GLS UNIVERSITY

COMPUTER FUNDAMENTALS & INFORMATION TECHNOLOGY.
UNIT– I

Application of Computers

The various applications of computers in today's arena :

Education :
Uses of computer in education –

- Teaching and Learning Online
- Result Processing
- Student Data Processing
- Question Preparation
- Handouts and Notes Preparation
- Online Education and Classes
- Online examinations

The CAL (Computer Aided Learning), CBI (Computer Based Instructions), CAI (Computer Aided Instruction) are common tools used for teaching.

Application of Computers

Business

The main objective of business is transaction processing, which involves transactions with suppliers, employees or customers. Computers can make these transactions easy and accurate.

Uses of computer in business organizations −

- Salary and Payroll Calculations
- Budgeting
- Sales Analysis
- Financial Forecasting
- Managing Employee Database
- Maintenance of Stocks, etc.

Application of Computers

Banking

In banks and financial companies, form basic to secret all information such as account holders detail, address, deposits, withdrawal, interest, etc. are managed by computers.

Banks are also using a computer network to interconnect all of its branches assisting customers to deposit money in any branch of the same bank.

Uses of computers in the banking sector –

- Online Banking (e-banking)
- Electronic Fund Transfer (EFT) Transactions
- Reading and sorting cheques with the help of
- MICR (Magnetic Ink Character Reader)

Additionally, ATM (Automated Teller Machine) is used to either deposit or withdraw cash in/from banks.

Application of Computers

Medical Field

Computers are used in hospitals to maintain a **database of patients' history, diagnosis, X-rays, live monitoring of patients,** etc. Surgeons nowadays use **robotic surgical devices** to perform delicate operations, and conduct surgeries remotely. **Virtual reality technologies** are also used for training purposes. It also helps to monitor the fetus inside the mother's womb.

Application of Computers

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.

Application of Computers

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.

Application of Computers

Military:

➢ Computers are largely used in defense.
➢ 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

Application of Computers

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

Application of Computers

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

Application of Computers

Entertainment:

Computers are used to create entraining things and content attractively so that users can engage with it. Many computer games are also available on the internet which is like traditional games like cheese, football, cricket, etc.

Uses of computers in entertainment are –

➢ Watching Movies
➢ Watching Videos
➢ Listening Songs
➢ Viewing Photos
➢ Playing Online Games, etc.

Capabilities and Limitations Of Computers

➢ The first computer was ENIAC (Electronic Numerical Integrator and Computer).

➢ It occupied about 1,800 square feet.

➢ Though it was very helpful during those times, it wasn't very efficient.

➢ It weighed almost 50 tons.

➢ Computers have evolved a lot since then but just as every coin has two sides i.e, Capabilities and Limitations of Computer Systems.

Capabilities Of Computer System

Capabilities of a computer system are the qualities of the computer that put it in a positive light and make the user experience more efficient.

Few capabilities of Computer are listed below:
- **Speed**
- **Accuracy**
- **Reliability**
- **Adaptability**
- **Storage**

Capabilities Of Computer System

➢ **Speed:**
  - Speed means the duration computer system requires in fulfilling a task or completing an activity.

  - It is well-known that computers need very little time than humans in completing a task.

  - Generally, humans take into account a second or minute as a unit of time.

  - Nevertheless, computer systems have such fast operation capacity that the unit of time is in fractions of a second.

  - Today, computers are capable of doing 100 million calculations per second and that is why the industry has developed Million Instructions per Second (MIPS) as the criterion to classify different computers according to speed.

Capabilities Of Computer System

- ➢ **Accuracy:**
  - Accuracy means the **level of precision** with which calculations are made and tasks are performed.

  - One may invest years of his life in detecting errors in computer calculations or updating a wrong record.

  - A large part of mistakes in Computer Based Information System(CBIS) occurs due to bad programming, erroneous data, and deviation from rules. Humans cause these mistakes.

  - Errors attributable to hardware are generally distinguished and corrected by the computer system itself.

  - The computers **rarely commit errors and do all types of tasks precisely.**

Capabilities Of Computer System

➢ **Reliability:**

- Reliability is the quality due to which the user can stay dependable on the computer.

- Computers systems are well-adjusted to do repetitive tasks.

- They never get tired, bored or fatigued. Hence, they are a lot reliable than humans.

- Still, there can be failures of a computer system due to internal and external reasons.

- Any failure of the computer in a highly automated industry is disastrous.

- Hence, the industry in such situations has a backup facility to take over tasks without losing much of the time.

Capabilities Of Computer System

➢ **Adaptability:**

- Adaptability of computer system means the quality of it to complete a different type of tasks: simple as well as complex.

- Computers are normally versatile unless designed for a specific operation.

- Overall, a daily purpose computer is used in any area of application: business, industry, scientific, statistical, technological and so on

- A general purpose computer, when introduced in a company, can replace the jobs of multiple specialists due to its flexibility.

- A computer system can replace the functions of all these specialists because of being very versatile.

Capabilities Of Computer System

➢ **Storage:**

- Storage is the ability of the computer to store data in itself for accessing it again in future.

- Nowadays, apart from having instantaneous access to data, computers have a huge ability to store data in a little physical space.

- A general computer system has a capacity of storing and providing online millions of characters and thousands of pictures.

- It is obvious from the above discussion that computer capabilities outperform the human capabilities.

- Therefore, a computer, when used rightfully, will tenfold the effectiveness of an organization.

Limitations Of Computer System

➢ Limitations are the drawbacks of the computer system in which humans outperform them.Few limitations of Computer Systems are

- Lack of common-sense

- Zero IQ

- Lack of Decision making

Limitations Of Computer System

➢ Lack of common-sense:
- This is one of the major limitations of computer systems.

- No matter how efficient, fast and reliable computer systems might be but yet do not have any common sense because no full-proof algorithm has been designed to programme logic into them.

- As computers function based on the stored programme(s), they simply lack common sense.

Limitations Of Computer System

➤ **Zero IQ:**

- Another of the limitations of computer systems is that they have zero Intelligence Quotient (IQ).

- They are unable to see and think the actions to perform in a particular situation unless that situation is already programmed into them.

- Computers are programmable to complete each and every task, however small it may be.

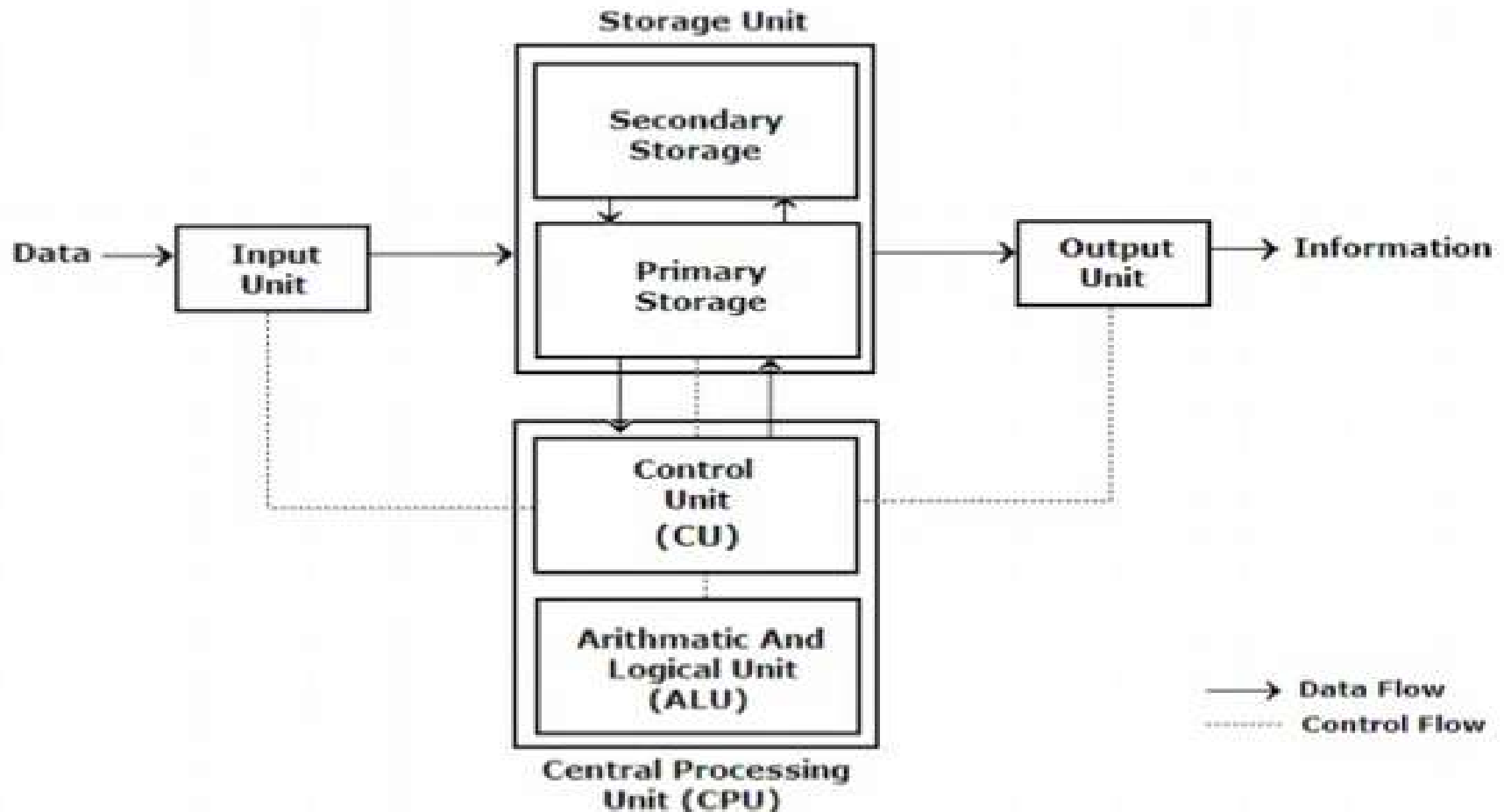# Limitations Of Computer System

➢ **Lack of decision making:**

- Decision-making is a complicated process involving information, knowledge, intelligence, wisdom, and ability to judge.

- The computer system does not have the ability to make decisions on their own because they do not possess all the essentials of decision-making.

- They can be programmed to take such decisions, which are purely procedure-oriented.

- If a computer has not been programmed for a particular decision situation, it will not take a decision due to lack of wisdom and evaluation faculties.

- Human beings, on the other hand, possess this great power of decision-making.

Block Diagram of Computer

Block Diagram of Computer

The Five Basic Operations of a Computer System

- **Inputting:** The process of **entering** data and instructions into the computer system.

- **Storing: Saving** data and instructions to make them readily available for initial or additional processing whenever required.

- **Processing**: Performing arithmetic operations (add, subtract, multiply, divide, etc.) or logical operations (comparisons like equal to, less than, greater than, etc.) on data to convert them into useful information.

- **Outputting**: The process of producing useful information or results for the user such as a printed report or visual display.

- **Controlling**: Directing the manner and sequence in which all of the above operations are performed.

Input Unit

An input unit of a computer system performs the following functions:

- It accepts (or reads) instructions and data from outside world.
- It converts these instructions and data in computer acceptable form.
- It supplies the converted instructions and data to the computer system for further processing.

Eg: keyboards, mouse, scanners, digital cameras and joysticks.

Output Unit

An output unit of a computer system performs the following functions:

- It accepts the results produced by the computer, which are in code form and hence, cannot be easily understood by us.

- It converts these coded results to human acceptable (readable) form.

- It supplies the converted results to outside world.

Eg: monitor, screen, projector, printer, etc.

Storage Unit

**The storage unit of a computer system holds (or stores) the following :**

- Data and instructions required for processing (received from input devices).
- Intermediate results of processing.
- Final results of processing, before they are released to an output device.

Storage unit is divided into two parts:
1. Primary Storage
2. Secondary Storage

Central Processing Unit (CPU)

It is the **heart** of a computer system. It is responsible for controlling the operations of all other units of a computer system.

Arithmetic Logic Unit (ALU)	+	Control Unit (CU)	=	Central Processing Unit (CPU)
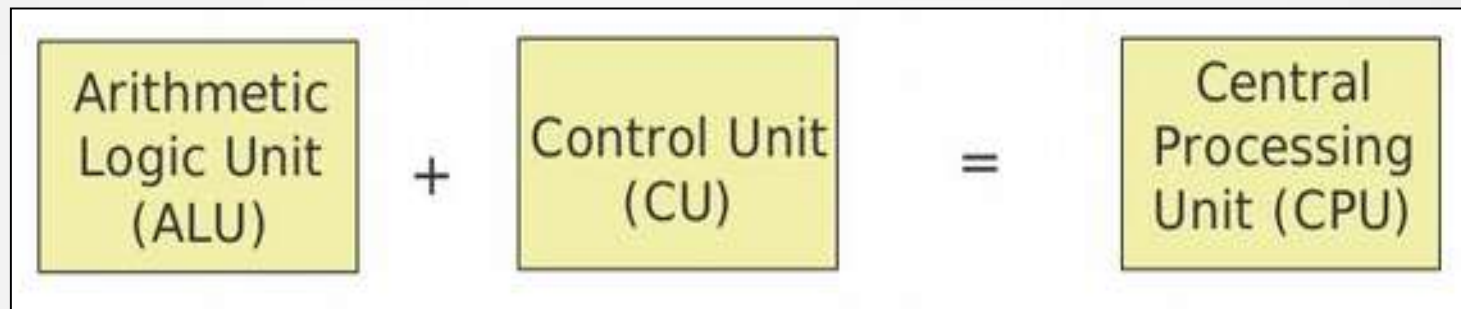
Arithmetic Logic Unit (ALU)

Arithmetic Logic Unit of a computer system is the place where the **actual executions** of instructions takes place during processing operation.

Control Unit (CU)

Control Unit of a computer system **manages** and **coordinates** the operations of all other components of the computer system