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INFORMATION COMMUNICATION TECHNOLOGY

NOTES

By

INFORMATION COMMUNICATION TECHNOLOGY

Definition:

ICT (information and communications technology - or technologies) is a term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries.

Or

ICT stands for Information and Communication Technology and are defined as a set of technological tools and resources used to communicate, create, disseminate, store and manage information.

These tools include computers, the internet, broadcasting (radio and Television)

The importance of ICTs lies less in the technology itself than in its ability to create greater access to information and communication in underserved populations. Many countries around the world have established organizations for the promotion of ICTs, because it is feared that unless less technologically advanced areas have a chance to catch up, the increasing technological advances in developed nations will only serve to exacerbate the already-existing economic gap between technological "have" and "have not" areas. Internationally, the United Nations actively promotes ICTs for Development (ICT4D) as a means of bridging the digital divide.

Digital divide is a term that refers to the gap between demographics and regions that have access to modern information and communications technology, and those that don't or have restricted access. This technology can include the telephone, television, personal computers and the Internet.

INTRODUCTION TO COMPUTERS

What is a computer?

A computer is a general-purpose electronic machine that receives / accepts, processes, stores and output data into meaningful information

A computer can also be defined as an electronic device operating under control of instructions stored in its own memory that can accept data, manipulate the data according to specified rules, produce results, and store the results for future use.

Characteristics of Computers.

- **Speed:** The computers process data at an extremely fast rate, at millions or billions of instructions per second. A computer can perform a huge task in a few seconds that otherwise a normal human being may take days or even years to complete. The speed of a computer is calculated in MHz (Megahertz), that is, one million instructions per second.
- **Accuracy:** Besides the efficiency, the computers are also very accurate. The level of accuracy depends on the instructions and the type of machines being used. A computer in other words does not make any mistakes. For example a computer can accurately give the result of division of any two numbers up to 10 or more decimal places
- **Diligence:** Computer, being a machine, does not suffer from the human traits of tiredness and lack of concentration. If four million calculations have to be performed, then the computer will perform the last, four-millionth calculation with the same accuracy and speed as the first calculation.
- **Reliability:** Generally, reliability is the measurement of the performance of a computer, which is measured against some predetermined standard for operation without any failure.
- **Storage Capability:** Computers can store large amounts of data and can recall the required information almost instantaneously i.e. data can be retrieved whenever required.
- **Versatility:** Computers are quite versatile in nature. It can perform multiple tasks simultaneously with equal ease. For example, at one moment it can be used to draft a letter, another moment it can be used to play music and in between, one can print a document as well.
- **Resource Sharing:** In the initial stages of development, computers used to be isolated machines. With the tremendous growth in computer technologies, computers today have the capability to connect with each other. This has made the sharing of costly resources like printers possible. Apart from device sharing, data and information can also be shared among groups of computers, thus creating a large information and knowledge base.

Parts of a computer system

A complete computer system comprises of four distinct parts.

- Hardware
- Software
- Data

- User

Data and information

Data is a collection of unprocessed items, which can include text numbers, images audio and video.

Data is raw facts and figures by its self it doesn't provide anything meaningful.

Information: Is processed data. It has meaning and is useful to one or more people.

Information processing cycle

A computer processes input (data) into output (information). Most people refer to the series of input, process, output and storage activities as the information processing cycle.

- **Input:** this is the first stage in the cycle. This stage involves collection of data from the outside or also from within the system. The commonly used input devices are keyboard, bar code readers, mouse, scanners e.t.c
- **Processing:** This is the stage where by the computer works on the data entered and makes it usable.
- **Output:** this is the stage in which the processed information is now transmitted to the user. The output can be given inform of audio, video, text and graphics. Results can be viewed on the screen or printed on a physical medium.
- **Storage:** after the data has been processed into information the results can be kept for future use.

How a computer represents data

The computer reads and stores data of all kinds in form of numbers.

Computers use the binary number system while humans normally use decimal number system.

Binary number system

- Has two distinct digits, 0 and 1
- 0 and 1 combine to make numbers.

Decimal number system

- Contains ten distinct digits e.g 0 up to 9.
- Digits combine to make larger numbers.

Digital data representation

The form in which information is conceived manipulated and recorded.

Bit (binary digit)

- It is the smallest possible unit of data a computer can recognize or use.
- In other words, it is the smallest unit of data representation.

- 0 (off, No) OR 1 (on, Yes).

Byte

- The Smallest unit of data Storage.
- A byte is 8 bits, about one character of data.
- Half a byte is a nibble.

Bits and bytes

- One bit is a single 0 or 1.
- One byte consists of 8 bits.
- One kilobyte consists of 1,024 bytes approximately 1000 bytes.
- One megabyte is 1,024 kilobytes or approximately 1 million bytes.
- One gigabyte is 1,024 megabytes or approximately 1 billion bytes One terabyte is 1,024 gigabytes or approximately 1 trillion bytes.

WORLD OF ICT

ICT is the tools and techniques used to capture, store, manipulate, communicate and use information.

Fully exploiting the capability of ICT is of critical importance to the delivery of modern government and businesses in a knowledge - driven economy

Use of ICTs in;

Education

Education is the process of acquiring knowledge and skills, in the traditional model, people learn from others such as parents, teachers and employers. Many forms of printed materials such as books and manuals are used in learning. Today educators also are turning to ICT to assist with education.

As the cost of computers and other ICT tools drops, many schools and companies can afford to equip labs and class rooms with computers.

E- Learning

- Sometimes the delivery of education occurs at a place while the learning occurs at other locations (distance learning). e.g. Students can take classes on web. More than 70% of colleges in developed countries offer some type of distance learning classes. A few even offer entire degrees online.
- Students use software to assist with learning or complete assignment.
- Through ICT there has been enhanced class room teaching through use of presentations as well as projectors to deliver the information in a more convincing way.

- Schools and Institutions use computers to typeset examinations.
- Online registration and admissions: Most institutes and schools have opened up websites which offer online registration and admissions without visiting the institute physically.
- Ubiquitous learning (through virtual mentors / teacher)
- Research. Teachers and students use the internet to carry out research on various topics.
- Communication (Teacher-students / Teachers - parents communication) through e-mail.
- Online discussion (video-conferencing).

E- Commerce.

E - Commerce is the general term used for companies trading online. It is a shorter way of saying electronic trading. The “E” is for Electronic and commerce means trading.

The prevailing E-commerce activities have been divided into 3 major categories Business-to-Consumer (B2C)

In a Business-to-Consumer E-commerce environment, companies sell their online goods to consumers who are the end users of their products or services. Usually, B2C E-commerce web shops have an open access for any visitor, meaning that there is no need for a person to login in order to make any product related inquiry.

1. Business-to-Business (B2B)

In a Business-to-Business E-commerce environment, companies sell their online goods to other companies without being engaged in sales to consumers. In most B2B E-commerce environments entering the web shop will require a log in. B2B web shop usually contains customer-specific pricing, customer-specific assortments and customer-specific discounts.

2. Consumer-to-Business (C2B)

In a Consumer-to-Business E-commerce environment, consumers usually post their products or services online on which companies can post their bids. A consumer reviews the bids and selects the company that meets his price expectations.

3. Consumer-to-Consumer (C2C)

In a Consumer-to-Consumer E-commerce environment consumers sell their online goods to other consumers. A well- known example is eBay.

Health

Nearly every area of health care uses computers whether you are visiting a family doctor for a regular check-up.

- Hospitals and doctors use computers to maintain patients records.
- Computers monitor patients" vital signs in the hospital room and at home.
- Computers and computerized devices assist doctors, nurses and technicians with medical tests.
- Doctors use the web and medical software to assist with researching and diagnosing health conditions.
- Doctors use e-mail to correspond with patients.
- Pharmacists use computers to file insurance claims.
- Surgeons use computer-controlled devices to provide them with precession during operations such as for laser eye surgery and robot assist heart surgery.
- Surgeons implant computerized devices, such as pace makers that allow patients to live longer.
- Many websites provide up-to date medical fitness, nutrition or exercise information. These Websites also maintain lists of doctors and dentists to help you find the one that suits your need.
- They have chat rooms so you can talk to others diagnosed with similar conditions.
- Websites even allow you to order prescriptions online. An exciting development in health care is telemedicine, which is a form of long-distance health care.
- Through telemedicine, Health care professionals in separate locations have live conferences on computers e.g. doctors at another location to discuss a bone X-ray live images of each doctor along with the X-ray are displayed on each doctor's computer.

Security

- Use of CCTV cameras to monitor supermarkets for shop lifters / thieves and to monitor crucial buildings like banks, parliament e. t. c.
- Use of traffic camera to track traffic offenders.
- Use of biometric devices like finger print scan, iris scan to keep records of right employees.
- Mobile phones have tracking records used to track down rebels and suspected criminal.
- Walkie talkies that are used in communication by armies and police.
- Surveillance cameras that help in capturing criminals.
- Computers are used by police and other security agents in storing databases for criminals.

Art, leisure and entertainment

One of the most compelling ways in which technology has affected our lives is in the way we are entertained or we choose to entertain ourselves

- The internet can be used to book tickets for concert or visit to the cinema.
- Portable devices like phones are used for playback music and video files.
- Digital transmission is used to broadcast TV and radio programs. TV programs are provided free to air or on a pay to view basis through satellite and cable services.
- Music download from the internet, the internet is used as a channel for the distribution of music through music download website.
- Playing of games is an important leisure activity for many computer users.

Industrial, technical and scientific uses

Many processes that were traditionally performed manually in the manufacturing industry are now done using a variety of technologies.

Industries that manufacture products usually have large number of employees and high capital expenditure capital includes factories ware houses, machinery and computers.

1. CAD (Computer Aided Design)

Computers are used to design the model of a product on the computer. This process is called Computer Aided Design

2. CAM (Computer Aided Manufacturing)

Computer Aided Manufacturing (CAM) refers to the use of computers to assist with manufacturing process as fabrication and assembly. Often robots carryout processes in a CAM environment,

3. Process control

Some entire manufacturing processes are now fully automated and controlled by computer technology. One of the best known examples is the car manufacturing process, where robots build and process most of the infrastructure re with minimal human input.

Some companies have automated packaging processes that use computer - operated packing machines capable of packing a wide range of products, including perishable and easily damaged products like fruits or vegetables.

Uses of computers at Home

- Computers help in calculating home grocery bills.
- Computers can be used as Television sets those that have TV cards.
- Computers can act as radios at home since music can be heard from computers by either inserting in a CD or MP3.
- You can access internet on a computer at home

Implications of using icts

Social / ethical Positive implication

- ICT has enabled efficient and instant communication through the use of TV, radios and telephones with comprehensive news.
- Elders were custodians of secrecy and indigenous knowledge, technology has demanded that their Knowledge be drained and stored in DB (Database) where much of it is moved to the public Domain
- Fast and easy way of getting friends through social networks like Face book, twitter e.t.c
- Use of mobile money to pay bills, fees, and convey money to our family members without incurring costs
- E-policy, viewing policies online.
- Online Education where by people gets academic qualifications online.
- People can communicate any time and at any place with the introduction of phones
- Information rich and easy access through the internet

Negative implications.

- Social Networking has removed the boundaries of respect and direct dialogue between and among youths and elders.
- Access of pornographic material and immoral movies by young people through the internet has led to moral decay.
- Culture degeneration due the exposure of western culture.
- ICT has diluted traditional community religions.
- Information poor: not all people have access to computers thus making it difficult to access information that can be got from computers.
- High level of unemployment as a result of introduction of ICTs in most companies. ICT replace

human beings.

- Change in family patterns may be indirectly and partly caused by computerization. Research has shown that families are spending less and less time together.
- Economic implications.

Positive

- Establishment of ICT networks has led to more infrastructure development e.g. more software applications have been introduced to the market.
- Investment in mechanical ICTs, contributes to labour productivity growth. Workers are trained to use the machines thus increasing on the productivity level.
- Through the use of ICTs, many countries have developed databases that provide detailed and comprehensive data on the performance of individual firms. This source of information can help establish a link between firm performances.
- The effective use of ICT has helped firms gain market share at the cost of less productive firms, which could raise overall productivity.
- The use of ICT has helped firms to be innovative, e.g. by helping them to expand their product range, customize the services offered, or respond better to clients.
- ICT has helped to reduce inefficiency in the use of capital and labour, e.g. by reducing inventories. These effects all lead to higher productivity growth.
- Capital deepening as a result of investment in ICT. This is important for economic growth business with enough capital tend to succeed.
- Computers have automated most aspects of banking, and bill paying and automotive productions. Before computers each bill had to be typed in and the person actually had to pull up a customer record from filing cabinets and mark it paid which was very slow and expensive.

Negative

- Many ICTs are being sold on the market. Most electronic equipment from certain country are fake and do not last long.
- With many ICT technologies on the market, it has become difficult to choose from options.
- Most ICTs are not environmental friendly.
- There is a high rate of unemployment as ICT has replaced man.

Green computing

This is the environmentally responsible use of computers and related resources.

It can also be defined as the practice of efficiently and effectively using computers and related resources with minimal or no impact on the environment

Advantages

- Reduced energy usage from green computing helps lower carbon dioxide emissions that come from the fuel used in power plants and transportation.
- Conserving resources means less energy is required to produce, use and dispose of products which are environmental friendly.
- Saving energy and resources means saving money.
- Reduce the risk existing in the laptop such as chemical known to cause cancer, nerve damage and immune reactions in human.
- Green computing also includes changing government policy to encourage recycling and lowering energy use by individuals and business.

Disadvantage

- High start-up cost
- Not readily available
- Still experimental

Green computing suggestions

- Use computers and devices that comply with the ENERGY STAR program.
- Do not leave the computer running overnight.
- Turn off the monitor, printer, and other devices when not in use.
- Use paperless methods to communicate.
- Recycle paper.
- Buy recycled paper.
- Recycle toner cartridges.
- Recycle old computers and printers.
- Telecommute (saves gas).



Starting a computer

Turn on the power button on the system Unit then turn on the power button of the monitor or visual display unit.

Booting

This is the process by which the computer loads system files into the main memory. This process involves carrying out diagnostics test.

Or is the process of starting or restarting a computer.

Types of booting

1. **Cold booting.** This is the starting up of the computer which has not been on by turning on power buttons.
2. **Warm booting** This is the restarting of the computer. It is known as system reset which can be done by processing the resetting button.

Files and folders

A **file** is collection related information that is given a name and stored so that it can be retrieved when needed.

File names can contain two characters including spaces.

A **folder** is a collection of files. A folder can also contain many sub-folders

Creating a folder

From the main option select new and then click folder. Type in the name of the new folder.

Or

Right click on the desktop

From the sub menu choose New then click on folder By default a new folder will be created with a tittle new folder Type the name of the new folder and press ENTER.

Renaming a folder

After selecting the folder Select rename from the file option Or click the right button and select rename.

Or Press F2 from the keyboard

Deleting a folder

Files deleted are put in the recycle bin. A recycle bin is a place for files no longer needed.

To delete a file do one of the following.

Select or (click on the file).

Then press delete on the keyboard

From the message box “Are sure you want to delete the folder” click OK

How to retrieve deleted files

Double click on recycle bin icon and click on file you want to retrieve. It will be restored back to its original location.

Open the recycle Bin, Right click on the folder / file you want to restore.

From the sub menu click on Restore

Emptying the recycle bin

Right click on the recycle Bin and then click empty recycle Bin

Double click on the recycle bin icon on the file menu click on the empty recycle bin.

HARDWARE

These comprises of physical, electronic, electric and mechanical components of a computer that help it to process data. They can also be defined as parts / components of a computer that are tangible and occupy space.

These components include **input devices, output devices, a system storage devices and communication devices.**

Qn: What is the difference between Computer Hardware and Computer Peripherals?

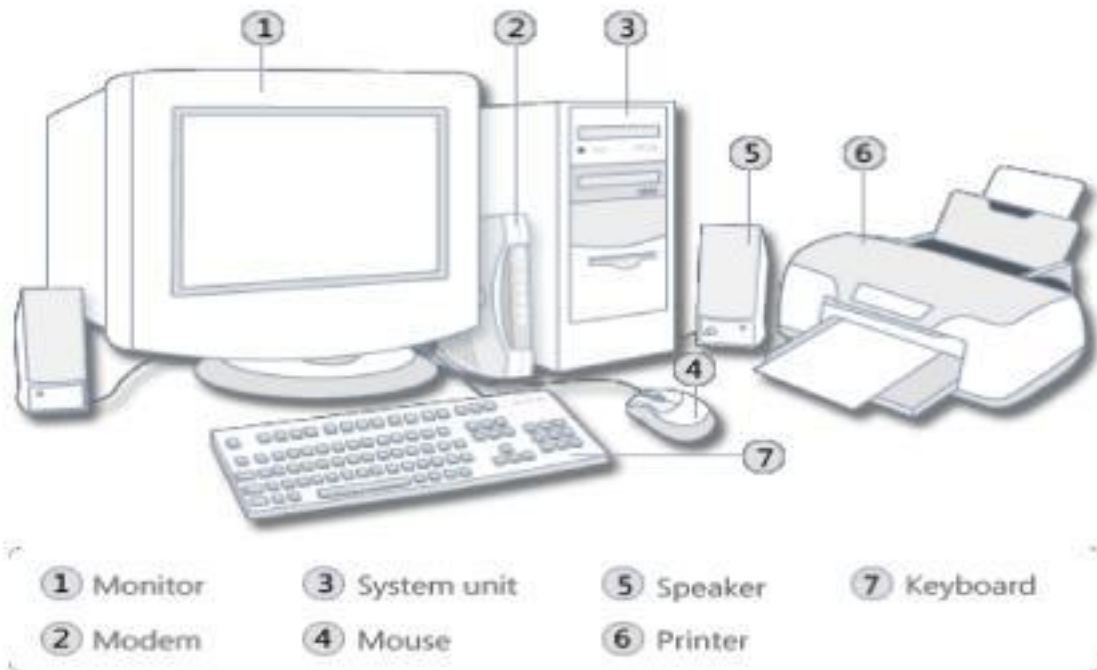
Computer hardware refers to the physical components of a computer that can be touched.

Computer hardware includes the essential mechanical, magnetic, electronic, and electrical components making up a computer system

While

A peripheral is a device attached to a host computer but not part of it whose primary functionality is to expand the host’s capabilities. A peripheral device is not part of the system's core architecture.

The Illustration below shows the most common hardware.



Hardware that is not part of the system unit is sometimes called a peripheral device or device.

INPUT DEVICES

An input device is any hardware component that allows you to enter data or instructions into the computer. Six widely used input devices are the keyboard, mouse, microphone, scanner, digital camera and PC video camera.

Mouse. Is a pointing device used to manipulate on screen objects. A mouse is a small hand held device used for pointing.

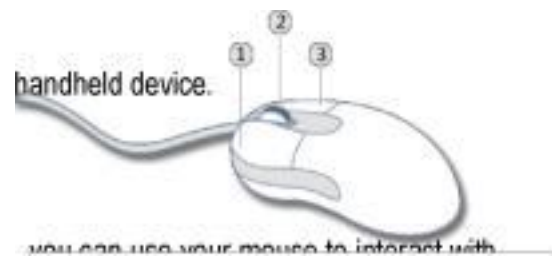
A mouse moves a pointer on the computer screen.

It acts like a finger, allowing you to press buttons and select objects

Using your mouse

Basic parts

A mouse typically has two buttons: a primary button (usually the left button) and a secondary button (usually the right button). The primary button is the one you will use most often. Most mice also include a scroll wheel between the buttons to help you scroll through documents and web pages more easily. On some mice, the scroll wheel can be pressed to act as a third button. Advanced mice might have additional buttons that can perform other functions.



- Left Hand Button - Use to point and select
- Right Hand Button - To open menus, commands
- Using the scroll wheel
- If your mouse has a scroll wheel, you can use it to scroll through documents and web pages. To scroll down, roll the wheel backward (toward you). To scroll up, roll the wheel forward (away from you).
- Cord - plugs mouse into computer

Mouse operations Pointing

Pointing to an item on the screen means moving your mouse so the pointer appears to be touching the item. When you point to something, a small box often appears that describes the item.

- **Clicking (single-clicking).** To click an item, point to the item on the screen, and then press and release the primary button (usually the left button). Clicking is most often used to select (mark) an item or open a menu. This is sometimes called single-clicking or leftclicking. Right click to open a menu and to give more advanced instructions
- **Double-clicking.** To double-click an item, point to the item on the screen, and then click twice quickly. If the two clicks are spaced too far apart, they might be interpreted as two individual clicks rather than as one double-click. Double-clicking is most often used to open items on your desktop. For example, you can start a program or open a folder by double-clicking its icon on the desktop.
- **Drag.** You can move items around your screen by dragging them. To drag an object, point to the object on the screen, press and hold the primary button, move the object to a new location, and then release the primary button. Dragging (sometimes called dragging and dropping) is most often used to move files and folders to a different location and to move windows and icons around on your screen.

Tips for using your mouse safely.

Holding and moving your mouse properly can help you avoid soreness or injury to your wrists, hands, and arms, particularly if you use your computer for long periods of time. Here are some tips to help you avoid problems:

- Place your mouse at elbow level. Your upper arms should fall relaxed at your sides.
- Don't squeeze or grip your mouse tightly. Hold it lightly.
- Move the mouse by pivoting your arm at your elbow. Avoid bending your wrist up, down, or to the sides.
- Use a light touch when clicking a mouse button.

- Keep your fingers relaxed. Don't allow them to hover just above the buttons.
- When you don't need to use the mouse, don't hold it.
- Take short breaks from computer use every 15 to 20 minutes

Other pointing devices / variants of the mouse

The mouse is the most widely used pointing device today. Some users however, work with other pointing devices.

These include the following.

- **Track ball.** A track ball is a stationary pointing device with a ball onto its top.
- **Touchpad.** A touchpad is a small, flat, rectangular pointing device that is sensitive to pressure and motion. To move the pointer using a touchpad, slide your fingertip across the surface of a pad.
- **Joystick and wheel.** A joy stick is a vertical lever mounted on a base. You move the lever in different directions to control the actions of the simulated vehicle or players
- **Wheel.** Is a steering wheel-type input device.
- **Pointer stick.** A pointer stick is a pressure-sensitive pointing device shaped like a pencil eraser that is positioned between keys on a keyboard.
- **Light pen.** A light pen is a handheld input device that can detect the presence of light.
- **Touch screen.** A touch user's screen is a touch-sensitive display device. Users interact with these devices by touching areas of the screens require a lot of arm movements.

Keyboard

A keyboard is an input device that contains keys users press to enter data into a computer.

This is an input device comprising of alphabetical letters, numbers and other keys used to enter data into a computer. Many computer keyboards have got four sections.

- **Typing keys (Alphabetical key pad):** Which include letters of the alphabet, numbers, punctuation marks, and other basic keys.
 - **Numeric key pad:** on the right side of the keyboard.
 - **Functional Keys:** which are labeled with the letter F followed by a number (F1, F2-F12)
 - **Special keys on the keyboard**
1. **Enter Key (Execute key).** It is used to accept a command or execute a command. Or it is used to go to another line when typing,

2. **Back space key.** It is used to erase / rub characters to the left side of the cursor.
3. **Space bar.** It is the longest key on the keyboard and it is used to insert spaces between word and characters.
4. **Caps lock.** It is used to turn capital letters into small letters and small letters into capital letters. When the caps lock is pressed a caps lock light on the top right corner is turned on to indicate that you are in capital letters to switch to small letters press the caps lock button again,
5. **Shift key.** It is used to activate characters on top of the buttons, it can also turn in either small letters or capital letters dependin g on the keyboard case mode.
6. **Delete key.** It is used to erase characters on the right side of the cursor.
7. **F1:** It is used as help.
8. **Esc (escape):** it is used to cancel an application under taken.

Functions of the keyboard.

Its keys allow the user to type data in form of text.

It can be used to command the computer to perform an operation or task,

It is the major connector between the user and the computer,

Without it die user may not be put in the language the compute understands,

Other input devices

Scanner. This is a light-sensing input device that reads printed text and graphics and translates the results into a form a computer can process

Digital camera. It allows users to take pictures and store the photographed images digitally Instead of on traditional film.

Web cam. This is a video camera that displays it's output on a web page.

Joysticks. It is a pointing device with vertical lever for playing games.

Touch Screen. A touch screen is a special kind of input device that allows the direct selection of a menu item or the desired icon with the touch of finger. Essentially, it registers the input when a finger or other object is touched to the screen

Bar code reader. Bar code is a machine-readable code in the form of a pattern of parallel vertical lines of varying widths. It is commonly used for labeling goods that are available in super markets and numbering

books in libraries. This code is sensed and read by a bar code reader using reflective light. The information recorded in bar code reader is then fed into the computer, which recognizes the information from the thickness and spacing of bars.

OUTPUT DEVICES

This is any type of hardware component that conveys information one or more people.

Commonly used output devices include display devices, printers, speakers and headsets, fax machines and fax modems, multifunction peripheral data projectors e.t.c.

Output is data that has been processed into useful form. The computer processes input (data) into information (Output).

The out put, which can be easily understood and used by human beings, are of the following two forms:

1. **Hard Copy:** The physical form of output is known as hard copy. In general, it refers to the recorded information copied from a computer onto paper. Hard copy output is permanent and a relatively stable form of output. This type of output is also highly portable. Paper is one of the most widely used hard copy output media.
2. **Soft Copy:** The electronic version of an output, which usually resides in computer memory and/or on disk, is known as soft copy. Unlike hard copy, soft copy is not a permanent form of output. It is transient (lasting for a short period of time) and is usually displayed on the screen. This kind of output is not tangible, that is, it cannot be touched. Soft copy output includes audio and visual form of output, which is generated using a computer

Following are few of the important output devices, which are used in Computer Systems:

Monitors

Monitor commonly called as Visual Display Unit (VDU) is the main output device of a computer. It forms images from tiny dots, called pixels, that are arranged in a rectangular form. The sharpness of the image depends upon the number of the pixels.

There are two kinds of viewing screen used for monitors:

- **Cathode-Ray Tube (CRT).** In the CRT, display is made up of small picture elements called pixels for short. The smaller the pixels, the better the image clarity or resolution. It takes more than one illuminated pixel to form whole character, such as the letter 'e' in the word help.
- **Flat-Panel Display Monitor** The flat-panel display refers to a class of video devices that have

reduced volume, weight and power requirement compared to the CRT. You can hang them on walls or wear them on your wrists. Current uses for flat-panel displays include calculators, video games, monitors, laptop computer, graphics display. The flat-panel display are divided into two categories:

1. **Emissive Displays** - The emissive displays are devices that convert electrical energy into light. Example are plasma panel and LED (Light-Emitting Diodes).
2. **Non-Emissive Displays** - The Non-emissive displays use optical effects to convert sunlight or light from some other source into graphics patterns. Example is LCD (Liquid-Crystal Device)

Printers.

A printer prints information and data from the computer onto a paper. The quality of a printer is determined by the clarity of a print it can produce, that is, its resolution.

Printers are divided into two basic categories: impact printers and non-impact printers. As their names specify, impact printers work by physically striking a head or needle against an ink ribbon to make a mark on the paper. This includes dot matrix printers, daisy wheel printers, and drum printers. In contrast, inkjet and laser printers are non-impact printers. They use techniques other than physically striking the page to transfer ink onto the page.

Factors considered before buying a printer

- The number of pages per minute (ppm) the printer can print.
- The memory size of the printer i.e. at least 2 MB
- The price of the cartridge or tonner.
- The availability of cartridge or tonner.
- The price of the printer.
- The purpose for which the printer is going to be put to use

Advantages of Hard copy over soft copy

- A hard copy can easily be accessed by both the rich and poor readers.
- It cannot easily be changed without tracing.
- 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 / data.

- Hard copies last longer if stored in a safe place compared to softcopy, which must be all the time changed with the technological developments taking place.

Speakers and headsets

An audio output device is a component of a computer that produces music, speech, or other sounds such as beeps. Two commonly used audio output devices are speakers and headsets. Many personal computers users add stereo speakers to their computers to generate a high-quality sound.

Fax machines and Fax Modems

A fax machine is a device that transmits and receives documents over telephone lines. A fax modem is a modem that allows you to send (and sometime receive) electronic documents as faxes

Data projectors

These are devices that take the images from a computer screen and projects it onto a larger screen and projects it onto a larger screen so an audience of people can see the image clearly.

Qn1: Mention devices which can be classified as both input and also output computer hardware.

1. **Touch Screen** - a touch-sensitive display device you touch words, pictures, numbers, letters, or locations identified on the screen.
2. **a floppy diskette drive** - a device used for both reading and writing data to and from a floppy disk
3. **Optical Disk Writer** - a device used for both reading and writing data to and from optical disks such as CDs, DVDs and Blu-ray disks
4. **a hard disk drive** - a device used for both reading and writing data to and from a Hard disk
5. **USB flash drive** - used for both reading and writing data to and from Flash disks
6. **Modem**

STORAGE

Storage holds data, instruction and information for future use e.g. computers can store lots and millions of customers' names and addresses.

A computer keeps data, instructions and information on storage media e.g. floppy diskette, zip disk, USB flash disk, Hard disk, memory cards and Tapes.

Storage devices

These records (writes and records item) information to and from a storage media.

Storage medium: also called secondary storage, is a physical material on which a computer keeps data, instructions, and information. E.g. floppy disk, Zip disk, hard disks, CDs and DVDs, tapes, PC Cards.

Storage Capacity is the number of bytes (Characters) a storage medium can hold.

Reading: is the process of transferring data, instructions and information from a storage medium into the memory.

Writing: is the process of transferring items from memory to a storage medium.

The speed of a storage media is defined by its access time, which is the amount of time it takes to locate an item on a storage medium.

Primary Memory (Main Memory)

Primary memory holds only those data and instructions on which computer is currently working. It has limited capacity and data gets lost when power is switched off.

It is generally made up of semiconductor device. These memories are not as fast as registers. The data and instructions required to be processed earlier reside in main memory. It is divided into two subcategories

RAM and ROM.

Characteristic of Main Memory

- These are semiconductor memories.
- It is known as main memory.
- Usually volatile memory.
- Data is lost in case power is switched off.
- It is working memory of the computer.
- Faster than secondary memories.
- A computer cannot run without primary memory.

A RAM constitutes the internal memory of the CPU for storing data, program and program result. It is read/write memory. It is called random access memory (RAM).

RAM is volatile, i.e., data stored in it is lost when we switch off the computer or if



there is a power failure. Hence, a backup uninterruptible power system (UPS) is often used with computers. RAM is small, both in terms of its physical size and in the amount of data it can hold. ROM stands for Read Only Memory. The memory from which we can only read but cannot write on it. This type of memory is non-volatile. The information is stored permanently in such memories during manufacture.

A ROM stores such instructions as are required to start computer when electricity is first turned on, this operation is referred to as bootstrap. ROM chip are not only used in the computer but also in other electronic items like washing machine and microwave oven.



Secondary Memory

This type of memory is also known as external memory or non-volatile. It is slower than main memory. These are used for storing Data/Information permanently.

CPU directly does not access these memories, instead they are accessed via input-output routines.

Contents of secondary memories are first transferred to main memory and then CPU can access it. For example, disk, CD-ROM, DVD, etc.

Characteristics of Secondary Memory

- These are magnetic and optical memories.
- It is known as backup memory.
- It is non-volatile memory.
- Data is permanently stored even if power is switched off.
- It is used for storage of the data in the computer.

- Computer may run without secondary memory.
- Slower than primary memories.

Primary magnetic storage Primary Optical storage

- Diskettes
- Compact Disk Read Only Memory (CD ROM)
- Hard disks (both fixed and removable)
- Digital Video Disk Read Only Memory (DVD ROM)
- High capacity floppy disks CD Recordable (CD R)
- Disk cartridges CD Rewritable (CD RW)
- Magnetic tape
- Photo CD

Processing system unit

As we have seen that a computer includes devices used for input, processing, output, storage and communication, many of these components are part of the system unit.

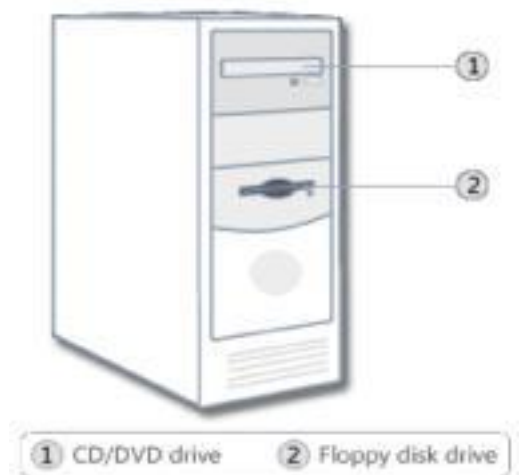
The system is the case that contains electronic components of the computer used to process data

Although many system units resemble a box, they are available in many shapes and sizes.

The size and layout of a system unit is called the form factor.

The case of the system unit sometimes called the chassis, is made of metal or plastic and protects the internal electronic components from damage. All computers have a system unit

Components of the system unit includes: the processor, memory, adaptor cards, ports, bays, and power supply



The motherboard

The motherboard, sometimes called a system board, is the main circuit board of the system unit. Many electronic components attach to the mother board others are built into it.

A desktop motherboard contains components that attach to it, including the processor, adaptor cards, memory and other components on i motherboard consists of one or more computer chips

A computer chip is a small piece of semi-conducting material, usually silicon on which integrated circuits are etched.

Components of the motherboard

Processor (Central Processing Unit)

The processor interprets and carries out the basic instructions that operate a computer. The processor significantly impacts the overall computing power and manages most computer operation.

Central Processing Unit. The “brain” of the computer. It executes commands which, eventually, we see as a response to our input. Without the CPU, the computer is nothing.

Processors contain the control unit, Arithmetic Logic unit and registers.

These three components work together to perform processing operations

1. **The control unit:** The control unit is the component of processor that directs and co-ordinates most of the operations in the computer.
2. **Arithmetic Logic Unit:** The Arithmetic Unit is another component of the processor, which performs arithmetic, comparison, and

Comparison operations involving comparing one data item with another to determine whether the first item is greater than, equal to, or less than the other.

Logical Operations. Include conditions along with logical operators such as AND, OR, and NOT.
3. **Logic operations:** Arithmetic operations include basic calculations such as addition, subtraction, multiplication, and division.
4. **Registers:** The registers are devices that hold data inside the computer’s memory long enough to execute a particular function, such as indexing, calculating, sorting or otherwise manipulating data. They are the CPU's own internal memory. Registers also contains high-speed storage locations called registers that temporarily hold data and instructions. Registers are part of the processor not part of memory or storage.

Heat sink and heat pipes.

Although the computer's main fan generates airflow, today's processors require additional cooling.

Heat sink: It absorbs and ventilates heat produced by electronic components such as processor.

Heat pipes: These cool processors in notebook computers

Memory

This holds data waiting to be processed and instructions waiting to be executed. And memory is usually part or are connect to the main circuit board called mother board.

Expansion slots

An expansion slot is a socket on the motherboard that can hold an adaptor card.

Adaptor cards

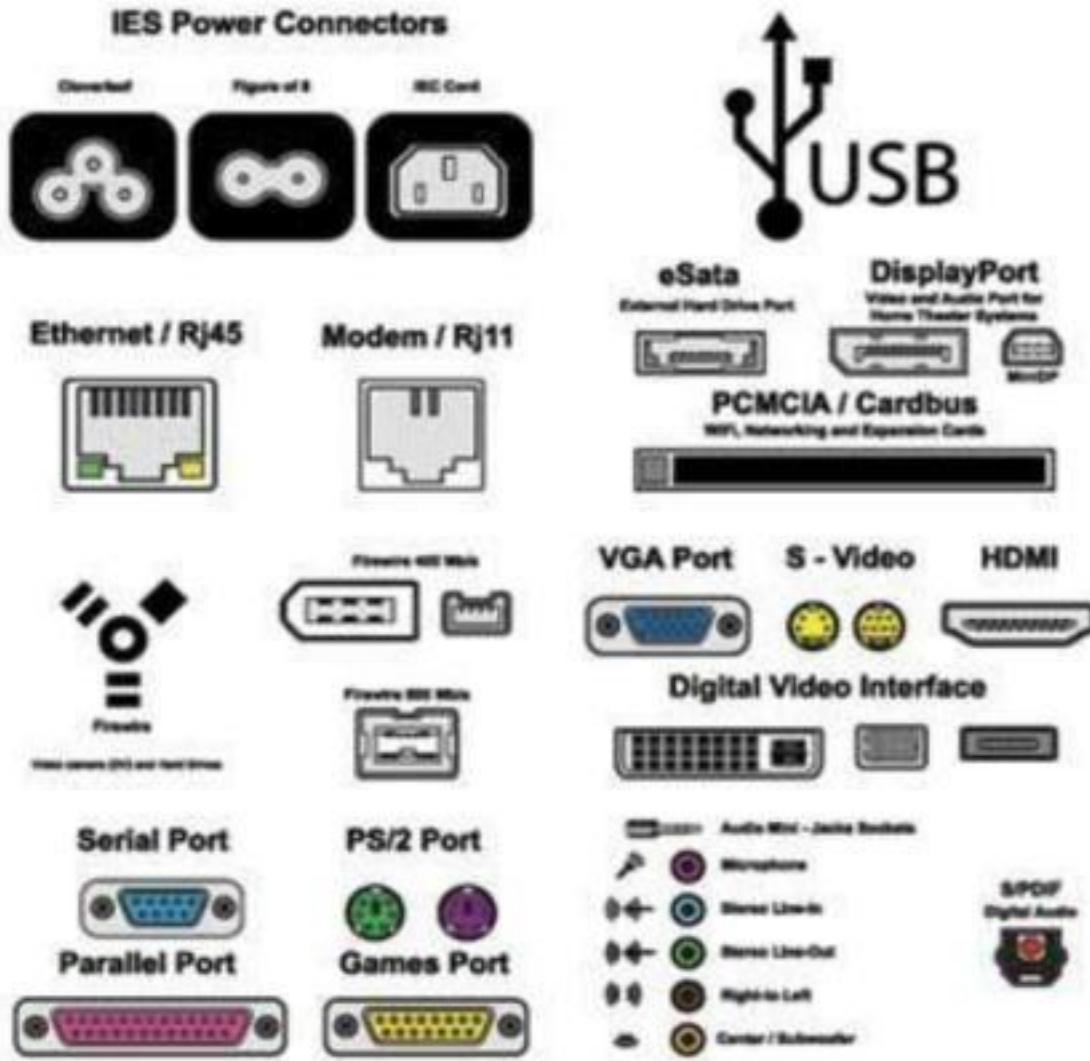
An adaptor card sometimes called an expansion card is a circuit board that enhances functions of a component of the system unit and /or provides connections to peripheral.

Ports and connections

A computer port is a physical docking point using which an external device can be connected to the computer.

A computer port can also be programmatic docking point through which information flows from a program to computer or over the internet. External devices are connected to a computer using cables and ports. Ports are slots on the motherboard into which a cable of external device is plugged in.

Examples of external devices attached via ports are mouse, keyboard, monitor, microphone , speakers, etc.



Following are few important types of ports:

Serial Port

Used for external modems and older computer mouse.

Two versions: 9 pin, 25 pin model.

Data travels at 115 kilobits per second.

Parallel Port

Used for scanners and printers

Also called printer port.

25 pin model.

Also known as IEEE 1284-compliant Centronics port.

PS/2 Port

Used for old computer keyboard and mouse

Also called mouse port.

Most of the old computers provide two PS/2 ports, each for mouse and keyboard.

Also known as IEEE 1284-compliant Centronics port.

Universal Serial Bus (or USB) Port

Can connect all kinds of external USB devices such as external hard disk, printer, scanner, mouse, keyboard, etc.

Introduced in 1997.

Most of the computers provide two USB ports as minimum.

Data travels at 12 megabits per second.

USB compliant devices can get power from a USB port.

VGA Port

Connects monitor to a computer's video card.

Has 15 holes.

Similar to serial port connector but serial port connector has pins, it has holes.

Power Connector

Three-pronged plug

Connects to the computer's power cable that plugs into a power bar or wall socket.

Firewire Port

Transfer large amounts of data at very fast speed.

Connects camcorders and video equipments to the computer

Data travels at 400 to 800 megabits per second.

Invented by Apple

Modem

Connects a PC's modem to the telephone network.

Ethernet Port

Connects to a network and high speed Internet.

Connects network cable to a computer.

This port resides on an Ethernet Card.

Data travels at 10 megabits to 1000 megabits per second depending upon the network bandwidth.

Game Port

Connect a PC to a joystick.

Now replaced by USB.

Digital Video Interface, DVI port

Connects a Flat panel LCD monitor to the computer's high-end video graphic cards.

Very popular among video card manufacturers.

Sockets

Connect microphone, speakers to sound card of the computer

Hardware represents the physical and tangible components of the computer, i.e., the components that can be seen and touched.

Some motherboards include all necessary capabilities and do not require adaptor cards e.g. sound and video functions may be built in a newer motherboard. Other motherboards may require adaptor cards to provide sound, video, modem and network capabilities.

A sound card enhances the sound generating capabilities of a personal computer by allowing sound to be input through microphone and output through external speakers and headsets.

A video card also called a graphic card converts computer output into a video signal that travels through a cable to monitor which displays an image on the screen.

A network card (RJ45) is a communication device that allows computers to access a network.

In the past installing a card was not easy and required you to set switches and other elements on the motherboard. Many of today's computers support Plug and Play where a computer automatically configures adaptor cards and other peripheral as you install them. Having a plug and play support means you can plug in a device, turn on the computer, and then immediately begin using them.

PORTS AND CONNECTIONS

A port is the point at which a peripheral attaches to the system unit so as it can send data and receive information from the computer. A connector joins a cable to the peripheral.

Most computers have atleast one serial port, one parallel port, and four USB ports.

Serial Ports (Male port)

A serial port is a type of interface that connects a device to the system unit by transmitting 1 bit of data at a time. Serial ports usually connect devices that do not require faster data transmission e.g. monitor keyboard, or modem

Parallel Port. (Female port)

A parallel port is an interface that connects devices by transferring more than 1 bit of data a time. Parallel ports were developed as an alternate to the slower speed serial ports. They connect devices such as printers.

USB ports

USB ports can connect up to 127 different peripherals together with a single connector type. Personal computers typically have four to eight USB ports either on the front or back of the system unit.

A USB hub is a device that plugs into a USB port on the system unit and contains multiple USB ports into which you plug cables from USB devices.

SOFTWARE

Software is a set of instructions that drive a computer to perform specific tasks.

These instructions tell the machine's physical components what to do.

A set of instructions is often called a program.

When a computer is using a particular program, it is said to be running or executing the program.

The two most common types of programs are system software and application software.

TYPES OF SOFTWARE

Computer software is broadly divided into two categories namely:

- System software
- Application software

System Software.

This consists of programs that control or manage the operation of the computer and its devices. System software serves as an interface between users, the application its software and the computer's hard ware. System software is computer software designed to operate the computer hardware and to provide maintain a platform for running application software.

Examples of system software include;

- The operating system
- Utility Programs
- Programming language



OPERATING SYSTEM

This is a set of programs containing instructions that co-ordinate all the activities among hardware resources.

- In otherwords, an operating system is a computer's master control program.
- It provides a user with the tools (commands) that enable him/her interact with the computer.
- It also acts as a primary controlling mechanism for the computers hardware.
- Without an operating system, a user cannot run an application program on their computer.

Classification of operating system

Real-Time operating Systems:

- Refers to multitasking operating system that aims at executing real-time applications.
- A real time application is an application that responds to certain inputs extremely quickly.
- Very fast and relatively small operating systems.
- Built into a device, not loaded from a disk drive.
- Used in MP3 players, Medical devices such as medical diagnostics equipment, life-support systems etc.

Single-User/Single-Tasking Operating Systems:

- Allows a single user to perform just one task at a time
- Take up little space on disk
- Run on inexpensive computers
- Examples include; MS-DOS and Palm OS for palm handheld computers.

Single-User/Multi-Tasking Operating Systems:

- Allows a single user to perform two or more functions at once.
- Commonly used on personal computers.
- Examples include; Microsoft Windows and MAC OS.

Multi-User/Multitasking Operating Systems:

- Allows multiple users to use programs that are simultaneously running on a single network server.
- Here, each user is given a user session on the server.
- UNIX, Linux are examples.
- Maintenance can be easy.
- Requires a powerful computer.

FUNCTIONS OF OPERATING SYSTEM

- The operating system manages the computer devices (Device manager)
- It conducts the process of booting or starting the computer (starting a computer)
- It acts as a file manager (file management): Operating systems often provide users with the capability of managing files, viewing graphics files, uninstalling programs, scanning disks.
- It acts as an interface between the computer and the user (providing a User interface)
- It provides the means for proper user of the resources like monitor, memory, input and output devices,
- It interprets the program instructions one at a time (managing programs):
- Some operating systems support only one running program at a time others support thousands of users running multiple programs.
- It loads the user program into the memory.
- It gives instruction to display the results on the monitor.
- It also manages the printing process: the operating system determines the order in which jobs are

processed. A job is an operation that the processor manages.

- Memory management: the purpose of memory management is to optimize the use of Random Access Memory. The operating systems allocates, assigns data and instructions to an area of the memory while they are being processed.
- Configuring Devices: A driver is a small program that tells the operating system how to communicate with a specific device. When you boot the computer, the operating system loads each device's driver. These devices will not function without their correct drivers.
- Controlling a network: Some operating systems are network operating systems. A network OS is an operating system that organizes and coordinates how multiple users access and share resources on a network resources including hardware, software, data and information. It has more security features than other OS.

Examples of operating system

- Windows XP
- Windows 2000
- Fedora
- Ubuntu
- Linux
- UNIX
- Novel Netware
- Macintosh
- Window server

TYPES OF USER INTERFACE

The two most common types of user interfaces are graphical and command line.

GRAPHICAL USER INTERFACE (GUI)

These are interfaces which use icons, small pictures and viewable images to issue commands.

You are provided with a coloured screen with lines (bars) each representing a program and a mouse.

Graphical user Interfaces (GUI):

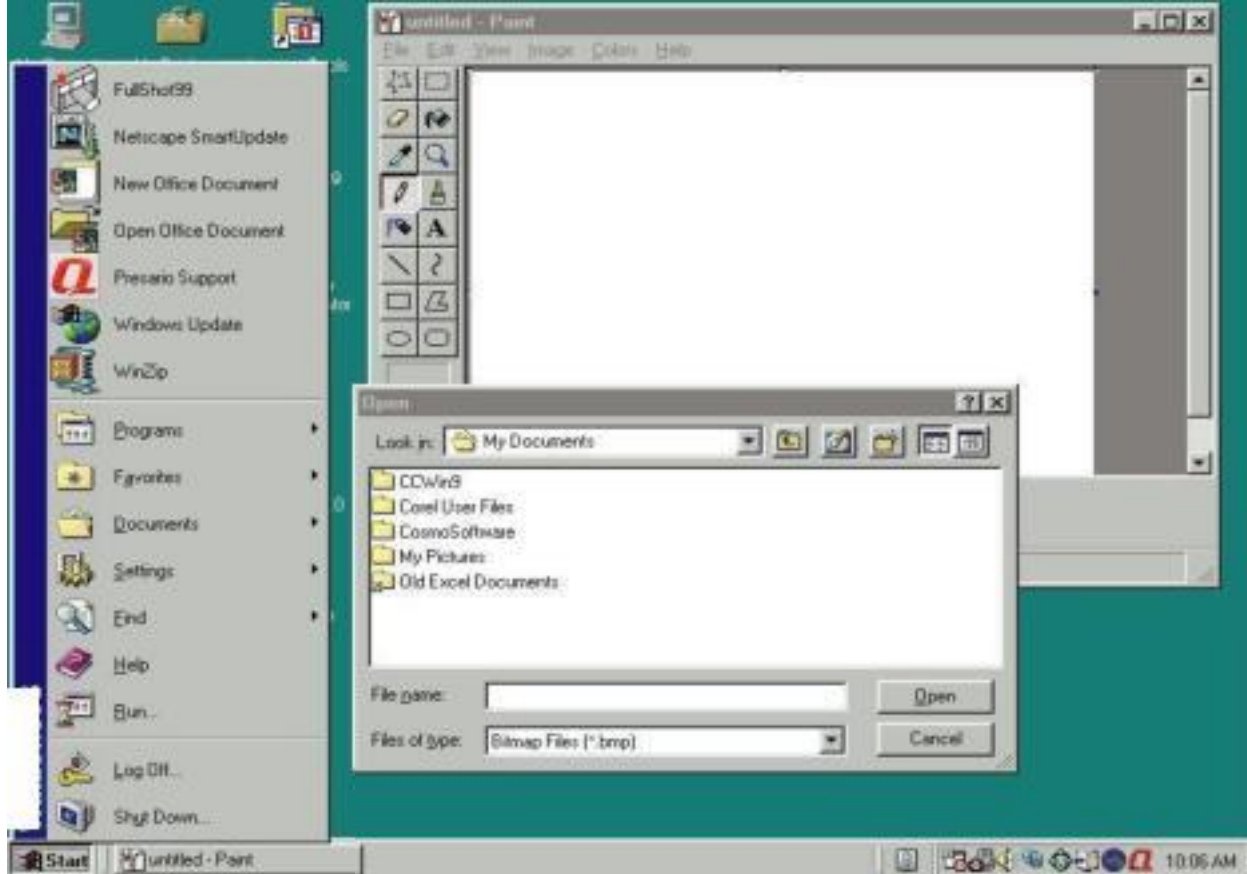
Most common interface used in versions of; Windows, MAC OS, in some versions of LINUX and UNIX.

Uses a mouse to work with graphical objects such as windows, menus, icons, buttons and other tools.

Can use Shortcuts to open programs or documents.

It enables task switching.

Advantage: It frees a computer user from memorizing and typing text commands.



COMMAND LINE USER INTERFACE

These are interface where commands are issued by typing special keys on the keyboard, a user is provided by a blank screen with a blinking cursor called a prompt. Example includes DOS, Linux.

2) Command Line Interface

Older interface used in MS-DOS, Linux, UNIX

User types commands at a prompt to execute tasks.

User must remember all commands.

Windows also has an optional command prompt that can be used by administrators to run non-GUI programs for managing and troubleshooting windows.



DIFFERENCES BTN COMMAND LINE AGRAPHICAL USER INTERFACES.

COMMAND LINE	WINDOWS (GRAPHICAL USER INTERFACE)
Interface takes up little memory and doesn't require very fast processor.	Needs or requires more memory as well as a faster processor.
Operation is fast because commands can be entered directly through the keyboard	Operation on the windows environment depends on the powerfulness of the processor.
Many commands can be grouped together as a batch file so that repetition task can be automated.	It is difficult to automate functions for expert users.
Commands can be learnt	Graphical user interface is a user friendly because it is easy to learn and work with.
Commands have to be memorized	Commands do not need to be memorized because the commands are represented with icons and pictures.

Utility program

A utility program is a type of system software that performs specific task usually related to managing a computer its devices or its programs.

Utility software: Utility software is a kind of system software designed to help analyses, configure, optimize and maintain the computer

Most operating systems include several utility programs,

Utility programs

Defragmenting Utility

Anti-virus Utility

Time Utility

Date Utility

Copying

APPLICATION SOFTWARE.

It consists of programs that perform specific tasks to a user. Application software is used for a variety of reasons.

- As a business tool.
- To assist with graphics and multimedia projects
- To support home, personal, and educational activities.
- To facilitate communication

Most application software are available as packed software that can be purchased in a software shop or the web. Application software is available of forms. i.e. packages (off-shelf) custom, shareware, freeware and public domain.

Packaged software (off-shelf)

This is a mass produced, copy written retail software that meets the needs of wide variety of users not just a single user or company. Application software are available in general nature

Custom software

These are software designed to meet the needs of a particular organization or user (consumer) and performs function specific for the business or industry. Sometimes the company cannot find package software that meets its requirement so it orders for a custom software

Shareware

This is a copy written software that it is distributed free for a trial period

To use a share ware program beyond that period you send the payment to the person or a company that developed that program

Free ware

This software is provided at no cost to a user by an individual or a company

Public ware

Is an application software that is designed for the public.

Starting and interacting with an application software To use application software you must instruct the operating system to start the program

INTERNET AND WORLD WIDE WEB

The Internet Is a global system of Interconnected computer networks that use the standard Internet /³protocol suite (TCP/IP) to link several billion devices worldwide

Internet is a massive network of networks, connecting millions of computers via protocols, hardware and communication channels.

The Internet Is a global network of networks that enables people to communicate and share resources Through the Internet society has access to Information from all around the world, It offers many Conveniences. The magnificence of the Internet Is you can access It from a computer anywhere.

Some of uses of the Internet:

- Access a wealth of Information, news and research material
- Communicate with others around the world
- Bank and Invest
- Shop for goods and services
- Download and listen to music or download and watch movies
- Take a course or access other educational material
- Access sources of entertainment and leisure such as online games, magazines and holidays
- Planning guides
- Access other computers, mobile phones or PDA and exchange files
- Share and edit documents with others in real time
- Provide information, photographs, audio clips or video clips

The Internet services

To support these and other activities, the Internet provides a variety of services that include: www: (World Wide Web / web)

E-mail: sending and receiving of electronic messages (text, sound, video and graphics) on the internet.

File transfer: an Internet standard that allows us to upload and download files with other computers on the Internet. Some FTP sites limit file transfers to individuals who have authorized accounts (user names and passwords).

Chat room: is an online forum where people can chat online (talk by broadcasting messages to people on the same forum in real time). Sometimes these venues are moderated either by limiting who is allowed to speak (not common), or by having moderation volunteers patrol the venue watching for disruptive or

otherwise undesirable behaviour.

Instant messaging: a real-time Internet communications service that notifies you when one or more people are online and then allows you to exchange messages or files or join a private chat room with them. To use IM you install software from an instant messaging service, sometimes called an instant messenger (ICQ, Skype, AIM, MSN, Jabber, ...).

Instant messaging is by far the most common form of communication in recent times, it can (exchange text, voice, video).

Newsgroups: A newsgroup is an online area in which users conduct written discussion about a particular subject. To participate in a discussion, a user sends a message to the news group, and other users in the newsgroup read and reply to the message.

IRC (Internet Relay Chat) e.g. This service allows the Internet to one or more of Internet users who are hooked to the same channel at the same time see the text that you type on your computer, and the texts of other active users typing on his computer.

Voice / Video Communication - Skype

Social networks e.g. LinkedIn', 'Myspace', 'Tumblr', 'Instagram, TWITTER, BLOG Search Engines i.e. Apple, google, yahoo, bingo, e.t.c Web-Hosting (DATACENTER)

E-MAIL (Electronic Mail)

This is the transfer of electronic messages from one geographical location to another using computers and computer related computerized devices.

Some websites such as MSN Hotmail, G-mail and Yahoo, provide free email services, to use these web-based email programs, you connect to the website and set up an e-mail account which typically include an e-mail address and a password.

Structure of an e-mail

Username @ Domain name. Top level domain

Nakaferoshanita @ yahoo. com (nakaferoshanita@yahoo.com)

Examples of e-mail addresses

- namitalarehema@yahoo.com
- nantongosylvia@myway.com
- aganasjaffar@hotmail.com

User name: This is a unique combination of characters, such as letters of alphabets or numbers that identifies a specific user

Domain name: This is the name of the search engine, website e.g. yahoo, hotmail, my way

Top level: This indicates the purpose of the organization which the computer sometimes has no part e.g. com, org.

Advantages of e-mail communication over an ordinary mail

Qn: Mention the advantages of using email as a means of communication Email has many advantages over both ordinary mail and the telephone for example:

- A message can be sent anywhere in the world at the price call without having to leave your desk.
- Speed of delivery: The message will arrive in a few minutes: can be picked up the next time the recipient looks at their e-mail.
- Ability to send to multiple recipients: the message can be sent to a group of people.
- It is very easy to send a reply to an email as soon as it is receive using the reply button.
- Large files such as spreadsheets and graphics can be sent attachments
- Low costs: an email is very cheap.
- E-mail is universal while ordinary mail one has to change address wherever he/she is located.
- Free mail like sports can be subscribed.
- You can send multimedia like Music, Videos
- Assurance of whether the mail has been delivered or not.
- Easy to use. Emails applications have user friendly tools that help during composing messages.
- Easy to prioritize: Since the mails have subject lines, it is easy to prioritize them and ignore unwanted mails.

- Emails can also carry hyperlinks that lead to other Webpages with just a click.
- One can subscribe to news and other online services through email
- Email software have management features that help users to organize their messages in folders like inbox, sent, draft, etc.
- Easier for reference: When one needs to reply to a mail, there is a provision in the mailing system to attach the previous mails as references. This refreshes the recipient's knowledge, on what he is reading.
- Environment friendly: Postal mails use paper as a medium to send letters. Electronic mail thus, saves a lot of trees from being axed. It also saves fuel needed in transportation.
- Email software has a good degree of security features such as username and password before sign in
- Email applications have inbuilt English dictionary which safeguards the sender from incorrect spelling and grammar.
- There is flexibility in time of opening the e-mail for any time access. At any time of the day or night, one can communicate with friends, relatives, professors and business associates.
- Messages remain permanent for future and frequent accessing from anywhere.
- Use of graphics such as colorful greeting cards and interesting pictures can be sent through e-mails.
- Advertising tool: many individuals and companies are using e-mails to advertise their products, services, etc.

Disadvantages / limitation

Outline the limitations of using Email as means of communication.

- Emails can carry Viruses: The recipient needs to scan the mails, as viruses are transmitted through them and have the potential to harm computer systems.
- Spam and Junk: E-mails when used to send unsolicited messages and unwanted advertisements create nuisance called Spam. Checking and deleting these unwanted mails can unnecessarily consume a lot of time, and it has become necessary to block or filter the unwanted e-mails by means of spam filters.
- E-mail spoofing is another common practice. Spoofing involves deceiving the recipient by altering the e-mail headers or the addresses from which the mail is sent.

- Hacking and email interception: The act of unauthorized attempts to bypass the security mechanisms of an information system or network is termed as hacking. After the e-mail is sent and before it is received by the desired recipient, it "bounces" between servers located in different parts of the world. Hence, the e-mail can be intercepted by a professional hacker.
- Misinterpretation: One has to be careful while posting any kind of content through an e-mail. If typed in a hurry, the matter could be misinterpreted.
- Since the content posted via e-mails is considered informal, there is a chance of business documents going unnoticed. Thus, urgent transactions and especially those requiring signatures are not managed through e - mails.
- Crowded inbox: Over a period of time, the e-mail inbox may get crowded with mails. It becomes difficult for the user to manage such a huge chunk of mails.
- Need to check the inbox regularly: In order to be updated, one has to check his e-mail account regularly, which may be expensive in the long run.
- Email cannot be used without computers especially in remote areas without electricity
- In case one forgets his/her password, signing in is not possible and this can lead to loss of information.
- Email may violate privacy in case someone else gets to know your user password since the other may check your mails.

What is needed to connect the internet and World Wide Web?

The basic requirements are

- Computers
- Modem
- Phone line
- An internet service provider.

Advantages and disadvantages of internet.

Advantages

Faster Communication:

The foremost target of Internet has always been speedy communication and it has excelled way beyond the expectations. Now, you can communicate in a fraction of second with a person who is sitting in the

other part of the world.

Information Resources

Information is probably the biggest advantage that Internet offers. Internet is a virtual treasure trove of information. Any kind of information on any topic under the sun is available on the Internet.

Entertainment

This is another popular reason why many people prefer to surf the Internet. In fact, the Internet has become quite successful in trapping the multifaceted entertainment industry. Downloading games or just surfing the celebrity websites are some of the uses people have discovered.

Social Networking

One cannot imagine an online life without Facebook or Twitter. Social networking has become so popular amongst youth that it might one day replace physical networking. It has evolved as a great medium to connect with millions of people with similar interests. Apart from finding long-lost friends, you can also look for a job, business opportunities.

Online Services

The Internet has made life very convenient. With numerous online services you can now perform all your transactions online. You can book tickets for a movie, transfer funds, pay utility bills, taxes etc., and right from your home.

Powerful search engines

Ability to do research from your home versus research libraries.

Information at various levels of study. Everything from scholarly articles to ones directed at children.

Message boards where people can discuss ideas on any topic. Ability to get wide range of opinions. People can find others that have a similar interest in whatever they are interested in.

The internet provides the ability of emails. Free mail service to anyone in the country.

Platform for products like SKYPE, which allow for holding a video conference with anyone in the world who also has access.

Friendships and love connections have been made over the internet by people involved in love/passion over similar interests.

Things such as Yahoo Answers and other sites where kids can have readily available help for homework.

News, of all kinds is available almost instantaneously. Commentary, on that news, from every conceivable viewpoint is also available

Disadvantages of internet:

- Virus Threat: Internet users are often plagued by virus attacks on their systems. Virus programs are inconspicuous and may get activated if you click a seemingly harmless link.
- There is a lot of wrong information on the internet. Anyone can post anything, and much of it is garbage.
- There are predators that hang out on the internet waiting to get unsuspecting people in dangerous situations.
- Some people are getting addicted to the internet and thus causing problems with their interactions of friends and loved ones.
- Pornography that can get in the hands of young children too easily.
- Easy to waste a lot of time on the internet. You can start surfing, and then realize far more time has passed than you realized. Internet and television together of added to the more sedentary lifestyles of people which further exacerbate the obesity problem.
- Internet has a lot of "cheater" sites. People can buy essays and pass them off as their own far more easily than they used to be able to do.
- There are a lot of unscrupulous businesses that have sprung up on the internet to take advantage of people.
- Hackers can create viruses that can get into your personal computer and ruin valuable data.
- Hackers can use the internet for identity theft.
- It can be quite depressing to be on the internet and realize just how uneducated so many people have become in today's society.

Internet service providers

Is large organization/ company that provides internet access to an organization or individual

Examples of internet service providers in Uganda

- MTN
- Africa online
- Uganda one
- Uganda telecom

- Infocom
- Warid
- Orange
- Broadband

Uniform resource locator (url / web address)

This is a unique address of a web page.

The URL tells the browser where to locate the names and sometimes the path to a specific web page or location on a web page.

For example the home page for Pimbas secondary school web site has a web address of <http://pimbasss.com>. A web browser retrieves a web page such as Pimbas s. s home page

Example of a web address / URL

<http://www.newvision.com> [http: // www.globalcomacademy.co.ug](http://www.globalcomacademy.co.ug)

[Http: // www.globalcomacademy.co.ug](Http://www.globalcomacademy.co.ug)

Protocol host / domain name top level domain

TOP LEVEL DOMAIN

Original Top level Domain Type of Domain

com commercial organizations, businesses and companies

edu educational institutions

gov government agencies

mil military organizations

net network providers

org nonprofit organization.

WWW (World Wide Web)

This consists of worldwide collection of electronic documents. Each document on the web is called web page.

The World Wide Web (WWW): The part of the internet called the web is a multimedia-based technology that enables you to access more than just text. That is you can download art, audio, video and animation and also engage in interactive games.

Is a collection of internet resources such as hyperlinked text, audio, and video files, and remote sites that can be accessed and searched by browsers.

Web page.

This is a file of information created and stored on a web server.

A webpage can also be defined as an electronic document on the web; it can contain t audio (sound) and video.

Website.

A website is a collection of related web pages and associated items such as documents and pictures owned by an individual or organization on a web server.

Browsing the web.

What is a browser -a program with a graphical user interface for displaying HTML files, used to navigate the World Wide Web?

A web browser (commonly referred to as a browser) is a software application for retrieving, presenting and traversing information resources on the World Wide Web.

Or

A web browser is application software that allows users to view or access web pages.

An information resource is identified by a Uniform Resource Identifier (URI/URL) and may be a web page, image, video or other piece of content To browse the web, you need a computer that is connected to the internet and that has a web browser.

With the internet connection established, you can use the mouse to start a web browser. The browser retrieves and displays a starts page, times called the browser's home page. The initial page that is displayed is the one that is selected by your web browser.

Home page: This is the first page that a website displays (similar to a book cover or table of content)

Examples of web browsers.

The more widely used web browsers are:

Microsoft internet explorer

Mozilla

Safari

Netscape

Opera

Google chrome

Surfing the web

This refers to the activity of using links to explore the web.

Down loading

Down loading is the process of a computer receiving information from a server on the internet such as a web page from a server

Depending on the speed of your internet connection and amount of graphics involved, a web page down load can take from few seconds to several minutes

Hyper link

This is a built -in - connection from a web page to another related web page or part of a web page.

Links allow you to obtain information in a non - linear way. Reading a book from cover to cover is a linear way of learning.

Search engine.

This is a program designed to help a user find web sites and web pages. Search engines are particularly helpful in locating specific web pages about certain topics of web pages for which you do not know the exact web address. Search engines are programs that search documents for specified keywords and returns a list of the documents where the keywords were found.

A search engine is really a general class of programs; the term is often used to specifically describe systems like Google, Bing and Yahoo! Search that enable users to search for documents on the World Wide Web.

SEARCH ENGINE WEB ADDRESS

Yahoo Yahoo.com

Google google.com

AltaVista altervista.com

HotBot hotbot.com Looksmart

looksmart WebCrawler webcrawler.com Overture overture.com

CLOUD COMPUTING (Store and share in the cloud)

(Save work files in Drive, access them from any device and share them instantly with teammates. No more

sending

attachments or merging different versions.)

Cloud computing consists of hardware and software resources made available on the Internet as managed third-party services. These services typically provide access to advanced software applications and high-end networks of server computers.

Types of Cloud Computing

Service providers create cloud computing systems to serve common business or research needs. Examples of cloud computing services include:

virtual IT - configure and utilize remote, third-party servers as extensions to a company's local IT network

software - utilize commercial software applications, or develop and remotely host custom built applications

Network storage - back up or archive data across the Internet to a provider without needing to know the physical location of storage.

Cloud computing systems all generally are designed for scalability to support large numbers of customers and surges in demand.

Examples of Cloud Computing Services

These examples illustrate the different types of cloud computing services available today:

Amazon EC2 - virtual IT Google App Engine - application hosting Google Apps - software as a service

Apple MobileMe - network storage

Some providers offer cloud computing services for free while others require a paid subscription.

Cloud Computing Pros and Cons

Service providers are responsible for installing and maintaining core technology within the cloud. Some customers prefer this model because it limits their own manageability burden. However, customers cannot directly control system stability in this model and are highly dependent on the provider instead.

Cloud computing systems are normally designed to closely track all system resources, which enables providers to charge customers according to the resources each consumes. Some customers will prefer this so-called metered billing approach to save money, while others will prefer a flat-rate subscription to ensure predictable monthly or yearly costs. Using a cloud computing environment generally requires you to send data over the Internet and store it on a third-party system. The privacy and security risks associated with this model must be weighed against alternatives.

COMPUTER ETHICS AND SOCIETY.

Definition of Computer Ethics

Ethics are a set of moral principles that govern an individual or a group on what is acceptable behaviour while using a computer.

Computer ethics is a set of moral principles that govern the usage of computers and computer systems.

One of the common issues of computer ethics is violation of copyright issues.

Duplicating copyrighted content without the author's approval, accessing personal information of others are some of the examples that violate ethical principles.

What is an IT code of conduct?

These are written guideline that helps determine whether computer action is ethical, Employers can distribute to employees.

Internet Ethics for everyone

Internet ethics means acceptable behavior for using internet. We should be honest, respect the rights and property of others on the internet.

Netiquette,

Netiquette, or net etiquette, refers to etiquette on the Internet.

Good netiquette involves respecting others' privacy and not doing anything online that will annoy or frustrate other people. Three areas where good netiquette is highly stressed are e-mail, online chat, and newsgroups. For example, people that spam other users with unwanted e-mails or flood them with messages have very bad netiquette. You don't want to be one of those people. If you're new to a newsgroup or online chat room, it may help to observe how people communicate with each other before jumping in

Acceptance

One has to accept that Internet is not a value free-zone .It means World Wide Web is a place where values are considered in the broadest sense so we must take care while shaping content and services and we should recognize that internet is not apart from universal society but it is a primary component of it.

Sensitivity to National and Local cultures

It belongs to all and there is no barrier of national and local cultures. It cannot be subject to one set of values like the local TV channel or the local newspaper we have to accommodate multiplicity of usage.

While using e-Mail and chatting

Internet must be used for communication with family and friends. Avoid chatting with strangers and

forwarding e-mails from unknown people /strangers. We must be aware of risks involved in chatting and forwarding e-mails to strangers.

Pretending to be someone else

We must not use internet to fool others by pretending to be someone else. Hiding our own identity to fool others in the Internet world is a crime and may also be a risk to others.

Avoid Bad language

We must not use rude or bad language while using e-Mail, chatting, blogging and social networking; We need to respect their views and should not criticize anyone on the internet.

Hide personal information

We should not give personal details like home address, phone numbers, interests, passwords. No photographs should be sent to strangers because it might be misused and shared with others without their knowledge.

While Downloading

Internet is used to listen and learn about music, It is also used to watch videos and play games we must not use it to download them or share copyrighted material. We must be aware of the importance of copyrights and issues of copyright.

Access to Internet

The internet is a time-efficient tool for everyone that enlarges the possibilities for curriculum growth. Learning depends on the ability to find relevant and reliable information quickly and easily, and to select, understand and assess that information. Searching for information on the internet can help to develop these skills. Classroom exercises and take - home assessment tasks, where students are required to compare website content, are ideal for alerting students to the requirements of writing for different audiences, the purpose of particular content, identifying and judging accuracy and reliability. Since many sites adopt particular views about issues, the internet is a useful tool for developing the skills of distinguishing fact from opinion and exploring subjectivity and objectivity.

Ethical rules for computer users (IT code of conduct)

- Some of the rules that individuals should follow while using a computer are listed below:
- Do not use computers to harm other users.
- Do not use computers to steal others information.
- Do not access files without the permission of the owner.

- Do not copy copyrighted software without the author's permission.
- Always respect copyright laws and policies.
- Respect the privacy of others, just as you expect the same from others.
- Do not use other user's computer resources without their permission.
- Use Internet ethically.
- Complain about illegal communication and activities, if found, to Internet service Providers and local law enforcement authorities.
- Users are responsible for safeguarding their User Id and Passwords. They should not write them on paper or anywhere else for remembrance.
- Users should not intentionally use the computers to retrieve or modify the information of others, which may include password information, files, etc..

COMPUTER NETWORK

This is a connection of two or more computers via a communication media to share resources. E.g. a group of computers can be sharing a printer.

A computer network is a system in which multiple computers are connected to each other to share information and resources.

Types of computer networks

There are three types of computer networks namely:-

Local Area Network (LAN)

This is a network that connects computers and devices in a limited geographical area such as a home, school computer lab, Office Building

Metropolitan Area Network (MAN)

Is a high-speed network that connects local area networks in a metropolitan area e.g. a city or town.

Wide Area Network (WAN)

Is a Network that covers a large geographical area (such as a city, country or the world) using a communication channel.

Wireless Local Area Network - a LAN based on WiFi wireless network technology

Advantages of Networking over stand-alone computers

- Facilitates communication: Using a network, people communicate efficiently and easily via email, Instant Messaging, chat rooms e.tc
- Sharing hardware: In a networked environment, each computer on the network has access to hardware on the network e.g. Printers, scanners e. t. c.
- Data and Information sharing: In a networked environment any authorized computer user can access data and Information stored on computers on the network.
- Sharing software: Users connected to a network has access to software on the network. To support multiple users access of software most Venders sell network version or site licenses of their software.
- A network license is a legal agreement that allows multiple users to access the software on a server.
- A site license is legal agreement that permits users to install the software on multiple computers,

- Transferring funds called (Electronic Fund Transfer): It allows users connected to a network to transfer money from one bank account to another via telephone lines,
- Share same language.
- Reducing on cost by sharing hardware like printers and software.
- It allows for tight control over who has access to what data.
- It enables online learning and collaborative research
- It allows access to free common databases and databanks like free software, as in banks like ATM.
- [It allows for advertising tools for products and services
- It allows access to more entertainment, leisure, clubs e.g. e-zoos.
- [Has enabled improved travel service through e-books and e-reservation.
- News updates can be got on climate, weather, politics, and sports. Provides for online employment e.g. telecommuting.

Disadvantages of networks

- Security concerns, due to information being accessed in many ways
- Viruses and malware which spread to all computers through the network
- Single point of failure
- Need for an efficient handler
- There"s lack of independence in the operation of the computers

COMPUTER SECURITY RISKS COMPUTER VIRUSES, WORM AND TROJAN HOUSE

Nearly every computer user is susceptible to the first type of computer security risk. A computer virus, worm and Trojan horse.

Computer virus is a potentially damaging computer program that affects or infects, a computer negatively by altering the way a computer works without the user knowledge or permission.

Once the virus infects the computer, it can spread throughout any may damage files and system software including operating system.

A worm is a program that copies itself repeatedly, for example in memory or on a network, using up resources and possibly shutting down the computer or network.

Trojan horse. Is a program that hides within or out. Worm or Trojan horse does not replicate itself to other computer.

Unauthorized use: is the use of a computer or its data for unapproved or possibly illegal activities e.g. an employee using an organization's computer to send personal e-mails.
Safe guards against unauthorized Access and Use.

Hardware theft and vandalism

- Hardware theft and vandalism are another type of computer security risks.
- Hardware theft is the act of stealing computer equipments.
- Hard ware vandalism is the act of defacing or destroying computer equipments. e.g. somebody cutting a computer cable to individuals breaking into a school computer lab and aimlessly smashing computers

Software theft

Another type of computer security risk. Software theft occurs when someone steals software media, intentionally erases programs or illegally copies a program.

Software piracy

- This is unauthorized and illegal duplication of copyrighted software.
- Safe guards against software theft.
- License agreement. It is the right to use the software.
- Keep original software boxes and media in a secure location out of sight.

Information theft

This occurs when someone steals personal or confidential information. If stolen, the loss of information can cause as much damage as hardware theft and software theft.

Safe guards against information theft.

User identification and authentication

Encryption: This is the process of converting readable data into unreadable characters to prevent unauthorized access. To convert the data to readable form you Decrypt it

HEALTH CONCERNS OF COMPUTER USE

Users are key component in any information system. Thus protecting users is just as important as protecting hardware, software and data.

Long-term computer use can lead to health complication.

A muscles Skeletal Disorder (MSD), also called Repetitive Strain Injury (RSI): is any injury or disorder of the muscles, nerves, tendons, ligaments and joints.

You can prevent this problem by taking frequent breaks during the computer session to exercise your hands and arms

To prevent injury due to typing, place a wrist rest between the keyboard and the edge of your desk. c)

To prevent injury while using the mouse, place the mouse almost inches from the edge of your desk.

Computer vision syndrome.

You may have a computer vision syndrome if you have any of these conditions sore, tired, burning, itching or dry eyes, blue red or double vision, distance blurred vision after prolonged staying at a display device.

Headache or sore neck, difficulty shifting focus between a display device and documents, difficulty focusing on the screen image.

Solutions to the vision syndrome.

- Every 10 - 15 minutes, take an eye break. Roll your eyes in a complete cycle, look into a distance and focus on an object for 20 - 30 seconds, close your eyes and rest for 1 minute.
- Blink your eyes every after five seconds.
- Place your display device about an arm length away from your eyes with the top of the screen eye level or below your eyes with the top.
- Use large fonts
- Adjust the lighting.
- computer addiction
- This is when the computer consumes someone"s entire social life.
- Symptoms to user with computer addiction.
- Craves computer time.
- Overjoyed when at the computer.
- Unable to stop computer activities.
- Neglects family and friends.
- Irritable when not at the computer.