

## 4- TYPES OF COMPUTERS

### 4-1 Analog computer

These systems were the first type to be produced. It is an electronic machine capable of performing arithmetic functions on numbers which are represented by some physical quantities such as temperature, pressure, voltage, etc. Analog refers to circuits or numerical values that have a continuous range. Popular analog computer used in the 20<sup>th</sup> century was the slide rule.

### 4-2 Digital Computers

Virtually all modern computers are digital. Digital refers to the processes in computers that manipulate binary numbers (0s or 1s), which represent switches that are turned on or off by electrical current. A bit can have the value 0 or the value 1, but nothing in between 0 and 1. A desk lamp can serve as an example of the difference between analog and digital. Digital computers are more common in use and it will be our focus of discussion.

### 4-3 Hybrid Computer

This is when a computer makes use of both analog and digital components and techniques. Such computers require analog to digital and digital to analog converters which will make analog and digital data palatable to it. The basic classification nowadays uses the following:

#### 1- The Desktop



A computer is referred to as "desktop" when it is relatively small enough to be positioned on top of a table where a person is working. Such a computer can also be placed on the floor or somewhere under, or aside of, the table, in which case the monitor would be placed on top of the table. This is the most common type of computers used in the office or at home. A desktop computer is made of different parts that are connected with cables.

#### 2- The Laptop



A computer is called laptop when it combines the CPU, the monitor, the keyboard, and the mouse in one unit to be so small that you can carry it on your laps when traveling or commuting.

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A laptop is also called a notebook. Other parts, such as an external mouse, an external keyboard, or peripherals such as a printer or a projector, can be connected to the laptop. A laptop is only physically smaller than a desktop but, everything considered, it can do anything that a desktop can do.

### 3- The Server



A server is a computer that holds information that other computers, called workstations, can retrieve. Such workstations are connected to the server using various means. This means that they could be connected

using cable, wireless connection, etc. Only computers that maintain a type of connection with the server can get the information that is stored in the server. Normally, although not particularly recommended, any computer, including a desktop or even a laptop can be used as a server, as long as it can do the job required. A server is more defined by the program (called an operating system) that is installed in it, not how the machine looks.

Any type of computer, including a desktop, a laptop, a CD or DVD machine, etc can be connected to a server. The person who sets up a server also defines the types of connections it is made for.

### 4- The Mainframe



A mainframe is a computer, usually physically big, that does almost all the jobs for other types of computers that are connected to it. Like a server, the program (operating system) that runs in the mainframe defines its role.

## 4-4 ANATOMY OF COMPUTER SYSTEM

A typical computer system irrespective of its size, class or type consists of hardware and software, integrated and harmonized together to perform computational work (scientific or military) or data processing.

### 4-4-1COMPUTER HARDWARE

**Hardware system:** Computer hardware consists of the components that can be physically handled. It refers to the physical units or machine of functional units, which makes up the computer configuration which is done to suit the goals and objectives of the user. The function of these components is typically divided into

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three main categories: input, output, and storage. Components in these categories connect to microprocessors, specifically, the computer's central processing unit (CPU), the electronic circuitry that provides the computational ability and control of the computer, via wires or circuitry called a bus. Hardware may be classified into Central Processing Units (CPU) and the peripherals. The CPU entails Control Unit (CU), Arithmetic and Logic Unit (ALU) and the Internal Memory Unit (IMU) or main memory. The peripherals consist of the input, output and Auxiliary Storage Units.

**Strictly speaking, computer is made up of distinct elements include:**

- 1- A central processing unit (ALU and CU)
- 2- Input unit
- 3- Output unit
- 4- Storage unit (Internal and Auxiliary)
- 5- The communication network; 'bus' that links all the elements of the system, and connects the
- 6- External world. (Cables and Cords)

**4-4-2 MOTHERBOARD:**

The motherboard is a printed circuit board that connects other components through the use of traces, or electrical pathways. The motherboard is indispensable to the computer and provides the main computing capability. Personal computers normally have one central processing unit (CPU) on the motherboard.

1- THE CENTRAL PROCESSING UNIT (CPU)

This is the main brain of the computer that accepts data, performs operations on the data and sends out the result. Information from an input device or from the computer's memory is communicated via the bus to the Central Processing Unit (CPU), which is the part of the computer that translates commands and runs programs. It consists of ALU and CU, and a single chip or series of chips that performs arithmetic and logical calculations and controls the operations of the other elements of the system.

**Most CPU chips are composed of four functional sections:**

1. ALU: Calculating ability either arithmetical or logical operations.
- 2- Registers: Temporary storage areas that hold data, keep tracks of instruction, and hold the location and results of these operations.

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- 3- Control section: Times and regulates the operation of the entire computer system, by using its instruction decoder to read patterns of data in a designated register and translate the patterns into activities, such as addition or comparison.
- 4- Internal Bus: Network of communication lines that connects the internal elements of the processor and also leads to external connectors that links the processor to the other element of the computer.

**The main functions of the microprocessor (CPU chips) include the following:**

- a. Control use of the main storage in storing data and instructions (i.e the ROM).
- b. Control the sequence of operations.
- c. Give commands to all parts of the computer system.
- d. Carry out processing.