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computer hardware

Computer hardware is a collective term used to describe any of the physical components of an analog or digital computer.

What is computer hardware?

Computer hardware is a collective term used to describe any of the physical components of an analog or digital computer. The term hardware distinguishes the tangible aspects of a computing device from software, which consists of written, machine-readable instructions or programs that tell physical components what to do and when to execute the instructions.

Hardware and software are complementary. A computing device can function efficiently and produce useful output only when both hardware and software work together appropriately.

Computer hardware can be categorized as being either internal or external components. Generally, internal hardware components are those necessary for the proper functioning of the computer, while external hardware components are attached to the computer to add or enhance functionality.

What are internal computer hardware components?

Internal components collectively process or store the instructions delivered by the program or operating system (OS). These include the following:

Motherboard. This is a printed circuit board that holds the central processing unit (CPU) and other essential internal hardware and functions as the central hub that all other hardware components run through.

CPU. The CPU is the brain of the computer that processes and executes digital instructions from various programs; its clock speed determines the computer's performance and efficiency in processing data.

RAM. RAM -- or dynamic RAM -- is temporary memory storage that makes information immediately accessible to programs; RAM is volatile memory, so stored data is cleared when the computer powers off.

Hard drive. Hard disk drives are physical storage devices that store both permanent and temporary data in different formats, including programs, OSes, device files, photos, etc.

Solid-state drive (SSD). SSDs are solid-state storage devices based on NAND flash memory technology; SSDs are non-volatile, so they can safely store data even when the computer is powered down.

Optical drive. Optical drives typically reside in an on-device drive bay; they enable the computer to read and interact with nonmagnetic external media, such as compact disc read-only memory or digital video discs.

Heat sink. This is a passive piece of hardware that draws heat away from components to regulate/reduce their temperature to help ensure they continue to function properly. Typically, a heat sink is installed

directly atop the CPU, which produces the most heat among internal components.

Graphics processing unit. This chip-based device processes graphical data and often functions as an extension to the main CPU.

Network interface card (NIC). A NIC is a circuit board or chip that enables the computer to connect to a network; also known as a network adapter or local area network adapter, it typically supports connection to an Ethernet network.

This computer hardware chart below illustrates what typical internal computer hardware components look like.

What are external hardware components?

External hardware components, also called peripheral components, are those items that are often externally connected to the computer to control either input or output functions. These hardware devices are designed to either provide instructions to the software (input) or render results from its execution (output).

Common input hardware components include the following:

Mouse. A mouse is a hand-held pointing device that moves a cursor around a computer screen and enables interaction with objects on the screen. It may be wired or wireless.

Keyboard. A keyboard is an input device featuring a standard QWERTY keyset that enables users to input text, numbers or special characters.

Microphone. A microphone is a device that translates sound waves into electrical signals and supports computer-based audio communications.

Camera. A camera captures visual images and streams them to the computer or through a computer to a network device.

Touchpad. A touchpad is an input device, external or built into a laptop, used to control the pointer on a display screen. It is typically an alternative to an external mouse.

USB flash drive. A USB flash drive is an external, removable storage device that uses flash memory and interfaces with a computer through a USB port.

Memory card. A memory card is a type of portable external storage media, such as a CompactFlash card, used to store media or data files.

Other input hardware components include joysticks, styluses and scanners.

Examples of output hardware components include the following:

Monitor. A monitor is an output device similar to a TV screen that displays information, documents or images generated by the computing device.

Printer. Printers render electronic data from a computer into printed material.

Speaker. A speaker is an external audio output device that connects to a computer to generate a sound output.

Headphones, earphones, earbuds. Similar to speakers, these devices provide audio output that's audible only to a single listener.

Components of a Computer

The five classic components of a computer are briefly described below. Each component is discussed in more detail in its own section. The operation of the processor is best understood in terms of these components.

Datapath - manipulates the data coming through the processor. It also provides a small amount of temporary data storage.

Control - generates control signals that direct the operation of memory and the datapath.

Memory - holds instructions and most of the data for currently executing programs.

Input - external devices such as keyboards, mice, disks, and networks that provide input to the processor.

Output - external devices such as displays, printers, disks, and networks that receive data from the processor.

أسئلة طرحها الآخرون

What are the 10 computer components?

There are four main computer hardware components that this blog post will cover: input devices, processing devices, output devices and memory (storage) devices. Collectively, these hardware components make up the computer system.٢٠٢٠/١٠/١٦

Input Unit

A computer will only respond when a command is given to the device. These commands can be given using the input unit or the input devices.

For example: Using a keyboard we can type things on a Notepad and the computer processes the entered data and then displays the output of the same of the screen.

The data entered can be in the form of numbers, alphabet, images, etc. We enter the information using an input device, the processing units convert it into computer understandable languages and then the final output is received by a human-understandable language.

utput Unit

result. This result is called output. There are various output devices connected to the computer. The most basic of which is a monitor. Whatever we write using a keyboard or click using a mouse, is all displayed on the monitor.

Thus, the output unit gives us the final result once the entire processing is done within the mechanism of a device.

For example: when we visit an ATM, we enter our details like language, pin, amount to be withdrawn, etc. and then the final money which the cash dispenser releases is our outcome. In this case, the cash dispenser acts as an output unit.

Memory Unit

When we enter the data into the computer using an input device, the entered information immediately gets saved in the memory unit of the Central Processing Unit (CPU). Because of the presence of some existing programming, the Memory Unit transmits the data further to the other parts of the CPU.

Similarly, when the output of our command is processed by the computer, it is saved in the memory unit before giving the output to the user.

Control Unit

This is the core unit which manages the entire functioning of the computer device. It is one of the most essential components of the computer system.

The Control Unit collects the data entered using the input unit, leads it on for processing and once that is done, receives the output and presents it to the user. It can be said to the centre of all processing actions taking place inside a computer device.

Basically, the instructions taken, interpretation of entered data, issuing signals to execute the data and then finally retrieving the data is all done in the Control Unit.

Arithmetic & Logical Unit

As the name suggests, all the mathematical calculations or arithmetic operations are performed in the Arithmetic and Logical Unit of the CPU.

It can also perform actions like a comparison of data and decision-making actions. The ALU comprises circuits using which addition, subtraction, multiplication, division and other numerical based calculations can be performed.