

The Parts of a computer

A computer is an electronic device used to process data, converting the data into information that is useful to people. Any computer is controlled by programmed instructions giving the machine a purpose and telling it what to do. A complete computer system consists of four parts

- o Hardware
- o Software
- o People
- o Data

The mechanical devices that make up the computer are called hardware.

Software is a set of electronic instructions consisting of complex codes called programs that make the computer perform tasks. The software tells the computer what to do.

People are the computer operators also known as users. Even if a computer can do its job without a person sitting in front of it, people still design, build, program and repair it.

Data consists of raw facts which the computer stores and reads in the form of numbers. No matter what the type of data that is entered into the computer – letters, numbers, sounds or images, the computer converts it to numbers.

Within the computer data is organized into files. A computer file is simply a set of data or program instructions that has been given a name. A file that the user can open is often called a document.

Looking inside the machine

The computer itself – the hardware – has many parts but the critical components fall into one of four categories,

- o Processor
- o Memory
- o Input and Output data
- o Storage.

The Processor - The procedure that transforms raw data into useful information is called processing. The computer uses two components to perform this task – the processor and memory. The processor is like the brain of the computer in that it organizes and carries out instructions that come from the user or the software. In a PC the processor consists of one or more microprocessors that are slivers of silicon or other materials etched with many tiny electronic circuits. To process data the computer passes electricity through the circuits to complete an instruction.

The microprocessor is plugged into the computers motherboard – a rigid rectangular card containing the circuitry that connects the processor to the rest of the hardware. The motherboard is a circuit board and many of the other internal devices such as sound cards are housed on their own smaller circuit boards.

A PC's processor is usually a single chip contained on the circuit board. In some powerful computers the processor consists of many chips. In both cases the term CPU – central processing unit – refers to a computer's processor.

Memory is like an electronic scratch pad inside a computer. When you launch a program it is loaded into and run from memory. Data used by the program is also loaded into the memory for faster access. As you enter new data into the computer it is temporarily stored in the memory. The most common type of memory is called random access memory RAM.

One of the most important factors affecting the speed of the computer is the amount of RAM that it has. The most common measurement unit for describing a computer's memory is the byte – the amount of memory that it takes to store a single character.

Input and Output Devices - Computers would be useless if they did not provide interaction with users. Input devices accept data and instructions from the user or from another computer system. Output devices return processed data back to the user or to another computer.

The most common input device is the keyboard. Other popular input devices are the mouse, trackball, touchpads, joysticks, scanners, digital cameras and microphones.

The function of an output device is to present processed data to the user. The most common output devices are the monitor and the printer.

The computer sends output to the monitor when the user needs only to see the output. It sends output to the printer when the user needs a paper copy – also called a hard copy. Stereo speakers or headphones can also be used to produce sound output.

Some types of hardware act as both input and output devices such as touchscreens. The most common type of devices that perform both input and output are communications devices which connect one computer to another – a process known as networking. The most common of these devices is the modem which enables computers to communicate through telephone lines or cable television systems.

Network Interface Cards (NICs) allow users to connect a group of computers to share data and devices.

Storage - To be really useful a computer needs a place to keep program files and related data when not using them. The purpose of storage is to hold data. There are three major differences between storage and memory,

There is more room in storage than memory. Contents are retained in storage even when the computer is turned off. Storage is much slower but much cheaper than memory.

The most common storage medium is the magnetic disk. The device that holds a disk is called the disk drive. Most computers have at least one nonremovable hard disk. There is also a diskette drive allowing you to use removable diskettes. Most removable disks are encased in a plastic or vinyl cover to protect them.

The CD-ROM drive is the next most popular storage device. CDs are a type of optical storage device. A CD-R drive gives you the option to record your own CDs. A CD-RW disk allows you to write multiple times to a CD in a similar way to a floppy disk.

An increasingly popular data storage technology is the Digital Versatile Disk - DVD

Software – Bringing the machine to life.

Computers can be applied to many different tasks. The ingredient that allows the computer to perform a specific task is software which consists of electronic instructions.

When a computer is using a particular program it is said to be running or executing the program. Most software falls into two major categories system software and application software.

The major type of **system software** known as the OS **tells the computer how to use its own components.** **Application software tells the computer how to accomplish specific tasks.**

Operating Systems

The first step a computer goes through after the power has been turned on is the power on self test (POST). The computer identifies all devices attached to it, identifies the available memory and does a quick check on the memory to see if it is functioning correctly. Next the computer looks for the OS usually stored on the hard disk. The OS tells the computer how to interact with the user and how to use the hardware devices attached to the computer. Eg. Windows 98, Windows 2000, Windows XP.

Application software

Application software tells the computer how to accomplish tasks the user requires. Some important kinds of application software are word processing programs, spreadsheets, database management software, presentation programs, graphics programs, multimedia authoring applications, entertainment and education software. Web design tools and Web browsers, Internet applications, utilities and networking and communications software. E.g. Microsoft Word, Microsoft Excel, Microsoft Powerpoint.

4 types of file organization

1. Partially indexed files
2. Fully indexed files
3. Direct access files
4. External sorts