/data marts, Data-mining tools, Mobile networks, Collaborative filtering (CF)

Personalization Technology (2 of 2)

- Collaborative Filtering (CF)
  - Search for specific information or patterns using input from multiple business partners and data sources
  - Identifies groups of people based on common interests and recommends products
  - Works well for a single product category
- Collaborative filtering drawbacks
  - Needs a large sample of users and content to work well
  - Fails to make recommendations across unrelated categories
- Application
  - Making automatic predictions about customer preferences based on similar users

Knowledge Management (KM)

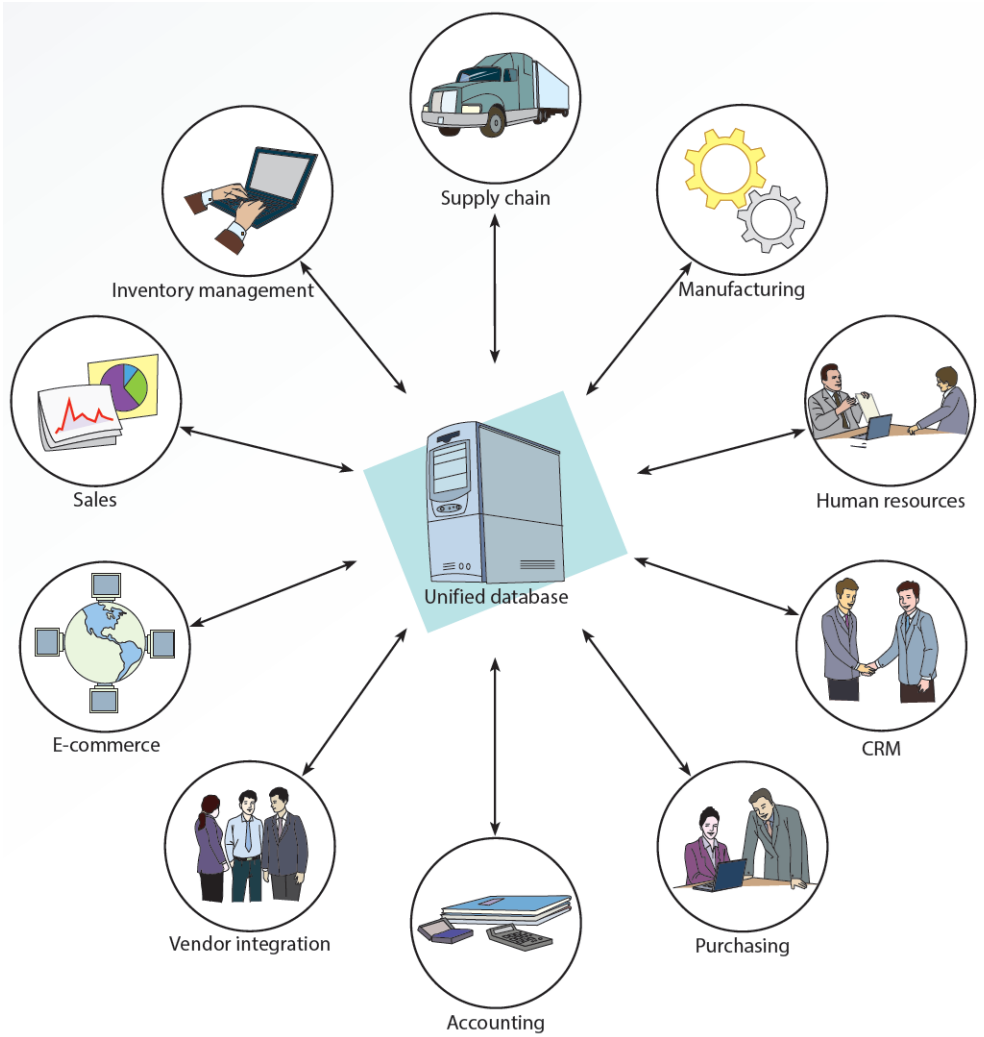
- Watch: https://www.youtube.com/watch?v=-XPbfsl3WGo
- Technique used to improve CRM systems
  - Identifying, storing, and disseminating “know-how”— facts about how to perform tasks
- Draws on concepts of organizational learning, culture, and best practices to:
  - Convert tacit knowledge into explicit knowledge
  - Create a knowledge-sharing culture in an organization
  - Eliminate obstacles to sharing knowledge
- Knowledge repository can be created by storing knowledge captured from experts
  - Can be accessed by employees when needed and used when new products are designed
- Tracks how often an employee participates in knowledge-sharing interactions
  - Can be used to reward employees

Knowledge Management (KM)

- Tools and technologies
  - Groupware to create, manage, and distribute documents in an organization
  - DBMSs and data-mining tools
  - Decision support systems
- Contributions to an organization
  - Promotes innovation
  - Reduces response time and improves customer service
  - Increases revenue by reducing delivery time
  - Improves employee retention by rewarding knowledge

Enterprise Resource Planning (ERP)

- Watch: https://www.youtube.com/watch?v=jjyn0QMl0Fc
- Integrated planning system
  - Collects and processes data
  - Manages and coordinates resources, information, and functions
  - Includes hardware, software, procedures, and input from all functional areas
  - Systems use a unified database to store data for various functions



Components	Functions
Purchasing	Provides information related to the purchasing function, including e-procurement
Accounting	Tracks financial information, such as budget allocations and debits and credits
Vendor integration	Integrates information for vendors, such as offering automated downloads of data on product pricing, specifications, and availability
E-commerce	Provides B2C information related to order status and B2B information related to suppliers and business partners
Sales	Provides information on sales and marketing

Components	Functions
Unified database	Collects and analyzes relevant internal and external data and information needed by other functions
Inventory management	Provides inventory status and inventory forecasts
Supply chain	Provides information on supply chain members, including suppliers, manufacturing, distribution, and customers
Manufacturing	Provides information on production costs and pricing
Human resources	Provides information on assessing job candidates, scheduling and assigning employees, and predicting future personnel needs
CRM	Provides information on customers and their needs and preferences

Enterprise Resource Planning (ERP)

- Benefits of a well-designed ERP system
  - Increased availability and timeliness of integrated information
  - Increased data accuracy and response time
  - Improved customer and employee satisfaction, planning and scheduling, supplier relationship
  - Improved reliability of information
  - Reduced inventory costs, labor costs, and order-to-fulfillment time

- Drawbacks
  - High cost
  - Difficulties in installation
  - Need for extensive training
  - Compatibility problems with legacy systems
- Available as modules so organizations can purchase only required components
  - Keeps costs down

Cloud-Based Enterprise Systems

- System managed by a cloud provider instead of on premise
- Advantages
  - Lower cost, paid incrementally
  - Increased storage, highly automated
  - Increased flexibility, scalability, mobility
  - Frees up in-house IT resources
  - Improved security
- Challenges
  - Lack of customization
  - Possible downtime
  - Vendor lock-in

Knowledge Check Activity 1-1

A supply chain is

a. a flow of raw material for production.

b. a network of personnel, administrators, logistics, information, and resources involved in delivering a product to consumers.

c. the process of documenting information regarding all personnel involved in production.

d. the process of ensuring transparency in the procurement of raw materials.

Knowledge Check Activity 1-1: Answer

A supply chain is

Answer: b. a network of personnel, administrators, logistics, information, and resources involved in delivering a product to consumers.

A supply chain is an integrated network that links the roles of all entities involved from production to distribution of products

Polling Activity 1-1

It’s time to take a poll! Get your devices ready and open your [Kahoot] app. You can join the poll using this link/PIN: [enter link or PIN]

3D and 4D printing facilitate which step of an SCM?

a. Determining demand and planning production
b. Transportation of finished products to consumers
c. Development and customization of products
d. Responding to customer complaints

Polling Activity 1-1: Answer

3D and 4D printing facilitate which step of an SCM?

Answer: c. Development and customization of products

Using fast 3D and 4D printed prototypes, product development time can be reduced and products can be configured more flexibly

Discussion Activity 1-1

In a large dairy farm operated by a dairy product manufacturer, cattle are required to be milked a fixed number of times every week. The farm workers who carry out milking currently identify cattle by sight and manually keep track of cattle that need to be milked each day. They have requested management to provide a more effective method of keeping track of this process.

Discuss a possible solution with your classmates.

Discussion Activity 1-1: Answer

In a large dairy farm operated by a dairy product manufacturer, cattle are required to be milked a fixed number of times every week. The farm workers who carry out milking currently identify cattle by sight and manually keep track of cattle that need to be milked each day. They have requested management to provide a more effective method of keeping track of this process.

Discuss a possible solution with your classmates.

Answer: Equip cattle with RFID chips (e.g. in their collars)

Explanation: By scanning the RFID chips, farm workers will be able to identify cattle and record the times they have been milked, and therefore determine a list of cattle to be milked on a particular day

Self Assessment

Suppose you set up a business to sell used books to students in your institution. The process involves collecting books from past students and listing them on a webpage for sale to current students, and then repeating the process every semester.

What would the supply chain configuration look like for this business? What supply chain management steps will be required to operate the business efficiently? How would you go about implementing them?

Summary

- Supply chains exist in both service and manufacturing organizations
  - CRM systems help organizations make better use of data and knowledge to understand their customers
  - KM systems are used to improve efficiency of CRM systems
  - ERP systems use a unified database to store data for various functions
  - Cloud-based SCMs, CRMs, and ERPs are popular alternatives to on-premise systems