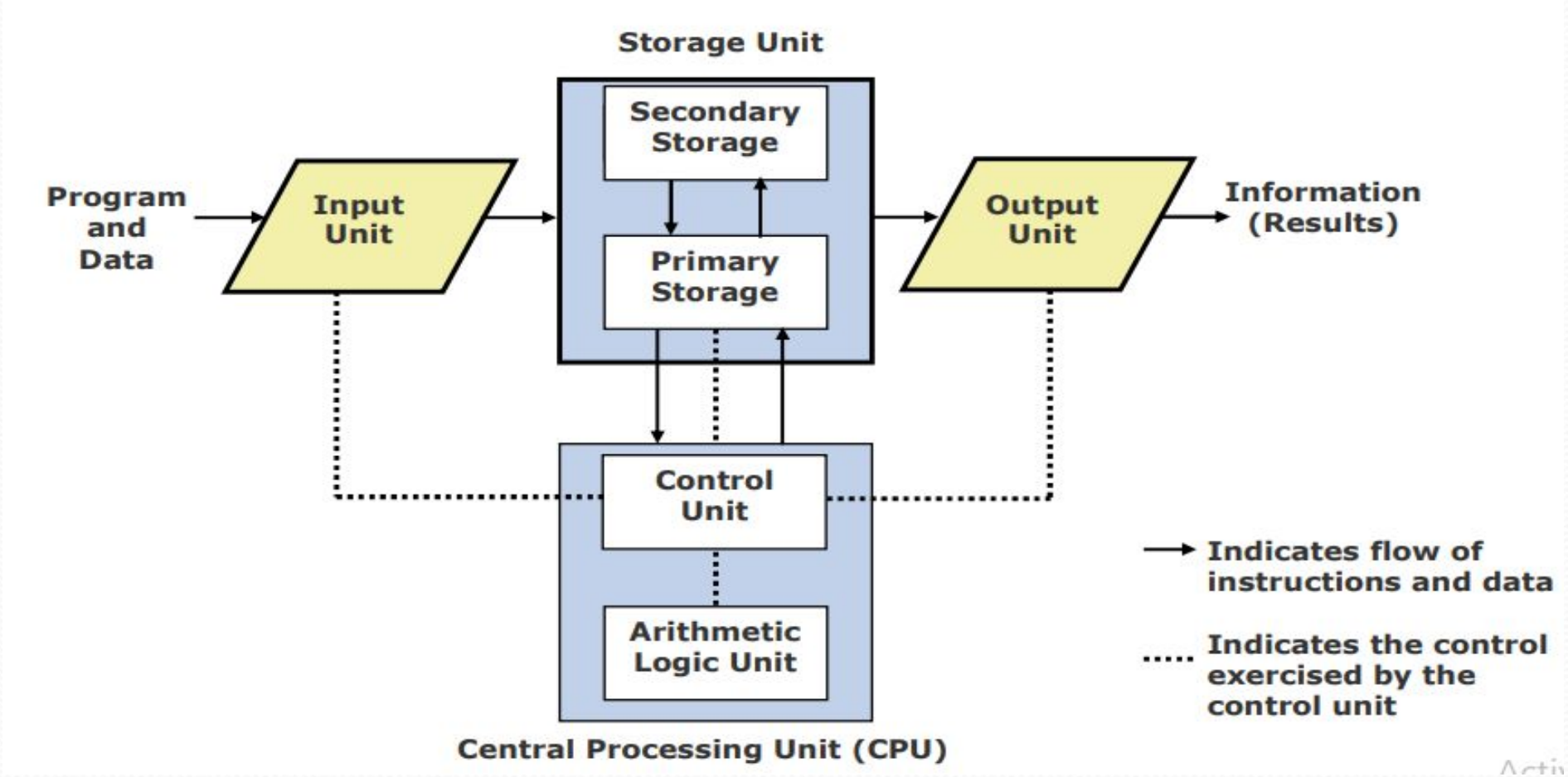
Functional Units of Digital System and their Interconnections

- A computer consists of five main components namely, Input unit, Central Processing Unit, Memory unit Arithmetic & logical unit, Control unit and an Output unit.

Block Diagram of Digital Computer



Input unit

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

1. It accepts (or reads) instructions and data from outside world
2. It converts these instructions and data in computer acceptable form
3. It supplies the converted instructions and data to the computer system for further processing over a cable to either the memory or the processor.

Output Unit

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

1. It accepts the results produced by the computer, which are in coded form and hence, cannot be easily understood by user
2. It converts these coded results to human acceptable (readable) form
3. It supplies the converted results to outside world

Memory unit

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

1. Data and instructions required for processing (received from input devices)
2. Intermediate results of processing
3. Final results of processing, before they are released to an output device
4. The Memory unit can be categorized in two ways namely, primary memory and secondary memory.
5. Primary storage is the fastest memory that operates at electronic speeds. Primary memory contains a large number of semiconductor storage cells, capable of storing a bit of information.
6. It enables a processor to access running execution applications and services that are temporarily stored in a specific memory location.

7. It is also known as the volatile form of memory, means when the computer is shut down, anything contained in RAM is lost.
8. The word length of a computer is between 16-64 bits.
9. The most common examples of primary memory are RAM and ROM.
10. Cache memory is also a kind of memory which is used to fetch the data very soon. They are highly coupled with the processor.
11. Secondary memory is used when a large amount of data and programs have to be stored for a long-term basis.
12. It is also known as the Non-volatile memory form of memory, means the data is stored permanently irrespective of shut down.
13. The most common examples of secondary memory are magnetic disks, magnetic tapes, and optical disks.

Central Processing Unit (CPU)

1. The CPU is called the brain of the computer because it is the control center of the computer. Once the information is entered into the computer by the input device, the processor processes it.
2. It first fetches instructions from memory and then interprets them so as to know what is to be done. If required, data is fetched from memory or input device. Thereafter CPU executes or performs the required computation and then either stores the output or displays on the output device.
3. Control Unit and Arithmetic Logic Unit are the main components of the CPU.

Control unit

1. Control Unit of a computer system manages and coordinates the operations of all other components of the computer system
2. It tells the computer's memory, arithmetic/logic unit and input and output devices how to respond to a program's instructions.
3. The control unit is also known as the nerve center of a computer system.

Arithmetic & logical unit

1. Arithmetic Logic Unit of a computer system is the place where the actual executions of instructions takes place during processing operation
2. It performs arithmetic operations like addition, subtraction, multiplication, division and also the logical operations like AND, OR, NOT operations.