

# INFS 214: Introduction to Computing

## Session 4 – Input Technology

Lecturer: Dr. Ebenezer Ankrah, Dept. of Information Studies  
Contact Information: [eankrah@ug.edu.gh](mailto:eankrah@ug.edu.gh)



# UNIVERSITY OF GHANA

College of Education

**School of Continuing and Distance Education**

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# Session Overview

- Computer systems use input devices to capture data for processing. Input technologies consist of devices that translate data into a form that the computer system can process.
- This session explains the types and categories of input devices that are used in the computer environment.

# Session Overview

- At the end of the session, the student will
  - Understand and differentiate between the various types of input devices
  - Be able to give examples of input devices
  - Understand the various types of input devices for the physically challenged
  - Be able to identify the components of some of the input devices
  - Be able to differentiate between various scanning devices

# Session Outline

The key topics to be covered in the session are as follows:

- Input Devices
- The Keyboard
- Pointing Devices
- Scanning Devices

# Reading List

- Hutchinson, S. E., & Sawyer, S. C. (2013). *Computers: The user perspective*. Boston: Irwin McGraw-Hill. (Chapter 3)
- O'Leary, T. J., & O'Leary, L. I. (2014). *Computer Today*. Boston: McGraw Hill. (Chapter 7)
- Williams, B. K., & Sawyer, S. C. (2014). *Using Information Technology: A practical introduction to computers and communications (11<sup>th</sup> ed.)*. McGraw-Hill Education. (Chapter 6)

Topic One

# INPUT DEVICES



# Input Devices

- Input (as a noun) is used to describe data and instruction used by a computer. The process by which data is sent into the computer system for processing is also termed input (as a verb).
- Input devices are various devices used to enter data and instructions into a computer either for processing or storage. Computer systems use input devices to capture data for processing.
- Input hardware consist of devices that translate data into a form the computer system can process.

# Input Devices

- Input devices could be classified as follows:
  - Keyboards
  - Pointing Devices
  - Scanning Devices
  - Data Collection Devices
  - Digitizing Devices
  - Audio Input Devices
  - Input Devices for the Physically Challenged



# Questions

- **Individual Assignment:**
  - List some of the pointing input devices
  
- **Forum Question:**
  - What are the major differences between pointing and scanning devices?

Topic Two

# THE KEYBOARD

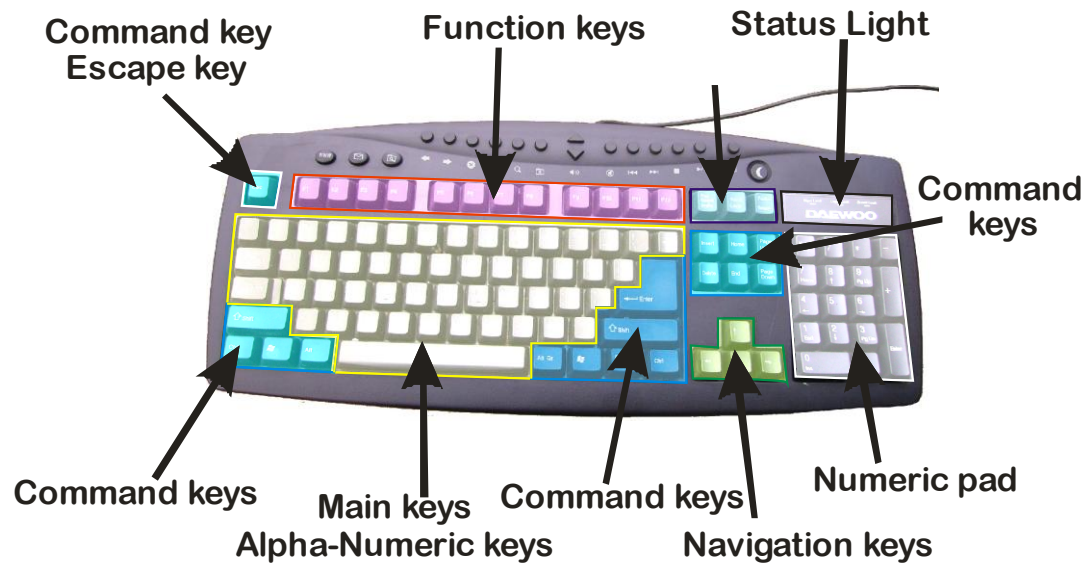


# The Keyboard

- One of the primary input devices used with a computer is the keyboard. The keyboard looks very similar to the keyboards of electric typewriters, with some additional keys. Keyboards allow a computer user to input letters, numbers, and other symbols into a computer system.
- There are four types of keyboards, namely:
  - Traditional keyboard
  - Ergonomic keyboard
  - Flexible keyboard
  - Wireless keyboard

# The Keyboard

- **Traditional keyboard**



# The Keyboard

- **Ergonomic keyboard**
  - Ergonomic keyboards are designed to minimize strain on hands and wrists. Ergonomic incorporates comfort, efficiency and safety into design of items in workplace



# The Keyboard

- **Flexible keyboard**
  - Flexible (Foldable) keyboards are extremely good for travelling. Simply roll them up and then unroll them when you need them again.



- **Wireless keyboard** – This is a keyboard without a cable connecting to the system unit.

Topic Three

# POINTING DEVICES



# Pointing Devices

- A pointing device is a hardware input device that allows the user to move the mouse pointer to select items on a display screen.
- The type of pointing device is:
  - Based on rolling a ball
  - Based on touching a surface
  - Based on moving stick



# Pointing Devices

- The types of pointing devices are:
  - Mouse
  - Track-ball
  - Track point
  - Track space
  - Joy stick
  - Touch Screens
  - Light Pen

# Pointing Devices

- **Mouse**

- A mouse is a device that is moved by hand over a flat surface. As the ball on its underside rotates, the movement of the mouse causes corresponding movement of a pointer on the computer screen. Pressing buttons on the mouse enables you to invoke commands on the computer system.
- There are three types of mouse, these are:
  - Mechanical mouse
  - Optical mouse
  - Cordless or wireless

# Pointing Devices

- Track Ball
- The track-ball or roller ball is like an upside-down mouse and one can roll the ball directly with the hand.
- The trackball does not require a clear surface to roll on, and it can be attached firmly to the keyboard or computer case (it is often built in on portable computers).



# Pointing Devices

- Track Point/Track Space
- This is represented as a rubber stick protruding from the keyboard with silicon rubber. This is also called pointing stick. Its alternative is the track space (also known as touch space) where a blank space with silicon rubber is also created at the bottom of the laptop keyboard.
- In both cases, they gripped the thumb and as you move the thumb, the pointer makes corresponding movement on the monitor. A mouse can still be connected to a computer with a track point / track space to allow a dual-pointer use. Also in use on laptops are mini-trackballs.

# Pointing Devices

- Joy Stick
  - The best known of this category of input device is the joystick that appeared with the first computer games.
  - Joysticks have evolved into many styles of input devices,
    - including hand grips,
    - steering wheels, and even
    - combination of mouse-joysticks.
  - The joystick for games was the first popular input device used for graphics. Today there are even 3-D devices that let you control more than a single dimension of space.

# Pointing Devices

- **Touch screens**

- Touch screens accept input data by letting you point at the screen to make your choice. Sensors on the edges of the screen pinpoint the touched location and cause a corresponding action on the screen.

- **Light pen**

- A light pen is a light-sensitive pen-like device. The light pen is placed against the monitor to close photo-electric circuit and identify the spot for entering or modifying data. For example, light pens are used to edit digital images.

Topic Four

# SCANNING DEVICES



# Scanning Devices

- Scanning devices are input devices used for direct data entry in to a computer system.
- The following are scanning devices:
  - Optical Scanners
  - Bar Code Readers
  - Magnetic-Ink Character Recognition
  - Optical Character Recognition
  - Optical Mark Recognition



# Scanning Devices

- **Optical Scanners**
- An optical scanner is a hardware input device that allows a user to take an image or text and convert it into a digital file, allowing the computer to read or display the scanned object.
- There are four types of optical scanners. These are:
  - Flatbed
  - Handheld /Pen
  - Sheet-fed
  - Drum

# Scanning Devices

- **Bar Code Readers**

- It is a device that is used to read stripped lines (bar code) by means of reflected light. Bar code readers can read bar codes patterns of printed bars.
- Lines of different widths and sizes representing data that, when read, will determine what the scanned object is. Bar codes are often used to help organize and be able to index information or prices about an object.

# Scanning Devices

- A barcode reader consists of a scanner, a decoder, and cable used to connect the reader with a computer.
- Data coded in the form of small line are known as bar code. It directs a beam of light across the bar code and measures the amount of light that is reflected back.
- The scanner converts the light energy into electrical energy, which is then converted into data by decoder and forwarded to a computer.

# Scanning Devices

- **Magnetic-Ink Character Recognition**

- Magnetic-Ink Character Recognition (MICR) is a method of machine-reading characters made of magnetized particles.
- The most common example of magnetic characters is the array of futuristic-looking numbers on the bottom of your personal cheque.
- The MICR process is, in fact, used mainly by banks for processing cheques. MICR is used in banking industry for faster processing of a large number of cheques daily. MICR characters are printed in special typefaces with a magnetic ink or toner.

# Scanning Devices

- **Optical Character Recognition**
  - Optical Character Recognition (OCR) is meant to identify characters exactly as they look. When images are scanned, they are made as pictures. OCR identifies scan images as characters and not as images.

# Scanning Devices

- **Optical Mark Recognition**
- Optical Mark Recognition (OMR) is sometimes called mark sensing, because a machine senses marks on a piece of paper.
- As a student, you may immediately recognize this approach as the technique used to score certain tests. Using a pencil, you make a mark in a specified box or space that corresponds to what you think is the answer.
- The answer sheet is then graded by a device that uses a light-beam to recognize the marks and convert them to electrical signals, which are sent to the computer for processing.

# References

- Hutchinson, S. E., & Sawyer, S. C. (2013). *Computers: The user perspective*. Boston: Irwin McGraw-Hill.
- O'Leary, T. J., & O'Leary, L. I. (2014). *Computer Today*. Boston: McGraw Hill.
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