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Understanding What is Inside Your Computer and How it Works

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Why is it Important to Understand Computer parts?

Computers are abundant in the life we live now. Everyone uses computers but the average person does not understand how a computer functions or what exactly they are paying for, in terms of its specifications. Most people heavily rely on computers today so it is in their best interest to understand a basic computer's components, functions, and cost. If you can understand this, it is possible for you save money when purchasing or seeking repairs on your device.

It is imperative to understand the name and function of each component in a computer in order to understand how it functions as a whole. Attempt to always remember that a computer is based off the human body and functions in the same way. You cannot expect to understand the human body without first understanding its organs and their functions. A computer is composed of components in the same way that the body is composed of organs that together work to make the body or computer function. A basic computer has at least 8 basic components which include a computer case or tower, motherboard, Central Processing Unit (CPU), Power Supply Unit (PSU), Random Access Memory (RAM), hard drive (HDD), Graphic Processing Unit (GPU) and some type of optical drive which would be your CD/DVD drive. These 8 components are the backbone of every healthy, functioning computer.

It is easy to memorize the parts of a computer but slightly trickier to understand each part's function. Understanding this will make your knowledge of technology immensely powerful.

Computer Case:

The computer case is an enclosure that holds all the wires and components of the computer inside it. It is like the human skeletal system. Inside it are all the parts necessary for a computer to function. It keeps them safe and securely attached so that they do not shift freely and allows for air ventilation to prevent overheating. You will want to invest in something that is sturdy but it does not need to necessarily be extremely expensive, flashy or glamorous. As long as it holds the items together securely its role has been fulfilled. Look to spend $40-$100 here depending on how much you care about the cosmetics of your computer or gaming rig.

Motherboards

Motherboards, often referred to as a logic board, main board or "mobo" for short, are the "back-bone" of the computer. Its purpose is to connect all the parts of the computer together and make everything centralized using its printed circuit board. The central processing unit, hard drives, memory, graphic processing unit, printers, and other ports all connect to the computer directly or via special cables that attach on to the motherboard. When you plug in a USB or thumb drive to a computer you are actually plugging it directly into the computer! You will want to spend between $40-$200 on a motherboard depending on how demanding your needs are. On average a motherboard is about $80-$90 for something that is not too basic or too elite. It is important that you pick a motherboard that has all the types of ports you may need in the future. In the past, it was important to purchase sound cards (in charge of allowing your computer to play audio for all college parties we love) but today they tend to be integrated into the motherboard already so you are actually saving money thanks to technological advances! If you are tight on a budget it is recommended that you do not cheap out on the motherboard since all your computer parts will run according to the specifications of the slots available on the motherboard. You want to spend your big bucks here to guarantee you receive a system circuit or nervous system that can perform for a prolonged period like the human body.

CPU

The next most important component is the CPU, central processing unit, which is "the brains" of a computer. Jeremy Laird, an avid tech journalist, says that the CPU's "function is to select instructions, process them, perform arithmetic and logical comparisons, and store results of operations in memory," (Laird). Most computers today have two or more CPUs to help maximize potential and processing power. Have you ever wondered what the "dual-core" or "quad-core" labels on your computer meant? Simply put, "dual-core" refers to two CPUs as opposed to "quad-core" which is four CPUs and the general standard today. Generally, the more CPU cores you have, the faster your computer will be able to complete requests made by the user such as exporting a movie file. The two major corporations to produce this part are Intel and AMD. It is personal preference which company you choose but statistically speaking and from personal experience Intel processors outperform AMD so that is something to be aware of. Depending on what your needs are it is recommended you spend $60-$300. The better brain you have, the more tasks you can take on and complete in shorter time duration. If you plan on doing heavily demanding things such as video editing, photo editing, gaming, or programming robust programs it is highly recommended to get the best CPU in the market or close to it. Today that would be an Intel i7 Sandy Bridge Quad-Core CPU.

Power Supply

Humans eat food to acquire important nutrients to maintain health and provide energy for the body. This energy is what enables us to do work and complete tasks. In the same way that we eat to acquire this energy a computer utilizes a power supply unit (PSU), which is in charge of bringing electrical power to the computer. The PSU helps convert AC (alternating currents) from your home to the DC (direct current) needed to power your computer components. You want to make sure you don't cheap out on this because it supplies power to all the parts and peripherals (USB, external hard drives, hubs, mouse, keyboard, etc.) you enjoy when you use your computer. By purchasing a reliable PSU, you are ensuring that all your components are capable of working to max capacity at all times and also provides that extra boost of energy to help you get through your school work, intense gaming, or designing. Athletes eat to maintain their body's health and energy in the same way that computer builders pick PSU that are durable and reliable to maximize component potential.

Hard Drives

If you've ever wondered where all your information goes when you enter it onto a Word Document and continue to save it, the answer is the hard drive. It is known as permanent memory and is not volatile, meaning it does not get erased when the power is shut off. This type of memory is where all your documents, pictures, programs, videos and movies are stored and kept safely. As technology has grown to be more universal and cheaper to produce, the price of hard drives have dramatically decreased. Manufacturers will often offer 500GB drives for $50-65. It is possible to buy a 1TB drive for roughly $80-90, which is more than enough for most people. The more sufficient space you have to save your files the better. When purchasing a hard drive it is important to note whether it is 5400RPM or 7200RPM. RPM stand for rotation per minute and these relate to how fast the drive can read and write data. Of course 7200RPM is what you want to aim for since we are a part of the instant glorification age.

Memory (Random Access Memory)

It starts to get a little confusing here differentiating between hard drive memory and random access memory but there is a clear distinction which most people cannot identify until they are told. Have you ever wondered why when you try to buy a computer the sales associate insists you get more RAM (Random Access Memory) so that your computer is faster? Well, they never really told you the real reason behind that logic I'm guessing. Random Access memory, often referred to as RAM, is memory that can be accessed randomly. Likewise, when your brain can recall from memory quickly it is able to better react to situations or problems. This is special to computers because they can only manipulate data that is on the main memory. Therefore, every program you execute or every file you access must be moved from the hard drive into the memory. The amount of main memory on a computer is vital, as explained by Edward Felten, the director of Princeton University's Center for Information Technology Policy, because it is the "determining factor in how many programs can run simultaneously or how much data can be available for a certain program at any given time" (Felten). Imagine your brain capped off at a certain point in memory recall. This would be disastrous during a test because you would be unable to recall facts. In the same way you want to have enough RAM

so you can easily run programs simultaneously and allow them all to run sufficiently. Essentially, RAM will allow you to execute multiple programs at once without suffering lag or long loading times. If your budget allows, try to purchase 6-12GB of ram depending if you are a low-end user or gamer which will cost you anywhere from $40-$100.

GPU/Graphic Cards/Video Cards

Now it is time to look at how your computer puts out such beautiful visuals. This is no miracle. The Graphics processing unit (GPU) often referred to as a graphics card is used primarily for 3D applications. NVIDIA, a global corporation that manufactures graphics processors, mobile technologies, and desktop computers defines a GPU as a "single chip process that aids in creating lighting effects and transforming objects every time a 3D scene is redrawn" (Britannica). This is the equivalent to how your eyes function and relate your beautiful visual sensory details to your brain. These calculations are extremely mathematically intensive tasks that would put fair amount of strain on the CPU. By allowing the GPU to take over these tasks it enable the CPU to tend to other non-visual related calculations that the computer needs to function. GPU's are interesting since they are manufactured by either NVIDIA or Radeon and can range from $40-$1000 or more. The GPU do not have a limit and are always being tested to find the next generation of technology that can duplicate the visuals we see as humans.

Optical Drives

The final part is an optical drive. We are all familiar with this and tend to use them often. An optical drive is just a fancy word for a CD or DVD drive. These are used to read or write data from discs which can then be removed and carried. Blu-Ray readers are the new technology standard for movies but overall as a removal memory they have become almost obsolete due to the creation of USB's and thumb drives. Not only are USBs easier to carry, but also so cheap that everyone has one on their key chains these days.

By understanding these basic functions of each computer component you have enabled yourself to become a more educated consumer. You can now understand if a sales person is simply pressing your wallet for more sales revenue and commission or if they are truly helping you in your purchase. Technology has become so prevalent in our lives that this information will serve as the basis for you to expand your knowledge if you choose. If not, the basics allow you to understand what you are purchasing and how efficient it will be for your personal or business needs.

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