

Computer hardware and software

Every computer is composed of two basic components: **hardware and software**.

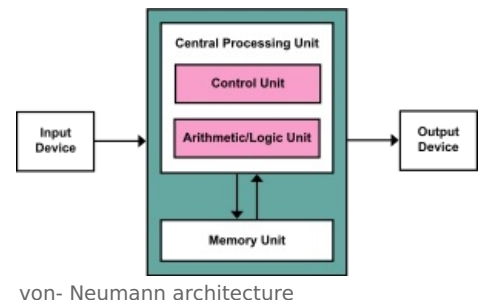
- **Hardware** includes the Physical features, which are every part that you can either see or touch, for example: monitor, case, keyboard, mouse, and printer.
- The part which activates the physical components is called **software**. It includes the features that are responsible for directing the work to the hardware. Software can be divided into the programs and data.

Von-Neumann architecture of the computer

Von-Neumann computer consists of two main components: memory and CPU (Central Processing Unit). The rest of the computer can be viewed as input/output devices for the two main components. This concept has not yet been overcome and even the latest computers still come from von-Neumann architecture.

Application Software

An **application software** is a computer program designed to perform a group of coordinated functions, tasks, or activities. Examples of an application include a word processor, a spreadsheet, an accounting application, a web browser, a media player, or a console game^[1]. Applications may be connected with the computer and its system software or may be published separately, and may be coded as proprietary or open-source.



Operating System

Operating system is defined as a system software that manages computer hardware and software resources and provides common services for computer programs. All application software computer programs require an operating system to function. Operating system controls computer's hardware, run the computer's programs, and organizes files.

CPU

Central processing unit. Unit that brings the instructions from memory to be executed and decoded.

Storing device

Any hardware that can hold information, temporarily or permanently. We distinguish two types of storage: a primary storage device (RAM), and a secondary storage device (hard drive). Secondary storage can be removable, internal, or external storage.

Examples of permanent computer storage:

1. Magnetic storage devices: hard drive, floppy diskette etc.
2. Optical: blu-ray disc, CD-rom disc etc.
3. Flash memory devices: memory card, memory stick, SSD

RAM

It stands for random access memory, it keeps the data and general purpose program that the computer is executing at the moment. RAM is not permanent; its content can be changed and it is erased when the computer is off.

Motherboard

It is the physical arrangement in a computer that contains the computer's basic circuitry and components. It has a socket for the CPU, RAM and expansion part (sound cards, graphic cards ETC) and also connects together the CPU, memory, hard drives, optical drives, video card and more.

Bits and bytes

Bit is the smallest storage unit in the computer. A bit can store just 0 or 1, which is called binary, and therefore can be stored by physical devices or systems that has two separate states. For example 2 positions, or states of an electrical switch, the two states being 'on' and 'off'. A bit can also be described as true/ false, no/ yes etc. Notice that a bit has only two coding options, or 2 values. One bit is too small to be used, and thus computers use a larger storage unit called bytes.

Bytes- are made of bits. 8 bits are used to create 1 byte. Notice that a Byte has 2^8 coding options, 256 values. RAM, hard drives and flash drives, are all types of storages measured by Bytes.

Other storage units:

- 1 KB (kilobytes)= 1024 Bytes
- 1 MB (megabytes)= 1024 KB
- 1 GB (gigabyte)= 1024 MB
- 1 TB (terabyte)= 1024 GB
- 1 PB (petabyte)= 1024 TB

Data

is any set of characters that has been gathered and translated for some purpose, usually analysis. It can be any character, including text and numbers, pictures, sound, or video. If data is not put into context, it doesn't do anything to a human or computer. Within a computer's storage, data is a collection of numbers represented as bytes that are in turn composed of bits.

Information

a meaning change data into information. For instance letter A, is only a data for an illiterate person but an information for someone who can read.

Knowledge

is a familiarity, awareness, or understanding of someone or something, such as facts, information, descriptions or skills, which is acquired through experience or education by perceiving, discovering, or learning. Knowledge can refer to a theoretical or practical understanding of a subject.

Algorithm

is a procedure or formula for solving a problem based on conducting a sequence of specified actions. A computer program can be viewed as an elaborate algorithm. In mathematics and computer science, an algorithm usually means a small procedure that solves a recurrent problem.

References

1. "Application software". *PC Magazine*. Ziff Davis.

external links

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<http://whatis.techtarget.com/definition/algorithm>

<http://www.merriam-webster.com>

<https://web.stanford.edu/class/cs101/bits-bytes.html>