COMPUTER LAUNCH

This is a comprehensive approach to all computer theory questions and basic concepts required in using a computer.

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DEDICATION: I willingly want to dedicate this part of work to all students in different institutions with love and passion for computer studies and are willing to do what is necessary to understand the content in this book in order to help them pass their examinations and advance to other fields of IT and computer.

I also dedicate this piece of work my teachers in the field of ICT and computer studies to smoothen their conduct of work during teaching the generations of the nation.

This piece of work was inspired and motivated with the love that I have for the technology that is developing day to day and I promise to uphold this spirit furthermore in my journey ahead.

ACKNOWLEDGEMENT: I want to extend my heartfelt gratitude to Mr. Kalungi George who taught me Computer studies and enabled me acquire this knowledge. I want to all thank my Jinja Progressive Academy ICT department teachers for the best effort they did to me to enable me attain well grades and understand this subject furthermore.

A special thank and recognition my beloved lecturers of Kampala University in the faculty of computer science and Information technology who enlighten and guided me on how to put myself into good use in the field of ICT.

I would lastly and warmly thank my dear loving parents for the hard work they have dedicated to push me this far and make sure that my candle is still burning. Together with my friends and colleagues in different fields of life that I partake.

May the GOOD LORD bless the work of my hands.

"Computer life is the best experience I have ever faced so far, embrace it"

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ICT

This is known as the Information and Communication Technology. It comprises of three terms which include:

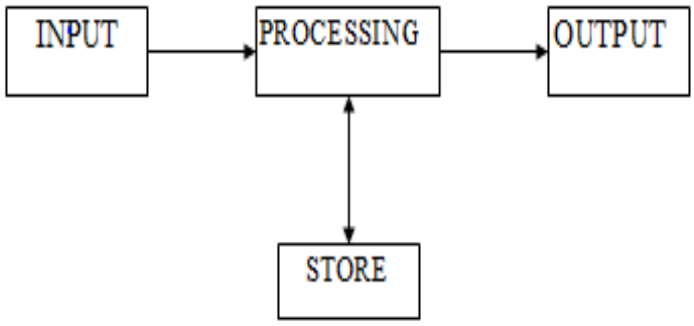
Information: This broadly refers to the processed and organized data that can be used by the user. It can in form of video, audio, text or any other form that suits the user demand.

Communication: This refers to the sending and receiving of information from one person or computer to another.

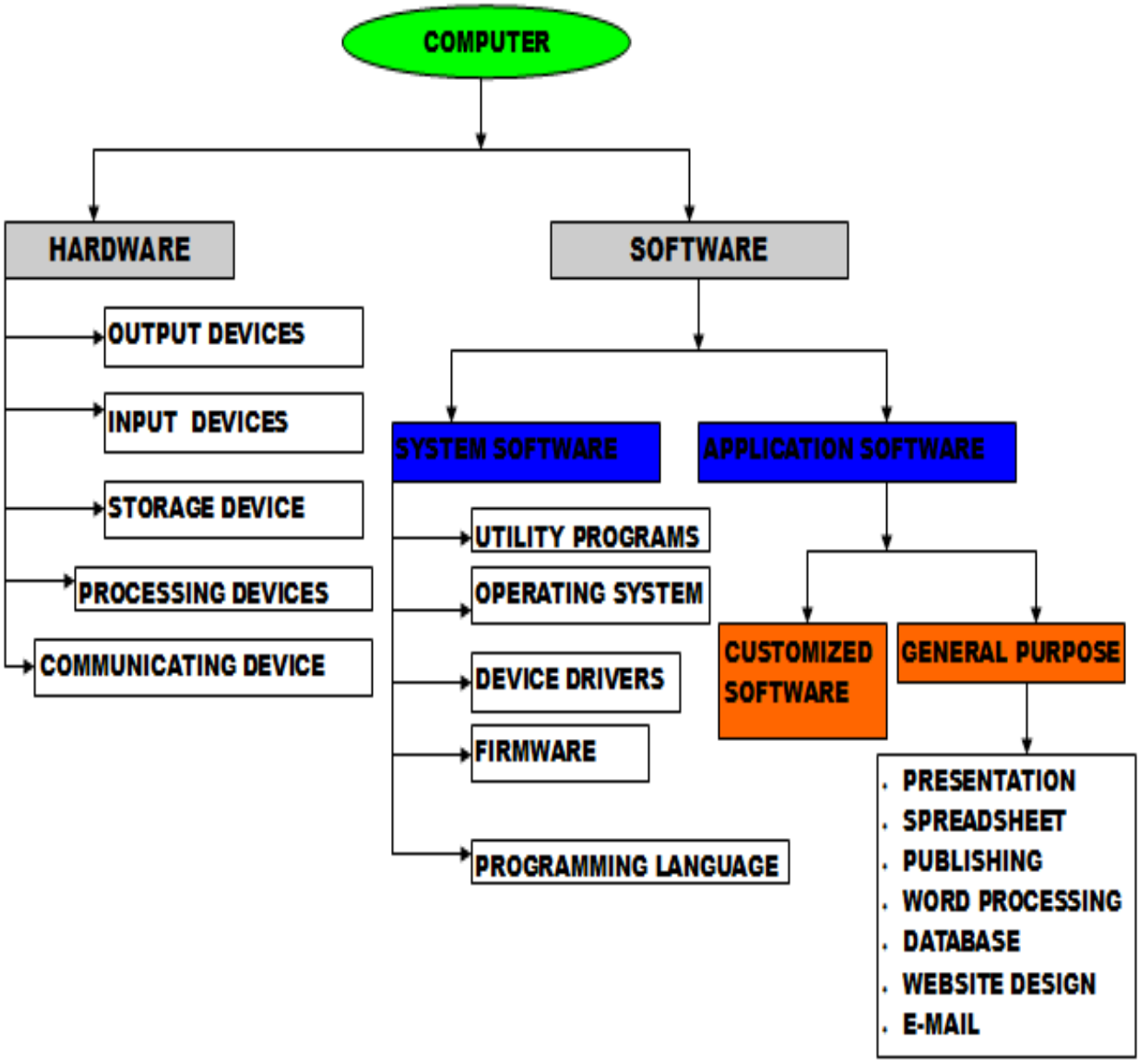
Technology: This comes from the word technique and technique refers to the way of doing something. Therefore technology refers to the application of scientific knowledge for practical purpose especially in industry, engineering and communication. It involves use of tools, machines and systems to solve problems, improve efficiency and enhance quality of life.

The combination of information to enhance communication with scientific methods collectively require a machine to process and achieve it. This machine is the so called computer. It receives the signals in form of data and process it, stores it and then forwards data signals or feedback to the required or concerned person as illustrated below.

INFORMATION PROCESSING CYCLE



SCOPE OF COMPUTER STUDIES



COMPUTER

This is an electronic device that works under the control of a stored program to accept data input, stores it, processes it and outputs information meaningful to the user. The machine to be called a computer should be electronic, accepts input, stores, processes and outputs information.

KEY WORDS IN THE DEFINITION OF COMPUTER

Data: This refers to the raw facts that are to be processed into meaningful information

Information: This refers to the processed meaningful data to the user.

Input: This refers to entering of data and commands into the computer

Output: This refers to the display of information from the computer

Processing: This refers to the act of performing series of operations on data and information

Storage: This refers to storing of data and information for future use.

CHARACTERISTICS OF MODERN COMPUTERS

Large Storage: Computers have storage space called the memory where data fed into the can be temporarily stored and later processed

Diligence: Computers can perform the same task over and over period of time without getting tired. For example industrial robots in the car assembly lines

Artificial Intelligence (AI): Computers can respond to requirements given to them and also provide solutions through their programs.

Automation: Computers do not need any supervision so as to perform programmed routines. For example traffic lights, digital watches.

Speed: computers are fast during execution of commands and can do a lot of tasks in a small given time

Versatility: Computers can be used for many different purposes and can change from one activity to another.

IMPORTANCE OF COMPUTERS IN DIFFERENT FIELDS OF THE SOCIETY

- Hospitals:
  - ✓ Used to monitor patient's conditions
  - ✓ Used to keep records for hospital
  - ✓ Used to organize arrangements and budgets of the hospitals
  - ✓ Used to make payment rolls of health workers
  - ✓ Used for hospital security inform of cameras
- Entertainment:
  - ✓ Used to play games
  - ✓ Used to record music and movies
  - ✓ Used to store data for studios
  - ✓ Used to listen to music
  - ✓ Used to view images
- Education:
  - ✓ Used for research
  - ✓ Used for online lesson sin form of E-leaning
  - ✓ Used to keep records for students
  - ✓ Used to assess students
  - ✓ Used for CALs, CATs and also writing exams
- Business:
  - ✓ Used to keep records
  - ✓ Used for advertisement
  - ✓ Used to make payment rolls
  - ✓ Used to arrange meetings online
  - ✓ Used to plan and manage capital

There are various fields that can be assessed regarding computers therefore you ought to make sure to learn them and analyze the use of computers in each field.

HINT: When answering such a question, mention more about communication and also planning because almost in every field that's the most important use of computer.

COMPUTER GENERATIONS/ADVANCEMENTS IN ICT

These are the different technological advancements through which computers have undergone during its evolution. They are so far five generations as seen below

1. **First generation(1946-1956)**
    I. These used Magnetic drums and **Vacuum tubes**
    II. Produced a lot of heat
    III. They were big in size and heavy
    IV. Consumed a lot of power
    V. They were very expensive
2. **Second generation(1957-1963)**
    I. These used **Transistors**
    II. Lesser power used compared to those in first
    III. Relatively smaller than the first generation
    IV. Slightly cheaper than the first ones
3. **Third generation(1964-1979)**
    I. Used **integrated circuits**
    II. Used simple programming language like BASIC
    III. Very small compared to those before it
    IV. Generated less heat
4. **Fourth generation(1979-1989)**
    I. These used **microprocessors**
    II. They were small in size
    III. Very fast during processing
    IV. Relatively cheap
    V. Consumed less power
5. **Fifth generation(1990-now)**
    I. These use **Artificial intelligence**
    II. Processes very fast
    III. Very small and very cheap
    IV. Produces less heat and consumes less power
    V. Can do commands like humans do

ARTIFICIAL INTELLIGENCE: This is the ability of computers to perform tasks that require human intelligence such as learning, problem solving and decision making

Read about History of computers from Mechanical era, Abacus and Napier's Bones.

ADVANTAGES OF USING COMPUTERS

- ✓ Produce accurate work; Computers are very accurate in performing any programmed routine
- ✓ They are flexible; Computers are flexible that they can perform a variety of programmed tasks
- ✓ They save time, The computer speed enables computers to handle tasks quickly even those with complicated procedures
- ✓ They are effective; Computers process huge volumes of data effectively
- ✓ They are diligent; Computers never get tired of doing programmed tasks
- ✓ They save space; Computers are space saving when it comes to document storage as they store large volumes of data.
- ✓ Less hectic; Computers are automatic and do not need supervision to complete programmed tasks
- ✓ Simplifies work; Computers simplify problem solving using programs designed for the purpose
- ✓ Good for information flow; Computers improve information flow in an organization
- ✓ They are entertaining; Use of computers has ushered in the era of games and music playing

DISADVANTAGES OF USING COMPUTERS

- ✓ Computers have led to increase in unemployment of human labor
- ✓ Computers cannot tackle all problems cost effective
- ✓ Computer systems can easily be cheated by knowledgeable persons
- ✓ Data and information can easily be lost due to power failure and disruptions, viruses
- ✓ Computers are very costly. The initial cost of purchase and costs of maintenance of computers are very high
- ✓ Computers cannot think so whatever is fed to them whether correct or wrong is accepted.
- ✓ Once attacked by viruses, loss of data and software may occur.

CLASSIFICATION OF COMPUTERS

Computers are available in different shapes, sizes and weights, due to these different shapes and sizes they perform different sorts of jobs from one another. A computer that is used in a home differs in size and shape from the computer being used in a hospital. Computers are classified according to the following:

- ✓ Classification by process
- ✓ Classification by purpose
- ✓ Classification by size
- ✓ Classification by processor power

1. CLASSIFICATION BY PROCESS

Under this computers are classified according to how data processed is presented and there are three categories:

- Digital Computers:

A digital computer is a computer that processes data in discrete format for example: Digital watches, mathematical calculators. Discrete values are numbers that can be defined like 1, 2, and 3

- Analog Computers:

An analog computer is a computer that process data that is in a continuous form and is in measurable quantities such as electrical, mechanical, or hydraulic quantities to model the problem being solved. For example: Petrol pump, Speedometer

- Hybrid Computers:

These are computers that have combined features of both digital and analog computers. The digital component normally serves as the controller and provides logical operations, while the analog component normally serves as a solver of differential equations.

2. CLASSIFICATION BY PURPOSE:

Under this computers are grouped into the following:

- Special Purpose Computers:

  These are computers that are designed to handle only a particular task and their operations are limited in nature for example: Digital watches, Pocket calculators and Lifts

- General Purpose Computers

  These are computers that are designed to solve a wide range of problems. They can: Perform calculations and Keep time

3. CLASSIFICATION BY SIZE

Computers are classified according to the size of the machine and the main categories include:

a. Super Computers

- A supercomputer is an extremely fast computer that can perform hundreds of millions of instructions per second. They tend to be specialized for certain types of computation, usually numerical calculations, and perform poorly at more general computing tasks.
- They perform complex tasks requiring a lot of computational power
- They have multiple processors that split a single task among processors foe faster execution and a single central processor controls all the processors
- They are the most powerful category of computers and are expensive
- They are operated in special rooms with special environment controls

b. Main Frame Computers

- A mainframe computer is a powerful multi-user computer capable of supporting many hundreds or thousands of users simultaneously.
- They are large general purpose computers with extended processing, storage, input and out- put capabilities
- They store large amounts of data and process tasks at a high rate.
- They can support between 500-1000 users at a time however each user has a separate key board and monitor but shares the same central processing unit with others.

c. Mini Computers

A minicomputer is a multi-user computer capable of supporting from 10 to hundreds of users simultaneously.

- These are small and have low user capacity
- Users can range from 50-100 at a time
- They are widely used by medium sized organizations

d. Micro Computers

These are smaller than the above three categories and are single user capacity. One person can only use the key board, central processing unit and the monitor at a time

- They are also called personal computers(PCs) or micros
- However, although personal computers are designed as single-user systems, it is common to link them together to form a network. In terms of power, there is great variety

4. **CLASSIFICATION BY PROCESSOR POWER**

The first computers had a processor power of less than 0.4 million instructions per second but today 15 million instructions per second is the minimum

Types of Processor

Power Pentium 1

Pentium 11

Pentium 111

Pentium 1V

Intel 80X86 series

Intel Pentium series

Motorola 680X0 series I

BM power pc DEC Alpha

COMPUTER LABORATORY

This is a specially designed room where computer operations are carried out and computers are kept.

It is made in such a way that is safe and secure for computers and the users.

SOME COMPUTER LABORATORY RULES AND REGULATIONS

✓ Avoid smoking and exposing computers to dust since they contain small abrasive particles that can damage computer components and cause wearing of moving parts.

✓ Avoid carrying food and beverages to the computer room since these may fall into moving parts causing rusting or electrical faults.

✓ Avoid unnecessary movements because you may accidentally knock down peripheral devices

.✓ At all times follow the right procedures while starting and shutting down the computer therefore abrupt switching on and off the computer should be avoided since this can lead to damaging the computer

✓ Do not open up the metallic covers of computers or peripherals without permission and particularly when the computer power is still on.

✓ Any repairs to the computer should be done by someone who has knowledge regarding computer repairs.

✓ Any connections (keyboard, mouse, printer and monitor) to the computer should be done when the computer power has been switched off.

✓ Computers should be regularly serviced and keep a regular record of computer servicing and repair to establish maintenance costs and common problems to your computer.

✓ Guard your computer against new users who might spoil the computer and data corruption by unauthorized parties

✓ Cover the computers after using them or when not in use. Let the computers cool down before being covered to avoid trapping heat.

✓ The computers should be cleaned on a regular basis to remove dust from the keyboard, mouse and other parts.

REQUIREMENTS OF A GOOD COMPUTER LABORATORY

- ✓ Blower
- ✓ Air-conditioner
- ✓ Fire extinguishers
- ✓ Uninterruptible Power supply
- ✓ Burglar proofing
- ✓ Anti-glare screens
- ✓ Woolen carpet
- ✓ Firewall
- ✓ Water proof covers
- ✓ Internet gateway
- ✓ First aid kid

STUDY QUESTIONS ON COMPUTER LABORATORY

1. Define the term computer laboratory

2. Mention four factors to consider when preparing a computer laboratory.

3. Why must there be safety rules and precautions in a computer laboratory? List any three reasons.

4. List down two reasons as to why power cables in the computer laboratory need to be properly insulated.

5. Mention two reasons as to why computers need a stable power supply.

6. Suggest two ways through which good air circulation can be achieved in a computer laboratory.

7. Suggest two reasons why standard furniture must be provided for a computer laboratory.

8. Mention five ways through which computers can be kept safe.

COMPUTER SYSTEM

This refers to a series of components interconnected to enable data processing in a computer. These components include

- ✓ Hardware
- ✓ Software
- ✓ User

COMPUTER HARDWARE

This refers to the physical and tangible components of a computer. It is usually visible and can be felt using our hands. It is divided into 5 sections as seen in the scope and they include

- ✓ Input device
- ✓ Output device
- ✓ Storage device
- ✓ Processing devices
- ✓ Communication devices

And we shall look at each in particular in order to understand how the visible components are used and operated.

INPUT DEVICES

These are devices that are used to enter data into the computer for processing. The data format that is being input dictates the type of input devices. The most common input devices are elaborated below

- ✓ KEYBOARD

  This is used to enter data inform of characters like letters and commands into the computer system usually known as Alphanumeric characters. It is done by striking the buttons with the corresponding required character in order to execute commands'.

  They are found on telephones, laptops and most commonly attached to the PCs

- ✓ MOUSE

This is a mouse like device that is used to move the cursor on the screen and used to select by clicking on its buttons. It has two clicks i.e. left and right which it uses to select items or open up programs or windows on the screen of the computer.

They are very many types of Mouse depending on how they operate and their appearance. They can be wireless/cordless or mechanical or optical.

- ✓ TOUCH SCREEN

This input data by just using fingers to touch on the required commands. They are found on smart phones and some laptops with pen and touch devices.

- ✓ LIGHT PEN

This is a pen that enables navigation and simple drawing on the screen of the computer. It has a stylus technology. They are most commonly found on smart phones and signature devices

- ✓ SCANNER

This is a device that captures images from sources like posters, magazines and photographic prints for editing and display on a computer.

- ✓ MICROPHONES

This inputs data inform of sound into a computer. It enables input of voice notes and sounds into phones for processing.

- ✓ CAMERA

This captures photographs using digital lenses and used to take pictures

- ✓ JOYSTICKS

These are used during gaming to enable movements and motions in games.

- ✓ BAR CODE READER

This scans barcodes decodes information and sends it to the computer

- ✓ MICR(MAGNETIC INK CHARACTER READER

It is a device that identifies the unique number and decodes the information behind the number and sends information into the computer

OUTPUT DEVICES

These are devices that are used to display information from the computer. They also differ because of the form of information type; it can be audio, video, text or any other. Below are some of their elaborations;

- ✓ PRINTERS

These are used to convert text or images from soft copy into hard copy on a paper or other materials. They are various types of printers that are used today and they are classified in accordance of how they put dots on the papers and how they operate in terms of noise or silence, examples include

- Laser printers
- Inkjet printers
- Thermal printers
- 3D printers
- Dot matrix printers
- LED printers
- Daisy wheel printers

NOTE: research about definitions and differences between the types of printers

- ✓ MONITORS

These are also known as Video Display Units (VDU) and they display images made up of tiny dots called Pixels. They are connected to a computer to enable the user see what he or she is working upon. They are various types of computers and they include some of the following

LCD (Liquid Crystal Display)

LED (Light Emitting Diodes)

CRT (Cathode Ray Tubes)

There are other monitors like the touch screen, curved and portable monitors.

There are some factors to put into consideration when buying a monitor like Resolution, Response, Connectivity, and adjustability.

- ✓ SPEAKERS AND HEADPHONES

These output audio signals allowing the user to hear music and listen to other sounds. The headphones similar to speakers they do the same just that it's for personal and private use.

- ✓ PROJECTORS

They are used during presentation to the crowd to display images or videos or plans onto a large screen or surface. They are also used in meetings of business or press to enable all the members to see what is being discussed. It is a secondary output since it displays information from other devices.

- ✓ PLOTTERS

These are output devices used to produce large scale, high quality graphical output such as Technical drawings, posters, banners and signs. Plotters use a pen or inkjet technology to draw or print on paper or polyester film. They are used more in the field of architecture, engineering and graphics design. However modern plotters can be output producing physical output and also input accepting user to input data by scanning physical documents

- ✓ VIRTUAL REALITY

This is a computer- generated simulation of three-dimensional environment that can be experienced and interacted within a seemingly real or physical way. In other words, it simulates whatever happening to look like real happenings. They are mainly used in gaming, architecture, education and also health care.

NOTE TO REMEMBER

There are many other output devices since the technology advances day to day and I urge you to find out their importance and advantages with disadvantages.

PROCESSING DEVICES

These are the hardware devices that execute instructions and perform calculations to process data. They are the 'BRAIN' of the computer. Here we shall expound all the processing devices and also the processing processes like Machine cycle as indicated below:

- ✓ CENTRAL PROCESSING UNIT

This is the primary processing device responsible for executing instructions and performing calculations. It is made up of three main parts which are

Control Unit: this retrieves and decodes instructions and generates control signals and manages data transfers between different parts of the CPU

Arithmetic and Logic Unit (ALU): This performs the arithmetic and logical operations such as addition, subtraction and multiplication with division of digits, the AND, OR and NOT gates.

Memory Registers: This is a small, high-speed memory location that store data completely while it is being processed.

The CPU has other parts Like BUS, CACHE memory which will be elaborated at the end of the processing devices.

- ✓ GRAPHICS PROCESSING UNIT

A specialized processing device designed for graphics rendering, gaming and other graphics - intensive tasks.

- ✓ MICROPROCESSORS

A small device that contains the entire CPU on a small chip. It integrates all the components of a CPU.

- ✓ MICROCONTROLLER

It is also a small processing device that contains a CPU, memory and input/output peripherals on a single chip

- ✓ APPLICATION-SPECIFIC INTEGRATED CIRCUIT (ASIC)

It is a customized processing device designed for a specific application or task.

DIGITAL SIGNAL PROCESSOR (DSP)

A specialized processing device designed for processing digital signals in real time.

TASK: *find out the functions of the processing devices and the characteristics of them*

MACHINE CYCLE

This refers to the sequence of steps that the CPU follows to execute or carry out a single instruction.

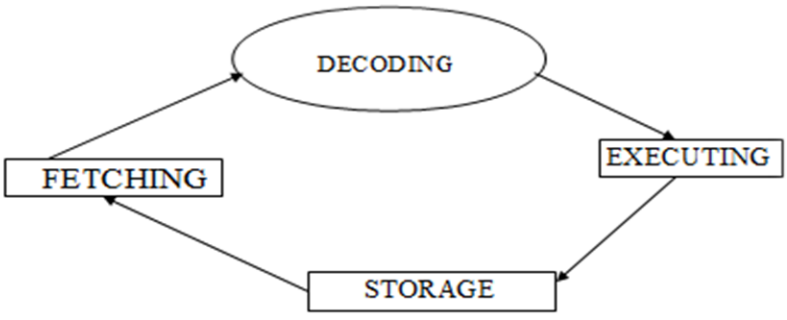
It is done in four major steps are explained below

Fetching: Here the CPU retrieves instruction from the computer memory

Decoding: Here the CPU interprets the instruction determining what operation needs to be performed.

Execution: The CPU performs the operation specified during decoding.

Storage: this is the last step where the result of the instruction is stored in memory or the register



BUS AND CACHE MEMORY

BUS:

This a communication pathway that allows different components of a computer system to exchange data, instructions, and control signals. Below are the types of common buses:

Address Bus: This carries memory addresses from the CPU to the memory.

Data Bus: This carries data between the CPU, memory and input/output devices.

Control Bus: This control bus carries control signals such as clock signals, reset signals and interrupts signals.

Peripheral Component Interconnect (PCI) Bus: This is a high speed bus that connects peripheral devices such as graphics cards and sound cards to the CPU.

Universal Serial Bus (USB): This is a bus that connects peripheral devices such as keyboards, mouse, printers and even flash drives.

NOTE: Peripheral devices are physical devices that are attached to the computer to enhance performance and functionality.

CACHE MEMORY:

This is a small, fast and temporary memory storage location that stores frequently used data, instructions or results. Its primary purpose is to speed up data access times by providing quick access to essential information.

STORAGE DEVICES

These are devices that are used to store data of a computer keeping it for future reference and use by the user.

This is mainly divided into four parts which elaborated below:

- ✓ PRIMARY STORAGE DEVICES:

These are internal and volatile memory components that store data temporarily while the computer is running and they are mainly two which include

  - Random Access Memory (RAM)
  - Cache Memory

- ✓ SECONDARY STORAGE DEVICES:

These are non volatile external storage components that hold data and programs even when the computer is off.

They include

  - Hard Disk Drive (HDD)
  - Solid State Drive (SSD)
  - Flash Drive
  - CD (compact discs)/DVD (digital Versatile Disc) and Blue- Ray Drive

- ✓ TERTIARY STORAGE DEVICES:
  These are external, non-volatile storage components that provide long-term storage for infrequently accessed data. Examples include
  - Magnetic tapes
  - Cloud storage
  - Network Attached Storage (NAS)

Other forms of storage include USB drives, SD cards and external hard drives

RAM AND ROM

RAM: this refers to the computer memory that store data temporarily and instructions while the computer is running.

CHARACTERISTICS OF RAM

- It is volatile
- It is temporary
- It is fast access time
- Can be read and written to multiple times

EXAMPLES OF RAM

- DRAM (Dynamic RAM)
- SRAM (Static RAM)
- SDRAM (Synchronous RAM)
- DDR RAM (Double Data Rate RAM)

ROM: This refers to the computer memory that permanently stores data and program instructions that cannot be modified.

CHARACTERISTICS OF ROM

- It is non volatile
- It is permanent access
- Slow access time compared to RAM

Can be read, but not written to

EXAMPLES OF ROM

- Mask ROM
- PROM (Programmable ROM)
- EPROM (Erasable Programmable ROM)
- EEPROM (Electronically Erasable Programmable ROM)

COMMUNICATING DEVICES

These are devices that enable data transmission, exchange and reception between devices, networks and systems. These devices are mostly used in networking and connectivity to access the internet. The examples are explained as below:

- ✓ **MODEMS**: This is a device that connects a computer to the internet via a telephone line, cable or satellite connection
- ✓ **NETWORK INTERFACE CARD (NIC):** This is a hardware component that connects a computer to a network.
- ✓ **HUBS**: This is a simple device that connects multiple devices to a single network.
- ✓ **SWITCHES**: like the Hubs, switches are just modification of hubs but they also connect multiple devices on the network.
- ✓ **ROUTERS:** These are devices which connect different networks together.
- ✓ **GATEWAYS:** This is a device that connects a local network to the internet.
- ✓ **WIRELESS ACCESS POINTS (WAPS):** This is a device that connects wireless devices to a wired network.
- ✓ **BLUETOOTH DEVICES:** These are wireless devices that connect to other devices using Bluetooth technology.
- ✓ **SATELLITE DISHES:** This is a device that receives and transmits data signals to and from a satellite.
- ✓ **NETWORK CABLES:** These are wires that transmit data in form of light, electrical or segmented signals to and from a network. They include fiber optic, twisted pair cables, Ethernet cables and coaxial cables.

Most of the communicating devices will be well explained when we are dealing with networking software and the internet.

This climaxes the subset of Hardware in Computer system and I encourage you to understand them and review them for easy capture as we continue to the next chapter of the computer system.

COMPUTER SOFTWARE

These refer to the set of instructions or programs that tell a computer what to do. It is a collection of data, instruction and algorithms that are used to operate manage and control computer hardware. The software is categorized into;

- ✓ System software
- ✓ Application software

SYSTEM SOFTWARE

This refers to the type of software that manages controls and operates the computer hardware components. It is divided into five distinct units which are:

- **Operating systems**
- **Utility programs**
- **Firmware**
- **Programming languages**
- **Device drivers**

OPERATING SYSTEMS (OS)

This is the system software that manages computer hardware resources and provides a platform for running application software.

TYPES OF OPERATING SYSTEMS

- ✓ **SINGLE-USER, SINGLE TASKING OS:** This is a type of OS that allows one user to run one program at a time.
- ✓ **SINGLE-USER, MULTI TASKING OS:** This is a type of OS that allows one user to run multiple programs at the same time.
- ✓ **MULTI –USER OS:** This is the type of OS that allows multiple users to access the computer simultaneously.
- ✓ **REAL-TIME OS**: This is a type of OS that guarantees a predictable and fast response to events, often used in embedded systems.
- ✓ **MOBILE OS:** This is the type of OS that is designed for mobile devices such as smart phones and tablets.

EXAMPLES OF OPERATING SYSTEMS

Windows: Developed by Microsoft and widely used on desktops and laptops

MacOS: developed by Apple and exclusively used by Mac computers.

Linux: Open-source for servers, supercomputers and embedded devices

Android: Widely used for mobile devices such as smart phones and tablets

iOS: Widely and exclusively used for iphones and iPad devices.

FUNCTIONS OF OPERATING SYSTEMS

Process Management: Manages the creation, execution and termination of processes.

Memory Management: Manages the allocation and reallocation of memory for running programs

File Management: Provides a file system to store, retrieve and manage files.

Booting a computer: OS enables the starting and restarting a computer.

Resource Allocation: Manages the allocation and reallocation of the system resources.

Security and Access control: Provides a mechanism for controlling access to the computer resources.

BOOTING OF A COMPUTER

This is the starting or restarting of a computer that has been off or turned on.

There are two types of booting a computer which include;

- ✓ **Cold/Hard Booting:** This refers to the starting a computer that has been initially powered off.
- ✓ **Soft/Warm booting:** This refers to restarting a computer that has been initially powered on by pressing CTRL + ALT + DEL keys simultaneously.

STEPS DURING BOOTING PROCESS

1. Power-On Self Test (POST): The computer performs a series of diagnostic tests to ensure that the hardware is functioning properly.

2. Boot loader loading: The computer loads the boot loader, which is responsible for loading the operating system.

3. Operating System Loading: The boot loader loads the OS into the memory.

4. Operating System Initialization: The operating system initializes its components, such as device drivers and system services.

5. User Authentication: The user is prompted to log in to the computer

6. Desktop Environment Loading: The desktop environment such as windows or MacOS is loaded.

REASONS FOR WARM BOOTING

- When a new program has been installed
- When the computer freezes
- After installing a new device
- When the computer slows down

USER INTERFACE

This is the point of interaction between a user and a computer system, device or software. It enables interaction with the system by the user and receives feedback.

TYPES OF USER-INTERFACE

- ✓ **Graphical User Interface**: A visual interface that uses graphics, icons and menus to interact with the system.
- ✓ **Command Line Interface (CLI):** A text-based interface where users interact with the system by typing commands
- ✓ **Voice User Interface (VUI**): An interface that uses voice commands to interact with the system.
- ✓ **Gesture-Based Interface:** An interface that uses gestures, such as touch or motion to interact with the system.
- ✓ **Virtual Reality (VR) Interface:** An immersive interface that simulates a virtual environment.

COMPONENTS OF A USER INTERFACE

- ✓ Input devices like keyboard
- ✓ Output Devices like monitors
- ✓ Menus
- ✓ Icons
- ✓ Windows
- ✓ Dialog box

UTILITY PROGRAM

These are software tools that perform specific maintenance or management task on a computer system. They are designed to manage and optimize computer resources.

TYPES OF UTILITY PROGRAMS

- ✓ **Disk Management Utilities:** These manage disk space, formats disks and check for disk errors
- ✓ **File Management Utilities:** These manage files, folders and directories.
- ✓ **System Information Utilities:** Display system information such as hardware configuration and installed software.
- ✓ **Security and Antivirus utilities:** Protects the system from malware and virus attacks by detecting and removing all bugs and other forms of virus.
- ✓ **Backup and recovery utilities:** Creates backup of information and restore the system in case of failure.
- ✓ **Performance Optimization Utilities:** Optimizes system performance by cleaning up temporary files, registry entries and other system resources.
- ✓ **Diagnostic Utilities:** diagnose and troubleshoot system problems

EXAMPLES OF UTILITY PROGRAMS

- ✓ Disk cleanup
- ✓ Disk defragmenter
- ✓ File explorer
- ✓ Antivirus software

- ✓ Backup and restore
- ✓ Firewall software
- ✓ CCleaaner
- ✓ Installers and uninstallers

TROUBLE SHOOTING

This is the process of identifying and resolving problems or issues with the computer system, network or application.

PROGRAMMING LANGUAGES

These are systems of notations used to write programs. These are set of instructions and rules that a computer can understand and execute.

MAJOR TYPES OF PROGRAMMING LANGUAGES

- ✓ **Assembly language:** These are low level language that uses symbolic codes to represent machine-specific instructions. Examples include:;
  - X86 Assembly
  - ARM Assembly
  - MIPS Assembly
- ✓ **Machine language:** These are low level languages that consist of binary code that a computer can executed directly. Examples include
  - X86 Machine code
  - ARM Machine code
  - MIPS Machine code
- ✓ **High level language:** This is the programming language that provides a higher level of abstraction and ease to use. Examples include;
  - C
  - C++
  - Java
  - Python
  - JavaScript

TRANSLATORS IN PROGRAMMING LANGUAGES

A translator is a program that converts source code written in one programming language into another programming language with equivalence in codes. Examples include

- ✓ **Compilers:** These translate or convert source code into machine code
- ✓ **Interpreters:** These directly execute the instructions written in programming languages
- ✓ **Assemblers:** These convert assembly language code into machine cede

DEVICE DRIVERS

These are software components that allow a computer's operating system to communicate with a hardware device.

TYPES OF DEVICE DRIVERS

- **Kernel Mode Drivers:** These run in Kernel mode and have direct access to hardware resources.
- **User mode Drivers:** These run in user mode and do not have a direct access to hardware devices.
- **Virtual device drivers:** These provide a virtual interface to hardware resources.
- **Bus Drivers:** These manage communication between a device and a bus
- **Filter Drivers:** These filter data that is being transferred between a device and the operating system.

EXAMPLES OF DEVICE DRIVERS

- Graphics drivers
- Sound Drivers
- Network Drivers
- Printer Drivers
- Mouse Drivers

FUNCTIONS OF DEVICE DRIVERS

- **Hardware abstraction:** They provide a layer of abstraction between the operating system and the hardware device
- **Communication**: They enable communication between the operating system and the hardware device.
- **Data Transfer:** They manage the transfer of data between the Operating system and the hardware device.
- **Interrupt Handling:** They handle interrupts generated by the hardware devices
- **Resource Management:** They manage allocation and reallocation of system resources

FIRMWARE

This is a type of software program that is permanently stored in the Read-Only Memory (ROM) of a computer or other electronic device.

TYPES OF FIRMWARE

- **BIOS (Basic Input/output System**): This is the firmware that controls the basic functions of a computer like booting and hardware configuration.
- **UEFI (Unified Extensive Firmware):** A modern replacement for BIOS providing more advanced features and security.
- **Device Firmware:** This is the Firmware that controls specific devices such as printers, routers or smart phones
- **Embedded Firmware:** This is a firmware that is embedded in specialized devices, such as traffic lights, medical devices or industrial control systems.

FUNCTIONS OF FIRMWARE

- **Hardware Control:** The firmware controls the hardware components of a device.
- **Device Functionality:** Firmware provides the functionality of a device
- **Security:** firmware can provide security features, such as secure boot and encryption
- **Updates and Maintenance:** Firmware can be updated to fix bugs, and add new features and improve performance.

FILES AND FOLDERS

FILE: This is a collection of related data stored on a computer's hard drive or other storage device.

TYPES OF FILES

Text Files: Contain plain text data, such as documents and configuration files.
Binary Files: Contains Machine-readable data, such as executable programs and images.
Multimedia Files: These contain audio, video or image data such as MP3s, AVIs, MP4s and JPEG.

FOLDERS: This is also known as a directory, is a container that holds files and other folders on a computer's hard drive or storage device.

TYPES OF FOLDERS

Root folders: These are top-level folder on the storage device denoted by a forward slash (/) or a backslash (\)
Sub-folders: These are folders contained within other folders
System folders: These are folders that are automatically created by the operating system such as the Windows Folder or MacOS folder.

FILES AND FOLDER OPERATION

- Create
- Delete
- Rename
- Move
- Copy

FILE EXTENSION

This is a set of characters that follow the dot (.) at the end of a file name. It indicates the type of file and file format.

FUNCTION OF FILE EXTENSION

Identify file types
Associate with applications
Organize files

COMMON EXAMPLES OF FILE EXTENSIONS

Text Files:

.txt (plain text)

.docx (Microsoft word document)

.pdf (Portable document format)

Image Files

.jpg (joint photographic experts group)

.png (Portable Network graphics)

.gif (graphics Interchange Format)

Audio Files:

.mp3 (MPEG Audio layer 3)

.wav (waveform audio file format)

.ogg (Ogg Vorbis)

Video Files:

.mp4 (MPEG-4)

.avi (Audio Video interleave)

.mov (QuickTime Movie)

Executable Files:

.exe (Executable file)

.msi (Windows Installer Package)

.apk (Android Package file)

TASK

Find out how to create a folder on desktop using;

A) Mouse

B) Keyboard

APPLICATION SOFTWARE

This is a computer program that performs specific task to the user. It is categorized into two i.e.

1. **Customized software:** This is the type of software that is specifically designed and developed for a particular user or organization. It is made unique and not available commercially for public and for a specific purpose

EXAMPLES OF CUSTOMIZED/BESPOKE SOFTWARE

- CRM software
- Accounting software
- Customized mobile app for retail business
- Tailored project management software

2. **General purpose software:** This is a type of software that can be used by a wide range of users for various purposes. They are made ready and available to the public and are easy to learn to serve various purposes.

EXAMPLES OF GENERAL PURPOSE SOFTWARE

- Word processing software
- Spreadsheet software
- Presentation software
- Publishing software
- Database management software
- Internet and Networking software

FORMS OF APPLICATION SOFTWARE

Freeware: This refers to the software that is available for use at no cost, with restrictions on its use, copying or distribution

- **Shareware:** This refers to the software that is available for use at no cost for a trial period after which a license fee is required to continue using the software.
- **Copyrighted software**: This refers to the software that is protected by copyright law which gives creator exclusive rights to reproduce, distribute and display the software.

- **Un copyrighted software:** This is also known as Public Domain software, it is one that is not protected by the copyright law and is available for use, modification, and distribution without restriction.
- **Trial version of software**: Refers to software which consumers can try before they buy. Trial versions of software usually contain all the functionality of the regular version, but can only be used for a limited time.
- **Software versioning**: is the process of assigning either unique version names or unique version numbers to unique states of computer software.
- **Adware:** This refers to software that contains commercial advertisements of the company embedded in the application that constantly displays when the user open the application..
- **Beta software:** This is a type of software provided to people for testing purposes.

WORD PROCESSING SOFTWARE

Word processing software is a type of application designed for creating, editing, formatting, and managing text-based documents. These tools are widely used for a variety of purposes, including personal, educational, and professional tasks.

EXAMPLES OF WORD PROCESSING SOFTWARE

- Microsoft Word,
- Corel Word Perfect,
- Lotus Word Pro,
- Apple Pages,
- Open Office.
- Org Writer

KEY TERMS USED IN WORD PROCESSING

- **Type face:** This refers to the shape of a character. These are sometimes known as font styles Examples are Times new Roman, monotype Corsica, Tahoma etc.
- **Line spacing:** This refers to amount of vertical white space between two lines of text i.e. From base line to another base line.
  NOTE: line space is measured in points.
- **Text alignment:** This refers to the lines of texts are arranged relative to the edges of a block of text. There are four kinds of text alignment which include; left, right, center and Justify.
- **Justification:** Refers to the process of aligning texts in a document to both left and right margins at the same time. Justified texts may have extra spaces between letters within words, so that paragraphs appear as a block with an even right margin ending.
- **Indent.** An indent is the amount of white space in between the margins and the beginning of a text. Examples include; the first line indent, hanging indent, and right indent.
- **Formatting text:** Text formatting is the process of changing the appearance of text in a
  document. Formatting text can involve using commands such as bold, italics, underline, changing font, colored.
- **Editing text:** This refers to the process of making changes to the content of existing document. It involves commands such as; cut and paste, over write, undo, delete etc.
- **Copy:** To place a selected text on a clipboard without being removed from its original position.
- **Cut:** To move a selected text from its original position to the clipboard.

- **The clip board:** This refers to an area of a memory in which you can store copied or to cut text, graphics, or any other Item temporarily before being pasted into other locations.
- **Paste special**: This feature which enables one to a void pasting text with all its formatting.
  The paste special command prompts the user of the computer more controls of what to paste.
- **Header:** This refers to a text which appears on the top margins of all pages of document.
- **Footer:** This refers to a text which appears on the bottom margins of all pages of document.
- **Ruler:** This is a feature which allows determining the indent and margins and table markers.
- **Hard copy:** A document which is on paper form/physical form.
- **Soft copy:** A copy of a document which is stored on a disk or other computer storage devices.
- **Paragraph:** It refers to text between one paragraph break and the next. A paragraph break is inserted by pressing the enter key.
- **Save**: It is the process of writing the document's current state from RAM to a storage device.
- **Proofreading:** This is the process of reviewing a document to ensure the accuracy of its content. Proof reading tools include spelling grammar check (F7), thesaurus, etc.

COMMON FEATURES OF WORD PROCESSING APPLICATIONS

- **Save as.** It is a feature which allows one o save a file with a specific name.
- **Grammar checker**. this reports grammatical errors usually by wavy green lines and suggestions on how to correct them.
- **Thesaurus.** This feature suggests alternative words with the same meaning (synonyms) for
  use in the document
- .**Spell checker**. Allows the user to check spellings of the whole document at one time or to
  check and even correct the spellings of individual words as they are typed. (Auto-correct)
- **Automatic Page numbering**. Numbers the pages automatically in the document.
- **Drop cap.** This feature formats the first letter in a paragraph to be drop capped within 2 or more lines.
- **Clip art.** This refers to pre-made images about various subjects used to illustrate certain concepts within a document.
- **Printing.** This feature allows a user to obtain a hard copy of a document from the printer.

- **Templates.** Establishes the initial document layouts and formats for various document types.
- **Word count**. This establishes the number of words, characters, paragraphs, etc. in a document.
- **Headers and footers.** Used to insert texts in the top and bottom margins through the document.
- **Footnotes and endnotes**. These are used as reference that provide additional information about a word or phrase within a document.✓ Insert and delete. This allows a user to add and remove portions of texts while editing a document.
- **Tables.** This allows the user to organize information into rows and columns
- .**Multi-columns.** This arranges text into two or more columns that look similar to newspapers or magazine.
- **Find.** This allows the user to locate all currencies of a particular character, word or phrase.
- **Replace.** This allows the user to substitute the existing word in a document with the new one.

COMMON PARTS OF A WORD PROCESSOR

- .**Title bar**- this indicate the task and currently running.
  On the right hand side of the title, are the minimize button, restore, and close button
- **Menu bar**-this provides the user with a group of commands that are used to manipulate the document.
- **Tool bars**- these consist of sets of command buttons for quick execution of frequently used groups of commands.
- .**Document window-** this is the working area/ space where the document is created. This is sometimes known as typing area.
- **Status bar**- displays information that the user may need to know such as the current position of the insertion point, progress, edit mode

ADVANTAGES OF WORD PROCESSORS

- ✓ Reviewing of document for any errors before printing them out.
- ✓ It has got many text formatting features such as bold, underline font color etc. that can be used to create documents which look more professional and more appealing to the eye
- ✓ Word processors can save copies for future reference• It is easy to correct mistakes made during the process of typing. This process is known as editing.
- ✓ Using word processors, it is easy to create graphics and insert pictures unlike the manual methods and type writers.

- ✓ Word processors have inbuilt word wrap feature which enables the user to continue typing a document even when he reaches the end of the line.
- ✓ A word processor can work on many pages at ago i.e. inserting headers, footers, and page numbers etc.
- ✓ Word processors have inbuilt in edit features such as copy, paste, cut which enhance the visualization of a document.
- ✓ With the help of word processors, user is able to create one document which can be sent to many people (mail merging).

DISADVANTAGES OF WORD PROCESSORS

✓ With word processors, one can't use them when power is off.
✓ Word processors are expensive as it requires one o have a computer which is expensive to attain.
✓ Word processors have attributed to wide spread unemployment as much work can be done within a shortest time.
✓ Word processors require extra cost of printers so as to attain a hard copy form.
✓ Word processors are difficult to use for people who are illiterate (with no computing skill).
✓ Computers are associated with virus which attributes to loss of a lot of information created with word processors.

Research about shortcuts used in word processing and their keys used.

SPREADSHEET SOFTWARE

Spread sheets. These are programs which are used in manipulation of numerical data, carrying calculations and creation of graphs.
A spreadsheet is a large sheet having data and information arranged in row s and columns. It is used in making budgets, timetables and all sorts of data that requires tabulation

EXAMPLES OF SPREADSHEET SOFTWARE

- Ms. excel
- Lotus1-2-3
- Quattro pro.
- VisiCalc

There are three forms of data entered in spread sheets i.e.
1. Values
2. Labels
3. Formulas

CATEGORIES OF SPREADSHEETS

1. Manual spreadsheets. This involves use of the brain and the physical body parts to carry out calculations.
ADVANTAGE
✓Relatively cheap and easy to use.
DISADVANTAGE.
✓Wrong results as a result of tiredness.

2. Mechanical spreadsheets. This involves use of calculators and other simple calculating devices to carry out calculations. The advantage with this method is that it is relatively cheap and not tiresome like the manual spreadsheets.

Electronic spreadsheets.
With this method, involves the use of computers, to manipulate data and carry out calculations
ADVANTAGES OF USING ELECTRONIC SPREAD SHEETS

- It offers large sheet of data entry in rows and columns.
- It has got inbuilt formulas for data entry and manipulation of data mathematically. Mistakes are easily traced with spreadsheets
- Easy to carry out analysis of the data by use of relative charts.
- The can afford to handle many tasks such as financial planning and budgets.
- .They can present data in graphical form since they have in built graph function. Work sheets can be saved for future reference.

DISADVANTAGES OF ELECTRONIC SPREAD SHEETS.

- They can't be used by people with no computing knowledge.
- Any mistake in a spreadsheet can make the entire results wrong
- Difficult to use by illiterate people
- A single mistake in formula can make the entire answers in the work book wrong
- Electronic spread sheets require specific software's which make them expensive to attain.
- They require electricity for usage

FEATURES OF ELECTRONIC SPREADSHEETS

1. AutoSum - helps you to add the contents of a cluster of adjacent cells.
2. List AutoFill - automatically extends cell formatting when a new item is added to the end of a list.

3. AutoFill - allows you to quickly fill cells with repetitive or sequential data such as chronological dates or numbers, and repeated text. AutoFill can also be used to copy functions. You can also alter text and numbers with this feature.
4. AutoShapes toolbar- will allow you to draw a number of geometrical shapes, arrows, flowchart elements, stars and more. With these shapes you can draw your own graphs.
5. Wizard - guides you to work effectively while you work by displaying various helpful tips and techniques based on what you are doing. 6. Drag and Drop - it will help you to reposition the data and text by simply dragging the data with the help of mouse.
6. Charts - it will help you in presenting a graphical representation of your data in the form of Pie, Bar, Line charts and more.
7. PivotTable - it flips and sums data in seconds and allows you to perform data analysis and generating reports like periodic financial statements, statistical reports, etc. You can also analyses complex data relationships graphically.
8. Shortcut Menus - the commands that are appropriate to the task that you are doing will appear by clicking the right mouse button

.FUNCTION AND SYMBOLS USED IN SPREAD SHEET

NAME	SIGN	FUNCTION
Division	/	Divide
Multiplication	*	Multiply
Addition	+	Add
subtraction	-	subtract

COMMON TERMS AS USED IN SPREAD SHEETS

1. **Cell**. Refer to an intersection of rows and columns
2. **Active cell**. It refers to an active cell you are currently working on.
3. **Filter**. Refers to a feature which allows one to sort out data in the cells basing on the require procedures
4. **Work sheets**. Refer to the main page containing cells which you are currently using. This contains about 65,536 rows and 256 columns.

5. **Work book**. It refers to a collection of many work sheets.
6. **Cell address**. This is the one which easily identifies the location of cell i.e. b4, d9 etc.
7. **A formula**. This is an arithmetic function which is entered in a work sheet to carry out calculation and later display the result in the cell.

8. **Arrange**. Refers to a group of adjacent cells
9. **Function**. Refer to a pre- written or pre-determined formula that provides a short cut to perform calculation e.g. if function, rank etc.

10. **Relative cell referencing**. This is a cell which keep changing depending according to the location of the cell in which referencing takes place i.e. b2+c2 entire in cell d2 will be shift to b3+c3
11. **Mixed cell referencing**. This is the one which contains a single dollar $ sign which acts symbol for fixing and this one will show that only part of function was fixed and won't change if one goes to another i.e. c$4*d3.
12. **Absolute cell referencing**. This is the one which remains fixed even when jumped to another cell. However, for mixed cell it contains two dollar signs which fix both the column and the row i.e. c2. This will remain the same when jumped to another cell.

13. **A value**. A number which can be entered into a cell. Grid lines. The horizontal and vertical lines on the spread sheets

15. **Sheet tabs**. Tabs that identifies the worksheets in a workbook.

Research more about formulas and functions used in excel and how to use then and also the errors in cells

PRESENTATION SOFTWARE

This refers to the one which is used in preparation and creation of animated slides with transitions which help in the enhancement of the speakers' presentation.

OR

A presentation program is a software program that helps create a slideshow that addresses a topic. Presentation programs can be used in businesses and schools for discussing a topic or for teaching. Many times, the presenter uses a projector to project the slideshow up on to screen that everyone can see.

EXAMPLES OF PRESSENTATION SOFTWARE

- Microsoft power point.
- Lotus Florence,
- Micro median director

KEY TERMS USED

A slide: Is an individual page in a presentation.
Animation: This refers to the movement of put in the contents of the slide i.e. words and pictures
Slide show: This is the view mode where slides can cover the whole screen for the audience to see what is being presented.
A place holder: This is the structure on a slide which holds the contents on the slide.

A transition: This is the effect between two slides.
Slide layout: The way how place holders are organized in a slide.
Slide design: This is the predesigned background for the slide.
A handout: This is the combination of more than one slide on a page.

Speaker's note: This refers to the printout of each slide belonging to a speaker.

Template: This defines how the presentations will look like.

Auto features: These make it easy to perform tasks.

Custom show: A custom show is a group of slides selected from a larger presentation to present a smaller presentation.

Default design template: This is the plain white slide template in anew Microsoft PowerPoint.

Hyperlink: This allows the viewer to quickly access another location in the presentation or link to another file

Master slide: This is a design template used for the slides in the presentation.

Normal view: This is the main working window in the presentation.

Outline view: This vies all text of all slides in a lists on the left of the PowerPoint screen.
Summary slide: This is a slide that shows all the title of the slides in a presentation.
A watermark: This is a faded image or text used as a background of the slides.

PRINCIPLES OF A GOOD POWERPOINT PRESENTATION

1. Should have a title slide, content slide and conclusion slide.
2. Each slide has to address a specific topic only.
3. Each point on a slide has to begin with a bullet.
4. Points need to be short and straight forward.
5. Should have minimal animation for both text and graphics.

6. Always use simple background themes and colors.
7. Should have relevant graphics to either the title or content the slide.

8. Do not use many graphics on an individual slide.
9. For timings, always rehearse the timings.
10. A presentation should have a required number of slides.

BENEFITS OF USING PRESENTATION SOFTWARE

- Enhanced Visual Communication: Combines text and visuals for better audience engagement.
- Ease of Customization: Adjust designs, colors, and layouts to fit the topic or audience.
- Time-Saving: Templates and drag-and-drop features simplify the creation process.
- Interactive Features: Enables quizzes, polls, and hyperlinks to engage the audience.

Research about the steps on how to create a hyperlink in slides

DESKTOP PUBLISHING SOFTWARE

This is a software that helps in creating and distributing the information that is inform of visual communication this form of visual communication includes; business cards, brochures, greeting cards, posters web pages etc. It is also known as electronic publishing software / web publishing software. It helps electronically publish materials in formats other than prints

EXAMPLES OF PUBLISHING SOFTWARE

- Adobe in design
- Adobe page
- maker Corel
- Ventura Quark
- X press Aldus
- Microsoft publisher
- Broderbund

CREATIONS MADE BY DESKTOP PUBLISHING SOFTWARE

- Text books
- letters
- Product catalogues
- Annual reports
- Business cards
- Calendars
- Flyers

FEATURES OF DESKTOP PUBLISHING SOFTWARE

- Ability to create master pages Large paper sizes Paper grids for aligning text and graphics
- Ability to stack and overlap multiple objects on a peg
- Ability to trap objects to eliminate white space between colors in a printed document.

ADVANTAGES OF DESKTOP PUBLISHING SOFTWARE

Supports color separation for producing the master copies used in the final presswork.

Very high quality print with a lot of creativity needed for example in printer, graphic designers and the press.

They have several standard templates which are ready for use

DATABASE MANAGEMENT SOFTWARE

❖ Database can be defined as a collection of data organized in a way that allows access, retrieval and use of the data..

❖ A database consists of a collection of tables organized in rows and columns. Other objects that can be formed in a database include; queries, forms, reports and relationships. A software/ program designed to manage databases (to store, modify and extract information from a database) is called a database management system (DBMS).

ADVANTAGES OF A DBMS

❖ Improved availability: One of the principle advantages of a DBMS is that the same information can be made available to different users.

❖ Minimized redundancy: The data in a DBMS is more concise because, as a general rule, the information in it appears just once. This reduces data redundancy, or in other words, the need to repeat the same data over and over again. Minimizing redundancy can therefore

❖ significantly reduce the cost of storing information on hard drives and other storage devices. In contrast, data fields are commonly repeated in multiple files when a file management system is used.

❖ Accuracy: Accurate, consistent, and up-to-date data is a sign of data integrity. DBMSs foster data integrity because updates and changes to the data only have to be made in one place. The chances of making a mistake are higher if you are required to change the same data in several different places than if you only have to make the change in one place.

❖ Program and file consistency.

❖ Using database management system, file formats system programs are standardized. This makes the data files easier to maintain because the same rules and guidelines apply across all types of data. The level of consistency across files and programs also makes it easier to manage data when multiple programmers are involved.

DISADVANTAGES OF A DBMS

There are basically two major downsides to using DBMSs. One of these is cost, and the other the threat to data security

- **Cost**: Implementing a DBMS system can be expensive and time-consuming, especially in large organizations. Training requirements alone can be quite costly.
- **Security**: Even with safeguards in place, it may be possible for some unauthorized users to access the database. In general, database access is an all or nothing proposition. Once an unauthorized user gets into the database, they have access to all the files, not just a few. Depending on the nature of the data involved, these breaches in security can also pose a threat to individual privacy. Steps should also be taken to regularly make backup copies of the database files and store them because of the possibility of fires and earthquakes that might destroy the system

TYPES OF DATABASE

1. Flat files databases. (FFD) These are basically used for simple lists and may have duplications of data much like a simple record card system. A flat file database is made up of only one table

2. Relational Databases (RDS) Can take information from two or more database tables and combine them into a new table or report, Are those where the data is held in a number of cross referenced files in order to reduce duplication. They make it easier to find, analyses, maintain and protect your data because it is held in one place.

EXAMPLES OF DATABASE SOFTWARE

- Microsoft access
- . Mysql
- SQL server
- Oracle
- PostgreSQL
- RDMS
- FoxPro
- Clipper Dbase
- Paradox
- Sybase
- Lotus Approach

COMMON TERMS USED IN DATABASES

Primary key/database key: This is a column (field) in the table that uniquely identifies a record.

Foreign key: This is a column in a table that contains data of a primary key in another table.

Table: This is an object defined and used to store data. Each table contains information about a particular subject, such as customers or orders. A table contains Fields (columns) that store different kinds of data, such as a name or an Address, and. Records (rows) that collect all the information about a particular instance of the subject such as customers, students, etc. A table is a collection of fields and records. A data base may contain one or more tables. Tables are most important objects in database and are used for data entry. In a table each record is displayed as a row and each field is displaced a column. You can define a primary key (a field that has a unique value for each record) and others fields to help you retrieve your data easily.

Record: This is a row in a table that contains information about a given personal product or event or object. (An individual entry in a table). Or is a complete set of fields relating to the same item e.g. a record can contain name and address of one client.

Field: This is a column in a table that contains a specific piece of information within a record or is a piece of information in record. Attribute Is a single data item related to a database object.

Field name: is the title of a particular column. Afield name is assigned to each field to identify the different fields.

Field length: is the maximum number of characters that can be sorted for data in a particular field.

Table structure; Refers to the number of fields, the field names, the field length, and data types in the database table

Filter; a filter restricts the display of database information to records and fields that match criteria that you can specify Filtering; is the process of recording amount of information displayed by access; either fever fields in each record or by showing only those records that match criteria filters are helpful.

Data type: This specifies the type of data that the field can contain or data type determines the way of data you can store in a field and tells access how to handle it. Data types are determined in the design view of the table;

1. Design view: is a view in which you can change the organized structure of your table. All fields (e.g. field names, field length) are organized using designed view.

2. Datasheet view: is a view of database table where you can see information presented in rows and columns with several records visible at the same time.

DATA TYPES IN DBMS

- **Text: Holds Letters,** Numbers or special characters. Or It is used for any sort of alphabetic or numeric data. If the data is numeric, it cannot be used in calculations
- **Numeric type: hold number s only;** it is for numeric data that may be used in calculations
- **Currency;** hold dollar and cents amount .it is used for money values or other numeric data used in calculations involving data with one to four decimal places.
- **Date/time:** hold month, day and year information, it is used for data or time data.
- **Memo:** contain text of any type or length. Is used for any sort of alphabetic or numeric data e.g. description, notes.
- **Boolean type;** hold values that are either true or false.
- **OLEB Objects**; (object linking and embedding) objects, graphics, or other binary data. Field capacity is up to gigabyte (GB) or limited by available disk space,
- **Look up wizard**; when the values that you need exists in another table or form list of Static values you use the look up wizard to help you to establish column Co the Cable or to define the combo box that will display the list of values on a form of report
- **Field properties** Field properties are special characteristics of a Particular field properties are specialized from the general tab on the table structure in the design view. They include field characteristic like size caption, format, dermal place, validation rule, text and these change depending on the type of data type specified.
- **Field size:** Specifies the maximum length of characters including spaces) any data item should have. Default field size in 200+255 2003(50)
- **Format:** Specifies the appearance of any data entered in that particular file. Samples of the supported formats are normally on the drop down list but appear when you check in the format box e.g. fixed format etc.

- **Caption;** Specifies a different name to be used as a field label instead of the specified field name e.g. student ID student identity.
- **Decimal places:** Specifies the number of decimal places the figure should have.
- **Validation Rule:** Helps to specify a condition to be met before data can be accepted in the field e.g. You may limit a field to —m —or —F‖ etc.
- **Validation text:** Specifies the text is to be displayed in case the condition specified „ in the validation rule is not met.
- **Default value:** Specifies the data entry value to be entered automatically for each field unless changed.
- **Indexed:** Specifies whether the data in this field should be listed chronologically and also whether to allow duplicate data items.
- **Allow zero length:** If set to yes even an empty string will be accepted as a valid entry
- **Required:** if set yes, this field cannot be left blank during data entry.
- **Input mask;** Specifies specific pattern or mask for entering data items in a particular field.

FEATURES OF DATABASE

- **Table:** A table is a primary database structure where data is stored
- **Forms:** These are screens of data entry by displaying a record at a time. It provides alternatives to it for data entry and viewing records.
- **Query:** A query is a request for specific data from a database. Or queries are database tools used to request or connect database records that match specific criteria, match and display them in a specific order. Queries are used to locate specific records within the table or ask questions to your database You may want to extract records that meet specific selection criteria e.g. All employees who earn above a certain amount of salary in accounts department Reports This a request for summarizing data in tables for easy reading and printing.

Research about how link tables to form a query

INTERNET NETWORKING AND WEBSITE PUBLISHING SOFTWARE

Networking in particular comes from network.

Computer Network: This refers to the interconnection of two or more computers and other devices to share resources and information.

Network comprises of four **main components** which are explained as below:

- Network devices
- Links
- Communication protocols
- Network defense or security

1) **NETWORK DEVICES:** These are devices that need to be linked in the network to allow communication between the computers. They include

- **Computers/phones/consumer devices**: These are the end devices that users directly and frequently access
- **Servers:** These are application or storage programs where the main computation and data storage occur.
- **Routers:** These are devices that connect two or more devices on different networks. Routing is the process of selecting the network path through which data packets transverse.
- **Switches:** These are devices that connect two or more computers on the same network.
- **Bridges:** These are devices that connect two or more devices on one network.
- **Gateway:** This is a network device that enables communication of devices with the internet.
- **Repeaters:** These are network devices that receive, amplify, and retransmit data signals to the end user or receiver
- **Hub:** This is a device that connects two or more devices on a network.

2) **COMMUNICATION PROTOCOLS:** These are set of rules followed by all nodes involved in the transfer of information. They include;

- **Ethernet:** This defines physical and data link layers for wired networks
- **Wi-Fi (Wireless Fidelity):** This defines physical and data layer for wireless networks
- **IP (Internet Protocol):** This routes data packets between node on a network providing logical addressing and routing

- **UDP (User Datagram Protocol):** This provides best effort, connectionless data transfer, allowing faster transmission but with less reliability
- **HTTP (Hyper Text Transfer Protocol):** This transfers data between web servers and clients providing a standard way for web browsers to request and receive web pages
- **FTP (File Transfer Protocol):** This transfers files between nodes providing a standard way to upload and download files
- **TCP (Transmission Control Protocol):** This is a fundamental protocol in the internet that enables reliable and secure transfer of data from one computer to another in a network.
- **SSL/TLS (Secure Sockets Layer/Transport Layer security):** This provides encryption and authentication for secure data transfer and ensuring that data is protected from eavesdropping and tempering.

3) **NETWORK LINKS:** These are the transmission media used to transfer data from computer to another. They can be wireless or wired. The wired include;
   - **Twisted Pair Cables:** These are types of cables that consists of two insulated copper wires twisted together to form a single cable. They are in two categorizes which are
     - **UTP (Unshielded Twisted Pair):** These are the most common types consisting of four pairs of twisted copper wires and used for Ethernet connections, telephone systems and other applications
     - **STP (Shielded Twisted Pair):** These are similar to UDPs but have an additional shield to reduce electromagnetic interference.

Other forms of twisted pair cables include FTP (Foiled Twisted Pair) and SFTP (Shielded Foiled Twisted Pair).

   - **Coaxial Cables:** These are cables that consist of a central copper wire surrounded by an insulating material, a braided or foil shield and an outer jacket. Commonly used as TV cables
   - **Fiber Optic Cables:** These are cables that consist of thin glass or plastic fibers that transmit data as light signals. They are commonly used for high speed internet and Telecommunications

The Wireless transmission media include; Wi-Fi, Bluetooth, Satellite communications and cellular networks.

4) **NETWORK DEFENSE:** These are defense mechanisms or software set in place to protect and prevent the network from outside and unauthorized access. It can be done by setting up a fire wall.

Firewall: This is a network security system that monitors and controls incoming and outgoing network traffic based on predetermined **security** rules.

TYPES OF NETWORKS

- **LAN (Local Area Network):** This is a type of network that covers a small geographical area, typically within a building. It connects devices such as computers and printers. It is usually managed by a single organization.
- **MAN (Metropolitan Area Network):** This is a type of network that covers a large geographical area larger than a LAN typically within a city. It connects multiples LANs and Provide high connectivity.
- **WAN (Wide Area Network):** This is a type of network that covers a large geographical area, typically across cities and boundaries. It connects multiple LANs and MANs.
- **WLAN (Wireless Network):** This is a type of network that connects devices wirelessly using radio waves or infrared signals. Often used in homes or offices and public hotspot
- **VPN (Virtual Private Network):** This is a type of network that uses encryption and tunneling protocols to create a secure and private connection between devices over the internet.
- **INTRANET:** This is a type of network that is not accessible to the general public typically used within an organization. It provides a safe and secure environment for sharing information
- **EXTRANET:** This is a type of network that is accessible to partners, customers, or suppliers but not to general public. It is used by organization to collaborate with partners and customers.
- **INTERNET:** This refers to the global interconnection of computers and servers that use standardized protocols to share resources and information.

DATA TRANSFER AND TRANSMISSION

Data like any other quantity; it is measured in units called Bits and bytes.

KEY TERMS IN DATA TRANSFER

Bit: This is the basic unit of information in computing and digital communication

Byte: A byte is a group of 8 bits that are processed together as a single unit

Bit rate: This is the number of bits that are transmitted or processed per unit of time.

Bandwidth: This is the amount of data that can be transmitted over a communication channel or network in a given amount of time. It can be in bps/kbps/mbps or gbps.

CONVERSIONS IN DATA TRANSFER

AMOUNT	EQUIVALENCE
1 byte	8 bits
1024 bytes	1 Kilo byte
1024 kilo bytes	1 Mega byte
1024 Mega bytes	1 Giga byte
1024 Giga byte	1 Tera byre
1024 Tera byte	1 Peta byte

TYPES OF DATA TRANSMISSION

Analog Transmission: This is the transfer of data that is represented in continuous form such as amplitude, frequency temperature.

Digital Transmission: This is the transfer of data that is represented in discrete format. However the analog and digital signals can be modified through modulation and demodulation.

Modulation *refers to the process of modifying* ***analog signals to digital***

While

Demodulation *refers to the process of modifying* ***digital signals to analog***

MODES OF DATA TRANSMISSION

Simplex Mode: *This is the mode of data transmission where data only flows in one direction. An example is watching news or TV programs on a TV*

Half Duplex mode: *This is the mode of data transmission where data flows in both directions but not at the same time. An example is a walkie-talkie.*

Full duplex mode: *This is the mode of data transmission where data flows in both directions simultaneously. An example is a phone call*

METHODS OF DATA TRANSMISSION

Asynchronous Transmission: *This is where data is transmitted character by character by character across a transmission medium*

Synchronous Transmission; *This is where data is transmitted as a whole line by line or block by block across a transmission medium*

However there are other modes of data transmission in networking which are

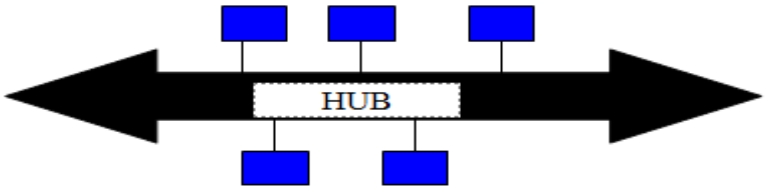
- *Unicast: This refers to the sending of data from one single source to one single destination. It is a one-to-one communication.*
- *Multicast: This refers to sending of data from one source to a specific group. It is a one-to-many but not all those on the network*
- *Broadcast: This refers to sending of data to all possible destinations on the network. It is a one-to-all communication.*

NETWORK TOPOLOGY

This refers to the physical arrangements of computers in a network. Computers can be arranged differently according very many factors which dictate the type of topology to put in place. Below are the six common topologies.

1. BUS TOPOLOGY

A bus topology is a network topology in which all devices are connected to a single cable, called the backbone.



ADVANTAGE OF BUS TOPOLOGY

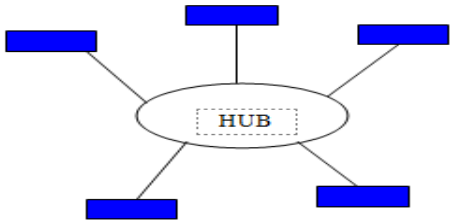
- Easy to install and maintain
- Requires less cable than other topologies
- Simple to add or remove devices

DISADVANTAGES OF BUS TOPOLOGY

- A single fault in the backbone can bring down the entire network
- Difficult to troubleshoot and isolate problems
- Limited scalability

2. STAR TOPOLOGY

A star topology is a network topology in which all devices are connected to a central device, called a hub or switch forming a star.



ADVANTAGES OF STAR TOPOLOGY

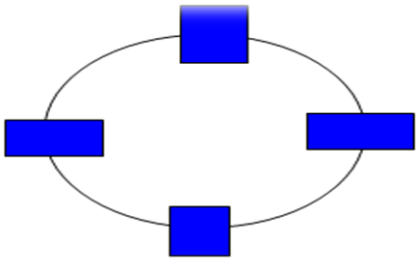
- Easy to install, maintain, and troubleshoot
- Centralized management and control
- Scalable and flexible

DISADVANTAGES OF STAR TOPOLOGY

- If the central device fails, the entire network is affected
- More expensive than bus topology
- Requires more cable than bus topology

3. RING TOPOLOGY

A ring topology is a network topology in which devices are connected in a circular configuration, and data travels in one direction around the ring.



ADVANTAGES OF RING TOPOLOGY

- Provides high-speed data transfer
- Fault tolerance, as data can be rerouted if a device fails
- Easy to install and maintain

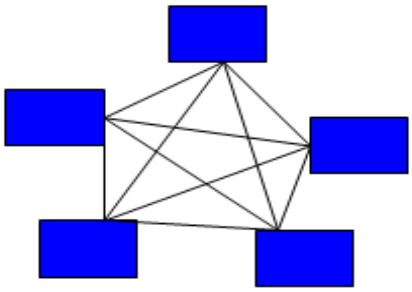
DISADVANTAGES OF RING TOPOLOGY

- Difficult to add or remove devices
- A single fault in the ring can bring down the entire network
- Requires specialized hardware and software

3. MESH TOPOLOGY

A mesh topology is a network topology in which each device is connected to every other device, providing multiple paths for data to travel.

;



ADVANTAGES OF MESH TOPOLOGY

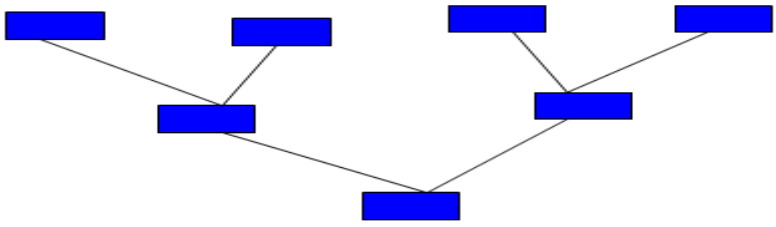
- Highly reliable and fault-tolerant
- Provides high-speed data transfer
- Scalable and flexible

DISADVANTAGES OF MESH TOPOLOGY

- Most expensive topology to implement and maintain
- Requires a large amount of cable and hardware
- Complex to install and manage

5. TREE TOPOLOGY

A tree topology is a network topology that combines the characteristics of bus and star topologies, with multiple branches connected to a central trunk.



ADVANTAGES OF TREE TOPOLOGY

- Combines the advantages of bus and star topologies
- Scalable and flexible
- Easy to install and maintain

DISADVANTAGES OF TREE TOPOLOGY

- Can be complex to troubleshoot and manage
- Requires more cable than bus topology
- Limited fault tolerance

6. HYBRID TOPOLOGY

A hybrid topology is a network topology that combines two or more different topologies, such as bus, star, and ring.

ADVANTAGES OF HYBRID TOPOLOGY

- Combines the advantages of multiple topologies
- Scalable and flexible
- Can provide high-speed data transfer and fault tolerance

DISADVANTAGES OF HYBRID TOPOLOGY

- Can be complex to install, manage, and troubleshoot
- Requires specialized hardware and software
- Can be expensive to implement and maintain

FACTORS TO CONSIDER WHEN SELECTING A TOPOLOGY

- Distance between devices
- Physical layout of the area
- Scalability
- Reliability
- Cost
- Maintenance
- Flexibility

E-MAIL SERVICE

An email (short for Electronic Mail) is a method of exchanging digital messages from one computer user to another through a network, typically the internet.

PARTS OF AN EMAIL

- **Header:** Contains information about the email, such as the sender's and recipient's email addresses, the subject, and the date and time the email was sent.
- **Sender's email address:** The email address of the person sending the email.
- **Recipient's email address:** The email address of the person receiving the email.
- **Subject:** A brief summary of the email's content.
- **Body:** The main content of the email, which can include text, images, and file attachments.
- **Attachments:** Files or documents that are sent along with the email.
- **Signature:** A block of text that is automatically added to the end of an email, typically containing the sender's name, contact information, and other details.
- **Footer:** Optional information that can be added to the end of an email, such as a disclaimer or a copyright notice. Here are some common features of an email:
- **CC (Carbon Copy):** Allows the sender to send a copy of the email to one or more recipients, in addition to the primary recipient.
- **BCC (Blind Carbon Copy):** Allows the sender to send a copy of the email to one or more recipients without revealing their email addresses to the primary recipient.
- **Hyperlinks:** Allows the sender to include clickable links to websites or other online resources.
- **Images:** Allows the sender to include images in the email body.
- **Priority:** Allows the sender to set the priority of the email, such as high, normal, or low
- **Formatting options:** Allows the sender to format the email text using options such as bold, italic, and font sizes.

TASK: write the steps taken to send an email from one person to another.

INTERNET AND WORLD WIDE WEB

The **Internet** is a global network of interconnected computers and servers that communicate with each other using standardized protocols. It is a massive network of networks that allows devices to communicate with each other and share information.

HISTORY OF THE INTERNET

The Internet has its roots in the 1960s, when the United States Department of Defense's Advanced Research Projects Agency (ARPA) funded a project to create a network of computers that could communicate with each other. This project, called ARPANET, was the first operational packet switching network, and it was developed in the late 1960s and early 1970s.

In the 1980s, the Internet Protocol (IP) was developed, which allowed different computer networks to communicate with each other and form a single, global network. This network was called the Internet.

INTERNET INFRASTRUCTURE

The Internet infrastructure consists of several key components, including:

- **Internet Service Providers (ISPs):** ISPs provide access to the Internet for individuals and organizations.
- **Network Service Providers (NSPs):** NSPs provide connectivity between different networks and ISPs.
- **Internet Exchange Points (IXPs**): IXPs are physical locations where multiple networks and ISPs interconnect.
- **Domain Name System (DNS):** DNS is a system that translates domain names into IP addresses.
- **Routers and switches:** Routers and switches are devices that direct traffic between different networks and devices.

INTERNET PROTOCOLS (IP)

These are the rules that govern the communication and sharing of resources over the internet. The Internet uses several protocols to manage communication between devices and networks. Some of the most important Internet protocols include:

- **Transmission Control Protocol (TCP):** TCP is a protocol that ensures reliable communication between devices.
- **Internet Protocol (IP):** IP is a protocol that provides logical addressing and routing for the Internet.
- **Hypertext Transfer Protocol (HTTP**): HTTP is a protocol that manages communication between web servers and clients.
- **File Transfer Protocol (FTP):** FTP is a protocol that manages file transfers between devices.

USES OF THE INTERNET

- ✓ **Communication:** Email, instant messaging, video conferencing, and social media.
- ✓ **Information:** Access to vast amounts of information, including news, education, and entertainment.
- ✓ **Commerce:** Online shopping, banking, and other financial transactions.
- ✓ **Education:** Online courses, degree programs, and educational resources.
- ✓ **Entertainment:** Streaming music and video, online gaming, and other forms of entertainment.

BENEFITS OF INTERNET USAGE

- ✓ **Global connectivity:** The Internet connects people and devices from all over the world.
- ✓ **Access to information:** The Internet provides access to vast amounts of information and educational resources.
- ✓ **E-commerce and online shopping:** The Internet enables online commerce and shopping, making it easier to purchase goods and services.
- ✓ **Improved communication:** The Internet enables fast and efficient communication through email, instant messaging, and video conferencing.
- ✓ **Entertainment and leisure:** The Internet provides access to a wide range of entertainment and leisure activities, including streaming music and video, online gaming, and social media.

CHALLENGES FACED BY USAGE OF INTERNET

- ✓ **Cyber security:** The Internet is vulnerable to cyber threats, including hacking, malware, and phishing.
- ✓ **Privacy**: The Internet raises concerns about privacy, as personal data can be collected and shared without consent.
- ✓ **Digital divide**: The Internet can exacerbate existing social and economic inequalities, as some people may not have access to the Internet or the skills to use it effectively.
- ✓ **Addiction and mental health:** Excessive Internet use can lead to addiction and negative impacts on mental health.
- ✓ **Regulation and governance:** The Internet raises challenges for regulation and governance, as it is a global network that transcends national borders.

NETIQUETTE

Netiquette refers to the rules of behavior and etiquette that govern online interactions, including email, social media, online forums, and other digital communication platforms.

EXAMPLES OF NETIQUETTES

- ✓ Treat others online with the same respect and kindness you would in person.
- ✓ Be truthful and transparent in your online interactions.
- ✓ Be considerate of others' feelings, opinions, and cultural backgrounds.
- ✓ Take responsibility for your online actions and their impact on others.
- ✓ Help the recipient quickly understand the purpose of the email.
- ✓ Be clear and concise in the body
- ✓ Use a formal greeting and signature
- ✓ Use proper formatting
- ✓ Proofread and edit
- ✓ Use proper grammar and spelling
- ✓ Be respectful and considerate
- ✓ Respect others' opinions
- ✓ Follow community guidelines

WWW STANDS FOR WORLD WIDE WEB. It's a system of interlinked hypertext documents that are accessed via the internet. The World Wide Web was invented in 1989 by Tim Berners-Lee, a British computer scientist.

KEY FEATURES OF THE WORLD WIDE WEB

- ✓ **Hypertext:** The World Wide Web uses hypertext, which allows users to access and link to other documents and websites using hyperlinks.
- ✓ **Web Pages:** Web pages are documents that contain text, images, and other multimedia content, which are accessed using a web browser.
- ✓ **Web Browsers:** Web browsers are software applications that allow users to access and view web pages, such as Google Chrome, Mozilla Firefox, and Safari.
- ✓ **HTTP and HTTPS:** The World Wide Web uses HTTP (Hypertext Transfer Protocol) and HTTPS (Hypertext Transfer Protocol Secure) protocols to transfer data between web servers and web browsers.
- ✓ **URLs:** URLs (Uniform Resource Locators) are used to identify and locate web pages and other online resources.
- ✓ **Search engine:** This is the software that enables the user to view websites or other online content based on the user's search query. Examples include; Google, Bing, Yahoo, DuckDuckGo.

HOW THE WORLD WIDE WEB WORKS

- ✓ **User Requests**: A user requests a web page by entering a URL into their web browser.
- ✓ **DNS Lookup:** The web browser performs a DNS (Domain Name System) lookup to translate the URL into an IP address.
- ✓ **HTTP Request:** The web browser sends an HTTP request to the web server associated with the IP address.
- ✓ **Web Server Response:** The web server processes the HTTP request and sends an HTTP response back to the web browser.
- ✓ **Web Page Display:** The web browser receives the HTTP response and displays the web page to the user.

IMPACT OF THE WORLD WIDE WEB

- ✓ **Global Connectivity:** The World Wide Web has enabled global connectivity, allowing people to access and share information from anywhere in the world.
- ✓ **E-commerce:** The World Wide Web has enabled e-commerce, allowing businesses to sell products and services online.
- ✓ **Information Sharing:** The World Wide Web has enabled the sharing of information on a massive scale, facilitating education, research, and innovation.
- ✓ **Social Media:** The World Wide Web has enabled the development of social media platforms, which have transformed the way people communicate and interact with each other.

CLOUD COMPUTING AND GREEN COMPUTING

Cloud computing: This is the delivery of computing services over the internet where resources such as software and applications are provided as a service to users on demand.

Green Computing: This is the practice of using computing resources in an environmentally responsible and sustainable manner

BENEFITS OF GREEN COMPUTING

- ✓ Cost saving
- ✓ Environmental benefits and conservation
- ✓ Improved brand images
- ✓ Compliance with regulations

Virtualization: This is a technology that allows multiple virtual machines to run on a single machine sharing resources such as CPU, memory and storage

COMPUTER USERS AND THEIR CARRIERS

This part of the user is the most important part of the computer system because a computer cannot operate without a user. Below are some of the computer users and their carriers in the field of ICT.

Network Administrators: He/she installs, configures and maintains computer network.

Network engineers: He/she designs, implements and maintains computer networks.

System Administrators: He/she manages and maintains computer systems including servers and desktops

Cloud computing Professionals: He/she manages and maintains cloud computing systems

Software developers: He/she designs and develops software applications

Mobile App developers: He/she designs, develops and tests mobile apps

Web developers: He/she designs, develops and maintains a website and web applications.

Information Security Analysts: He/she analyses and implements security measures to protect computer systems and networks.

Cyber security Specialists: He/she protects the computer system and network from cyber threats.

Data Scientists: He/she collects analyses and interprets complex data to gain insights

IT Managers: He/she oversees the overall IT strategy and direction of an organization.

Project Manager: He/she manages IT projects from planning to delivery

Telecommunication Engineer: He/she designs and develops telecommunication systems.

Database administrators: He/she designs and implements and maintains databases

Web designers: He/she develops and designs website web applications

Computer hardware engineer: He/she designs and develops computer hardware components.

Solution Architect: He/she designs and implements comprehensive solutions to meet business needs

EXAMPLES OF CARRIERS IN IT AND COMPUTER STUDIES

- Software development
- Web designing
- Data science and analytics
- Cyber security
- Repair and maintenance
- Teaching and lecturing
- Network designing
- IT management
- Telecommunications
- Artificial Intelligence

CYBER ATTACKS AND CYBER SECURITY

CYBER ATTACKS/THREATS: This refers to crimes that involve use of a computer while carrying them out. They may be with the intention of destruction, data breach or need of money from culprits. They are made by individuals who know how to use a computer collectively known as 'wizards'. Some of the cyber crimes include;

- **Hacking:** This is the illegal access to the computer information or network without authorization.
- **Cracking:** This is the act breaking into computer systems, networks or software without authorization with the aim of destroying information
- **Phishing:** This is act of tricking users into revealing sensitive information such as password or credit card number
- **Denial of Service (DoS):** This is the type of cyber attack where the attacker attempts a computer or network resource unavailable by overwhelming it with traffics or requests.
- **Spamming:** This is the act of sending unwanted e-mails or requests to the computer or network of the user
- **Sniffing:** This is the act of capturing and analyzing sensitive information like passwords to enable the attacker to access information without authorization.
- **Eavesdropping:** This is the act of listening to private information without authorization from the owners.
- **Wiretapping:** This refers to the intercepting communication between two parties often through physical access to the network infrastructures.
- **Ransom ware:** This is the type of malware that encrypts victim's files and demands payments in exchange for decryption key.

CYBER SECURITY: This refers to the practices, technologies and processes designed to protect digital information, computer systems and networks from unauthorized access, use or disclosure.

MEASURES IN CYBER SECURITY

- **Firewall:** This is a network security system that controls incoming and outgoing network traffics or limits and controls physical access to the system
- **Access Control:** This measure controls who can access a computer system, network or data.
- **Encryption:** This is the changing of data from readable format to unreadable format
- P**asswords**: These are combination of characters that are easy to remember but difficult to guess that a user can use to access information on a computer
- **Two-factor Authorization:** This is where two methods or requests like a password and fingerprint are required for one to access information on the computer
- **Biometrics:** This is the use of unique biological characteristics such as fingerprint, iris scan, voice recognition and also face recognition.

COMPUTER VIRUS AND MALWARE

MALWARE: This refers to any type of software that is designed to harm or exploit a computer system. Malware includes

- **Computer Virus**: This is the type of malware that replicates itself by attaching to other programs or files on a computer. They can delete, corrupt or crash computer files and programs
- **Trojan horse:** This is the type of malware that disguises itself like a legitimate program and corrupts files with information.
- **Worms:** This is the type of malware which spreads itself without needing to be attached to a computer program or file and corrupts them.
- **Logic Bombs:** This is the type of malware that is triggered by a specific event or date or time to corrupt and crush files
- **Spyware:** This is the type of malware that secretly monitors and collects user data, such as browsing history or passwords
- **Adware:** This is the type of malware that displays unwanted advertisements on a computer

- **Botnet:** This is a network of computer that have been infected with malware and can be controlled remotely.
- **Ransom ware:** This is the type of malware that encrypts victim's files and demands payments in exchange for decryption key.

ICT AND COMPUTER STUDIES ABREVIATIONS

1. **ACC**-Accumulator
2. **AGP**-Accelerated Graphics Port.
3. **AI**- Artificial intelligence
4. **ALU**-Arithmetic Logic Unit
5. **ALU**-Arithmetic Logic Unit
6. **AP**-Access Point
7. **ARPANET**-Advanced Research Projects Agency Network
8. **ASCII**-American Standard Cord for Information Interchange.
9. **AT**-Automated teller machine.
10. **BCC**-Blind Carbon Copy
11. **BCD**-Binary Coded Decimal
12. **BIOS**-Basic Input and Output System
13. **BIT**- Binary digit
14. **Bps**-Bits Per Second
15. **Bps**-Bytes Per Second
16. **CAD**-Computer Aided Design
17. **CAI**-Computer Aided Learning
18. **CAL**-Computer Aided Learning
19. **CD** – R -Compact Disk – Recordable
20. **CD** – ROM -Compact Disk - Read Only Memory
21. **CD** – RW -Compact Disk - Rewritable
22. **CD**-Compact Disk
23. **CD-R**-Compact Disk Recordable
24. **CIR**-Current Instruction Register
25. **CMOS** -Complementary Metal Oxide Semiconductor
26. **COBOL**-Common Business Oriented Language
27. **CPU**-Central Processing unit
28. **CRT**-Cathode Ray Tube
29. **CU**-Control Unit
30. **CUI**-Command Line User Interface
31. **DBMS**-Data Base Management System
32. **DOS**-Disk Operating System
33. **DRAM**-Dynamic Radom Access Memory

34. **DSL**-Digital Subscriber Line
35. **DTP**-Desk Top Publishing
36. **DVD** – R -Digital Video Disk - Recordable
37. **DVD** – RAM -Digital Video Disk - Random Access Memory
38. **DVD** – RW -Digital Video Disk - Rewritable
39. **DVD ROM**- Compact Disk Read Only memory
40. **DVD RW**- Digital Video Disk –Rewritable
41. **DVD**-Digital Versatile Disk
42. **DVI -**Digital Visual Interface
43. **EDCDIC**-Extended Binary Coded Decimal Interchange Code
44. **EDSAC** -Electronic delay storage automatic computer **(Applies to O level only out going curriculum)**
45. **EDVAC** -Electronic discrete variable automatic computer **(Applies to O level only out going curriculum)**
46. **EEPROM**-Electronically Erasable Programmable Read Only Memory
47. **EFT**-Electronic Funds Transfer
48. **EIDE** -Enhanced Integrated Drive Electronics
49. **EISA** - Extended Industry Standard Architecture
50. **E-mail**-Electronic Mail
51. **ENIAC**-Electronic Numerical Integrator and Calculator **(Applies to O level only out going curriculum)**
52. **EPROM**-Electronically Programmable Read Only Memory
53. **EULA**-End User License Agreement
54. **FAQ**-Frequently Asked Questions
55. **FORTRAN**- Formula Translation
56. **FTP**-File Transfer Protocol
57. **GB-**Giga Byte
58. **GIGO**-Garbage In Garbage Out
59. **GPRS**-General Packet Radio Service
60. **GPS**-Global Positioning System
61. **GUI**-Graphical User Interface
62. **GW**-Gate Way
63. **HDD**- Hard Disk Drive
64. **HDMI -**High-Definition Multimedia Interface
65. **MHz**-Megahertz
66. **HTML**-Hyper Text Mark-Up Language
67. **HTTP**-Hypertext Transfer Protocol
68. **HTTPS**- Hyper Text Transfer Protocol Secure
69. **IC**- Integrated Circuits **(Applies to O level only out going curriculum)**

70. **ICT**-Information Communication Technology
71. **IM**-Instant Messaging
72. **IP**- Internet Protocol
73. **IRC**-Internet Relay Chart
74. **IRDA**-Infrared Data Association
75. **ISA** - Industry Standard Architecture
76. **ISDN**-Integrated Services Digital Network
77. **ISP**-Internet Service Provider
78. **JPEG**- Joint Photographic Experts Group
79. **KB**-Kilobyte
80. **KB**-Kilobyte
81. **KH**-Kilohertz
82. **KHz**-Kilohertz
83. **LAN**-Local Area Network
84. **LCD**-Liquid Crystal Display
85. **LED**-Light Emitting Diode
86. **LSI**-Large Scale Integration
87. **MAN**-Metropolitan Area Network
88. **MAR**-Memory Address Register
89. **MB**- Megabyte
90. **MDR**-Memory Data Register
91. **MICR**-Magnetic Ink Character Recognition
92. **MIDI**-Musical Instrument Digital interface
93. **MIPS**-Millions of Instructions Per Second
94. **MODEM**-Modulation Demodulation
95. **MP3**-Moving Picture expert Group layer 3
96. **Netiquette**-Internet Etiquette or Network Etiquette
97. **NIC**-Network Interface Card
98. **NOS**-Network Operating System
99. **OCR**-Optical Character Recognition

100. **OMR**-Optical Mark Recognition
101. **OOPL**-Object Oriented Programming Language
102. **OSI**-Open Systems Interconnection
103. **OS**-Operating System
104. **OTT**-Over The Top
105. **PCIE** -Peripheral Component Interconnect Express
106. **PCI**-Peripheral Component Interconnect
107. **PC**-Personal Computer
108. **PC**-Program Counter
109. **PDA**-Personal Digital Assistant
110. **POS**-Point of Sale
111. **PPM**-Pages Per Minute
112. **PROM**-Programmable Read Only Memory
113. **RAM**-Random Access Memory
114. **RFID**-Radio Frequency Identification
115. **RSI**-Repetitive Strain Injury
116. **SAS** -Serial Attached SCSI
117. **SATA**-Serial Advanced Technology Attachment
118. **SCSI** - Small Computer Systems Interface.
119. **SCSI**-Small Computer System Interface
120. **SDRAM**-Synchronous Dynamic Random-Access Memory
121. **SI**-System International Unit
122. **SQL**-Structured Query Language
123. **SRAM**-Static Random-Access Memory
124. **SSD**-Solid State Drive
125. **TB**-Terabyte
126. **TCP**-Transmission Control Protocol
127. **UNIVAC** -Universal automatic computer **(Applies to O level only out going curriculum)**
128. **UNIVAC**-Universal Variable Computer **(Applies to O level only out going curriculum)**

129. **UPS**-Uninterruptible Power Supply
130. **URL**-Uniform Resource Locator
131. **USB**-Universal Serial Bus
132. **VDU**-Visual Display Unit
133. **VGA-**Video Graphics Array
134. **VLSI**-Very Large Scale Integration**(Applies to O level only out going curriculum)**
135. **VOIP**-Voice Over Internet Protocol
136. **WAN**-Wide Area Network
137. **WAP**-Wireless Application Protocol
138. **WWW**-World Wide Web
139. **WYSIWYG**-What You See Is What You Get

END

ABOUT THE AUTHOR

DHIGOMBYE JACKSON wrote this book as he was pursuing his Bachelor's degree in Computer Science and Information technology at Kampala University. He began his first step of education at Jinja Happy Hours Primary school where he attained 7 aggregates and was admitted to Ristaka High School, Busiika where he left with a Uganda Certificate Of Education of 15 aggregates. He furthermore advanced his studies at Jinja Progressive Academy doing PCM/ICT and managed to get his 16 points that enabled him to join University level.

ABOUT THE BOOK

"**Computer Launch**" is a book written with trusted information from different sources and all information inside it is trusted and marked right when well presented in exams. This is the first edition and as we know that computer advances day to day, be flexible to adapt to new ideas and findings.

This is good for all levels of secondary and those who seek computer literacy or introduction in all institutions and all levels. It is approved by trusted personnel in the field of ICT

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