06 - Input and Output Devices

IT1206

Level I - Semester 1

Input and Output Devices

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Input devices

- Input devices refer to any device that can provide an input of information, data or commands into the computer system

- In the case of a primitive and simple computer system the most common input devices are the keyboard and the mouse

Pointer devices

- Any location on the computer screen can be addressed by using X-Y coordinates

- Pointer devices as the name implies are used to point to specific location on the computer screen

- By moving the pointer device you can move the pointer on the computer screen and thereby identify any point on the screen.

6.1.2.4 Pointing stick

- A pointing stick is an isometric miniature joystick that is primarily used in laptops as a cursor pointing device

- The pointing stick moves and manipulates the computer cursor like a joystick

- Its height is designed to be slightly above the keys

- If a laptop does not have the proper space for a touchpad, a pointing stick is a useful alternative

6.1.2.4 Pointing stick cont.....

- To work as designed, the pointing stick's sensitivity grading must be calibrated to sense movements and taps meant for its use

- Pointing sticks are commonly found on ThinkPad laptops

6.1.2.5 Gesture recognition platforms

- Gesture recognition is a type of perceptual computing user interface that allows computers to capture and interpret human gestures as commands

- The general definition of gesture recognition is the ability of a computer to understand gestures and execute commands based on those gestures

- Most consumers are familiar with the concept through Wii Fit, X-box and PlayStation games such as "Just Dance" and "Kinect Sports"

6.1.2.5 *Gesture recognition platforms cont....*

- Microsoft is leading the charge with Kinect, a gesture recognition platform that allows humans to communicate with computers entirely through speaking and gesturing

- Kinect gives computers, "eyes, ears, and a brain." There are a few other players in the space such as
    - ➤ SoftKinect,
    - ➤ GestureTek,
    - ➤ PointGrab,
    - ➤ eyeSight and PrimeSense,
    - ➤ an Israeli company recently acquired by Apple

6.1.2.5 *Gesture recognition platforms cont....*

- Gesture recognition examples beyond gaming
  - In-store retail engagement
  - Changing how we interact with traditional computers
  - The operating room
  - Windshield wipers
  - Mobile payments
  - Sign language interpreter

6.1.2.6 Graphic tablets

- Also called a drawing tablet or a pen tablet

- A graphics tablet is a natural input device that converts information from a handheld stylus

- The user uses the stylus like a pen, pencil, or paintbrush, pressing its tip on the tablet surface

- The device can also be used in replacement of a computer mouse. Pictured is an example of a graphics tablet and stylus, manufactured by Wacom.

6.1.2.6 Graphic tablets cont....

- Similar to an artist drawing with a pencil and paper, a user draws on the graphics tablet with a stylus

- The computer will convert the drawing strokes into digital form, displaying them on the computer screen

- The graphics tablet can also be used to capture users' signatures

6.1.2.6 Graphic tablets cont...

- Below is a list of professions and people who are more likely to use a graphics tablet
    - Architects and Engineers
    - Artists
    - Cartoonist
    - Fashion designers
    - Graphic designers
    - Illustrators
    - Photographers
    - Teachers

6.1.2.7 Web cams

- A webcam is a camera that connects to a computer

- It captures either still pictures or motion video, and with the aid of software, can transmit its video on the Internet in real-time

- The picture is of a Logitech Webcam C270, an example of a webcam

6.1.2.7 Web cams cont....

- Today, most webcams are either embedded into the display with laptop computers or connected to the USB or FireWire port on the computer

Output devices

- An output device is any peripheral that receives data from a computer, usually for display, projection, or physical reproduction

- For example, the image shows an inkjet printer, an output device that can make a hard copy of anything shown on the monitor

- Monitors and printers are two of the most commonly used output devices used with a computer

Monitors

- Alternatively referred to as a VDT (video display terminal) and VDU (video display unit), a monitor is an output device that displays video images and text

- A monitor is made up of circuitry, a screen, a power supply, buttons to adjust screen settings, and casing that holds all of these components

- Like most early TVs, the first computer monitors were comprised of a CRT (cathode ray tube) and a fluorescent screen. Today, all monitors are created using flat-panel display technology, usually backlit with LEDs

6.2.1.3 LCD

- Short for liquid-crystal display, LCD is a flat display technology used in laptops, cell phones, calculators, digital cameras, and flat screen displays

- The LCD is made of two sheets of a flexible polarizing material and a layer of liquid crystal solution between the two

6.2.1.3 LCD cont....

- An LCD is available as an active-matrix, dual-scan, or passive-matrix display and are most common with laptop computers, like the Dell laptop computer shown in the picture

6.2.1.4 LED

- Short for light-emitting diode, LED is a semiconductor that illuminates when an electrical charge passes through it
- LEDs are commonly green, amber or red, but they can be an assortment of other colors as they've become popular with case lighting
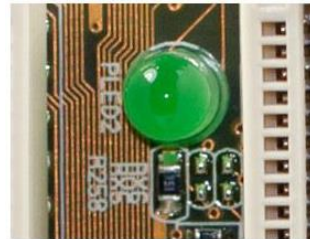
LED Status Indicators

| Green | Amber | Red |

6.2.1.4 LED cont....

- Below are examples of how an LED could be used with a computer
  - Keyboard LEDs
  - Mouse LED
  - Motherboard LED

  - Floppy, hard drive, CD-ROM, and other drives LED
  - Printer, speakers, monitor, and other devices LED

6.2.1.4 LED cont....

- Red, amber, green, white, and blue LED meanings
  - Solid green, blue, or white LED
    - A solid green, blue, or white LED on the front of a computer, monitor, or another device is often an indication of power
  - Blinking green, blue, or white LED
    - Amber or yellow LEDs indicate that data is being transferred over a network card, modem, switch, or router. In the case of a router, this light may also blink so fast sometimes that it may appear to be solid
  - Solid amber or yellow LED
    - A red LED is often a method of notification or alert. For example, on a surge protector or UPS, a red LED indicates that surge protection is working and available

6.2.1.4 LED cont….

- Blinking amber or yellow LED
  - Amber or yellow LEDs indicate that data is being transferred over a network card, modem, switch, or router. In the case of a router, this light may also blink so fast sometimes that it may appear to be solid
- Solid red LED
  - A red LED is often a method of notification or alert. For example, on a surge protector or UPS, a red LED indicates that surge protection is working and available
- Blinking red LED
  - A blinking red LED is often usually only used as an alert to notify the user that there is a problem

6.2.1.5 Comparison of monitor types

- CRT (cathode ray tube) monitors
  - These monitors employ CRT technology, which was used most commonly in the manufacturing of television screens
  - With these monitors, a stream of intense high energy electrons is used to form images on a fluorescent screen
  - A cathode ray tube is basically a vacuum tube containing an electron gun at one end and a fluorescent screen at another end
  - While CRT monitors can still be found in some organizations, many offices have stopped using them largely because they are heavy, bulky, and costly to replace should they break
  - While they are still in use, it would be a good idea to phase these monitors out for cheaper, lighter, and more reliable monitors

6.2.1.5 Comparison of monitor types cont.….

- LCD (liquid crystal display) monitors

  - LCD displays are not self-illuminating
  - They need a backlight in order to produce a visible picture
  - Regular LCDs are backlit by CCFLs (Cold Cathode Florescent Lamps)
  - These lights resemble the florescent light tubes used for lighting, and are arranged in horizontal rows behind the LCD screen

6.2.1.5 Comparison of monitor types cont…..

- LCD (liquid crystal display) monitors
  - The advantages of LCD monitors include their compact size which makes them lightweight
  - They also don't consume much electricity as CRT monitors, and can be run off of batteries which makes them ideal for laptops
  - However, this type of monitor does have disadvantages, such as its relatively high price, an image quality which is not constant when viewed from different angles, and a monitor resolution that is not always constant, meaning any alterations can result in reduced performance

6.2.1.5 Comparison of monitor types cont.....

- LED (light-emitting diodes) monitors
  - LED monitors are the latest types of monitors on the market today
  - These are flat panel, or slightly curved displays which make use of light-emitting diodes for back-lighting, instead of cold cathode fluorescent (CCFL) back-lighting used in LCDs
  - LED monitors are said to use much lesser power than CRT and LCD and are considered far more environmentally friendly

6.2.1.5 Comparison of monitor types cont....

- LED (light-emitting diodes) monitors
  - The advantages of LED monitors are that they produce images with higher contrast, have less negative environmental impact when disposed, are more durable than CRT or LCD monitors, and features a very thin design
  - They also don't produce much heat while running. The only downside is that they can be more expensive, especially for the high-end monitors like the new curved displays that are being released.er, more contemporary feature

Activity 01

1) Explain which are the most commonly used input devices with examples.

2) Explain about which input device would be the most suitable for disabled person to use.

3) Categories the input devices in to below two categories.
    i.   Manual input devices
    ii. Automatic input devices