



**Atria Institute of Technology**  
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**Subject Name : Information Management  
System**

**Subject Code : 18IS645**

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# **MODULE 1**

## **2.1 Information Systems in Business**

### **2.1.1 Introduction**

- Information technology can help all kinds of businesses improve the efficiency and effectiveness of their business processes, managerial decision making, and workgroup collaboration, thus strengthening their competitive positions in a rapidly changing marketplace.
- Internet-based systems have become a necessary ingredient for business success in today's dynamic global environment.
- Information technologies are playing an expanding role in business.

### **2.1.2 The Real World of Information system**

An information system (IS) can be any organized combination of people, hardware, software communications networks and data resources that stores and retrieves, transforms and disseminates information in an organization. People have relied on information systems to communicate with each other using a variety of physical devices (hardware), information processing instructions and procedures (software), communication channels (network) and stored data (data resources)

#### **Systems vs. Information Technology**

- Information Systems (IS) – all components and resources necessary to deliver information and information processing functions to the organization
- Information Technology (IT) – various hardware components necessary for the system to operate

#### **Types of Information Technologies**

- **Computer Hardware Technologies**

Including microcomputers, midsize servers, and large mainframe systems, and the input, output, and storage devices that support them

- **Computer Software Technologies**

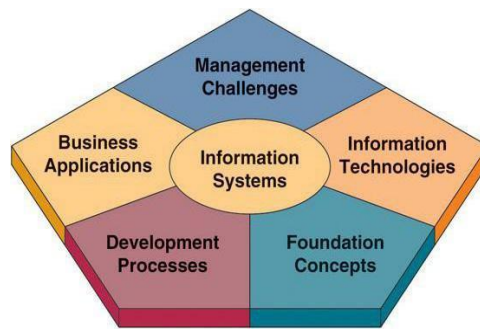
Including operating system software, Web browsers, software productivity suites, and software for business applications like customer relationship management and supply chain management

- **Telecommunications Network Technologies**

including the telecommunications media, processors, and software needed to provide wire-based and wireless access and support for the Internet and private Internet-based networks

- **Data Resource Management Technologies**

including database management system software for the development, access, and maintenance of the databases of an organization



### Conceptual Framework of IS Knowledge

An Is frame work for business professionals above fig illustrates a usefull conceptual framework that organizes the knowledge presented in this text nad outlines what you need to know about information systems.

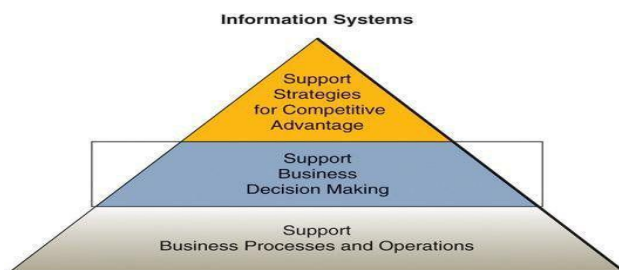
**Foundation concepts.** Fundamental behaviour, technical, business and managerial concepts about the components and roles of information system. examples include basic information system concepts derived from general systems theory. **Information technologies.** major concepts ,developments and management issues in information technology that is hardware,software, networks data management and many internet based technologies.

**Business applications.**the major uses of information systems for the operations, management, and competitive advantage of a business.

**Development process.** how business professionals and information specialists plan, develop, and implement information systems to meet business opportunities

**Management challenges.** The challenges of effectively and ethically managing information technology at the end user,enterprise and global levels of a business

### Roles of IS in Business



- There are three fundamental reasons or all bisness applications of information technology
- Support of its business processes and operations
- Support of decision making by employees and managers
- Support of its strategies for competitive advantages

### Trends in Information Systems

Until the 1960s, the role of most information systems was simple: transaction processing, record-keeping, accounting, and other electronic data processing (EDP) applications.

Then another role was added, as the concept of management information systems (MIS) was conceived.

By the 1970s, it was evident that the prespecified information products produced by such management information systems were not adequately meeting many of the decision-making needs of management. So the concept of decision support systems (DSS) was born. The new role for information-making processes.

In the 1980s, several new roles for information systems appeared. First, the rapid development of microcomputer processing power, application software packages, and telecommunications networks gave birth to the phenomenon of end user computing. End users could now use their own computing resources to support their job requirements instead of waiting for the indirect support of centralized corporate information services departments.

Executive's information systems (EIS) were developed. These information systems were created to give top executives an easy way to get the critical information they want, when they want it, tailored to the formats they prefer.

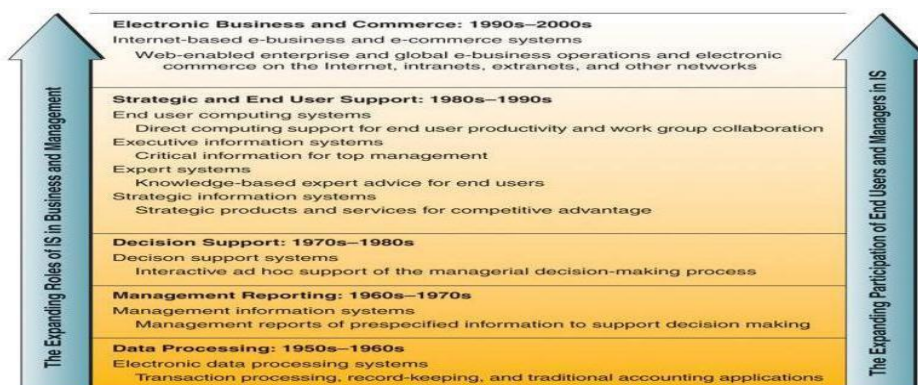
Expert systems (ES) and other knowledge-based systems also forged a new role for information systems. Today, expert systems can serve as consultants to users by providing expert advice in limited subject areas.

This is the concept of a strategic role for information systems, sometimes called strategic information systems (SIS), in this concept; information technology becomes an integral component of business processes, products, and service that help a company gain a competitive advantage in the global marketplace.

The mid -to late 1990s was the revolutionary emergence of enterprise resource planning (ERP) systems. This organization - specific form of strategic information systems integrates all facets of a firm, including its planning, manufacturing , sale, resources, and marketing—virtually every business function .

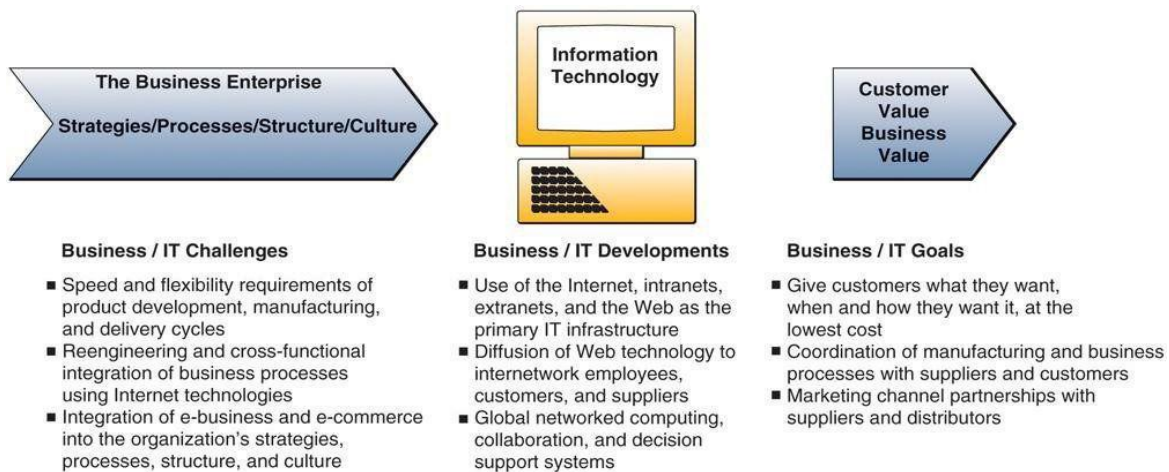
ERP systems lies in their common interface for literally all computer-based organizational function and tight integration and data sharing necessary for flexible strategic decision making.

Finally, the rapid growth of the internet, intranets, extranets, and other interconnected global networks in the 1990s dramatically changed the capabilities of information systems in business at the beginning of the twenty- first century. Internet-based and Web-enabled enterprise and Gloabal electronic business and commerce systems are becoming commonplace in the operations and management of today's business enterprises.



## Management Challenges & Opportunities

Below fig illustrates the scope of the challenges and opportunities facing business managers and professionals in effectively managing information systems and technologies. Also emphasis that information systems and their technologies must be managed to support the business strategies, business process and organizational structures and culture of a business enterprise. the goal of many companies today is to maximize their customer and business value by using information technology to support their employees in implementing cooperative business process with customer ,suppliers and others.



## Measures of Success

IS SHOULD NOT BE MEASURED ONLY BY ITS EFFICIENCY

- Efficiency
  - Minimize costs
  - Minimize time
  - Minimize the use of information resources

Success should also be measured by its effectiveness of IT

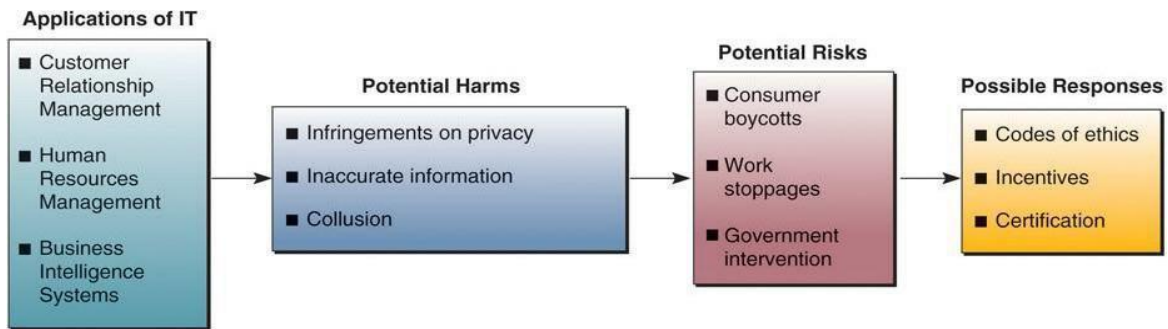
- Effectiveness
  - Support an organization's business strategies
  - Enable its business processes
  - Enhance its organizational structure and culture
  - Increase the customer business value of the enterprise

## Developing IS Solutions



The several major activities must be accomplished and managed in a complete IS development cycle. In this development process, end users and information specialists design information system application based on an analysis of the business requirements of an organization. Examples of other activities include investigating the economic or technical feasibility of proposed application, acquiring and learning how to use the software required implementing the new system, and making improvements to maintain the business value of a system

## Ethical Challenges of IT



As a prospective managers order you will be challenged by the ethical responsibilities by the use of information technology. For example what uses of IT might be considered improper ,irresponsible or harmful to other individuals to society.

## IT Career Trends

- Rising labor costs have resulting in large-scale movement to outsource programming functions to India, the Middle East and Asia-Pacific countries.
- More new and exciting jobs emerge each day as organizations continue to expand their wide-scale use of IT.
- Frequent shortages of qualified information systems personnel.
- Constantly changing job requirements due to dynamic developments in business and IT ensure long-term job outlook in IT remains positive and exciting.

## The IS Function represents

- A major functional area of business equally as important to business success as the functions of accounting, finance, operations management, marketing, and human resource management.
- An important contributor to operational efficiency, employee productivity and morale, and customer service and satisfaction.
- A major source of information and support needed to promote effective decision making by managers and business professionals.
- A vital ingredient in developing competitive products and services that give an organization a strategic advantage in global marketplace.
- A dynamic, rewarding, and challenging career opportunity for millions of men and women.

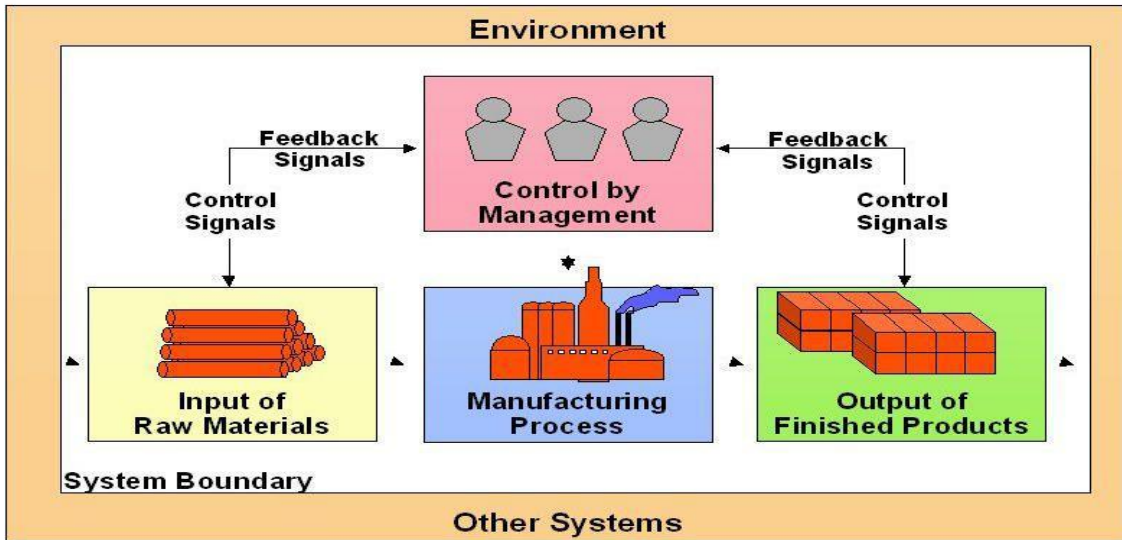
- A key component of the resources, infrastructure, and capabilities of today's networked business enterprise.

### What is a System?

#### Definition:

A group of interrelated components, with a clearly defined boundary, working together toward a common goal by accepting inputs and producing outputs in an organized transformation process.

### What is a System?



#### System Components

- Input – capturing and assembling elements that enter the system to be processed for example raw materials must be secured and organized for processing.
- Processing – transformation steps that convert input into output examples are a manufacturing process, human breathing process
- Output – transferring elements that have been produced by a transformation process to their ultimate destination for example finished products

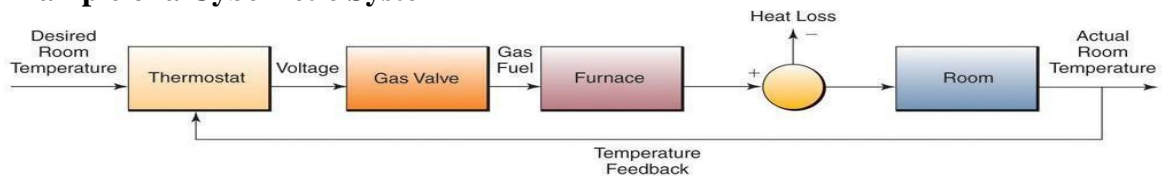
#### Cybernetic Systems

##### Definition:

a self-monitoring, self-regulating system.

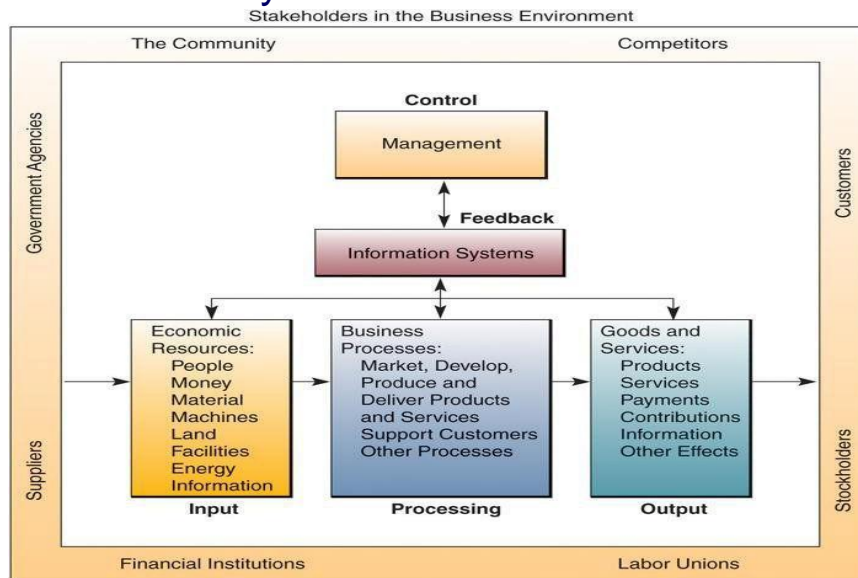
- Feedback – data about the performance of a system
- Control – monitoring and evaluating feedback to determine whether a system is moving toward the achievement of its goal

#### Example of a Cybernetic System

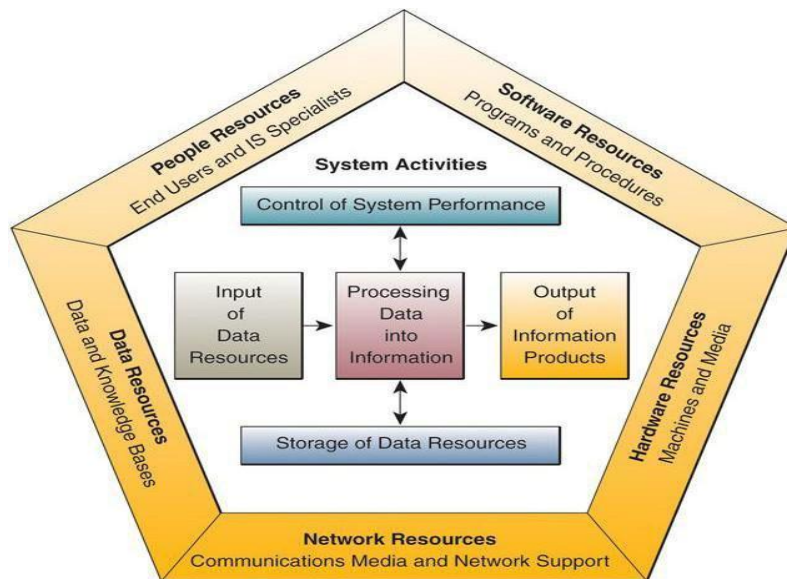




# A Business System



## Resources & Activities IS Resources & Activities



### Information System Resources

- People – end users and IS specialists
- Hardware – physical devices and materials used in information processing including computer systems, peripherals, and media
- Software – sets of information processing instructions including system software, application software and procedures
- Data – facts or observations about physical phenomena or business transactions
- Network – communications media and network infrastructure

### People resources End users

People are the essential ingredient for the successful operation of all information system

End users (also called users or clients) are the people who use an information system or the information it produces. They can be customers, salespersons, engineers, clerks, managers. Most end users are knowledge workers that is people who spend most of their time communicating and collaborating in teams and workgroups and creating using and distributing information

### **IS specialist**

People who develop and operate information systems. they include systems analysts, software developers, system operators and other managerial, technical and clerical IS personnel. Software developers create computer programs based on the specifications of system analysts

### **Hardware resources**

The concept of hardware resources includes all physical devices and materials used in information processing, it includes not only machines such as computers and other equipment but also data media data are recorded from sheets of paper to magnetic disk

**Computer systems** which consist of central processing units containing microprocessors and a variety of interconnected peripheral devices. Example laptop

**Computer peripherals** which are devices such as a keyboard or electronic mouse for input of data and commands

### **Software resources**

The concept of software resources includes all sets of information processing instructions. this concept includes not only the sets of operating instructions called programs which direct and control the hardware but also sets of information processing instructions called procedures

The following are the examples of software resources

**System software.** Such as an operating system program, which controls and supports the operation of a computer system

**Application software** which are the programs that direct processing for a particular use of a computer by end users

**Procedures** which are operating instructions for the people who will use an information system

### **Data resources**

Data are more than a raw material of information systems

Data that were previously captured as a result of common transaction are now stored, processed and analyzed using sophisticated software applications that can reveal complex relationships about sales, customers, competitors and market.

Text data consisting of sentences and paragraphs used in written communications image data, such as graphic shapes and figures and video images and audio data, the human voice and other sounds are also important forms of data

- **Data** – raw facts or observations typically about physical phenomena or business transactions for specific end users.

Data resources of IS are typically organized, stored, and accessed by a variety of data resources management technologies into:  
 Databases that hold processed and organized data  
 Knowledge bases that hold knowledge in a variety of form such as facts, rules

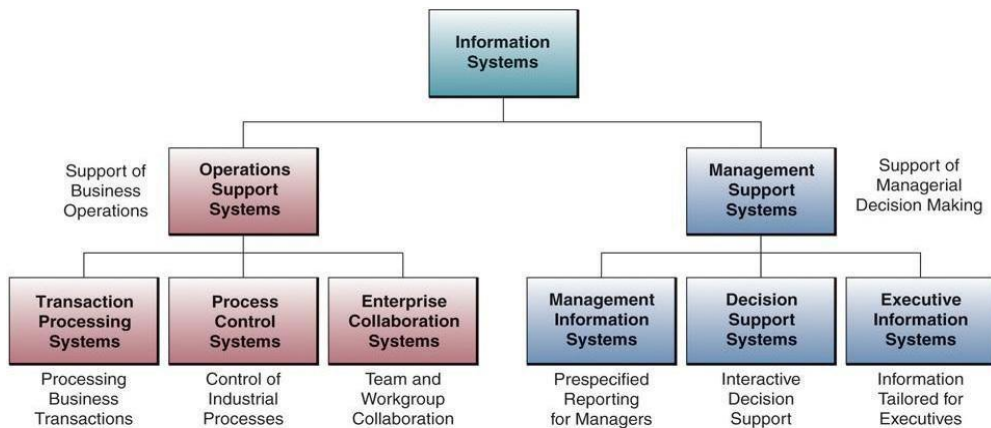
### Data versus Information



### Network Resources

- Communications Media – examples include twisted-pair wire, coaxial and fiber-optic cables, microwave, cellular, and satellite wireless technologies
- Network Infrastructure – examples include communications processors such as modems and internet work processors, and communications control software such as network operating systems and Internet browser packages.

### Types of Information Systems



### Operation Support Systems

- Information systems that process data generated by and used in business operations
- Goal is to efficiently process business transactions, control industrial processes, support enterprise communications and collaboration, and update corporate databases

## **Examples of Operations Support Systems\**

- Transaction Processing Systems (TPS) – process data resulting from business transactions, update operational databases, and produce business documents. They process data in two ways .In batch processing, transactions data are accumulated over a period of time and processed periodically. In real time processing data are processed immediately after a transaction occurs
- Process Control Systems (PCS) – monitor and control industrial processes. for example, a petroleum refinery uses electronic sensors linked to computers to continually monitor chemical processes and make instant adjustments that control the refinery process.
- Enterprise Collaboration Systems – support team, workgroup, and enterprise communications an collaboration. for example ,knowledge workers in a project team may use electronic mail and receive electronic messages,and videoconferencing to hold electronic meetings to coordinate their activities.

## **Management Support Systems**

Information systems that focus on providing information and support for effective decision making by managers

- Management Information Systems (MIS) – provide information in the form of pre-specified reports and displays to support business decision making.
- Decision Support Systems (DSS) – provide interactive ad hoc support for the decision making processes of managers and other business professionals. for example ,an advertising managers may use a DSS to perform a what if analysis as a part of a decision to determine where to spend advertising dollars
- Executive Information Systems (EIS) – provide critical information from MIS, DSS, and other sources tailored to the information needs of executives. for example top executives may use touch screen terminals to instantly view text and graphics displays that highlights key areas of organizational and competitive performance

## **Operational & Managerial IS**

- Expert Systems – provide expert advice for operational chores or managerial decisions example: credit application advisor, process monitor
- Knowledge Management Systems – support the creation, organization, and dissemination of business knowledge to employees and managers Example: Internet access to best business practices, and customer problem resolution system

## **IS Classifications by Scope**

- Functional Business Systems – support basic business functions. Examples information systems that support applications in accounting,finance,marketing,operations management and human resource management
- Strategic Information Systems – support processes that provide a firm with strategic products, services, and capabilities for competitive advantage
- Cross-functional Information Systems – integrated combinations of information systems

## **Information Systems Activities**

- Input of Data Resources
  - Processing of Data into Information
-

- Output of Information Products
- Storage of Data Resources
- Control of System Performance

**Input of data resources** data about business transactions and other events must be captured and prepared for processing by the input activity. Input typically takes the form of data entry activities such as recording and editing. end user typically enter data directly into a computer system. This usually includes a variety of editing activities to ensure that they have recorded data correctly. Once entered, data may be transferred onto a machine-readable medium such as magnetic disk until needed for processing.

**Input of data resources** data about business transactions and other events must be captured and prepared for processing by the input activity. Input typically takes the form of data entry activities such as recording and editing. end user typically enter data directly into a computer system. This usually includes a variety of editing activities to ensure that they have recorded data correctly. Once entered, data may be transferred onto a machine-readable medium such as magnetic disk until needed for processing.

### **Processing of data into information**

Data are typically subjected to processing activities such as calculating, comparing, sorting, classifying and summarizing. These activities organize, analyze, and manipulate data, thus converting them into information for end users.

For example. Data received about a purchase can 1) added to a running total of sales results 2) compared to a standard to determine eligibility for a sales discount 3) sorted in numerical order based on product identification numbers 4) classified into product categories 5) summarized to provide a sales manager with information about various product categories and finally 6) used to update sales record

### **Output of information products**

Information in various forms is transmitted to end users and made available to them in the output activity. the goal of information systems is the production of appropriate information products for end users common information products include messages, reports, forms, and graphic images. for example, a sales manager may view a video display to check on the performance of a sales persons .

### **Storage of data resources**

Storage is basic system component of information systems. storage is the information system activity in which data and information are retained in an organized manner for use. For example text material is organized into words, sentences, paragraphs and documents, stored data are commonly organized into a variety of data elements and databases

**Control of system performance control of system performance.** An information system should produce feedback about its input, processing, output, and storage activities. This feedback must be monitored and evaluated to determine if the system is meeting established performance

## **MODULE 2**

# ELECTRONIC COMMERSE SYSTEM

## What is E-Business

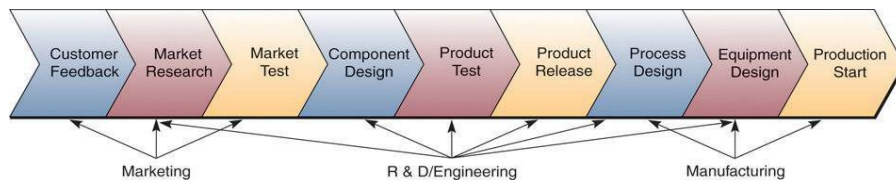
The use of the Internet and other networks and information technologies to support electronic commerce, enterprise communications and collaboration, and Web-enabled business processes, both within a networked enterprise and with its customers and business partners.

## Cross-Functional Enterprise Systems

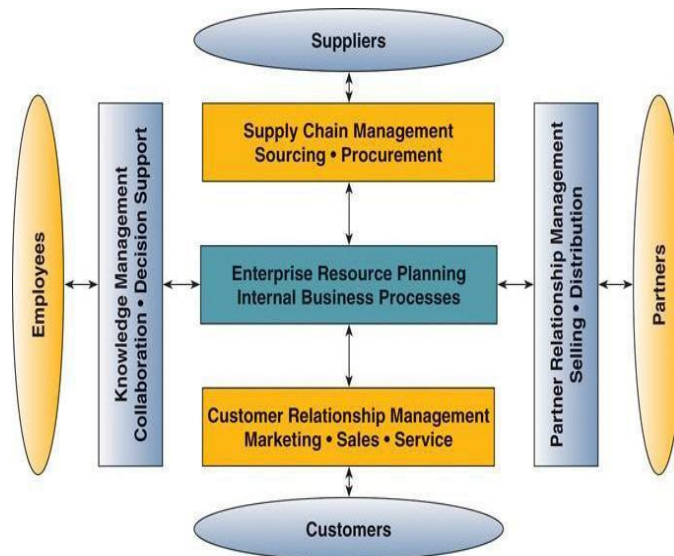
### Definition:

Information systems that cross the boundaries of traditional business functions in order to reengineer and improve vital business processes all across the enterprise

### Cross-Functional Information Systems



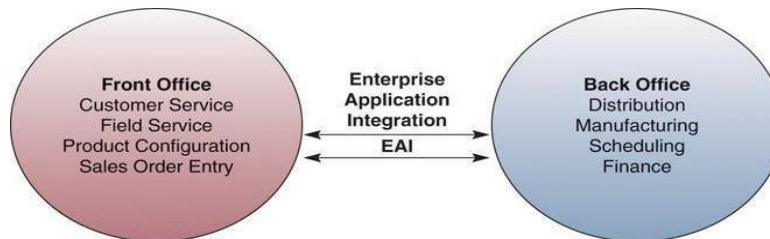
## Enterprise Application Architecture



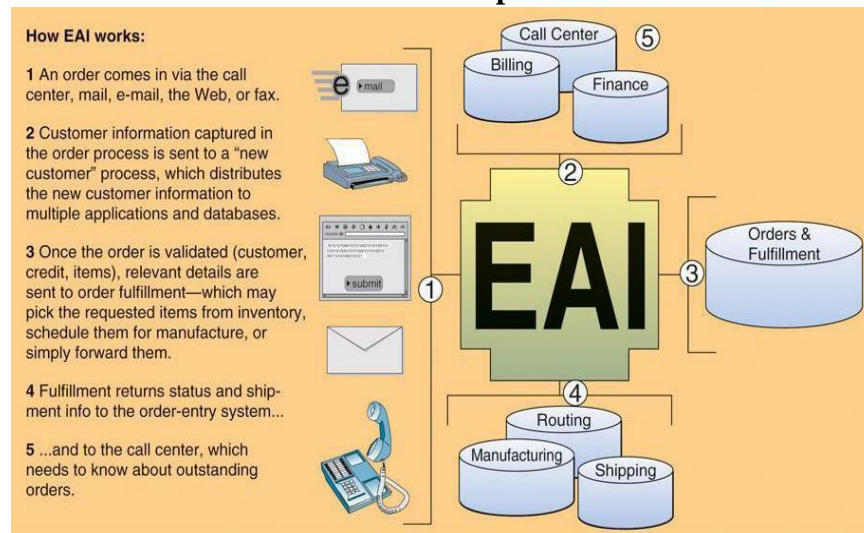
## Enterprise Application Integration (EAI)

### Definition:

- Software that integrates a variety of enterprise application clusters by letting them exchange data according to rules derived from the business process models developed by users



### EAI Example



## Transaction Processing Cycle

### Definition:

- Cross-functional information systems that process data resulting from the occurrence of business transactions
- Transactions – events that occur as part of doing business
- Online Transaction Processing Systems (OLTP) – real-time systems that capture and process transactions immediately

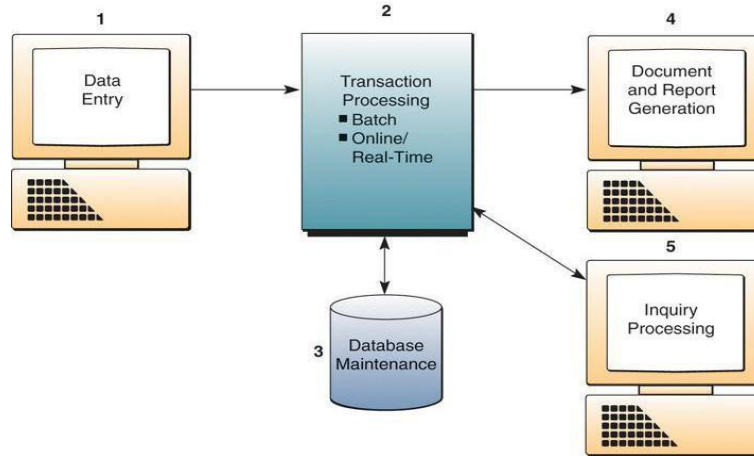
## Transaction Processing Cycle

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- **Data Entry** – capture of business data for example transaction data may be collected by point of sale terminals using optical scanning bar codes and credit card readers at a retail stores. the proper recording and editing of data so they quickly and correctly captured for processing is one of the major design challenges of IT.
- **Transaction Processing**
  - Transaction processing systems process data in two basic ways
  - Batch – transaction data are accumulated over a period of time and processed periodically
  - Real-Time – data are processed immediately after a transaction occurs. all online transaction processing systems incorporate real-time processing capabilities. Many online systems also depend on the capabilities of fault tolerant computer systems that can continue to operate even if parts of the system fail.
- **Database Maintenance** – updating corporate databases of an organization to reflect changes resulting from day-to-day business transactions for example credit sales made to customers will cause customers account balances to be increased and amount of inventory on hand to be decreased. Document and Report Generation – including transaction documents, transaction listings and error reports example purchase order, paychecks etc
- **Inquiry Processing** – making inquiries and receiving responses concerning the results of transaction processing activities for example you might check on the status of a sales order, balance in an account, or the amount of stock in inventory and receive immediate responses at your pc.

### Transaction Processing Cycle

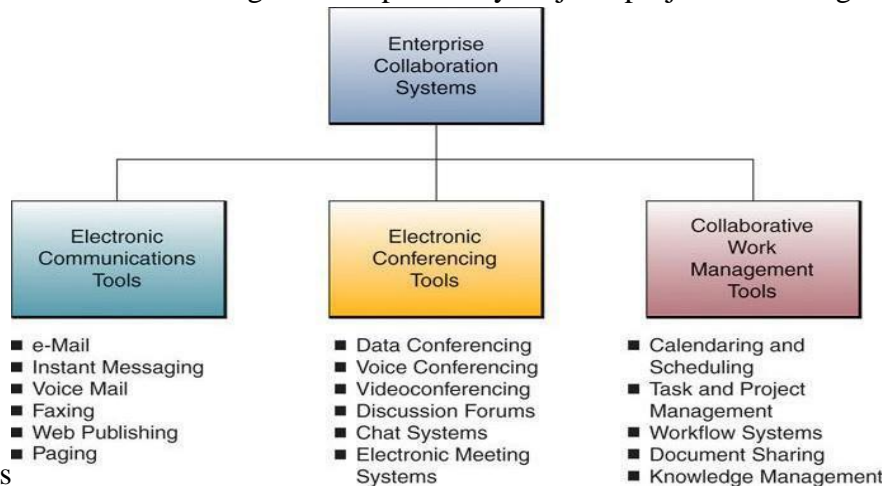


### Enterprise collaboration system

Cross-functional information systems that enhance communication, coordination, and collaboration among the members of business teams and workgroups Internet technologies tools to help us to collaborate to communicate ideas, share resources and coordinate our cooperative work efforts as members of the many formal informal process and projects teams and workgroups that make up many of today's organizations.

- Communicate – share information

- Coordinate – coordinate individual work efforts and share resources
- Collaborate – work together cooperatively on joint projects and assignments



ECS Tools

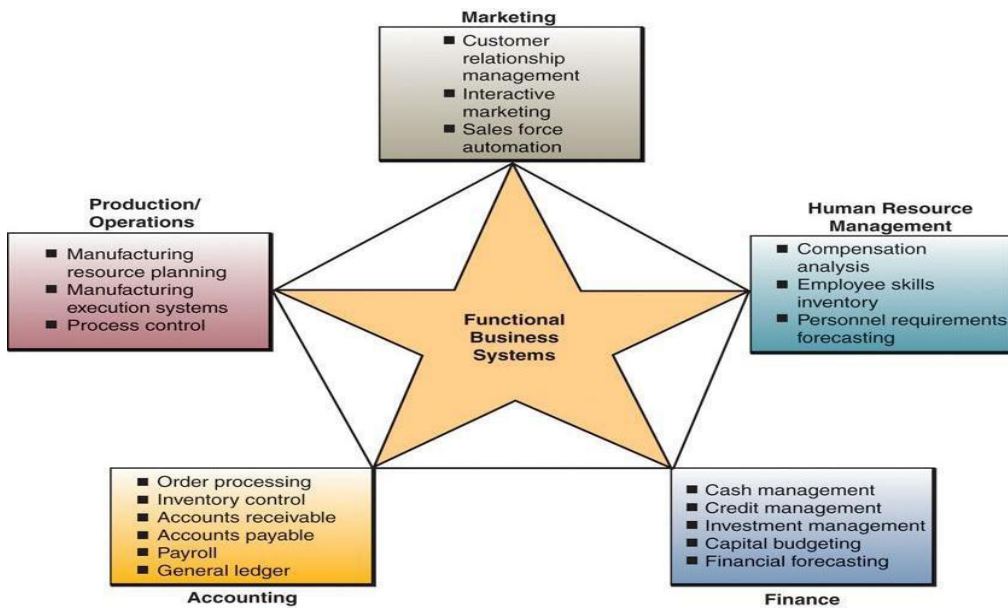
**Electronic communication tools** include electronic mail, voice mail, faxing web publication bulletin boards systems, paging, and internet phone systems. These tools enable us to electronically send messages, documents and files in data, text, voice or multimedia over computer networks. These help you to share everything from voice and text messages to copies of project documents and data files with team members.

**Electronic conferencing tools** help people communicate and collaborate while working together. A variety of conferencing methods enables the members of teams and workgroups at different locations to interact with ideas interactively at the same time, or at different times at their convenience. Electronic conferencing tools include electronic meeting systems and group support systems where team members can meet at the same time and place in a decision room setting.

**Collaborative work management tools** help people accomplish or manage group work activities. This category of software includes calendaring and scheduling tools, task and project management, workflow systems and knowledge management tools.

### Functional Business IS

Functional business systems that is a variety of types of information systems (transaction processing, management information, decision support etc) that support the business functions of accounting, finance, marketing operations management and human resource management.



## Marketing Systems

The business function of marketing is concerned with the planning, promotion and sale of existing products markets, and the development of new products and new markets to better attract and serve present and potential customers



## Interactive Marketing

### Definition:

- Customer-focused marketing process that is based on using the Internet, intranets, and extranets to establish two-way transactions between a business and its customers or potential customers

### Goal:

- Use networks to attract and keep customers who will become partners with the business in creating, purchasing, and improving products and services.

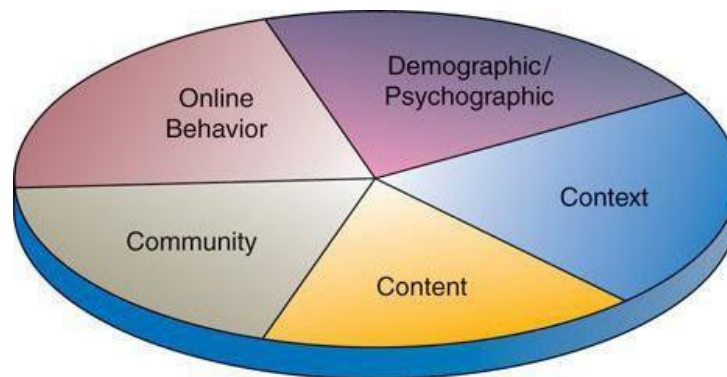
In interactive marketing, customers are just participants who receive media advertising prior to purchase but are actually engaged in network enabled proactive and interactive process. Interactive marketing encourages customers to become involved in product development, delivery and service issues.

### **Targeted Marketing**

#### Definition:

Tool for developing advertising and promotion strategies to strengthen a company's e-commerce initiatives, as well as its traditional business venues

#### **Targeted Marketing Components**



- **Community** – customize advertising to appeal to people of specific virtual communities
- **Content** – advertising placed on a variety of selected websites, in addition to a company's website. An ad for a product campaign on the opening page of an internet search engine is a typical example.
- **Context** – advertising placed on web pages that are relevant to the content of a product or service. so advertising is target only at people who are already looking for information about a subject matter that is related to company's product
- **Demographic/Psychographic** – web marketing efforts aimed at specific types or classes of people
- **Online Behavior** – promotion efforts tailored to each visit to a site by an individual. This strategies is based on a tracking techniques such as web—cookie files recorded on the visitors disk drive from previous visits.

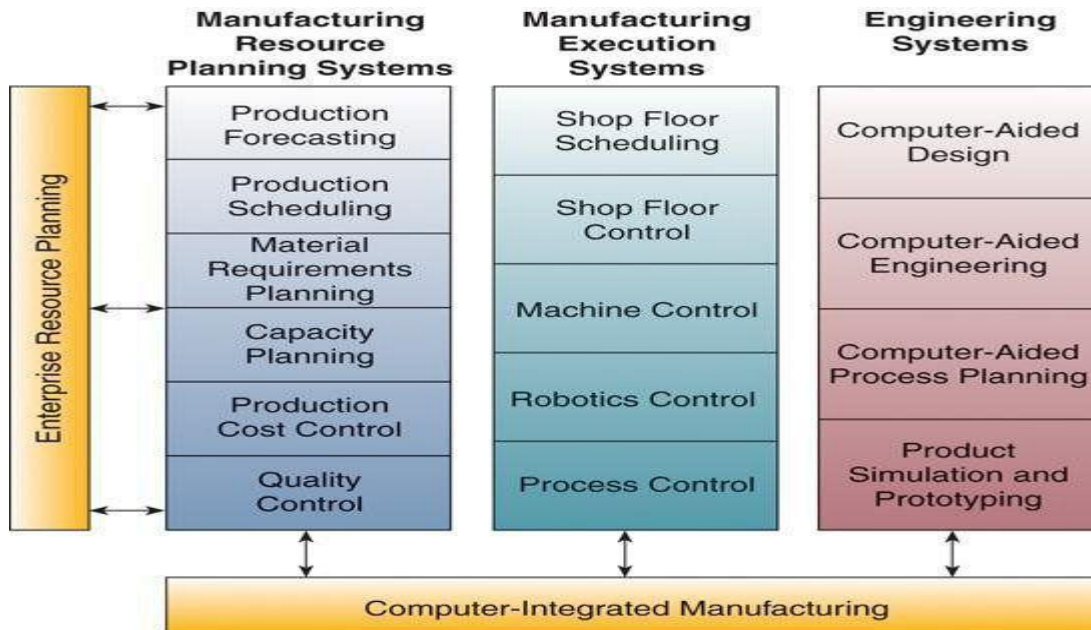
**Sales Force Automation** Information systems that improve the delivery of information and support to salespeople with the goal of improving sales productivity and marketing responsiveness

### **Manufacturing Systems**

#### Definition:

- Information systems that support the production/operations function that includes all activities concerned with the planning and control of the processes producing goods and services.
- The production/operation s function is concerned with the management of the operational processes and systems of all business firms.

## Manufacturing Systems



### Computer-Integrated Manufacturing (CIM)

#### Objectives:

- **Simplify** production processes, product designs, and factory organization as a vital foundation to automation and integration
- **Automate** production processes and the business functions that support them with computers, machines, and robots
- **Integrate** all production and support processes using computer networks, cross-functional business software, and other information technologies

The overall goal of CIM and such manufacturing information systems is to create flexible, agile and manufacturing processes that effectively produce products of the highest quality. The CIM supports the concepts of flexible manufacturing systems, agile manufacturing, and total quality management. Implementing such manufacturing concepts enables a company to quickly respond to and fulfill customer requirements with high quality products and services.

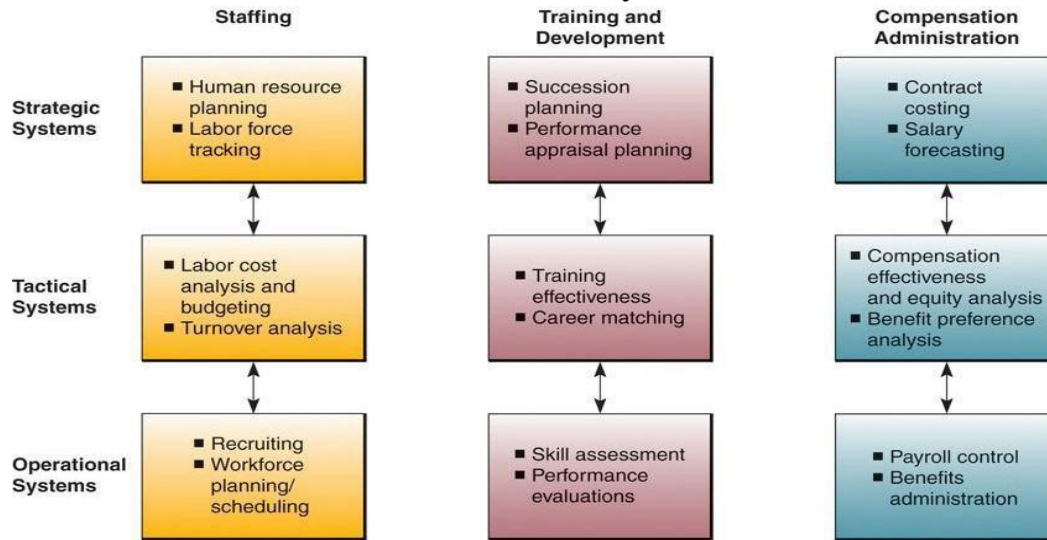
Computers are used to help engineers design better products using both **computer-aided engineering (CAE)**, and **computer-aided design (CAD)** systems and better production processes with **computer-aided process planning**.

They are also used to help plan the types of material needed in the production process, which is called **material requirements planning (MRP)**, and to integrate MRP with production scheduling and shop floor operations **manufacturing resource planning**

- **Computer-aided manufacturing (CAM)** - Information systems that automate the production process

- **Manufacturing execution systems (MES)** – performance monitoring information systems for factory floor operations. They monitor, track, and control the five essential components involved in production process: materials, equipment, personanel, instructions and specification, and production facilities
- **Process Control** – use of computers to control ongoing physical processes. Process control computers control physical processes in petroleum refineries, cement plants. process control computer system requires the use of special sensing devices that measures physical phenomena such as temperature or pressure changes
- **Machine Control** – use of computers to controls the actions of machines. this is also called numerical control.

### Human Resource Systems



### HRM and the Internet

The human resource system function involves the recruitment, placement, evaluation, compensation and development of the employees of an organization.

The goal of HRM system is designed to support  
 Planning to meet the personal needs of a business  
 Development of employees to their full potential

Controls of all personal policies and programs computer based IS to produce paychecks and payrollreports,maintain personal records, analyze the use of personnel in business operations. Human resource information systems that also support 1) recruitment, selection, and hiring 2)job placement 3)performance appraisals 4)employee benefits analysis 5)training and development and 6)health safety and security

- Recruiting employees through recruiting services and databases on the World Wide Web
- Posting messages in selected Internet newsgroups
- Communicating with job applicants via e-mail

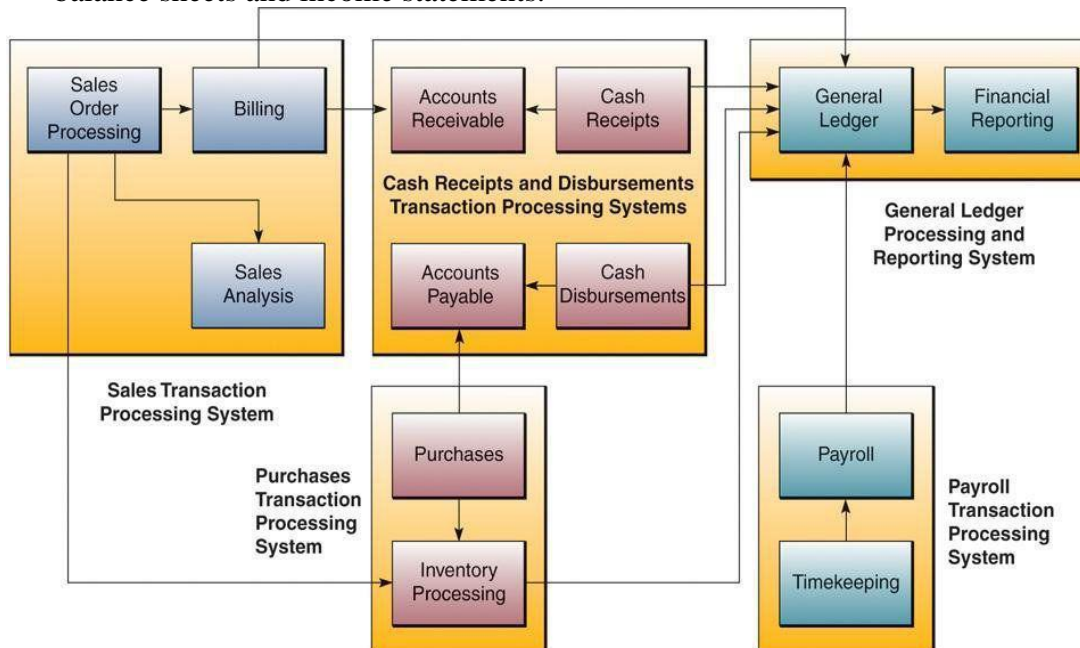
## HRM and Corporate Intranets

- Process common HRM applications
- Allow HRM department to provide around-the-clock services
- Disseminate valuable information faster than through previous company channels
- Collect information from employees online
- Allow managers and other employees to perform HRM tasks with little intervention by the HRM department

For example employee self service intranet applications allow employees to view benefits enter travel and expense reports, verify employment and salary information access and update their personal information and enter the data that has time constraints to it

## Accounting Information Systems

Accounting system they record report business transactions and other economic events. computer based accounting system record and report the flow of funds through an organization on a historical basis produced important financial statements such as balance sheets and income statements.



- Order Processing – Captures and processes customer orders and produces data for inventory control and accounts receivable
  - Inventory Control – Processes data reflecting changes in inventory and provides shipping and reorder information
  - Accounts Receivable – Records amounts owed by customers and produces customer invoices, monthly customer statements, and credit management reports
  - Accounts Payable – Records purchases from, amounts owed to, and payments to suppliers, and produces cash management reports
  - Payroll – Records employee work and compensation data and produces paychecks and other payroll documents and reports
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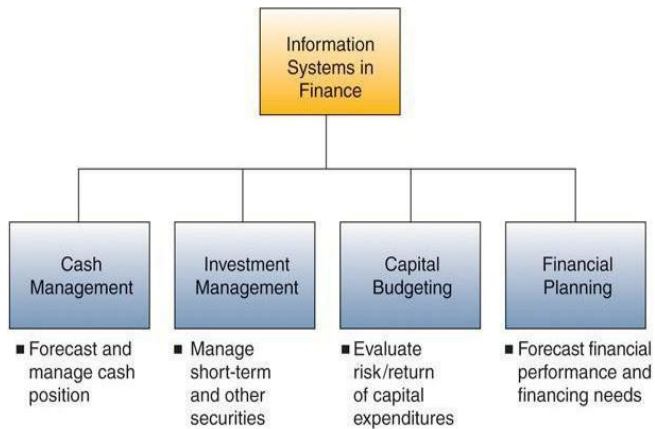
General Ledger – Consolidates data from other accounting systems and produces the periodic financial statements and reports of the business

### **Financial Management Systems**

Financial management system support business managers and computer professionals in decisions concerning 1)the financing of a business and 2)the allocation and control of financial resources within a business. major financial management system categories include cash and investment management, capital budgeting, financial forecasting, and financial planning.

Capital Budgeting – evaluating the profitability and financial impact of proposed capital expenditures

Financial Planning – evaluating the present and projected financial performance of a business





# **MODULE 3**

## ENTERPRISE BUSINESS SYSTEMS

### Customer Relationship Management?

- It is easier than ever for customers to comparison shop and, with a click of the mouse, to switch companies. As a result, customer relationships have become a company's most valued asset.

### Customer Relationship Management?

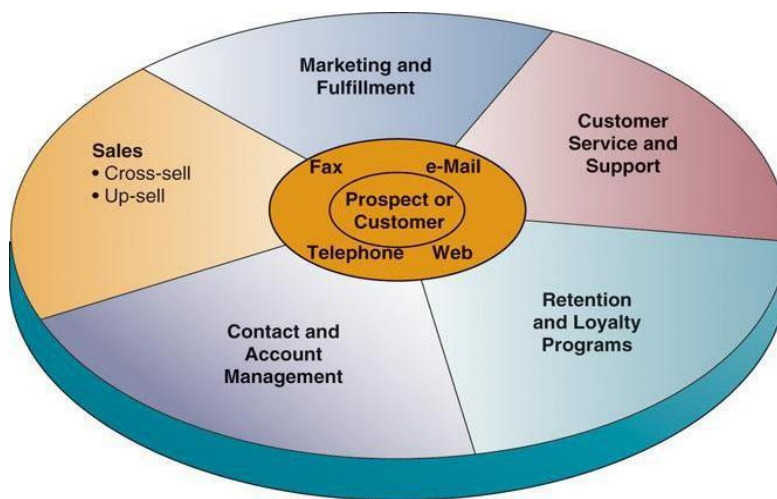
- It is easier than ever for customers to comparison shop and, with a click of the mouse, to switch companies. As a result, customer relationships have become a company's most valued asset.

### Customer Relationship Management (CRM)

#### Definition:

- The use of information technology to create a cross-functional enterprise system that integrates and automates many of the customer-serving processes in sales, marketing, and customer services that interact with a company's customers

### CRM Application Clusters



### CRM Application Components

- Contact and Account Management – helps sales, marketing, and service professionals capture and track relevant data about every past and planned contact with prospects and customers, as well as other business and life cycle events of customers
- Sales – provides sales reps with tools and company data sources needed to support and manage sales activities, and optimize cross-selling and up-selling

### CRM Application Components

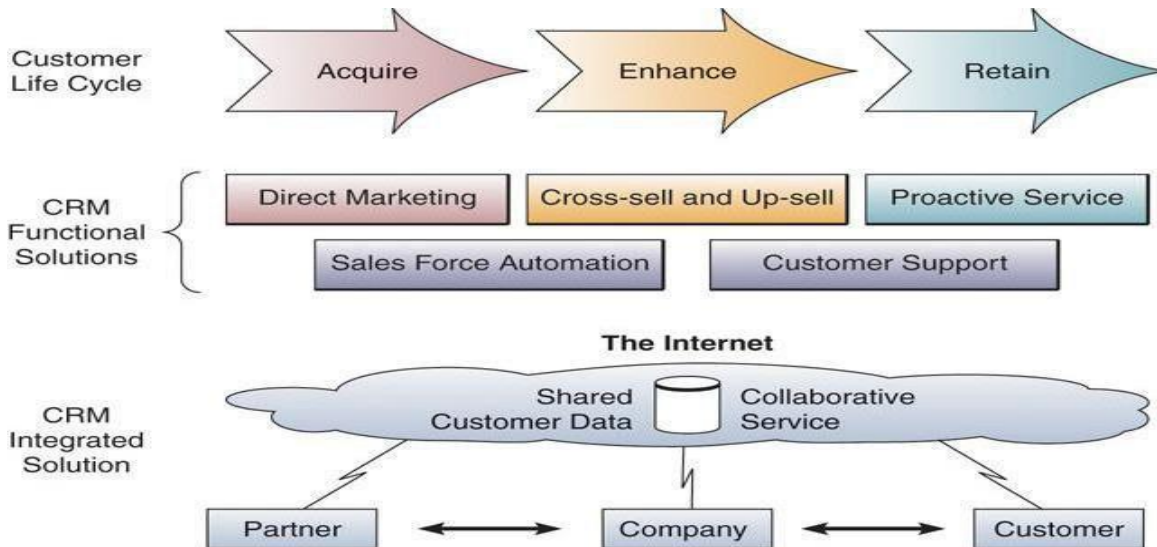
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- Marketing Fulfillment – help marketing professionals accomplish direct marketing campaigns by automating such tasks as qualifying leads for targeted marketing, and scheduling and tracking direct marketing mailings
- Customer Service and Support – provides service reps with software tools and real-time access to the common customer database shared by sales and marketing professionals

### CRM Application Components

- Retention and Loyalty Programs – help a company identify, reward, and market to their most loyal and profitable customers

### Three Phases of CRM



### Three Phases of CRM

- Acquire new customers by doing a superior job of contact management, sales prospecting, selling, direct marketing, and fulfillment
- Enhance relationship with customer by supporting superior service from a responsive networked team of sales and service specialists and business partners
- Retain and expand business with customers by proactively identifying and rewarding the most loyal and profitable customers

### Benefits of CRM

- CRM allows a business to identify and target their best customers so they can be retained as lifelong customers for greater and more profitable services.
- CRM makes possible real-time customization and personalization of products and services based on customer wants, needs, buying habits, and life cycles.

### **Benefits of CRM**

- CRM can keep track of when a customer contacts the company, regardless of the contact point.
- CRM systems can enable a company to provide a consistent customer experience and superior service and support across all the contact points a customer chooses.

### **CRM Failures**

- Lack of understanding and preparation
- Rely on CRM to solve business problem without first developing the business process changes and change management programs that are required
- CRM projects implemented without the participation of the business stakeholders involved

### **Trends in CRM**

- Operational
- Analytical
- Collaborative
- Portal-based

### **Operational CRM**

- Supports customer interaction with greater convenience through a variety of channels.
- Synchronizes customer interactions consistently across all channels
- Makes your company easier to do business with

### **Analytical CRM**

- Extracts in-depth customer history, preferences, and profitability information from your data warehouse and other databases
- you to analyze, predict, and derive customer value and behavior and forecast demand
- Lets you approach your customers with relevant information and offers that are tailored to their needs

### **Collaborative CRM**

- Enables easy collaboration with customers, suppliers, and partners
- Improves efficiency and integration throughout the supply chain
- Allows greater responsiveness to customer needs through sourcing of products and services outside of your enterprise

### **Portal-based CRM**

- Provides all users with the tools and information that fit their individual roles and preferences
  - Empowers all employees to respond to customer demands more quickly and become truly customer-focused
-

- Provides the capability to instantly access, link, and use all internal and external customer information

### **Partner Relationship Management (PRM)**

#### Definition:

- Applications that apply many of the same tools used in CRM systems to enhance collaboration between a company and its business partners, such as distributors and dealers, to better coordinate and optimize sales and service to customers across all marketing channels

### **Enterprise Resource Planning (ERP)**

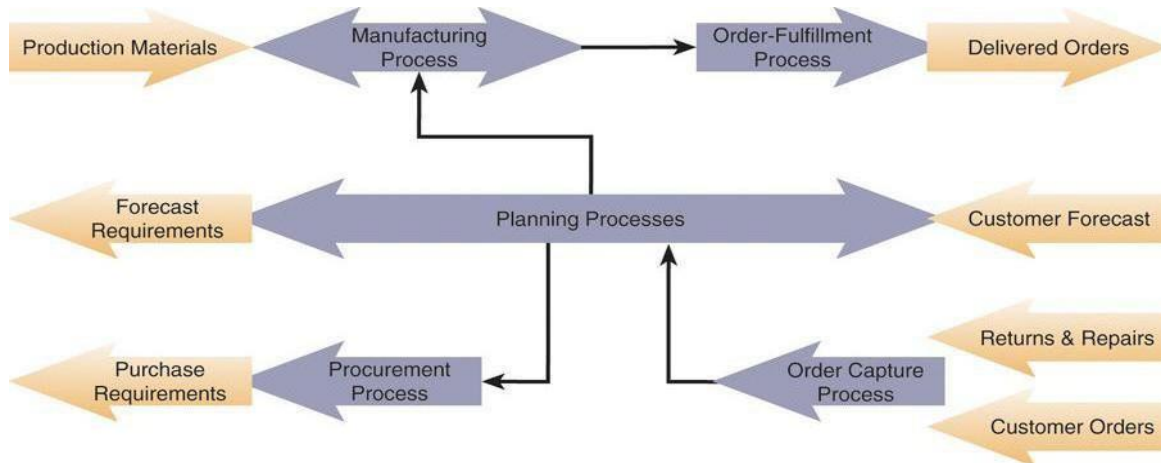
#### Definition:

- A cross-functional enterprise system driven by an integrated suite of software modules that supports the basic internal business processes of a company

### **ERP Application Components**



### **ERP Process & Information Flows**



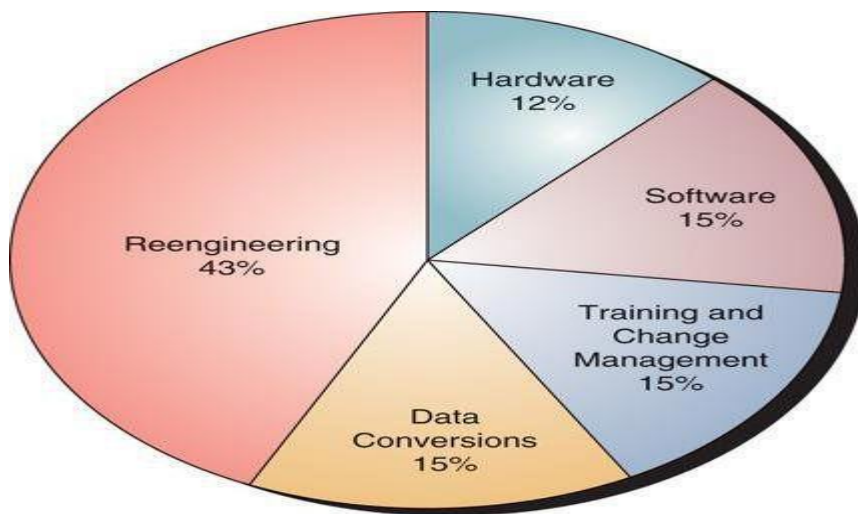
### **ERP Benefits**

- Quality and Efficiency – ERP creates a framework for integrating and improving a company’s internal business processes that results in significant improvements in the quality and efficiency of customer service, production, and distribution
- Decreased Costs – Significant reductions in transaction processing costs and hardware, software, and IT support staff

### **ERP Benefits**

- Decision Support – Provides vital cross-functional information on business performance quickly to managers to significantly improve their ability to make better decisions in a timely manner
- Enterprise Agility – ERP breaks down many former departmental and functional walls of business processes, information systems, and information resources

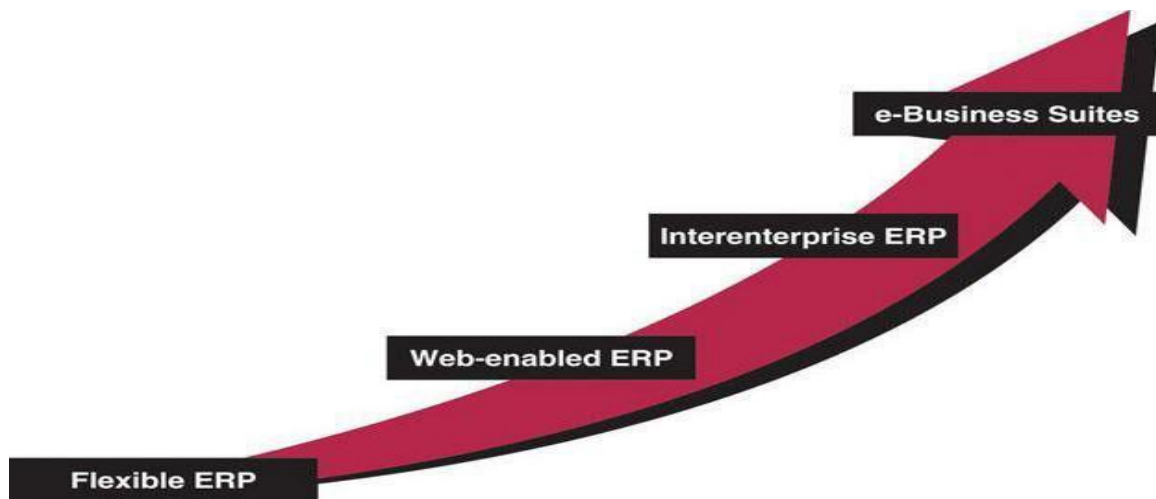
### **Costs of ERP**



### Causes of ERP Failures

- Business managers and IT professionals underestimate the complexity of the planning, development, and training needed
- Failure to involve affected employees in the planning and development phases
- Trying to do too much too fast in the conversion process
- Failure to do enough data conversion and testing

### Trends in ERP



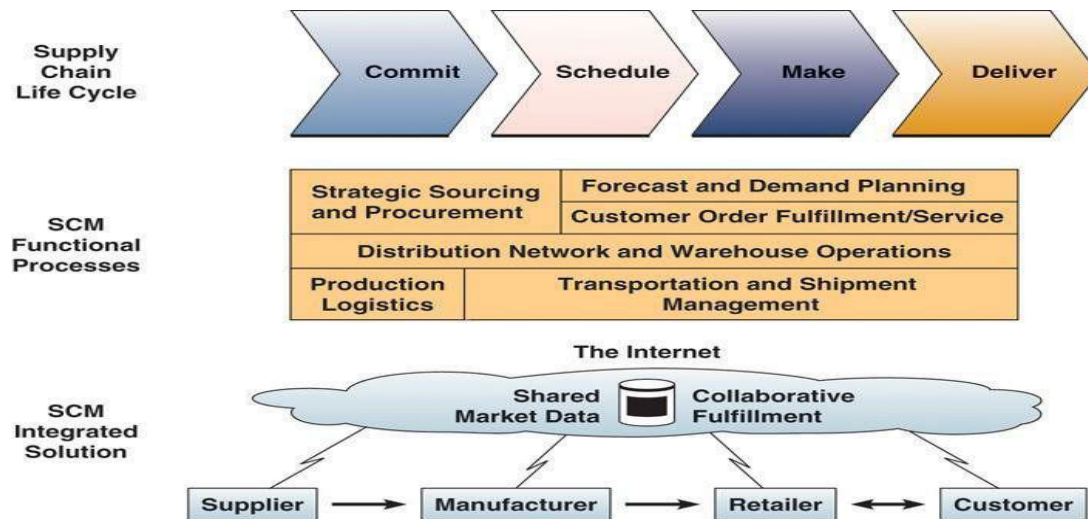
### Supply Chain Management (SCM)

Definition:



- A cross-functional interenterprise system that uses information technology to help support and manage the links between some of a company's key business processes and those of its suppliers, customers, and business partners

## SCM Life Cycle

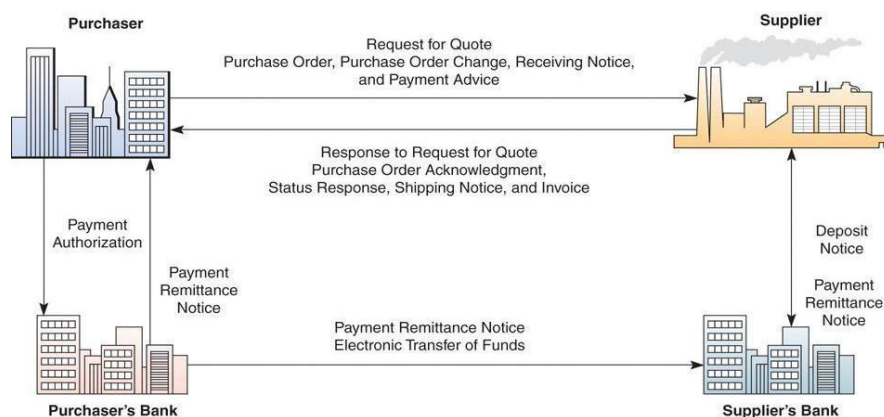


## Electronic Data Interchange (EDI)

### Definition:

- Involves the electronic exchange of business transaction documents over the Internet and other networks between supply chain trading partners

## EDI Activities



## Role of SCM



SCM Objectives		SCM Outcomes
<p><b>What?</b> Establish objectives, policies, and operating footprint</p>	<p><b>Strategic</b></p>	<ul style="list-style-type: none"> <li>• Objectives</li> <li>• Supply policies (service levels)</li> <li>• Network design</li> </ul>
<p><b>How much?</b> Deploy resources to match supply to demand</p>	<p><b>Tactical</b></p>	<ul style="list-style-type: none"> <li>• Demand forecast</li> <li>• Production, procurement, logistics plan</li> <li>• Inventory targets</li> </ul>
<p><b>When? Where?</b> Schedule, monitor, control, and adjust production</p>	<p><b>Operational</b></p>	<ul style="list-style-type: none"> <li>• Work center scheduling</li> <li>• Order/inventory tracking</li> </ul>
<p><b>Do</b> Build and transport</p>	<p><b>Execution</b></p>	<ul style="list-style-type: none"> <li>• Order cycle</li> <li>• Material movement</li> </ul>

### SCM Planning Functions

- Supply Chain Design – optimize network of suppliers, plants, and distribution centers
- Collaborative Demand and Supply Planning – develop an accurate forecast of customer demand by sharing demand and supply forecasts instantaneously across multiple tiers

### SCM Execution Functions

- Materials Management – share accurate inventory and procurement order information, ensure materials required for production are available in the right place at the right time, and reduce raw material spending, procurement costs, safety stocks, and raw material and finished goods inventory
- Collaborative Manufacturing – optimize plans and schedules while considering resource, material, and dependency constraints

### SCM Execution Functions

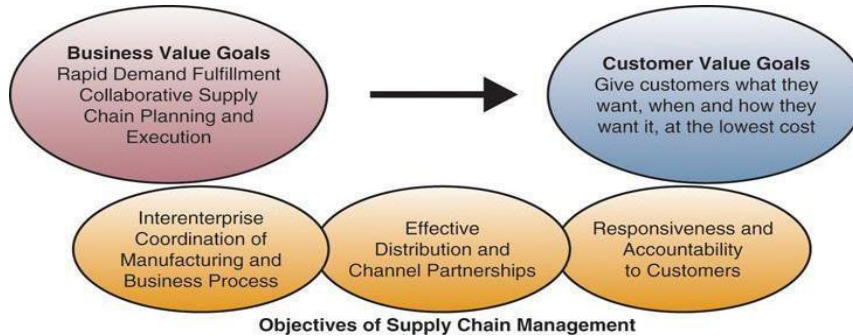
- Collaborative Fulfillment – commit to delivery dates in real time, fulfill orders from all channels on time with order management, transportation planning, and vehicle scheduling, and support the entire logistics process, including picking, packing, shipping, and delivery in foreign countries
- Supply Chain Event Management – monitor every stage of the supply chain process, from price quotation to the moment the customer receives the product, and receive alerts when problems arise

## SCM Execution Functions

- Supply Chain Performance Management – report key measurements in the supply chain, such as filling rates, order cycle times, and capacity utilization

## SCM Objectives

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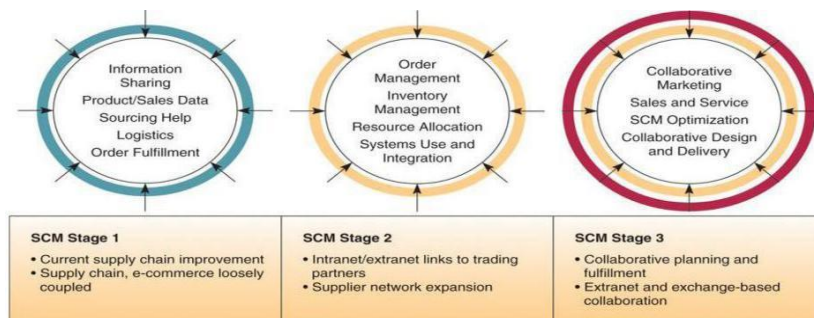
## SCM Benefits

- Faster, more accurate order processing
  - Reductions in inventory levels
- Quicker times to market
- Lower transaction and material costs
  - Strategic relationship with suppliers

## Causes of SCM Failures

- Lack of proper demand planning knowledge, tools and guidelines
- Inaccurate or overoptimistic demand forecasts
- Inaccurate production, inventory and other business data provided by a company's other information systems
- Lack of adequate collaboration among marketing, production, and inventory management departments within a company
- Immature, incomplete or hard to implement SCM software tools

## Trends



## **MODULE 4**

## **ELECTRONIC COMMERCE SYSTEMS**

### **Electronic Commerce Systems**

- Identify the major categories and trends of e-commerce applications.
- Identify the essential processes of an e-commerce system, and give examples of how they are implemented in e-commerce applications.
- Identify and give examples of several key factors and Web store requirements needed to succeed in e-commerce.
- Identify and explain the business value of several types of e-commerce marketplaces.
- Discuss the benefits and trade-offs of several e-commerce clicks and bricks alternatives.

What is Electronic Commerce?

•Electronic commerce encompasses the entire online process of developing, marketing, selling, delivering, servicing, and paying for products and services transacted on internet worked, global marketplaces of customers, with the support of a worldwide network of business partners.

Case #1: Success in an Online Marketplace

#### **Evolution of eBay:**

- Consumer auction market for small segment of population to sell collectibles
- 30 million users listing 12 million items daily with own laws, feedback system, enforcement, payment processing unit

Case #1: Success in an Online Marketplace

#### **Reasons for Success:**

- Voice of the Customer program
- Customer take initiative to expand eBay economy
- Industrial products marketplace
- e-Bay motors
- Wholesale business

Case #1: Success in an Online Marketplace

•Why has eBay become such a successful and diverse online marketplace? Visit the eBay website to help you answer, and check out their many trading categories, specialty sites, international sites, and other features.

Case #1: Success in an Online Marketplace

•Why do you think eBay has become the largest online/off-line seller of used cars, and the largest online seller of certain other products, like computers and photographic equipment?

Case #1: Success in an Online Marketplace

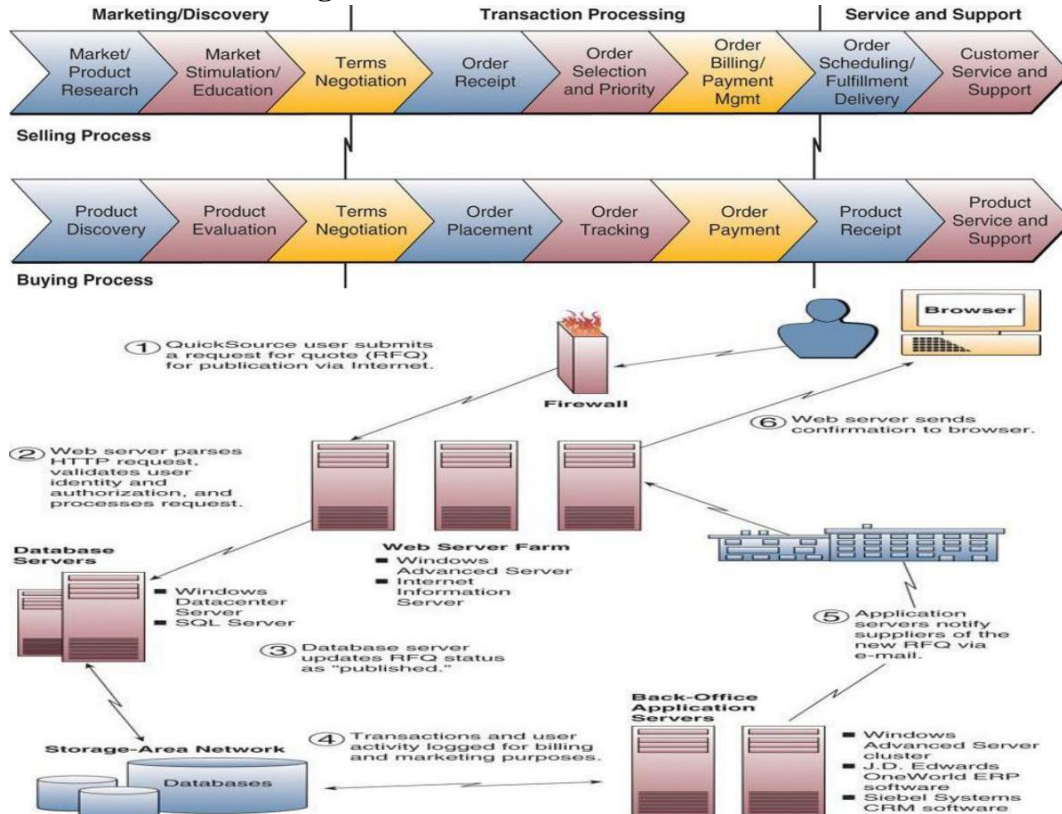
•Is eBay's move from a pure consumer-to-consumer auction marketplace to inviting large and small businesses to sell to consumers and other businesses, sometimes at fixed prices, a good long-term strategy? Why or why not?

•What are the benefits and limitations of being an eBay Power Seller or Trading Assistant?

Scope of e-Commerce

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## e-Commerce Technologies



### Categories of e-Commerce

- Business-to-Consumer (B2C) – businesses develop attractive electronic marketplaces to sell products and services to consumers
- Business-to-Business (B2B) – involves both electronic business marketplaces and direct market links between businesses
- Consumer-to-Consumer (C2C) – includes auction websites and electronic personal advertising

### Categories of e-Commerce

#### Essential e-Commerce Processes

##### Access Control and Security

##### Definition:

- E-commerce processes must establish mutual trust and secure access between the parties in an e-commerce transaction by authenticating users, authorizing access, and enforcing security features

##### Profiling and

##### Personalizing Definition:

- Processes that gather data on you and your website behavior and choices, and build electronic profiles of your characteristics and preferences. These profiles are then used to recognize you as an individual user and provide you with a personalized view of the contents of the site, as well as product recommendations and personalized Web advertising

### Search Management

### Definition:

- Efficient and effective search processes provide a top e-commerce website capability that helps customers find the specific product or service they want to evaluate or buy Content and Catalog Management
- Content Management – software that helps e-commerce companies develop, generate, deliver, update, and archive text data and multimedia information at e-commerce websites
- Catalog Management – software that helps generate and manage catalog content

### **Workflow Management**

#### Definition:

- Software that helps employees electronically collaborate to accomplish structured work tasks within knowledge-based business processes

### **Event Notification**

#### Definition:

- Software that notifies customers, suppliers, employees, and other stakeholders of their status in a transaction based on events initiated by one of the parties

### **Collaboration and Trading**

#### Definition:

- Processes that support the vital collaboration arrangements and trading services needed by customers, suppliers, and other stakeholders

### **Electronic Payment Processes**

- Web Payment – credit card payment processes
- Electronic Funds Transfer (EFT) – use IT to capture and process money and credit transfers between banks and businesses and their customers
- Secure Electronic Payments – security measures including encrypting data passing between customer and merchant, encrypting data passing between customer and company authorizing the credit card transaction, and taking sensitive information off-line

#### Case #2: Lean Manufacturing

- Lean manufacturing is a methodology that seeks to eliminate all waste from the manufacturing process.
- The goal is to create a production environment driven by demand that holds only a small amount of inventory and products at any given time

#### Case #2: Lean Manufacturing

### **Modern Practices Employed:**

- Just-in-time processes ensure that goods arrive when needed for production
  - Kaizen calls on everyone to look for ways to improve quality, cycle times, safety and other aspects of an operation
  - Kanban establishes a pull instead of a push system of moving goods through the factory
- Case #2: Lean Manufacturing
- What are the major business advantages of lean manufacturing? Provide some specific examples.
  - Does a company's size have an effect on the advantage gained from lean manufacturing and integrations of the various procurement systems?
- 
-

## Case #2: Lean Manufacturing

- Should all manufacturing businesses begin a process of integration toward a lean-manufacturing posture? Explain.

- What are some of the business and IT challenges faced by companies striving for lean manufacturing by integrating their procurement, customer, and supplier systems? What types of solutions might you propose to overcome these challenges?

e-Commerce Trends Business-to-

Consumer e-Commerce e-

Commerce Success Factors

- Selection and Value – attractive product selections, competitive prices, satisfaction guarantees, and customer support after the sale

- Performance and Service – fast, easy navigation, shopping, and purchasing, and prompt shipping and delivery

### e-Commerce Success Factors

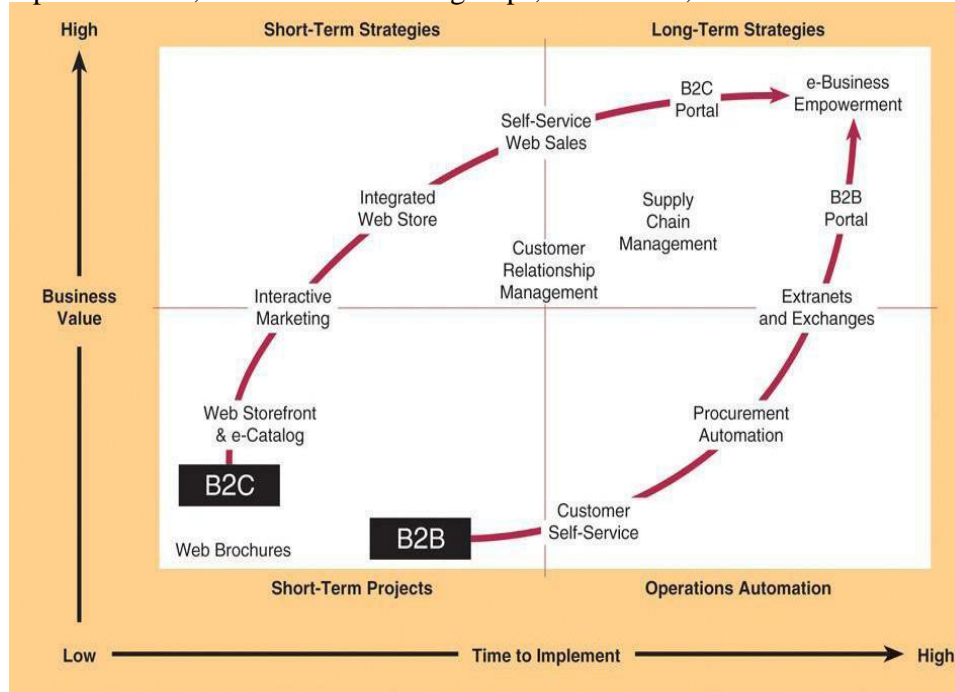
- Look and Feel – attractive web storefront, website shipping areas, multimedia product catalog pages, and shopping features

- Advertising and Incentives – targeted web page advertising and e-mail promotions, discounts and special offers, including advertising at affiliate sites

e-Commerce Success Factors

- Personal Attention – personal web pages, personalized product recommendations, Web advertising and e-mail notices, and interactive support for all customers

- Community Relationships – virtual communities of customers, suppliers, company representatives, and others via newsgroups, chat rooms, and links to related sites



### e-Commerce Success Factors

#### Web Store Requirements

Developing a Web Store		
<ul style="list-style-type: none"> <li>• <b>Build</b></li> <li>Website design tools</li> <li>Site design templates</li> <li>Custom design services</li> <li>Website hosting</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Market</b></li> <li>Web page advertising</li> <li>E-mail promotions</li> <li>Web advertising exchanges with affiliate sites</li> <li>Search engine registrations</li> </ul>	
Serving Your Customers		
<ul style="list-style-type: none"> <li>• <b>Serve</b></li> <li>Personalized Web pages</li> <li>Dynamic multimedia catalog</li> <li>Catalog search engine</li> <li>Integrated shopping cart</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Transact</b></li> <li>Flexible order process</li> <li>Credit card processing</li> <li>Shipping and tax calculations</li> <li>E-mail order notifications</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Support</b></li> <li>Website online help</li> <li>Customer service e-mail</li> <li>Discussion groups and chat rooms</li> <li>Links to related sites</li> </ul>
Managing a Web Store		
<ul style="list-style-type: none"> <li>• <b>Manage</b></li> <li>Website usage statistics</li> <li>Sales and inventory reports</li> <li>Customer account management</li> <li>Links to accounting system</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Operate</b></li> <li>24x7 website hosting</li> <li>Online tech support</li> <li>Scalable network capacity</li> <li>Redundant servers and power</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Protect</b></li> <li>User password protection</li> <li>Encrypted order processing</li> <li>Encrypted website administration</li> <li>Network firewalls and security monitors</li> </ul>

•Security and Reliability – security of customer information and website transactions, trustworthy product information, and reliable order fulfillment

### Web Store Requirements

#### Developing a Web Store

- Build website using simple website design tools
- Market website to attract visitors and transform them into loyal Web customers

#### Serving Customers

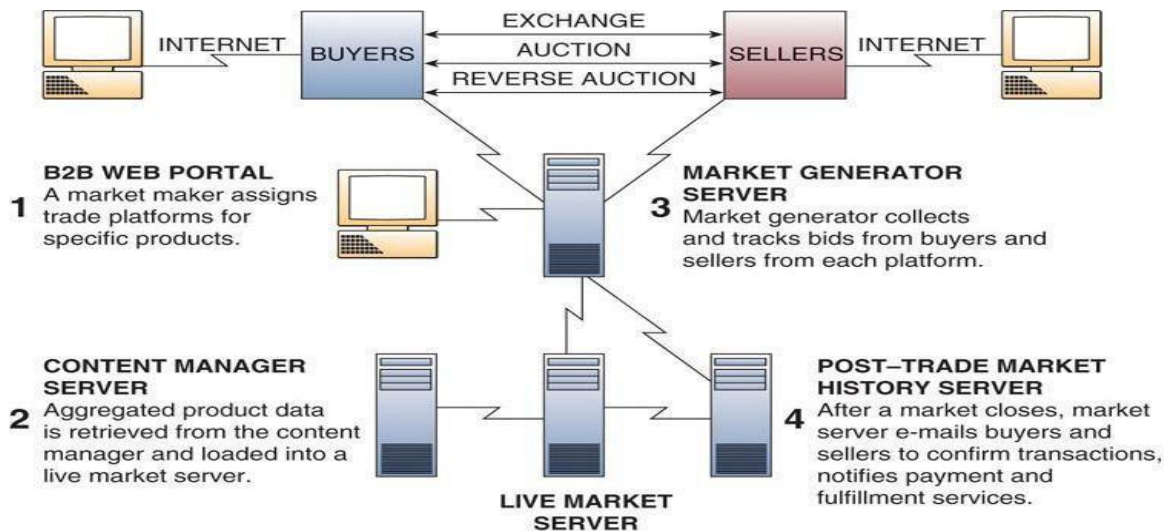
- Serve customers by creating user profiles, customer files, personal Web pages and promotions that help develop a one-to-one relationship
- Transact with customers by providing dynamically changing catalog, fast catalog search engine, and convenient shopping cart system integrated with promotions, payment, shipping, and account information
- Support customers with help menus, tutorials, FAQs and e-mail correspondence with customer service representatives

#### Managing a Web Store

- Manage both the business and the website
- Operate twenty-four hours a day, seven days a week
- Protect Web store transactions and customer records, and repel hacker attacks and other security threats

### Business-to-Business e-Commerce





•B2B e-commerce is the wholesale and supply side of the commercial process, where businesses buy, sell, or trade with other businesses.

•All factors for building a successful retail website also apply to wholesale websites for B2B e-commerce.

#### e-Commerce Marketplaces

•One to Many – sell-side marketplaces host one major supplier who dictates product catalog offerings and prices

•Many to One – buy-side marketplaces attract many suppliers that flock to these exchanges to bid on the business of a major buyer

•Some to Many – distribution marketplaces unite major suppliers who combine their product catalogs to attract a larger audience of buyers

#### e-Commerce Marketplaces

•Many to Some – procurement marketplaces unite major buyers who combine their purchasing catalogs to attract more suppliers and thus more competition and lower prices

•Many to Many – auction marketplaces used by many buyers and sellers that can create a variety of buyers' or sellers' auctions to dynamically optimize prices

#### e-Commerce Portals

##### Definition:

•Websites developed and hosted by third-party market-maker companies who serve as infomediaries that bring buyers and sellers together in catalog, exchange, and auction markets.

#### B2B e-Commerce Web Portal

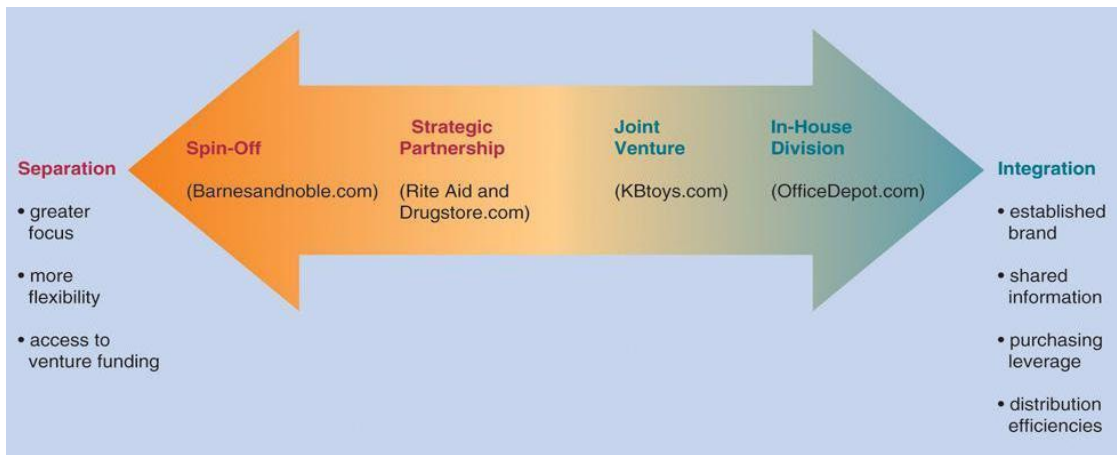
#### Infomediaries

##### Definition:

•Companies that serve as intermediaries in e-business and e-commerce transactions Provide e-commerce marketplace software products and services to power business Web portals for e-commerce transactions

#### Clicks and Bricks in e-Commerce

#### Clicks and Bricks in e-Commerce



## E-Commerce Channel

### Definition:

- The marketing or sales channel created by a company to conduct and manage its chosen e-commerce activities

### Checklist for Channel Development

- What audiences are we attempting to reach?
- What action do we want those audiences to take?
- Who owns the e-commerce channel within the organization?
- Is the e-commerce channel planned alongside other channels?

### **Checklist for Channel Development**

- Do we have a process for generating, approving, releasing, and withdrawing content?
- Will our brands translate to the new channel or will they require modification?
- How will we market the channel itself?

Case #3: Clicks and Bricks e-Commerce

### **Benefits of E-Trade's Diversification:**

- Allowed E-Trade to offer customers risk-free alternatives
- Online banking's overhead is low so E-Trade can offer higher savings yields and lower loan rates

Case #3: Clicks and Bricks e-Commerce

### **Cross Selling on the Web:**

- The longer a customer has been online, the more of our products he is likely to have.
  - Regular Web users are exposed to all products when they log on.
  - Customers access new services through the same familiar interface
- Case #3: Clicks and Bricks e-Commerce
- What lessons in business strategy can be applied to development of the e-commerce channels of other companies from the experience of E-Trade?
  - What is the business value of the C.E.O. online wholesale banking portal to Wells Fargo?

- What can other companies learn from the successes and mistakes of the Wells Fargo e-commerce system?

Case #4: WWW not Business as Usual

- Microsoft is building community features for Microsoft.com including interactive Webcasts, newsgroups, and online chat forums that can better explain its software and even influence product design.

- Microsoft is also adding interactive features to help it tailor upcoming products based on input from influential customers.

Case #4: WWW not Business as Usual

- Dell has launched a redesign of its e-commerce site intended to make it easier for customers to navigate complex custom orders and for Dell to deliver fine-tuned promos anywhere on the site based on the products a customer bought or looked at in the past.

- Dell will attempt a worldwide consolidation of the back-end data center and applications that power Dell's site in 80-plus countries.

Case #4: WWW not Business as Usual

- What is the primary driver behind the Web upgrade activities of Microsoft and Dell?

- What is the business value of Microsoft's web-based, live feedback program?

- What lessons on developing successful e-commerce projects can be gained from the information in this case?

Summary

- Electronic commerce encompasses the entire online process of developing, marketing, selling, delivering, servicing, and paying for products and services.

- The basic categories of e-commerce include B2C, B2B and C2C.

Summary

- Many e-business enterprises are moving toward offering full service B2C and B2B e-commerce portals supported by integrated customer-focused processes and internetworked supply chains.

- Companies must evaluate a variety of e-commerce integration or separation alternatives and benefit trade-offs when choosing a clicks and bricks strategy and e-commerce channel.

Summary

- Businesses typically sell products and services to consumers at e-commerce websites that provide attractive Web pages, multimedia catalogs, interactive order processing, secure electronic payment systems, and online customer support.

Summary

- Business-to-business applications of e-commerce involve electronic catalog, exchange, and auction marketplaces that use Internet, intranet, and extranet websites and portals to unite buyers and sellers.

## **MODULE 5**

## Decision Support Systems

**Introduction:** we identify the following key roles in this unit.

- Identify the changes taking place in the form and use of decision support in business.
- Identify the role and reporting alternatives of management information systems.
- Describe how online analytical processing can meet key information needs of managers.

Learning Objectives

- Explain the decision support system concept and how it differs from traditional management information systems.
- Explain how the following information systems can support the information needs of executives, managers, and business professionals:
  - Executive information systems
  - Enterprise information portals
  - Knowledge management systems
- Identify how neural networks, fuzzy logic, genetic algorithms, virtual reality, and intelligent agents can be used in business.
- Give examples of several ways expert systems can be used in business decision-making situations.

### Decision Support Systems

- As companies migrate toward responsive e-business models, they are investing in new data-driven decision support application frameworks that help them respond rapidly to changing market conditions and customer needs.

#### Information, Decisions and Management

This figure emphasizes that the type of information required by decision makers in a company is directly related to the level of management decision making and the amount of structure in the decision situations they face. levels of management decision making still exist, but their size, shape, and participants continue to change as todays fluid organizational structures evolve. but their size, shape, and participants continue to change as todays fluid organizational structures evolve.



## Levels of Management Decision Making

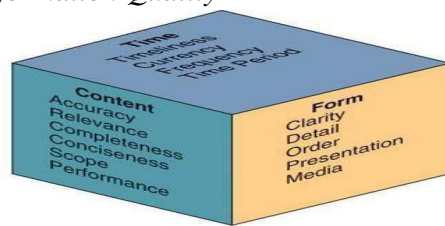
- Strategic – group of executives develop overall organizational goals, strategies, policies, and objectives as part of a strategic planning process
- Tactical – managers and business professionals in self-directed teams develop short- and medium-range plans, schedules and budgets and specify the policies, procedures and business objectives for their subunits
- Operational – managers or members of self-directed teams develop short-range plans such as weekly production schedules

## Information Quality

### Definition:

- Information products whose characteristics, attributes, or qualities make the information more value

### Attributes of Information Quality



<b>Time Dimension</b> Timeliness Currency Frequency Time Period	Information should be provided when it is needed. Information should be up-to-date when it is provided. Information should be provided as often as needed. Information can be provided about past, present, and future time periods.
<b>Content Dimension</b> Accuracy Relevance Completeness Conciseness Scope Performance	Information should be free from errors. Information should be related to the information needs of a specific recipient for a specific situation. All the information that is needed should be provided. Only the information that is needed should be provided. Information can have a broad or narrow scope, or an internal or external focus. Information can reveal performance by measuring activities accomplished, progress made, or resources accumulated.
<b>Form Dimension</b> Clarity Detail Order Presentation Media	Information should be provided in a form that is easy to understand. Information can be provided in detail or summary form. Information can be arranged in a predetermined sequence. Information can be presented in narrative, numeric, graphic, or other forms. Information can be provided in the form of printed paper documents, video displays, or other media.

## Decision Structure

- Structured – situations where the procedures to follow when a decision is needed can be specified in advance
- Unstructured – decision situations where it is not possible to specify in advance most of the decision procedures to follow
- Semi structured - decision procedures that can be prespecified, but not enough to lead to a definite recommended decision

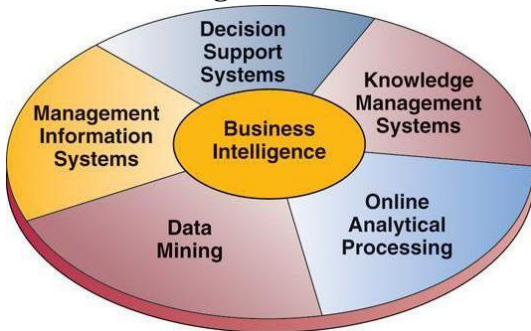
## Decision Support Trends

- This emerging class of applications focuses on personalized decision support, modeling, information retrieval, data warehousing, what-if scenarios, and reporting.

MIS vs. DSS

	Management Information Systems	Decision Support Systems
• Decision support provided	Provide information about the performance of the organization	Provide information and decision support techniques to analyze specific problems or opportunities
• Information form and frequency	Periodic, exception, demand, and push reports and responses	Interactive inquiries and responses
• Information format	Prespecified, fixed format	Ad hoc, flexible, and adaptable format
• Information processing methodology	Information produced by extraction and manipulation of business data	Information produced by analytical modeling of business data

## Business Intelligence



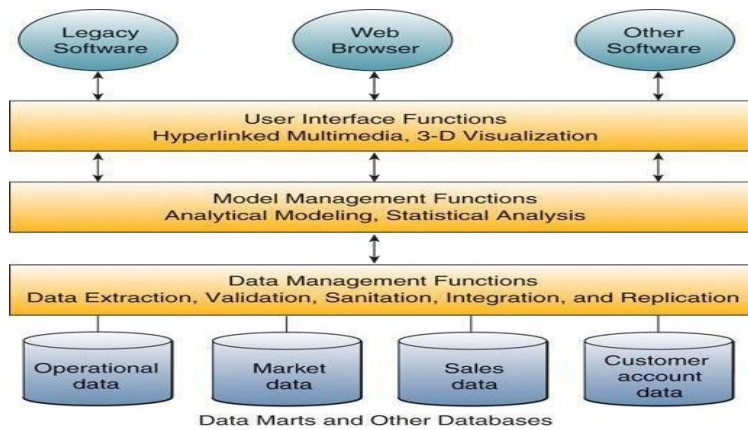
•Executive class information delivery and decision support software tools used by lower levels of management and by individuals and teams of business professionals

## Decision Support Systems (DSS)

### Definition:

- Computer-based information systems that provide interactive information support to managers and business professionals during the decision-making process using the following to make semi structured business decisions
- Analytical models
- Specialized databases
- A decision maker's own insights and judgments
- An interactive, computer-based modeling process

## DSS Components

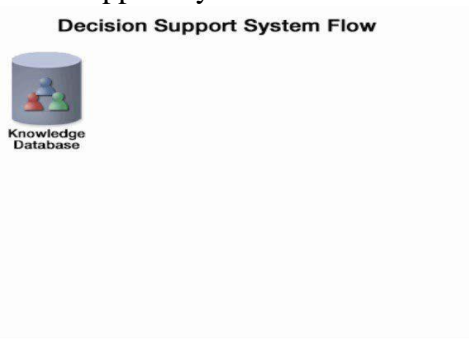


## Model Base

### Definition:

• Software component that consists of models used in computational and analytical routines that mathematically express relationships among variables

### Decision Support System



## Management Information Systems (MIS)

### Definition:

• An information system that produces information products that support many of the day-to-day decision-making needs of managers and business professionals

### Management Reporting Alternatives

- Periodic Scheduled Reports
- Exception Reports
- Demand Reports and Responses
- Push Reporting

## Online Analytical Processing (OLAP)

### Definition:

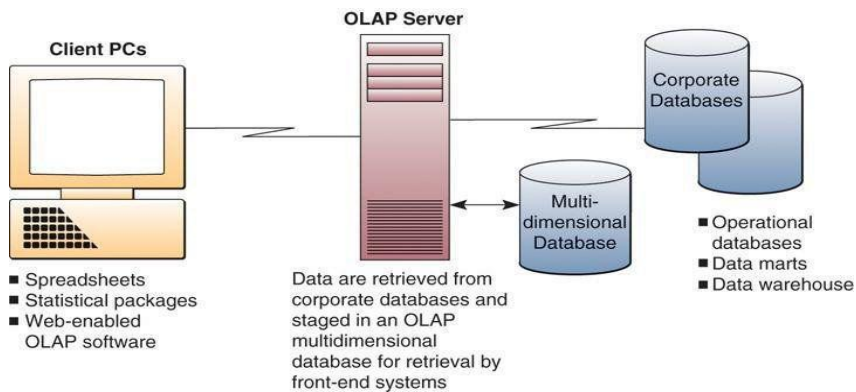
• Enables managers and analysts to interactively examine and manipulate large amounts of detailed and consolidated data from many perspectives

### Analytical Operations

- Consolidation – aggregation of data
- Drill-down – detail data that comprise consolidated data
- Slice and Dice – ability to look at the database from different viewpoints



## OLAP Technology



## Geographic Information Systems (GIS)

### Definition:

•DSS that uses geographic databases to construct and display maps and other graphics displays that support decisions affecting the geographic distribution of people and other resources

## Data Visualization Systems (DVS)

•DVS represent complex data using interactive three-dimensional graphical forms such as charts, graphs, and maps

•DVS tools help users to interactively sort, subdivide, combine, and organize data while it is in its graphical form.

## Using DSS

•What-if Analysis – end user makes changes to variables, or relationships among variables, and observes the resulting changes in the values of other variables

•Sensitivity Analysis – value of only one variable is changed repeatedly and the resulting changes in other variables are observed

•Goal-Seeking – set a target value for a variable and then repeatedly change other variables until the target value is achieved

•Optimization – goal is to find the optimum value for one or more target variables given certain constraints then one or more other variables are changed repeatedly until the best values for the target variables are discovered

## Data Mining for Decision Support

•Data mining software analyzes the vast stores of historical business data that have been prepared for analysis in corporate data warehouses, and tries to discover patterns, trends, and correlations hidden in the data that can help a company improve its business performance.

•Data mining software may perform regression, decision tree, neural network, cluster detection, or market basket analysis for a business.

## Market Basket Analysis (MBA)

### Definition:

- The purpose is to determine what products customers purchase together with other products

## Executive Information Systems (EIS)

### Definition:

- Information systems that provide top executives, managers, analysts, and other knowledge workers with immediate and easy access to information about a firm's key factors that are critical to accomplishing an organization's strategic objectives.

### **Features of an EIS**

Information presented in forms tailored to the preferences of the executives using the system

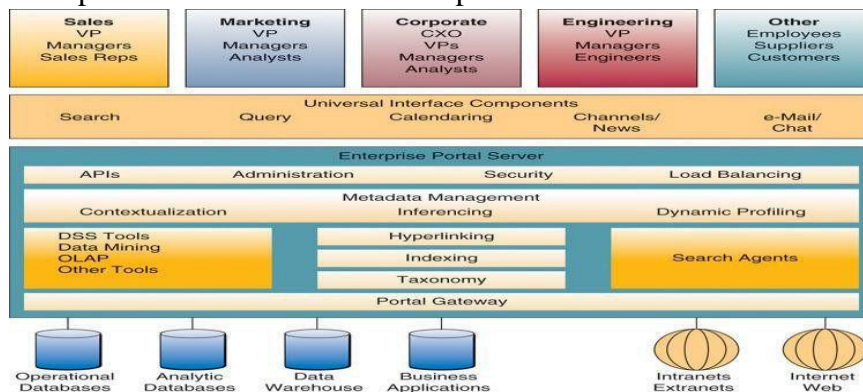
- Customizable graphics displays
- Exception reporting
- Trend analysis
- Drill down capability

## Enterprise Portals and Decision Support

### Definition:

A Web-based interface and integration of MIS, DSS, EIS, and other technologies that gives all intranet users and selected extranet users access to a variety of internal and external business applications and services

### Enterprise Information Portal Components



## Knowledge Management Systems

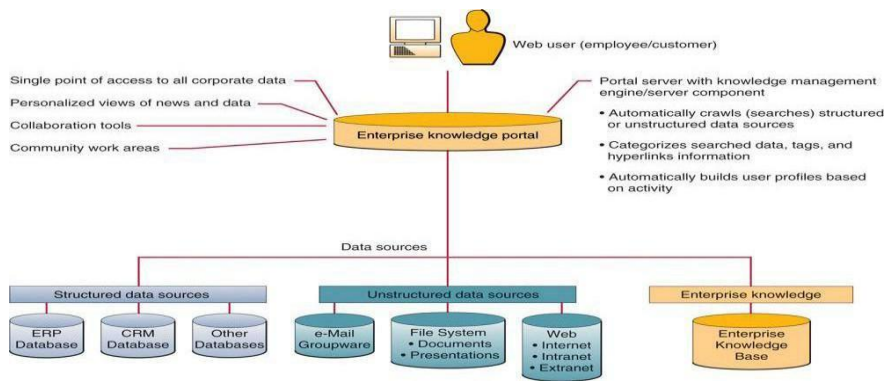
### Definition:

The use of information technology to help gather, organize, and share business knowledge within an organization

### Enterprise Knowledge Portals

### Definition:

Entry to corporate intranets that serve as their knowledge management systems



## Business Value of AI

### Artificial Intelligence Uses:

- Design jet engines
- Monitor factory equipment and signal when preventative maintenance is needed
- Gain insights into human genome for pharmaceutical research
- Detect credit card fraud

### Case #2: Business Value of AI

#### AI Benefits:

- Data mining systems sift instantly through a deluge of data to uncover patterns and relationships that would elude an army of researchers
- Companies can predict sales and other customer behaviors

#### Challenges in AI Systems:

- Getting transaction data
- Dealing with disparate sources of data
- What is the business value of AI technologies in business today? Use several examples from the case to illustrate your answer.
- What are some of the benefits and limitations of data mining for business intelligence? Use Bank Financials experience to illustrate your answer.

## Artificial Intelligence (AI)

### Definition:

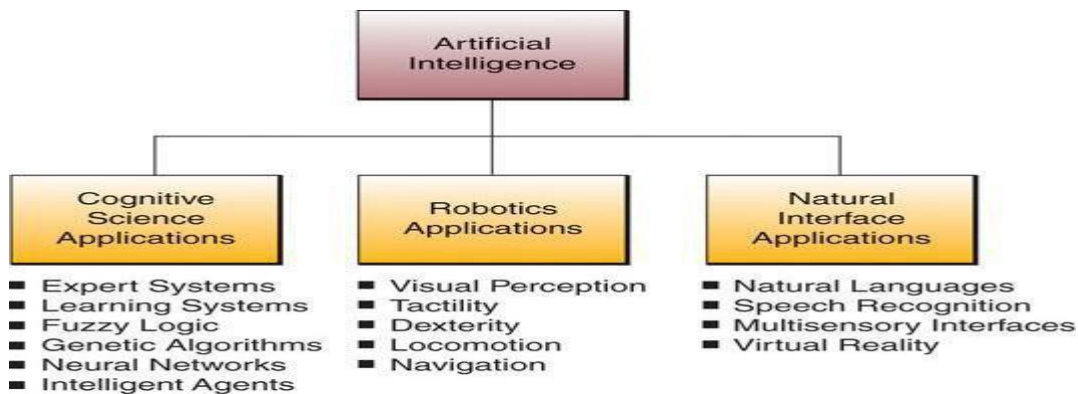
- A field of science and technology based on disciplines such as computer science, biology, psychology, linguistics, mathematics, and engineering
- Goal is to develop computers that can simulate the ability to think, as well as see, hear, walk, talk, and feel.

### *Attributes of Intelligent Behavior*

- Think and reason
- Use reason to solve problems
- Learn or understand from experience

- Acquire and apply knowledge
- Exhibit creativity and imagination
- Deal with complex or perplexing situations
- Respond quickly and successfully to new situations
- Recognize the relative importance of elements in a situation
- Handle ambiguous, incomplete, or erroneous information

## Domains of Artificial Intelligence



### Cognitive Science

#### Definition:

- Focuses on researching how the human brain works and how humans think and learn

### Robotics

#### Definition:

- Robot machines with computer intelligence and computer controlled, humanlike physical capabilities

### Natural Interfaces

#### Definition:

- Includes natural language, speech recognition, and the development of multi sensory devices that use a variety of body movements to operate computers

### Expert Systems

#### Definition:

- A knowledge-based information system that uses its knowledge about a specific, complex application to act as an expert consultant to end users

### Expert System Components

- Knowledge Base – facts about specific subject area and heuristics that express the reasoning procedures of an expert
- Software Resources – inference engine and other programs refining knowledge and communicating with users

## Methods of Knowledge Representation

- Case-Based – examples of past performance, occurrences and experiences
- Frame -Based – hierarchy or network of entities consisting of a complex package of data values
- Object-Based – data and the methods or processes that act on those data
- Rule-Based – rules and statements that typically take the form of a premise and a conclusion

## Expert System Benefits

- Faster and more consistent than an expert
- Can have the knowledge of several experts
- Does not get tired or distracted by overwork or stress
- Helps preserve and reproduce the knowledge of experts

## Expert System Limitations

- Limited focus
- Inability to learn
- Maintenance problems
- Developmental costs

## Suitability Criteria for Expert Systems

Suitability Criteria for Expert Systems
<ul style="list-style-type: none"><li>• <b>Domain:</b> The domain, or subject area, of the problem is relatively small and limited to a well-defined problem area.</li><li>• <b>Expertise:</b> Solutions to the problem require the efforts of an expert. That is, a body of knowledge, techniques, and intuition is needed that only a few people possess.</li><li>• <b>Complexity:</b> Solution of the problem is a complex task that requires logical inference processing, which would not be handled as well by conventional information processing.</li><li>• <b>Structure:</b> The solution process must be able to cope with ill-structured, uncertain, missing, and conflicting data, and a problem situation that changes with the passage of time.</li><li>• <b>Availability:</b> An expert exists who is articulate and cooperative, and who has the support of the management and end users involved in the development of the proposed system.</li></ul>

## Knowledge Engineer

### Definition:

- A professional who works with experts to capture the knowledge they possess

## Neural Networks

### Definition:

- Computing systems modeled after the brain's mesh-like network of interconnected processing elements, called neurons

## **Fuzzy Logic**

### Definition:

- Method of reasoning that resembles human reasoning since it allows for approximate values and inferences and incomplete or ambiguous data instead of relying only on crisp data

## **Genetic Algorithms**

### Definition:

- Software that uses Darwinian, randomizing, and other mathematical functions to simulate an evolutionary process that can yield increasingly better solutions to a problem

## **Virtual Reality (VR)**

### Definition:

- Computer-simulated reality that relies on multisensory input/output devices such as a tracking headset with video goggles and stereo earphones, a data glove or jumpsuit with fiber-optic sensors that track your body movements, and a walker that monitors the movement of your feet.

## **Intelligent Agents**

### Definition:

- A software surrogate for an end user or a process that fulfills a stated need or activity by using built-in and learned knowledge base to make decisions and accomplish tasks in a way that fulfills the intentions of a user

## **User Interface Agents**

- Interface Tutors – observe user computer operations, correct user mistakes, and provide hints and advice on efficient software use
- Presentation – show information in a variety of forms and media based on user preferences
- Network Navigation – discover paths to information
- Role-Playing – play what -if games and other roles to help users understand information and make better decisions

## **Information Management Agents**

- Search Agents – help users find files and databases, search for desired information, and suggest and find new types of information products, media, and resources
- Information Brokers – provide commercial services to discover and develop information resources that fit the business or personal needs of a user
- Information Filters – receive, find, filter, discard, save, forward, and notify users about products received or desired

## **Note**

- Information systems can support a variety of management decision -making levels including strategic, tactical and operational as well as structured, semi structured and unstructured.
-

- Decision support in business is changing, driven by rapid developments in end user computing and networking.

Summary

- Management information systems provide prespecified reports and responses to managers on a periodic, exception, demand, or push reporting basis, to meet their need for information to support decision making.

- Online analytical processing interactively analyzes complex relationships among large amounts of data stored in multidimensional databases.

Summary

- Data mining analyzes the vast amounts of historical data that have been prepared for analysis in data warehouses.

- Decision support system are interactive, computer-based information systems that use DSS software and a model base and database to provide information tailored to support semi structured and unstructured decisions faced by individual managers.

- Executive information systems are easy to use and enable executives to retrieve information tailored to their needs and preferences.

- Enterprise information and knowledge portals provide a customized and personalized Web-based interface for corporate intranets to give their users easy access to a variety of internal and external business applications, databases, and information services that are tailored to their individual preferences and information needs.

- The goal of artificial intelligence is the development of computer functions normally associated with human physical and mental capabilities.

- Expert systems are knowledge -based information systems that use software and a knowledge base about a specific, complex application area to act as expert consultants to users in many business and technical applications.



