

CHAPTER 1 :

General Introduction



1.1. Definitions

1.1.1. Computer science (Informatics):

Is a portmanteau word, made up of information and automatic. Informatics is therefore the automatic processing of information using a computer.

1.1.2. Computer:

Is an automatic information processing machine allowing data to be stored, processed and restored without human intervention by carrying out arithmetic and logical operations under the control of recorded programs.

1.1.3. L'information:

Here means everything that can be processed by the computer (text, numbers, images, sounds, videos, etc.).

Computer science therefore designates a concept or a science, while the computer is a tool or a machine designed to carry out computer operations.

1.2. Architecture of a computer

A computer (Figure 1.1) has a central unit (case) and a set of external peripherals (screen (monitor), keyboard, mouse, printer, modem, scanner, etc.).

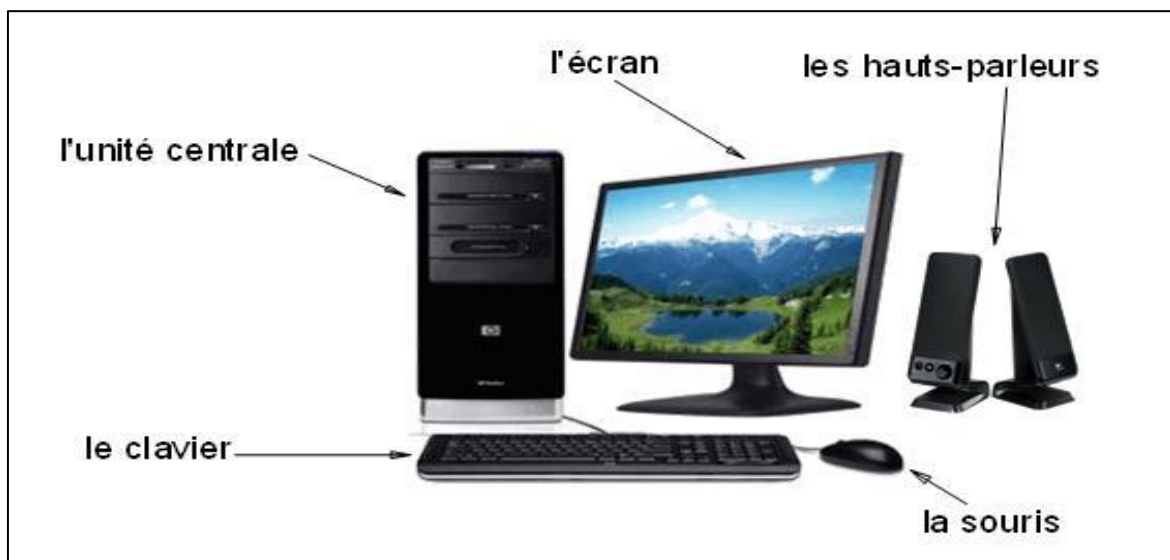


Figure 1.1 : Computer components.

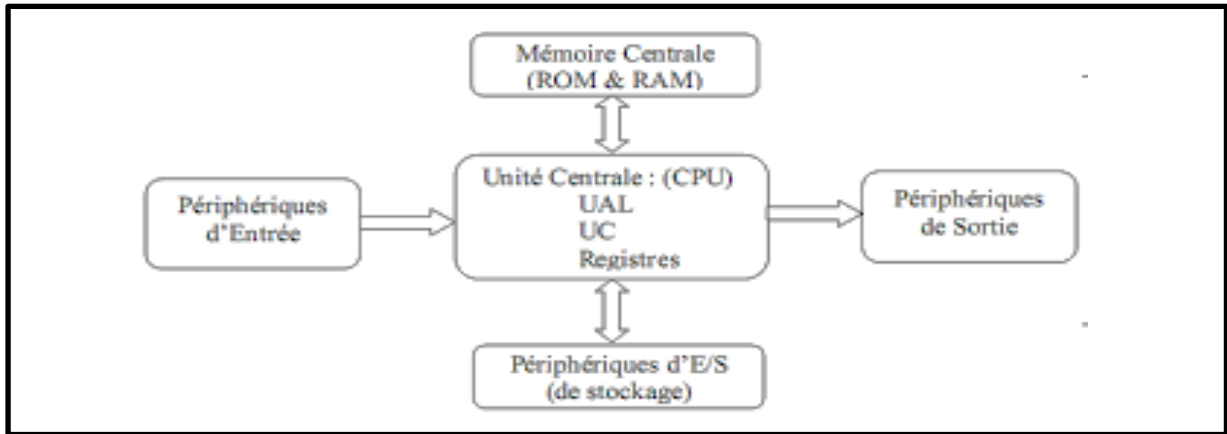


Figure 1.2 : General structure of a computer

The constituent parts of a computer are:

- **Memories:** there are essentially two types of internal memories:
 - **ROM (Read Only Memory):** is a non-volatile, read-only memory that can only be read. It contains information necessary for starting the computer.



Figure 1.3 : Dead memory ROM

- **RAM (Random Access Memory) ou central memory:**

RAM is a living memory (in which the processor can read and write) and volatile (empties when the computer is turned off). It contains the programs and data currently being processed.

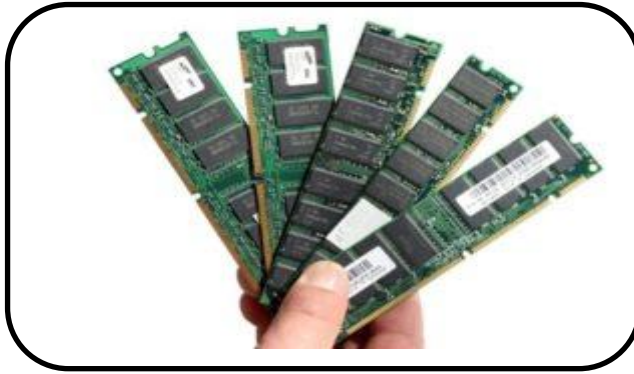


Figure 1.4: Living memory RAM

- **Mass memories or secondary memories :** are storage media which are used to permanently store information (they keep the information even in the absence of electric current). Unlike central memory, secondary memories are slow (example: hard disk (fixed), floppy disk and CD-ROM (removable), etc.). For this, an existing program on the hard drive must be loaded into central memory to be executed.



Figure 1.5: Examples of mass memories

- **Peripherals:** are the organs of the computer that allow it to communicate with the outside world. There are three types of devices:
 - ❖ **Input peripherals :** allow the computer to receive information (example: keyboard, mouse, CD-ROM reader, scanner, etc.).

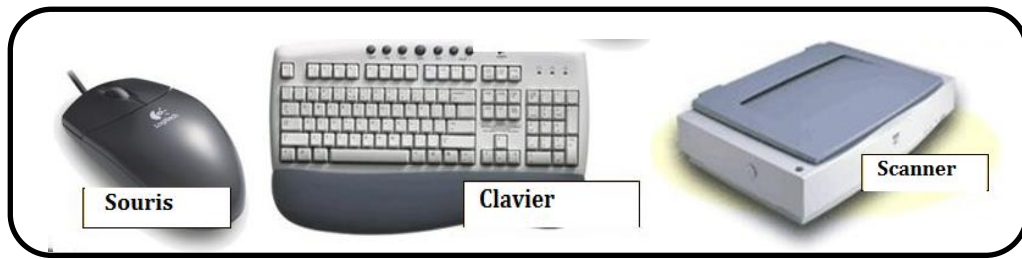


Figure 1.6: Examples of input peripherals

- ❖ **Output peripherals** : allow the computer to provide information (example: screen, printer, burner, etc.).



Figure 1.7: Examples of output peripherals

- ❖ **Input/output peripherals**: allow information to be exchanged in both directions (example: floppy disk drive, modem, etc.).



Figure 1.8: Examples Input/Output peripherals

- **The processor or central processing unit (CPU: Central Processing Unit)** : is

the brain of the computer. Its role is to execute programs stored in central memory by loading the instructions, decoding them and executing them one after the other. The CPU is a complex electronic circuit composed of a control unit (CU) which loads and decodes instructions, and an arithmetic logic unit (ALU) which executes the instructions.



Figure 1.9: Example of a CPU

- **Bus :** is a set of n conductive wires for transmitting data between different units of the computer (1 wire can transmit 1 bit).

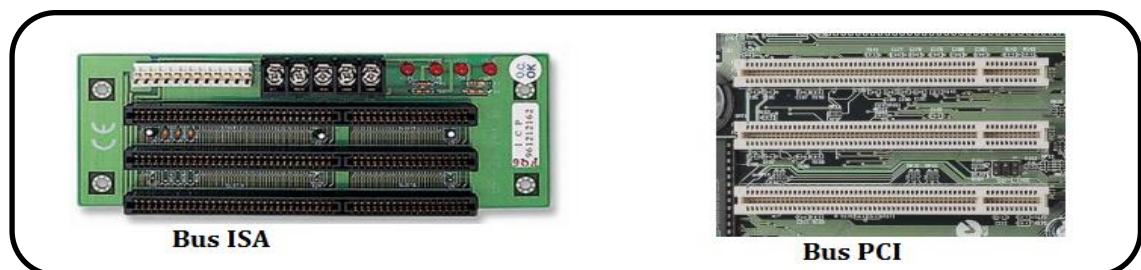


Figure 1.10: Example of Bus

1.3. Generations of computers

☞ First generation (1945-1955) :

The computers are equipped with vacuum tubes.



Figure 1.10: Vacuum tubes.

☞ **Second generation (1955-1965) :**

Replacement of vacuum tubes with transistors.

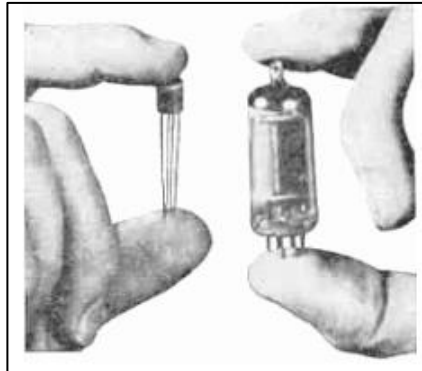


Figure 1.11: Transistor.

☞ **Third generation (1965-1971) :**

Appearance of integrated circuits (chips) and processors which improved capacities and speed.

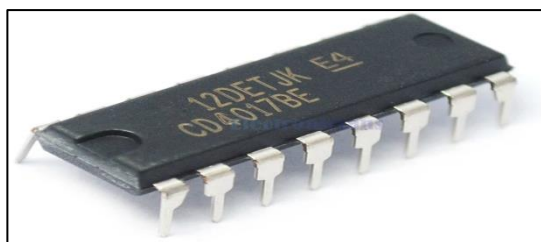


Figure 1.12: Exemple de circuit intégré.

☞ **Fourth generation (1971-.....) :**

- Increase in the number of transistors in chips.
- Personal computers PC (first PC in 1981 by IBM).
- Networks, terminals and multiprocessor machines.