Input Devices

What is an input device?
- peripheral devices to provide data to computer
- devices to provide control signals to computer
- devices allow us to enter raw data for processing.

Devices in syllabus:
- Mouse
- Trackball
- Keyboard/Concept keyboards
- Microphone
- Digital Camera
- 2D Scanners
- 3D Scanners
- Interactive Whiteboards
- Touchscreens
- Barcode readers
- QR Code readers

MOUSE:

An input device that allows you to control the coordinates and movement of the onscreen cursor/pointer by simply moving the mouse across a flat surface.

There are optical mice and analogue mice. They can be wired or wireless.

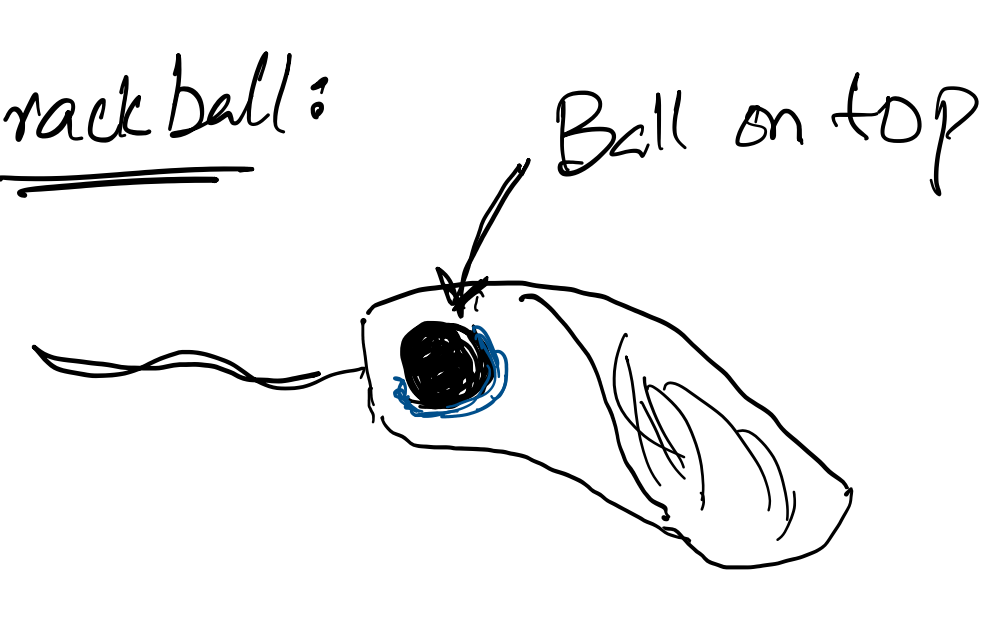
Typical applications:
- Used in everyday life computing to control the pointer in GUI.

Benefits:
- Simple & easy to use
- Efficient way to navigate.

Drawbacks:
- Requires a flat surface to operate
- Requires space.
- Human injuries like RSI.

Mouse Operations Steps:
1. Laser is beamed towards the surface.
2. It reflects back to the camera.
3. Camera takes the image
4. Image is transfered to the digital Signal Processor
5. DSP determines the change in coordinates.
6. Calculated coordinates are transfered to the O/S.
7. O/S shows the pointer at the new location.

Trackball:



- An input device to control onscreen cursor/pointer
- Device is stationary while the user moves the ball within its socket.

Applications:
- Computer Aided Design (CAD)
- where space is limited.
- people with limited motor skills.

Benefits:
- Need little desk space
- Finer control
- Can be embedded within keyboard.

Drawbacks:
- User might need time to get used to.

Keyboard:

Input devices that allow the entry of data and commands by pressing keys over the keyboard.

These are common place input devices, often used alongside mouse.

They can be wired or wireless.

Applications:

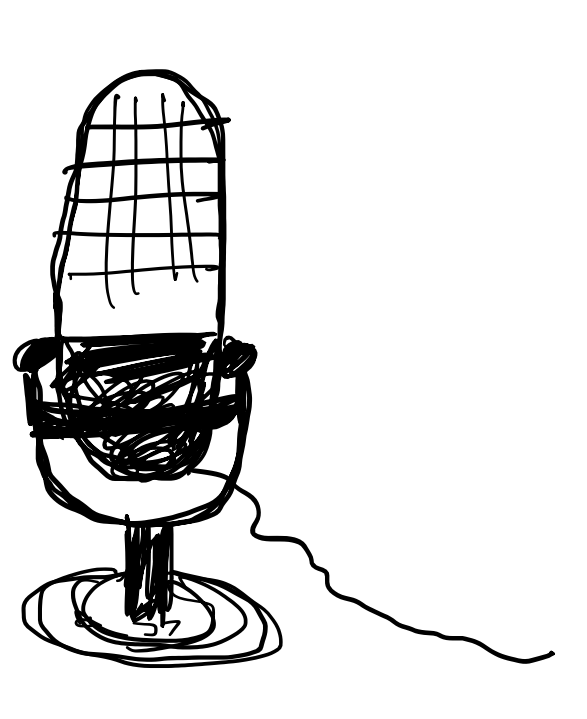
In everyday life they are used in every computer app in business or at home, from gaming to banking.

Benefits:
- Intuitive
- Easy to use
- Potentially very fast to get used to and enter data fast.

Drawbacks:
- It becomes slow one if the person is not trained to enter data.
- Spell mistakes can be there.
- Human injury. (Neck and wrist)

Keyboard operations:
1. User presses a key
2. It completes a circuit
3. Current flows to the Digital Signal Processor.
4. DSP matches the data with a preset list
5. Pressed key is determined
6. Control signal or ASCII value of the pressed key is sent to the operating system.
7. O/S shows/does according to the key pressed.

Microphone:



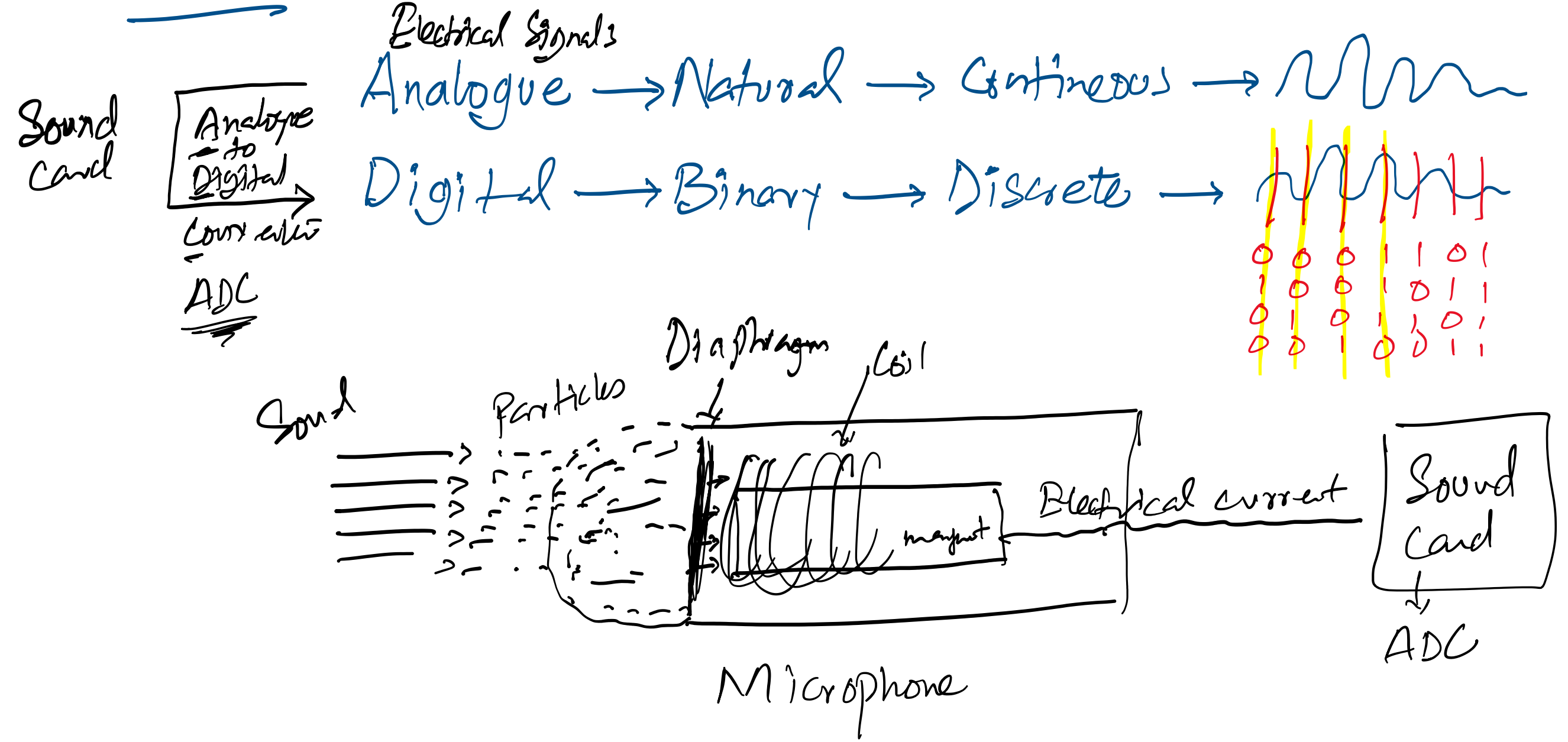
- Input devices that take analogue sound wave and convert them to electrical signals.
- They play an important role in speech recognition.

Uses:
- Mobile phone
- Tablets, Laptop
- VoIP. Using IP networks to make phone calls.
- Voice recognition systems.

Benefits:
- Special people can use to give instructions to computers.
- Enables us to produce speech recognition software.
- Allows voice calls over digital devices. VoIP.

Drawback:
- Speech recognition might be imperfect sometimes.

Sideline



Operation:
1. Sound is produced.
2. Brings change in air particles
3. particles hit the diaphragm on the top of mic.
4. Under diaphragm there is coil and magnet.
5. Contineous vibrations over the diaphragm produce electrical current b/c of magnet & coil.
6. Electric current reaches to ADC (Sound card) and gets converted to the binary form. (Digitisation).

Digital Camera:

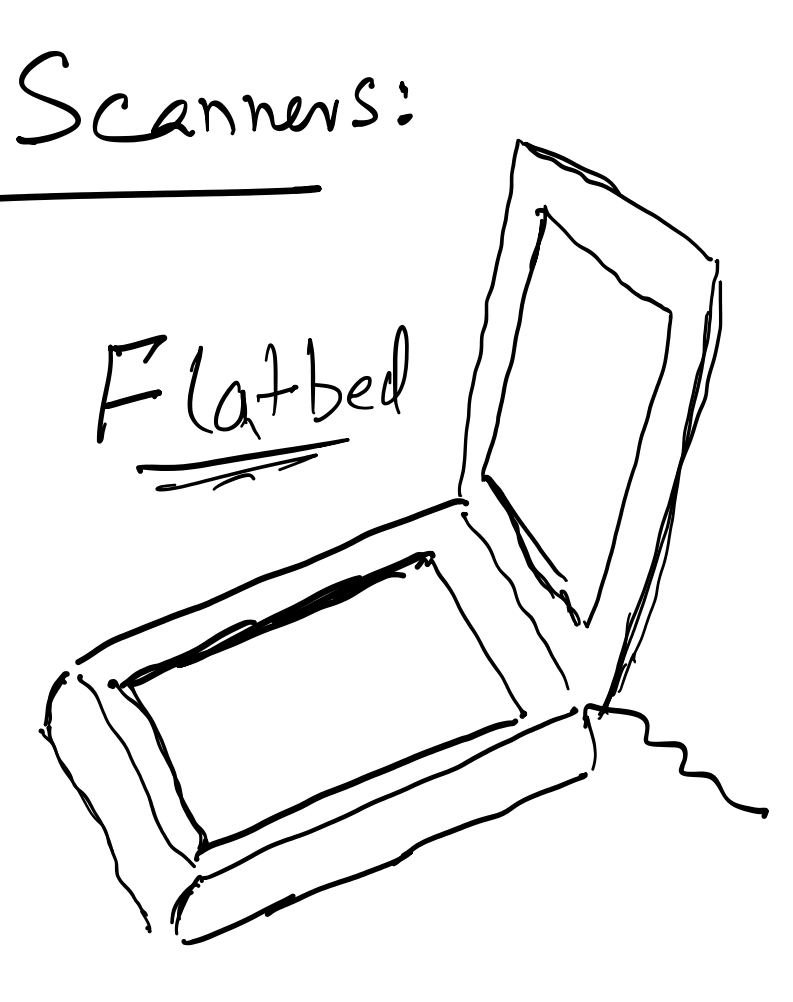
- Input devices that capture images digitally.
- They use image sensor chip to capture images.
- Images recorded on the memory cards.
- They have LCD as well to preview & review images.

Applications:
- professional photography, using DSLRs
- Amateur photography.
- Speed Cameras ....

Benefits:
- Images can be reviewed immediately.
- Images can be copied or edited.
- Image can be automatically shared.

Drawbacks:
- Sometimes the performance is not satisfactory.
- Large memory is required for better quality images.
- Expensive accessories.

2D Scanners:



- 2D Scanner perform the task to turn 2D document or image into digital file/form.
- There are two forms, i.e. flatbed & handheld.
- Its efficiency is enhanced using OMR and OCR software.

Applications:
- Converting a hardcopy doc into an electronic or digital form.
- Digital form can be shared.
- Reading passports at airports.

Benefits:
- Produce high quality digital copies.
- Digital copies can be shared, edited electronically.

Drawbacks:
- Scanned docs might take alot of storage.