

Chapter – 3 : Output Devices

Output devices displays output to the users. Followings are some output devices:

- Monitors
 - CRT Monitors
 - Non CRT Monitors
 - LCD/LED
- Plotters
- Printers
 - Impact Printers
 - Non-impact Printers
- FAX
- OLED
- Headphones
- SGD (Speech Generating Device)
- COM (Computer Output Microfilm)
- Google Glass

Fax (Fascimile) :

Short for fascimile *machine*, a device that can send or receive pictures and text over a telephone line. Fax machines work by digitizing an image -- dividing it into a grid of dots. Each dot is either on or off, depending on whether it is black or white. Electronically, each dot is represented by a bit that has a value of either 0 (off) or 1 (on).

In this way, the fax machine translates a picture into a series of zeros and ones (called a bit map) that can be transmitted like normal computer data.

On the receiving side, a fax machine reads the incoming data, translates the zeros and ones back into dots, and reprints the picture.

The idea of fax machines has been around since 1842, when Alexander Bain invented a machine capable of receiving signals from a telegraph wire and translating them into images on paper.

A fax machine consists of an optical scanner for digitizing images on paper, a printer for printing incoming fax messages, and a telephone for making the connection.

The optical scanner generally does not offer the same quality of resolution as stand-alone scanners. Some printers on fax machines are *thermal*, which means they require a special kind of paper.

Headphone :

If it be listening to music, audiobooks, or watching videos, we all use our headphones pretty regularly.

Headphones are basically tiny speakers, and use an electromagnet to vibrate air, creating sound.

Different types of headphones use different technology — for example, noise cancelling headphones have some extra tech in there aimed at cutting down on ambient noise.

In principle, headphones work the same as speakers, and the opposite of microphones — that's to say, they essentially turn electrical energy into sound by using magnets to vibrate the air, which creates sound.

Digital audio is stored in a device in the form of data — 1's and 0's. When you hit play on that device, those 1's and 0's — which represent the sampling of an actual sound that was recorded with a microphone

That signal is sent through your headphones' wires, and into the headphones themselves.

Google Glass :

Google Glass is a wearable, voice- and motion-controlled Android device that resembles a pair of eyeglasses and displays information directly in the user's field of vision.

Google Glass offers an augmented reality experience by using visual, audio and location-based inputs to provide relevant information. For example, upon entering an airport, a user could automatically receive flight status information.

The Google Glass operating system (OS) is based on a version of Android. The OS can run application virtualization tools called Glassware that are optimized for the device.

Glassware allows the device to deliver an app to the user, instead of a full desktop. The glasses have built-in Wi-Fi and Bluetooth connectivity and a camera for taking photographs and videos.

The smart eyewear uses motion and voice recognition to process commands from the wearer. A touchpad is also available on the glasses' rim.

Google Glass then uses a field sequential color (FSC) liquid crystal on silicon (LCOS) system to display images on the lens, allowing wearers to view the image in true colors.

Features :

- The ability to take photos and videos and then share exactly what the user is seeing through Google Hangouts.
- The option to use the Google search engine through the glasses, using Wi-Fi or a smartphone's data connection.
- The ability to have translations streamed straight to the wearer through the screen.
- Reminders to complete certain chores or tasks with an added visual aspect that will prompt a notification to appear on the user's screen every time they look at a particular object.

- The ability to sync the glasses to calendars stored on phones or computers in order to receive reminders of events and meetings.
- Support of both voice and video calls. In the video calls, wearers can show the other person exactly what they're looking at instead of talking face-to-face.
- The ability to answer emails and text messages using voice dictation.
- Collaboration with Google Maps to provide step-by-step directions with a map displayed on the screen.
- The ability to respond to facial and head movements, such as allowing the user to tilt their head to scroll through a page or operate the device with eye movements.

Organic LED (OLED) :

- An **organic light-emitting diode (OLED or organic LED)**, also known as **organic electroluminescent (organic EL) diode** is a light-emitting diode (LED) in which the emissive electroluminescent layer is a film of organic compound that emits light in response to an electric current.
- OLEDs are used to create digital displays in devices such as television screens, computer monitors, and portable systems such as smartphones, handheld game consoles and PDAs.
- An OLED display works without a backlight because it emits visible light.
- In low ambient light conditions (such as a dark room), an OLED screen can achieve a higher contrast ratio than an LCD,
- They're super-light, almost paper-thin, theoretically flexible enough to print onto clothing, and they produce a brighter and more colorful picture

- An OLED is simply an LED where the light is produced ("emitted") by organic molecules
- A simple OLED is made up of six different layers. On the top and bottom there are layers of protective glass or plastic.
- The top layer is called the **seal** and the bottom layer the **substrate**.
- In between those layers, there's a **negative terminal** (sometimes called the cathode) and a **positive terminal** (called the anode). Finally, in between the anode and cathode are two layers made from organic molecules called the **emissive layer**.

SGD (Speech Generating Device) :

- **Speech-generating devices (SGDs)**, also known as **voice output communication aids**, are electronic augmentative and alternative communication (AAC) systems used to supplement or replace speech or writing for individuals with severe speech impairments, enabling them to verbally communicate
- SGDs are important for people who have limited means of interacting verbally, as they allow individuals to become active participants in communication interactions.
- They are particularly helpful for patients suffering from amyotrophic lateral sclerosis (ALS) but recently have been used for children with predicted speech deficiencies
- Speech-generating devices can produce electronic voice output by using digitized recordings of natural speech or through speech synthesis—which may carry less emotional information but can permit the user to speak novel messages.

- The content, organization, and updating of the vocabulary on an SGD is influenced by a number of factors, such as the user's needs and the contexts that the device will be used in
- There are multiple methods of accessing messages on devices: directly or indirectly, or using specialized access devices
- The first known SGD was prototyped in the mid-1970s.

COM (Computer Output Microfilm) :

- COM is a system that converts stored data directly to microfilm or microfiche.
- COM are still in use today, used mostly by organizations who need to store accounting, insurance, or employee data.
- Here the organizations have to search manually for a record and use a reader printer to save out a particular file.
- The feasible option is to convert COM to digital image via Generation scanning services
- Using high quality microfiche scanners, we convert microfiche to digital form.
- The end result of this entire process is a digital scanner which you can easily search the file containing records by name, account number, date, security number. This saves time and efficiency.

