Department of Commerce (CA)

INTRODUCTION TO INFORMATION TECHNOLOGY

SEMESTER:I **SUB CODE:18BCA14C**

I B.COM(CA)

UNIT 1: Computer systems-types of computer systems-importantance of computers in business-computer applications in various areas of business-components of computers system-input,output and storage devices-types of software.

REFERENCE BOOK:

*INTRODUCTION TO INFORMATION TECHNOLOGY BY ALX LEON AND MATHEW LEON

*INTRODUCTION TO INFORMATION TECHNOLOGY BY PARAMESHWARAN

*INTRODUCTION TO INFORMATION TECHNOLOGY BY V RAJARAM

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UNIT I

COMPUTER

Computer is an Electronic Device which can perform Arthimatic Logical Operations and also store data

Computer was 1st Invented by these devices was conceived in 1782 by J.H.Smith. It was never built.

Difference engines were forgotten and then rediscovered in 1822 by Charles Babbage.

- Generations of Computer

  The growth of a computer can be classified into five generations of Computers.

- First Generation
- The basic component of the first generation of computers was vacuum tubes. A vacuum tube is an electronic device that permitted the processing of digital signals at a faster speed.
- Second Generation

- . The second generation of computers used a solid-state device called transistor in the place of vacuum tubes. Transistors were very convenient when compared to vacuum tubes. They were more efficient and cheaper than the vacuum tube
- Third Generation
- Though transistors were an improvement over the vacuum tube, they still had some limitations. They had complex circuits with numerous connections between the individual transistors.

- A major breakthrough was achieved when hundreds of transistors were successfully connected together and placed on a single silicon chip called the Integrated Circuit (IC). The use of IC chips in the place of transistors gave birth to third generation of computers.
- Fourth Generation
- LSI technology led to the development of Very Large Scale Integration (VLSI) where millions of transistors could be placed on a single chip called the Microprocessor. This was the basic component of fourth generation of computers. The VLSI chips could perform faster calculations.
- Fifth Generation
- In this generation, researches are focused on developing thinking computers. This technology is referred to as Artificial Intelligence. These computers are called the fifth generation computers. The computers you are using now belong to the fifth generation of computers

- Phone
- A speech sound considered as a physical event without regard to its place in the sound system of a language.
- Phone was Invented by Alexander Graham Bell in the year 1876.

Various Types of Phone/Mobiles Models

- Technology
- A Theoritical concept which can be Materialized that serves the basic needs of Human Beings.
- Computer
- Phone

- Communication
- Communication is transfer of information from one person to another.

- Various Communications Devices

- Main Parts of the Computer
- Hardware Componets Mother Board, Power Supply, Micro Processor, RAM Card, HardDisk, CD/DVD Drive, Graphic Card, LAN Card, Cables, etc.,

- Software Componets

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Main Parts of the Phone/Mobile

- Hardware Components of Phone/ Mobile

- Software Components of Phone/Mobile
  Main Purpose of Computer/Mobile
- Uses Schools, Offices, Air Lines, Hospitals.
-
- Applications
- Bluetooth
- Wifi Wifi
- Games

- Usage of Communication in Daily Life
- Mobile
- Communications
- Satellite
- Communications
- Radar

- Communications

Usage of Technology in Daily Life

- SoftwareDevelpment
- 2G Technology,
- 3G Technology
- Bluetooth,
- WiFi

- Multimedia
- Technology
- Scientific
- Technology
-
- Robotics

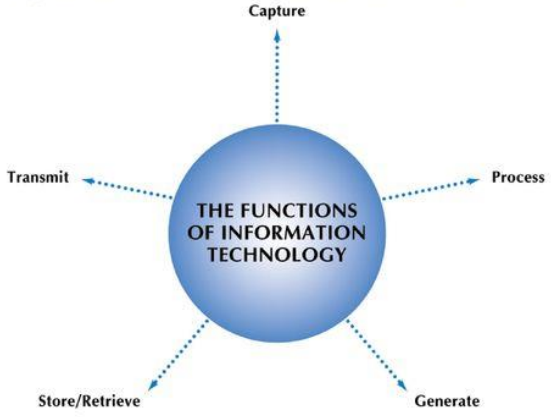
- Present Technology In Computer/Mobile
- Tablet Computers These use a touch-sensitive screen for typing and navigation. Since they don't require a keyboard or mouse, tablet computers are even more portable than laptops. The iPad is an example of a tablet computer.
- Mobile Phones Many mobile phones can do a lot of things a computer can do, such as browsing the internet or playing games. These phones are often called smartphones.
- Game Consoles A game console is a specialized kind of computer that is used for playing video games. Although they are not as fully-featured as a desktop computer, many newer consoles, such as the Nintendo Wii, allow you to do non-gaming tasks like browsing the internet.
- TVs Many TVs now include applications (or apps) that let you access various types of online content. For example, you can view your Facebook news feed or watch streaming movies on Netflix.

What is Information Technology (IT) ?

- Information technology is " Using technology (especially computers and telecommunications) for create , storing, retrieving, processing , secure and exchange information".
- IT is almost everywhere , used by
  - Companies
  - Governments
  - Universities and collages
  - Hospital
  - Ordinary people
- Success in business is largely determined by the effectiveness with which information technology is used.
- Information technology is embedded in many products and services

The Functions Of Information Technology

Figure 1.10 The Six Functions of Information Technology



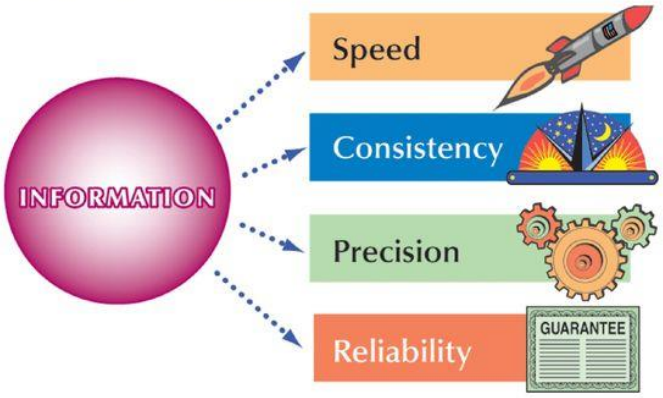
The Functions Of Information Technology

3. ***Generation:*** The process of organizing information into a useful form, whether as numbers, text, sound, or visual image.

4. ***Storage and Retrieval:***
   - **Storage** is the computer process of retaining information for future use.
   - **Retrieval** is the process by which a computer locates and copies stored data or information for further processing or for transmission to another user.
     - **Example :** Search Engine like Google , Bing , Yahoo " these companies have data centers which store information which can be used at a latter stage by the end user who will be searching for information online.

5. ***Transmission:*** The computer process of distributing information over a communications network.
   - Electronic Mail, or E-Mail
   - Voice Messaging, or Voice Mail

Figure 1.11 The Benefits of Information Technology



The Benefits of Information Technology

There are four main benefits for Information technology which are :

1. Speed
2. Consistency
3. Precision
4. Reliability

The Benefits of Information Technology

- **Speed**
  - Users of information technology can use tools like computers to perform different tasks faster, such as: calculation and filtering .
  - Computer can perform multiple functions on the same time which can not be done by humans.
  - Computers have applications which can store data in a systematic way making it easy to understand and organize important facts.
  - Organizations can use internet to interact with their customers in real time and respond to their needs.

The Functions Of Information Technology

1. ***Capture:*** This is the process of compiling information
   - **Example:** AMAZON.COM use internet cookies to capture data about a customer's purchases via their website.

2. ***Processing:*** The process of converting, analyzing, computing, and producing all forms of data, information.
   - Information Processing
   - Image Processing
   - Voice Processing

TYPES OF COMPUTER

- **Microcomputers:** is a small, relatively inexpensive computer ,the most common of all, easily outsells all other types of computers annually for use in business and at home.

- **Five types of Microcomputers:**
  - Desktop Computers
  - Notebook Computers/Laptop Computers
  - Tablet
  - Handheld computer , such as : smartphone

TYPES OF COMPUTER

- **Mainframes** are a type of computer that generally are known for their large size, amount of storage and processing power.
  - More powerful and larger than a microcomputer.
  - Primarily used by large organizations for mission-critical applications requiring high volumes of data processing , such as census , consumer statistics and financial transaction processing.

- **Midrange computers** is a computer smaller than a mainframe, but larger than a microcomputer.
  - A medium-sized **computer**
    - Computers that are more powerful and capable than microcomputer computers but less powerful and capable than mainframe computers.

TYPES OF COMPUTER

- ***Supercomputers:*** The most powerful and largest computers
  - Supercomputers were designed to solve problems consisting of long and difficult calculations.
  - Example: NASA and Weather forecasting

Supercomputer

Data Representation

- **Data** refers to the words, numbers, figures, sounds, and graphics that describe people, events, things, and ideas
- **Binary digits** (**bits**) value is either **0 or 1**
- A series of eight bits (8 bits) is called a **byte**
  - **Kilobyte** (**KB** or **K**) = 1024 bytes
  - **Megabyte** (**MB**) = approx. one million bytes
  - **Gigabyte** (**GB**) = approx. one billion bytes
  - **Terabyte** (**TB**) = approx. one trillion bytes

Computer System

- ***System:*** A set of components that interact to accomplish a purpose.
- A computer system consists of two major elements which are complement each others:
  1. **Hardware** refers to the physical components of a computer
     - Example : mouse , CPU, memory and monitor.
  2. **Software** refers to the intangible components of a computer system, particularly the **programs**, or lists of instructions, the computer needs to perform a specific task
     - Example : Windows and Microsoft word.

Hardware and Software are Complement Each Other

- We can equate hardware and software with human body and human intelligence, respectively.
- All human physical actions such as walking and eating are based on the thoughts and feelings, which is raised by the brain.
- If the brain does not raise thoughts and feelings, we do not perform any physical activity. Similarly, the actions and functioning of **every hardware equipment is driven by software.**
- The combination of physical equipment (hardware) and logical instructions (software) gives modern computing system their power and versatility.

Computer Hardware Components

A typical computer is made up of:

1. The **motherboard** is the main electronic component of the computer
2. System Unit
3. Input devices and output devices
   - Multimedia Devices
     - Computer hardware designed to display, store, record or play multimedia content such as photos, music and videos.
     - Types of multimedia devices include microphones, speakers, cameras and headphones.

System Unit

- The central component of the system
  1. The Processor: corresponds to the CPU
  2. Memory: RAM and ROM
  3. Storage: Hard Disk or Removable Storage devices

THE PROCESSOR (CPU)

- A central processing unit (**CPU**) is the electronic circuitry within a computer that carries out the instructions of a computer program.
- This unit performs processing of instructions and data
- CPU is your computers brain.
- The processor tells your computer what to do and when to do it.
- Does the calculations
- Speed is very important – measured in megahertz (MHz): the faster the processor the more calculations performed per second.

Memory

- Memory is any physical device capable of storing information temporarily or permanently.
- Measured in *bytes*
- One byte = eight *bits*
- **Types of memory:**
  1. Random Access Memory (RAM) : Volatile memory
  2. Cache memory(RAM cache or CPU cache) : - Volatile memory
  3. Virtual memory: Volatile memory
  4. Read-only memory(ROM) : nonvolatile memory

Types Of Memory

1. **Random Access Memory (RAM)**
   - Used by the Computer as the working area
   - Holds the working program, the data being processed and the interim results
   - **Volatile** - contents are erased if power is cut
   - Can be accessed randomly: can get any piece of data directly.
   - Faster than permanent storage
   - Not to be confused with ROM (Read-Only Memory)

Types Of Memory

2. **Cache memory (CPU memory)**
   - Cache memory is random access memory (RAM) that a computer microprocessor can access more quickly than it can access regular RAM.
   - This memory is typically integrated directly with the CPU chip or placed on a separate chip that has a separate bus interconnect with the CPU.
   - **Volatile** - contents are erased if power is cut

3. **Virtual memory**
   - Virtual memory meant the idea of using disk to extend RAM.

Types Of Memory

4. **Read-only memory(ROM)**
   - Once data has been written onto a **ROM** chip, it cannot be removed / modified and can **only** be **read** since these instructions do not need to be changed very often.
   - Read-only memory (ROM) contains the instructions for what needs to happen when a computer is powered on.
   - Unlike main **memory** (RAM), **ROM** retains its contents even when the computer is turned off. **ROM** is referred to as being nonvolatile, whereas RAM is volatile.

Storage

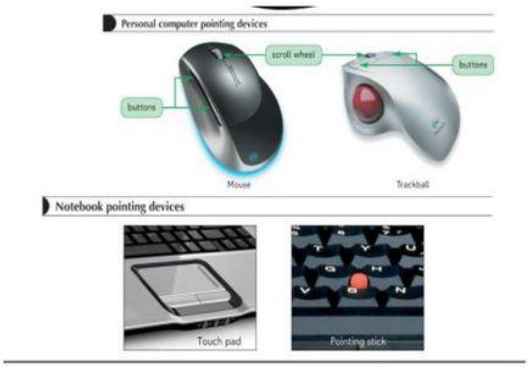
- **Saved permanently**- records and stores all programs and data / information
- **Types of Storage media**
  1. Hard Disk
  2. Optical storage device
     - CD – DVD – CD-R
     – CD-RW –DVD-RW – DVD-R – CD-ROM
  3. Flash memory
     - Flash memory cards
     - USB flash storage device

INPUT AND OUTPUT

- The data or instructions you type into the computer are called **input**
- The result of the computer processing your input is referred to as **output**
- **Peripheral devices** accomplish input and output functions

INPUT DEVICES

- You use an **input device**, such as a keyboard or a mouse, to input data and issue commands
  - **Keyboard**
  - **Pointing device** :controls the **pointer**
    1. Mouse
    2. Trackball
    3. Touchpad
    4. Pointing stick
  - **Touchscreen**
  - **Scanner**



OUTPUT DEVICES

- **Output devices** show you the results of processing data
  - **Monitor**
  - **Printer**
    - Laser
    - Inkjet
    - Dot matrix

Software

- Generic name of all programs
- Made up of code interpreted by the hardware
- Written in *programming languages* - Java, C and C++
- Two kinds of Software:
  1. System
  2. Application

System Software

- **System software** helps the computer carryout its basic operating tasks.
- Example of System software is **Operating System (OS)**
- The **operating system** is a software program that acts as an interface between the user and the computer
  - **OS** is used to control and manage the hardware components such as keyboard, monitor, printer, etc.
  - **OS** the driving program of the computer
    - OS has **Multitasking** features
    - communicates between all programs and the hardware
    - manages data to ensure security and integrity
    - Examples: Windows, Mac OS, Unix

System Software

- The basic functions of an operating systems are:
  1. Process Management
  2. Memory Management
  3. File Management
  4. Security Management
  5. User interface