Management Information System
Referred Book
James_OBrien_George_Marakas_Management_Information_Systems_10th_ Edition
C h a p t e r **3 Computer Hardware**

1. What is hardware?
Ans:
Computer hardware (usually simply called '**hardware**' when a computing context is concerned) is the collection of physical elements that constitutes a computer system. Computer hardware is the physical parts or components of a computer, such as the monitor, mouse, keyboard, computer data storage, hard disk drive (HDD), graphic cards, sound cards, memory (RAM), motherboard, and so on, all of which are physical objects that are tangible.[1] In contrast, software is instructions that can be stored and run by hardware.

2. Types of computers system.
Ans:
Today's computer systems come in a variety of sizes, shapes, and computing capabilities. Categories such as *mainframe, midrange,* and *microcomputer* systems are still used to help us express the relative processing power and number of end users that can be supported by different types of computers.

Supercomputer

The most powerful computers in terms of performance and data processing are the Supercomputers. These are specialized and task specific computers used by large organizations. These computers are used for research and exploration purposes, like NASA uses supercomputers for launching space shuttles, controlling them and for space exploration purpose. The supercomputers are very expensive and very large in size. It can be accommodated in large air-conditioned rooms; some super computers can span an entire building.

Uses of Supercomputers

In Pakistan Supercomputers are used by Educational Institutes like NUST for research purposes. Pakistan Atomic Energy commission & Heavy Industry Taxila uses supercomputers for Research purposes.

Space Exploration

Supercomputers are used to study the origin of the universe, the dark-matters. For these studies scientist use IBM's powerful supercomputer "Roadrunner" at National Laboratory Los Alamos.

Earthquake studies

Supercomputers are used to study the Earthquakes phenomenon. Besides that supercomputers are used for natural resources exploration, like natural gas, petroleum, coal, etc.

Weather Forecasting

Supercomputers are used for weather forecasting, and to study the nature and extent of Hurricanes, Rainfalls, windstorms, etc.

Nuclear weapons testing

Supercomputers are used to run weapon simulation that can test the Range, accuracy & impact of Nuclear weapons.

Popular Supercomputers

- IBM's Sequoia, in United States
- Fujitsu's K Computer in Japan
- IBM's Mira in United States
- IBM's Super MUC in Germany
- NUDT Tianhe-1A in China

Mainframe computer

Although Mainframes are not as powerful as supercomputers, but certainly they are quite expensive nonetheless, and many large firms & government organizations uses Mainframes to run their business operations. The Mainframe computers can be accommodated in large air-conditioned rooms because of its size. Super-computers are the fastest computers with large data storage capacity, Mainframes can also process & store large amount of data. Banks educational institutions & insurance companies use mainframe computers to store data about their customers, students & insurance policy holders.

Popular Mainframe computers

- Fujitsu's ICL VME
- Hitachi's Z800

Minicomputer

Minicomputers are used by small businesses & firms. Minicomputers are also called as "Midrange Computers". These are small machines and can be accommodated on a disk with not as processing and data storage capabilities as super-computers & Mainframes**.** These computers are not designed for a single user. Individual departments of a large company or organizations use Mini-computers for specific purposes. For example, a production department can use Mini-computers for monitoring certain production process.

Popular Minicomputers

- K-202
- Texas Instrument TI-990

- SDS-92
- IBM Midrange computers

Microcomputer

Desktop computers, laptops, personal digital assistant (PDA), tablets & smart phones are all types of microcomputers. The micro-computers are widely used & the fastest growing computers. These computers are the cheapest among the other three types of computers. The Micro-computers are specially designed for general usage like entertainment, education and work purposes. Well known manufacturers of Micro-computer are Dell, Apple, Samsung, Sony & Toshiba.

Desktop computers, Gaming consoles, Sound & Navigation system of a car, Net books, Notebooks, PDA's, Tablet PC's, Smartphone, Calculators are all type of Microcomputers.

Microcomputers are the most important category of computer systems for business, people and consumers. Although usually called a *personal computer*, or PC, a microcomputer is much more than a small computer for use by an individual as a communication device.

Midrange systems are primarily high-end network servers and other types of servers that can handle the large-scale processing of many business applications. Although not as powerful as mainframe computers, they are less costly to buy, operate, and maintain than mainframe systems and thus meet the computing needs of many organizations.

Mainframe systems are large, fast, and powerful computer systems. For example, mainframes can process thousands of million instructions per second (MIPS). Mainframes can also have large primary storage capacities. Their main memory capacity can range from hundreds of gigabytes to many terabytes of primary storage.

The term supercomputer describes a category of extremely powerful computer systems specifically designed for scientific, engineering, and business applications requiring extremely high speeds for massive numeric computations. They use supercomputers for applications such as global weather forecasting, military defense systems, computational cosmology and astronomy, microprocessor research and design, and large-scale data mining.

3. Define Input, Output and Storage Devices with Examples.
Ans:
Input Devices:

Input technologies now provide a more **natural user interface** for computer users. we can enter data and commands directly and easily into a computer system through pointing devices like electronic mice and touch pads and with technologies like optical
scanning, handwriting recognition, and voice recognition, Magnetic stripe, smart cards. digital camera

Output Devices:

Computers provide information in a variety of forms. Video displays and printed documents have been, and still are, the most common forms of output from computer systems. Video displays are the most common type of computer output. Many desktop computers still rely on **video monitors** that use a *cathode ray tube* (CRT) technology **liquid crystal displays** (LCDs) printers are the example of output devices. Speakers, Voice output communication aid, Automotive navigation system, Video, Plotter are the example of output devices.

Storage Device:

Data and information must be stored until needed using a variety of storage methods. The formation of store data in computer memory devices consists are RAM, ROM, Magnetic disk, Optical Disk magnetic tape etc.

4. Define Semiconductor memory. What are the differences between Primary and secondary storage.

Ans:

The primary storage (main memory) of your computer consists of microelectronic semiconductor memory chips. It provides you with the working storage your computer needs to process your applications. Plug-in memory circuit boards containing 256 megabytes or more of memory chips can be added to your PC to increase its memory capacity.

Primary Storage	Secondary Storage
Primary memory storages are temporary	Secondary storage is permanent.
Primary memory is expensive and smaller	Secondary memory is cheaper and larger
Primary memory storages are faster	Secondary memory is slower
Primary memory storages are connected through data buses to CPU	Secondary storages are connect through data cables to CPU
Primary memory is volatile.	Secondary memory is always non volatile
These memories are also called as internal memory	These memories are also called as external memory
Primary memory is the main memory (Hard disk, RAM)	Secondary memory can be external devices like CD, floppy magnetic discs etc.

5. Define RFID.

One of the newest and most rapidly growing storage technologies is radio frequency Identification (RFID) , a system for tagging and identifying mobile objects such as store merchandise, postal packages, and sometimes even living organisms. Using a special device called an **RFID reader,** RFID allows objects to be labeled and tracked as they move from place to place. The RFID technology works using small (sometimes smaller than a grain of sand) pieces of hardware called **RFID chips.** These chips feature an antenna to
Transmit and receive radio signals.