Ministry of Higher Education and Scientific Research

Al-Mustaqbal University

College of Engineering

Medical Instrumentation Techniques Engineering Department

Computer Application

One Class

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Software and hardware relationship

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introdiction

Software and hardware are interdependent components of a computer system. Hardware refers to the physical components like the central processing unit (CPU), memory, storage devices, and input/output devices. Software, on the other hand, includes the programs and data that run on the hardware.

The relationship between them is crucial for the functioning of a computer. Software instructs the hardware on how to perform specific tasks, and the hardware executes these instructions. Without software, hardware is inert, and without hardware, software has no platform to run on.

In essence, they work together to enable the functionality and operation of a computer system. Changes or advancements in hardware can influence the performance and capabilities of software, and vice versa. It's a symbiotic relationship that defines the capabilities and efficiency of a computing system.

Relationship between Hardware and Software

•Hardware and software are mutually dependent on each other.

Both of them must work together to make a computer produce

a useful output.

•Software cannot be utilized without supporting hardware.

•Hardware without set of programs to operate upon cannot be

utilized and is useless.

•To get a particular job done on the computer, relevant software

should be loaded into the hardware

•Hardware is a one-time expense.

•Software development is very expensive and is a continuing expense.

•Different software applications can be loaded on a hardware to run different jobs.

•A software acts as an interface between the user and the hardware.

•If hardware is the 'heart' of a computer system, then software is its 'soul'. Both are complimentary to each other.

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Computer Memory

•Memory is used to store the information (programs and data) that the computer is currently using. It is sometimes called main or primary memory.

•RAM - random access memory. This means that any location in memory may be accessed in the same amount of time as any other location. Memory access means one of two things, either the CPU is reading from a memory location or the CPU is writing to a memory location. When the CPU reads from a memory location, the contents of the memory location are copied to a CPU register.

When the CPU writes to a memory location, the CPU copies the contents of a CPU register to the memory location, overwriting the previous contents of the location. The CPU cannot carry out any other operations on memory locations.

•RAM is a form of short term or volatile memory. Information

stored in short term storage is lost when the computer is switched off (or when power fails e.g. if you pull out the power lead!). There is therefore a requirement for permanent or long term storage which is also referred to as secondary storage or auxiliary storage. This role is fulfilled by disk and tape storage

Random Access Memory (RAM)

RAM(Random Access Memory) is the internal memory of the CPU for storing data, program and program result. It is read/write memory which stores data until the machine is working. As soon as the machine is switched off, data is erased.

Access time in RAM is independent of the address that is, each storage location inside the memory is as easy to reach as other locations and takes the same amount of time. Data in the RAM can be accessed randomly but it is very expensive.

RAM is volatile, i.e. data stored in it is lost when we switch off the computer or if there is a power failure. Hence a backup uninterruptible power system(UPS) is often used with computers. RAM is small, both in terms of its physical size and in the amount of data it can hold.

RAM is of two types

•Static RAM (SRAM)

•Dynamic RAM (DRAM)