BE TRUE

TRINITY COLLEGE NABBINGO

S.2 COMPUTER STUDIES

INSTRUCTIONS: Copy the Notes in your books, if you had not finished by the time you left school.

MICROCOMPUTER OUTPUT DEVICES

The term **output** refers to information out of a computer.

Output devices refer to any device capable of displaying, representing and reproducing information from a computer.

The two major forms of computer output are:

- Soft copy
- Hard copy

Soft copy: This refers to information/data displayed visually on the screen or is audio or voice form such as speech or music and this kind of output is not tangible.

Soft copy output devices include: Monitors and Speakers

Hard copy: This refers to information/data that is in a permanent form that is in print out form. Hard copy refers to a printout of data stored in a computer.

It is considered hard because it exists physically on paper, whereas a soft copy exists only electronically.

Hard copy out put devices: Printers **and** Plotters

Advantages of hardcopy over softcopy

- It cannot be easily changed without trace
- It can be read off line namely without a computer
- It is cheaper compared to softcopy which requires computer devices to be able to read the information

- Hardcopies last longer if stored in a safe place compared to softcopy which must be all the time changed with the technological developments taking place
- Hardcopies are universal as both rich and poor readers read them

EXAMPLES OF OUTPUT DEVICES;

1. **PRINTERS**

A printer is an output device that produces a hard copy of documents stored in electronic form, usually on physical print media such as paper.

Printers are categorized by how images are formed that is whether or not the image is formed by physical contact of the print mechanism with paper.

There are two major categories:

- Impact printers
- Non impact printers

The distinction between impact printers and non impact printers is that impact printers tend to be considerably noisier than nonimpact printers but are useful for multipart forms such as invoices.

IMPACT PRINTERS

Impact printers are a class of printers that work by banging a head or needle against an ink ribbon to make a mark on the paper.

Impact printers use pins or hammers which hit a ribbon to transfer images to paper. They can print on Paper, Cloth & Plastic transparencies.

EXAMPLES OF IMPACT PRINTERS

They include the following:

- Character printers/serial printers
- Line printers/high speed printers
- Dot matrix printers

a) Character/serial printers

These are low speed printers that copy the action of the type writers by printing one character at a time.

Characters are engraved on the print heads directly.

Character fonts cannot easily be modified.

Examples of character printers; Daisy's wheel, Thimble printer

b) Line printers

These are high-speed printers capable of printing an entire line at one time.

A fast line printer can print as many as 3,000 lines per minute.

The disadvantages of line printers are that they cannot print graphics, the print quality is low, and they are very noisy.

c) Dot matrix printers

Dot-matrix printers are so far the most commonly used impact printers.

A dot matrix printer works by striking an ink ribbon to print tiny and closely spaced dots onto paper to form certain characters and simple images.

Dot matrix printers produce characters and illustrations by striking pins against an ink ribbon to print closely spaced dots in the appropriate shape.

Dot-matrix printers are relatively expensive and do not produce high-quality output.

However, they can print to multi-page forms (carbon copies).

Examples of dot matrix printers

- Epson LQ 1170
- Epson LQ 2170
- Epson FX 880

ADVANTAGES OF IMPACT PRINTERS

- They are easier to maintain because their print heads require fewer periodic cleaning.
- They are reliable especially in commercial printing since print heads have longer life span.

- They are faster and can go over speeds of 160 characters per second hence increased productivity.

- They are flexible and cheap capable of printing various font styles and heavy graphics and can be used in place of plotters that are expensive.

DISADVANTAGES OF IMPACT PRINTERS

- These printers are very noisy during operation though plastic covers are used on them to reduce the noise.
- They have low print resolution that is they are not good for high quality graphics
- Print heads over heat during long print out periods hence leading to low productivity.

NON-IMPACT PRINTERS

Non impact printers are printers that do not operate by striking a head against a ribbon.

Non impact printers are printers that use chemicals, lasers or heat to form the images on the paper.

They include the following:

- Inkjet/DeskJet printers
- Bubble jet printers
- Thermal printers
- Laser jet/page printers

Inkjet printers

Inkjet printers spray extremely tiny and precise ink droplets to create characters and graphics.

Based on color mixing principles, inkjet printers utilize several ink cartridges containing different colors to produce vivid color images, which is why inkjet printers are often applied for picture-intensive printing.

Examples of inkjet printers; HP Desk jet 690C **and** Epson stylus 640

Advantages of inkjet printers

- Low levels of noise during operation

- Fairly high speed
- Ability to print in colour
- Very good quality output and ability to print graphics
- Small
- Energy efficient
- Many choices from which to choose

Disadvantages of inkjet printers

- Nozzles can be blocked if unfiltered ink is used
- Very high costs of maintenance and buying
- Higher cost per page
- Slow
- Special paper is required for highest resolution output
- Limited to cut sheet media

Bubble jet printers
These are a type of ink-jet printer developed by Canon.

The bubble-jet printers use special heating elements to prepare the ink.

Bubble-jet printers consist of a grid of ink-containing nozzles that forms an image when the ink is heated and expanded, forcing it out onto the page.

Examples include:

- Canon BJC 200

Advantages

- High quality output
- They are portable
- They are battery driven
- They are reasonably priced

Disadvantage

- Bubble-jet printers do not print as fast or sharply as a laser printer

Thermal printers

Thermal printers are printers that use heat to transfer an image onto a special paper.

Thermal printers produce images by melting thermal ribbon to affix it upon paper or another material.

There are two kinds of thermal printers: **thermal wax transfer** and **direct thermal**.

Thermal wax transfer: This is a printer that adheres wax-based ink onto paper.

A thermal print head melts wax-based ink from the transfer ribbon onto the paper. When cool, the wax is permanent.

This type of thermal printer uses an equivalent panel of ink for each page to be printed, no matter if a full page or only one line of print is transferred.

The big advantages of these printers over thermal dye transfer printers are that they don't require special paper and they are faster.

Direct thermal: This is a printer that prints the image by burning dots onto coated paper when the paper passes over a line of heating elements.

Early fax machines used direct thermal printing.

Advantages of thermal printers

- Highest quality desktop colour printing
- Low noise level

Disadvantages of thermal printers

- Are relatively slow
- Require special expensive paper that degrades with storage
- The paper is expensive

Laser printer

A type of printer that utilizes a laser beam to produce an image on a drum.

The light of the laser alters the electrical charge on the drum wherever it hits.

The drum is then rolled through a reservoir of toner, which is picked up by the charged portions of the drum.

Finally, the toner is transferred to the paper through a combination of heat and pressure.

Because an entire page is transmitted to a drum before the toner is applied, laser printers are sometimes called page printers.

In addition to the standard monochrome laser printer, which uses a single toner, there also exist color laser printers that use four toners to print in full color.

Color laser printers tend to be about five to ten times as expensive as their monochrome siblings.

Laser printers produce very high-quality print and are capable of printing an almost unlimited variety of fonts.
In addition to text, laser printers are very adept at printing graphics. However, you need significant amounts of memory in the printer to print high-resolution graphics.

Because laser printers are nonimpact printers, they are much quieter. They are also relatively fast. The speed of laser printers ranges from about 4 to 20 pages of text per minute.

Examples of laser printers

- HP LaserJet 1100 series
- HP Laser Jet 5M colour printer
- Epson EPL-N2000 PS printer

Advantages of laser printers

- They produce high quality text and graphics
- Have very productive speed of between 5-50 copies per minute
- Low noise levels
- Excellent graphics capabilities
- Low maintenance requirements
- Large variety of type face sizes and styles
- Fast

- Many choices from which to choose
- Low cost per page

Disadvantage of laser printers

- They are expensive especially the colour printers
- Limited to cut sheet media
- Slow for graphics output

Advantages of non impact printers

- They are noiseless
- They consume very little power
- Produce clear images with high resolution
- Their print mechanisms are reliable with no paper jams, blocked nozzles thereby increasing productivity

Disadvantages of non impact printers

- Require special paper fro printing hence increasing the costs
- Paper are affected by age, sunlight, humidity and chemical vapour
- Papers have to be specially prepared hence inconvenient in commercial printing.
- Print heads can not be repaired even if a single dot heat fails the entire print head must be replaced
- Print speed is low due to the time given for the print heads to cool before the next print cycle
- Print heads have shorter life span

Common problems associated with the use of printers

- Paper misfeeds
- Paper jams
- Clogged ink jets
- Jammed ribbons
- Toner build up on rollers

Factors to consider before buying a printer

- Pager per minute print out
- Memory of at least 2 mega bytes
- Price
- Availability of the tonner or cartridge
- Purpose of the printer
- Printer drivers

Define the following terms

Near letter quality (NLQ)

Refers to the standard that compares printers' output of characters to the standard characters

Resolution

This describes the clearness or sharpness of an image

Drops per inch (DPI)

Refers to the number of dots per inch on any print media

ADVANTAGES OF PRINTERS

- Information produced is permanent

DISADVANTAGES OF PRINTERS

- The time to get the printout is slow when compared to display devices
- Paper is wasted for obtaining the output
- Printers are generally noisier than display devices

The major output devices of a computer include the following:

1. MONITOR/VISUAL DISPLAY UNIT/SCREEN

A computer display monitor, usually called simply a monitor, is a piece of electrical equipment which displays viewable images generated by a computer without producing a permanent record.

This is the most common output device found on computers today.

The monitor is used to view data that is input from the key board.

Monitors are of many sizes that is 14", 16", 22".

The monitors are categorized according to their shape and technology of operation. They include:

a) Cathode Ray Tube (CRT)

This is the most common and popular type of monitor used on desktop computers, work stations and dumb.

These monitors generate images using small dots on them called picture elements (pixels).

The smaller the pixels and the closer they are, the better the images clarity and sharpness. (Resolution)

Resolution is the clearness or sharpness of an image.

Advantages of cathode ray tubes

- High resolution
- Sharp contrast at large view angles

Disadvantages of cathode ray tubes

- They are bulky
- Consume a lot of power
- They are expensive

b) Flat panel displays / LCD

These are thin, weightless and low power consuming monitors used on portable computers.

Liquid crystal display (LCD)

This is a type of display used in digital watches and many portable computers.

Advantages of flat screens

- Reduce glare
- Reduce reflection
- Reduce distortion of images
- Reduce eyestrain and fatigue

Distinguish between cathode ray tubes and liquid crystal displays

Cathode ray tubes work like standard televisions because they also contain a cathode ray tube.

Cathode ray tubes	liquid crystal displays
-Consume more power	-Consume less power
-Relatively cheap	-More expensive
-Common on desktops	-Common with hand held devices
-Use analog signals	-Use digital signals
-Not ideal due to their size	-Ideal for limited space
-Emit electro- magnetic radiation	-Do not emit electro- magnetic radiation

Advantages of display devices such as monitors over printers

- They are generally quiet
- Need no paper
- Output can be modified or changed easily
- Scrolling enables focus on a particular or part of the document
- Transmission to another device is faster for example on a local area network
- They are the user's workplace therefore making them easier to use
- The time taken to display the images is fast
- Screen displays can include text, graphics and colours

Disadvantages

- Need separate devices to produce the hard copy
- Unsuitable for users with visual problems
- Information produced on the screen is only temporary and will be lost when the power of the display device is turned off.

2. PLOTTERS

Plotters draw lines using a pen; as a result, they can produce continuous lines,

Multicolor plotters use different-colored pens to draw different colors.

The plotters are used in engineering applications where precision is mandatory.

Plotters print their output by moving a pen across the surface of a piece of paper. They are suitable for architectural drawing and map making.

3. SPEAKERS-AUDIO OUTPUT DEVICES

These produce sound output and are common with today's multi media programs that have become so important and necessary.

Speakers are electro-acoustic transducers that convert electrical

signals into sounds loud enough to be heard at a distance.

Advantages of audio output devices

- Are ideal for visually impaired people

Disadvantages

- Are not suitable for use in noisy environment
- Not suitable for use in very quiet environment where other people are working for example libraries
- No permanent copy is produced
- A computer can only repeat the same message exactly the same way therefore when the message is not understood the first time, it may not be understood the second time.

4. DATA PROJECTORS

These take images displayed on the computer screen and cast them so they can be clearly seen by a room full of people.

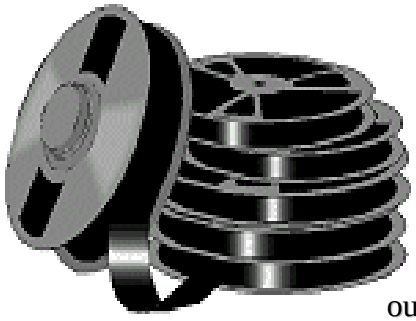
Their **disadvantage** is that the resulting image is distorted or has poor resolution.

These are devices that launch computer output onto a white or silver fabric screen that is wall, ceiling or tripod mounted.

These are widely used in classrooms and auditoriums for instruction and slide presentations.

A data projector has a VGA socket for computer screen input at resolutions such as 800x600, 1024x768 and 1280x1024.

5. COMPUTER OUTPUT MICRO FILM



This is a system that allows a computer user to produce microfilm copies of computer output.

The Computer output micro film unit operates independently of the CPU and is therefore called an off-line device.

Output from computer processing is recorded on generic media and later recorded on microfilm.

This is output technology that records output from a computer as microscopic images on the roll or sheet film.

Advantages

- Fast data recording
- Low costs
- Less space is needed
- Less cost for storage

6. FACSIMILE MACHINE

This is a machine that transmits and receives documents over telephone lines

This is a device that can send or receive pictures and text over a telephone line.

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

Advantages

- Saves paper
- Allows a user to store received faxes on the computer
- Received faxes can be e-mailed to others
- Hard copies are available

Disadvantages

- Sending a big document can be slow
- Waste of paper when junk faxes are sent

7. MULTIFUNCTIONAL DEVICES

These refer to a single piece of equipment that provides the functionality of a printer, scanner, copy machine and facsimile machine.

Advantages

- Less space is needed
- Less costs for buying separate units

Disadvantage

- When it breaks down, the user loses all its functions

End.

Prepared By TULINA DOROTHY

Stay Home, Stay Safe.