INTRODUCTION
TO
INFORMATION SYSTEMS

CHAPTER 2
COMPUTER HARDWARE(Cont..)

WEEK4

LECTURE1

Computer as a system

- A computer is a system, an inter related combination of components that performs the basic system functions of input, processing, output, storage and control thus providing end users with a powerful information processing tool.
- INPUT: The input devices of a computer system include computer keyboards, touch screens, pens, electronic mouses optical scanners and so on.

- They convert data into electronic form for direct entry or through a telecommunication networks into a computer system.

- PROCESSING: The CPU is the main processing component of a computer system. The circuitry of CPU can be sub divided into two major sub units: ALU(Arithmetic Logic Unit) and Control Unit.

- OUTPUT: The output devices of a computer system include video display units, printers, audio response units and so on. They convert electronic information produced by the computer into human intelligible form for end users.

- STORAGE: The storage function of a computer system takes place in the storage circuits of the computer's primary storage unit, or memory supported by secondary storage devices such as magnetic disk and optical disk drives.

  Computer processors may also include storage circuitry called ***cache memory*** for high speed, temporary storage.

- CONTROL UNIT : It is the control component of a computer system. Its registers and other circuits interpret software instructions and transmit directions that controls the activities of other components of the computer system.

Computer Processing Speeds

- Millisecond – thousandth of a second
- Microsecond – millionth of a second
- Nanosecond – billionth of a second
- Picosecond – trillionth of a second

Factors which affects processing speed

a. Clock Speed: Preset speed of the clock

b. Word length: The number of bits that can be processed by the CPU at any one time.

c. Bus width: Size of the physical path. The wider the bus, more data can be travelled.

d. Number of transistors per chip.

Peripherals

Peripherals is the generic name given to all input, output and secondary storage devices that are part of a computer system, but that are not part of the CPU. The major types of peripherals and media that can be part of computer system are listed below.

a. Monitors

b. Printers

c. Scanners

d. Hard disk drives

e. CD and DVD drives

f. Backup systems

Input technologies

Input technologies now provide a more natural user interface for computer users.

You can enter data and commands directly and easily into a computer system through the devices.

Keyboards: Keyboards are the most widely used devices for entering data and text into computer system.

Pointing Devices

- Pointing devices are better alternative for issuing commands, making choices and responding to prompts displayed on your video screen. They work with the operating system’s GUI, which presents you with icons, menus, windows, buttons, bars and so on.

- Electronic Mouse: It is the most popular pointing device used to move the cursor on the screen, as well as to issue commands and make icon and menu selections.
- Trackball: A stationary device related to the mouse. Roller bar is used to move cursor on the screen.

- Pointing stick: Also called trackpoint is small eraser head-like device in keypad. Moves cursor in direction of pressure placed on stick.
- Touchpad: is a small rectangular touch-sensitive surface usually placed below the keyboard. The cursor moves in the direction your finger moves on the pad.

- Touch screen: Are devices that allow you to use a computer by touching the surface of its video display screen. Some touch screens emit a grid of infra red beams, sound waves or a slight electric current that is broken when the screen is touched.

Pen based computing

- This technologies are being used in many hand held computers and PDAs.
- These contain fast processors and software that recognizes and digitizes handwriting, handprinting and hand drawing.
- They have pressure-sensitive layer like touch screen under liquid crystal display(LCD) screen.

Speech recognition systems

- Speech recognition system promises to be the easiest method for data entry, word processing and conversational computing since speech is the easiest, most natural means of human communication.
- Early speech recognition products used discrete speech recognition, where you had to pause between each spoken word.

- New continuous speech recognition(CSR) software recognizes continuous, conversationally-paced speech.
- Speech Recognition Systems digitize, analyze and classify your speech patterns to a database of sound patterns in its vocabulary and passes recognized words to your application software.

Optical Scanning

- It reads text or graphics and convert them into digital input. Thus optical scanning enables the direct entry of data from source documents into a computer system.
- OCR(optical character recognition) read characters and codes on merchandise tags, sort mail etc.

Other Input technologies

- Magnetic Stripe: It helps computers to read credit cards. The iron oxide coating of the magnetic stripe on the back of such cards can hold about 200 bytes of information. Customer account number can be recorded on the magnetic stripe so it can be read by bank ATMs.

- Smart Cards: Micro processor chip and memory on credit or debit card.
- Digital cameras: Digital still and video cameras enable you to shoot, store and download still photos or full motion video with audio into your PC.

Output technologies

Video displays and printed documents have been the most common type of computer output. Other output technologies such as voice response systems and multimedia output are found in business applications.

Video displays: is the most common type of computer output.

Use CRT technology similar to the picture tubes used in home TV.

LCD: Liquid crystal displays used for laptops and PDAs.

Printed output

- Printed output is still a common form of business communications and is frequently required for legal documentation.
- Thus computers can produce printed reports and correspondence , documents such as sales invoices, payroll checks and bank statements.

- Inkjet printers: which spray ink onto a page have become the most popular, low cost printers for micro computer systems. They produce several pages per minute of high quality output in black-white and color print.
- Laser printer: Uses electrostatic process similar to a photocopying machine to produce many pages per minute of high quality black and white output.