CHAPTER 6 :

INPUT AND OUTPUT

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Here is where presentation begins

INPUT

- Data that a computer receives.

INPUT DEVICES

- Translate data into a form that the system unit can process.

INPUT DEVICES

Keyboard **01**

Pointing Input **02**

Audio Input **03**

04 Scanning

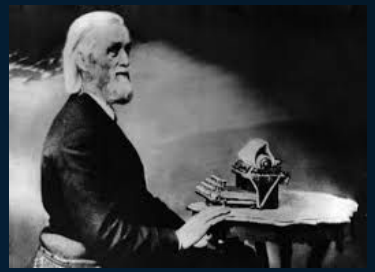
05 Mice

06 Image Capturing

KEYBOARD

- Inputting data to computer
- Sizes: 84/101/102/104/108 keys
- Contains extra command keys & function keys.

FOUNDER



Christopher Latham Sholes

VARIETY OF KEYBOARD

GAMING KEYBOARD

Speedy response
~ Fast reaction time
~ High quality & performance.

CHICLET KEYBOARD

~ Rectangular in shape with rounded edges.
~ Extra spacing between the keys.

THUMB KEYBOARD

~ Typing using thumb, while holding the device

VIRTUAL KEYBOARDD

~ Without physical key
~ When user touch the surface covered by an image of a key, the device records the corresponding keystroke

TYPES OF KEYBOARD

BLUETOOTH KEYBOARD

WIRELESS KEYBOARD

TRADITIONAL KEYBOARD

FLEXIBLE KEYBOARD

MAGIC KEYBOARD

MECHANICAL KEYBOARD

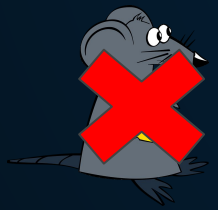
CHORDED KEYBOARD

POINTING DEVICES

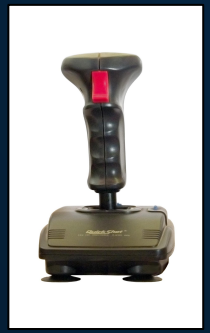
A generic term for any device used to control the movement of cursor on a computer screen.

Touch Screen

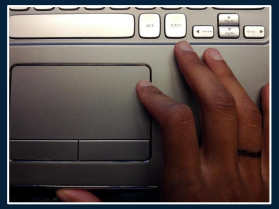
Mouse



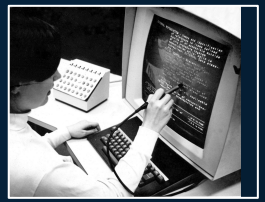
Joystick



Touch Pad



Light Pen

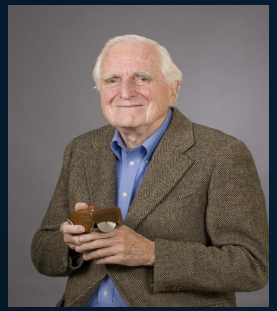


Trackball

~ AMBIDEXTROUS
~ SMALLER SPACE
~ ACCURATE
~ ERGONOMIC

MOUSE

Help to control cursor that is visible on the computer screen while moving the mouse on flat surface place



Douglas Engelbart

Mechanical Mouse

~ Sealed bottom surfaces absorb dust & dirt.
~ Have a metal/ rubber ball.
~ When the ball is rolled, sensors detect the motion & move the on-screen mouse pointer accordingly.

3-D Mouse

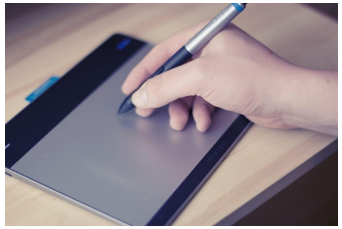
~ Control models in 3D env. (multi-axis,sensor, accelerometers & IR sensors)
~ Push, pull, twist/tilt to pan, zoom & rotate 3D models.
~ Comfort
~ Efficient workflow

Optical Mouse

~ Uses LED and light detector, such as an array of photodiodes, to detect movement relative to a surface.
~ Has no moving part
~ Can be used on any surface

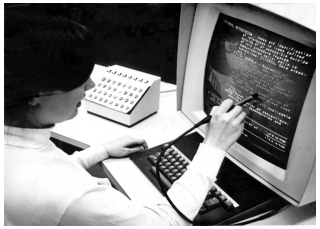
Wireless Mouse

~ Battery opereated.
~ Use radio waves/infrared light wave



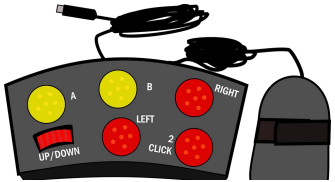
Stylus

~ Small pen-like pointer to draw on the screen.
~ Uses handwriting recognition software
~ PDA, tablets PC,
& drawing table.



Light Pen

~ Detects brightness changes of nearby screen pixels when scanned by CRT electron beam & communicates the timing of this event to the computer.



Foot Mouse

~ Move the cursor & click the mouse buttons with their feet.
~For users with disabilities/ high-back/neck problems.

Touch Pad

~ Translate motion & position of user's fingers to relative position on the operating system & output to the screen.

Ergonomic Mouse

~ Allows user to mouse in the natural, handshake position, alleviating pain & stress injuries.
~ Require less grip strength.

GAMING CONTROLLER

Motion sensing device control

~Uses accelerometers／other sensors to track motion and provide input.

Gaming Mice

~ Higher pecision & accurate in many fast paced game.
~ Response time usually 1ms
~ Comfort
~ Ergornomic

Gamepad

~ Provide input to a video game to control object/ character in the game.
~ Using both hands.

Joystick

~ Control video games & have one/more push-buttons whose state can also be read by the computer.
~ Use pressure & direction of the stick.

SCANNING DEVICES

An input device that scans documents such as photographs and pages of text.It is convert data into a form the system unit can process. This creates an electronic version of the document that can be viewed and edited on a computer.

OPTICAL SCANNER

input device that uses a light beam to scan codes, text, or graphic images directly into a computer or computer system

Flatbed Scanner

Portable Scanner

Document Scanner

3D Scanner

EXAMPLE

CARD READERS

SUBSCRIBE

DEFINITION

Interpret encoded information that is stored on
debit, credit and identification cards

Magnetic card reader

- Information read from strip when swiped through reader
- Smart cards hold additional security information
- Provides an extra level of security when banking and shopping online. It uses your current account Visa debit card and your PIN to generate a unique eight-digit passcode which authorises log in and certain transactions.

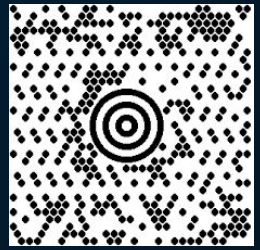
Wand Reader

Hand held readers

UPC and MaxiCode reader

UPC are heavily used in grocery stores for
automated checkout and inventory control

MaxiCode used by shipping companies for
routing packages



DEFINITION

Contain photo electric cells that scan or read bar codes or the zebra striped marks printed on product containers

EXAMPLE

RFID READERS

SUBSCRIBE

Function

- Tracking pets
- Update and control inventories
- Read passports

RADIO FREQUENCY IDENTIFICATION

Tiny chips embedded in most anything contain electronically stored information that can be read using an RFID reader located several yards away.

CHARACTER AND MARK RECOGNITION READER

recognize the entire **character** and matches it to the matrix of **characters** stored in the software. As a result, this technique is also known as pattern matching or matrix matching.

- **Character and mark recognition devices**
  - **Magnetic ink character recognition (MICR)**
    Used by banks to read encoded characters on checks
  - **Optical character recognition (OCR)**
    Reads preprinted characters such as wand scanners
  - **Optical mark recognition (OMR)**
    Sense the presence of absence of marks used for test scoring

IMAGE CAPTURING DEVICES

DEFINITION

-Create or capture single frames of video, converts the analogue values to digital, and feeds the result into the computer memory.

Digital Camera

- Capture images digitally and store in memory

Web Cams

- Capture images and send to a computer

AUDIO-INPUT DEVICES

Voice recognition systems

- Use a microphone, sound card, and special software
- Users can operate computers and create documents using voice commands

Examples:

- Siri in iPhones
- ortana in Windows phones
- Google Now in Google phones

OUTPUT

Processed data or information

- Types of output
  - -Text
  - -Graphics/photos
  - - Audio & video

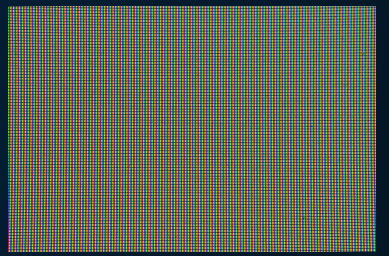
OUTPUT DEVICE

-Monitors
- Printers
-Audio-output devices

MONITOR

- **Display screen that display text, graphics and videos as soft copies**

- **Features:**
  - **Resolution/pixels:** The clearness of the image
  - **Dot pitch:** How sharp the displayed image can be
  - **Contrast ratios:** Difference in light intensity between brightest white and darkest black
  - **Size:** Size of the monitor
  - **Aspect ratio:** Width to height proportion



Pixels

TYPES OF MONITOR

Flat-Panel

- ❏ A thin panel design
- ❏ Require less power
- ❏ Portable and thin
- ❏ Most are backlit

LCD

- Older monitor
- Light and energy efficient

PLASMA

- Don't require backlighting
- Brighter and wider viewing angle than LCD

OLED

- Organic compound that produces light
- Don't require backlight
- Less power
- Thinner display
- Brighter

LED

- More advanced backlighting
- More energy efficient

Curved Monitors

- Better viewing angles
- Used by high-end gamers
- Used for smart watch displays

E-book Readers

- Traditional books printed in electronic form
- Storing and displaying e-books
- Use e-ink technology: produce images that reflect light
- A low-power, paper-like display
- Many feature subscriptions

Digital/interactive Whiteboards

- Controlled by special pen or finger
- Classrooms and corporate boardrooms

Digital Projector

- Project the images from traditional monitor onto a screen

Ultra High-definition Television (UHDTV)

- Clearer and more detailed image

PRINTER

- **Translates information that has been processed**
- **by the system unit**
- **Output as hard copy**

- **Features:**

  - **Resolution:** The image clarity
  - **Color:** Printers with separate cartridges produce the best quality output
  - **Speed:** Is measured in pages per minute (PPM)
  - **Memory:** All printers come with printer memory installed and most are upgradeable
  - **Duplex printing:** Printer allow print on both side

TYPES OF PRINTER

Ink-jet Printer

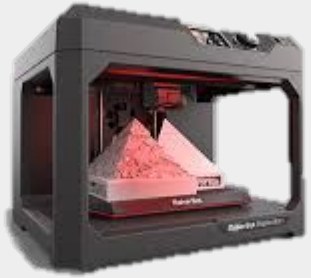
- Spray ink in high speed
- Reliable
- Quiet
- Affordable

Laser Printer

- Use laser light beam
- Faster
- Higher quality
- More economical
- Personal and shared

3D Printer

- Create 3-D shapes with a thin layer of material
- Additive manufacturing
- Education, Medicine, Prototyping and Manufacturing



TYPES OF PRINTER

Plotter

- Cloud printer
- Print oversize images.
- Use a computer controlled pen.

Thermal Printer

- Cloud printer
- To print receipts and electronic ticketing in airpot.
- Thermal wax transfer printing
- Direct thermal printing

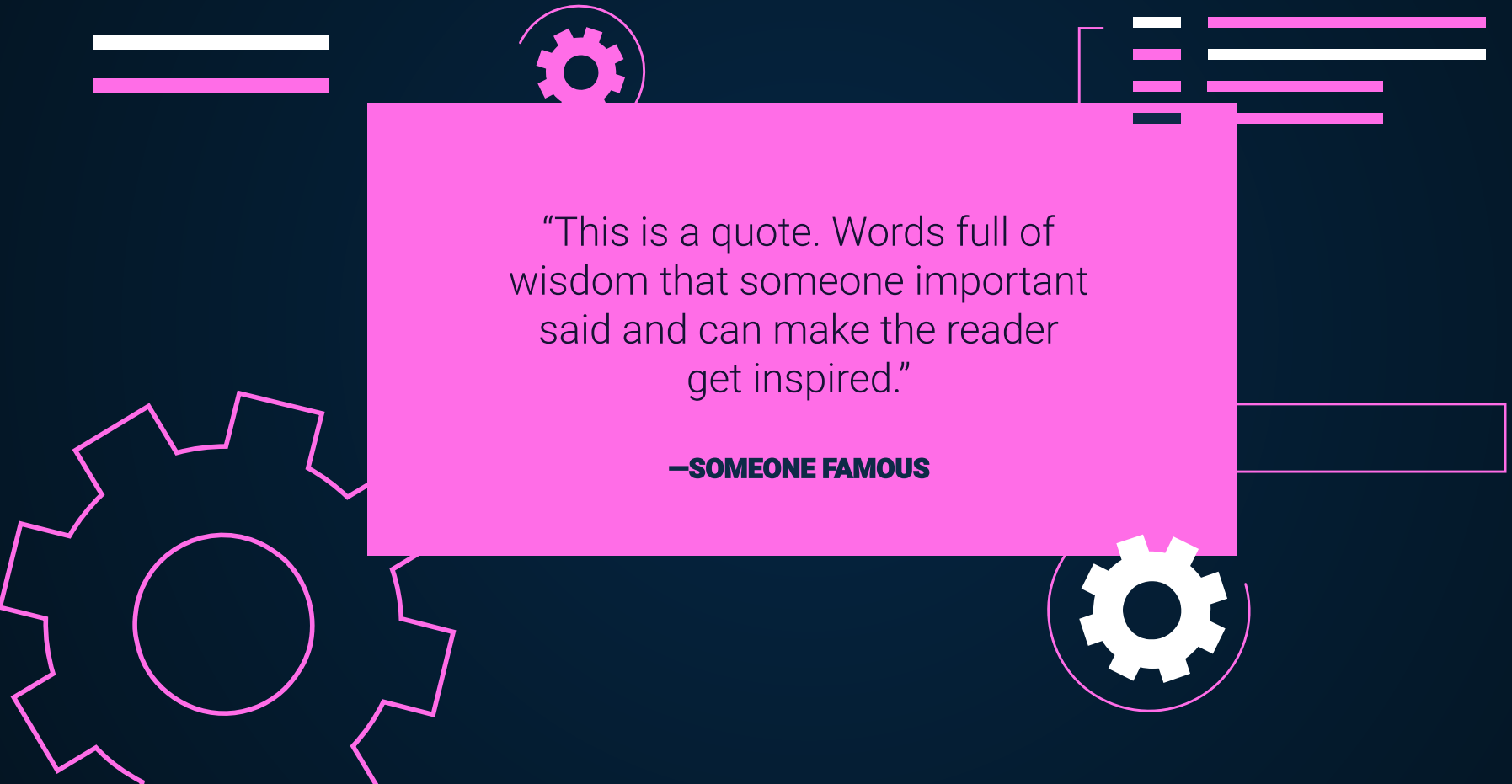
Wireless Printer

- Several devices can print to the same printer from any location.
- WiFi and Bluetooth have a range up to 300 feet.
- Print from portable devices

SOUND OUTPUT

- ★ **Translates audio information from the computer into sounds that people can understand**

- ★ **Subwoofers:** Speaker that produce only low bass sound
- ★ **Surround-sound speaker:** A system that envelops in a 360-degree field of sound
- ★ **Wireless speaker system:** Wireless technology or
- ★ bluetooth technology
- ★ **Headphones or earbuds:** Avoid distracting other


“This is a quote. Words full of wisdom that someone important said and can make the reader get inspired.”
—SOMEONE FAMOUS

Combination input and output devices

- Combination input and output devices also known as dual devices are devices that can take and process input and produces output.
- Dual Devices are made to serve specific uses that requires the ability to process input and to produce output. Sometimes they are made to make tasks more intuitive, like for example: Interactive whiteboards, and touch screens.
- Dual devices can be regularly seen in almost everywhere and with many variations

Different forms of dual devices

- There are many different form of devices in the dual devices umbrella, with the notable ones being:

1. Headsets: Headsets are dual devices because essentially they are a combination of the microphone (input) and the speaker (output) with the microphone to process the input and the speaker to produce the output.
2. FAX machine (Facsimile machine): The FAX machine is a combination of the scanner device (input) to read the messages and the printer (output) to print out the messages.
3. Touch Screen: The touch screen is a computer display screen that is layered almost on top of every every visual display nowadays, the touch screen allows the user to input data and control the data directly with what is displayed.

Robots

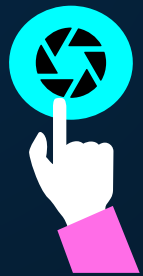
- Robots are machines that are programmed by a computer to do complex actions automatically
- Robots have many types because they take up many different shapes and forms to do certain tasks
- Robots use a central computer to process information, as well as input and output devices to react and carry out tasks

Types of Robots

- Drones: are unmanned aerial vehicles which varies in design some are used for taking bird-eye view photos or videos and some are used for military purposes.
- Industrial: are robots that are used for manufacture or assembly purposes in an industrial setting. There are about 6 types of industrial robots: Articulated, Cartesian, Cylindrical, Polar, SCARA, Delta.
- Medical: are robots that are used to assist in surgery, disinfect entire hospital rooms and etc.
- Other types: Commercial, Disaster response and many more.

VR Headsets and Gloves

- VR Devices are devices that takes the user from normal reality to a three-dimensional computer-generated virtual reality to provide an immersive experience for the user.
- A VR system is both an input and output system which consists of a computer and a software with the software being the one that does the head-tracking and the touch controllers or gloves acting as input devices.



Ergonomics

- Ergonomics is the study of work or the “science of work” in which it is used to optimize efficiency in workplaces through using psychological and physiological principles in engineering to design products for workplaces.
- Because of the nature of most workplaces there are a possibility that you will contract work-related medical conditions like: Tech neck, Computer Hunch and so on.
- Most of these conditions can be solved by buying office equipments that are made for convenience (like for example: a chair with headrest for tech neck) or by doing exercises like chest stretches or thoracic bridges.

THANK YOU FOR YOUR TIME