Karpagam Academy of Higher Education

(Deemed to be University Established Under section 3 of the UGC Act, 1956)

Pollachi Main Road, Eachanari (Post), Coimbatore – 641 021.

DEPARTMENT OF COMMERCE

II B.COM (PROFESSTIONAL ACCOUNTING) - ELECTIVE

MANAGEMENT INFORMATION SYSTEM– 16PAU303B

THIRED SEMSTER

LECTURE PLAN

UNIT-1

S. No.	LECTURE DURATION (Periods)	TOPICS TO BE COVERED	SUPPORT MATERIALS
1.	1	Information System ➢ Introduction ➢ Meaning & Definition ➢ Nature & Features	R1: p. 4 - 19
2.	1	Components of Information System	R1: p. 22 - 26
3.	1	Functions of an information system	R1: p. 20 - 22
4.	1	Steps in implementation of MIS	R1: p. 22 - 26
5.	1	Strategies of System Implementation	R1: p. 42 - 46
6.	1	Need for information ➢ Information system Architecture ➢ Evolution of information System	R1: p. 16 - 19
7.	1	Information system for Decision Making ➢ Decision support system ➢ Group Decision Support System ➢ Executive information system ➢ Expert system	R1: p. 11 - 15
8.	1	MIS as competitive Advantage	R1: p. 40 - 46
9.	1	Collect the Name and analyse the features of any five E- Business Models (Tutorial Hour)	W2
10.	1	MIS Structures	W1
11.	1	Recapitulation and discussion of important questions	
		Total no. of hours planned for unit-1	**11 Hours**

UNIT-2

S. No.	LECTURE DURATION (Periods)	TOPICS TO BE COVERED	SUPPORT MATERIALS
1.	1	Strategic Information System ➢ Meaning, ➢ Definition, and nature	R1: p. 40 - 49
2.	1	MIS Support for Management Function ➢ Planning ➢ Organising ➢ Controlling	W1
3.	3	MIS for Specific Function ➢ Production Information System ➢ Financial Information System ➢ Marketing Information System ➢ Inventory Information system ➢ Production Information System	R1: p. 213 - 238
4.	1	Data Base Management ➢ Purpose and uses	R1: p. 140 - 155
5.	1	Develop the New Information system for any one of the New Functional Area of Modern Business (Tutorial Hour)	W2
6.	1	System Models ➢ Steps ➢ techniques	R1: p. 375 - 399
7.	1	Hierarchical of System Models	R1: p. 399 -422
8.	1	Net Work of System Models ➢ Relational ➢ Modular	W1
9	1	Recapitulation and discussion of important questions	
		Total no. of hours planned for unit-2	**11 Hours**

UNIT-3

S. No.	LECTURE DURATION (Periods)	TOPICS TO BE COVERED	SUPPORT MATERIALS
1.	1	Computer Hardware ➢ Introduction ➢ Meaning, definition ➢ Need and significance	R1: p. 67 -69
2.	1	Description of Electronic Computers	W1
3.	1	CPU Operations ➢ IT – Digital Signals ➢ Memory Units	R1: p. 75-76
4.	1	Computer Generations ➢ First, Second, Third, Fourth and Recent	R1: p. 96 -102
5.	1	Classification of Computer ➢ Analog ➢ Digital ➢ Hybrid	R1: p. 80-81
6.	1	Digital Computers and Its Type ➢ Main ➢ Mini ➢ Workstations ➢ Micro ➢ Super ➢ Personal	R1: p. 70 - 79
7.	1	Computer Software ➢ Introduction ➢ Meaning, definition ➢ Need and significance	R1: p. 104 - 116
8.	1	Types of Computer ➢ System Software ➢ Application Software	R1: p. 118 - 138
9.	1	Data Representation in Computer	R1: p. 140 -162
10	1	Introduction to Client Server	R1: p. 190
11	1	Write an Executive Summary for a New Information System (Tutorial Hour)	W1
12.	1	Recapitulation and discussion of important questions	
		Total no. of hours planned for unit-3	**12 Hours**

UNIT-4

S. No.	LECTURE DURATION (Periods)	TOPICS TO BE COVERED	SUPPORT MATERIALS
1.	1	Input Devices ➢ Introduction and Overview ➢ Various Classification	R1: p. 80-82
2.	1	Input Devices for Text ➢ Keyboard and OMR ➢ OCR,MICR and Others	R1: p. 85 - 86
3.	1	Input Devices for Graphics ➢ Digital Scanner ➢ Camera ➢ Virtual reality ➢ Sensors ➢ Voice input devices	R1: p. 87 - 88
4.	1	Input Point Devices ➢ Mouse, Pen based input ➢ Touch Screen	R1: p. 83 - 85
5.	1	Output Devices ➢ Introduction and Overview ➢ Various Classification	R1: p. 87-88
6.	1	Output Device ➢ Impact Printer ➢ Non – Impact Printer	R1: p. 88 - 89
7.	1	Output Device ➢ Video Display Terminals	R1: p. 92 - 95
8.	1	Output Device ➢ Plotters ➢ Voice Output Devices	R1: p. 96 - 98
9.	1	Secondary Storage Devices ➢ Magnetic Disk ➢ Floppy	R1: p. 98 -102
10.	1	Secondary Storage Devices ➢ Magnetic Tape ➢ Optical Disk, DROM	R1: p. 102 -104
11.	1	Prepare Hardware and Software Specification for a New Computer System – Developing By You (Tutorial Hour)	W1
12.	1	Recapitulation and discussion of important questions	
		Total no. of hours planned for unit-4	**12 Hours**

UNIT-5

S.No	LECTURE DURATION (Periods)	TOPICS TO BE COVERED	SUPPORT MATERIALS
1	1	Telecommunication Revolution	R1: p. 171 -176
2	1	Introduction to ➢ Email ➢ Internet ➢ Intranet	R1: p. 178 -181
3	1	Teleconferencing	W1
4	1	www Architecture	R1: p. 382 -383
5	1	Introduction to E - Commerce	R1: p. 283 - 290
6	1	E – Commerce Models ➢ B2B ➢ B2C ➢ EDI & EDI Applications in Business	R1: p. 305 -310
7	1	Electronic Payment Cash ➢ Smart Card ➢ Credit Card	R1: p. 293 -294
8	1	Fundamentals of ERP	R1: p. 258 - 282
9.	1	IT Act 2000	W1
10.	1	Recapitulation and discussion of important questions	-
11.	1	**Revision :** Discussion of ESE question papers	
12.	1	Discussion of ESE question papers	
13.	1	Discussion of ESE question papers	
14.	1	**Total no. of hours planned for unit-5 &** **Question Paper Discussion**	**14 hours**

SUPPORT MATERIALS

Text Book

T – James O Brien (2014) Management Information System, New Delhi : Data Mc Grew

Reference books

R1 – Gordon B Davis (2012) Management Information System, New Delhi : Data Mc Grew

R2 – Sudalaimuthu. S (2014) Computer Application in Business. Mumbai : Himalaya Publishing House P Ltd

Website Reference

W1 : http://mbaexamnotes.com/management-information-system-notes.html

W2: www.tutorialspoint.com/management_information_system/management_information_system.htm

Semester III

		L	T	P	C
17PAU303B	**SEC 1 – MANAGEMENT INFORMATION SYSTEM**	**5**	**1**	**-**	**4**

Course Objectives:

Management Information System represents the knowledge and exposure to the concepts, theories and practices in the field of MIS. It explains the relationship among and between information systems and management, analyze how technology can be used to synthesize complex data to make sound business decisions. This paper presents the basic understanding of information systems and its operations.

Learning Outcome:

- To enable the students to learn the management information system and their applications in Management.
- To create awareness among students in telecommunication revolution

UNIT I

Introduction to Information Systems - Definition - Features - Steps in Implementation of MIS - Need for Information - Information System for Decision making- MIS as Competitive Advantages – MIS Structures.

UNIT II

MIS - Strategic Information System - MIS Support for Planning - Organising - controlling - MIS for Specific Functions - Personnel - Finance - Marketing Inventory Production Data Base Management System Models - Hierarchical - Network - Relational - Modular.

UNIT III

Computer Hardware - Description of Electronic Computers - CPU Operations - Classification of Computers - Main - Mini - Workstations - Micro Computers - Super Computers - Personal Computers. Computer Software - Types of Software - Data Representation in Computers - Introduction to Client-Server.

UNIT IV

Input Devices - Mouse - Touch Screens - MICR - OCR - Keyboard - Pen Based Input - Digital Scanners - Voice Input Devices - Sensors. Output Devices - Impact Printers - Non-Impact Printers - Video Display Terminals - Plotters - Voice Output Devices. Secondary Storage Devices - Magnetic Disk, Floppy, Magnetic Tape, Optical Disk Storage - DROM

UNIT V

Telecommunication Revolution - Introduction to Email- Internet - Intranet - Teleconferencing - www Architecture - Introduction to E-Commerce - Models B_B, B_C, and EDI, EDI Applications in Business - Electronic Payment Cash - Smart Cards - Credit Cards - Fundamentals of ERP- Information Technology Act, 2000.

SUGGESTED READINGS:

TEXT BOOKS

1. James O Brien. (2014). *Management Information System*. New Delhi: Tata Mc Grew Hill.

REFERENCES

1. Kenneth Laudon., & Jane Laudon. (2011). *Management Information System- A contemporary perspective*. New Delhi: Pearson Prentice Hall of India.

2. Gordon B Davis. (2012). *Management Information System*. New Delhi: Tata Mc Grew Hill.

3. Sudalaimuthu, S. (2014). *Computer applications in business*. Mumbai: Himalaya Publishing House Pvt.Ltd.

Unit - I

MIS - Basic Information Concepts

UNIT I : Introduction to Information Systems - Definition - Features - Steps in Implementation of MIS - Need for Information - Information System for Decision making- MIS as Competitive Advantages – MIS Structures.

An **Information System** is a system that gathers data and disseminates information with the sole purpose of providing information to its users.

The main object of an information system is to provide information to its users. Information systems vary according to the type of users who use the system.

A **Management Information System** is an information system that evaluates, analyzes, and processes an organization's data to produce meaningful and useful information based on which the management can take right decisions to ensure future growth of the organization.

Information Definition

"Information can be recorded as signs, or transmitted as signals. Information is any kind of event that affects the state of a dynamic system that can interpret the information.

Conceptually, information is the message (utterance or expression) being conveyed. Therefore, in a general sense, information is "Knowledge communicated or received, concerning a particular fact or circumstance". Information cannot be predicted and resolves uncertainty."

Information Vs Data

Data can be described as unprocessed facts and figures. Plain collected data as raw facts cannot help in decision-making. However, data is the raw material that is organized, structured, and interpreted to create useful information systems.

Data is defined as 'groups of non-random symbols in the form of text, images, voice representing quantities, action and objects'.

Information is interpreted data; created from organized, structured, and processed data in a particular context.

According to **Davis and Olson**:

"Information is a data that has been processed into a form that is meaningful to recipient and is of real or perceived value in the current or the prospective action or decision of recipient."

Information, Knowledge and Business Intelligence

Professor Ray R. Larson of the School of Information at the University of California, Berkeley, provides an Information Hierarchy, which is:

- Data - The raw material of information.
- Information - Data organized and presented by someone.
- Knowledge - Information read, heard, or seen, and understood.
- Wisdom - Distilled and integrated knowledge and understanding.

Scott Andrews' explains Information Continuum as follows:

- Data - A Fact or a piece of information, or a series thereof.
- Information - Knowledge discerned from data.
- Business Intelligence - Information Management pertaining to an organization's policy or decision-making, particularly when tied to strategic or operational objectives.

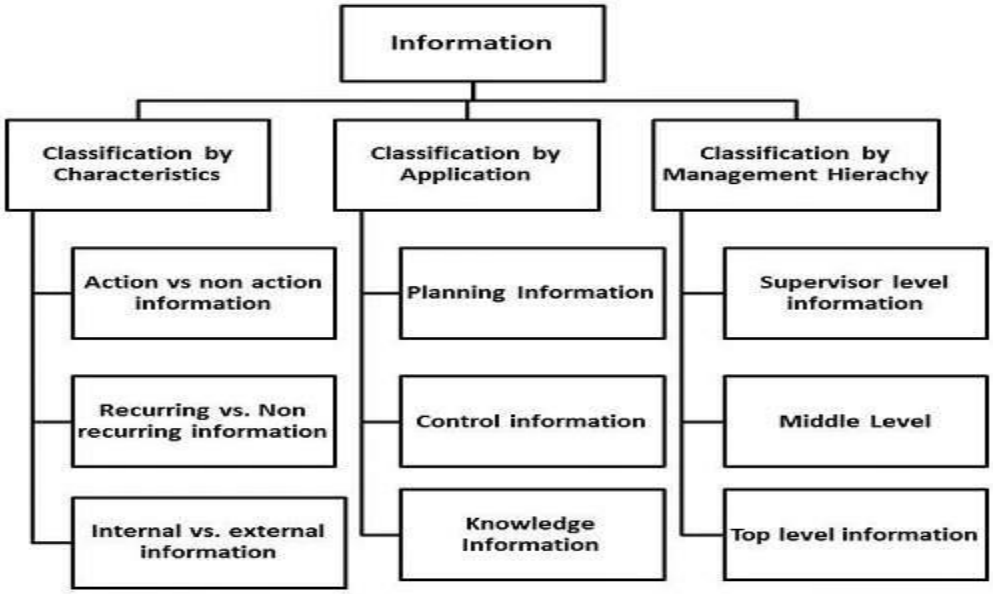
Information/Data Collection Techniques

The most popular data collection techniques include:

- Surveys: A questionnaires is prepared to collect the data from the field.
- Secondary data sources or archival data: Data is collected through old records, magazines, company website etc.
- Objective measures or tests: An experimental test is conducted on the subject and the data is collected.
- Interviews: Data is collected by the system analyst by following a rigid procedure and collecting the answers to a set of pre-conceived questions through personal interviews.

MIS - Classification of Information

Information can be classified in a number of ways and in this chapter, you will learn two of the most important ways to classify information.



Classification by Characteristic

Based on Anthony's classification of Management, information used in business for decision-making is generally categorized into three types:

- **Strategic Information:** Strategic information is concerned with long term policy decisions that defines the objectives of a business and checks how well these objectives are met. For example, acquiring a new plant, a new product, diversification of business etc, comes under strategic information.
- **Tactical Information:** Tactical information is concerned with the information needed for exercising control over business resources, like budgeting, quality control, service level, inventory level, productivity level etc.
- **Operational Information:** Operational information is concerned with plant/business level information and is used to ensure proper conduction of specific operational tasks as planned/intended. Various operator specific, machine specific and shift specific jobs for quality control checks comes under this category.

Classification by Application

In terms of applications, information can be categorized as:

- **Planning Information:** These are the information needed for establishing standard norms and specifications in an organization. This information is used in strategic, tactical, and operation planning of any activity. Examples of such information are time standards, design standards.
- **Control Information:** This information is needed for establishing control over all business activities through feedback mechanism. This information is used for controlling attainment, nature and utilization of important processes in a system. When such information reflects a deviation from the established standards, the system should induce a decision or an action leading to control.
- **Knowledge Information:** Knowledge is defined as "information about information". Knowledge information is acquired through experience and learning, and collected from archival data and research studies.
- **Organizational Information:** Organizational information deals with an organization's environment, culture in the light of its objectives. Karl Weick's Organizational Information Theory emphasizes that an organization reduces its equivocality or uncertainty by collecting, managing and using these information prudently. This information is used by everybody in the organization; examples of such information are employee and payroll information.
- **Functional/Operational Information:** This is operation specific information. For example, daily schedules in a manufacturing plant that refers to the detailed assignment of jobs to machines or machines to operators. In a service oriented business, it would be the duty roster of various personnel. This information is mostly internal to the organization.
- **Database Information:** Database information construes large quantities of information that has multiple usage and application. Such information is stored, retrieved and managed to

create databases. For example, material specification or supplier information is stored for multiple users.

MIS - Information Need & Objective

Information processing beyond doubt is the dominant industry of the present century. Following factors states few common factors that reflect on the needs and objectives of the information processing:

- Increasing impact of information processing for organizational decision making.
- Dependency of services sector including banking, financial organization, health care, entertainment, tourism and travel, education and numerous others on information.
- Changing employment scene world over, shifting base from manual agricultural to machine-based manufacturing and other industry related jobs.
- Information revolution and the overall development scenario.
- Growth of IT industry and its strategic importance.
- Strong growth of information services fuelled by increasing competition and reduced product life cycle.
- Need for sustainable development and quality life.
- Improvement in communication and transportation brought in by use of information processing.
- Use of information processing in reduction of energy consumption, reduction in pollution and a better ecological balance in future.
- Use of information processing in land record managements, legal delivery system, educational institutions, natural resource planning, customer relation management and so on.

In a nutshell:

- Information is needed to survive in the modern competitive world.
- Information is needed to create strong information systems and keep these systems up to date.

Implications of Information in Business

Information processing has transformed our society in numerous ways. From a business perspective, there has been a huge shift towards increasingly automated business processes and communication. Access to information and capability of information processing has helped in achieving greater efficiency in accounting and other business processes.

A complete business information system, accomplishes the following functionalities:

- Collection and storage of data.
- Transform these data into business information useful for decision making.
- Provide controls to safeguard data.
- Automate and streamline reporting.

The following list summarizes the five main uses of information by businesses and other organizations:

- **Planning** - At the planning stage, information is the most important ingredient in decision making. Information at planning stage includes that of business resources, assets, liabilities,

plants and machineries, properties, suppliers, customers, competitors, market and market dynamics, fiscal policy changes of the Government, emerging technologies, etc.

- **Recording** - Business processing these days involves recording information about each transaction or event. This information collected, stored and updated regularly at the operational level.
- **Controlling** - A business need to set up an information filter, so that only filtered data is presented to the middle and top management. This ensures efficiency at the operational level and effectiveness at the tactical and strategic level.
- **Measuring** - A business measures its performance metrics by collecting and analyzing sales data, cost of manufacturing, and profit earned.
- **Decision-making** - MIS is primarily concerned with managerial decision-making, theory of organizational behavior, and underlying human behavior in organizational context. Decision-making information includes the socio-economic impact of competition, globalization, democratization, and the effects of all these factors on an organizational structure.

In short, this multi-dimensional information evolves from the following logical foundations:

- Operations research and management science
- Theory of organizational behavior
- Computer science:
    - Data and file structure
    - Data theory design and implementation
    - Computer networking
    - Expert systems and artificial intelligence
- Information theory

Following factors arising as an outcome of information processing help speed up of business events and achieves greater efficiency:

- Directly and immediate linkage to the system
- Faster communication of an order
- Electronic transfer of funds for faster payment
- Electronically solicited pricing (helps in determining the best price)

MIS Need for Information Systems

Managers make decisions. Decision-making generally takes a four-fold path:

- Understanding the need for decision or the opportunity,
- Preparing alternative course of actions,
- Evaluating all alternative course of actions,
- Deciding the right path for implementation.

MIS is an information system that provides information in the form of standardized reports and displays for the managers. MIS is a broad class of information systems designed to provide information needed for effective decision making.

Data and information created from an accounting information system and the reports generated thereon are used to provide accurate, timely and relevant information needed for effective decision making by managers.

Management information systems provide information to support management decision making, with the following goals:

- Pre-specified and preplanned reporting to managers.
- Interactive and ad-hoc support for decision making.
- Critical information for top management.

MIS is of vital importance to any organization, because:

- It emphasizes on the management decision making, not only processing of data generated by business operations.
- It emphasizes on the systems framework that should be used for organizing information systems applications.

MIS - Introduction

Management Information System is an implementation of the organizational systems and procedures. To a programmer it is nothing but file structures and file processing. However, it involves much more complexity.

The three components of MIS provide a more complete and focused definition, where **System** suggests integration and holistic view, **Information** stands for processed data, and **Management**is the ultimate user, the decision makers.

Management information system can thus be analyzed as follows:

Management

Management covers the planning, control, and administration of the operations of a concern. The top management handles planning; the middle management concentrates on controlling; and the lower management is concerned with actual administration.

Information

Information, in MIS, means the processed data that helps the management in planning, controlling and operations. Data means all the facts arising out of the operations of the concern. Data is processed i.e. recorded, summarized, compared and finally presented to the management in the form of MIS report.

System

Data is processed into information with the help of a system. A system is made up of inputs, processing, output and feedback or control.

Thus MIS means a system for processing data in order to give proper information to the management for performing its functions.

Definition

Management Information System or 'MIS' is a planned system of collecting, storing, and disseminating data in the form of information needed to carry out the functions of management.

Objectives of MIS

The goals of an MIS are to implement the organizational structure and dynamics of the enterprise for the purpose of managing the organization in a better way and capturing the potential of the information system for competitive advantage.

Following are the basic objectives of an MIS:

- **Capturing Data:** Capturing contextual data, or operational information that will contribute in decision making from various internal and external sources of organization.
- **Processing Data:** The captured data is processed into information needed for planning, organizing, coordinating, directing and controlling functionalities at strategic, tactical and operational level. Processing data means:
    - making calculations with the data
    - sorting data
    - classifying data and
    - summarizing data
- **Information Storage:** Information or processed data need to be stored for future use.
- **Information Retrieval:** The system should be able to retrieve this information from the storage as and when required by various users.
- **Information Propagation:** Information or the finished product of the MIS should be circulated to its users periodically using the organizational network.

Characteristics of MIS

Following are the characteristics of an MIS:

- It should be based on a long-term planning.
- It should provide a holistic view of the dynamics and the structure of the organization.
- It should work as a complete and comprehensive system covering all interconnecting sub-systems within the organization.
- It should be planned in a top-down way, as the decision makers or the management should actively take part and provide clear direction at the development stage of the MIS.
- It should be based on need of strategic, operational and tactical information of managers of an organization.
- It should also take care of exceptional situations by reporting such situations.
- It should be able to make forecasts and estimates, and generate advanced information, thus providing a competitive advantage. Decision makers can take actions on the basis of such predictions.
- It should create linkage between all sub-systems within the organization, so that the decision makers can take the right decision based on an integrated view.
- It should allow easy flow of information through various sub-systems, thus avoiding redundancy and duplicity of data. It should simplify the operations with as much practicability as possible.
- Although the MIS is an integrated, complete system, it should be made in such a flexible way that it could be easily split into smaller sub-systems as and when required.

- A central database is the backbone of a well-built MIS.

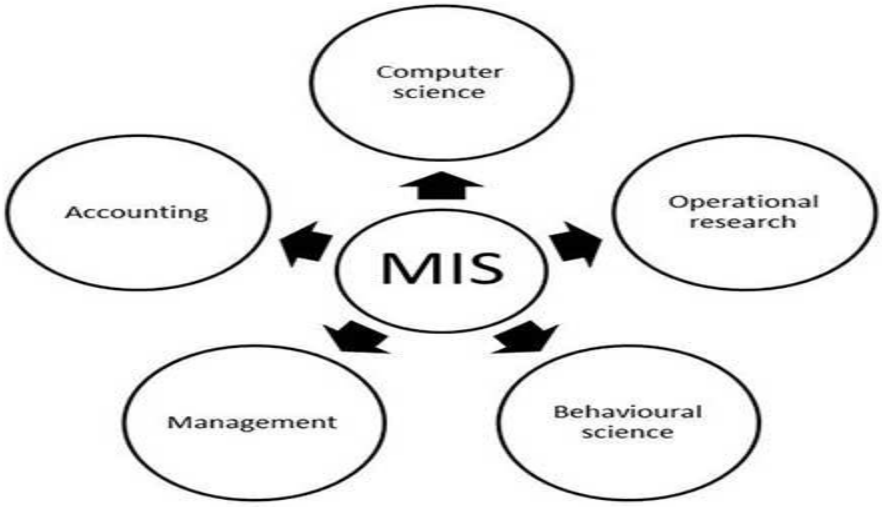
Characteristics of Computerized MIS

Following are the characteristics of a well-designed computerized MIS:

- It should be able to process data accurately and with high speed, using various techniques like operations research, simulation, heuristics, etc.
- It should be able to collect, organize, manipulate, and update large amount of raw data of both related and unrelated nature, coming from various internal and external sources at different periods of time.
- It should provide real time information on ongoing events without any delay.
- It should support various output formats and follow latest rules and regulations in practice.
- It should provide organized and relevant information for all levels of management: strategic, operational, and tactical.
- It should aim at extreme flexibility in data storage and retrieval.

Nature and Scope of MIS

The following diagram shows the nature and scope of MIS:



Implementation, Evaluation and Maintenance of Information System

Implementation

The design of a management information system may seem to management to be an expensive project, the cost of getting the MIS on line satisfactorily may often be comparable to that of its design, and the implementation has been accomplished when the outputs of the MIS are continuously utilized by decision makers.

Once the design has been completed, there are four basic methods for implementing the MIS. These ares-

1. Install the system in a new operation or organization.
2. Cut off the old system and install the new

This produces a time gap during which no system is in operation. Practically, installation requires

one or two days for small companies or small systems.

3. Cut over by segments

This method is also referred as" phasing in" the new system. Small parts or subsystems are substituted for the old. In the case of upgrading old systems, this may be a very desirable method.

4. Operate in parallel and cut over.

The new system is installed and operated in parallel with the current system until it has been checked out, then only the current system is cut out. This method is expensive because of personal and related costs. Its big advantages are that the system is fairly well debugged when it becomes the essential information system.

Plan the implementation

The three main phases in implementation take place in series.

These are

1. The initial installation
2. The test of the system as a whole
3. The evaluation, maintenance and control of the system.

Many implementation activities should be undertaken in parallel to reduce implementation time. Training of personnel and preparation of software may be in parallel with each other and with other implementation activities.

The first step in the implementation procedure is to plan the implementation. Some analyst includes the planning of the implementation with the design of the system, the planning and the action to implement the plan should be bound closely together. Planning is the first step of management, not the last. The MIS design and the urgent need for the system at the time the design is completed will weigh heavily on the plan for implementation.

Implementation Tasks

The major implementation tasks consists of-

1. Planning the implementation activities
2. Acquiring and laying out facilities and offices
3. Organizing the personnel for implementation
4. Developing procedures for installation and testing
5. Developing the training program for operating personnel.
6. Completing the system's software
7. Acquiring required hardware
8. Generating files
9. Designing forms
10. Testing the entire system
11. Completing cutover to the new system
12. Documenting the system
13. Evaluating the MIS
14. Providing system maintenance(debugging and improving)

1. Planning the implementation activities

Establish Relationships among tasks

For small projects, the order of performance may simply be described in text form. A Gantt chart or network diagram makes visualization of the plan and schedule much clearer.

For large projects, many concurrent and sequential activities are interrelated so that a network diagram must be employed in any good plan.

Establish a Schedule

Schedule is prepared by having the system designers estimate the times between the events in the program network. The critical path (longest time through the network) can be calculated. After specifying the starting date, the end date is established.

Cost Schedule to Tasks and Time

The cost for completing each task required to complete is established as part of the plan; then the rate of expenditures should be budgeted.

Reporting and control of the work in progress may be obtained by weekly meetings. The financial personnel must make certain that report formats allow them to show cost and technical progress relationship as well as cost and time.

2. Acquiring and laying out facilities and offices

For the installation of a new system to replace a current one may require a major revision of facilities as well as completely new office, computer room etc.

The MIS project manager must prepare rough layouts and estimates of particular floor areas that feel to be needed. The manager then prepares cost estimates.

Space planning must be done by the space to be occupied by people, the space occupied by equipment and the movement of people and equipment in the work progress. A large investment in good working conditions will repay its cost many times.

3. Organizing the personnel for implementation

As the implementation tasks have been defined, management usually assigns a project manager to guide the implementation.

The purpose of the MIS is to increase the amount and quality of their contributions, the system is their system.

Top management must make the middle managers for their involvement in implementation, besides these, systems specialists, computer programmer; top management should make sure that each people who will operate the system should have active parts in the implementation.

4. Developing procedures for installation and testing

After organizing the personnel for implementation the next task is to develop or prepare the procedures for implementation. As the project leader has the network plan for proceeding with the implementation, this leader calls the key people in the project to prepare more detailed procedures for system installation.

Procedures for evaluating and selecting hardware must be spelled out. Procedures for phasing in parts of the MIS or operating the MIS in parallel must be developed.

The major part of implementing the MIS is the testing of each segment of total system as it is installed.

5. Developing the training program for operating personnel

A program is developed keeping in mind to impress management and support. After developing the program, it is necessary to train operating personnel in their new duties. They must have a thorough understanding of what the new MIS is like and what it is supposed to do. They must learn how it will operate. They are faced with many changes in their work and have to obtain acceptance of changes.

As there are various levels of personnel and these people will be working with only a small part of the MIS, the seminars should be designed to provide them with an understanding of the complete system.

6. Completing the system's software

As the software is developed internally or under contract, in both cases, the software development must take in mind the nature of the hardware required.

As the system designers and programmers provide the flow diagrams and the block diagrams during the detailed design state. Some modification may be required, as the implementation stage progresses.

7. Acquiring required hardware

This acquisition is usually the limiting factor in getting am MIS implementation. These tasks should be started during the design stage.

The decision is to be needed, whether to buy or lease the hardware. Capital expenditure analysis is only one of many factors involved in this decision. Others are prestige, usage etc.

8. Generating files

In the implementation stage, the actual data must be obtained and recorded for the initial testing and operation of the system. This requires format of the data, storage form and format and remarks to indicate when the data have been stored.

The collection of data used in routine operations is often called the master file.

Responsibility for file maintenance for each file item should also be assigned. The development of files or databases belongs to information system designers and storage and retrieval experts.

The translation of specifications for files into computer programs is a function of computer specialists.

9. Designing forms

For controlling the marketing, a salesperson has to fill out the forms summarizing the day's activities. The form ensures the right information to be supplied for computer storage.

Forms are required not just for input and output but also for transmitting data at intermediate stages.

10. Testing the entire system

As the total system is installed, tests should be performed with the test specifications and procedure. A test during installation stage consists of component tests, subsystem tests and total system acceptance tests.

Components may be equipment (that can be new or old), new software programs, new data collection methods, work procedures, reporting formats. Difficulties that occur during component tests may lead t design changes.
As more components are installed, subsystems may be tested. There is a difference between the testing of component and the testing of a system.
System tests require verification of multiple inputs, complex logic systems, and timing aspects of many parts.

11. completing cutover to the new system

Cutover is a point at which the new component replaces the old component to the new system replaces the old system. This involves old forms, old files and old equipment being retried.
The debugging proves associated with the cutover to the new system may extend for several months.

12. Documenting the system

Documentation of the MIS means preparation of written descriptions of the scope, purpose, information flow components, and operating procedures of the system.
Documentation is a necessity for troubleshooting, for replacement of subsystems, for interfacing with other systems, for training new operating personnel and also for evaluating and upgrading the system.

13. Evaluating the system

After the MIS has been operating smoothly for a short period of time, an evaluation of each step in the design and of the final system performance should be made.
Evaluation should not be delayed beyond the time when the system's analysts have completed most of the debugging. The longer the delay, the more difficult it will be for designer to remember important details.
The evaluation should be made by the customer as well as by the designers.

14. Providing system maintenance

Control and maintenance of the system are the responsibilities of the line managers.
Control of the systems means the operation of the system as it was designed to operate. Sometimes, well-intentioned people or operators may make unauthorized changes to improve the system, changes that are not approved or documented.
Maintenance is closely related to control. Maintenance is that ongoing activity that keeps the MIS at the highest levels of effectiveness and efficiency within cost constraints.
Maintenance is directed towards reducing errors due to design, reducing errors due to environmental changes and improving the system's scope and services.

Management Information Systems and Decision-Making

The **type of information** required by decision makers in a company is directly related to:

- the level of management decision making
- the amount of structure in the decision situations managers face

The **levels of management decision making** that must be supported by information technology in a successful organization (independently of its size, shape, and participants), are often shown as a managerial pyramid – see the figure below (O'Brien, p. 393) and Lecture 4:

Strategic management: As part of a strategic planning process top executives

i. develop overall organizational goals, strategies, policies, and
ii. monitor the strategic performance of the organization and its overall direction in the political, economic, and competitive business environment

Tactical management: Business unit managers and business professionals in self-directed teams

i. develop short- and medium-range plans, schedules, budgets and specify policies, procedures, and business objectives for their sub-units of the company, and
ii. allocate resources and monitor the performance of their organizational sub-units, including departments, divisions, process teams, project teams, and other workgroups.

Operational management: Operating managers and members of self-directed teams

i. develop short-range plans (e.g. weekly production schedules), and
ii. direct the use of resources and the performance of tasks according to procedures and within budgets and schedules they establish for the teams and other workgroups of the organization.

Decision makers need information products whose characteristics, attributes or quality are having the **three dimensions** of time, content, and form – see the figure below (O'Brien, p. 393).

Decision maker at different levels of the organization are making more or less structured decisions. Typically there are three types of **decision structure**:

Unstructured decisions (usually related to the long-term strategy of the organization);

Semi-structured decisions (some decision procedures can be pre-specified but not enough to lead to a definite recommended decision);

Structured decisions (the procedure to follow, when a decision is needed, can be specified in advance).

Earlier in this course we discussed the concept of system as a set of interrelated components, with a clearly defined boundary, working together to achieve a common set of objectives. With respect to the **information system**, it can be any organized combination of people, hardware, software, communication networks, data resources, and policies and procedures that stores, retrieves, transforms, and disseminates information in an organization (O'Brian, p. 4).

There are three vital roles that information systems can perform for a business enterprise: support of business processes and operations, support of decision making by employees and managers, and support of strategies for competitive advantage – see the figure below (O'Brien, p. 8).

The **applications of information systems** that are implemented in today's business world can be classified as either operations or management information systems

Operations Support Systems (OSS) produce a variety of information products for internal and external use, such as processing business transactions, controlling industrial processes, supporting enterprise communications and collaborations, and updating corporate databases effectively. They do not emphasize the specific information products that can best be used by managers. Further processing by management information systems is usually required.

In this course we are interested more on the **Management Support Systems** (Support of Managerial Decision Making) and more specifically on the process of providing information and support for decision-making by different levels of responsibilities of the managers and business professionals. The management classifications of information systems can be structured in four main groups of systems (O'Brien, the figure above, and chapter 10):

Management Information Systems (MIS): provide information in the form of reports and displays to managers and many business professionals that support their day-to-day decision-making needs. Usually the information has been specified in advance to adequately meet the expectations on operational and tactical levels of the organization, where the decision making situations are more structured and better defined.

Decision Support Systems (DSS) are computer-based information systems that provide interactive information support to managers and business professionals during the decision-making process. DSS use analytical models, specialized databases, a decision maker's own insights and judgments, and an interactive, computer-based modeling process to support semi-structured business decisions.Â

Executive Information Systems (EIS) or **Executive Support Systems** (ESS) are information systems that combine many of the futures of MIS and DSS. Here the information is presented in forms tailored to the preferences of the executives using the system, such as graphical user interface, customized to the executives graphics displays, exception reporting, trend analysis, and abilities to 'drill-down' and retrieve displays of related information quickly at lower levels of detail.

Specialized Processing Systems (PS) are information systems characterized as functional business systems, strategic information systems, knowledge management systems, and expert systems.

It is important to realize that business applications of information systems in the real world are typically integrated combinations of all these types of information systems. In practice, all these different types and roles of information systems are combined into integrated or **Cross-Functional Business Information Systems** that provide a variety of functions. Thus, most information systems are designed to produce information and support decision making for various levels of management and business functions, as well as perform record-keeping and transaction-processing chores.

Whenever you analyze or work with an information system, you probably see that it provides information for a variety of managerial levels and business functions. This will be explain and demonstrated in greater details in Lectures 7 to 12 of this course.

The figure below illustrates the scope of the managerial challenges and opportunities facing business managers and professionals in effectively managing information systems and technologies

To analyse an organisations competitive advantage one just has look at Michael Porter's competitive forces model.

Competitive advantage grows fundamentally from the value a firm is able to create to their customers. Customers are willing to pay for value and superior value stems from offering lower prices than competitors for equivalent benefits or providing unique benefits that more than offset higher prices.", Porter (1985:3).

This model below is the most widely used for understanding competitive advantage.

From this model an organisation achieves a snapshot of itself, its competitors, and the environment. In Porter's competitive forces model, the strategic position is identified by the competition of existing / traditional direct, new market entrants, substitute products, customers, and suppliers.

Porter's Generic Strategies

(source:
Porter,)

		COMPETITIVE ADVANTAGE	
		Lower Cost	Differentiation
COMPETITIVE SCOPE	Broad Target	1. Cost Leadership	2. Differentiation
	Narrow Target	3A. Cost Focus	3B. Differentiation Focus

The evolution of information has certainly altered how managers throughout business see the role of Information Systems. The value of information is now recognised. Furthermore, it is recognised that information is a depreciating asset and must be treated as a resource that the organization could / should use in its business. Robson (1997:188)

One can utilise information systems for competitive advantage by identifying how the systems can enhance core competencies. Consumer behaviour is more dynamic than ever. It is no longer static and businesses need to evolve and be innovative and up to date if they want to position themselves above the rest.

An organisation's returns on investment are often linked to strategic business lines. Information systems can improve the overall performance of business lines by enhancing synergies, utilising Client Relationship Management (CRM) applications, BI Tools for enhanced analytics and core competencies.

The following applications can assist businesses in obtaining a competitive advantage:

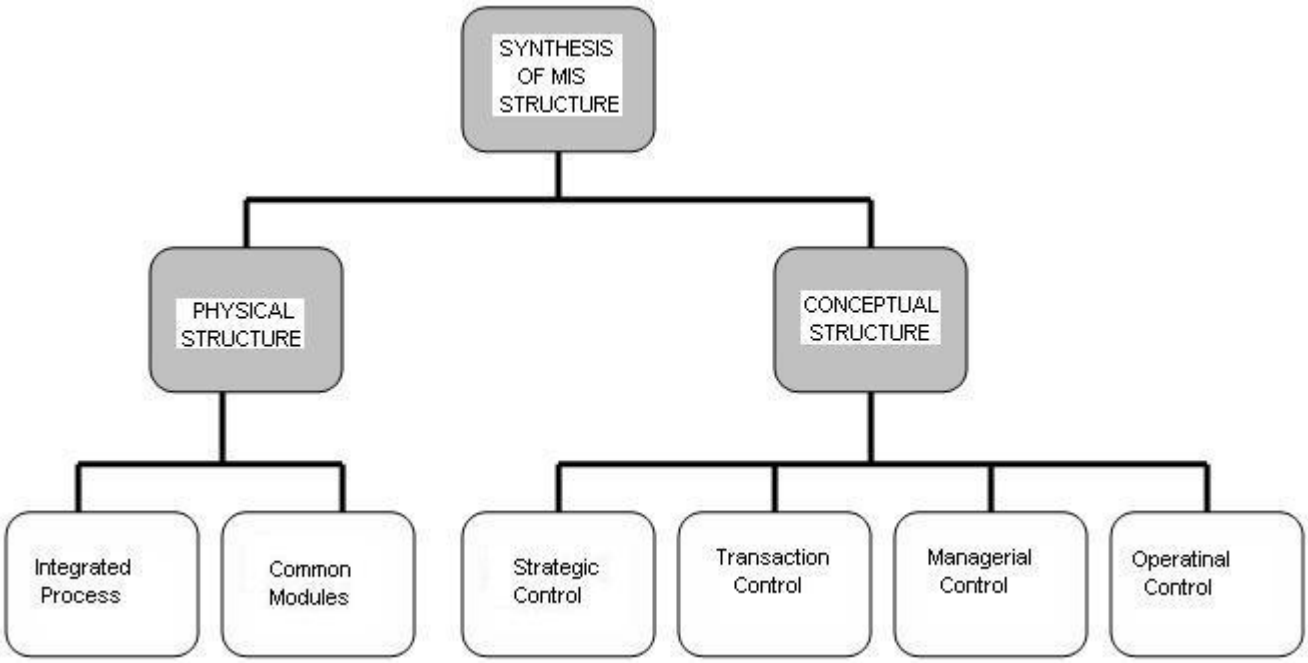
- CRM applications assists businesses in understanding and managing their customers.
- Social Engagement (SE) Tools – provide positive and negative sentiments from comments made on Twitter, Facebook, Helopeter, etc. This feedback can be acted upon timeously and assist in strategic business decisions.
- Marketing Tools like Microsoft Dynamics Marketing (MDM) that can assist in building marketing campaigns, measure success/failure of marketing campaigns, reports to assist business with marketing strategies, etc.
- Business Intelligence (BI) Tools – assist the business in analysing Sales, and key business information via Dashboards and Reports. This financial information which is pulled out of a Data warehouse, can be analysed and used by businesses for strategic planning and analysis.
- HRIS application enabling talent management, HR metrics and a complete HR Solution

Information systems that allow for the sharing of knowledge across business lines enhances competency and provides the business with a competitive advantage over its rivals.

Within any business information management is one of the most important areas of competitive strategy. The accurate management of customer information is paramount to the optimisation of a customer's life cycle within the company, including their spend with the organisation.

Certain organisation's competitive strategy includes the up selling and cross-selling of customer product benefits. Information management systems that are companywide allowing all departments to access the same set of customer information in real time. Without such access and single view, the profits and retention efforts gained through the up selling and cross selling of customer departments would not be possible.

If one looks at traditional environments outsourcing shared business units such as Finance, for example and concentrating on core business. ICT has evolved into a similar model with "The Cloud" in terms of business concentrating on core business and not spending too much on IT infrastructure enabling one to use software as and when required.



MIS - Decision Support System

Decision support systems (DSS) are interactive software-based systems intended to help managers in decision-making by accessing large volumes of information generated from various related information systems involved in organizational business processes, such as office automation system, transaction processing system, etc.

DSS uses the summary information, exceptions, patterns, and trends using the analytical models. A decision support system helps in decision-making but does not necessarily give a decision itself. The decision makers compile useful information from raw data, documents, personal knowledge, and/or business models to identify and solve problems and make decisions.

Programmed and Non-programmed Decisions

There are two types of decisions - programmed and non-programmed decisions.

Programmed decisions are basically automated processes, general routine work, where:

- These decisions have been taken several times.
- These decisions follow some guidelines or rules.

For example, selecting a reorder level for inventories, is a programmed decision.

Non-programmed decisions occur in unusual and non-addressed situations, so:

- It would be a new decision.
- There will not be any rules to follow.
- These decisions are made based on the available information.
- These decisions are based on the manger's discretion, instinct, perception and judgment.

For example, investing in a new technology is a non-programmed decision.

Decision support systems generally involve non-programmed decisions. Therefore, there will be no exact report, content, or format for these systems. Reports are generated on the fly.

Attributes of a DSS

- Adaptability and flexibility
- High level of Interactivity
- Ease of use
- Efficiency and effectiveness, Complete control by decision-makers
- Ease of development, Extendibility
- Support for modeling and analysis
- Support for data access
- Standalone, integrated, and Web-based

Characteristics of a DSS

- Support for decision-makers in semi-structured and unstructured problems.
- Support for managers at various managerial levels, ranging from top executive to line managers.
- Support for individuals and groups. Less structured problems often requires the involvement of several individuals from different departments and organization level.
- Support for interdependent or sequential decisions.
- Support for intelligence, design, choice, and implementation.
- Support for variety of decision processes and styles.
- DSSs are adaptive over time.

Benefits of DSS

- Improves efficiency and speed of decision-making activities.
- Increases the control, competitiveness and capability of futuristic decision-making of the organization.
- Facilitates interpersonal communication.
- Encourages learning or training.
- Since it is mostly used in non-programmed decisions, it reveals new approaches and sets up new evidences for an unusual decision.
- Helps automate managerial processes.

Components of a DSS

Following are the components of the Decision Support System:

- **Database Management System (DBMS)**: To solve a problem the necessary data may come from internal or external database. In an organization, internal data are generated by a system such as TPS and MIS. External data come from a variety of sources such as newspapers, online data services, databases (financial, marketing, human resources).
- **Model Management System**: It stores and accesses models that managers use to make decisions. Such models are used for designing manufacturing facility, analyzing the financial health of an organization, forecasting demand of a product or service, etc.

  Support Tools: Support tools like online help; pulls down menus, user interfaces, graphical analysis, error correction mechanism, facilitates the user interactions with the system.

Classification of DSS

There are several ways to classify DSS. Hoi Apple and Whinstone classifies DSS as follows:

- **Text Oriented DSS:** It contains textually represented information that could have a bearing on decision. It allows documents to be electronically created, revised and viewed as needed.
- **Database Oriented DSS:** Database plays a major role here; it contains organized and highly structured data.
- **Spreadsheet Oriented DSS:** It contains information in spread sheets that allows create, view, modify procedural knowledge and also instructs the system to execute self-contained instructions. The most popular tool is Excel and Lotus 1-2-3.
- **Solver Oriented DSS:** It is based on a solver, which is an algorithm or procedure written for performing certain calculations and particular program type.
- **Rules Oriented DSS:** It follows certain procedures adopted as rules.
- **Rules Oriented DSS:** Procedures are adopted in rules oriented DSS. Export system is the example.
- **Compound DSS:** It is built by using two or more of the five structures explained above.

Types of DSS

Following are some typical DSSs:

- **Status Inquiry System:** It helps in taking operational, management level, or middle level management decisions, for example daily schedules of jobs to machines or machines to operators.
- **Data Analysis System:** It needs comparative analysis and makes use of formula or an algorithm, for example cash flow analysis, inventory analysis etc.
- **Information Analysis System:** In this system data is analyzed and the information report is generated. For example, sales analysis, accounts receivable systems, market analysis etc.
- **Accounting System:** It keeps track of accounting and finance related information, for example, final account, accounts receivables, accounts payables, etc. that keep track of the major aspects of the business.
- **Model Based System:** Simulation models or optimization models used for decision-making are used infrequently and creates general guidelines for operation or management.

POSSIBLE QUESTION
PART – A (TWO MARK)

1. What is Management Information System?
2. What are the components of an information system?
3. Distinguish between data and information .
4. Describe the three levels of information in managerial level.
5. What do you meant by competitive advantage?

PART – B (SIX MARK)

1. Discuss the various characteristics of MIS.
2. In what ways do you think organization structure influence MIS and turn MIS influences the organizational structure.
3. How can a DSS help make decisions? How do MIS and DSS differ?
4. Can MIS be helpful in information organization? Elaborate.
5. Is 'software' necessary to run a computer?
6. Give a details description about the steps in implementation of MIS.
7. Give the framework for MIS and explain its components.
8. Explain the various benefits of MIS in detail.
9. List and explain the different types of information system.
10. Discuss how competitive strategies can use IT to confront competitive forces faced by a business.

Unit - II

Unit – II : MIS - Strategic Information System - MIS Support for Planning - Organising - controlling - MIS for Specific Functions - Personnel - Finance - Marketing Inventory Production Data Base Management System Models - Hierarchical - Network - Relational - Modular.

Strategic Information System

A SIS is a computer system that implements business strategies; They are those systems where information services resources are applied to strategic business opportunities in such a way that the computer systems affect the organization's products and business operations. Strategic information systems are always systems that are developed in response to corporate business initiative. The ideas in several well-known cases came from information Services people, but they were directed at specific corporate business thrusts. In other cases, the ideas came from business operational people, and Information Services supplied the technological capabilities to realize profitable results.

Most information systems are looked on as support activities to the business. They mechanize operations for better efficiency, control, and effectiveness, but they do not, in themselves, increase corporate profitability. They are simply used to provide management with sufficient dependable information to keep the business running smoothly, and they are used for analysis to plan new directions. Strategic information systems, on the other hand, become an integral and necessary part of the business, and they affect the profitability and growth of a company. They open up new markets and new businesses. They directly affect the competitive stance of the organization, giving it an advantage against the competitors.

Most literature on strategic information systems emphasizes the dramatic breakthroughs in computer systems, such asAmerican Airlines' Sabre System and American Hospital Supply's terminals in customer offices. These, and many other highly successful approaches are most attractive to think about, and it is always possible that an equivalent success may be attained in your organization. There are many possibilities for strategic information systems, however, which may not be dramatic breakthroughs, but which will certainly become a part of corporate decision making and will, increase corporate profitability. The development of any strategic information systems always enhances the image of information Services in the organization, and leads to information management having a more participatory role in the operation of the organization.

Three general types of information systems

The three general types of information systems that are developed and in general use are financial systems, operational systems, and strategic systems. These categories are not mutually exclusive and, in fact, they always overlap to some. Well-directed financial

systems and operational systems may well become the strategic systems for a particular organization.

- *Financial systems* are the basic computerization of the accounting, budgeting, and finance operations of an organization. These are similar and ubiquitous in all organizations because the computer has proven to be ideal for the mechanization and control or financial systems; these include the personnel systems because the headcount control and payroll of a company is of prime financial concern. Financial systems should be one of the bases of all other systems because they give a common, controlled measurement of all operations and projects, and can supply trusted numbers for indicating departmental or project success. Organizational planning must be tied to financial analysis. There is always a greater opportunity to develop strategic systems when the financial systems are in place, and required figures can be readily retrieved from them.
- *Operational systems*, or services systems, help control the details of the business. Such systems will vary with each type of enterprise. They are the computer systems that operational managers need to help run the business on a routing basis. They may be useful but mundane systems that simply keep track of inventory, for example, and print out reorder points and cost allocations. On the other hand, they may have a strategic perspective built into them, and may handle inventory in a way that dramatically affects profitability. A prime example of this is the American Hospital Supply inventory control system installed on customer premises. Where the great majority of inventory control systems simply smooth the operations and give adequate cost control, this well-known hospital system broke through with a new version of the use of an operational system for competitive advantage. The great majority of operational systems for which many large and small computer systems have been purchased, however, simply help to manage and automate the business. They are important and necessary, but can only be put into the "strategic" category it they substantially affect the profitability of the business.

All businesses should have both long-range and short-range planning of operational systems to ensure that the possibilities of computer usefulness will be seized in a reasonable time. Such planning will project analysis and costing, system development life cycle considerations, and specific technology planning, such as for computers, databases, and communications. There must be computer capacity planning, technology forecasting, and personnel performance planning.

Operational systems, then, are those that keep the organization operating under control and most cost effectively. Any of them may be changed to strategic systems if they are viewed with strategic vision.

- *Strategic systems* are those that link business and computer strategies.They are the systems where new business strategies has been developed and they can be realized using Information Technology. They may be systems where new computer technology has been made available on the market, and planners with an entrepreneurial spirit perceive how the new capabilities can quickly gain competitive advantage. They may be systems where operational management people and Information Services people have brainstormed together over business problems, and have realized that a new competitive thrust is possible when computer methods are applied in a new way.

There is general agreement that strategic systems are those information systems that may be used gaining competitive advantage. How is competitive advantage gained?. At this point, different writers list different possibilities, but none of them claim that there may not be other openings to move through.

Gaining competitive advantage

Some of the more common ways of thinking about gaining competitive advantage are:

- Deliver a product or a service at a lower cost. This does not necessarily mean the lowest cost, but simply a cost related to the quality of the product or service that will be both attractive in the marketplace and will yield sufficient return on investment. The cost considered is not simply the data processing cost, but is the overall cost of all corporate activities for the delivery of that product or service.
- Deliver a product or service that is differentiated. Differentiation means the addition of unique features to a product or service that are competitive attractive in the market. Generally such features will cost something to produce, and so they will be the setting point, rather than the cost itself. Seldom does a lowest cost product also have the best differentiation. A strategic system helps customers to perceive that they are getting some extras for which they will willingly pay.
- Focus on a specific market segment. The idea is to identify and create market niches that have not been adequately filled. Information technology is frequently able to provide the capabilities of defining, expanding, and filling a particular niche or segment. The application would be quite specific to the industry.
- Innovation. Develop products or services through the use of computers that are new and appreciably from other available offerings. Examples of this are automatic credit card handing at service stations, and automatic teller machines at banks. Such innovative approaches not only give new opportunities to attract customers, but also open up entirely new fields of business so that their use has very elastic demand.

Almost any data processing system may be called "strategic" if it aligns the computer strategies with the business strategies of the organization, and there is close cooperation in its development between the information Services people and operational business managers. There should be an explicit connection between the organization's business plan and its systems plan to provide better support of the organization's goals and objectives, and closer management control of the critical information systems.

Many organizations that have done substantial work with computers since the 1950s have long used the term "strategic planning" for any computer developments that are going to directly affect the conduct of their business. Not included are budget, or annual planning and the planning of developing Information Services facilities and the many "housekeeping" tasks that are required in any corporation. Definitely included in strategic planning are any information systems that will be used by operational management to conduct the business more profitably. A simple test would be to ask whether the president of the corporation, or some senior vice presidents, would be interested in the immediate outcome of the systems development because they felt it would affect their profitability. If the answer is affirmative, then the system is strategic.

Strategic system, thus, attempt to match Information Services resources to strategic business opportunities where the computer systems will affect the products and the business operations. Planning for strategic systems is not defined by calendar cycles or routine reporting. It is defined by the effort required to affect the competitive environment and the strategy of a firm at the point in time that management wants to move on the idea.

Effective strategic systems can only be accomplished, of course, if the capabilities are in place for the routine basic work of gathering data, evaluating possible equipment and software, and managing the routine reporting of project status. The calendarized planning and operational work is absolutely necessary as a base from which a strategic system can be planned and developed when a priority situation arises. When a new strategic need becomes apparent, Information Services should have laid the groundwork to be able to accept the task of meeting that need.

Strategic systems that are dramatic innovations will always be the ones that are written about in the literature. Consultants in strategic systems must have clearly innovative and successful examples to attract the attention of senior management. It should be clear, however, that most Information Services personnel will have to leverage the advertised successes to again funding for their own systems. These systems may not have an Olympic effect on an organization, but they will have a good chance of being clearly profitable. That will be sufficient for most operational management, and will draw out the necessary funding and support. It helps to talk about the possibilities of great

breakthroughs, if it is always kept in mind that there are many strategic systems developed and installed that are successful enough to be highly praised within the organization and offer a competitive advantage, but will not be written up in the Harvard Business Review.

Another way of characterizing strategic information systems is to point out some of the key ideas of the foremost apostles of such systems.

Models for strategic information system[edit]

Porter's competitive advantage

Michael E. Porter, Professor of Business Administration, Harvard Business School, has addressed his ideas in two keystone books. Competitive Strategy: Techniques for Analyzing Industries and Competitors, and his newer book, Competitive Advantage, present a framework for helping firms actually create and sustain a competitive advantage in their industry in either cost or differentiation. Dr. Porter's theories on competitive advantage are not tied to information systems, but are used by others to involve information services technologies. In his book, Dr. Porter says that there are two central questions in competitive strategy:

- How structurally attractive is the industry?
- What is the firm's relative position in the industry?

Neither of these question is sufficient alone to guide strategic choices. Both can be influenced by competitor behavior, and both can be shaped by a firm's actions. It is imperative that these questions be answered by analysis, which will be the starting point for good strategic thinking, and will open up possibilities for the role of information systems.Industry profitability is a function of five basic competitive forces:

- the threat of new entrants
- the threat of substitute products or services
- the bargaining power of suppliers
- the bargaining power of buyers and
- the intensity of the rivalry among existing competitors

Porter's books give techniques for getting a handle on the possible average profitability of an industry over time. The analysis of these forces is the base for estimating a firm's relative position and competitive advantage. In any industry, the sustained average profitability of competitors varies widely. The problem is to determine how a business can outperform the industry average and attain a sustainable competitive advantage. It is possible that the answer lies in information technology together with good management. Porter claims that the principal types of competitive advantage are low cost producer, differentiation, and focus. A firm has a competitive advantage if it is able to deliver its product or service at a lower cost than its competitors. If the quality of its product is

satisfactory, this will translate into higher margins and higher returns. Another advantage is gained if the firm is able to differentiate itself in some way. Differentiation leads to offering something that is both unique and is desired, and translates into a premium price. Again, this will lead to higher margins and superior performance. It seems that two types of competitive advantage, lower cost and differentiation, are mutually exclusive. To get lower cost, you sacrifice uniqueness. To get a premium price, there must be extra cost involved in the process. To be a superior performer, however, you must go for competitive advantage in either cost or differentiation. Another point of Porter's is that competitive advantage is gained through a strategy based on scope. It is necessary to look at the breadth of a firm's activities, and narrow the competitive scope to gain focus in either an industry segment, a geographic area, a customer type, and so on. Competitive advantage is most readily gained by defining the competitive scope in which the firm is operating, and concentrating on it. Based on these ideas of type and scope, Porter gives a useful tool for analysis which he calls the value chain. This value chain gives a framework on which a useful analysis can be hung. The basic notion is that to understand competitive advantage in any firm, one cannot look at the firm as a whole. It is necessary to identify the specific activities which the firm performs to do business. Each firm is a collection of the things that it does that all add up to the product being delivered to the customer. These activities are numerous and are unique to every industry, but it is only in these activities where cost advantage or differentiation can be gained. The basic lis that the firm's activities can be divided into nine generic types. Five are the primary activities, which are the activities that create the product, market it and deliver it; four are the support activities that cross between the primary activities.

The primary activities are:

- Inbound logistics, which includes the receipt and storage of material, and the general management of supplies.
- Operations, which are the manufacturing steps or the service steps.
- Outbound logistics, which are associated with collecting, storing, and physically distributing the product to buyers. In some companies this is a significant cost, and buyers value speed and consistency.
- Marketing and sales includes customer relations, order entry, and price management.
- After-sales services covers the support of the product in the field, installation, customer training, and so on.

The support activities are not directed to the customer, but they allow the firm to perform its primary activities. The four generic types of support activities are:

- Procurement, which includes the contracting for and purchase of raw materials, or any items used by the enterprise. Part of procurement is in the purchasing department, but it is also spread throughout the organization.
- Technology development may simply cover operational procedures, or many be involved with the use of complex technology. Today, sophisticated technology is pervasive, and cuts across all activities; it is not just an R&D function.
- Human resource management is the recruiting, training, and development of people. Obviously, the cuts across every other activity.
- Firm infrastructure is a considerable part of the firm, including the accounting department, the legal department, the planning department, government relations, and so on.

The basic idea is that competitive advantage grows out of the firm's ability to perform these activities either less expensively than its competitors, or in a unique way. Competitive advantage should be linked precisely to these specific activities, and not thought of broadly at a firm-wide level. This is an attractive way of thinking for most information Services people, as it is, fundamentally, the systems analysis approach. Computer people are trained to reduce systems to their components, look for the best application for each component, then put together an interrelated system. Information technology is also pervasive throughout all parts of the value chain. Every activity that the firm performs has the potential to embed information technology because it involves information processing. As information technology moves away from repetitive transaction processing and permeates all activities in the value chain, it will be in a better position to be useful in gaining competitive advantage. Porter emphasizes what he call the linkages between the activities that the firm performs. No activities in a firm are independent, yet each department is managed separately. It is most important to understand the cost linkages that are involved so that the firm may get an overall optimization of the production rather than departmental optimizations. A typical linkage might be that if more is spent in procurement, less is spent in operations. If more testing is done in operations, after-sales service costs will be lower. Multifunctional coordination is crucial to competitive advantage, but it is often difficult to see. Insights into linkages give the ability to have overall optimization. Any strategic information system must be analyzed across all departments in the organization. Cost and Competitive Advantage. Cost leadership is one of Porter's two types of competitive advantage. The cost leader delivers a product of acceptable quality at the lowest possible cost. It attempts to open up a significant and sustainable cost gap over all other competitors. The cost advantage is achieved through superior position in relation to the key cost drivers. Achieving cost leadership usually requires trade-offs with differentiation. The two are usually

incompatible. A firm's relative cost position cannot be understood by viewing the firm as a whole. Overall cost grows out of the cost performing discrete activities. Cost position is determined by the cumulative cost of performing all value activities. To sustain cost advantage, Porter gives a number of cost drivers which must be understood in detail because the sustainability of cost advantage in an activity depends on the cost drivers of that activity. Again, this type of detail is best obtained by classical systems analysis methods.

Some of the cost drivers which must be analyzed, understood, and controlled are:

- Scale. The appropriate type of scale must be found. Policies must be set to reinforce economies of scale in scale-sensitive activities.
- Learning. The learning curve must be understood and managed. As the organization tries to learn from competitors, it must strive to keep its own learning proprietary.
- Capacity Utilization. Cost can be controlled by the leveling of throughput.
- Linkages. Linkages should be exploited within the value chain. Work with suppliers and channels can reduce costs.
- Interrelationships. Shared activities can reduce costs.
- Integration. The possibilities for integration or de-integration should be examined systematically.
- Timing. If the advantages of being the first mover or a late mover are understood, they can be exploited.
- Policies. Policies that enhance the low-cost position or differentiation should be emphasized.
- Location. When viewed as a whole, the location of individual activities can be optimized.

Care must be taken in the evaluation and perception of cost drivers because there are pitfalls if the thinking is incremental and indirect activities are ignored. Even though the manufacturing activities, for example, are obvious candidates for analyses, they should not have exclusive focus. Linkages must be exploited and cross-subsidies avoided.

Porter gives five steps to achieving cost leadership:

- Identify the appropriate value chain and assign costs and assets to it.
- Identify the cost drivers of each value activity and see how they interact.
- Determine the relative costs of competitors and the sources of cost differences.
- Develop a strategy to lower relative cost position through controlling cost drivers or reconfiguring the value chain.
- Best the cost reduction strategy for sustainability

Differentiation advantage

Differentiation is the second of Porter's two types of competitive advantage. In the differentiation strategy, one or more characteristics that are widely value by buyers are selected. The purpose is to achieve and sustain performance that is superior to any competitor in satisfying those buyer needs. A differentiator selectively adds costs in areas that are important to the buyer. Thus, successful differentiation leads to premium prices, and these lead to above-average profitably if there is approximate cost parity. To achieve this, efficient forms of differentiation must be picked, and costs must be reduced in areas that are irrelevant to the buyer needs. Buyers are like sellers in that they have their own value chains. The product being sold will represent one purchased input, but the seller may affect the buyer's activities in other ways. Differentiation can lower the buyer's cost and improve the buyer's performance, and thus create value, or competitive advantage, for the buyer. The buyer may not be able to assess all the value that a firm provides, but it looks for signals of value, or perceived value.

A few typical factors which may lower the buyer's costs are:

- Less idle time
- Lower risk of failure
- Lower installation costs
- Faster processing time
- Lower labor costs
- Longer useful life, and so on.

Porter points out that differentiation is usually costly, depending on the cost drivers of the activities involved. A firm must find forms of differentiation where it has a cost advantage in differentiating. Differentiation is achieved by enhancing the sources of uniqueness. These may be found throughout the value chain, and should be signaled to the buyer. The cost of differentiation can be turned to advantage if the less costly sources are exploited and the cost drivers are controlled. The emphasis must be on getting a sustainable cost advantage in differentiating. Efforts must be made to change the buyer's criteria by reconfiguring the value chain to be unique in new ways, and by preemptively responding to changing buyer or channel circumstances. Differentiation will nor work if there is too much uniqueness, or uniqueness that the buyers do not value. The buyer's ability to pay a premium price, the signaling criteria, and the segments important to the buyer must all be understood. Also, there cannot be over reliance on sources of differentiation that competitors can emulate cheaply or quickly.

Porter lists seven steps to achieving differentiation:

- Determine the identify of the real buyer.
- Understand the buyer's value chain, and the effect of the seller's product on it.

- Determine the purchasing criteria of the buyer.
- Assess possible sources of uniqueness in the firm's value chain.
- Identify the cost of these sources of uniqueness.
- Choose the value activities that create the most valuable differentiation for the buyer relative to the costs incurred.
- Test the chosen differentiation strategy for sustainability.

Focus Strategies for Advantage. Porter's writings also discuss focus strategies. He emphasizes that a company that attempts to completely satisfy every buyer does not have a strategy. Focusing means selecting targets and optimizing the strategies for them. Focus strategies further segment the industry. They may be imitated, but can provide strategic openings. Clearly, multiple generic strategies may be implemented, but internal inconsistencies can then arise, and the distinctions between the focused entities may become blurred. Porter's work is directed towards competitive advantage in general, and is not specific to strategic information systems. It has been reviewed here at some length, however, because his concepts are frequently referred to in the writings of others who are concerned with strategic information systems. The value chain concept has been widely adopted, and the ideas of low cost and differentiation are accepted. This section, therefore, is an introduction into a further discussion of strategic information systems. The implementation of such systems tends to be can implementation of the factors elucidated by Porter.

Management Information System Planning, Controlling and Limitations

Planning - The top level management is mainly concerned with strategic planning for example the strategic planning activities of top management involve future interaction between the organization and its external environment.

Computational support for planning:

1. An analysis of historical data to obtain relationship useful for projection.

2. Various projection and forecasting techniques to estimate future value.

4. Computations internal to the plan and computation required for outputs.

5. Output of the results in a meaningful planning format.

Historical data analysis techniques

Historical data analyzed to discover pattern or relation that will be useful in projecting the future value of significance variables. Even when the quantitative relations are not

sufficiently stable to use in forecasting data analysis is useful for input into the judgmental forecast.

Historical extrapolation techniques

Historical data describes the past planning that involve the future estimating is generally based on analysis of past history combined with various technique to generate data for planning purposes.

Financial planning computation

Models that involve financial plan need to provide for various computation and analyses commonly required for measuring or evaluating profitability example are depreciation computation rate of return analysis and break even analysis. Depreciation is a significant computation in most financial planning it affect profit computation because it is an expense and it effect cash flow because of its impact on taxes. There are several methods for computing deprecation all of which should be available to the planner. These methods are straight line double declining balance sum of the year digits and production or use basis.

Controlling - At the middle level management, information is management control. Middle level managers such as departmental heads are concerned with the current and future performance of their units. Therefore they need aggregate information on the sales, profit etc.of their units such information is available from both within the organization as well as outside the organization, for example, financial data for budgets and ratio analysis are available from the company's records. However market data can be collected through special surveys and reports from outside the organization. Top level managers also require management control information. But these information must be more detailed narrower in scope and more accurate than information required for strategic planning. It should also generate at more frequent because the time horizon of decision is shorter.

At the supervisory level of management operational control is exercised production scheduling, cost and credit control, etc. are examples of operational control. Therefore a detailed report on a daily and weekly basis is required, inventory report, operating cost, production rate, etc are examples of such information. Such information available from with in the organization.

The control feedback loop is basic to system design. The computer can improve the control process in several ways:

1. The standard can be complex. Computational simplifications are not necessary.

2. The computation of deviation and identification of cause can be more sophisticated.

3. Reporting with computers can use irregular time interval which is very difficult with manual processing and can be done more frequently.

Limitation

1. **Aggression -** The people may hit back at the system and may even sabotage it by using equipment incorrectly by putting incomplete information into the system or buy actual destruction of hardware or software.

2. **Projection -** It is a psychological mechanism of blaming difficulties on someone or something else. When employees blame the **management information system** for problems caused by human error or other factors unrelated to the system, projection is taking place.

3. **Avoidance -** It occurs when individuals defend themselves by withdrawing from or avoiding a frustrating situation. Managers may avoid the system by ignoring its output, in favour of their own information sources.

Management Information System Planning - Management information system general business planning initiates from the following concepts :

1. Mission of the corporate.

2. Objectives and goals for the corporate in all key performance areas. These are in line with the mission of the corporate.

3. Strategic planning for general approach on how to achieve long term objectives.

4. Operational planning for specific guideline on how to transverse short term milestones.

An HRIS, the abbreviation for Human Resources Information System, is a system that lets you keep track of all your employees and information about them. It is usually done in a database or, more often, in a series of inter-related databases.

HRIS systems include the employee name and contact information and all or some of the following:

1. department,
2. job title,
3. grade,
4. salary,
5. salary history,
6. position history,
7. supervisor,
8. training completed,
9. special qualifications,
10. ethnicity,
11. date of birth,
12. disabilities,
13. veterans status,
14. visa status,
15. benefits selected,
16. and more

Improvements in Technology relating to microcomputers and software have also had a major impact on the use of information for managing human resources. Traditionally computers had been used in human resources only for compensation and benefits-for example, administering payroll.

However, new advances in microchips have made it possible to store large quantities of data on personnel computers and to perform statistical analyses that were once only possible with large mainframe computers. A Human Resource Information System (HRIS) is a system used to acquire, store, manipulate, analyze, retrieve, and distribute information related to the company's human resources. From the manager's perspective, an HRIS can be used to support strategic decision making, to avoid litigation, to evaluate programs or policies, or to support daily operating concerns.

A human resource Information system can be as large or as small as is necessary and may

contain one or two modules or upto twenty or so. Hundreds of HRIS software packages are being marketed for both mainframe and microcomputers. A great many decisions need to be made in the course of adopting and implementing an HRIS. The specific needs of the organization should dictate the type of human resource Information system chosen. Any project as potentially expensive, complex, and time consuming as the addition or upgrading of an HRIS requires careful analysis and planning.

In adopting a HRIS following issues need to be addressed:

- Careful need assessment
- What type and size of HRIS should be adopted
- Whether to develop software or buy and use off the shelf software
- Should the HRIS be implemented in total or in stages.

A computerized HRIS is an information system that makes use of computer and monitors control and influences the movement of human being from the time they indicate their intention to join an organization till they separate from it after joining . It consists of the following sub-system.

- **Recruitment Information:** It includes the placement data bank advertisement module, general requirement and training requirement data.
- **Personnel Information:** It includes employee information such as transfer monitoring and increment and promotion details.
- **Manpower Planning Information:** It seeks to provide information that could assist human resource mobilization, career planning, succession planning and input for skill development.
- **Training Information:** It provides information for designing course material, arrange for need base training and cost analysis of training etc.
- **Health Information System:** This subsystem provides information for maintenance of health related activities of the employees.
- **Appraisal Information:** It deals with the performance appraisal and merit rating information which serves as input for promotion, increment and secession and career planning etc.
- **Payroll System:** It consists of information concerning wages, salaries incentives, allowance, perquisite deduction for provident fund etc. Data on compensation pattern of competitor is also included in it.
- **Personnel Statistics System:** It is a bank of historic and current data used for various type of analyst.

Uses of HRIS

Human resource information system refers to the system of gathering, classifying, processing, recording and dismantling the information required for efficient and effective management of human resource in an organization. Need for such a system arises due to several factor.

1. Organizations that employ a very large number of people, it becomes necessary to develop employee database for taking personnel issues.
2. In a geographically dispersed company every office requires timely and accurate information for manpower management. If information is stored in a multiple location cost and inaccuracy will increase.
3. Modern day compensation package is complex consisting of many allowance and deductions etc. A centrally available data can become useful for taking timely decisions.
4. Organizations have to comply with several laws of the land. A computerized information system would store and retrieve data quickly and correctly enabling the organization to comply with statutory requirements.
5. With the help of computerization personnel information system, employer record and file can be integrated and retrieved for cross-referencing and forecasting. The system should be oriented towards decision making rather than towards record keeping.
6. Necessary flexibility for adaptation to changes taking place in the environment can be built into mechanized information system.

In the field of human resource management, information system has been limited to payroll preparation, job status and work history report of new hires, termination and insurance payment. Gradually however progressive companies have started computerized information system in the area of collective bargaining, employee manual, training, performance appraisal etc. With sophisticated software, computer based information system can be used in almost all the functions of human resource management. A sound HRIS can offer the following advantages:

- Clear definitions of goal.
- Reduction in the amount and cost of stored human resource data.
- Availability of timely and accurate information about human assets.
- Development of performance standard for the human resource division
- More meaningful career planning and counselling at all levels.
- Individual development through linkage between performance reward and job training.
- High capability to quickly and effectively solve problems.

- Implementation of training programmes based on knowledge of organizational needs.
- Ability to respond to ever changing statutory and other environment
- Status for the human resource functions due to its capability for strategic planning with the total organization.

HRIS software:

- **Abra Suite:** for human resources and payroll management
- **ABS (Atlas Business Solutions):** General Information, Wages information, emergency information, Reminders, Evaluators, Notes customer information, Documents and photos, Separation information.
- CORT: HRMS: applicant tracking, Attendance tracking and calendars, Wage information, Skills tracking, Reports-to information, Status tracking, Job history tracking, Cost center tracking, Reviews and tracking, Mass update and change tools etc.
- HRSOFT: Identify and track senior managers, Assess management skills and talents, Generate a wide range of reports, resumes, employee profiles, replacement tables and succession analysis reports, Identify individuals for promotion, skills shortages, unexpected vacancy, Discover talent deep, Competency Management, career development, align succession plans etc.
- Human Resource MicroSystems: sophisticated data collection and reporting, flexible spending accounts, compensation, employment history, time off, EEO, qualifications, Applicant/Requisition Tracking, Position Control/Succession Planning, Training Administration, Organization Charts, HRIS-Pro Net (employee/managerial self-service), HR Automation (eNotification and eScheduler), and Performance Pro (performance management)
- **ORACLE- HRMS**: Oracle iRecruitment, Oracle Self-Service Human Resources, Payroll, HR Intelligence, Oracle Learning Management, Oracle Time and Labor
- PEOPLESOFT: Enterprise eRecruit, Enterprise Resume Processing, Enterprise Services Procurement, Workforce Planning, Warehouse
- SAP HR: Human Capital Management (HCM) for Business, All-in-One: Rapid HR,
- **SPECTRUM HR**: iVantage® and HRVantage®. iVantage is a Web-based HRIS product designed for organizations with up to 10,000 employees.
- **VANTAGE: HRA:** 'Point-and-Click' report writing, internal Messaging System for leaving reminders to yourself, to someone else or to everyone using HRA - very useful for Benefit Applications, Disciplinary Actions, Special Events,

Employee Summary Screen for Basic, Leave (Absenteeism) and Salary/Position History, skills & training module, Leave Tracking Module.

Human Resource Information Software (HRIS) System

Running a business will generate a lot of information, both related to the business and related to your employees. You need to be able to harness and secure this information in a system for a couple of different reasons. First, you don't want confidential information about your organization or employees getting into the wrong hands. Additionally, a human resource information software (HRIS) system is a wise choice because it will reduce the amount of paper generated, organize your data, streamline processes, and help your company's bottom line.

So, why is HR information important? Your employees are your biggest asset-having a system in which to contain their private personnel information, safely and securely is critical. You have worked hard to become an employer of choice-don't ruin that credibility by mishandling confidential information.

Making a Business Case for the HRIS System

The HRIS system is an investment to an organization. An HRIS system is more than just a storage and organizational tool to contain confidential information about your organization's employees. The HRIS system needs to be viewed from a financial perspective. For instance, an HR manager or department usually has to justify their expenditures and if HR's functions are not tracked properly, you could be losing money. These include:

- Providing benefits for ineligible employees or their dependents.
- Cost of training new employees.
- Documenting why people leave the organization because the cost of terminations is high, and if you can track why people leave, then changes can ensue.
- Not properly recording vacation or sick leave taken. Time and attendance creates a loss of productivity, so having a way to track it to ensure there is not abuse of the system or employees taking time they don't have will help to reduce the risk of losing productivity and, ultimately, revenue.
- Reduce potential legal expenses in an employee dispute. Accurate and complete records can help build your case or diffuse a situation before it even gets in the courts.

Other justifications for a HRIS system can include savings in paper and supply costs and savings in time spent on human resource tasks. By implementing an effective HRIS system, the organization is well on their way to increasing confidentiality of their employees' information.

Financial Information System

Financial information system is special kinds of business software used to input, collect, track and examine financial and accounting data. It accumulates and analyzes financial data used for optimal financial planning along with forecasting decisions and results. The output produced help in making good financial management decisions thus helping the managers to run the business effectively. FIS is used in conjunction with decision supporting system, and it helps the organization to achieve its finance-related objectives because they use a nominal amount of resources relative to a determined limit of safety.

An FIS can be understood as a financial planner for electronic commerce that can also produce huge amounts of data related to market and finance at once obtained from financial databases worldwide. FIS is a combination of computer hardware and application software which provides financial data and analysis, general ledger, payroll, etc. It is a combination of computer system and the user in a networked environment to support the decision makers. Information system that tracks financial events and summarizes information that supports adequate management reporting, policy decisions, responsibilities and preparation of auditable financial statements is known as FIS. FIS helps you to run an evaluation for the general ledger, accounts receivable and accounts payable.

The relationships between the financial statements help investors, creditors and internal company management understand how well a business is performing and areas that require improvement. FIS is responsible for accurate, complete and consistent information at the right time and situation. It should provide sufficient management reporting so as to support the preparation of the budget and financial statements. One of the greatest advantages of FIS is that it requires less administrative manpower and cost being reliable at the same time.

The steps involved in a systematic FIS are as follows:

1. Collection of data about business events.
2. Analysis of business events.
3. Recording in the business books.
4. Preparation of the Trial Balance.
5. Preparation of Financial Statements.
6. Communication of information to the users.

Features of FIS

1. **Quick Decisions:** The FMIS application provides accurate, reliable and verifiable information timely that accelerates the decision-making process. It provides strengthened financial reporting and decision-making procedures for evaluating the advantages or limitations of our operational and tactical approaches to business. This reduces uncertainties that may hinder our implementation of important business decisions.
2. **Planning:** Implementation of FMIS enhances your capacity of forecasting and scheduling. This enables you to designate your financial resources effectively, set realistic performance targets and limit the scope of your plans to your financial resource capabilities. The realistic planning capacity also boosts up the achievement of targeted goals within the given time frame. The companies have all the tools and technologies they need such as support for languages, country specific laws, guidelines, multiple currencies and conversions and multi-national transactions with the help of FIS. This supports to better coordinate activities which span multiple departments and business units and improve execution of all financial tasks across all global locations.
3. **Efficiency:** A company or firm can achieve greater efficiency in financial operations and reporting procedures by using FMIS applications. These systems establish the directions and restrictions you need to waive misuse of financial resources, but also the mitigation measures you apply in order to protect the business against the resulting of expected and unexpected risks. The control measures also provide the historical testimony of performance you need to regulate the current and future activities of the business. Auditors also use this historical data for evaluating the progress of the business.
4. **Integration:** FMIS provides you with a structure for assimilating the functional processes and financial resources in your business. This hastens the processing of transactions and communication of financial information, in addition to eliminating duplicate tasks and responsibilities within the organization's chain of command. Systems integration also provides you greater weight for centralizing shared services so as to reduce operational costs associated with running multiple operational units for the shared services.
5. **Competition**: The adoption of FMIS applications elevates the competitive advantage of any kind of business. Meanwhile, the strategic value of information technology is extremely important for the advancement of customer satisfaction and increment of productivity. It enables the business to respond appropriately to changes in target markets and stay ahead of its competitors.

6. **Cash flow management and tracking**: Tracking income by department and business groups and supervising how money is spent across various divisions and locations are carried out by FIS. Allocation of budget and another cash flow management task and activities of an entire enterprise is done by FIS.
7. **Advanced reporting and analysis**: FIS generates consistent, highly accurate balance sheet, profit and loss statements along with budget allocation.

Marketing Information Systems

All businesses are operating under conditions of risk and uncertainty. The success or failure of any firm or company depends on many factors like economic situation, the changing tastes of customers, the extent and nature of competition and competitive activities and more. Business decisions and especially marketing decisions, are actually the decisions about the future of a company. The management of successful companies always focuses on each of the aspects of their business in order to make achievable decision. Marketing is usually that area of a company which requires lots of attention. Company sales depend on marketing so company must use adequate solutions for the more effective promotion of their products. For this purpose companies rely on marketing information system. Marketing information system allows a company to use all relevant information for developing its marketing strategies more effectively.

Definition of Marketing Information System

Philip Kotler defines MIS system as "people, equipment, and procedures to gather, sort, analyze, evaluate, and distribute needed, timely, and accurate information to marketing decision makers". In simple words we can say that Marketing information includes all those facts, estimates, guidelines, opinions, policies and other important data which is necessary for taking marketing decisions. This information may be collected from internal and external sources. This information usually collected from customers,

competitors, company salesmen, suppliers, government sources, specialized agencies and others. Now a day MIS system uses modern technology and techniques for collecting, analyzing, storing and distributing information.

Steps of Marketing Information System

In order to use marketing information, companies have to focus on three main steps of marketing information systems.

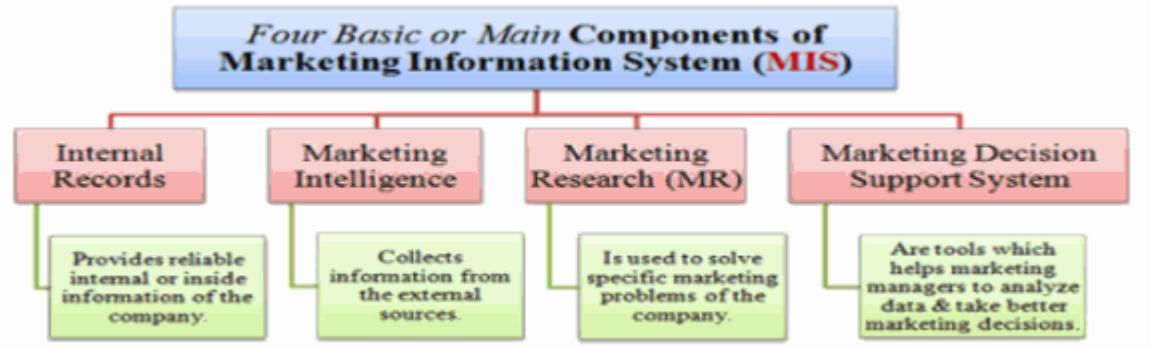
- Assessing Information Needs
- Developing Information
- Distributing Information

Assessing Information Needs

First of all marketer should know why the marketing information is necessary? MIS system primary serves the management and company's employees. However it may also provide information to external partners, such as suppliers, retailers and other marketing agencies. For example Wal-Mart gives their key suppliers access to their information system. Dell creates premium pages for their customers, giving them access to product design and other services information. Company's managers must know about a new product that competitors plans to introduce. By all this it is clearly disclosed that marketing information system plays a vital role for a company to make on time decision making and effective business strategy.

Markers can get information from:

1. **Internal Records** can be found in company's marketing, sale, accounting departments.
2. **Marketing Intelligence** collect and analyzed publically available data of competitors and other developments in the marketplace.
3. **Marketing Research** analyzed the collected data for report generation.
4. **Marketing Decision Support System**s are tools help in marketing decision process.



Developing Information

The second and most important step in marketing information system is to develop or collect information. There are various techniques adopted by different companies for collecting data and information. The techniques of collecting data may vary from company to company according to their specific needs. The common methods of data collection are as under:

- Observational research
- Survey research
- Focus group interview
- Personal contact method
- Sampling research plan and
- Questionnaires

Distributing & Using Marketing Information

The gathered information has no value until it is used to make better marketing decision making. So the information should be timely available to managers and other top level management who make marketing decisions and deal with customers. This can only be happen by regular performance reports, intelligence updates and other information collected by research studies.

DBMS - Overview

Database is a collection of related data and data is a collection of facts and figures that can be processed to produce information.

Mostly data represents recordable facts. Data aids in producing information, which is based on facts. For example, if we have data about marks obtained by all students, we can then conclude about toppers and average marks.

A **database management system** stores data in such a way that it becomes easier to retrieve, manipulate, and produce information.

Characteristics

Traditionally, data was organized in file formats. DBMS was a new concept then, and all the research was done to make it overcome the deficiencies in traditional style of data management. A modern DBMS has the following characteristics −

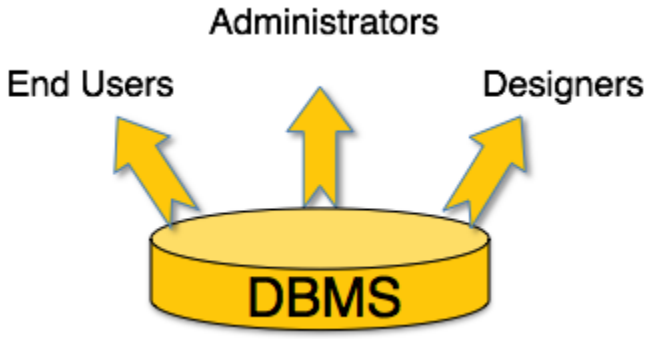
- **Real-world entity** − A modern DBMS is more realistic and uses real-world entities to design its architecture. It uses the behavior and attributes too. For example, a school database may use students as an entity and their age as an attribute.

- **Relation-based tables** − DBMS allows entities and relations among them to form tables. A user can understand the architecture of a database just by looking at the table names.
- **Isolation of data and application** − A database system is entirely different than its data. A database is an active entity, whereas data is said to be passive, on which the database works and organizes. DBMS also stores metadata, which is data about data, to ease its own process.
- **Less redundancy** − DBMS follows the rules of normalization, which splits a relation when any of its attributes is having redundancy in values. Normalization is a mathematically rich and scientific process that reduces data redundancy.
- **Consistency** − Consistency is a state where every relation in a database remains consistent. There exist methods and techniques, which can detect attempt of leaving database in inconsistent state. A DBMS can provide greater consistency as compared to earlier forms of data storing applications like file-processing systems.
- **Query Language** − DBMS is equipped with query language, which makes it more efficient to retrieve and manipulate data. A user can apply as many and as different filtering options as required to retrieve a set of data. Traditionally it was not possible where file-processing system was used.
- **ACID Properties** − DBMS follows the concepts of**A**tomicity, **C**onsistency, **I**solation, and **D**urability (normally shortened as ACID). These concepts are applied on transactions, which manipulate data in a database. ACID properties help the database stay healthy in multi-transactional environments and in case of failure.
- **Multiuser and Concurrent Access** − DBMS supports multi-user environment and allows them to access and manipulate data in parallel. Though there are restrictions on transactions when users attempt to handle the same data item, but users are always unaware of them.
- **Multiple views** − DBMS offers multiple views for different users. A user who is in the Sales department will have a different view of database than a person working in the Production department. This feature enables the users to have a concentrate view of the database according to their requirements.
- **Security** − Features like multiple views offer security to some extent where users are unable to access data of other users and departments. DBMS offers methods to impose constraints while entering data into the database and retrieving the same at a later stage. DBMS offers many different levels of security features, which enables multiple users to have different views with different features. For

example, a user in the Sales department cannot see the data that belongs to the Purchase department. Additionally, it can also be managed how much data of the Sales department should be displayed to the user. Since a DBMS is not saved on the disk as traditional file systems, it is very hard for miscreants to break the code.

Users

A typical DBMS has users with different rights and permissions who use it for different purposes. Some users retrieve data and some back it up. The users of a DBMS can be broadly categorized as follows −



- **Administrators** − Administrators maintain the DBMS and are responsible for administrating the database. They are responsible to look after its usage and by whom it should be used. They create access profiles for users and apply limitations to maintain isolation and force security. Administrators also look after DBMS resources like system license, required tools, and other software and hardware related maintenance.
- **Designers** − Designers are the group of people who actually work on the designing part of the database. They keep a close watch on what data should be kept and in what format. They identify and design the whole set of entities, relations, constraints, and views.
- **End Users** − End users are those who actually reap the benefits of having a DBMS. End users can range from simple viewers who pay attention to the logs or market rates to sophisticated users such as business analysts.

DBMS - Architecture

The design of a DBMS depends on its architecture. It can be centralized or decentralized or hierarchical. The architecture of a DBMS can be seen as either single tier or multi-tier. An n-tier architecture divides the whole system into related but independent**n** modules, which can be independently modified, altered, changed, or replaced.

In 1-tier architecture, the DBMS is the only entity where the user directly sits on the DBMS and uses it. Any changes done here will directly be done on the DBMS itself. It does not provide handy tools for end-users. Database designers and programmers normally prefer to use single-tier architecture.

If the architecture of DBMS is 2-tier, then it must have an application through which the DBMS can be accessed. Programmers use 2-tier architecture where they access the DBMS by means of an application. Here the application tier is entirely independent of the database in terms of operation, design, and programming.

3-tier Architecture

A 3-tier architecture separates its tiers from each other based on the complexity of the users and how they use the data present in the database. It is the most widely used architecture to design a DBMS.

- **Database (Data) Tier** − At this tier, the database resides along with its query processing languages. We also have the relations that define the data and their constraints at this level.
- **Application (Middle) Tier** − At this tier reside the application server and the programs that access the database. For a user, this application tier presents an abstracted view of the database. End-users are unaware of any existence of the database beyond the application. At the other end, the database tier is not aware of any other user beyond the application tier. Hence, the application layer sits in the middle and acts as a mediator between the end-user and the database.
- **User (Presentation) Tier** − End-users operate on this tier and they know nothing about any existence of the database beyond this layer. At this layer, multiple views of the database can be provided by the application. All views are generated by applications that reside in the application tier.

Multiple-tier database architecture is highly modifiable, as almost all its components are independent and can be changed independently.

DBMS - Data Models

Data models define how the logical structure of a database is modeled. Data Models are fundamental entities to introduce abstraction in a DBMS. Data models define how data is connected to each other and how they are processed and stored inside the system.

The very first data model could be flat data-models, where all the data used are to be kept in the same plane. Earlier data models were not so scientific, hence they were prone to introduce lots of duplication and update anomalies.

Entity-Relationship Model

Entity-Relationship (ER) Model is based on the notion of real-world entities and relationships among them. While formulating real-world scenario into the database

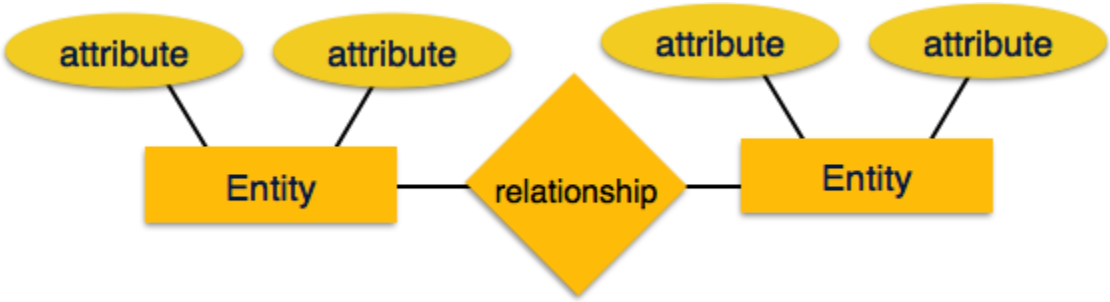
model, the ER Model creates entity set, relationship set, general attributes and constraints.

ER Model is best used for the conceptual design of a database.

ER Model is based on −

- **Entities** and their *attributes.*
- **Relationships** among entities.

These concepts are explained below.

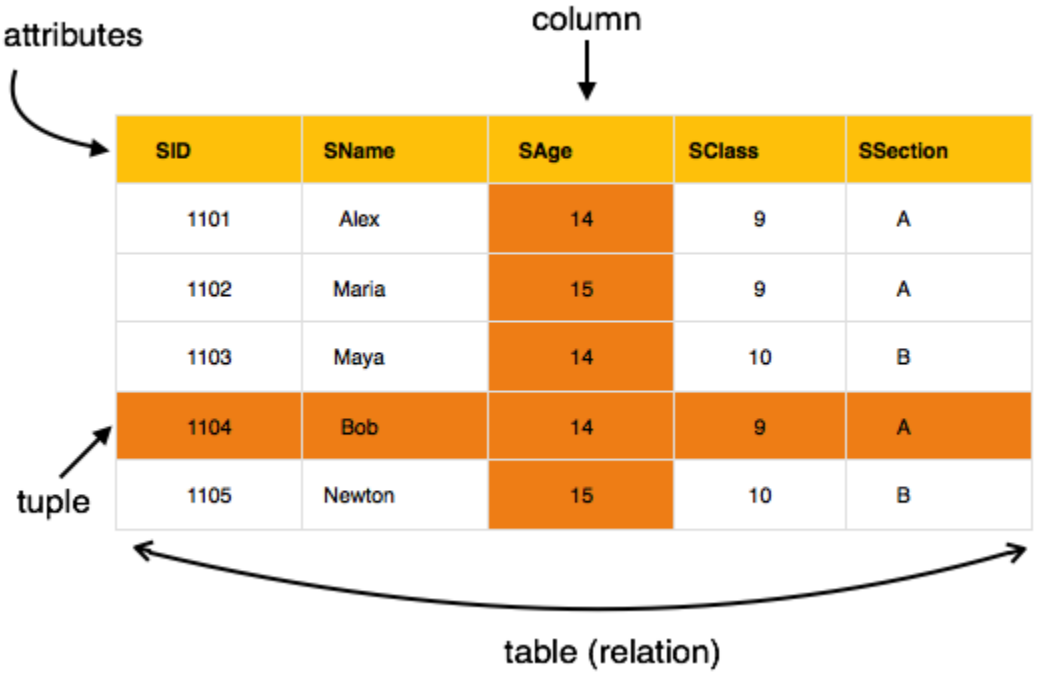


- **Entity** − An entity in an ER Model is a real-world entity having properties called **attributes**. Every **attribute** is defined by its set of values called **domain**. For example, in a school database, a student is considered as an entity. Student has various attributes like name, age, class, etc.
- **Relationship** − The logical association among entities is called ***relationship***. Relationships are mapped with entities in various ways. Mapping cardinalities define the number of association between two entities.

  Mapping cardinalities −
  - one to one
  - one to many
  - many to one
  - many to many

Relational Model

The most popular data model in DBMS is the Relational Model. It is more scientific a model than others. This model is based on first-order predicate logic and defines a table as an **n-ary relation**.



SID	SName	SAge	SClass	SSection
1101	Alex	14	9	A
1102	Maria	15	9	A
1103	Maya	14	10	B
1104	Bob	14	9	A
1105	Newton	15	10	B

The main highlights of this model are −

- Data is stored in tables called **relations**.
- Relations can be normalized.
- In normalized relations, values saved are atomic values.
- Each row in a relation contains a unique value.
- Each column in a relation contains values from a same domain.

POSSIBLE QUESTION
PART – A (TWO MARK)

1. What is entity relationship model?
2. Write a short note on marketing information system.
3. List out the advantages of DBMS.
4. Define clients and servers
5. How will you classify computer system?

PART - B (SIX MARK)

1. Explain the role of users in developing an information system for decision making..
2. Discuss the basic structure of DSS and its Components.
3. Give a design of the MIS for the Inventory Control system of an automobile company.
4. Describe the MIS in functional areas of business with examples.
5. Outline the advantages of database management approach to managing the data recourses of a business.
6. Explain the steps to developing financial information system.
7. How is MIS applied in Management process? Describe.
8. Explain briefly how computer based information system can enhance marketing functions in a firm.
9. What are the types of decision support system? Explain them in detail.
10. Explain HRM Sub system in detail.

UNIT III : Computer Hardware - Description of Electronic Computers - CPU Operations - Classification of Computers - Main - Mini - Workstations - Micro Computers - Super Computers - Personal Computers. Computer Software - Types of Software - Data Representation in Computers - Introduction to Client-Server.

Hardware

Today's world is an information-rich world and it has become a necessity for everyone to know about computers. A computer is an electronic data processing device, which accepts and stores data input, processes the data input, and generates the output in a required format.

The purpose of this tutorial is to introduce you to Computers and its fundamentals.

Functionalities of a Computer

If we look at it in a very broad sense, any digital computer carries out the following five functions –

Step 1 − Takes data as input.

Step 2 − Stores the data/instructions in its memory and uses them as required.

Step 3 − Processes the data and converts it into useful information.

Step 4 − Generates the output.

Step 5 − Controls all the above four steps.

Advantages of Computers

Following are certain advantages of computers.

High Speed

- Computer is a very fast device.
- It is capable of performing calculation of very large amount of data.
- The computer has units of speed in microsecond, nanosecond, and even the picoseconds.
- It can perform millions of calculations in a few seconds as compared to man who will spend many months to perform the same task.

Accuracy

- In addition to being very fast, computers are very accurate.
- The calculations are 100% error free.
- Computers perform all jobs with 100% accuracy provided that the input is correct.

Storage Capability

- Memory is a very important characteristic of computers.
- A computer has much more storage capacity than human beings.
- It can store large amount of data.
- It can store any type of data such as images, videos, text, audio, etc.

Diligence

- Unlike human beings, a computer is free from monotony, tiredness, and lack of concentration.
- It can work continuously without any error and boredom.
- It can perform repeated tasks with the same speed and accuracy.

Versatility

- A computer is a very versatile machine.
- A computer is very flexible in performing the jobs to be done.
- This machine can be used to solve the problems related to various fields.
- At one instance, it may be solving a complex scientific problem and the very next moment it may be playing a card game.

Reliability

- A computer is a reliable machine.
- Modern electronic components have long lives.
- Computers are designed to make maintenance easy.

Automation

- Computer is an automatic machine.
- Automation is the ability to perform a given task automatically. Once the computer receives a program i.e., the program is stored in the computer memory, then the program and instruction can control the program execution without human interaction.

Reduction in Paper Work and Cost

- The use of computers for data processing in an organization leads to reduction in paper work and results in speeding up the process.
- As data in electronic files can be retrieved as and when required, the problem of maintenance of large number of paper files gets reduced.
- Though the initial investment for installing a computer is high, it substantially reduces the cost of each of its transaction.

Disadvantages of Computers

Following are certain disadvantages of computers.

No I.Q.

- A computer is a machine that has no intelligence to perform any task.
- Each instruction has to be given to the computer.
- A computer cannot take any decision on its own.

Dependency

- It functions as per the user's instruction, thus it is fully dependent on humans.

Environment

- The operating environment of the computer should be dust free and suitable.

No Feeling

- Computers have no feelings or emotions.
- It cannot make judgment based on feeling, taste, experience, and knowledge unlike humans.

Application of computers

Business

A computer has high speed of calculation, diligence, accuracy, reliability, or versatility which has made it an integrated part in all business organizations.

Computer is used in business organizations for −

- Payroll calculations
- Budgeting
- Sales analysis
- Financial forecasting
- Managing employee database
- Maintenance of stocks, etc.

Banking

Today, banking is almost totally dependent on computers.

Banks provide the following facilities −

- Online accounting facility, which includes checking current balance, making deposits and overdrafts, checking interest charges, shares, and trustee records.
- ATM machines which are completely automated are making it even easier for customers to deal with banks.

Insurance

Insurance companies are keeping all records up-to-date with the help of computers. Insurance companies, finance houses, and stock broking firms are widely using computers for their concerns. Insurance companies are maintaining a database of all clients with information showing −

- Procedure to continue with policies
- Starting date of the policies
- Next due installment of a policy
- Maturity date
- Interests due
- Survival benefits
- Bonus

Education

The computer helps in providing a lot of facilities in the education system.

- The computer provides a tool in the education system known as CBE (Computer Based Education).
- CBE involves control, delivery, and evaluation of learning.
- Computer education is rapidly increasing the graph of number of computer students.
- There are a number of methods in which educational institutions can use a computer to educate the students.
- It is used to prepare a database about performance of a student and analysis is carried out on this basis.

Marketing

In marketing, uses of the computer are following −

- **Advertising** − With computers, advertising professionals create art and graphics, write and revise copy, and print and disseminate ads with the goal of selling more products.
- **Home Shopping** − Home shopping has been made possible through the use of computerized catalogues that provide access to product information and permit direct entry of orders to be filled by the customers.

Healthcare

Computers have become an important part in hospitals, labs, and dispensaries. They are being used in hospitals to keep the record of patients and medicines. It is also used in scanning and diagnosing different diseases. ECG, EEG, ultrasounds and CT scans, etc. are also done by computerized machines.

Following are some major fields of health care in which computers are used.

- **Diagnostic System** − Computers are used to collect data and identify the cause of illness.
- **Lab-diagnostic System** − All tests can be done and the reports are prepared by computer.
- **Patient Monitoring System** − These are used to check the patient's signs for abnormality such as in Cardiac Arrest, ECG, etc.
- **Pharma Information System** − Computer is used to check drug labels, expiry dates, harmful side effects, etc.
- **Surgery** − Nowadays, computers are also used in performing surgery.

Engineering Design

Computers are widely used for Engineering purpose.

One of the major areas is CAD (Computer Aided Design) that provides creation and modification of images. Some of the fields are −

- **Structural Engineering** − Requires stress and strain analysis for design of ships, buildings, budgets, airplanes, etc.
- **Industrial Engineering** − Computers deal with design, implementation, and improvement of integrated systems of people, materials, and equipment.

- **Architectural Engineering** − Computers help in planning towns, designing buildings, determining a range of buildings on a site using both 2D and 3D drawings.

Military

Computers are largely used in defence. Modern tanks, missiles, weapons, etc. Military also employs computerized control systems. Some military areas where a computer has been used are −

- Missile Control
- Military Communication
- Military Operation and Planning
- Smart Weapons

Communication

Communication is a way to convey a message, an idea, a picture, or speech that is received and understood clearly and correctly by the person for whom it is meant. Some main areas in this category are −

- E-mail
- Chatting
- Usenet
- FTP
- Telnet
- Video-conferencing

Government

Computers play an important role in government services. Some major fields in this category are −

- Budgets
- Sales tax department
- Income tax department
- Computation of male/female ratio
- Computerization of voters lists
- Computerization of PAN card
- Weather forecasting

Generation & Description

Generation in computer terminology is a change in technology a computer is/was being used. Initially, the generation term was used to distinguish between varying hardware technologies. Nowadays, generation includes both hardware and software, which together make up an entire computer system.

There are five computer generations known till date. Each generation has been discussed in detail along with their time period and characteristics. In the following table, approximate dates against each generation has been mentioned, which are normally accepted.

Following are the main five generations of computers.

S.No	Generation & Description
1	**First Generation** The period of first generation: 1946-1959. Vacuum tube based.
2	**Second Generation** The period of second generation: 1959-1965. Transistor based.
3	**Third Generation** The period of third generation: 1965-1971. Integrated Circuit based.
4	**Fourth Generation** The period of fourth generation: 1971-1980. VLSI microprocessor based.
5	**Fifth Generation** The period of fifth generation: 1980-onwards. ULSI microprocessor based.

Computer - Types

Computers can be broadly classified by their speed and computing power.

S.No.	Type	Specifications
1	PC (Personal Computer)	It is a single user computer system having moderately powerful microprocessor
2	Workstation	It is also a single user computer system, similar to personal computer however has a more powerful microprocessor.
3	Mini Computer	It is a multi-user computer system, capable of supporting hundreds of users simultaneously.
4	Main Frame	It is a multi-user computer system, capable of supporting hundreds of users simultaneously. Software technology is different from minicomputer.
5	Supercomputer	It is an extremely fast computer, which can execute hundreds of millions of instructions per second.

PC (Personal Computer)

A PC can be defined as a small, relatively inexpensive computer designed for an individual user. PCs are based on the microprocessor technology that enables manufacturers to put an entire CPU on one chip. Businesses use personal computers for word processing, accounting, desktop publishing, and for running spreadsheet and database management applications. At home, the most popular use for personal computers is playing games and surfing the Internet.

Although personal computers are designed as single-user systems, these systems are normally linked together to form a network. In terms of power, now-a-days high-end models of the Macintosh and PC offer the same computing power and graphics capability as low-end workstations by Sun Microsystems, Hewlett-Packard, and Dell.

Workstation

Workstation is a computer used for engineering applications (CAD/CAM), desktop publishing, software development, and other such types of applications which require a moderate amount of computing power and relatively high quality graphics capabilities.

Workstations generally come with a large, high-resolution graphics screen, large amount of RAM, inbuilt network support, and a graphical user interface. Most workstations also have mass storage device such as a disk drive, but a special type of workstation, called diskless workstation, comes without a disk drive.

Common operating systems for workstations are UNIX and Windows NT. Like PC, workstations are also single-user computers like PC but are typically linked together to form a local-area network, although they can also be used as stand-alone systems.

Minicomputer

It is a midsize multi-processing system capable of supporting up to 250 users simultaneously.

Mainframe

Mainframe is very large in size and is an expensive computer capable of supporting hundreds or even thousands of users simultaneously. Mainframe executes many programs concurrently and supports many simultaneous execution of programs.

Supercomputer

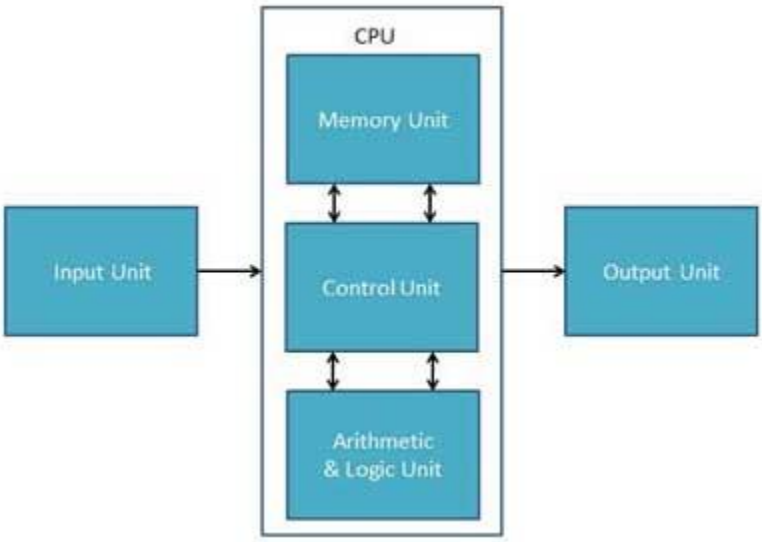
Supercomputers are one of the fastest computers currently available. Supercomputers are very expensive and are employed for specialized applications that require immense amount of mathematical calculations (number crunching).

For example, weather forecasting, scientific simulations, (animated) graphics, fluid dynamic calculations, nuclear energy research, electronic design, and analysis of geological data (e.g. in petrochemical prospecting).

Computer - Components

All types of computers follow the same basic logical structure and perform the following five basic operations for converting raw input data into information useful to their users.

S.No.	Operation	Description
1	Take Input	The process of entering data and instructions into the computer system.
2	Store Data	Saving data and instructions so that they are available for processing as and when required.
3	Processing Data	Performing arithmetic, and logical operations on data in order to convert them into useful information.
4	Output Information	The process of producing useful information or results for the user, such as a printed report or visual display.
5	Control the workflow	Directs the manner and sequence in which all of the above operations are performed.



Input Unit

This unit contains devices with the help of which we enter data into the computer. This unit creates a link between the user and the computer. The input devices translate the information into a form understandable by the computer.

CPU (Central Processing Unit)

CPU is considered as the brain of the computer. CPU performs all types of data processing operations. It stores data, intermediate results, and instructions (program). It controls the operation of all parts of the computer.

CPU itself has the following three components −

- ALU (Arithmetic Logic Unit)
- Memory Unit
- Control Unit

Output Unit

The output unit consists of devices with the help of which we get the information from the computer. This unit is a link between the computer and the users. Output devices translate the computer's output into a form understandable by the users.

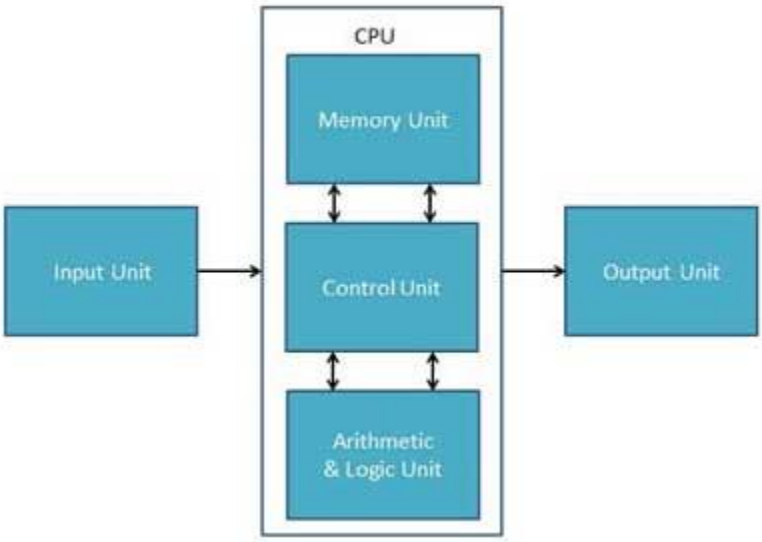
Computer - CPU(Central Processing Unit)

Central Processing Unit (CPU) consists of the following features −

- CPU is considered as the brain of the computer.
- CPU performs all types of data processing operations.
- It stores data, intermediate results, and instructions (program).
- It controls the operation of all parts of the computer.

CPU itself has following three components.

- Memory or Storage Unit
- Control Unit
- ALU(Arithmetic Logic Unit)



Memory or Storage Unit

This unit can store instructions, data, and intermediate results. This unit supplies information to other units of the computer when needed. It is also known as internal storage unit or the main memory or the primary storage or Random Access Memory (RAM).

Its size affects speed, power, and capability. Primary memory and secondary memory are two types of memories in the computer. Functions of the memory unit are −

- It stores all the data and the instructions required for processing.
- It stores intermediate results of processing.
- It stores the final results of processing before these results are released to an output device.
- All inputs and outputs are transmitted through the main memory.

Control Unit

This unit controls the operations of all parts of the computer but does not carry out any actual data processing operations.

Functions of this unit are −

- It is responsible for controlling the transfer of data and instructions among other units of a computer.
- It manages and coordinates all the units of the computer.
- It obtains the instructions from the memory, interprets them, and directs the operation of the computer.
- It communicates with Input/Output devices for transfer of data or results from storage.
- It does not process or store data.

ALU (Arithmetic Logic Unit)

This unit consists of two subsections namely,

- Arithmetic Section
- Logic Section

Arithmetic Section

Function of arithmetic section is to perform arithmetic operations like addition, subtraction, multiplication, and division. All complex operations are done by making repetitive use of the above operations.

Logic Section

Function of logic section is to perform logic operations such as comparing, selecting, matching, and merging of data.

Computer - Memory

A memory is just like a human brain. It is used to store data and instructions. Computer memory is the storage space in the computer, where data is to be processed and instructions required for processing are stored. The memory is divided into large number of small parts called cells. Each location or cell has a unique address, which varies from zero to memory size minus one. For example, if the computer has 64k words, then this memory unit has 64 * 1024 = 65536 memory locations. The address of these locations varies from 0 to 65535.

Memory is primarily of three types −

- Cache Memory
- Primary Memory/Main Memory
- Secondary Memory

Cache Memory

Cache memory is a very high speed semiconductor memory which can speed up the CPU. It acts as a buffer between the CPU and the main memory. It is used to hold those parts of data and program which are most frequently used by the CPU. The parts of data and programs are transferred from the disk to cache memory by the operating system, from where the CPU can access them.

Advantages

The advantages of cache memory are as follows −

- Cache memory is faster than main memory.
- It consumes less access time as compared to main memory.
- It stores the program that can be executed within a short period of time.
- It stores data for temporary use.

Disadvantages

The disadvantages of cache memory are as follows −

- Cache memory has limited capacity.
- It is very expensive.

Primary Memory (Main Memory)

Primary memory holds only those data and instructions on which the computer is currently working. It has a limited capacity and data is lost when power is switched off. It is generally made up of semiconductor device. These memories are not as fast as registers. The data and instruction

required to be processed resides in the main memory. It is divided into two subcategories RAM and ROM.

Characteristics of Main Memory

- These are semiconductor memories.
- It is known as the main memory.
- Usually volatile memory.
- Data is lost in case power is switched off.
- It is the working memory of the computer.
- Faster than secondary memories.
- A computer cannot run without the primary memory.

Secondary Memory

This type of memory is also known as external memory or non-volatile. It is slower than the main memory. These are used for storing data/information permanently. CPU directly does not access these memories, instead they are accessed via input-output routines. The contents of secondary memories are first transferred to the main memory, and then the CPU can access it. For example, disk, CD-ROM, DVD, etc.

Characteristics of Secondary Memory

- These are magnetic and optical memories.
- It is known as the backup memory.
- It is a non-volatile memory.
- Data is permanently stored even if power is switched off.
- It is used for storage of data in a computer.
- Computer may run without the secondary memory.
- Slower than primary memories.

RAM (Random Access Memory) is the internal memory of the CPU for storing data, program, and program result. It is a read/write memory which stores data until the machine is working. As soon as the machine is switched off, data is erased.

Access time in RAM is independent of the address, that is, each storage location inside the memory is as easy to reach as other locations and takes the same amount of time. Data in the RAM can be accessed randomly but it is very expensive.

RAM is volatile, i.e. data stored in it is lost when we switch off the computer or if there is a power failure. Hence, a backup Uninterruptible Power System (UPS) is often used with computers. RAM is small, both in terms of its physical size and in the amount of data it can hold.

RAM is of two types −

- Static RAM (SRAM)
- Dynamic RAM (DRAM)

Static RAM (SRAM)

The word **static** indicates that the memory retains its contents as long as power is being supplied. However, data is lost when the power gets down due to volatile nature. SRAM chips use a matrix of 6-transistors and no capacitors. Transistors do not require power to prevent leakage, so SRAM need not be refreshed on a regular basis.

There is extra space in the matrix, hence SRAM uses more chips than DRAM for the same amount of storage space, making the manufacturing costs higher. SRAM is thus used as cache memory and has very fast access.

Characteristic of Static RAM

- Long life
- No need to refresh
- Faster
- Used as cache memory
- Large size
- Expensive
- High power consumption

Dynamic RAM (DRAM)

DRAM, unlike SRAM, must be continually **refreshed** in order to maintain the data. This is done by placing the memory on a refresh circuit that rewrites the data several hundred times per second. DRAM is used for most system memory as it is cheap and small. All DRAMs are made up of memory cells, which are composed of one capacitor and one transistor.

Characteristics of Dynamic RAM

- Short data lifetime
- Needs to be refreshed continuously
- Slower as compared to SRAM
- Used as RAM
- Smaller in size
- Less expensive
- Less power consumption

Computer - Read Only Memory

ROM stands for **Read Only Memory**. The memory from which we can only read but cannot write on it. This type of memory is non-volatile. The information is stored permanently in such memories during manufacture. A ROM stores such instructions that are required to start a computer. This operation is referred to as **bootstrap**. ROM chips are not only used in the computer but also in other electronic items like washing machine and microwave oven.

Let us now discuss the various types of ROMs and their characteristics.

MROM (Masked ROM)

The very first ROMs were hard-wired devices that contained a pre-programmed set of data or instructions. These kind of ROMs are known as masked ROMs, which are inexpensive.

PROM (Programmable Read Only Memory)

PROM is read-only memory that can be modified only once by a user. The user buys a blank PROM and enters the desired contents using a PROM program. Inside the PROM chip, there are small fuses which are burnt open during programming. It can be programmed only once and is not erasable.

EPROM (Erasable and Programmable Read Only Memory)

EPROM can be erased by exposing it to ultra-violet light for a duration of up to 40 minutes. Usually, an EPROM eraser achieves this function. During programming, an electrical charge is trapped in an insulated gate region. The charge is retained for more than 10 years because the charge has no leakage path. For erasing this charge, ultra-violet light is passed through a quartz crystal window (lid). This exposure to ultra-violet light dissipates the charge. During normal use, the quartz lid is sealed with a sticker.

EEPROM (Electrically Erasable and Programmable Read Only Memory)

EEPROM is programmed and erased electrically. It can be erased and reprogrammed about ten thousand times. Both erasing and programming take about 4 to 10 ms (millisecond). In EEPROM, any location can be selectively erased and programmed. EEPROMs can be erased one byte at a time, rather than erasing the entire chip. Hence, the process of reprogramming is flexible but slow.

Advantages of ROM

The advantages of ROM are as follows −

- Non-volatile in nature
- Cannot be accidentally changed
- Cheaper than RAMs
- Easy to test
- More reliable than RAMs
- Static and do not require refreshing
- Contents are always known and can be verified

Computer - Hardware

Hardware represents the physical and tangible components of a computer, i.e. the components that can be seen and touched.

Examples of Hardware are the following −

- **Input devices** − keyboard, mouse, etc.
- **Output devices** − printer, monitor, etc.
- **Secondary storage devices** − Hard disk, CD, DVD, etc.
- **Internal components** − CPU, motherboard, RAM, etc.

Relationship between Hardware and Software

- Hardware and software are mutually dependent on each other. Both of them must work together to make a computer produce a useful output.
- Software cannot be utilized without supporting hardware.
- Hardware without a set of programs to operate upon cannot be utilized and is useless.
- To get a particular job done on the computer, relevant software should be loaded into the hardware.
- Hardware is a one-time expense.
- Software development is very expensive and is a continuing expense.
- Different software applications can be loaded on a hardware to run different jobs.
- A software acts as an interface between the user and the hardware.
- If the hardware is the 'heart' of a computer system, then the software is its 'soul'. Both are complementary to each other.

Computer - Software

oftware is a set of programs, which is designed to perform a well-defined function. A program is a sequence of instructions written to solve a particular problem.

There are two types of software −

- System Software
- Application Software

System Software

The system software is a collection of programs designed to operate, control, and extend the processing capabilities of the computer itself. System software is generally prepared by the computer manufacturers. These software products comprise of programs written in low-level languages, which interact with the hardware at a very basic level. System software serves as the interface between the hardware and the end users.

Some examples of system software are Operating System, Compilers, Interpreter, Assemblers, etc.

Here is a list of some of the most prominent features of a system software −

- Close to the system
- Fast in speed
- Difficult to design
- Difficult to understand
- Less interactive
- Smaller in size
- Difficult to manipulate
- Generally written in low-level language

Application Software

Application software products are designed to satisfy a particular need of a particular environment. All software applications prepared in the computer lab can come under the category of Application software.

Application software may consist of a single program, such as Microsoft's notepad for writing and editing a simple text. It may also consist of a collection of programs, often called a software package, which work together to accomplish a task, such as a spreadsheet package.

Examples of Application software are the following −

- Payroll Software
- Student Record Software
- Inventory Management Software
- Income Tax Software
- Railways Reservation Software
- Microsoft Office Suite Software
- Microsoft Word
- Microsoft Excel
- Microsoft PowerPoint

Features of application software are as follows −

- Close to the user
- Easy to design
- More interactive
- Slow in speed
- Generally written in high-level language
- Easy to understand
- Easy to manipulate and use
- Bigger in size and requires large storage space

Data Representation

Integers, Floating-point Numbers, and Characters

1. Number Systems

Human beings use *decimal* (base 10) and *duodecimal* (base 12) number systems for counting and measurements (probably because we have 10 fingers and two big toes). Computers use *binary* (base 2) number system, as they are made from binary digital components (known as transistors) operating in two states - on and off. In computing, we also use *hexadecimal* (base 16) or *octal* (base 8) number systems, as a *compact* form for represent binary numbers.

1.1 Decimal (Base 10) Number System

Decimal number system has ten symbols: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9, called *digit*s. It uses *positional notation*. That is, the least-significant digit (right-most digit) is of the order of 10^0 (units or ones), the second right-most digit is of the order of 10^1 (tens), the third right-most digit is of the order of 10^2 (hundreds), and so on. For example,

735 = 7×10^2 + 3×10^1 + 5×10^0

We shall denote a decimal number with an optional suffix D if ambiguity arises.

1.2 Binary (Base 2) Number System

Binary number system has two symbols: 0 and 1, called *bits*. It is also a *positional notation*, for example,

```
10110B = 1×2^4 + 0×2^3 + 1×2^2 + 1×2^1 + 0×2^0
```

We shall denote a binary number with a suffix B. Some programming languages denote binary numbers with prefix 0b(e.g., 0b1001000), or prefix b with the bits quoted (e.g., b'10001111').

A binary digit is called a *bit*. Eight bits is called a *byte* (why 8-bit unit? Probably because $8=2^3$).

1.3 Hexadecimal (Base 16) Number System

Hexadecimal number system uses 16 symbols: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, and F, called *hex digits*. It is a*positional notation*, for example,

```
A3EH = 10×16^2 + 3×16^1 + 14×16^0
```

We shall denote a hexadecimal number (in short, hex) with a suffix H. Some programming languages denote hex numbers with prefix 0x (e.g., 0x1A3C5F), or prefix x with hex digit quoted (e.g., x'C3A4D98B').

Each hexadecimal digit is also called a *hex digit*. Most programming languages accept lowercase 'a' to 'f' as well as uppercase 'A' to 'F'.

Computers uses binary system in their internal operations, as they are built from binary digital electronic components. However, writing or reading a long sequence of binary bits is cumbersome and error-prone. Hexadecimal system is used as a *compact* form or *shorthand* for binary bits. Each hex digit is equivalent to 4 binary bits, i.e., shorthand for 4 bits, as follows:

0H (0000B) (0D)	1H (0001B) (1D)	2H (0010B) (2D)	3H (0011B) (3D)
4H (0100B) (4D)	5H (0101B) (5D)	6H (0110B) (6D)	7H (0111B) (7D)
8H (1000B) (8D)	9H (1001B) (9D)	AH (1010B) (10D)	BH (1011B) (11D)
CH (1100B) (12D)	DH (1101B) (13D)	EH (1110B) (14D)	FH (1111B) (15D)

1.4 Conversion from Hexadecimal to Binary

Replace each hex digit by the 4 equivalent bits, for examples,

```
A3C5H = 1010 0011 1100 0101B
102AH = 0001 0000 0010 1010B
```

1.5 Conversion from Binary to Hexadecimal

Starting from the right-most bit (least-significant bit), replace each group of 4 bits by the equivalent hex digit (pad the left-most bits with zero if necessary), for examples,

```
1001001010B = 0010 0100 1010B = 24AH
```

10001011001011B = 0010 0010 1100 1011B = 22CBH

It is important to note that hexadecimal number provides a *compact form* or *shorthand* for representing binary bits.

1.6 Conversion from Base *r* to Decimal (Base 10)

Given a *n*-digit base *r* number: dn-1 dn-2 dn-3 ... d3 d2 d1 d0 (base r), the decimal equivalent is given by:

dn-1 × r^(n-1) + dn-2 × r^(n-2) + ... + d1 × r^1 + d0 × r^0

For examples,

A1C2H = 10×16^3 + 1×16^2 + 12×16^1 + 2 = 41410 (base 10)
10110B = 1×2^4 + 1×2^2 + 1×2^1 = 22 (base 10)

1.7 Conversion from Decimal (Base 10) to Base *r*

Use repeated division/remainder. For example,

To convert 261D to hexadecimal:
261/16 => quotient=16 remainder=5
16/16 => quotient=1 remainder=0
1/16 => quotient=0 remainder=1 (quotient=0 stop)
Hence, 261D = 105H

The above procedure is actually applicable to conversion between any 2 base systems. For example,

To convert 1023(base 4) to base 3:
1023(base 4)/3 => quotient=25D remainder=0
25D/3 => quotient=8D remainder=1
8D/3 => quotient=2D remainder=2
2D/3 => quotient=0 remainder=2 (quotient=0 stop)
Hence, 1023(base 4) = 2210(base 3)

1.8 General Conversion between 2 Base Systems with Fractional Part

1. Separate the integral and the fractional parts.
2. For the integral part, divide by the target radix repeatably, and collect the ramainder in reverse order.
3. For the fractional part, multiply the fractional part by the target radix repeatably, and collect the integral part in the same order.

Example 1:

Convert 18.6875D to binary
Integral Part = 18D
18/2 => quotient=9 remainder=0

9/2 => quotient=4 remainder=1
4/2 => quotient=2 remainder=0
2/2 => quotient=1 remainder=0
1/2 => quotient=0 remainder=1 (quotient=0 stop)
Hence, 18D = 10010B
Fractional Part = .6875D
.6875*2=1.375 => whole number is 1
.375*2=0.75 => whole number is 0
.75*2=1.5 => whole number is 1
.5*2=1.0 => whole number is 1
Hence .6875D = .1011B
Therefore, 18.6875D = 10010.1011B

Example 2:

Convert 18.6875D to hexadecimal
Integral Part = 18D
18/16 => quotient=1 remainder=2
1/16 => quotient=0 remainder=1 (quotient=0 stop)
Hence, 18D = 12H
Fractional Part = .6875D
.6875*16=11.0 => whole number is 11D (BH)
Hence .6875D = .BH
Therefore, 18.6875D = 12.BH

1.9 Exercises (Number Systems Conversion)

1. Convert the following *decimal* numbers into *binary* and *hexadecimal* numbers:
   a. 108
   b. 4848
   c. 9000
2. Convert the following binary numbers into hexadecimal and decimal numbers:
   . 1000011000
   a. 10000000
   b. 101010101010
3. Convert the following hexadecimal numbers into binary and decimal numbers:
   . ABCDE
   a. 1234
   b. 80F
4. Convert the following decimal numbers into binary equivalent:

. 19.25D

a. 123.456D

Answers: You could use the Windows' Calculator (calc.exe) to carry out number system conversion, by setting it to the scientific mode. (Run "calc" ⇒Select "View" menu ⇒Choose "Programmer" or "Scientific" mode.)

1. 1101100B, 1001011110000B, 10001100101000B, 6CH, 12F0H, 2328H.
2. 218H, 80H, AAAH, 536D, 128D, 2730D.
3. 10101011110011011110B, 1001000110100B, 100000001111B, 703710D, 4660D, 2063D.
4. ??

2. Computer Memory & Data Representation

Computer uses *a fixed number of bits* to represent a piece of data, which could be a number, a character, or others. A *n*-bit storage location can represent up to 2^*n*distinct entities. For example, a 3-bit memory location can hold one of these eight binary patterns: 000, 001, 010, 011, 100, 101, 110, or 111. Hence, it can represent at most 8 distinct entities. You could use them to represent numbers 0 to 7, numbers 8881 to 8888, characters 'A' to 'H', or up to 8 kinds of fruits like apple, orange, banana; or up to 8 kinds of animals like lion, tiger, etc.

Integers, for example, can be represented in 8-bit, 16-bit, 32-bit or 64-bit. You, as the programmer, choose an appropriate bit-length for your integers. Your choice will impose constraint on the range of integers that can be represented. Besides the bit-length, an integer can be represented in various *representation* schemes, e.g., unsigned vs. signed integers. An 8-bit unsigned integer has a range of 0 to 255, while an 8-bit signed integer has a range of -128 to 127 - both representing 256 distinct numbers.

It is important to note that a computer memory location merely *stores a binary pattern*. It is entirely up to you, as the programmer, to decide on how these patterns are to be *interpreted*. For example, the 8-bit binary pattern "0100 0001B" can be interpreted as an unsigned integer 65, or an ASCII character 'A', or some secret information known only to you. In other words, you have to first decide how to represent a piece of data in a binary pattern before the binary patterns make sense. The interpretation of binary pattern is called *data representation* or *encoding*. Furthermore, it is important that the data representation schemes are agreed-upon by all the parties, i.e., industrial standards need to be formulated and straightly followed.

Once you decided on the data representation scheme, certain constraints, in particular, the precision and range will be imposed. Hence, it is important to understand*data representation* to write *correct* and *high-performance* programs.

Rosette Stone and the Decipherment of Egyptian Hieroglyphs

Egyptian hieroglyphs (next-to-left) were used by the ancient Egyptians since 4000BC. Unfortunately, since 500AD, no one could longer read the ancient Egyptian hieroglyphs, until the re-discovery of the Rosette Stone in 1799 by Napoleon's troop (during Napoleon's Egyptian invasion) near the town of Rashid (Rosetta) in the Nile Delta.

The Rosetta Stone (left) is inscribed with a decree in 196BC on behalf of King Ptolemy V. The decree appears in *three* scripts: the upper text is *Ancient Egyptian hieroglyphs*, the middle portion Demotic script, and the lowest *Ancient Greek*. Because it presents essentially the same text in all three scripts, and Ancient Greek could still be understood, it provided the key to the decipherment of the Egyptian hieroglyphs.

The moral of the story is unless you know the encoding scheme, there is no way that you can decode the data.

Reference and images: Wikipedia.

3. Integer Representation

Integers are *whole numbers* or *fixed-point numbers* with the radix point *fixed* after the least-significant bit. They are contrast to *real numbers* or *floating-point numbers*, where the position of the radix point varies. It is important to take note that integers and floating-point numbers are treated differently in computers. They have different representation and are processed differently (e.g., floating-point numbers are processed in a so-called floating-point processor). Floating-point numbers will be discussed later.

Computers use *a fixed number of bits* to represent an integer. The commonly-used bit-lengths for integers are 8-bit, 16-bit, 32-bit or 64-bit. Besides bit-lengths, there are two representation schemes for integers:

1. *Unsigned Integers*: can represent zero and positive integers.
2. *Signed Integers*: can represent zero, positive and negative integers. Three representation schemes had been proposed for signed integers:
    a. Sign-Magnitude representation
    b. 1's Complement representation
    c. 2's Complement representation

You, as the programmer, need to decide on the bit-length and representation scheme for your integers, depending on your application's requirements. Suppose that you need a counter for counting a small quantity from 0 up to 200, you might choose the 8-bit unsigned integer scheme as there is no negative numbers involved.

Client Server Networks

A Computer networking model where one or more powerful computers (servers) provide the differentcomputer network services and all other user'of computer network (clients) access those services to perform user's tasks is known as client/server computer networking model.

In such networks, there exists a central controller called server. A server is a specialized computer that controls the network resources and provides services to other computers in the network.

All other computers in the network are called clients. A client computer receives the requested services from a server.

A server performs all the major operations like security and network management.

All the clients communicate with each other via centralized server

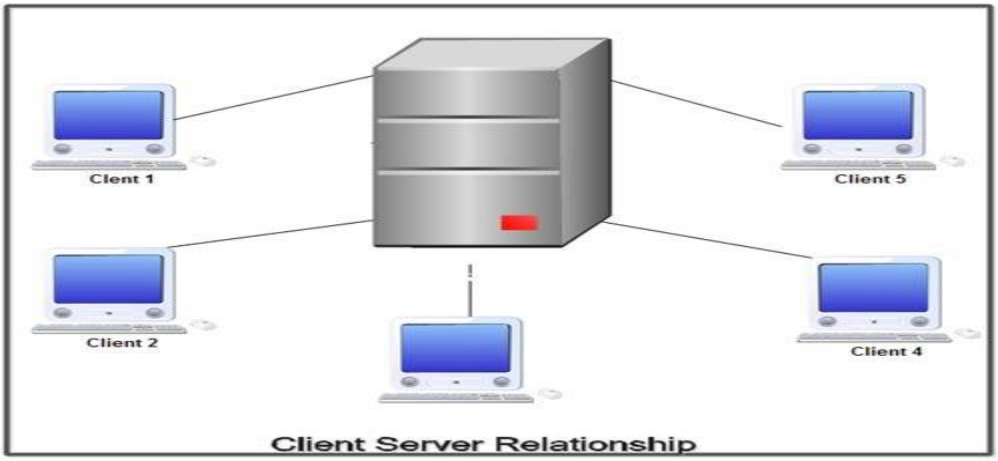
If client 1 wants to send data to client 2, it first sends request to server to seek permission for it. The server then sends a signal to client 1 allowing it to initiate the communication.

A server is also responsible for managing all the network resources such as files, directories, applications & shared devices like printer etc.

If any of the clients wants to access these services, it first seeks permission from the server by sending a request.

Most Local Area Networks are based on client server relationship.

Client-server networking became popular in the late 1980s and early 1990s as many applications were migrated from centralized minicomputers and mainframes to computer networks of persona computers.



Client Server Relationship

The design of applications for a distributed computing environment required that they effetely be divided into two parts: client (front end) and server (back end). The network model on which they were implemented mirrored this client-server model with a user's PC (the client) typically acting as the requesting machine and a more powerful server machine to which it was connected via either a LAN or a WAN acting as the supplying machine. It requires special networking operating system. It provides user level security and it is more expensive.

Advantages of Client Server Networks

1. Centralized back up is possible.
2. Use of dedicated server improves the performance of whole system.
3. Security is better in these networks as all the shared resources are centrally administered.
4. Use of dedicated servers also increases the speed of sharing resources.

Disadvantages of Client Server Networks

1. It requires specialized servers with large memory and secondary storage. This leads to increase in the cost.
2. The cost of network operating system that manages the various clients is also high.
3. It requires dedicated network administrator.

POSSIBLE QUESTION
PART – A (TWO MARK)

1. What are the functions in the input unit?
2. Define database
3. What are the functions on the output unit?
4. Define Personal Computer.
5. Specify the electronic components used for different computer generations.

PART - B (SIX MARK)

1. List and explain the components of DSS.
2. Discuss about the types of computers and their capabilities of processing.
3. What is a Microprocessor? Explain its role in the information processing of modern computer.
4. Discuss the growth and development of Electronic computer.
5. Give a detailed discussion about CPU operations.
6. Explain special purpose application software.
7. Write a short note on : i) Work Station ii) CPU iii) Super Computer
8. Distinguish between impact and non – impact printers.
9. Explain the applications of direct input devices.
10. Write a short notes on i) Main Computer ii) Mini Computer iii) Personal Computer.

UNIT IV : Input Devices - Mouse - Touch Screens - MICR - OCR - Keyboard - Pen Based Input - Digital Scanners - Voice Input Devices - Sensors. Output Devices - Impact Printers - Non-Impact Printers - Video Display Terminals - Plotters - Voice Output Devices. Secondary Storage Devices - Magnetic Disk, Floppy, Magnetic Tape, Optical Disk Storage - DROM

Input Devices

Following are some of the important input devices which are used in a computer −

- Keyboard
- Mouse
- Joy Stick
- Light pen & Track Ball
- Scanner & Graphic Tablet
- Microphone
- Magnetic Ink Card Reader(MICR)
- Optical Character Reader(OCR)
- Bar Code Reader
- Optical Mark Reader(OMR)

Keyboard

Keyboard is the most common and very popular input device which helps to input data to the computer. The layout of the keyboard is like that of traditional typewriter, although there are some additional keys provided for performing additional functions.

Keyboards are of two sizes 84 keys or 101/102 keys, but now keyboards with 104 keys or 108 keys are also available for Windows and Internet.

The keys on the keyboard are as follows −

S.No	Keys & Description
1	Typing Keys These keys include the letter keys (A-Z) and digit keys (09) which generally give the same layout as that of typewriters.
2	Numeric Keypad It is used to enter the numeric data or cursor movement. Generally, it consists of a set of 17 keys that are laid out in the same configuration used by most adding machines and calculators.
3	Function Keys The twelve function keys are present on the keyboard which are arranged in a row at the top of the keyboard. Each function key has a unique meaning and is used for some specific purpose.

4	Control keys These keys provide cursor and screen control. It includes four directional arrow keys. Control keys also include Home, End, Insert, Delete, Page Up, Page Down, Control(Ctrl), Alternate(Alt), Escape(Esc).
5	Special Purpose Keys Keyboard also contains some special purpose keys such as Enter, Shift, Caps Lock, Num Lock, Space bar, Tab, and Print Screen.

Mouse

Mouse is the most popular pointing device. It is a very famous cursor-control device having a small palm size box with a round ball at its base, which senses the movement of the mouse and sends corresponding signals to the CPU when the mouse buttons are pressed.

Generally, it has two buttons called the left and the right button and a wheel is present between the buttons. A mouse can be used to control the position of the cursor on the screen, but it cannot be used to enter text into the computer.

Advantages

- Easy to use
- Not very expensive
- Moves the cursor faster than the arrow keys of the keyboard.

Joystick

Joystick is also a pointing device, which is used to move the cursor position on a monitor screen. It is a stick having a spherical ball at its both lower and upper ends. The lower spherical ball moves in a socket. The joystick can be moved in all four directions.

The function of the joystick is similar to that of a mouse. It is mainly used in Computer Aided Designing (CAD) and playing computer games.

Light Pen

Light pen is a pointing device similar to a pen. It is used to select a displayed menu item or draw pictures on the monitor screen. It consists of a photocell and an optical system placed in a small tube.

When the tip of a light pen is moved over the monitor screen and the pen button is pressed, its photocell sensing element detects the screen location and sends the corresponding signal to the CPU.

Track Ball

Track ball is an input device that is mostly used in notebook or laptop computer, instead of a mouse. This is a ball which is half inserted and by moving fingers on the ball, the pointer can be moved.

Since the whole device is not moved, a track ball requires less space than a mouse. A track ball comes in various shapes like a ball, a button, or a square.

Scanner

Scanner is an input device, which works more like a photocopy machine. It is used when some information is available on paper and it is to be transferred to the hard disk of the computer for further manipulation.

Scanner captures images from the source which are then converted into a digital form that can be stored on the disk. These images can be edited before they are printed.

Digitizer

Digitizer is an input device which converts analog information into digital form. Digitizer can convert a signal from the television or camera into a series of numbers that could be stored in a computer. They can be used by the computer to create a picture of whatever the camera had been pointed at.

Digitizer is also known as Tablet or Graphics Tablet as it converts graphics and pictorial data into binary inputs. A graphic tablet as digitizer is used for fine works of drawing and image manipulation applications.

Microphone

Microphone is an input device to input sound that is then stored in a digital form.

The microphone is used for various applications such as adding sound to a multimedia presentation or for mixing music.

Magnetic Ink Card Reader (MICR)

MICR input device is generally used in banks as there are large number of cheques to be processed every day. The bank's code number and cheque number are printed on the cheques with a special type of ink that contains particles of magnetic material that are machine readable.

This reading process is called Magnetic Ink Character Recognition (MICR). The main advantages of MICR is that it is fast and less error prone.

Optical Character Reader (OCR)

OCR is an input device used to read a printed text.

OCR scans the text optically, character by character, converts them into a machine readable code, and stores the text on the system memory.

Bar Code Readers

Bar Code Reader is a device used for reading bar coded data (data in the form of light and dark lines). Bar coded data is generally used in labelling goods, numbering the books, etc. It may be a handheld scanner or may be embedded in a stationary scanner.

Bar Code Reader scans a bar code image, converts it into an alphanumeric value, which is then fed to the computer that the bar code reader is connected to.

Optical Mark Reader (OMR)

OMR is a special type of optical scanner used to recognize the type of mark made by pen or pencil. It is used where one out of a few alternatives is to be selected and marked.

It is specially used for checking the answer sheets of examinations having multiple choice questions.

Output Devices

Following are some of the important output devices used in a computer.

- Monitors
- Graphic Plotter
- Printer

Monitors

Monitors, commonly called as Visual Display Unit (VDU), are the main output device of a computer. It forms images from tiny dots, called pixels that are arranged in a rectangular form. The sharpness of the image depends upon the number of pixels.

There are two kinds of viewing screen used for monitors.

- Cathode-Ray Tube (CRT)
- Flat-Panel Display

Cathode-Ray Tube (CRT) Monitor

The CRT display is made up of small picture elements called pixels. The smaller the pixels, the better the image clarity or resolution. It takes more than one illuminated pixel to form a whole character, such as the letter 'e' in the word help.

A finite number of characters can be displayed on a screen at once. The screen can be divided into a series of character boxes - fixed location on the screen where a standard character can be placed. Most screens are capable of displaying 80 characters of data horizontally and 25 lines vertically.

There are some disadvantages of CRT −

- Large in Size
- High power consumption

Flat-Panel Display Monitor

The flat-panel display refers to a class of video devices that have reduced volume, weight and power requirement in comparison to the CRT. You can hang them on walls or wear them on your wrists. Current uses of flat-panel displays include calculators, video games, monitors, laptop computer, and graphics display.

The flat-panel display is divided into two categories −

- Emissive Displays − Emissive displays are devices that convert electrical energy into light. For example, plasma panel and LED (Light-Emitting Diodes).
- Non-Emissive Displays − Non-emissive displays use optical effects to convert sunlight or light from some other source into graphics patterns. For example, LCD (Liquid-Crystal Device).

Printers

Printer is an output device, which is used to print information on paper.

There are two types of printers −

- Impact Printers
- Non-Impact Printers

Impact Printers

Impact printers print the characters by striking them on the ribbon, which is then pressed on the paper.

Characteristics of Impact Printers are the following −

- Very low consumable costs
- Very noisy
- Useful for bulk printing due to low cost
- There is physical contact with the paper to produce an image

These printers are of two types −

- Character printers
- Line printers

Character Printers

Character printers are the printers which print one character at a time.

These are further divided into two types:

- Dot Matrix Printer(DMP)
- Daisy Wheel

Dot Matrix Printer

In the market, one of the most popular printers is Dot Matrix Printer. These printers are popular because of their ease of printing and economical price. Each character printed is in the form of pattern of dots and head consists of a Matrix of Pins of size (5*7, 7*9, 9*7 or 9*9) which come out to form a character which is why it is called Dot Matrix Printer.

Advantages

- Inexpensive
- Widely Used
- Other language characters can be printed

Disadvantages

- Slow Speed
- Poor Quality

Daisy Wheel

Head is lying on a wheel and pins corresponding to characters are like petals of Daisy (flower) which is why it is called Daisy Wheel Printer. These printers are generally used for word-processing in offices that require a few letters to be sent here and there with very nice quality.

Advantages

- More reliable than DMP
- Better quality
- Fonts of character can be easily changed

Disadvantages

- Slower than DMP
- Noisy
- More expensive than DMP

Line Printers

Line printers are the printers which print one line at a time.

These are of two types −

- Drum Printer
- Chain Printer

Drum Printer

This printer is like a drum in shape hence it is called drum printer. The surface of the drum is divided into a number of tracks. Total tracks are equal to the size of the paper, i.e. for a paper width of 132 characters, drum will have 132 tracks. A character set is embossed on the track. Different character sets

available in the market are 48 character set, 64 and 96 characters set. One rotation of drum prints one line. Drum printers are fast in speed and can print 300 to 2000 lines per minute.

Advantages

- Very high speed

Disadvantages

- Very expensive
- Characters fonts cannot be changed

Chain Printer

In this printer, a chain of character sets is used, hence it is called Chain Printer. A standard character set may have 48, 64, or 96 characters.

Advantages

- Character fonts can easily be changed.
- Different languages can be used with the same printer.

Disadvantages

- Noisy

Non-impact Printers

Non-impact printers print the characters without using the ribbon. These printers print a complete page at a time, thus they are also called as Page Printers.

These printers are of two types −

- Laser Printers
- Inkjet Printers

Characteristics of Non-impact Printers

- Faster than impact printers
- They are not noisy
- High quality
- Supports many fonts and different character size

Laser Printers

These are non-impact page printers. They use laser lights to produce the dots needed to form the characters to be printed on a page.

Advantages

- Very high speed
- Very high quality output
- Good graphics quality
- Supports many fonts and different character size

Disadvantages

- Expensive
- Cannot be used to produce multiple copies of a document in a single printing

Inkjet Printers

Inkjet printers are non-impact character printers based on a relatively new technology. They print characters by spraying small drops of ink onto paper. Inkjet printers produce high quality output with presentable features.

They make less noise because no hammering is done and these have many styles of printing modes available. Color printing is also possible. Some models of Inkjet printers can produce multiple copies of printing also.

Advantages

- High quality printing
- More reliable

Disadvantages

- Expensive as the cost per page is high
- Slow as compared to laser printer

Secondary Storage

Secondary Storage Devices are essential as the size of Primary storage or main memory in every computer is limited. With this, the computer can only accommodate a limited sized program and data. To carry out big jobs like commercial data processing, it becomes essential that data be held in some expansive form of storage. This is achieved through secondary storage Devices. It is also called as external storage, and can hold data either sequentially or at random. You should always keep in in mind that data in secondary storage devices is not directly accessible and has to be routed through the main storage for processing.

Types of Secondary storage Devices in Computers are:

- Magnetic tape
- Magnetic disk and
- Magnetic drum.

Magnetic tape:

• Tapes are used for recording and storing data for computer processing. It is plastic reel similar to long lengths of movie film. A tape is usually ½" wide and 2400 feet in length and it is coated with particles of ferric oxide on which data can be recorded magnetically.

• The process of reading and writing of data is carried out on a device called Tape Drive and the records on magnetic tape are stored in sequential order. For example: if the payroll file is to be stored on a magnetic tape, the records would likely to be stored in the sequence of employee numbers. Hence, magnetic tapes are referred to as sequential access device.

Magnetic disk:

• Magnetic disk is another type of secondary storage device known as random (direct) access as it permits direct accessing of data. An individual disk is a circular metal plate coated on both side by ferrous oxide material.

• Data is recorded in the form of magnetized spots on the tracks of the disk, a spot representing the presence by "1" and its absence by "0" enabling representing of data in binary form.

• The surface of the magnetic disk is divided into number of invisible concentric circles called "tracks" and these tracks are further subdivided into "sectors", "blocks" etc. each its own unique addresses to facilitate the location of data and the Disk moves on a vertical rotating spindle.

• Reading /writing on the disks is accomplished by means of series of read/write heads which are placed close to the surfaces of the disks.

• It is good to know that data on the magnetic disk can be accessed again and again. It can also be recorded erasing the older information.

Magnetic drum:

• It is a metallic cylinder coated with a special magnetic alloy.

• Data is stored in this surface as minute magnetized spoke arranged in binary form in a series of parallel circular tracks.

• The drum rotates at a constant speed and data is recorded (or) retrieved by the read/write head. One for each track.

• The magnetic drum provides random access storage.

ADVANTAGES

- Very fast access
- Random access capability
- Stored data is not destroyed until new data is written in the same location.

DISADVANTAGES

- Drums cannot be removed from the unit and stored.
- Storage capacity is limited.
- Requires machine interpretation to read the information as it is not humanly readable.

CD-ROM

♦ CD-ROM (Compact Disc Read Only Memory) is a Compact Disc contains data accessible by a computer. While the Compact Disc format was originally designed for music storage and play back, the format was later adapted to hold any form of binary data.

♦ The CR-ROM is also known as a laser disc, which is shiny metal like disk. The diameter of the disk is 5.25 inches or 12 cm disk. Information of 650 MB can be stored which is equal to nearly 2, 50,000 pages of printed text.

♦ The data is recorded as deep holes on the disk surface or burning microscopic bits.

♦ The plain and shiny disk surface and the microscopic bits help to represent the binary numbers 0 and 1, as required by the concentric tracks.

♦ CD-ROMs are popularly used to distribute computer software, including games and multimedia applications, though any data can be stored.

♦ Some CDs hold both computer data and audio with the latter capable of being played on a CD player, while data is only usable on a computer. These are called Enhanced CDs.

♦ The CD-ROMs are pre-recorded disks used for storing a large amount of data and information. Hence, the CD-ROM drive has become a standard peripheral device used for retrieval of stored data on the CD-ROM.

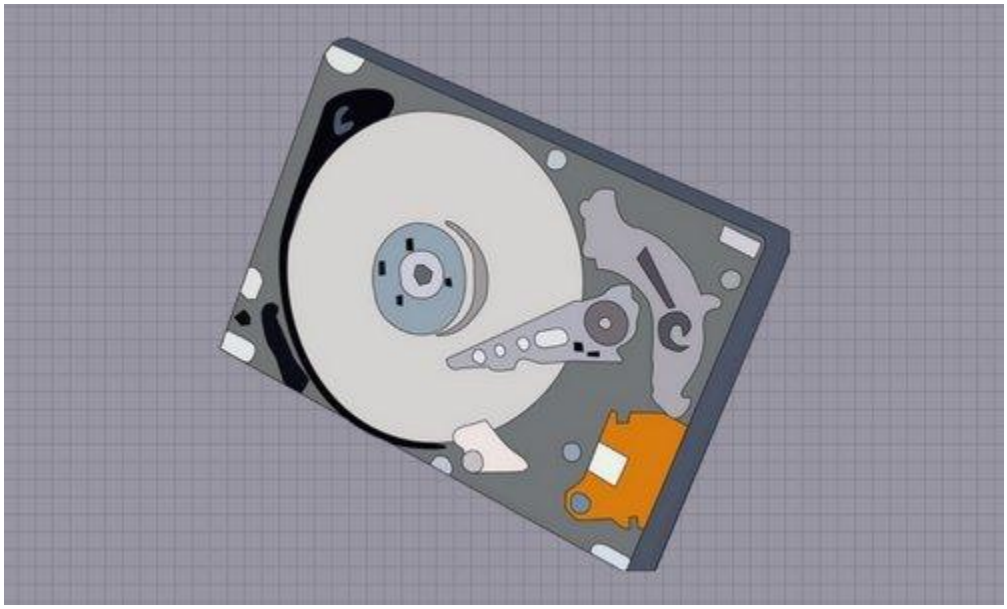
♦ A CD-ROM sector contains 2352 bytes, divided into 98 [ninety-eight], 24-byte frames.

♦ A mode-1 CD-ROM, which has the full three layers of error correction data, contains a net 2048 bytes of the available 2352 per sector.

♦ On a mode-2 CD-ROM, which is mostly used for video files, there are 2336 user available bytes per sector. A device called CD-Writer is necessary to record information onto a CD-ROM.

HARD DISK

♦ A hard disk drive [HDD], commonly referred to as a hard drive, hard disk or fixed disk drive. It is a non-volatile secondary storage device which stores digitally encoded data on rapidly rotating platters with magnetic surfaced. The hard disk is an electro mechanical device. The hard disk is also known as Winchester disk. HDDs record data by magnetizing a ferromagnetic material directionally to represent either a "0" or "1" binary digit. They read the data by detecting the magnetization of the material.



♦ The magnetic hard disk is an electro-mechanical device which consists of some smooth metal plates and disks coated on either sides or surfaces with a thin-film of magnetic material. The set of such magnetic disks are fixed on one spindle, one above the other, like a stack of disks. This is called a disk pack, which is sealed into one unit and mounted on a disk drive.

♦ The hard disk drive has a set of magnetic heads or read/write heads for both surfaces of each disk, on the spindle.

♦ The disk drive consists of a motor to rotate the disk pack at a speed of about 3600 revolutions per minute [rpm] about a spindle.

♦ Each magnetic head (or) magnetic read/write heads mounted on arm can move in and out rapidly on the disk surface to perform read and write operations. The information is recorded and stored or retrieved that is read from the magnetic recording surface, while the disk rotates about the spindle at high-speed.

♦ The information is stored on the magnetic surfaces as bits 0's and 1's on the concentric circles as tracks.

♦ Each track is divided into sectors of the same density.

♦ The set of corresponding tracks of all the surfaces of all the disks constitute a cylinder.

♦ The magnetic disk pack is connected to controller by an electronic circuit called as a disk controller (or) hard disk controller HDC. The controllers accept control signals from the control unit of the computer for specific read and write operation.

♦ Now days the capacity of hard disk begins from 20 GB, 40 GB and so on, to fulfill the need of large data information storage.

♦ Hard disk drives are sealed to prevent dust and other sources of contamination from interfering with the operation of the hard disk heads.

♦ The hard drives are not air tight, but rather utilize an extremely fine air filter, to allow for air inside the hard drive enclosure. The spinning of the disks causes the air to circulate forcing any particulars to become trapped on the filter. The same air currents also as a gas bearing which enables the heads to float on a cushion of air above the surfaces of the disks.

FLOPPY DISKS

These are also called as flexible disks. These are used in the smallest micro computer systems as well as mini computers. Floppy disks have higher storage capacity and offer direct access capability. The floppy disk is permanently sealed in a plastic coated jacket and the whole package is inserted the floppy drive for data recording and retrieval.

The jacket of the disk has a small slot to permit the read/write head to contact the disk. They are 5.25 inch (or) 3.5 inch in diameter. They come in single and double density and recorded on one or both surface of the diskette. The capacity of a 5.25 inch floppy is 1.2 mega bytes whereas for 3.5 inch floppy it is 1.44 mega bytes.

POSSIBLE QUESTION
PART – A (TWO MARK)

1. Write short notes on secondary storage.
2. What is meant by e – commerce?
3. What strategic role can information play in business process reengineering?
4. What are the major operations of computer?
5. Write a short note on video display terminals.

PART - B (SIX MARK)

1. Explain how the client server is functioning.
2. Explain in detail the functions of an operating system in a computer.
3. Write a short note : i) MICR ii)OCR iii) Sensor
4. List and describe the major input devices.
5. Explain the role and applications of various input devices.
6. Write in detailed about the milestones of various secondary storage devices.
7. Explain the working of digital scanner and voice input device.
8. What are the main types of printers? How do they work?
9. Explain the role of mouse, keyboard and pen based input in modern days of business.
10. Explain the relative advantages and disadvantages of Magnetic – tape and disk data storage.

UNIT V : Telecommunication Revolution - Introduction to Email- Internet - Intranet - Teleconferencing - www Architecture - Introduction to E-Commerce - Models B_B, B_C, and EDI, EDI Applications in Business - Electronic Payment Cash - Smart Cards - Credit Cards - Fundamentals of ERP- Information Technology Act, 2000.

Email

Email is a service which allows us to send the message in electronic mode over the internet. It offers an efficient, inexpensive and real time mean of distributing information among people.

E-Mail Address

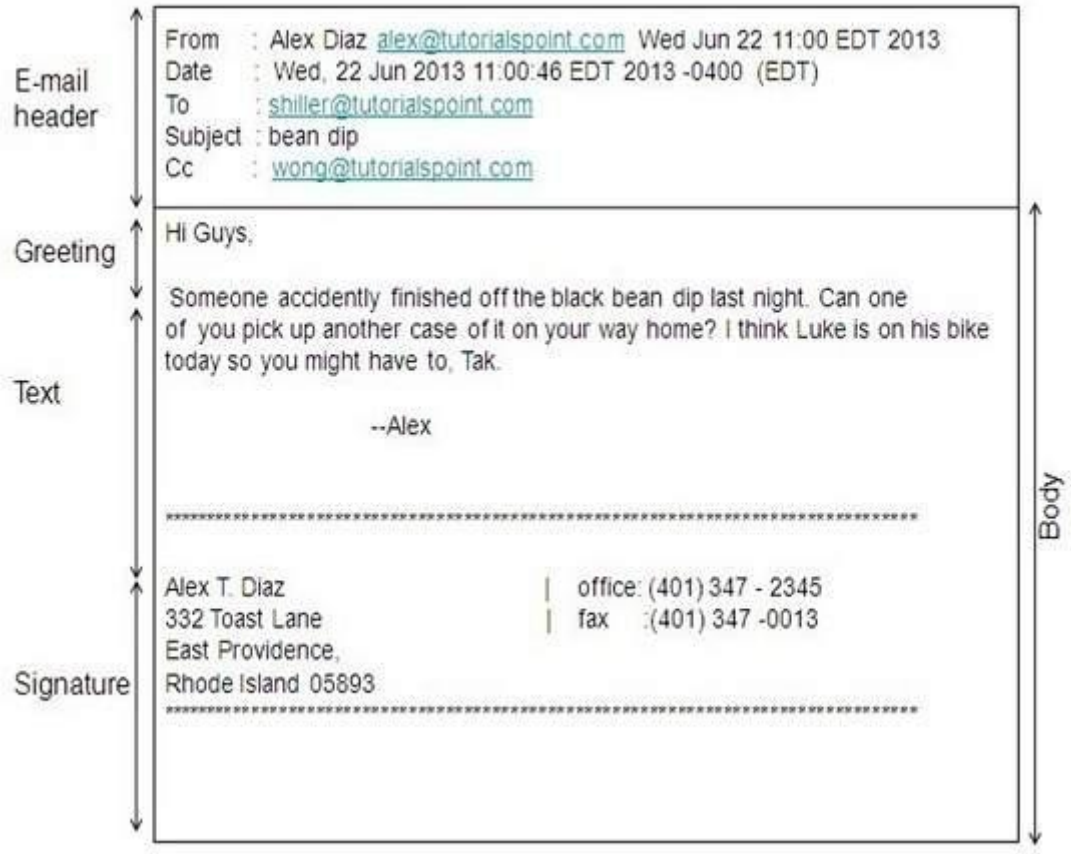
Each user of email is assigned a unique name for his email account. This name is known as E-mail address. Different users can send and receive messages according to the e-mail address.

E-mail is generally of the form username@domainname. For example, webmaster@tutorialspoint.com is an e-mail address where webmaster is username and tutorialspoint.com is domain name.

- The username and the domain name are separated by **@ (at)** symbol.
- E-mail addresses are not case sensitive.
- Spaces are not allowed in e-mail address.

E-mail Message Components

E-mail message comprises of different components: E-mail Header, Greeting, Text, and Signature. These components are described in the following diagram:



E-mail Header

The first five lines of an E-mail message is called E-mail header. The header part comprises of following fields:

- From
- Date
- To
- Subject
- CC
- BCC

FROM

The From field indicates the sender's address i.e. who sent the e-mail.

DATE

The Date field indicates the date when the e-mail was sent.

TO

The To field indicates the recipient's address i.e. to whom the e-mail is sent.

SUBJECT

The Subject field indicates the purpose of e-mail. It should be precise and to the point.

CC

CC stands for Carbon copy. It includes those recipient addresses whom we want to keep informed but not exactly the intended recipient.

BCC

BCC stands for Black Carbon Copy. It is used when we do not want one or more of the recipients to know that someone else was copied on the message.

GREETING

Greeting is the opening of the actual message. Eg. Hi Sir or Hi Guys etc.

TEXT

It represents the actual content of the message.

SIGNATURE

This is the final part of an e-mail message. It includes Name of Sender, Address, and Contact Number.

Advantages

E-mail has proved to be powerful and reliable medium of communication. Here are the benefits of **E-mail:**

- Reliable
- Convenience
- Speed
- Inexpensive
- Printable
- Global
- Generality

Reliable

Many of the mail systems notify the sender if e-mail message was undeliverable.

Convenience

There is no requirement of stationary and stamps. One does not have to go to post office. But all these things are not required for sending or receiving an mail.

Speed

E-mail is very fast. However, the speed also depends upon the underlying network.

Inexpensive

The cost of sending e-mail is very low.

Printable

It is easy to obtain a hardcopy of an e-mail. Also an electronic copy of an e-mail can also be saved for records.

Global

E-mail can be sent and received by a person sitting across the globe.

Generality

It is also possible to send graphics, programs and sounds with an e-mail.

Disadvantages

Apart from several benefits of E-mail, there also exists some disadvantages as discussed below:

- Forgery
- Overload
- Misdirection
- Junk
- No response

Forgery

E-mail doesn't prevent from forgery, that is, someone impersonating the sender, since sender is usually not authenticated in any way.

Overload

Convenience of E-mail may result in a flood of mail.

Misdirection

It is possible that you may send e-mail to an unintended recipient.

Junk

Junk emails are undesirable and inappropriate emails. Junk emails are sometimes referred to as spam.

No Response

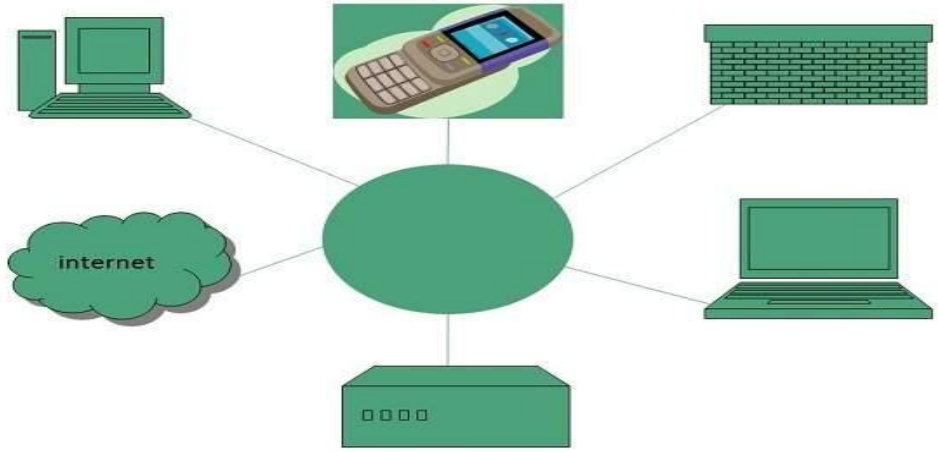
It may be frustrating when the recipient does not read the e-mail and respond on a regular basis.

Internet

Internet is defined as an Information super Highway, to access information over the web. However, It can be defined in many ways as follows:

- Internet is a world-wide global system of interconnected computer networks.
- Internet uses the standard Internet Protocol (TCP/IP).
- Every computer in internet is identified by a unique IP address.
- IP Address is a unique set of numbers (such as 110.22.33.114) which identifies a computer location.

- A special computer DNS (Domain Name Server) is used to give name to the IP Address so that user can locate a computer by a name.
- For example, a DNS server will resolve a name **http://www.tutorialspoint.com** to a particular IP address to uniquely identify the computer on which this website is hosted.
- Internet is accessible to every user all over the world.



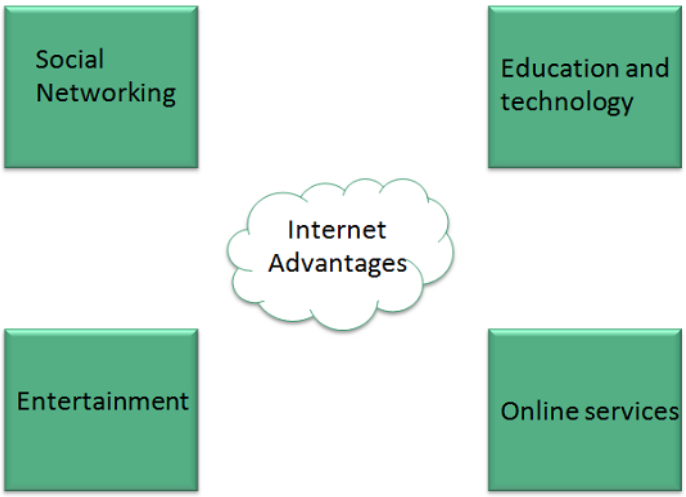
Evolution

The concept of Internet was originated in 1969 and has undergone several technological & Infrastructural changes as discussed below:

- The origin of Internet devised from the concept of **Advanced Research Project Agency Network (ARPANET).**
- **ARPANET** was developed by United States Department of Defense.
- Basic purpose of ARPANET was to provide communication among the various bodies of government.
- Initially, there were only four nodes, formally called **Hosts.**
- In 1972, the **ARPANET** spread over the globe with 23 nodes located at different countries and thus became known as **Internet.**
- By the time, with invention of new technologies such as TCP/IP protocols, DNS, WWW, browsers, scripting languages etc.,Internet provided a medium to publish and access information over the web.

Advantages

Internet covers almost every aspect of life, one can think of. Here, we will discuss some of the advantages of Internet:



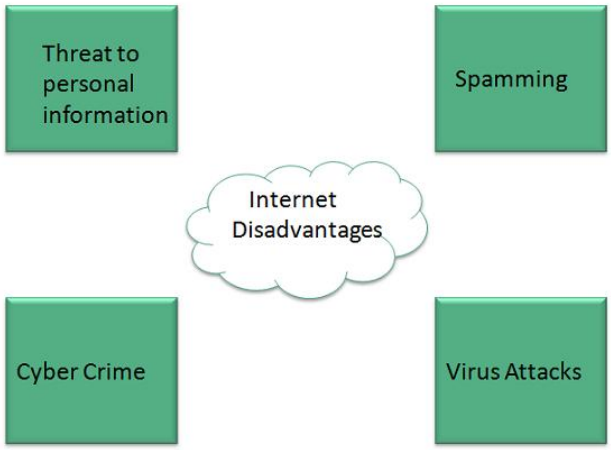
- Internet allows us to communicate with the people sitting at remote locations. There are various apps available on the wed that uses Internet as a medium for communication. One can find various social networking sites such as:
  - Facebook
  - Twitter
  - Yahoo
  - Google+
  - Flickr
  - Orkut
- One can surf for any kind of information over the internet. Information regarding various topics such as Technology, Health & Science, Social Studies, Geographical Information, Information Technology, Products etc can be surfed with help of a search engine.
- Apart from communication and source of information, internet also serves a medium for entertainment. Following are the various modes for entertainment over internet.
  - Online Television
  - Online Games
  - Songs
  - Videos
  - Social Networking Apps
- Internet allows us to use many services like:
  - Internet Banking
  - Matrimonial Services
  - Online Shopping

- Online Ticket Booking
- Online Bill Payment
- Data Sharing
- E-mail

- Internet provides concept of **electronic commerce**, that allows the business deals to be conducted on electronic systems

Disadvantages

However, Internet has prooved to be a powerful source of information in almost every field, yet there exists many disadvanatges discussed below:

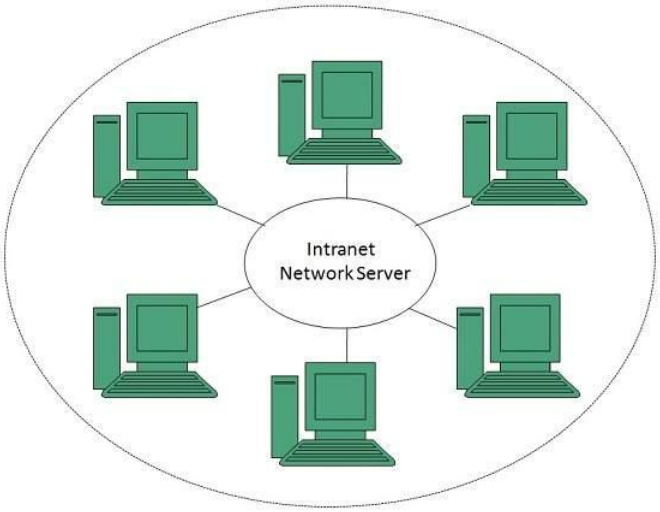


- There are always chances to loose personal information such as name, address, credit card number. Therefore, one should be very careful while sharing such information. One should use credit cards only through authenticated sites.
- Another disadvantage is the **Spamming**.Spamming corresponds to the unwanted e-mails in bulk. These e-mails serve no purpose and lead to obstruction of entire system.
- **Virus** can easily be spread to the computers connected to internet. Such virus attacks may cause your system to crash or your important data may get deleted.
- Also a biggest threat on internet is pornography. There are many pornographic sites that can be found, letting your children to use internet which indirectly affects the children healthy mental life.
- There are various websites that do not provide the authenticated information. This leads to misconception among many people.

Intranet

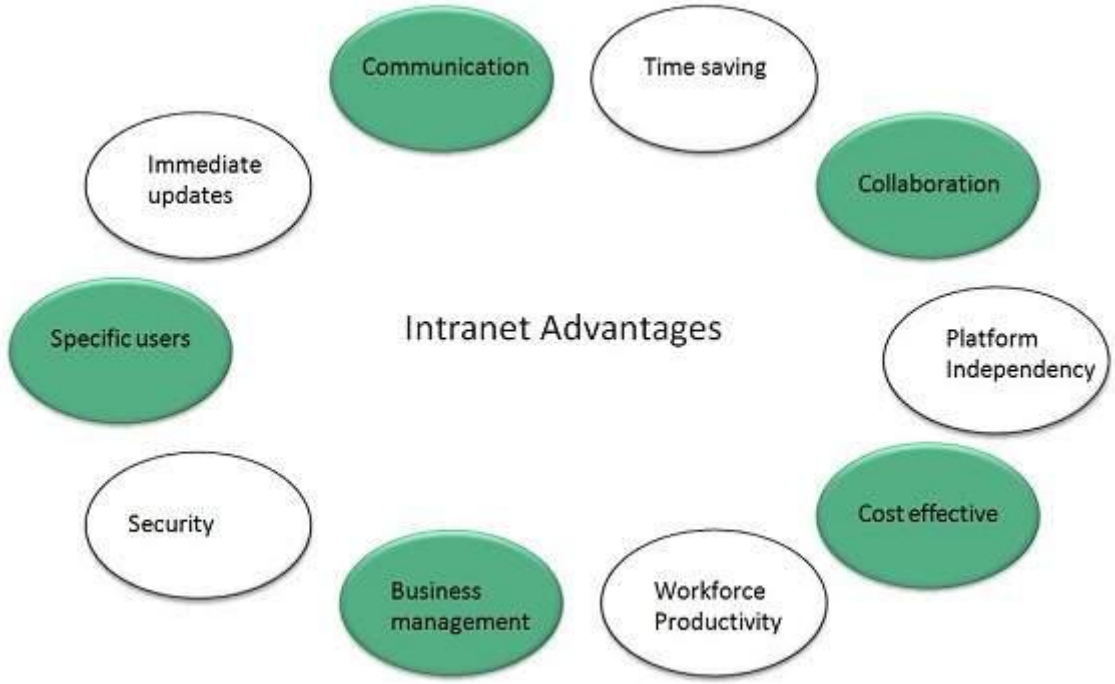
Intranet is defined as private network of computers within an organization with its own server and firewall. Moreover we can define Intranet as:

- Intranet is system in which multiple PCs are networked to be connected to each other. PCs in intranet are not available to the world outside of the intranet.
- Usually each company or organization has their own Intranet network and members/employees of that company can access the computers in their intranet.
- Every computer in internet is identified by a unique IP address.
- Each computer in Intranet is also identified by a IP Address, which is unique among the computers in that Intranet.



Benefits

Intranet is very efficient and reliable network system for any organization. It is beneficial in every aspect such as collaboration, cost-effectiveness, security, productivity and much more.



Communication

Intranet offers easy and cheap communication within an organization. Employees can communicate using chat, e-mail or blogs.

Time Saving

Information on Intranet is shared in real time.

Collaboration

Information is distributed among the employees as according to requirement and it can be accessed by the authorized users, resulting in enhanced teamwork.

Platform Independency

Intranet can connect computers and other devices with different architecture.

Cost Effective

Employees can see the data and other documents using browser rather than printing them and distributing duplicate copies among the employees, which certainly decreases the cost.

Workforce Productivity

Data is available at every time and can be accessed using company workstation. This helps the employees work faster.

Business Management

It is also possible to deploy applications that support business operations.

Security

Since information shared on intranet can only be accessed within an organization, therefore there is almost no chance of being theft.

Specific Users

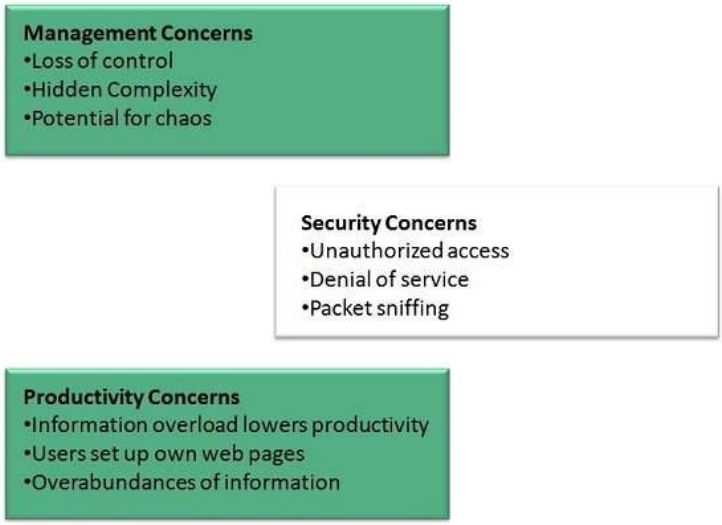
Intranet targets only specific users within an organization therefore, once can exactly know whom he is interacting.

Immediate Updates

Any changes made to information are reflected immediately to all the users.

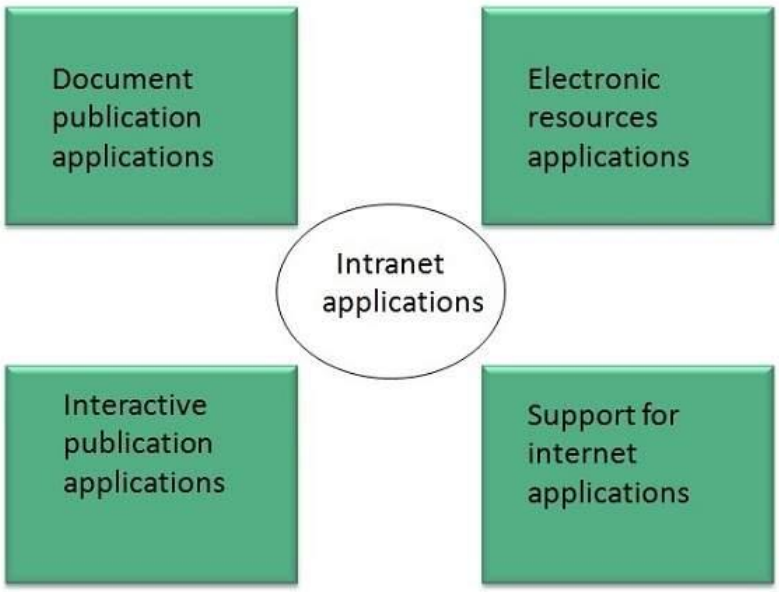
Issues

Apart from several benefits of Intranet, there also exist some issues.. These issues are shown in the following diagram:



Applications

Intranet applications are same as that of Internet applications. Intranet applications are also accessed through a web browser. The only difference is that, Intranet applications reside on local server while Internet applications reside on remote server. Here, we've discussed some of these applications:



Document publication applications

Document publication applications allow publishing documents such as manuals, software guide, employee profits etc without use of paper.

Electronic resources applications

It offers electronic resources such as software applications, templates and tools, to be shared across the network.

Interactive Communication applications

Like on internet, we have e-mail and chat like applications for Intranet, hence offering an interactive communication among employees.

Support for Internet Applications

Intranet offers an environment to deploy and test applications before placing them on Internet.

Internet vs. Intranet

Apart from similarities there are some differences between the two. Following are the differences between Internet and Intranet:

Intranet	Internet
Localized Network.	Worldwide Network
Doesn't have access to Intranet	Have access to Internet.
More Expensive	Less Expensive
More Safe	Less Safe

More Reliability	Less Reliability

Teleconferencing

Teleconferencing means meeting through a telecommunications medium. It is a generic term for linking people between two or more locations by electronics. There are at least six types of teleconferencing: audio, audiographic, computer, video, business television (BTV), and distance education. The methods used differ in the technology, but common factors contribute to the shared definition of teleconferencing:

- Use a telecommunications channel
- Link people at multiple locations
- Interactive to provide two-way communications
- Dynamic to require users' active participation

Interactive Technologies

The new systems have varying degrees of interactivity - the capability to talk back to the user. They are enabling and satellites, computers, teletext, viewdata, cassettes, cable, and videodiscs all fit the same emerging pattern. They provide ways for individuals to step out of the mass audiences and take an active role in the process by which information is transmitted. The new technologies are de-massified so that a special message can be exchanged with each individual in a large audience. They are the opposite o mass media and shift control to the user.

Many are asynchronous and can send or receive a message at a time convenient for individuals without being in communication at the same time. This overcomes time as a variable affecting communication. A video, data and voice delivery system reduces travel costs. When the material is retrieved and saved to a video tape or disc, the material can be used at anytime or anyplace.

As more interactive technologies emerge, the value of being an independent learner will increase. Research shows that learning from new technologies is as effective as traditional methods. Large groups are cost-effective and everyone gets the same information.

Types of Teleconferences

Audio Teleconference: Voice-only; sometimes called conference calling. Interactively links people in remote locations via telephone lines. Audio bridges tie all lines together. Meetings can be conducted via audio conference. Preplanning is necessary which includes naming a chair, setting an agenda, and providing printed materials to participants ahead of time so that they can be reviewed.Distance learning can be conducted by audio conference. In fact, it is one of the most underutilized, yet cost effective methods available to education. Instructors should receive training on how to best utilize audio conferences to augment other forms of distance learning.

Audiographics Teleconference: Uses narrowband telecommunications channels to transmit visual information such as graphics, alpha-numerics, documents, and video pictures as an adjunct to voice communication. Other terms are desk-top computer conferencing and enhanced audio. Devices include electronic tablets/boards, freeze-frame video terminals, integrated graphics systems (as part of personal computers), Fax, remote-access microfiche and slide projectors, optical graphic scanners, and voice/data terminals.

Audiographics can be used for meetings and distance learning.

Computer Teleconference: Uses telephone lines to connect two or more computers and modems. Anything that can be done on a computer can be sent over the lines. It can be synchronous or asynchronous. An example of an asychronous mode is electronic mail. Using electronic mail (E-Mail), memos, reports, updates, newsletters can be sent to anyone on the local area network (LAN) or wide area network (WAN). Items generated on computer which are normally printed and then sent by facsimile can be sent by E-Mail.

Computer conferencing is an emerging area for distance education. Some institutions offer credit programs completely by computer. Students receive texts and workbooks via mail. Through common files assigned to a class which each student can assess, teachers upload syllabi, lectures, grades and remarks. Students download these files, compose their assignment and remarks off-line, then upload them to the common files.

Students and instructors are usually required to log on for a prescribed number of days during the week. Interaction is a large component of the students' grades.

Through computers, faculty, students and administrators have easy access to one another as well as access to database resources provided through libraries. The academic resources of libraries and special resources can be accessed such as OCLC, ERIC, and Internet.

Administrators can access student files, retrieve institutional information from central repositories such as district or system offices, government agencies, or communicate with one another. Other resources can be created such as updates on state or federal legislation.

Video Teleconference: Combines audio and video to provide voice communications and video images. Can be one-way video/two-way audio, or two-way video/two-way audio. It can display

anything that can be captured by a TV camera. The advantage is the capability to display moving images. In two-way audio/video systems, a common application is to show people which creates a social presence that resembles face-to-face meetings and classes and enables participants to see the facial expressions and physical demeanor of participants at remote sites. Graphics are used to enhance understanding. There are three basic systems: freeze frame, compressed, and full-motion video.

Video conferencing is an effective way to use one teacher who teaches to a number of sites. It is very cost effective for classes which may have a small number of students enrolled at each site. In many cases, video conferencing enables the institution or a group of institutions to provide courses which would be canceled due to low enrollment or which could not be supported otherwise because of the cost of providing an instructor in an unusual subject area. Rural areas benefit particularly from classes provided through video conferencing when they work with a larger metropolitan institution that has full-time faculty.

Through teleconferencing, institutions are able to serve all students equitably.

Why Use a Teleconference?

Videoconferencing increases efficiency and results in a more profitable use of limited resources. It is a very personal medium for human issues where face-to-face communications are necessary. When you can see and hear the person you are talking to on a television monitor, they respond as though you were in the same room together. It is an effective alternative to travel which can easily add up to weeks of non-productive time each year. With videoconferencing, you never have to leave the office. Documents are available, and experts can be on hand. A crisis that might take on major proportions if you are out of town, can be handled because you're on the job. Videoconferencing maximizes efficiency because it provides a way to meet with several groups in different locations, at the same time.

As the limited resource of funding has decreased, limited resources now include instructors, parking spaces and buildings. Students now include time as a limited resources. Teleconferencing enables institutions to share facilities and instructors which will increase our ability to serve students.

Move Information - Not People

Electronic delivery is more efficient than physically moving people to a site, whether it is a faculty member or administrator.

Save Time: Content presented by one or many sources is received in many places simultaneously and instantly. Travel is reduced resulting in more productive time.

Communication is improved and meetings are more efficient. It adds a competitive edge that face-to-face meetings do not.

Lower Costs: Costs (travel, meals, lodging) are reduced by keeping employees in the office, speeding up product development cycles, improving performance through frequent meetings with timely information.

Accessible: Through any origination site in the world. Larger Audiences: More people can attend. The larger the audience, the lower the cost per person.

Larger Audiences: More people can attend. The larger the audience, the lower cost per person.

Adaptable: Useful for business, associations, hospitals, and institutions to discuss, inform, train, educate or present.

Flexible: With a remote receive or transmit truck, a transmit or receive site can be located anywhere.

Security: Signals can be encrypted (scrambled) when it is necessary. Encryption prevents outside viewers.

Unity: Provides a shared sense of identity. People feel more a part of the group...more often. Individuals or groups at multiple locations can be linked frequently.

Timely: For time-critical information, sites can be linked quickly. An audio or point-to-point teleconference can be convened in three minutes.

Interactive: Dynamic; requires the user's active participation. It enhances personal communication. When used well for learning, the interactivity will enhance the learning and the teaching experience.

Satellite Communications

Long distance telephone calls, national and international televised sporting events, and cable movie channels operate via satellites. Satellites have been used for years.

Geostationary Orbit: British physicist and science fiction writer, Sir Arthur C. Clarke, invented satellite communication in his 1954 paper Wireless World, which explained this east-west orbit, 22,300 miles above the equator; three satellites based in this orbit could provide world-wide communications. Today, many satellites are arrayed in the Clarke belt. To earth stations, they appear fixed in space.

Satellite Footprint: In geostationary orbit, communications satellites have direct line-of-sight to almost half the earth - a large "footprint" which is a major advantage. A signal sent via satellite can be transmitted simultaneously to every U.S. city. Many downlinks can be aimed at one satellite and each can receive the same program; this is called point to multipoint.

Transponders: Via an uplink, video, audio or data signals can be transmitted to a satellite transponder. There may be up to 40 transponders per satellite; each can amplify and relay signals to earth which are picked up by earth stations.

C/Ku-Band: Domestic communications satellites operate on two frequency ranges designated C- and Ku-band. Each requires specific electronic equipment. C-band is less expensive; operates at 4 kHz. Ku-band operates at 12 kHz. Some teleconferences are broadcast on both bands.

Receivers: Convert satellite signals into channels viewed (one at a time) on a TV monitor; designed to tune-in the format, bandwidth, and audio sub-carrier. Programs broadcast in code (encryption) are decoded at receive sites.

Basic Receivers: Lowest cost; limited (or manual) channel tuning capability; may use fixed antennas.

Multi-Format Receivers: Most versatile; adjusts for all broadcast formats; receive any satellite video program in six or more bandwidth selections, and two agile audio subcarrier switches; usually a motorized systems.

Fixed Position System: Low cost systems limited to reception from one satellite and one band.

Motorized System: Receives programs on different satellites by adjusting the dish position.

Automated Systems: Microprocessor controlled for instant movement to satellites (positions stored in memory).

International Satellite

Alpha Lyracom Space Communications/Pan American Satellite is the world's first private international satellite system. PAS-1 carries many specialized communications services including full and part-time video, low and high speed data, broadcast data and radio and business television to over 70 countries on three continents. It can be seen (received) by a 2.4 meter antenna. It has 18 C-band and six Ku-band transponders with a shared capacity that increases traffic.

PanAmSat handles all phases of an international broadcast as compared to INTELSAT (International Telecommunications Satellite Organization) where the customer must book the domestic and foreign half circuits and pay for each downlink. INTELSAT was established primarily to handle the PTT telephone transmissions, while PanAmSat was established to be easily accessible by distance education institutions and private enterprise. The FCC licenses PanAmSat transportables for years, as compared to the FCC special temporary authority (STA) license for INTELSAT. PanAmSat transportables can uplink from any location without a special license.

PanAmSat writes yearly contracts with customers. It does not charge for multiple downlinks. Time on PAS-1 books from between $960 to $2,400 per hour depending on the volume discount based on yearly usage. To book time on PAS-1, call the day-of-air or future event number, with the origination site, uplink, downlink sites, and conference time. PanAmSat handles the rest. By booking time through satellite brokers (EDS, PSN, Satellite Management International) ad hoc users can reduce time costs. PanAmSat is negotiating for three more satellites to be in place in 1994-95.

Compressed Video

Digital compression means that the codec compresses the video signal or data to a fraction of its original size so that the data rate is appropriate to transmit over low-cost terrestrial telephone lines or on a fraction of a satellite transponder. Codecs (COder/DECorder) compress the video and audio signal allowing it to be transmitted in a smaller bandwidth which reduces the cost of the transmission.

Standard transmission rates for video teleconferencing are multiples of 64 Kbs up to the T1 rate of 1.54 Mbs. Some codecs allow speed selection to match the circuit used. The speed selected is based on the content. When close to full motion video is needed, higher rates are needed.

T1 circuits connect PBXs to the telephone company's central office and can carry up to 24 voice channels at a lower cost than 24 voice circuits. A 56 Kb or 64 KBS codec operates in the range of one voice channel. A standard video signal digitized at 90 Mbs is comprised of about 1400 voice channels.

Freeze Frame Video

Freeze frame video uses telephone channels to transmit video information. Because of the narrow bandwidth, the image takes a few moments to reach the receive site where it appears on the TV as a still picture. The advantages are lower costs and flexibility in linking multiple sites. Slow scan systems are similar to freeze frame and the terms are often used synonymously.

Freeze frame technologies include a range of features; analog, digital, monochrome or color pictures, resolutions, transmission speeds, and extra memory. Newer models provide multiple send times to select the resolution and transmission time through digital circuits and compression coding. Some units transmit video information in digital format over a data circuit which reduces the transmission time to about nine seconds to a 56 kilobit link. Because of the faster transmission rates, many new freeze frame applications use data circuits.

Compressed video (near motion) and full-motion video differ; compressed video uses compression techniques to reduce channel bandwidth; images may not look as natural and may

blur or lose background resolution. The advantage is that the significant reduction in bandwidth reduces costs. Compressed video uses a telephone data circuit - currently a T1 carrier or 1.5 or 3 megabits - to transmit video, voice and data. It reduces video information (NTSC Standard-color video) with a compression technique to eliminate redundant information and reduce the 100 million bits signal to 1.5 or 3 million bits.

Digital video signals are broken down into thousands of elements called pixels. Between frames, many are the same. A codec takes advantage of this duplication by sending complete information on the first pixel and a brief code to repeat the values. This reduces the information sent and the bandwidth required. Interframe coding for conditional replenishment compares the changes between two frames and transmits changes. Motion compensation predicts changes between frames and transmits only the difference. Software holds the compression algorithm which can be upgraded. The CCITT Px64 international standard requires rates to operate in multiples of 64.

WWW Architecture

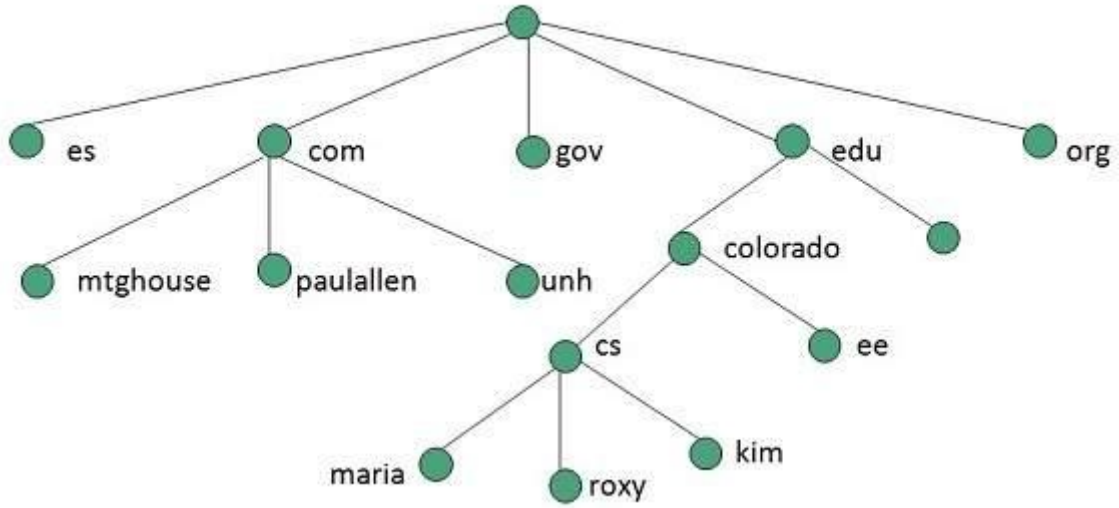
WWW stands for **World Wide Web.** A technical definition of the World Wide Web is : all the resources and users on the Internet that are using the Hypertext Transfer Protocol (HTTP).

A broader definition comes from the organization that Web inventor **Tim Berners-Lee** helped found, the **World Wide Web Consortium (W3C).**

The World Wide Web is the universe of network-accessible information, an embodiment of human knowledge.

In simple terms, The World Wide Web is a way of exchanging information between computers on the Internet, tying them together into a vast collection of interactive multimedia resources.

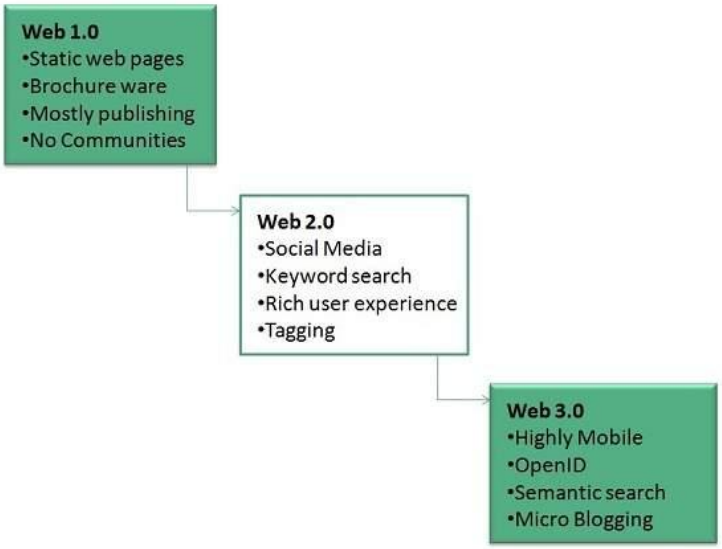
Internet and **Web** is not the same thing: Web uses internet to pass over the information.



Evolution

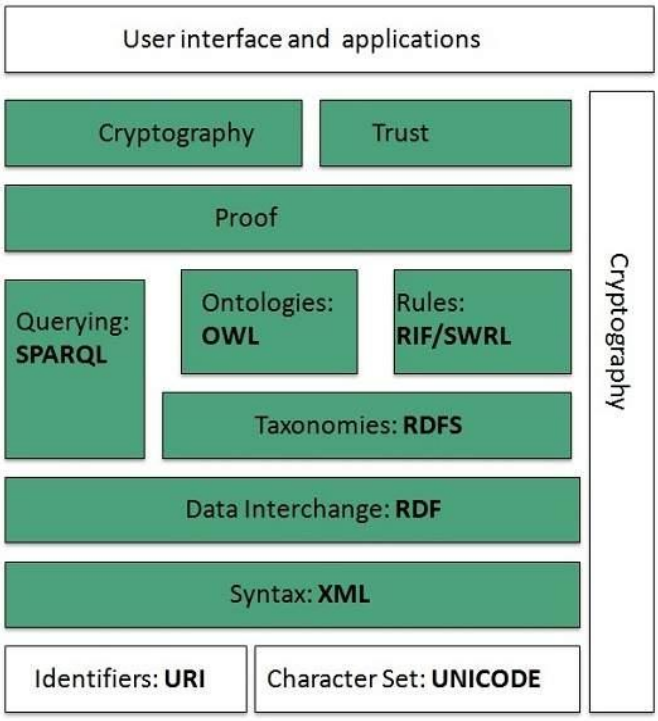
World Wide Web was created by **Timothy Berners Lee** in 1989 at **CERN** in **Geneva.** World Wide Web came into existence as a proposal by him, to allow researchers to work together effectively and efficiently at **CERN.** Eventually it became **World Wide Web.**

The following diagram briefly defines evolution of World Wide Web:



WWW Architecture

WWW architecture is divided into several layers as shown in the following diagram:



Identifiers and Character Set

Uniform Resource Identifier (URI) is used to uniquely identify resources on the web and **UNICODE** makes it possible to built web pages that can be read and write in human languages.

Syntax

XML (Extensible Markup Language) helps to define common syntax in semantic web.

Data Interchange

Resource Description Framework (RDF) framework helps in defining core representation of data for web. RDF represents data about resource in graph form.

Taxonomies

RDF Schema (RDFS) allows more standardized description of **taxonomies**and other **ontological** constructs.

Ontologies

Web Ontology Language (OWL) offers more constructs over RDFS. It comes in following three versions:

- OWL Lite for taxonomies and simple constraints.
- OWL DL for full description logic support.
- OWL for more syntactic freedom of RDF

Rules

RIF and **SWRL** offers rules beyond the constructs that are available from **RDFs** and **OWL.** Simple Protocol and **RDF Query Language (SPARQL)** is SQL like language used for querying RDF data and OWL Ontologies.

Proof

All semantic and rules that are executed at layers below Proof and their result will be used to prove deductions.

Cryptography

Cryptography means such as digital signature for verification of the origin of sources is used.

User Interface and Applications

On the top of layer **User interface and Applications** layer is built for user interaction.

WWW Operation

WWW works on client- server approach. Following steps explains how the web works:

1. User enters the URL (say, **http://www.tutorialspoint.com**) of the web page in the address bar of web browser.
2. Then browser requests the Domain Name Server for the IP address corresponding to www.tutorialspoint.com.
3. After receiving IP address, browser sends the request for web page to the web server using HTTP protocol which specifies the way the browser and web server communicates.
4. Then web server receives request using HTTP protocol and checks its search for the requested web page. If found it returns it back to the web browser and close the HTTP connection.
5. Now the web browser receives the web page, It interprets it and display the contents of web page in web browser's window.

Future

There had been a rapid development in field of web. It has its impact in almost every area such as education, research, technology, commerce, marketing etc. So the future of web is almost unpredictable.

Apart from huge development in field of WWW, there are also some technical issues that W3 consortium has to cope up with.

User Interface

Work on higher quality presentation of 3-D information is under deveopment. The W3 Consortium is also looking forward to enhance the web to full fill requirements of global communities which would include all regional languages and writing systems.

Technology

Work on privacy and security is under way. This would include hiding information, accounting, access control, integrity and risk management.

Architecture

There has been huge growth in field of web which may lead to overload the internet and degrade its performance. Hence more better protocol are required to be developed.

Full-Motion Video

Standard TV signals are broadcast using a significant amount of the bandwidth of wideband channels - 4 to 6 megahertz for color analog - to send video, voice and data. Because of the large channel capacity, it transmits a picture with the full motion and resolution of broadcast TV. The bandwidth used is the digital equivalent of 80 Mbps or more which corresponds to a full satellite transponder or 1820 voice phone lines. This translates into high costs for signal transmission.

Compression for One-Way Video

Consumer application for compressed video systems use higher rates than two-way compressed video to achieve near-broadcast quality video image. A digitally compressed video signal can be broadcast over 1/20 of a regular transponder channel reducing costs to under $200 per hour.

One use of the technology is SKY PIX, a pay per view movie service based on a Compression Labs, Inc. codec marketed by NW Star Scan which offers viewers a choice of up to 40 movies. The picture quality is better than VHS transmission quality. Scientific Atlanta offers PrimeStar, a competing entertainment service, which transmits at a data rate of 4 to 4.5 Mbs. Using the same technology, they will offer B-Mac users compatibility with compressed video users at a lower price because the transmission uses a fraction of a regular transponder channel.

Compression Labs, Inc. has recently introduced the SpectrumSaver System which can broadcast a digital signal to a fraction of a satellite transponder. Because up to 15 or 18 signals can be carried on a transponder (depending upon the system configuration), the cost of satellite time is significantly reduced. The National Technological University (NTU) is using the system, as well

as ITESM in Mexico. Each institution reports a savings of $1 million in satellite time during the first year of operation. The system is entirely digital.

Scientific Atlanta is about to bring its new digital satellite system to the market. This system is an upgrade to an existing Scientific Atlanta analog satellite system. As such, users will be able to broadcast in either analog or digital format.

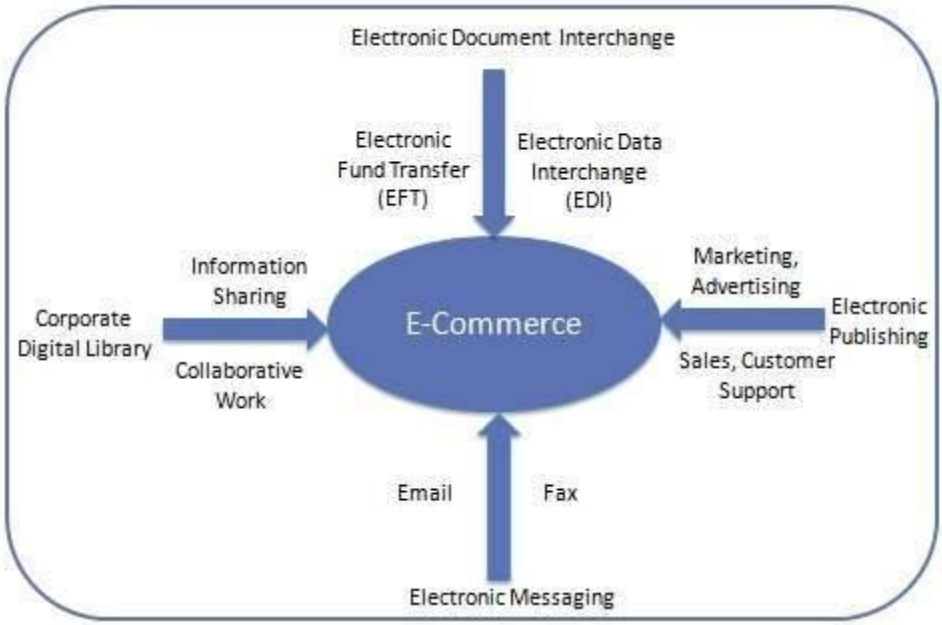
Fiber Optic Systems

The transmission of voice, video and data by light wave signals inside a thin, transparent glass fiber cable, is providing more choices for telecommunications users and is rapidly bringing digital communication to the home and office. One pair of fibers can carry up to 10,000 telephone calls simultaneously. Advantages: transmission clarity, speed, accuracy, security, and volume. Disadvantages: Construction, installation and maintenance costs, but they are declining.

E – Commerce

E-Commerce or Electronics Commerce is a methodology of modern business which addresses the need of business organizations, vendors and customers to reduce cost and improve the quality of goods and services while increasing the speed of delivery. E-commerce refers to paperless exchange of business information using following ways.

- Electronic Data Exchange (EDI)
- Electronic Mail (e-mail)
- Electronic Bulletin Boards
- Electronic Fund Transfer (EFT)
- Other Network-based technologies



Features

E-Commerce provides following features

- **Non-Cash Payment** − E-Commerce enables use of credit cards, debit cards, smart cards, electronic fund transfer via bank's website and other modes of electronics payment.
- **24x7 Service availability** − E-commerce automates business of enterprises and services provided by them to customers are available anytime, anywhere. Here 24x7 refers to 24 hours of each seven days of a week.
- **Advertising / Marketing** − E-commerce increases the reach of advertising of products and services of businesses. It helps in better marketing management of products / services.
- **Improved Sales** − Using E-Commerce, orders for the products can be generated any time, any where without any human intervention. By this way, dependencies to buy a product reduce at large and sales increases.
- **Support** − E-Commerce provides various ways to provide pre sales and post sales assistance to provide better services to customers.
- **Inventory Management** − Using E-Commerce, inventory management of products becomes automated. Reports get generated instantly when required. Product inventory management becomes very efficient and easy to maintain.
- **Communication improvement** − E-Commerce provides ways for faster, efficient, reliable communication with customers and partners.

Traditional Commerce v/s E-Commerce

Sr. No.	Traditional Commerce	E-Commerce
1	Heavy dependency on information exchange from person to person.	Information sharing is made easy via electronic communication channels making little dependency on person to person information exchange.
2	Communication/ transaction are done in synchronous way. Manual intervention is required for each communication or transaction.	Communication or transaction can be done in asynchronous way. Electronics system automatically handles when to pass communication to required person or do the transactions.
3	It is difficult to establish and maintain standard practices in traditional commerce.	A uniform strategy can be easily established and maintain in e-commerce.
4	Communications of business depends upon individual skills.	In e-Commerce or Electronic Market, there is no human intervention.
5	Unavailability of a uniform platform as traditional commerce depends heavily on personal communication.	E-Commerce website provides user a platform where al l information is available at one place.
6	No uniform platform for information sharing as it depends heavily on personal communication.	E-Commerce provides a universal platform to support commercial / business activities across the globe.

E-Commerce advantages can be broadly classified in three major categories:

- Advantages to Organizations
- Advantages to Consumers
- Advantages to Society

Advantages to Organizations

- Using E-Commerce, organization can expand their market to national and international markets with minimum capital investment. An organization can easily locate more customers, best suppliers and suitable business partners across the globe.
- E-Commerce helps organization to reduce the cost to create process, distribute, retrieve and manage the paper based information by digitizing the information.
- E-commerce improves the brand image of the company.
- E-commerce helps organization to provide better customer services.
- E-Commerce helps to simplify the business processes and make them faster and efficient.
- E-Commerce reduces paper work a lot.
- E-Commerce increased the productivity of the organization. It supports "pull" type supply management. In "pull" type supply management, a business process starts when a request comes from a customer and it uses just-in-time manufacturing way.

Advantages to Customers

- 24x7 support. Customer can do transactions for the product or enquiry about any product/services provided by a company any time, any where from any location. Here 24x7 refers to 24 hours of each seven days of a week.
- E-Commerce application provides user more options and quicker delivery of products.
- E-Commerce application provides user more options to compare and select the cheaper and better option.
- A customer can put review comments about a product and can see what others are buying or see the review comments of other customers before making a final buy.
- E-Commerce provides option of virtual auctions.
- Readily available information. A customer can see the relevant detailed information within seconds rather than waiting for days or weeks.
- E-Commerce increases competition among the organizations and as result organizations provides substantial discounts to customers.

Advantages to Society

- Customers need not to travel to shop a product thus less traffic on road and low air pollution.
- E-Commerce helps reducing cost of products so less affluent people can also afford the products.
- E-Commerce has enabled access to services and products to rural areas as well which are otherwise not available to them.

- E-Commerce helps government to deliver public services like health care, education, social services at reduced cost and in improved way.

E-Commerce disadvantages can be broadly classified in two major categories:

- Technical disadvantages
- Non-Technical disadvantages

Technical Disadvantages

- There can be lack of system security, reliability or standards owing to poor implementation of e-Commerce.
- Software development industry is still evolving and keeps changing rapidly.
- In many countries, network bandwidth might cause an issue as there is insufficient telecommunication bandwidth available.
- Special types of web server or other software might be required by the vendor setting the e-commerce environment apart from network servers.
- Sometimes, it becomes difficult to integrate E-Commerce software or website with the existing application or databases.
- There could be software/hardware compatibility issue as some E-Commerce software may be incompatible with some operating system or any other component.

Non-Technical Disadvantages

- Initial cost: The cost of creating / building E-Commerce application in-house may be very high. There could be delay in launching the E-Commerce application due to mistakes, lack of experience.
- User resistance: User may not trust the site being unknown faceless seller. Such mistrust makes it difficult to make user switch from physical stores to online/virtual stores.
- Security/ Privacy: Difficult to ensure security or privacy on online transactions.
- Lack of touch or feel of products during online shopping.
- E-Commerce applications are still evolving and changing rapidly.
- Internet access is still not cheaper and is inconvenient to use for many potential customers like one living in remote villages.

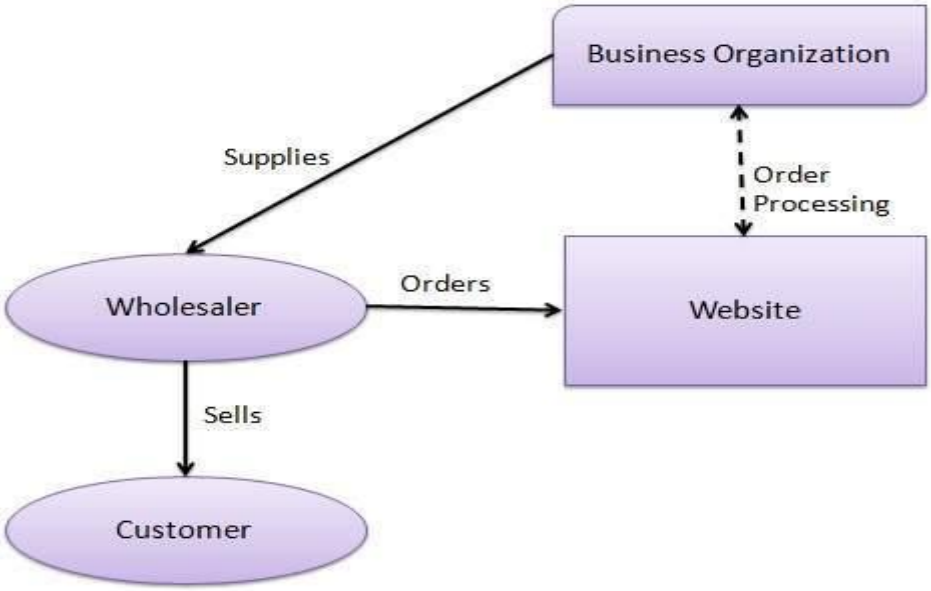
E-Commerce or Electronics Commerce business models can generally categorized in following categories.

- Business - to - Business (B2B)
- Business - to - Consumer (B2C)
- Consumer - to - Consumer (C2C)
- Consumer - to - Business (C2B)
- Business - to - Government (B2G)

- Government - to - Business (G2B)
- Government - to - Citizen (G2C)

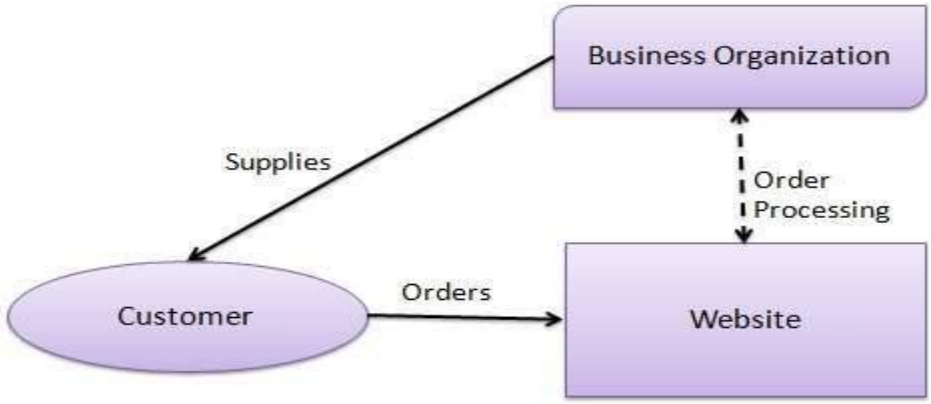
Business - to - Business (B2B)

Website following B2B business model sells its product to an intermediate buyer who then sells the product to the final customer. As an example, a wholesaler places an order from a company's website and after receiving the consignment, sells the end product to final customer who comes to buy the product at wholesaler's retail outlet.



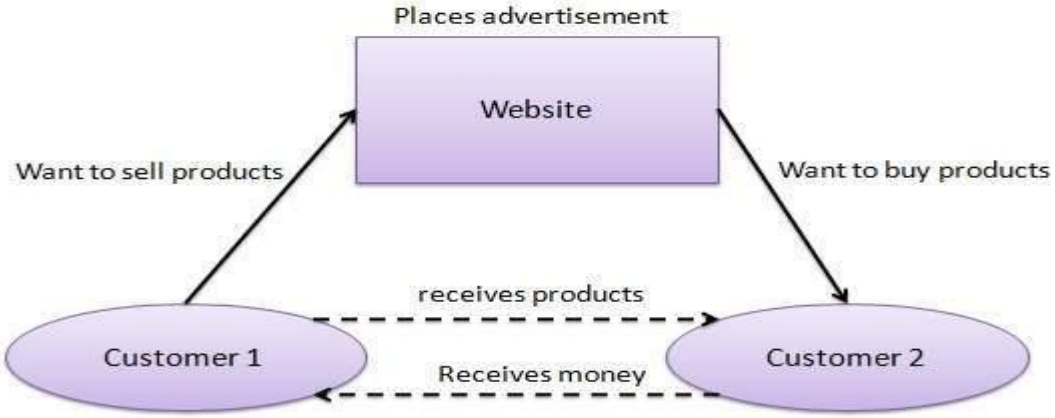
Business - to - Consumer(B2C)

Website following B2C business model sells its product directly to a customer. A customer can view products shown on the website of business organization. The customer can choose a product and order the same. Website will send a notification to the business organization via email and organization will dispatch the product/goods to the customer.



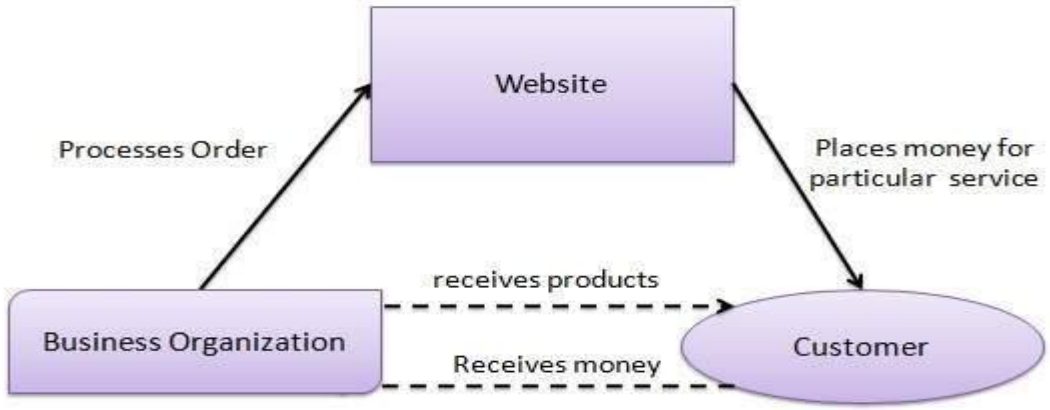
Consumer - to - Consumer (C2C)

Website following C2C business model helps consumer to sell their assets like residential property, cars, motorcycles etc. or rent a room by publishing their information on the website. Website may or may not charge the consumer for its services. Another consumer may opt to buy the product of the first customer by viewing the post/advertisement on the website.



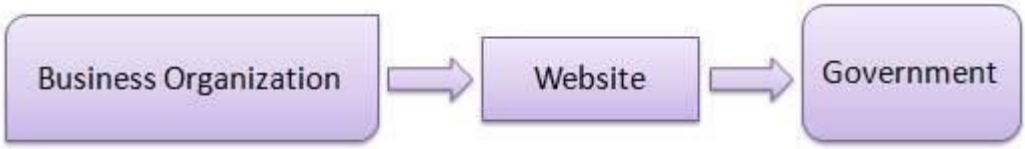
Consumer - to - Business (C2B)

In this model, a consumer approaches website showing multiple business organizations for a particular service. Consumer places an estimate of amount he/she wants to spend for a particular service. For example, comparison of interest rates of personal loan/ car loan provided by various banks via website. Business organization who fulfills the consumer's requirement within specified budget approaches the customer and provides its services.



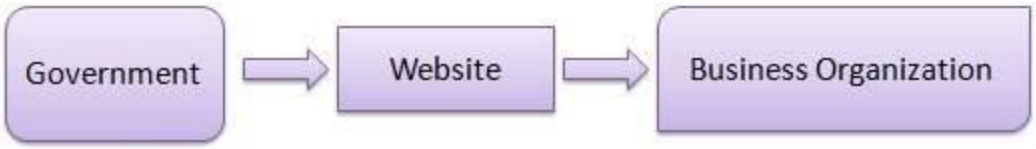
Business - to - Government (B2G)

B2G model is a variant of B2B model. Such websites are used by government to trade and exchange information with various business organizations. Such websites are accredited by the government and provide a medium to businesses to submit application forms to the government.



Government - to - Business (G2B)

Government uses B2G model website to approach business organizations. Such websites support auctions, tenders and application submission functionalities.



Government - to - Citizen (G2C)

Government uses G2C model website to approach citizen in general. Such websites support auctions of vehicles, machinery or any other material. Such website also provides services like registration for birth, marriage or death certificates. Main objectives of G2C website are to reduce average time for fulfilling people requests for various government services.

E-Commerce - Payment Systems

E-Commerce or Electronics Commerce sites use electronic payment where electronic payment refers to paperless monetary transactions. Electronic payment has revolutionized the business processing by reducing paper work, transaction costs, labour cost. Being user friendly and less time consuming than manual processing, helps business organization to expand its market reach / expansion. Some of the modes of electronic payments are following.

- Credit Card
- Debit Card
- Smart Card
- E-Money
- Electronic Fund Transfer (EFT)

Credit Card

Payment using credit card is one of most common mode of electronic payment. Credit card is small plastic card with a unique number attached with an account. It has also a magnetic strip embedded in it which is used to read credit card via card readers. When a customer purchases a product via credit card, credit card issuer bank pays on behalf of the customer and customer has a certain time period after which he/she can pay the credit card bill. It is usually credit card monthly payment cycle. Following are the actors in the credit card system.

- The card holder - Customer
- The merchant - seller of product who can accept credit card payments.
- The card issuer bank - card holder's bank
- The acquirer bank - the merchant's bank
- The card brand - for example , visa or mastercard.

Credit card payment process

Step	Description
Step 1	Bank issues and activates a credit card to customer on his/her request.
Step 2	Customer presents credit card information to merchant site or to merchant from whom he/she want to purchase a product/service.
Step 3	Merchant validates customer's identity by asking for approval from card brand company.
Step 4	Card brand company authenticates the credit card and paid the

	transaction by credit. Merchant keeps the sales slip.
Step 5	Merchant submits the sales slip to acquirer banks and gets the service chargers paid to him/her.
Step 6	Acquirer bank requests the card brand company to clear the credit amount and gets the payment.
Step 6	Now card brand company asks to clear amount from the issuer bank and amount gets transferred to card brand company.

Debit Card

Debit card, like credit card is a small plastic card with a unique number mapped with the bank account number. It is required to have a bank account before getting a debit card from the bank. The major difference between debit card and credit card is that in case of payment through debit card, amount gets deducted from card's bank account immidiately and there should be sufficient balance in bank account for the transaction to get completed. Whereas in case of credit card there is no such compulsion.

Debit cards free customer to carry cash, cheques and even merchants accepts debit card more readily. Having restriction on amount being in bank account also helps customer to keep a check on his/her spendings.

Smart Card

Smart card is again similar to credit card and debit card in apperance but it has a small microprocessor chip embedded in it. It has the capacity to store customer work related/personal information. Smart card is also used to store money which is reduced as per usage.

Smart card can be accessed only using a PIN of customer. Smart cards are secure as they stores information in encrypted format and are less expensive/provides faster processing.Mondex and Visa Cash cards are examples of smart cards.

E-Money

E-Money transactions refers to situation where payment is done over the network and amount gets transferred from one financial body to another financial body without any involvement of a middleman. E-money transactions are faster, convenient and saves a lot of time.

Online payments done via credit card, debit card or smart card are examples of e-money transactions. Another popular example is e-cash. In case of e-cash, both customer and merchant both have to sign up with the bank or company issuing e-cash.

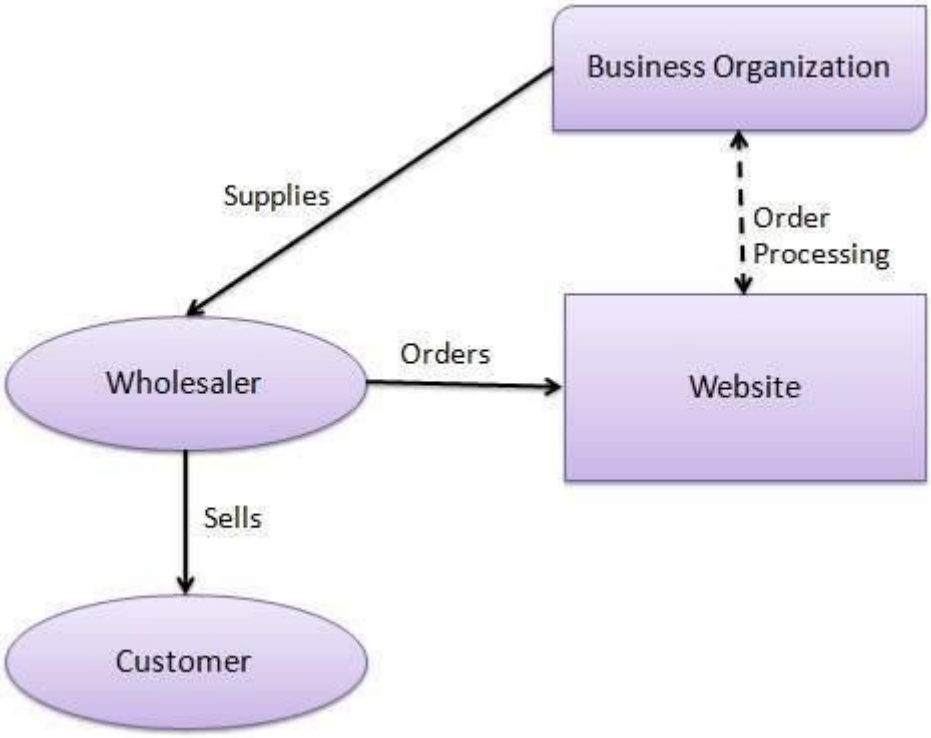
Electronic Fund Transfer

It is a very popular electronic payment method to transfer money from one bank account to another bank account. Accounts can be in same bank or different bank. Fund transfer can be done using ATM (Automated Teller Machine) or using computer.

Now a day, internet based EFT is getting popularity. In this case, customer uses website provided by the bank. Customer logins to the bank's website and registers another bank account. He/she then places a request to transfer certain amount to that account. Customer's bank transfers amount to other account if it is in same bank otherwise transfer request is forwarded to ACH (Automated Clearing House) to transfer amount to other account and amount is deducted from customer's account. Once amount is transferred to other account, customer is notified of the fund transfer by the bank.

E-Commerce - B2B Model

Website following B2B business model sells its product to an intermediate buyer who then sells the product to the final customer. As an example, a wholesaler places an order from a company's website and after receiving the consignment, sells the end product to final customer who comes to buy the product at wholesaler's retail outlet.



B2B implies that seller as well as buyer is business entity. B2B covers large number of applications which enables business to form relationships with their distributors, resellers, suppliers etc. Following are the leading items in B2B e-Commerce.

- Electronics
- Shipping and Warehousing
- Motor Vehicles
- Petrochemicals
- Paper
- Office products
- Food
- Agriculture

Key technologies

Following are the key technologies used in B2B e-commerce −

- **Electronic Data Interchange (EDI)** − EDI is an inter organizational exchange of business documents in a structured and machine processable format.
- **Internet** − Internet represents world wide web or network of networks connecting computers across the world.
- **Intranet**
  − Intranet represents a dedicated network of computers within a single organization
- **Extranet** − Extranet represents a network where outside business partners, supplier or customers can have limited access to a portion of enterprise intranet/network.
- **Back-End Information System Integration** − Back End information systems are database management systems used to manage the business data.

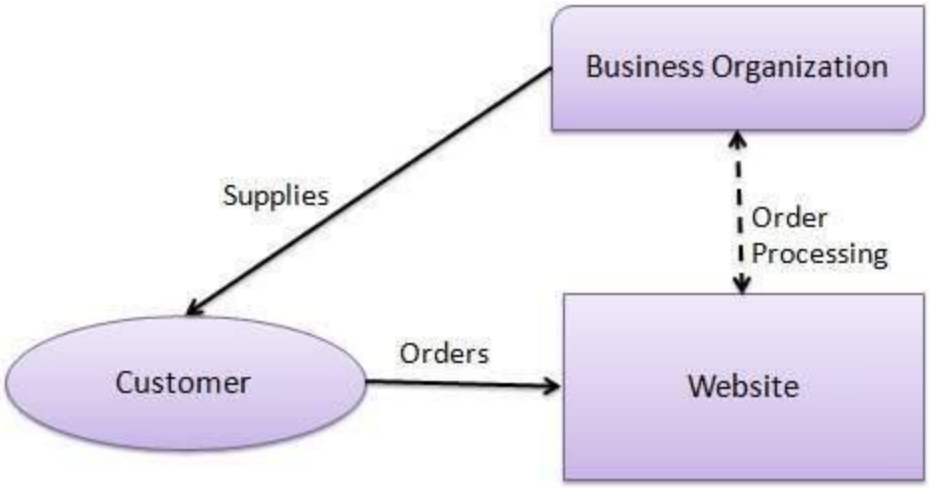
Architectural Models

Following are the architectural models in B2B e-commerce −

- **Supplier Oriented marketplace** − In this type of model, a common marketplace provided by supplier is used by both individual customers as well as business users. A supplier offers an e-stores for sales promotion.
- **Buyer Oriented marketplace** − In this type of model, buyer has his/her own market place or e-market. He invites suppliers to bid on product's catalog. A Buyer company opens a bidding site.
- **Intermediary Oriented marketplace** − In this type of model, an intermediary company runs a market place where business buyers and sellers can transact with each other.

E-Commerce - B2C Model

In B2C model, business Website is a place where all transactions take place between a business organization and consumer directly.



In B2C Model, a consumer goes to the website, selects a catalog, orders the catalog and an email is sent to business organization. After receiving the order, goods would be dispatched to the customer. Following are the key features of a B2C Model

- Heavy advertising required to attract large no. of customers.
- High investment in terms of hardware/software.
- Support or good customer care service

Consumer Shopping Procedure

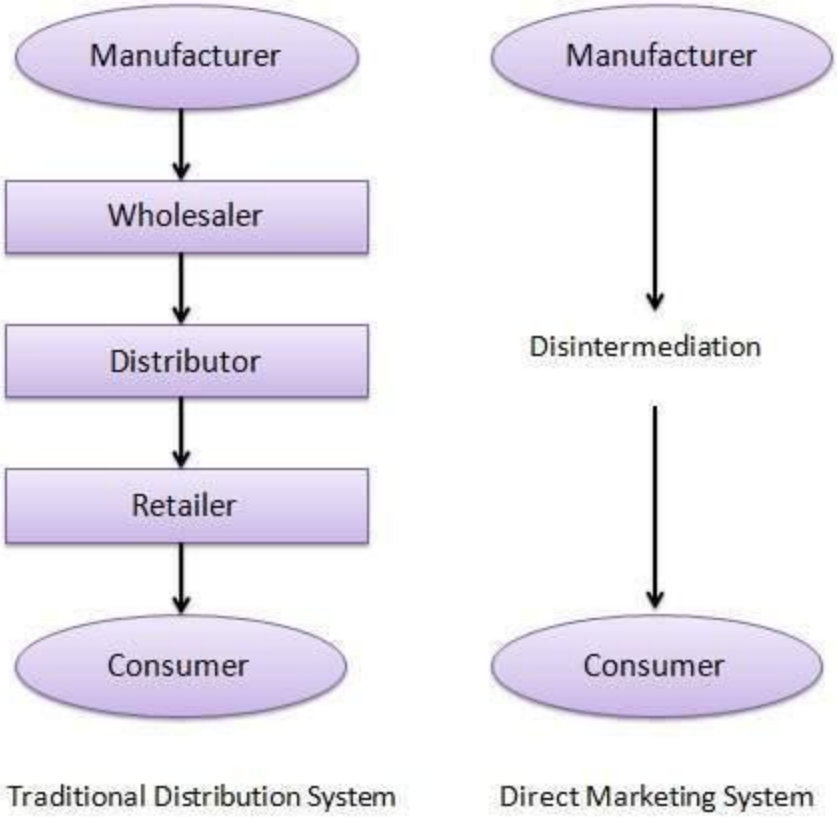
Following are the steps used in B2C e-commerce −

A consumer

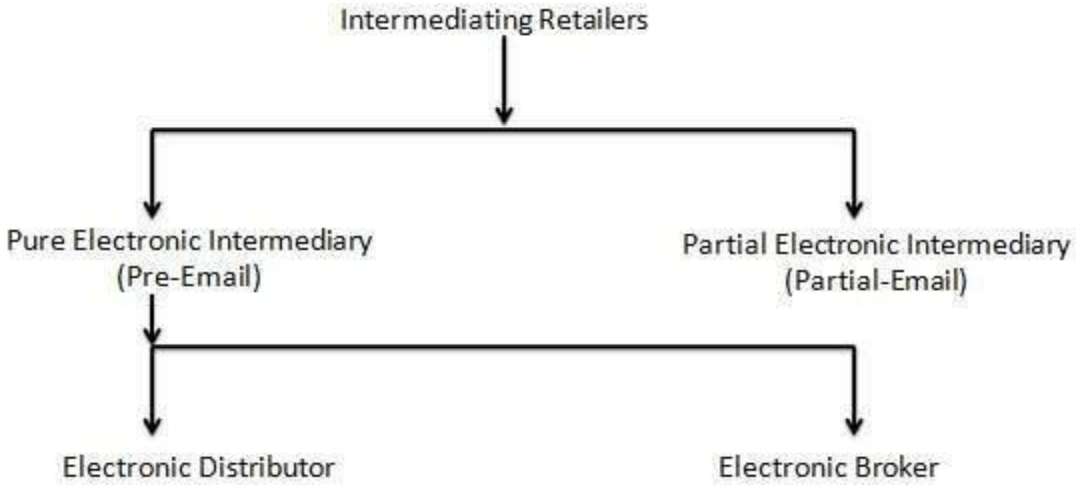
- determines the requirement.
- searches available items on the website meeting the requirment.
- compares similar items for price, delivery date or any other terms.
- gives the order.
- pays the bill.
- receives the delivered item and review/inspect them.
- consults the vendor to get after service support or returns the product if not satisfied with the delivered product.

Disintermediation and Reintermediation

In traditional commerce, there are intermediating agents like wholesalers, distributors, retailers between manufacturer and consumer. In B2C website, manufacturer can sell products directly to consumers. This process of removal of business layers responsible for intermediary functions is called Disintermediation.

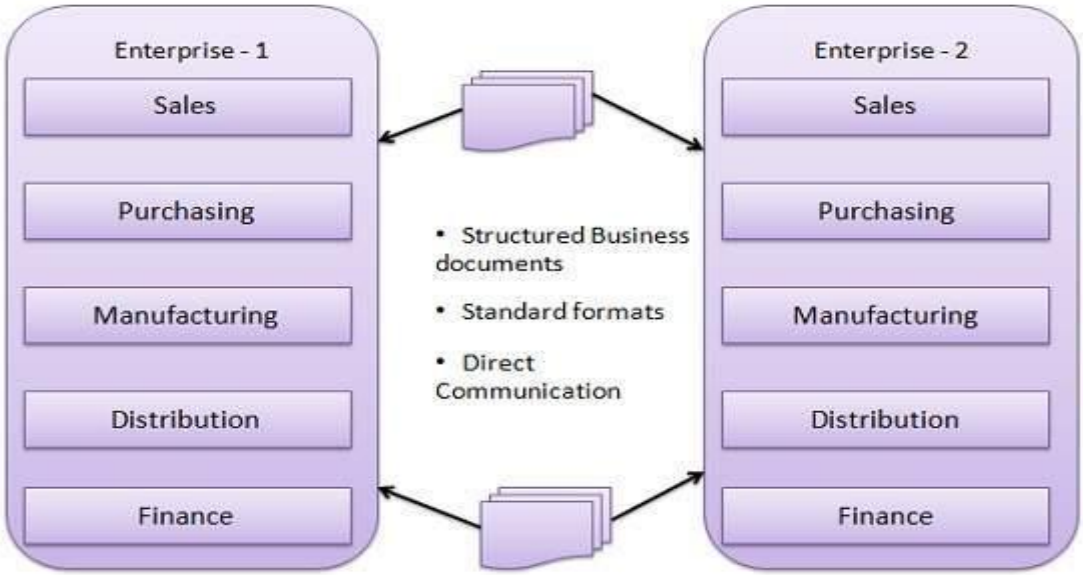


Now-a-days, a new electronic intermediary breed is emerging like e-mall and product selection agents are emerging. This process of shifting of business layers responsible for intermediary functions from traditional to electronic mediums is called Reintermediation.



E-Commerce - EDI

EDI stands for Electronic Data Interchange. EDI is an electronic way of transferring business documents in an organization internally between its various departments or externally with suppliers, customers or any subsidiaries etc. In EDI, paper documents are replaced with electronic documents like word documents, spreadsheets etc.



EDI Documents

Following are few important documents used in EDI −

- Invoices
- Purchase orders
- Shipping Requests
- Acknowledgement
- Business Correspondence letters
- Financial information letters

Steps in an EDI System

Following are the steps in an EDI System.

- A program generates the file which contains the processed document.
- The document is converted into an agreed standard format.
- The file containing the document is send electronically on network.
- The trading partner receives the file.
- An acknowledgement document is generated and sent to the originating organization.

Advantages of an EDI System

Following are the advantages of an EDI System.

- **Reduction in data entry errors.** − Chances of errors are much less being use of computer in data entry.
- **Shorter processing life cycle** − As orders can be processed as soon as they are entered into the system. This reduced the processing time of the transfer documents.
- **Electronic form of data** − It is quite easy to transfer or share data being in electronic format.
- **Reduction in paperwork** − As lot of paper documents are replaced with electronic documents there is huge reduction in paperwork.
- **Cost Effective** − As time is saved and orders are processed very effectively, EDI proves to be higly cost effective.
- **Standard Means of communication** − EDI enforces standards on the content of data and its format which leads to clearer communication.

Enterprise Resource Planning (ERP)

Introduction

In any industry, some of the demands managers face is to be cost effective. In addition to that, they are also faced with challenges such as to analyze costs and profits on a product or consumer basis, to be flexible to face ever altering business requirements, and to be informed of management decision making processes and changes in ways of doing business.

However, some of the challenges holding managers back include the difficulty in attaining accurate information, lack of applications that mimic existing business practices and bad interfaces. When some challengers are holding a manager back, that is where Enterprise Resource Planning (ERP) comes into play.

Over the years business applications have evolved from Management Information Systems with no decision support to Corporate Information Systems, which offer some decision support to Enterprise Resource Planning. Enterprise Resource Planning is a software solution that tackles the needs of an organization, taking into account the process view to meet an organization's goals while incorporating all the functions of an organization.

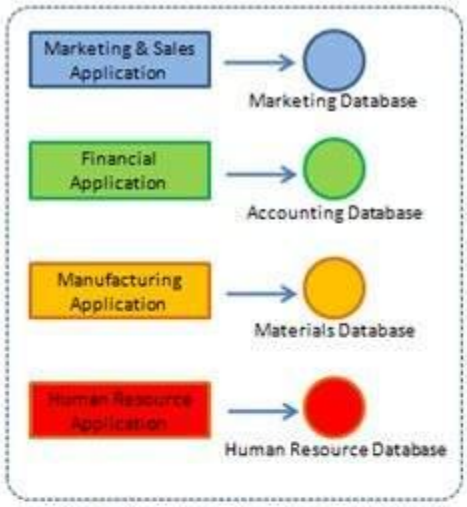
Its purpose is to make easy the information flow between all business functions within the boundaries of the organization and manage the organization's connections with its outside stakeholders.

In a nutshell, the Enterprise Resource Planning software tries to integrate all the different departments and functions of an organization into a single computer system to serve the various needs of these departments.

The task at hand, of implementing one software program that looks after the needs of the Finance Department together with the needs of the Human Resource Department and the Warehouse, seems impossible. These different departments usually have an individual software program that is optimized in the way each department works.

However, if installed correctly this integrated approach can be very cost effective for an organization. With an integrated solution, different departments can easily share information and communicate with one another.

The following diagram illustrates the differences between non-integrated systems versus an integrated system for enterprise resource planning.



Non-integrated System

Integrated System

The Driving Force behind ERP

There are two main driving forces behind Enterprise Resource Planning for a business organization.

- In a business sense, Enterprise Resource Planning ensures customer satisfaction, as it leads to business development that is development of new areas, new products and new services.

Also, it allows businesses to face competition for implementing Enterprise Resource Planning, and it ensures efficient processes that push the company into top gear.

- In an IT sense: Most softwares does not meet business needs wholly and the legacy systems today are hard to maintain. In addition, outdated hardware and software is hard to maintain.

Hence, for the above reasons, Enterprise Resource Planning is necessary for management in today's business world. ERP is single software, which tackles problems such as material shortages, customer service, finances management, quality issues and inventory problems. An ERP system can be the dashboard of the modern era managers.

Implementing ERP System

Producing Enterprise Resource Planning (ERP) software is complex and also has many significant implications for staff work practice. Implementing the software is a difficult task too and one that 'in-house' IT specialists cannot handle. Hence to implement ERP software, organizations hire third party consulting companies or an ERP vendor.

This is the most cost effective way. The time taken to implement an ERP system depends on the size of the business, the number of departments involved, the degree of customization involved, the magnitude of the change and the cooperation of customers to the project.

Advantages of ERP System

- With Enterprise Resource Planning (ERP) software, accurate forecasting can be done. When accurate forecasting inventory levels are kept at maximum efficiency, this allows for the organization to be profitable.
- Integration of the various departments ensures communication, productivity and efficiency.
- Adopting ERP software eradicates the problem of coordinating changes between many systems.
- ERP software provides a top-down view of an organization, so information is available to make decisions at anytime, anywhere.

Disadvantages of ERP System

- Adopting ERP systems can be expensive.
- The lack of boundaries created by ERP software in a company can cause problems of who takes the blame, lines of responsibility and employee morale.

Conclusion

While employing an ERP system may be expensive, it offers organizations a cost efficient system in the long run.

ERP software works by integrating all the different departments in on organization into one computer system allowing for efficient communication between these departments and hence enhances productivity.

The organizations should take extra precautions when it comes to choosing the correct ERP system for them. There have been many cases that organizations have lost a lot of money due to selecting the 'wrong' ERP solution and a service provider for them.

Information Technology Act, 2000

the Government of India enacted the Information Technology (I.T.) Act with some major objectives to deliver and facilitate lawful electronic, digital, and online transactions, and mitigate cyber-crimes.

Salient Features of I.T Act

The salient features of the I.T Act are as follows −

- Digital signature has been replaced with electronic signature to make it a more technology neutral act.
- It elaborates on offenses, penalties, and breaches.
- It outlines the Justice Dispensation Systems for cyber-crimes.
- It defines in a new section that cyber café is any facility from where the access to the internet is offered by any person in the ordinary course of business to the members of the public.
- It provides for the constitution of the Cyber Regulations Advisory Committee.
- It is based on The Indian Penal Code, 1860, The Indian Evidence Act, 1872, The Bankers' Books Evidence Act, 1891, The Reserve Bank of India Act, 1934, etc.
- It adds a provision to Section 81, which states that the provisions of the Act shall have overriding effect. The provision states that nothing contained in the Act shall restrict any person from exercising any right conferred under the Copyright Act, 1957.

Scheme of I.T Act

The following points define the scheme of the I.T. Act −

- The I.T. Act contains **13 chapters** and **90 sections**.
- The last four sections namely sections 91 to 94 in the I.T. Act 2000 deals with the amendments to the Indian Penal Code 1860, The Indian Evidence Act 1872, The Bankers' Books Evidence Act 1891 and the Reserve Bank of India Act 1934 were deleted.

- It commences with Preliminary aspect in Chapter 1, which deals with the short, title, extent, commencement and application of the Act in Section 1. Section 2 provides Definition.
- Chapter 2 deals with the authentication of electronic records, digital signatures, electronic signatures, etc.
- Chapter 11 deals with offences and penalties. A series of offences have been provided along with punishment in this part of The Act.
- Thereafter the provisions about due diligence, role of intermediaries and some miscellaneous provisions are been stated.
- The Act is embedded with two schedules. The First Schedule deals with Documents or Transactions to which the Act shall not apply. The Second Schedule deals with electronic signature or electronic authentication technique and procedure. The Third and Fourth Schedule are omitted.

Application of the I.T Act

As per the sub clause (4) of Section 1, nothing in this Act shall apply to documents or transactions specified in First Schedule. Following are the documents or transactions to which the Act shall not apply −

- **Negotiable Instrument** (Other than a cheque) as defined in section 13 of the Negotiable Instruments Act, 1881;
- A **power-of-attorney** as defined in section 1A of the Powers-of-Attorney Act, 1882;
- A **trust** as defined in section 3 of the Indian Trusts Act, 1882;
- A **will** as defined in clause (h) of section 2 of the Indian Succession Act, 1925 including any other testamentary disposition;
- Any **contract** for the sale or conveyance of immovable property or any interest in such property;
- Any such class of documents or transactions as may be notified by the Central Government.

Amendments Brought in the I.T Act

The I.T. Act has brought amendment in four statutes vide section 91-94. These changes have been provided in schedule 1-4.

- The first schedule contains the amendments in the Penal Code. It has widened the scope of the term "document" to bring within its ambit electronic documents.
- The second schedule deals with amendments to the India Evidence Act. It pertains to the inclusion of electronic document in the definition of evidence.

- The third schedule amends the Banker's Books Evidence Act. This amendment brings about change in the definition of "Banker's-book". It includes printouts of data stored in a floppy, disc, tape or any other form of electromagnetic data storage device. Similar change has been brought about in the expression "Certified-copy" to include such printouts within its purview.
- The fourth schedule amends the Reserve Bank of India Act. It pertains to the regulation of fund transfer through electronic means between the banks or between the banks and other financial institution.

Intermediary Liability

Intermediary, dealing with any specific electronic records, is a person who on behalf of another person accepts, stores or transmits that record or provides any service with respect to that record.

According to the above mentioned definition, it includes the following −

- Telecom service providers
- Network service providers
- Internet service providers
- Web-hosting service providers
- Search engines
- Online payment sites
- Online auction sites
- Online market places and cyber cafes

Highlights of the Amended Act

The newly amended act came with following highlights −

- It stresses on privacy issues and highlights information security.
- It elaborates Digital Signature.
- It clarifies rational security practices for corporate.
- It focuses on the role of Intermediaries.
- New faces of Cyber Crime were added.

POSSIBLE QUESTION

PART – A (TWO MARK)

1. What is meant by internet?
2. Expand and explain MICR.
3. What is meant by intranet?
4. List out the transaction types of e – commerce.
5. Define ERP.

PART - B (SIX MARK)

1. Discuss the benefits and trade – offs of several e – commerce alternatives.
2. Give an outline about IT Act 2000.
3. How can intranet technologies be involved in improving a process in one of the functions of a business.
4. Describe the ERP applications in business.
5. Discuss the importance of telecommunication.
6. Give examples of how internet and other information technology support business processed.
7. Write short notes on i) www. Architecture ii) Teleconferencing iii) B2B
8. Describe the various applications of EDI in modern business.
9. Discuss the major categories and trends of e – commerce applications.
10. Critically evaluate the electronic payment of cash.

Reg. No.....

\13CCU602\

KARPAGAM UNIVERSITY

Karpagam Academy of Higher Education
(Established Under Section 3 of UGC Act 1956)
COIMBATORE – 641 021
(For the candidates admitted from 2013 onwards)

B.Com., DEGREE EXAMINATION, APRIL 2017

Sixth Semester

COMMERCE (COMPUTER APPLICATIONS)

MANAGEMENT INFORMATION SYSTEM

Time: 3 hours Maximum : 60 marks

PART – A (20 x 1 = 20 Marks) (30 Minutes)
Answer ALL the Questions

1. The system concept should be an _____ oriented.
   a. Group b. Mass c. Individual d. Group oriented.

2. MIS is also known as _____
   a. The Information service b. The Information and Decision
   c. The computer-based information system d. The information receiver.

3. A system is called _____ if it has an interaction with the environment.
   a. Open b. Closed c. Isolated d. natural

4. _____ is the meaningful which is derived from the data.
   a. Information b. datum c. variable d. system.

5. _____ is the group of interrelated components accepting inputs and outputs.
   a. Information b. Data c. system d. elements

6. _____ is an example for the input device.
   a. Monitor b. video display. c. Scanner d. printer

7. _____ is the instruction or program that used to execute the output.
   a. Software b. Hardware c. Storage d. Register.

8. _____ is an example for the output device.
   a .Monitor b. Keyboard c. Scanner d. Web cam.

9. _____ example for the manufactured system.
   a. Solar system b. Water system c. Transportation system.
   d. nature system

10. _____ and _____ are the data processing method in transaction processing system.
    a. Batch & Real time Processing b. Real time & order processing
    c. Batch & order processing d. Order & real time processing

11. _____ is a integrated user machine system.
    a. Management Information system b. Management data system
    c. Management decision system d. Management support decision.

12. A "What if" approach that uses an information system to assist management in formulating policies is called _____
    a. DSS b. EDI c.AI d. TPS

13. MIS supports a Manager in his _____ responsibilities
    a. Operational b. Functional c. Personal d. official.

14. _____ management systems seek to create, capture, store and disseminate firm expertise and knowledge.
    a. Knowledge b. Enterprise c. Supply chain Management d. Office.

15. Third objective of the application development system is_____
    a. Query b. Analysis c. Control d. Accounting

16. Among the following modules of ERP, pick out the business module_____
    a. Accounting b. Planning c. Purchase d. Forecasting

17. Organizations are taking advantage of the connectivity and use of internet technology to create internal corporate network called _____
    a. Intranets b. Internet c. Extranet d. Network.

18. In which network topology the terminals are connected through one cable?
    a. Star Topology b. BUS c. Ring Top d. Star, Bus &Ring top

19. _____ is a specialist whose main basic are to protect and manage database.
    a. DBA b. Software engineer c. Test engineer d. Analysis engineer

20. In which Network Topology the communication are routed through the central system known as server?
    a. Star Topology b. BUS c. Ring top d. LAN

PART B (5 x 8 = 40 Marks) (2 ½ Hours)
Answer ALL the Questions

21. a. Discuss the different types of information system.

(Or)

b. Define MIS. Discuss its Model.

22. a. Describe the different types of Input & Output devices.

(Or)

b. What is mean by software? Discuss Application software.

23. a. Define DSS. Explain the components of a DSS?

(Or)

b. What is Transaction Processing System? Explain the steps in processing the transaction.

24. a. What do you understand by ERP? Explain its main functions?

(Or)

b. Explain the role of information technology in enterprise modelling.

25. a. Explain some of the advantages of information system to an organisation.

(Or)

b. Describe the functional areas of Business .Explain with a neat sketch.

Time: 3

1. IP st
a. In

2. FTP
a. F
c. F

3. Me
a. (

4. Fo
a. I

5. Ch
a.

6. In
a.

7. W
a

8. T

Reg. No.....

[14CCU601]

KARPAGAM UNIVERSITY

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(Established Under Section 3 of UGC Act 1956)
COIMBATORE – 641 021
(For the candidates admitted from 2014 onwards)

B.Com., DEGREE EXAMINATION, APRIL 2017

Sixth Semester

COMMERCE (COMPUTER APPLICATIONS)

MANAGEMENT INFORMATION SYSTEM

Time: 3 hours Maximum : 60 marks

PART – A (20 x 1 = 20 Marks) (30 Minutes)
(Question Nos. 1 to 20 Online Examinations)

PART B (5 x 8 = 40 Marks) (2 ½ Hours)
Answer ALL the Questions

21. a) Write a note on classification of the Information System.
Or
b) Explain the Components of Management Information System

22. a) Explain Hardware Trends in detail.
Or
b) Explain the types of Software in Detail.

23. a) Explain Transaction Processing System.
Or
b) Write notes on Artificial Intelligence and Expert System.

24. a) Write a note on Image Processing.
Or
b) Explain about evolution and growth of ERP.

25. a) Write notes on Database and Database Management System.
Or
b) Describe Client / Server architecture with a neat diagram.

Reg. No.....

[13CCU602]

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COIMBATORE – 641 021
(For the candidates admitted from 2013 onwards)

B.Com., DEGREE EXAMINATION, APRIL 2016

Sixth Semester

COMMERCE (COMPUTER APPLICATIONS)

MANAGEMENT INFORMATION SYSTEM

Time: 3 hours Maximum : 60 marks

PART – A (20 x 1 = 20 Marks) (30 Minutes)
(Question Nos. 1 to 20 Online Examinations)

PART B (5 x 8 = 40 Marks) (2 ½ Hours)
Answer ALL the Questions

21. a. List the steps for designing and implementing an MIS.

Or

b. Define MIS and state its objectives.

22. a. Describe the various components of a computer system briefly.

Or

b. What are the various output devices of a computer system and discuss their functions.

23. a. What are the different types of decision support system ?

Or

b. What are the components of an expert system?

24. a. Discuss the process of implementation of ERP in an organisation.

Or

b. Discuss the various applications of office automation.

25. a. Describe the various components of Data Base Management system.

Or

b. Discuss the steps involved in business process re-engineering.

Reg. No.....

[07CCU26]

KARPAGAM ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

[AFFILIATED TO BHARATHIAR UNIVERSITY]

COIMBATORE – 641 021

(For the candidates admitted from 2007 onwards)

B.COM DEGREE EXAMINATION, APRIL 2010

SIXTH SEMESTER

COMMERCE (COMPUTER APPLICATIONS)

MANAGEMENT INFORMATION SYSTEM

Time : 3 hours Maximum : 70 marks

PART – A (20 Marks) (30 Minutes)
(Question Nos. 1 to 20 Online Examinations)

PART B (5 X 6 = 30 Marks) (2 ½ Hours)
Answer any FIVE Questions

21. What is system? Explain its types.

22. Write note on controlling information system.

23. What is software? Explain its types.

24. Write short note on Artificial Intelligence.

25. Explain about electronic communication system.

26. What is communication? Explain the trends in role communication.

27. Explain the conceptual presentation concept in detail.

PART C (2 x 10 = 20 Marks)
Answer any TWO Questions

28. Explain the following:
    i. Management of Information System ii. Data versus information

29. Explain the decision support system with example.

30. Describe the concept of object oriented technology.

Reg. No. : .....

4043 Q.P. Code : [04 MB 10]

(For the candidates admitted from 2004 onwards)

M.B.A. DEGREE EXAMINATION, APRIL 2009.

Third Semester

MANAGEMENT INFORMATION SYSTEM

Time : Three hours Maximum : 75 marks

PART A — (5 × 6 = 30 marks)

Answer ALL questions.

1. (a) Explain the need and importance of the Information System in a Organization.

Or

(b) Identify the types of Information System used in Business Organization.

2. (a) What are the Marketing Information are expected to be collected in Marketing Information System?

Or

(b) How to design a Information Report System? What are the components are essential in it?

3. (a) Explain the Decision Support System (DSS) Model.

Or

(b) Write a short note on "Optimising Analysis".

4. (a) Identify the recent technology usage in managing the Information.

Or

(b) What is EDI? What are its advantages?

OLD QUESTION PAPER

5. (a) What are the security issues arises in Information Management?

Or

(b) Write short note on "Denial of Service and Spoofing".

PART B — (3 × 10 = 30 marks)

Answer any THREE questions

6. Explain the MIS scope and its challenges in the present scenario of Technology World.

7. Discuss the function of Transaction processing systems by the Information Management System.

8. Critically examine "the effectiveness of Decision Making Process has improved by the Information System".

9. Analyse the present scenario of global Information Technology Management.

10. Explain the various functions of feasibility control and procedural control in Management Information System.

PART C — (1 × 15 = 15 marks)

(Compulsory)

11. Analyse the Ethical and Social issues arises in the Information Management. How to create a Security. Management System for a Information Management.

KARPAGAM ACADEMY OF HIGHER EDUCATION
ESTABLISHED UNDER SECTION 3 OF UGC ACT 1956
DEPARTMENT OF COMMERCE
MANAGEMENT INFORMATION SYSTEM - 16PAU303B (PART A ONE MARK QUESTIONS) - UNIT I

1	Which type of system tracks day-to-day activities of an organization?
2	Which type of system produces reports on a regular schedule in a predetermined format?
3	Which type of system is most often used for analyzing semi structured problems?
4	These systems address non-routine decisions requiring judgment, evaluation, and insight because there is no a
5	Systems that span all functional areas and focus on executing business processes across the firm are called.
6	Which system stores all organizational data in a single central data repository?
7	Which type of enterprise application stores directories of employees with special areas of expertise?
8	Which person is responsible for the overall use of information technology in a large conglomerate?.
9	Data about the performance of a system is
10	Structured decisions are _____ in nature
11	Which of the following consists of all the hardware and software that a firm needs to achieve its business obj
12	Data shaped into meaningful form are called.
13	Raw facts that have not been organized into a useful form are called. a. Information.
14	Which activity of an Information System converts raw input into a meaningful form?.
15	The linkage of two or more computers together to share data or resources is called a
16	The shifting of intermediary role in a value chain to a new source is called as
17	This individual is credited with the development of the five forces competitive model:
18	Locking in customers by making it difficult for them to change to another product is referred to as.
19	Decisions in which the decision maker must provide judgment, evaluation, and insights into the problem defi
20	A type of decision in which there may be several "right" answers and no precise way to get a right answer is
21	These systems provide analytical models or tools for analyzing large quantities of data for middle managers w
22	GDSS can be expanded as
23	User training and System conversion belong to _____ phase of SDLC
24	"Who needs what information, where, when, and how" describes the most basic description of:.
25	Both the old and new systems are operated in _____ conversion
26	Developing Products, Services, or Process that give a Company a Superior Business Position is termed as ___
27	Restructuring & transforming a business process by a rethinking and redesign - done by
28	Organisation's rapid response to unexpected challenges is generally known as

29	_____is a form of organization that uses telecommunication networks & other Information Technolog
30	Which one of the following is not one of the major dimensions for developing international information syste
31	The Management Information System (MIS) provides timely and effective information to support decision m
32	An _____ system has a stored knowledge base and an inference engine.
33	An information system that supplies information specifically to aid managers with decision making responsib
34	Which of the following best explains the meaning of managerial participation in effective computer utilizatio
35	These systems typically provide periodic reports rather than instant information on operations
36	A hotel reservation system would be classified as a(n):.
37	MIS stands for ----------
38	A ---------- is a group of interrelated components working toward the attainment of a common goal by ac
39	Information system is an organized combination of _____
40	An end user is anyone who uses an _____
41	---------- provide managerial end users with information products that support much of their day-to-day deci
42	---------- is the monitoring, evaluating and modifying of operational information systems to make desirab
43	The Managerial level professional who personally uses information system is called ----------
44	---------- theory is also called the mathematical theory of communication
45	---------- is changing the equipment and work habits of today's end users with the help of information syste
46	---------- make long range strategic decision about what products and services to produce
47	---------- carry out the programs and plans of Senior Managers
48	---------- are responsible for monitoring the firms daily activities.
49	The system concept should be an ---------- oriented
50	The physical view of the MIS can be seen as an assembly of several sub-systems based on the ---------- in
51	The sub-systems of MIS could be at a ----------
52	The MIS may be ---------- in two organizations involved in the same business
53	The MIS is a ---------- concept subject to change time and again with a change in the business managemer
54	MIS is also known as ----------
55	Due to standardization or formalization the interaction between the individuals in the organization is --------
56	The role of the _____ in an organization can be compared to the role of in the body
57	The academic area of management information system is
58	Designing an MIS for an organization is an art and not a ----------
59	If application science & MIS can be brought together, the MIS design would be ----------
60	A system is called ---------- if it has an interaction with the environment

Transaction processing system (TPS)
Transaction processing system (TPS)
Transaction processing system (TPS)
Enterprise system.
Business functional systems.
Management information system.
Enterprise system
System Analyst
Marketing Data
Non-Repetitive
Database technology.
databank.
Business objectives.
Input.
System.
Intermediation
Henry Fayol
Creating switching costs
Structure
Structured decision
Decision support systems
Group Data Software Structure
.Analysis
Information requirements.
Direct Cutover
Monopoly
MIS
Real options pricing models

Flat structure
. Corporate global strategies
Operational and Tactical System.
Expert.
DBMS.
Managers operate the computer.
Strategic-level systems.
Management-level system.
Management Interactive System
System
People
Software
Information Reporting System
Analysis
End user
Information
Office Automation
Middle Managers
Middle Managers
Middle Managers
Group
Database
Functional level
Same
Dynamic
The Information service
Maximum
MIS
Management
Social
Not much realistic
Open

Management information system (MIS)
Management information system (MIS)
Management information system (MIS)
Supply chain management (SCM) system.
Enterprise applications
Customer relationship system.
Supply chain management system
Chief Executive Officer (CEO).
Control
Repetitive
Networking technology.
Feedback
Information.
Processing.
Network.
Disintermediation
Max Weber
Creating up-selling costs
Semistructure
Unstructured decision
Management information systems
Group Decision Software Solutions
Design
A feasibility study
Pilot
Top Performance
End-Users
Agility

Virtual Company
Organization structure
Decision Support System (DSS).
Centers.
MIS.
Need for understanding and support from top management'.
Operational-level systems.
Transaction-level system.
Manager of International Services
Software
software and Hardware
Product
MIS
Maintenance
Managerial end user
Probability
EDI
Senior Managers
Senior Managers
Operational Managers
Mass
Objectives
task level
Different
Static
Decision system
Minimum
EDI
Operational research
Science
Realistic and useful
Closed

Decision-support system (DSS)	Executive support system (ESS)
Decision-support system (DSS)	Executive support system (ESS)
Decision-support system (DSS)	Executive support system (ESS)
Executive support systems.	Knowledge management system (KMS).
Transaction processing systems.	Data management systems.
Enterprise system.	Transaction processing system.
Customer relationship management system.	Knowledge Management System.
Chief Information Officer (CIO).	Chief Management Officer (CMO).
Meta Data	Feed Back
Routine	both repetitive and routine
Storage technology.	Information technology.
Knowledge.	Information.
Data	Information systems.
Output.	Feedback
Protocol.	Information technology infrastructure
Re-intermediation	De-intermediation
Michael Porter	Michael Dell
Creating adoption costs	Creating seek time costs
Unstructure	Overt
Recurring decision	Nonrecurring decision
Executive support systems	Transaction processing systems
Group Decision Support System	. Group Decision Software System.
Implementation.	
Total quality management	Systems development processes
Parallel	Crash approach
Productivity	Competitive Advantage
BPR Process	Reduced rate of growth in expenses
Competitive advantage	Competitive necessity

Line and Staff	Matrix structure
Management and business processes.	Business process reengineering.
Data Communication System.	Automated Office System.
Control.	MIS.
OAS	DBA.
Managers need to be educated about computers.	
Management-level systems.	Knowledge-management systems.
Operational-level system.	Strategic-level system.
Management Information System	Management Information service
Hardware	secondary storage
Database and Netware	All
information system	Service
TPS	ESS
Implementation	planning
Software engineer	planner
liquidity	data
TPS	ERP
Operational Managers	employee
Operational Managers	employee
Senior Managers	employee
Individual	persons
Tasks	goal
work level	individual level
Equal	standard
standard	fixed
The computer-based information system	information provider
Increasing	decreasing
E-COM	EDP
Communication	motivation
Trend	sociology
real	reel
Isolated	joined

Transaction processing system (TPS)
Management information system (MIS)
Decision-support system (DSS)
Executive support systems.
Enterprise applications
Enterprise system.
Knowledge Management System.
Chief Information Officer (CIO).
Feed Back
both repetitive and routine
Information technology.
Information.
Data
Processing.
Network.
Re-intermediation
Michael Porter
Creating switching costs
Unstructure
Unstructured decision
Decision support systems
Group Decision Support System
Implementation.
Information requirements.
Parallel
Competitive Advantage
BPR Process
Agility

Virtual Company
Business process reengineering.
Data Communication System.
Expert.
MIS.
Need for understanding and support from top management'.
Management-level systems.
Transaction-level system.
Management Information System
System
All
information system
Information Reporting System
Maintenance
Managerial end user
Information
Office Automation
Senior Managers
Middle Managers
Operational Managers
Individual
Database
Functional level
Different
Dynamic
The computer-based information system
Minimum
MIS
Operational research
Science
Realistic and useful
Open

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DEPARTMENT OF COMMERCE
MENT INFORMATION SYSTEM - 16PAU303B (PART A ONE MARK QUESTIONS

Unit - II

1	The confusion created by data redundancy makes it difficult for companies to	Create online processing capabilities
2	Data redundancy occurs when:.	Multiple reports are accessed simultaneously
3	The data dictionary is the automated or manual file that:.	Stores information about data elements and
4	The most prominent data manipulation language today is:.	Pascal.
5	This database model uses a series of logically related two-dimensional tables or fi	Relational database
6	This database model is well suited to handle graphics-based or multimedia applica	Hierarchical DBMS
7	In a DBMS, the capability to specify the structure of the content of the database is	Data definition
8	A database that is stored in more than one physical location is called a(n)	Relational database
9	The power to define information requirements for the entire company is a function	Data planning and modeling
10	SIS means	Short-term Investment Strategy
11	_____ governs the activities concerned with the planning and control of the	HRIS
12	The most prominent system in the retail sales industry is the _____ system.	POS (point-of-sale).
13	. _____ automate the production process	Estimated disposal data.
14	MES means	Manufacturing Enlargement System
15	_____ provides a set of integrated computer tools that allow a decision maker to i	DBMS.
16	_____is the important component of DSS	Dialogue Management
17	In the Financial Decision-Making System which of the following is not a transacti	Cash receipts.
18	Which one of the following is not the function of MKIS?	Interactive Marketing
19	Planning is a process of determining the goals and ---------- and evolving strate	Objectives
20	. ---------- refers to the location or position where the decision making centre is l	Standardization
21	---------- is to make the interaction between the individuals in the organization as	Standardization
22	A system is an assembly of elements arranged in a logical order to achieve certai	Goals
23	Preparing scheduling and monitoring jobs for continuous processing by the compu	Job management
24	. ---------- involves the selection and training of personal and their assignment fo	Planning
25	---------- is the leadership of an organization through communication, inspiration	Directing
26	---------- planning deals with the targets and objectives of the organization	Long range planning
27	A ---------- is a meaningful representation of a real situation on a mini scale.	Design

28	---------- represents the structural aspects of the system, which demonstrates st	Static Model
29	The database models which are common in the industry are ----------	The Hierarchical Data base model
30	---------- model has found wider acceptance	Relational Data base model
31	---------- shows parent child relation.	The Network data base model
32	---------- is a vital organizational process that analyses and evaluates an organiz	Analyze
33	One of the benefits from functional information systems is	Reduced Cost
34	One of the benefits from functional information systems is	Increased Speed
35	_____ support decision making for the allocation and planning of p	AIS
36	_____ is the first step in production.	Product Design
37	The Product design activities are getting more automated through computer softwa	CIA
38	The Production subsystem measures the process in terms of _____-	Workforce
39	_____ relates to activities that ensures that the final product is of a required	CAD
40	_____ data is maintanied by purchase department	vendor data
41	Marketing is concerned with identifying the needs wants of _____	Employee
42	One of the subsystem for MKIS is_____	Marketing Intelligence system
43	_____ provides the information about the firm's advertisement and perso	DSS
44	Collection, analysis and reporting of market related data is called _____	Market survey
45	AIS Stands for_____	Accounting Information System
46	Accountig Information system deals with transaction which are _____ na	system
47	AIS caters to the information needs of both	External and Government
48	_____ system use mainly historical data	MIS
49	Tne Output of AIS may consists of _____	Cost Sheet
50	_____-- prepares the projections of activity of the firm in the future.	Sub System
51	_____ is to determine the flow of money into and out of the firm.	Fund Management
52	_____ verfies the accurancy of the companies financial accounting rec	Inspection
53	PIS Stands for	Public Information System
54	Staffing System is one the Subsystem of_____	AIS
55	_____is the one of the subsystem for HRIS	R&D
56	_____ planning covers a period of two to five years.	Long
57	_____ Planning is the plan for total enterprise	_____ Planning is the plan for total e
58	_____ is a process of dividing the whole organization into small divi	Sub – Unit
59	Employment of proper manpower in number and kind is first acting of ___	Directing

60	---------- is finding an optimum value for selected variables given certain constra	Optimization analysis
61		

Work in batch processing	Use a distributed database
The programs that access the data are change	Different users enter information
Allows the creation of supplementary reports	Presents the data as they would be perceived by end users
COBOL	SQL
Hierarchical database	Network database
Network DBMS	Relational DBMS
Recursive data	Data dictionary
Data warehouse	Normalized database
Database administration	Database technology
System Integrated Software	Strategic Information System
CIM	MKIS
COBOL.	ACM.
CAM	CRM
Malfunction Execution System	Manufacturing Execution System
DSS.	MIS
System Management	Input Management
Cash returns.	Cash issues.
Sales Force Automation	Maintenance of Payroll records
Dynamic	Controlling
Centralization	dymamic
Centralization	dynamic
controlling	dynamic
Resource management	Project management
Organizing	Staffing
Controlling	Staffing
Short range planning	middle range planning
Model	Analysis

Dynamic Model	Vibrant Model
The Network data base model	Relational data base model
The Hierarchical Data base model	The Network data base model
The Hierarchical data base model	The Relational data base model
Planning	Implementing
Reduced Profit	Reduced Production
Increased Cost	Increased Profit
MKIS	PIS
Inventory Data	Marketing Data
MIS	Tally
Standard	Time - Tracking
CIE	SIS
industrial data	labour data
Customer	Customer
Pay Roll System	Quality Control System
TPS	QAS
Marketing Research	Field Survey
Applied Informaation System	Area Information System
cost	profit
External and Political	External and Internal
DSS	AIS
Ledger	Financial Statement
Main System	Project
System Management	Accounts Management
Controlling	Auditing
Private Information System	Personnel Information System
HRIS	FIS
T&D	T&P
Medium	Short
Corporate	Enterprise
Sub – system	Departmentation
Staffing	Organizing

Goal seeking analysis	Analysis

Integrate data from different sources	Integrate data from different sources
Fields in many different files contain the same information	Fields in many different files contain the same information
Is used in conjunction with conventional third- or fourth-generation prog	Stores information about data elements and data characteristics
OLAP	SQL
Object-oriented database	Relational database
Object-oriented DBMS	Object-oriented DBMS
Data orientation	Data definition
Distributed database	Distributed database
The database management system	Database administration
Society of Information System	Strategic Information System
FIS	CIM
.PC/XT	POS (point-of-sale).
Total Quality Management	CAM
Manufacturing Engineering System	Manufacturing Execution System
Control	DSS.
Output Management	Dialogue Management
Warehouse requisition slip.	Warehouse requisition slip.
Product Management	Maintenance of Payroll records
planning	Objectives
decentralisation	Centralization
decentralisation	Standardization
planning	Goals
schedule management	Job management
directing	Staffing
directing, controlling, staffing	directing, controlling, staffing
first range plnning	Short range planning
approach	Model

fixed model	Static Model
Hierarchical, Network &Relational	Hierarchical, Network &Relational
Hierarchical, Network &Relational	Relational Data base model
Base model	The Hierarchical data base model
Evaluation	Planning
Reduced Efficency	Reduced Cost
Increased Time	Increased Speed
FIS	PIS
External Data	Product Design
CAD	CAD
safety	Time - Tracking
QC	QC
External Data	vendor data
Vendor	Customer
MIS	Marketing Intelligence system
Promotion Planning System	Promotion Planning System
Market Place	Marketing Research
approach intelligence system	Accounting Information System
financial	financial
Internal and Auditors	External and Internal
TCS	AIS
Common Size Statement	Financial Statement
Forecasting Sub system	Forecasting Sub system
Records Management	Fund Management
Testing	Auditing
People Informational System	Personnel Information System
MKIS	HRIS
T&L	T&D
Micro	Medium
Business Unit	Corporate
Branch	Departmentation
Procurement	Staffing

Seeking Analysis	Optimization analysis

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DEPARTMENT OF COMMERCE
ENT INFORMATION SYSTEM - 16PAU303B (PART A ONE MARK QUESTIO

Unit - III

1	The formal set of rules that govern the way in which computers communicat	Protocols
2	. ---------- includes all physical devices and materials used in Information	Software Resources
3	The network operating system is a ---------- that facilitates and controls	System software
4	Which program manages and supports the operation of a computer system	Application software
5	---------- is an operating system program which manages and supports the	Application software
6	---------- are programs that direct processing for a particular use of comp	System software
7	Computer system comprises of major units	input unit, output unit, control unit
8	The processor which performs arithmetical and logical operations is called	Control
9	Which of the following is the fastest	CPU
10	Computer Virus is a _____.	Hardware
11	A list of instructions used by a computer is called	Text
12	CPU controls _____.	All Input, Output and processing.
13	CPU stands for _____ ?	Central Performance Unit.
14	Which of the following holds the ROM, RAM, CPU?	Hard Disk
15	The part of machine level instruction, which tells the central processor what	Operation code
16	Most operating systems are comprised of three main components: the _____	desktop
17	The _____keeps track of directories and files.	kernel
18	A system program that combines the separately compiled modules of a progr	assembler
19	Process is	program in High level language kept on disk
20	Interprocess communication	is required for all processes
21	User-Friendly Systems are	required for object-oriented programming
22	A system program that sets up an executable program in main memory ready	assembler
23	The operating system is an example of a computer _____.	object
24	Before the days of Windows, users interfaced with the operating system thro	graphical
25	What is the name given to the organized collection of software that controls	Working system
26	Many operating system directory structures are _____.	discrete
27	Bug means	A logical error in a program

28	Memory management is	not used in modern operating system
29	An algorithm is best described as	A computer language
30	Examples of file _____ _are read only, hidden, and archive.	types
31	Software that measures, monitors, analyzes, and controls real-world events is	system software
32	PCB =	Program Control Block
33	A translator is best described as	an application software
34	What is the name given to all the programs inside the computer with makes i	Application software
35	Which is not a computer classification?	mainframe
36	Which operation is not performed by computer	Inputting
37	A collection of related instructions organized for a common purpose is refer	File
38	Plotter accuracy is measured in terms of repeatability and	Buffer size
39	Computer instructions written with the use of English words instead of binar	Mnemonics
40	Which language is directly understood by the computer without translation p	Machine language
41	On which aspect the analog computers are better than digital?	Speed
42	Which of the following processors use RISC technology?	486dx
43	Which of the following is used for manufacturing chips?	Control bus
44	Which of the following is not a micro computer?	Laptop PCs
45	What type of memory is not directly addressable by the CPU and requires sp	Extended
46	The first general purpose electronic digital computer in the world was	UNIVAC
47	Signals can be analog or digital and a computer that processes the both type	Analog computer
48	High level language is also called	Problem oriented language
49	Which company is the biggest player in the microprocessor industry?	Motorola
50	The first digital computer built with IC chips was known as	IBM 7090
51	Number crunchier is the informal name for	Mini computer
52	Which is the first electronic digital computer?	ENIAC
53	A computer program that converts an entire program into machine language	Interpreter
54	Intel corporation produces chips for which computers?	IBM PCs
55	Which of the following is not a class of computers based on size?	Mini computer
56	Which of the following is a class of computers based on model?	Digital Computer
57	Which unit converts user data into machine readable form?	Input unit
58	A computer programmer	Does all the thinking for a computer
59	A typical personal computer used for business purposes would have__ of RA	4 KB

60	The ALU of a computer normally contains a number of high speed storage e	Semiconductor memory

Algorithms	Standards	Procedures
Hardware Resources	System Software	system approach
Application software	Hardware	storage design
Operating system software	Both a & b	System software
System software	Software Engineer	Engineer
Application software	Procedure	Software
input unit, output unit, control unit and storag	input unit, output unit, central processing un	input, output and storage units
ALU	Register	Cache Memory
Magnetic Tapes and Disks	Video Terminal	Sensors, Mechanical Controllers
Software	Bacteria	Freeware
CPU	Program	Output
Controls Memory	Controlled by the input data	ALU
Control Processing Unit	Common Processing Unit	Central Processing Unit
ALU	Mother Board	Computer
Address	Locator	Flip-Flop
kernel	user interface	code
file system	shell	user interface
linking loader	cross compiler	load and go
contents of main memory	a program in execution	a job in secondary memory
is usually done via disk drives	is never necessary	allows processes to synchronize activity
easy to develop	common among traditional mainframe opera	becoming more common
linker	loader	compiler
file system	program	desktop
object oriented	command utility	command line
Peripheral system	Operating system	Controlling system
disparate	virtual	hierarchical
A difficult syntax error in a program	Documenting programs using an efficient do	keeps track of each and every memory loca

replaced with virtual memory on current syste	not used on multiprogramming systems	critical for even the simplest operating syst
A step by step procedure for solving a probler	A branch of mathematics	the address of the data is supplied by the u
sizes	attributes	formats
real-time software	scientific software	business software
Process Control Block	Process Communication Block	Program Communication Block
a system software	a hardware component	a software component
System software	Firm ware	Shareware
maxframe	mini	notebook
Processing	Controlling	Understanding
Database	Program	Templates
Resolution	Vertical dimensions	Intelligence
Symbolic cod	Gray codes	Opcode
Assembly language	High level language	System Language
Accuracy	Reliability	Automatic
Power PC	486sx	6340
Control unit	Parity unit	Semiconductor
Tablet PCs	Desktop PCs	Bigbus
Expanded	Base	Conventional
EDVAC	ENIAC	EDI
Digital Computer	Hybrid Computer	Mainframe Computer
oriented language	language	Software
IBM	Intel	AMD
Apple ? 1	IBM System / 360	VAX-10
Super computer	Microcomputer	Mainframe computer
MARK I	Z3	ABC
Simulator	Compiler	Commander
Apple	Macintosh PCs	ACC
Super computer	Microcomputer	Mainframe computer
Hybrid Computers	Analog Computers	AT Computers
Output unit	ALU	Control Unit
Can enter input data quickly	Can enter input data quickly	Can draw only flowchart
16 K	64 K	256 K

Registers	Hard disks	Magnetic disk

Protocols
System Software
System software
Operating system software
System software
Application software

input unit, output unit, central processing unit and storage unit

ALU
CPU
Software
Program
All Input, Output and processing.
Central Processing Unit
Mother Board
Operation code
kernel
file system
linking loader
a program in execution
allows processes to synchronize activity
becoming more common
loader
program
command line
Operating system
hierarchical
A logical error in a program

critical for even the simplest operating systems
A step by step procedure for solving a problem
attributes
real-time software
Process Control Block
a system software
System software
maxframe
Understanding
Program
Resolution
Symbolic cod
Machine language
Accuracy
Power PC
Semiconductor
Bigbus
Expanded
ENIAC
Hybrid Computer
Problem oriented language
Intel
IBM System / 360
Super computer
ABC
Compiler
IBM PCs
Mainframe computer
AT Computers
Input unit
Does all the thinking for a computer
256 K

Registers

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DEPARTMENT OF COMMERCE
MANAGEMENT INFORMATION SYSTEM - 16PAU303B (PART A ONE MARK QUESTIONS) - UNIT I

Unit - IV

1	---------- involves inputting and assembling elements that enter the system to be processed.
2	A system for reproducing images on paper at a remote location, often by data transmission through telephone line
3	Changing hardware and storage procedures or adding new data without having to rewrite application programs cal
4	Which is a volatile memory?
5	Which is non-volatile memory?
6	---------- data generated by touch-sensitive materials
7	Which one among the following is the “Input System”?
8	Which one among the following is the output of the system
9	Object-Scanner is a
10	_____ allow us to send information to the computer
11	CD-ROM stands for
12	MICR stands for
13	_____ allow us to get information from the computer
14	A light sensitive device that converts drawing, printed text or other images into digital form is
15	Dot-matrix is a type of
16	Cursor is a ____
17	ASCII stands for
18	Personal computers use a number of chips mounted on a main circuit board. What is the common name for such b
19	What type of device is computer keyboard?
20	Through which device the main components of the computer communicate with each other?
21	The difference between memory and storage is that memory is _____ and storage is _____
22	The size of commonly used floppy disk is
23	Which of the following memory is volatile
24	Which is the device that converts computer output into a form that can be transmitted over a telephone line?
25	Another term for Main Memory is
26	Dot-matrix, Deskjet, Inkjet and Laser are all types of which computer peripherals?
27	_____ is the high speed memory used in the computer.

28	The term 'memory' applies to which one of the following
29	The device primarily used to provide hardcopy is the
30	Which one is not an input device?
31	Memories which can be read only are called _____.
32	USB stands for _____?
33	An optical input device that interprets pencil marks on paper media is
34	What does a system bus do?
35	What are the two types of monitors?
36	_____ keys are present on the top row of the keyboard.
37	Which of the following devices have a limitation that we can only store information to it but cannot erase or modi
38	Which computer memory is used for storing programs and data currently being processed by the CPU?
39	What is output ?
40	In processing cheques which of the following I/O techniques have banks traditionally followed?
41	QWERTY is used with reference to
42	"Zipping" a file means
43	Integrated Circuits (IC) chips used in computers are made with
44	The term that we use to describe physical components of the system
45	What Does BIOS Stand For?
46	Which of the following is not a storage device?
47	The term 'memory' applies to which one of the following:
48	A disk's content that is recorded at the time of manufacture and cannot be changed or erased by user is
49	What is usually used for displaying information at public places?
50	A floppy disk can hold _____ when it is formatte
51	Which of the following memories needs refreshing?
52	Can you tell what passes into and out from the computer via its ports?
53	An output device that uses words or messages recorded on a magnetic medium to produce audio response is
54	Which of the items below are not considered removable storage media?
55	Which of the following is not purely output device?
56	Who developed a mechanical device in the 17^{th} century that could add, subtract, multiple, divide and find square r
57	The first Macintosh computer was from
58	Which of the following terms is the most closely related to main memory?
59	Which was the world's first minicomputer and when was it introduced?

60	A group of magnetic tapes, videos or terminals usually under the control of one master is

Input	Output
Fax	E-mail
Data independence	Data integrity
RAM	ROM
RAM	ROM
Tactile data	Text data
Page number	The Telephone number
Bill	Claim
Input device	Output device
input	output
Compactable Read Only Memory	Compact Data Read Only Memory
Magnetic Ink Code Reader	Magnetic Ink Cases Reader
input	output
Keyboard	Plotter
Tape	Printer
Pixel	Thin blinking line
American Stable Code for International Interchange	American Standard Case for Institutional Interchang
Father board	Daughter board
Memory	Output
Keyboard	System Bus
Temporary, Permanent	Permanent, Temporary
4.5"	3.5"
RAM	ROM
Teleport	Multiplexer
Hard Disk	ROM
Printers	Software
RAM	Hard Disk

Logic	Storage
CRT	Computer Console
Keyboard	Mouse
RAM	ROM
Universal Serial Bus	Universal Sequential Bus
Magnetic tape	Optical scanners
allows the user to communicate with the computer	carries out instructions
CRT and DVD	CRT and LCD
Function	Type writer
Floppy Disk	Hard Disk
Mass memory	Internal memory
What the processor takes from the user	What the user gives to the processor
OCR (Optical Character Recognition)	MICR (Magnetic Ink Character Recognition)
Monitor	Printer
Encrypting the message	Compressing the message
Gold	Silver
Hardware	Input
Better Integrated Operating System	Basic Input Output System
DVD	Hard Disk
Logic	Storage
Read-only	Memory-only
Monitors	Overhead
2.0 MB	1.44 KB
SRAM	DRAM
Data	Bytes
Magnetic tape	Voice response unit
Removable hard disk cartridges	(Magneto-optical) disk
Screen	Printer
Napier	Babbage
First generation	Second generation
Non volatile	Permanent
PDP-I, 1958	IBM System/36, 1960

Cylinder	Surface

Data	information provider
Tele conference	teleshopping
DDL	PPL
EPROM	EOPROM
EPROM	EOPROM
Image data	Data
Derivative number	Data number
Name and addresses	Bill and Claim
Device	Not an Object
data	CPU
Compactable Disk Read Only Memory	Compact Disk Read Only Memory
Mechanism Ink Character Reader	Magnetic Ink Character Reader
data	CPU
Scanner	OMR
Disk	Bus
Pointing device	input device
American Standard Code for Information Interchange	American Standard Code for Interchange Informati
Breadboard	Motherboard
Storage	Input
Monitor	Memory
Slow, fast	Data,backup
3.25"	5.5"
EPROM	PROM
Concentrator	Modem
Floppy Disk	RAM
Monitors	Keyboards
Cache	BIOS

Input Device	Output Device
Printer	Card Reader
Speaker	Scanner
DRAM	Secondary Memory
Unique Serial Bus	Unique Sequential Bus
Punch card reader	O.M.R
connects various components within the computer	stores data and instructions
DVD and VCD	LCD and DVD
Numeric	Navigation
Tape Drive	CD-ROM
Non-volatile memory	PROM
What the processor gets from the user	What the processor gives to the user
Barcode	VRT (Volume Rendering Technique)
Keyboard	Mouse
Transfer the message	Shortcut of message
Silicon	Copper
Software	Operating System
Battery Integrated Operating Setup	Backup Input Output System
Floppy Disk	Mouse
Input Device	Output Device
Run-only	Write-only
Monitor and overhead projection	Touch screen kiosks
1.44 MB	2.0KB
ROM	RAM
Graphics	Pictures
Voice recognition unit	Voice band
Flexible disks cartridges	Motherboard
Speaker	Plotter
Pascal	Leibniz
Third generation	Fourth generation
Control unit	Temporary
PDP-II, 1961	VAX 11/780, 1962

Track	Cluster

Input
Fax
Data independence
RAM
ROM
Tactile data
The Telephone number
Bill and Claim
Input device
input
Compact Disk Read Only Memory
Magnetic Ink Character Reader
output
Scanner
Printer
Thin blinking line
American Standard Code for Information Interchange
Motherboard
Input
System Bus
Temporary, Permanent
3.5"
RAM
Modem
RAM
Printers
Cache

Storage
Printer
Speaker
ROM
Universal Serial Bus
O.M.R
connects various components within the computer
CRT and LCD
Function
CD-ROM
Internal memory
What the processor gives to the user
MICR (Magnetic Ink Character Recognition)
Keyboard
Compressing the message
Silicon
Hardware
Basic Input Output System
Mouse
Storage
Read-only
Touch screen kiosks
1.44 MB
ROM
Data
Voice response unit
Motherboard
Screen
Leibniz
Fourth generation
Temporary
PDP-I, 1958

Cluster

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DEPARTMENT OF COMMERCE
MENT INFORMATION SYSTEM - 16PAU303B (PART A ONE MARK QUESTIONS

Unit - V

1	This term refers to the use of digital technology and the Internet to execute the ma	Electronic Business.
2	Electronic Retailing of Products & Services directly to individual consumers in	B2B
3	The world's largest and most widely used network is the	LAN
4	A network that covers a large geographic area is most commonly referred to as a(	Wide area network
5	A network inside an organization that supports communications and business fun	Intranet
6	Because e-commerce is ubiquitous it reduces.	Marketspace
7	Changing the delivered product or service based on a user's preferences or prior be	Information richness
8	Removing the middleman and selling directly to a consumer in a digital marketpl	Ubiquity
9	Single, digital marketplaces based on Internet technology for many different buye	Electronic data interchanges
10	Web sites specifically designed for m-commerce are called.	Wireless portals
11	Paypal is a perfect example of.	Digital checking accounts
12	An interconnected chain or group of systems is called as	System Chain
13	A challenge and obstacle to global business systems deals with political laws. Spe	Transborder data and privacy laws
14	Network of networks means	Intranet
15	A Company that provide access to the Internet to individuals and organisations	Trans border data flow
16	An Internet-like network with in the organisation	Internet
17	_____is a Network that links the selected resources of a company with it C	Internet
18	The term "E-Business" is coined by	Peter Drucker
19	Which of the following is or are the enterprise applications?	ERP
20	ECS means	Enterprise Collaboration System
21	Which of the following is Electronic Conference Tool(s)?	What'sup
22	In which way is Managerial Information System (MIS) superior to electronic data	It is batch oriented.
23	MIS in e-business forces managers to be more --------- and quick in response for c	Dynamic
24	---------- management systems seek to create, capture, store and disseminate f	Knowledge
25	The Enterprise Resource Planning solution structure is built in ----------	Technology
26	Among the following modules of ERP, pick out the business module	Accounting
27	---------- is the sub modules of Finance module of ERP	Funds Management

28	The selection of ERP is based on ----------	The vendor
29	Successful artificial intelligence are based on ----------	Human expertise
30	Buying and selling goods in the way of electronic medium is called ----------	EDP
31	---------- is a language enabling communication between web browser and web s	HTTP
32	---------- is an address of the page which is used for find web page	HTTP
33	The process of buying and selling goods and services electronically with computer	E-commerce
34	Internet connectivity and universal standards for information sharing radically ----	Raise
35	Choose the portal from the following	Yahoo.com
36	Choose the online service provider from the following	Xarive.com
37	---------- is a online market place	Pantellos.com
38	---------- is the electronic sales of goods and services among businesses	B2C
39	The transactions taking place in M-commerce and wireless devices technology ----	B2B
40	American Airlines is using ---------- to reduce its cost structure by encouraging	Travel Agent
41	---------- is an organizational department responsible for handling customer	Information centre
42	Which one is the electronic business model for ICICI	B2C
43	Satyam Infoway is a ---------- model	C2B
44	Times of India and LG Ltd. are ---------- model	B2C
45	The single users of Internet use ---------- connectivity	Dial-up
46	---------- a search engine	http://www.yahoo.com/
47	---------- is most popular web server	Apache HTTP server
48	The research network with new protocols and transmission speeds that provides ar	Internet 1
49	---------- is a commercial organization, with a permanent connection to the In	Internet service provider
50	---------- systems are a major form of electronic commerce systems in banking	E- electronic fund transfer
51	Among the following EMS, the one which acts as gateway to interact with the ver	CAD/CAM/CAE
52	EDI standard	is not easily available
53	What is the name of the card which can be used by the buyers during the time of p	E-Distributor
54	In Electronic cash payment	a debit card payment system is used
55	ERP supports _____ currency value.	Multiple
56	ERP package will handle _____ business functionalities.	Multiple
57	When IT Act 2000 came into effect?	2000 October 17
58	How many schedules are there in IT Act 2000?	3
59	Which is the Act which provides legal framework for e-Governance in India	IT (amendment) Act 2008

60	Which section of IT Act deals with the legal recognition of electronic records?	2

Electronic markets.	Electronic data interchange	Electronic management.
B2C	C2C	A2C
Intranet	Extranet	Internet
Local area network	Intranet	Inter network
Extranet	Virtual private network	Internet
Transaction costs	Dynamic pricing	Price discrimination
Information density	Personalization	Customization
Disintermediation	Reintermediation	Marketspace
Biosphere	Call centers	Net marketplaces
Online syndicators	Private exchanges	B2C e-commerce sites
Stored value payment systems	Peer-to-peer payment systems	Electronic billing presentation systems
Network	System expansion	Link
Language differences	Telecommunication standards.	Shortages of skilled consultants.
Internet	Extranet	Private network
Internet Service Provider	Sender	Systems Administrator
Intranet	Extranet	Network
Intranet	Extranet	Network
Miller S Scott	Lou Gerstner	James O Berien
CRM	PRM	CRM, PRM & ERP
Economical Calculation Service	Enterprise Communication System	Economical Communication Service
face Book	Voice Call	Chat System
It is most cost effective.	It provides summary reports without details.	It is Economically
Slow	Effective	fast
Enterprise	Supply chain Management	DSS
Business	Implementation	Technology, Business & Implementation
Planning	Purchase	Forecasting
Purchase	Order control	Planning

The technology	The solution scope and architecture	Vendor, technology & architecture
Knowledge	Selected reasoning pattern	Human expertise, Knowledge & reasonir
E-Commerce	AI	ERP
HTML	URL	Website
HTML	URL	DBMS
EDI	Office automation	Automation
Equals	Lower	Higher
EPM.com	Amazon.com	kbb.com
CNN.com	Bay.com	Expedia.com
ivillage.com	starmedia.com	WSJ.com
B2B	C2C	A2C
B2C	Both a & b	B2F
Web personalization	Offices	Manager
Call centre	Computer centre	Centre
C2B	B2B	B2B & C2B
B2B	B2C	D2F
C2B	B2B	C2C
Digital Dial-up	Leased line	LAN
http.//www.lycos.com/	http://www.webcrawler.com/	Yahoo, lycos &webcrawle
Microsoft's Internet Information Services	Both a & b	HTML
Internet 2	Internet 3	Internet 4
Intranet service provider	Extranet service provider	Service provider
EDI	AIM	IAM
EDI	SMS	DMS
defines several hundred transaction sets for va	is not popular	defines only a transmission protocol
Debit Card	Credit Card	Power Card
a customer buys several electronic coins whicl	a credit card payment system is used	RSA cryptography is used in the transact
Single	Three	Five
Single	Three	Five
2001 October 17	2000 November 11	2001 November 11
4	6	2
Indian Penal Code	IT Act 2000	IT Act 1956

6	5	4

Electronic Business.
B2C
Internet
Wide area network
Intranet
Transaction costs
Customization
Disintermediation
Net marketplaces
Wireless portals
Peer-to-peer payment systems
Network
Transborder data and privacy laws
Internet
Internet Service Provider
Intranet
Extranet
Lou Gerstner
CRM, PRM & ERP
Enterprise Collaboration System
Chat System
It provides summary reports without details.
Dynamic
Enterprise
Technology, Business & Implementation
Forecasting
Funds Management

Vendor, technology & architecture
Human expertise, Knowledge & reasoning
E-Commerce
HTTP
URL
E-commerce
Lower
Yahoo.com
Xarive.com
Pantellos.com
B2B
Both a & b
Web personalization
Call centre
B2B & C2B
C2B
B2C
Dial-up
Yahoo, lycos &webcrawle
Both a & b
Internet 2
Internet service provider
E- electronic fund transfer
EDI

defines several hundred transaction sets for various business forms

Debit Card

a customer buys several electronic coins which are digitally signed by coin issuing bank

Multiple
Multiple
2000 October 17
4
IT Act 2000