INTRODUCTION TO WWW

Meaning and Definition of WWW

WWW (World Wide Web) is part of the internet that contains linked text, image sound, and video documents. It is also define as an information space where documents and other web resources are identified by URLs, interlinked by hypertext links, and can be accessed via the Internet.

Brief History of WWW

In 1989, London born Timothy Berners-Lee came up with the idea of the web as a way to share
files with others. The idea for the web came while Berners-Lee was working for the European Organization for Nuclear Research (CERN). Scientists by trade, Berners-Lee and others inside CERN were looking for ways to transmit information between each other electronically. To do so, they created a set of tools including a language (html), a browser and other utilities which allowed them to establish
communication.

The first web browser was invented in 1990 by Sir Tim Berners-Lee. His browser was called WorldWideWeb and later renamed Nexus. Many others were soon developed, with Marc Andreessen's 1993 Mosaic (later called Netscape). Today, the major web browsers are Chrome, Safari, Internet Explorer, Firefox, and Edge

The internet was first introduced into Nigeria in the year 1995. It was in reality a project work by RINAF (Regional Information Society Network for Africa). It was backed up financially by UNESCO. Several workshops were organised in order to educate the Nigerian populace. the first test running was conducted in Obafemi Awolowo University in 1995. By the late 1990's the ''internet '' became a known term among the citizens of Nigeria.

Basic Terminologies of WWW

i. **Websites**: A collection of related web pages
ii. Webpage: A webpage is a document or information resource on the World Wide Web which can be accessed using a web browser.
iii. Web servers: web servers are computers that stores and disseminate web pages
iv. Web Browser: A web browser (commonly referred to as a browser) is a software application for retrieving, presenting, and traversing (moving through) information resources on the World Wide
v. Web address: A web address, also known as a URL (uniform resource locator), is an Internet or intranet name that points to a location where a file, directory or website page is hosted.
vi. Hyperlink: A link from a hypertext file or document to another location or file, typically activated by clicking on a highlighted word or image on the screen.

vii. Homepage (Main page): The introductory page of a website, typically serving as a table of contents for the site.
viii. Internet Protocol: The Internet Protocol (IP) is the method by which data is sent from one computer to another on the Internet or other network.

Protocols
The two general protocols of WWW are:
1. HTTP (Hypertext Transfer Protocol) is the set of rules for transferring files (text, graphic images sound, video and other multimedia files) on the world wide web.
2. HTML (Hypertext Markup Language) is a computer language used to build web pages.

Other protocols Include:
a. TCP: Transmission Control Protocol
b. UDP: User Data-gram Protocol
c. SMTP: Simple Mail Transfer Protocol
d. FTP: File Transfer Protocol
e. POP: Post Office Protocol
f. ICMP: Internet Control Protocol

Benefits of WWW
1. Availability of mainly free information
2. Facilitates rapid and interactive communication
3. It is accessible from anywhere
4. Facilitates the exchange of huge volume of data

Software for website development
Software for website development includes:
1. FrontPage: A computer program from Microsoft for windows and Mac for creating website and web pages.
2. Adobe Dream Weaver: An application used by web designers and developers to create website and applications for use across multiple targets
3. Web plus X4
4. Chrome DevTools
5. Wordpress
6. Sublime Text 2

Network Cables and Connectors

Definition of Network Cable
Network Cables are medium through which information usually moves from one network to another.

Types of Network Cables The following are the types of cables used in networks:
a. Unshielded Twisted Pair (UTP) Cables
b. Shielded Twisted Pair (STP) Cables
c. Coaxial Cables
d. Fibre Optics
e. Telephone

Unshielded Twisted Pair (UTP) Cable
UTP is a popular type of cable that consists of two unshielded wires twisted around each other. Due to its low cost, UTP cabling is used extensively for local-area networks (LANs) and telephone connections. UTP cabling does not offer as high bandwidth or as good protection from interference as coaxial or fiber optic cables, but it is less expensive and easier to work with.

Shielded Twisted Pair (STP) Cables
Shielded twisted pair is suitable for environments with electrical interferences; however the extra shielding can make the cables quite bulky.

Coaxial Cable

Coaxial cabling has a single copper conductor at its center. A plastic layer provides insulation between the center conductor and the braided metal shield. The metal shield helps block any outside interference from fluorescent lights, motors and other computers.
There are two types of coaxial cabling:
1. Thin coaxial cables (Thin net)
2. Thick coaxial cables (thick net

Fiber Optic Cable
Fiber Optic cable consists of a center glass core surrounded by several layers of protective materials. It transmit light rather than electronic signal eliminating the problem of electrical interference.

Telephone Cable
Telephone systems use low voltage electrical wires to convey signals to phone, modems and fax machine.

Network Connectors
An electrical connector is a conductive device for joining electrical circuits together.
Types of Connector 1. Registered Jacks
2. RJ 45 connector
3. RJ 11 Connectors
4. Coaxial connectors
5. T-connectors

Register Jacks The naming convention for Register jacks is RJ-xx, where xx is a two digit number. The two digits indicate the types interface and the area of its application. For example RJ 11, RJ 14 and RJ 25 are used for terminating telephone lines, whereas RJ 45 is used in computer networking.

RJ 45 connector
This is a plastic connector that looks like a large telephone style connector. A slot allows the RJ 45 to be inserted only one way.

RJ 11 connector The RJ 11 is the most common phone jack that is in use today. RJ 11 connectors are used to terminate phone lines, and are typically deployed with single line POTS (plain Old Telephone Service) telephone jacks.
Coaxial Cables Connector The most common types of connector used with coaxial cable is the Bayone-Neill-Concelman (BNC) connector.

T-connector BNC T-connectors are female devices for connecting three cables together. It is usually in the shape of a capital T.

Computer Cables and Connectors
Computer cables include the following:
1. Power cable
2. Data cable
3. Printer cable
4. Monitor cable
5. Serial cable
6. Universal Serial Bus (USB)

Power cable A power cable or main cable is a cord that temporary connects an electrical appliances like computer to the distribution circuits of an electrical power source via a wall socket or extension cord.
Data Cable Data cables are used to transmit information between system bus and peripheral devices.
Printer cable
Printer cable is used to connect a parallel printer to the parallel port on a PC. A

parallel port is a type of interface found on computer for connecting various peripheral devices.

Monitor cable A monitor cable or a VGA (Video Graphics Array) cable is a cable used to transmit video signals

Serial cable A serial cable is a cable used to transfer information between two devices using a serial communication protocol.
Computer Connector There are generally two types of connectors name male and female.
The gender of a connector is easy to determine. A male connector has one or more protrusions that couple with a female receptacle. Good examples of male connectors are power plugs and coaxial cable.
Virtually all of the receptacles (USB, RCA, and Ethernet connectors) on a computer are female.
The male has “pins” which stick out, while the female has holes, or receptacles contacts.

BASIC PROGRAMMING III (One Dimensional Array)

Definition of Array

An array is a list of variable of the same kind. A variable is a name which the computer assigns value to.

Types of Variables

1. **Numeric Variables**: These are used to store numeric values such as 23, 98, etc. There are two major types of numeric variables, which are; **Integer variable and real variable**

a. Integers are whole numbers without decimal places.

b. Real numbers are numbers with decimal places

Hence Integer variables are names which the computer can assign integer values to and real variables are name which the computer can assign real numbers to. Integer variable names are written with a "%" sign as the last character. E.g. . When a numeric variable name is written without the % sign, it can take both integer and real numbers.

2. **String Variables**: These are used to store alphabetic and alpha-numeric values. A string variable name is always written with a dollar sign ($) as the last character. E.g. Name$="John"

To create an array, the DIM (dimension) command is used. The DIM statement has the following syntax:

DIM arrayName(n)

For example DIM Score (5) will reserve 6 spaces, Score (0) Score (1), Score (2), Score (3), Score (4) and Score (5) in the memory to hold value. The number inside the parentheses of the individual variables are called **subscripts,** and each individual variable is called **subscripted variable or element**

Operations on Array

The following operation can be performed on an array. They are;

a. Input operation

b. Output operation

c. Arithmetic operation

Example1: Create and access array of 10 integers

REM An array to create and access 10 integers

```
DIM IN (10)

IN (1) = 10

IN (2) = 11

IN (3) = 12

IN (4) = 13

IN (5) = 14

IN (6) = 15

IN (7) = 10

IN (8) = 11

IN (9) = 12

IN (10) = 13

PRINT IN (5)

PRINT “THE SUM OF IN (2) AND IN (7) IS”; IN (2) + IN (7)

END

[run]
```

OUTPUT: THE SUM OF IN (2) AND IN (7) IS 21

Example 2 Create an array to access your favourite of the day of the week

```
REM Array to create and access your favourite the day of the week

REM Array to create and access the days of the week

DIM DAY$(7)

DAY$(1) = "Sunday"

DAY$(2) = "Monday"

DAY$(3) = "Tuesday"

DAY$(4) = "Wednesday"

DAY$(5) = "Thursday"

DAY$(6) = "Friday"

DAY$(7) = "Saturday"

INPUT "enter the number that corresponds to your favourite day of the week"; n

PRINT "My favourite day of the week is"; DAY$(n)

END
```

[run]

LOOPING

Looping is used to have the computer do repetitive tasks in a fraction of time. The most common types of loop used in QBASIC programming is the FOR…NEXT and WHILE WEND loop that repeats a series of instructions a specified number of times.

Review of FOR – NEXT Statement

Example 1

```
FOR I = 1 TO 5
PRINT "the bluntest pen is better than the sharpest memory"
NEXT I
END
```

The program will print the dullest pencil is better than the sharpest memory" five times.

Example 2 Write a program to print the first ten integers.

Solution

```
REM program to print the first ten integers

FOR NUM = 1 TO 10

PRINT NUM

NEXT NUM

END
```

Example 3 Write a program to print

a. odd numbers from 1 to 20

b. even number from 2 to 30 using FOR –NEXT statement

Solution

```
REM program to print odd numbers from 1 to 20

PRINT “odd numbers from 1 to 20 are”

FOR ODD =1 TO 20 STEP 2

PRINT ODD

NEXT ODD

END
```

Solve (b) part as class work

Example 4 write a program to add odd numbers from 1 t0 20

Solution

```
REM program to print odd numbers from 1 to 20
PRINT "odd numbers from 1 to 20 are"
LET SUM = 0
FOR ODD = 1 TO 20 STEP 2
   PRINT ODD
   LET SUM = ODD + SUM
NEXT ODD
PRINT “The sum of odd numbers from 1 to 20 is"; SUM
END
```

Review of WHILE -WEND Statement

Example 1

```
REM program to demonstrate the use of WHILE – WEND statement
CLS
```

```
LET A= 1

WHILE  A< 11

PRINT “Hello World”

A = A+1

WEND

END
```

Example 2 Write a program to print the square of even numbers from 6 to 22 using WHILE – WEND Statement

```
REM program to print the square of numbers

CLS

LET N = 6

WHILE N<23
```

```
PRINT  “the square of”; N; “is”; N*N

N=N+2

WEND

END
```

More examples using DIM, FOR-NEXT and WHILE – WEND statements

1. create and access an array of 10 integers using FOR – NEXT Statement

Solution

```
REM an array to create and access array of 10 integers
CLS
DIM IN(10)
FOR I = 1 TO 10
    INPUT "ENTER THE NUMBER"; IN(I)
NEXT I
PRINT "IN(3) is"; IN(3)
```

```
END
```

2. Calculate the average of one dimensional array with 100 numeric values.

```
REM an array to calculate the average of 100 numbers
CLS
DIM IN(100)
LET SUM = 0
FOR I = 1 TO 100
   INPUT "enter the next number"; IN(I)
   LET SUM = SUM + IN(I)
NEXT I
LET AVERAGE = SUM / 100
PRINT "average of 100 numbers is"; AVERAGE
END
```

3. Calculate the area of 10 different rectangles using the WHILE – WEND statement

```
REM Program to calculate the area of 10 different rectangles
```

```
CLS

DIM LENGTH(10)

DIM WID(10)

DIM AREA(10)

LET I = 1

WHILE I < 11

    INPUT "enter the length of the rectangle"; LENGTH(I)

    INPUT "enter the width of the rectangle"; WID(I)

    LET AREA(I) = LENGTH(I) * WID(I)

    PRINT "the area of the rectangle is"; AREA(I)

    I = I + 1

WEND

END
```

High Level Language

Definition of Terms

Program: A computer program is a sequence of related instruction (command) that tell the computer how to accomplish a specific task. A program can also be defined as a set of instruction that is executed by the CPU.

Programming: Programming is the act of writing computer program. A computer program are written by trained and qualify people called programmer.

Computer language: Computer language is a language used by, or associated with the computer.

Computer Programming Language: A computer programming language is an artificial language that can be used to control the behavior of a machine particularly a computer. Programming language is a means through which programmer communicate with the computer in solving different categories of problems. A set of rules governing how the words in the language are written is called syntax and the meaning associated with each word is called semantic. Markup languages like HTML are generally not regarded as programming languages, but they are computer language. Programming language foster the communication of programs among programmers and computer; markup language communicate the formatting or structure of document among human and computer.

High Level Language: These are programming languages that allow for programs to be written in forms that are readable to human beings. A high level language is a programming language that, in comparison to low level programming languages, may be more abstract, easier to use, or more portable across platforms.

Example of High Level Languages

PASCAL

BASIC (Beginners All-purpose Symbolic Instruction Code)

C ++

Java

FORTRAN (Formula Translation)

COBOL (Common Business Oriented Language)

PROLOG

ALGOL (Algorithmic language)

APL (A Programming Language)

RPG (Report Program Generator)

Python

Classification of High Level Language According to Use

a. Scientific: These languages are oriented towards the computational procedures for solving mathematical and statistical problem. Examples are BASIC, FOTRAN. AlGOL, APL.

b. Business Data Processing: These languages emphasize their capabilities for maintaining data processing procedures and files handling problems. Examples are COBOL and Prolog.

c. Artificial Intelligence (AI) :

d. String Processing

e. Object Oriented Programming Language: In OOP, the computer program is divided into objects. Examples:

- C++
- Java

f. General purpose: They are used for general purpose programming. Examples are:

- C
- PASCAL
- PL/I (Programming Language, Version I)

g. Special purpose programming language: This language had a special purpose for which they are developed. Examples are:

- SNOBOL (String-Oriented Symbolic Language)

h. Visual programming language: These are designed to for building window-based applications. Examples are:

- Visual Basic
- Visual Java
- Visual C

i. Artificial intelligence (AI) string and List processing

- Lisp (List processing)
- Prolog (program Logic)

High Level Languages according to mode of execution

1. **Interpreted**

   Interpreted languages are read and are executed directly with no compilation stage. E.g. BASIC, ASP, Lisp and Logo

2. **Compiled Language**

   Compiled languages are transformed into executable form before running. E.g. PASCAL, COBOL, C, and FORTRAN

Features of Some High Level Languages

High Level Language	**Features**
1. FORTRAN	1. Ideal for scientific application 2. Uses mathematical notation
2. COBOL	1. Ideal for business application 2. English like
3. BASIC	1. Interactive 2. Easy to learn 3. Uses mathematical notation
4. Pascal	1. Scientifically oriented 2. Focuses on structured programming.
5. C	1. Structured programming 2. General purpose programming 3. Procedural language

Advantages of HLL

1. User friendly
2. Easier to learn
3. They are easier to maintain
4. Machine independent
5. Requires less time to write

Data Representation

Data representation refers to the methods used to internally represent information stored in a computer. Computers store lot of different types of information which include: Numbers, Text, Graphics, and Sound. At least all seem different to us. However, all types of information stored in a computer are stored internally in the same format: a sequence of 0's and 1's.

Methods of Data Representation

Bits

The smallest unit of data on a binary computer is a single bit.

BCD (Binary Coded Decimal)

BCD is a method of using binary digits to represent decimal digits 0 through 9. A decimal digit is represented by four binary digits as shown below.

DECIMAL	BCD
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001

Example1: Convert the 49_{10} to BCD

Solution

From the table 4= 0100

9= 1001

Therefore 49_{10} = 01001001BCD

EBCDIC (Extended Binary Coded Decimal Interchange Code)

EBCDIC is eight bits or one byte wide. Each byte consists of two nibble. The first four define the class of character, while the second nibble defines the specific character inside that class. A coding scheme developed by IBM for use with its computers as a standard method of assigning binary (numeric) values to alphabetic, numeric, punctuation, and transmission-control characters.

ASCII (American Standard for Information Interchange

ASCII is a coding scheme that assigns numeric values to letters, numbers, punctuation marks, and certain other characters.

ASCII TABLE

UNICODE

Unicode provides a unique number for every character, no matter the platform, program and language.

Networking

Definition of Network and Networking

A computer network consists of a collection of computers, printers and other equipment that are connected together so that they can communicate with each other. It is also defined as a group of two or more computer systems linked together.

Computer Networking is the scientific and engineering discipline concerned with communication between computer systems.

Types of Network

Network can be grouped into three categories, namely;
A. By Scale
B. Topology
C. Functional Relationship

Types of Network According to Scale

Depending upon the geographical area covered by a network, it is classified as:

1. Personal Area Network (PAN). PAN is a computer network organized around an individual person (typically within 10 meters). PAN may be wired with computer such as USB and Fire wire. A wireless Personal Area Network (WPAN) can be made possible with network technology such as infrared Data Association (irDA) and Bluetooth.

2. Local Area Network (LAN). A local area network is a computer network covering a small local area, like a home, office, or school. LAN has the following elements:

i. Server: It is the main computer that acts as a host and provides data, software, etc. to the other terminal linked with it.
ii. Work station: These are the computers attached to the server on the LAN
iii. Network Interface Unit: is a device that serves as a common interface for various other devices within a local area network (LAN)
iv. Communication Channel: It is the medium through which the packets travel. The packets generally travel through cables which are of three types: Twisted pair cables, Co-axial cables and Fiber optic cables
v. LAN Software:
The software components of a LAN can be grouped into two categories:
1. Inside PCs/workstations and servers
· NIC Drivers
· Network Operating System for servers, for example, Novell® Netware 4.1 or Microsoft Windows® NT
· Network Operating System for clients (PCs/workstations), for example, Novell® Netware 4.1 client or Microsoft Windows® 95
· Networking protocol software, for example, TCP/IP, Novell® IPX
· Application software, for example, emails, Internet Web Browser

3. Metropolitan Area Network (MAN). MANs are large computer network usually spanning a large campus.
4. Wide Area Network (WAN). WAN is a computer network covering a broad geographical area.
5. Internet. The internet is a worldwide network of computers that share information

Network Topology
Network topology is the arrangement of the various elements (links, nodes, etc.) of a computer network. Network topology refers to the physical or logical layout of a network.

Types of Topology
1. Bus Topology
2. Star Topology
3. Ring Topology
4. Mesh Topology
5. Tree Topology
6. Hybrid Topology

All the nodes (file server, workstations, and peripherals) on a bus topology are connected by one single cable. A bus topology consists of a main run of cable with a terminator at each end. All nodes (file server, workstations, and peripherals) are connected to the linear cable. It is popular on LANs because they are inexpensive and easy to install.
Advantages of Bus Topology
1. It is Cheap, easy to handle and implement.
2. Require less cable
3. It is best suited for small networks.
Disadvantages of Bus Topology
1. The cable length is limited. This limits the number of stations that can be connected.
2. This network topology can perform well only for a limited number of nodes.

Ring Topology

In a ring network, every device has exactly two neighbours for communication purposes. All messages travel through a ring in the same direction. A failure in any cable or device breaks the loop and can take down the entire network. To implement a ring network we use the Token Ring technology. A token, or small data packet, is continuously passed around the network. When a device needs to transmit, it reserves the token for the next trip around, and then attaches its data packet to it.
Advantage of Ring Topology
1. Very orderly network where every device has access to the token and the opportunity to transmit.

2. Easier to Mange than a Bus Network
3. Good Communication over long distances
4. Handles high volume of traffic

Disadvantages of Ring Topology

1. The failure of a single node of the network can cause the entire network to fail.
2. The movement or changes made to network nodes affects the performance of the entire network.

Star Topology

In a star network, each node (file server, workstations, and peripherals) is connected to a central device called a hub. The hub takes a signal that comes from any node and passes it along to all the other nodes in the network. Data on a star network passes through the hub, switch, or concentrator before continuing to its destination. The hub, switch, or concentrator manages and controls all functions of the network. The star topology reduces the chance of network failure by connecting all of the systems to a central node.

Advantages of Star Topology

1. Easy to manage
2. Easy to locate problems (cable/workstations)
3. Easier to expand than a bus or ring topology.
4. Easy to install and wire.
5. Easy to detect faults and to remove parts.

Disadvantages of Star Topology

1. Requires more cable length than a linear topology.
2. If the hub or concentrator fails, nodes attached are disabled.
3. More expensive because of the cost of the concentrators.

Tree Topology

A tree topology (hierarchical topology) can be viewed as a collection of star networks arranged in a hierarchy. This tree has individual peripheral nodes which are required to transmit to and receive from one other only and are not required to act as repeaters or regenerators. The tree topology arranges links and nodes into distinct hierarchies in order to allow greater control and easier troubleshooting

Advantages of a Tree Topology

1. It allows point-to-point wiring for individual segments.
2. It is supported by several hardware and software vendors.
3. All the computers have access to the larger and their immediate networks.

Disadvantages of a Tree Topology

1. Overall length of each segment is limited by the type of cabling used.
2. If the backbone line breaks, the entire segment goes down.
3. More difficult to configure and wire than other topologies.

Mesh Topology

In this topology, each node is connected to every other node in the network. Implementing the mesh topology is expensive and difficult. In this type of network, each node may send message to destination through multiple paths. While the data is travelling on the Mesh Network it is automatically configured to reach the destination by taking the shortest route which means the least number of hops.

Advantage of Mesh Topology

1. No traffic problem as there are dedicated links.
2. It has multiple links, so if one route is blocked then other routes can be used for data communication.
3. Points to point links make fault identification easy.

Disadvantage of Mesh Topology

1. There is mesh of wiring which can be difficult to manage.
2. Installation is complex as each node is connected to every node.
3. Cabling cost is high.

Hybrid Topology

Hybrid topology is a combination of any two or more network topologies. A hybrid topology always accrues (results) when two different basic network topologies are connected. It is a mixture of above mentioned topologies.

Advantages of a Hybrid Topology

1. It is extremely flexible.
2. It is very reliable.

Disadvantages of a Hybrid Topology

1. Expensive

Definition of Network Devices

Network devices are components used to connect computer or other electronic devices together so that they can share files or resources. Some network devices are examined below:

1. Hubs: A hub is a device that joins multiple computers or other network devices to form a single network. It can also be defined as a common connection point for devices in a network. A hub does not read any of the data passing through them and not aware of their source or destination.
2. Switches: A network switch is a small hardware device that joins multiple computer networks together within a local area network. Switch generally contains more intelligence than a hub. Switches are capable of inspecting data packets as they are received, determine the source and destination device of each packet, and forward them appropriately.
3. Modem (MOdulator-DEModulator): A modem is an electronic device that allows computers to communicate over telephone lines.

4. Router: Routers are devices that join multiple wired or wireless networks together.
5. Network Interface Card (NIC): A network interface card (NIC) is a circuit board or card that is installed in a computer so that it can be connected to a network.

Benefits of Networking

1. Site (software) licenses are likely to be cheaper than buying several standalone licenses.
2. Files can easily be shared between users.
3. Network users can communicate by email and instant messenger..
4. Data is easy to backup as all the data is stored on the file server.
5. Networking offers a quick and easy way to share files directly.
6. All computers in the network can share resources such as printers, fax machines, modems and scanners.

Database

Definition of Database and DBMS

Database is a collection of related data organized for rapid search and retrieval. It can also be defined as a persistent, logically coherent collection of inherently meaningful data, relevant to some aspects of the real world.

DBMS (Data Base Management System) is the application software that controls the data in the database, including overall organization, storage, retrieval, security and data integrity.

Examples of DBMS packages are:

Dbase, Rbase, MS Access, Oracle, Paradox, SQL Server, SyBase, FOXPRO, IDMS, and System 2000.

Basic Terminologies

1. Field: A field is a specific item of information containing a homogenous set of values throughout the table. Fields appear as columns in a table and as cells in a form.
2. Record: an individual listing of related information consisting of a number of related fields stored in a table. A record is also called a row in the datasheet.
3. File: this is a collection of records, for example a school database.
4. Primary Key: a field in a table whose value is uniquely identifies each record in the table.
5. Foreign keys: foreign key used to create relationships between tables.
6. Object: An object is a component of a database, such as a table, query, form, or report
7. Query: Query is a request for a particular collection of data in a database.
8. Report: a formatted collection of information organized to provide printed data on a specific subject.
9. Form: A form is a window or screen that contains numerous fields, or spaces to enter data
10. Table: In database a table is where all the data in a database is stored.

Forms of Database Organization

Different forms of database organization are:

1. Hierarchical
2. Network
3. Relational

Hierarchical

A hierarchical database model is a data model in which the data is organized into a tree-like structure. It can also be defined as a design that uses a one-to-many relationship for data elements. The data is stored as records are connected to one another through links. Hierarchical database models links a number of disparate elements to one "owner," or "parent," primary record.

Network Database

A network database is a type of database model wherein multiple member records or files can be linked to multiple owner files and vice versa. In the network model of a database it is possible for a record to have multiple parents, making the system more flexible compared to the strict single parents of the hierarchical database.

Relational Database

A relational database is a digital database whose organization is based on the relational model of data, as proposed by E. F. Codd in 1970. A relational database is one that presents information in tables with rows and columns. Records are arranged in rows while fields are arranged in columns. Relational database is the most common type of database structure. It is used by most microcomputers Database Management System (DBMS) packages. The various software systems used to maintain relational databases are known as a relational database management system (RDBMS).

Features of Database Format

i. Files are designed as table
ii. Tables comprise of rows and columns
iii. Row contains related information about a record
iv. Column contains specific type of information a field.

Steps in Creating Database

i. Define the structure
ii. Indicate the field type (numeric character, data, text, etc)
iii. Enter data
iv. Save data

Basic Operations on Already created Database

i. Searching
ii. Modifying
iii. Sorting
iv. Reporting
v. Selecting
vi. Inserting, etc

Introduction to CorelDaw

Definition of Graphics Packages

A graphics package is an application that can be used to create and manipulate images on a computer.

There are two main types of graphics package:

1. Painting packages: A painting package produces images by changing the colour of pixels on the screen.

Note: a pixel is a smallest unit of a digital image that can be displayed and represented on a digital display device.

2. Drawing packages: A drawing package produces images that are made up from coloured lines and shapes such as circles, squares and rectangles.

Examples of graphics packages include:

a. MS Paint
b. PC Paintbrush
c. Adobe Photoshop
d. JASC's Paint Shop Pro
e. CorelDraw
f. Micrographix Designer
g. AutoCAD.

Features of CorelDraw Environment

1. Title Bar: It is the first bar in the screen of any opened application. It gives information about the program which you are working on and also the name used in saving the document.

2. Menu bar: Menu bar is the area containing pull-down menu options.CorelDraw as a program has Eleven (11) menus, they include, File, Edit, View,Layout, Arrange, Effect, Bitmap, Texts, Tools Window and Help menu. Each menu has its own function. When clicked on, sub-menu list appears

3. Toolbar: A detachable bar that contains shortcuts to menu and other command

4. Property Bar: A detachable bar with commands that relate to the active tool or object. For example, when the text tool is active, the text property bar displays commands that create and edit text.

5. The Rule: The rule (horizontal and vertical rule) enables us to determine the size and position of objects in a drawing

6. Drawing page: The area inside the drawing window. It is the printable area of your work area. Any work done outside of the printable page will not be printed

7. Drawing window: The area outside the drawing page bordered by the scroll bars and application controls

8. Color Palette: a dockable that contains color swatches.

9. Docker: A window containing available commands to settings relevant to a specific tool or task
10. Toolbox: A floating bar with tools for creating, filling and modifying objects in the drawing
11. Status bar: An area at the bottom of the application window that contains information about object properties. The status bar also shows the current mouse position
12. Document Navigator: The area at the bottom of the application window that contains controls for moving between pages and adding pages.

SECURITY AND ETHICS

Data security is the practice of keeping data protected from corruption and unauthorized access.

Sources of Security breaches

1. Virus, Worms and Trojan horses: Viruses, worms and Trojan Horses are all malicious programs that can cause damage to your computer, but there are differences among the three, and knowing those differences can help you to better protect your computer from their often damaging effects.

   Virus: A computer virus attaches itself to a program or file so it can spread from one computer to another, leaving infections as it travels. It is important to note that a virus cannot be spread without a human action, (such as running an infected program) to keep it going.

   Worms: Worms spread from computer to computer, but unlike a virus, it has the capability to travel without any help from a person. A worm takes advantage of file or information transport features on your system, which allows it to travel unaided

   Trojan horse: A Trojan horse is not a virus. It is a destructive program that looks as a genuine application. Unlike viruses, Trojan horses do not replicate themselves but they can be just as destructive. Trojans also open a backdoor entry to your computer which gives malicious users/programs access to your system, allowing confidential and personal information to be theft.
2. Poor network implementation
3. Poor implementation or lack of ICT policies

4. Carelessness-giving out personal and vital information on the net without careful screening
5. Hackers, spammers, scammers, etc: A hacker is a person who uses computers to gain unauthorized access to data. A Spammer is a person who send irrelevant messages sent to computer users using the internet as a medium with a motive of advertising, phishing or releasing malware. A scammer is a person who makes money using illegal methods, especially by tricking people.

Preventive Measures

1. Use of antivirus software e.g Norton, McAfee, Avast, etc
2. Use of firewall: A firewall is a software utility or hardware device that acts as a filter for data entering or leaving a network or computer.
3. Exercising care in giving out vital and personal information
4. Proper network implementation and polices
5. Exercising care in opening email attachments.

Ethics

Ethics is a set of moral principles that govern the behaviour of a group or individual. Therefore, computer ethics is set of moral principles that regulate the use of computers

Legal Issues

Legal issues are number of issues related to the use and misuse of ICT and its related fields.

Some common issues of include:

1. Intellectual property right: Intellectual property refers to creations of the mind. A right that is had by a person or by a company to have exclusive rights to use its own plans, ideas, or other intangible assets without the worry of competition, at least for a specific period of time. These rights can include copyrights, patents, trademarks, and trade secrets
2. Piracy: Software piracy is the illegal copying, distribution, or use of software. etc