

Computer Science

Pharmacy College.....First Stage

Chapter One

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Chapter I

Basic concept of information technology

1.1 Computer

Information processing machines used in different department & organization. OR. An electronic device for storing and processing data, typically in binary form, according to instructions given to it in a variable program.

- **Computer perform three main operations: -**
 1. Receive input Data.
 2. Process Data.
 3. Produce output. (information which is meaningful data)

1.2 Computer system

The components of computer system are: -

1. **Hardware:** refers to physical part of computer such as (screen, mouse, keyboard, and system box).
2. **Software:** A set of an instruction that tells the computer what to do and how to do it, such as: Word processing, computer games, & Graphics programs.
3. **Users:** A person who use the software on the computer to do some tasks.

1.3 Information Technology (IT)

A set of tools that are used to: Receive process, store, print and transmit information in an electrical form through computers. These forms can be: text, sound, picture or video.

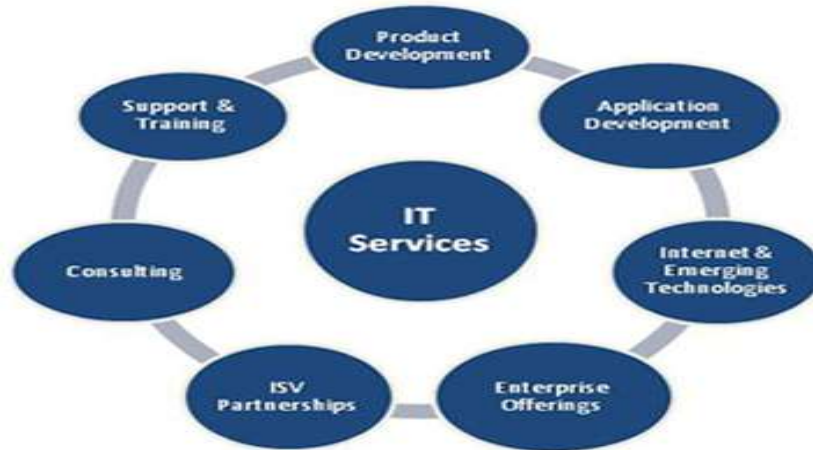


Fig: IT services

Note:

Information Technology (IT)

- This is a general term which relates to the use of computers as an aid to creating and maintaining data, i.e. information. IT is related to all aspects of managing and processing information, especially within a large organisation. Computers are critical to managing information, and computer departments within large organisations are often called IT departments. Alternative phrases are IS departments (Information Services) or MIS departments (Management Information Services). People working with computers within large companies will often refer to their job, as "working in IT".

1.4 Types of computers

According to their capacity, performance, computers classified into: -

Mainframe: (room size, expensive, high speed, very powerful, large storage capacities).

Minicomputer: (the same job as mainframe).

Personal computer: (PC_s).

Laptop computer:

Palmtop: (Note pad).

Network computer {NC}: (a large PC type computer called a *server* is connected to smaller PC_s called *clients or terminals*).

Super computer: (computer with very high speed, used in large scientific and research laboratories, weather forecasting, speed operation, and so on. Cost several million Dollars).

What is a mainframe computer?

- Mainframe computers are the big, powerful, expensive computers used in the background by most large organisations. The power of the mainframe can be distributed amongst many people accessing the mainframe via their own PC. Organisations such as large insurance companies would use the mainframe to keep track of their policyholders and send out renewal notices.



What is Minicomputer?

Is a class of smaller computers that evolved in the mid-1960s and sold for much less than mainframe and mid-size computers from IBM and its direct competitors? In a 1970 survey,



Fig: scientifically calculator minicomputer _1970

What is a PC?

- IBM invented the PC (Personal Computer) way back in 1981. All PCs released since then are in many ways compatible with the original design, though many extensions have been made. The term PC compatible relates to PCs manufactured by companies other than IBM which are compatible with the traditional PC specification. In the early days, most PCs ran an operating system called DOS (Disk Operating System). These days most PCs will be running a version of Microsoft Windows.



Fig: PC Computer.

What is a networked computer?

- A network allows you to connect two or more computers together. This allows data stored on one PC to be retrieved by other PCs connected to the network. It also allows the sharing of resources. Thus instead of each PC requiring its own printer to be directly connected to it, you can have a single printer shared amongst many networked PCs. In the early days, to network PCs together was a complicated task, only to be attempted by qualified professionals. These days most people with a good working knowledge of Microsoft Windows can install and configure a Windows based network. However to get the best out of your network, in terms of performance and security, still requires a qualified, experienced technician.



Fig: Network computer.

What are laptop & palmtop computers?

- Laptop computers, as the name implies, are small portable computers which can run on batteries as well as mains power. They use special screens, rather than the traditional bulky VDUs (Visual Display Units), which allows for longer battery life as well as portability. A newer term, "Notebooks", simply

indicates a VERY small laptop. These are especially popular with salespersons on the move or people giving presentations. While they tend to still be more expensive than an equivalent Desktop computer, they can now match the power of a Desktop computer. Palmtops are even smaller computers which can literally fit into the palm of your hand.



Fig: palmtop



Fig: Laptop

Supercomputer:

The fastest type of computer. Supercomputers are very expensive and are employed for specialized applications that require immense amounts of mathematical calculations. For example, weather forecasting requires a supercomputer. Other uses of supercomputers include animated graphics, fluid dynamic calculations, nuclear energy research, and petroleum exploration.

The chief **difference** between a supercomputer and a mainframe is that a supercomputer channels all its power into executing a few programs as fast as possible, whereas a mainframe uses its power to execute many programs concurrently.



Fig: Super computer

What is a Personal Digital Assistant (PDA)?

- These devices use a special pen, rather than a keyboard and can be used for storing and retrieving information. Like most computer devices, many can connect to the Internet. They are extremely compact.



Note: According to their capacity, performance, computers classified into: -

Types of computer - Mainframe

- **Capacity:** Very powerful computers often connected to many individual PCs over a network.

Speed: Much faster than PCs used for processing large amounts of data such as mail-shots, salaries, tax etc.

Costs: Very, very expensive, only affordable by large companies.

Typical Users: Only used by large companies including banks, building societies etc.

Types of computer - PC

- **Capacity:** Large hard disks combined with a large working memory (RAM)

Speed: Fast. Normally measured in GHz.

Costs: Getting cheaper by the day.

Typical Users: Home users, large and small offer users. Education, Doctors. In fact just about everyone needs to know how to operate a PC these days.

Types of computer - Networked PC

- **Capacity:** Large hard disks combined with a large working memory (RAM)

Speed: Fast. Normally measured in GHz.

Costs: A PC only requires an inexpensive card to be added to it to connect it to a network.

Note:

Typical Users: Due to ease of networking a PC these days just about anyone can network PCs together.

Types of computer - Laptop

- **Capacity:** Large hard disks combined with a large working memory (RAM) – Often less powerful than for a PC of equivalent price.

Speed: Fast. Normally measured in GHz. Often speed specifications are less than for a PC of equivalent price.

Costs: Components need to be much more compact, so there is a price overhead when compared to a PC of equivalent power.

Typical Users: Business users, people on the move, educational users.

Types of computer - Palmtop

- **Capacity:** Much smaller storage capacity compared to a PC.

Speed: Much less than a PC unless you pay a lot extra.

Costs: In relative terms expensive when compares to a PC.

Typical Users: Mostly business users.

Types of computer - PDA (Personal Digital Assistant)

- **Capacity:** Much smaller storage capacity compared to a PC.

Speed: Much less than a PC unless you pay a lot extra.

Costs: In relative terms expensive when compares to a PC.

Typical Users: Mostly business users.

1.5 part of computer

Main Parts of a Personal Computer

Understanding the main parts of a personal computer and peripheral devices

The System Unit

- The "system unit" is the name given to the main PC box which houses the various elements which go together to make up the PC. For instance within the system unit is the computer system's motherboard, which contains all the

main components, such as the CPU. The system unit also houses items such as the hard disk, the floppy disk and CD-ROM drives etc. System units come in two basic varieties, the tower version, as illustrated, or a desktop version, which is designed to sit on your desk with your monitor on top of the system unit.

The System (Mother) Board

- The system (mother) board is contained within your system unit and all the vital computer systems plug directly into the system board. The CPU is normally housed on your system board along with all the other electronic components. Other items such as the hard disk are attached to the system board, either directly or via cables. These boards are getting smaller and smaller as the components become more integrated. If you open up a modern system you will find that it is mainly full of air.



fig: Mother board



fig: system units

The CPU

- The CPU (Central Processing Unit) is normally an Intel Pentium (or equivalent) and it is one of the most important components within your computer. It determines how fast your computer will run and is measured by its MHz or GHz speed. Thus, a 2 GHz Pentium is much faster than say a 1 GHz Pentium CPU. It is the CPU which performs all the calculations within the computer, when running programs such as word-processors, spreadsheets and databases. See page 17 for more information.

Memory (RAM)

- The RAM (Random Access Memory) within your computer is where the operating system is loaded to when you switch on your computer and also where your applications are copied to when you start an application, such as a word processor or database program. When you create data, (e.g. letters

and pictures), these are initially created and held in RAM and then copied to disk when you save the data. As a rule of thumb, the more RAM you have installed in your computer the better. These days you will commonly find over 128 Megabytes of RAM installed.



ROM-BIOS

- The ROM-BIOS (Read Only Memory - Basic Input Output System) chip is a special chip held on your computer's system (mother) board. It contains software which is required to make your computer work with your operating system, for instance it is responsible for copying your operating system into RAM when you switch on your computer.



Serial Port

- The serial port is a socket located at the back of your computer which enables you to connect items to the computer, such as a modem. They are commonly labelled as COM1 or COM2.



Parallel Port

- The parallel port is a socket located at the back of your computer which enables you to connect items to the computer, such as a printer. It is commonly labelled as LPT1 or LPT2.

Universal Serial Bus (USB)

- The Universal Serial Bus is a relatively new item within the PC. You will see one or more USB sockets at the back of the system unit, allowing you to plug in devices designed for the USB. These devices include printers, scanners and digital cameras.



What are input devices?

- Input devices allow you to input information to the computer and include things such as the keyboard and mouse.

The Keyboard

- An Input device. The keyboard allows you to type information into the computer. It has evolved over the years and many people now use a Microsoft style keyboard, which has additional keys designed to make Microsoft Windows easier to use.

The Mouse

- An Input device. When using an operating system, such as Microsoft Windows, you use the mouse to select drop down menus, to point and click on items, to select items and to drag and drop items from one place to another.



What are output devices?

- Output devices allow you to output information from the computer and include the printer and the monitor.

The Monitor

- An output device. The monitor is the TV type screen on which you view your programs. They are supplied in different sizes, common sizes range from 15" to 21" screens. You should be aware that poor quality or badly maintained monitors could harm your eyesight.

Printers

- Most data is printed once you have created it and there are a vast number of different printers available to accomplish this. Most common are ink jet and laser printers both of which can now produce coloured output (at a cost).

What is a peripheral device?

- A peripheral device is any device which you can attach to your computer. Thus, you could attach a scanner or modem to the back of your system unit.

Scanners

- Scanners allow you to scan printed materials into your computer, which can then be stored within the computer. These pictures can then be altered,



resized and printed as required.

Modems

- A modem is a device which is used to attach your computer to the telephone system. The modem converts data into sound which is sent over the telephone line, the receiving modem turns the sounds back into data. If you wish to connect to the Internet, you will need a modem (or equivalent device). Modems used to be large boxes that you had to plug into the computer, but now modems boxes have become very small and in many cases the modem is actually inside the computer. If you are using ISDN or broadband then you will use another device similar to a modem.



Note:

. The major components of a PC are: -

1. System unit: it is the box which contains:
 - a. CPU {central processing unit}.
 - b. Main memory drives.
 - c. The power supply.
2. Input devices “e.g. keyboard, Mouse”
3. Output devices “e.g. monitor, printer”
4. Terminal: “e.g. printer, scanners, modem”

1) Intelligent terminal:

- a. Perform a lot of processing locally.
- b. Connected to mainframe.

2) Dumb terminal:

- a. Very limited processing.
- b. Connected to mainframe where data is processing

Note: A terminal (monitor and keyboard) that contains processing power. Intelligent terminals include memory and a processor to perform special display operations. In contrast, a dumb terminal has no processing capabilities; it must rely entirely on the central computer. A smart terminal has some processing capabilities, but not as much as an intelligent terminal.

Exercises:

1. Computer performs three main operations?
2. What are the components of computer system?
3. Define: (IT, Intelligent terminal).

H.W.

1. Explain the terms “hardware” & “software”, list two examples of each.
2. Create a table to compare between four types of computers: uses, prices, speed, capacity & memory.

Note:

The Student solves (H.W & Exercises).

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