Foreword

ICT Has seen a lot of challenges caused by teachers them self-confusing concepts. The government of Uganda introduced the subject to the curriculum before investing in training tutors and teachers, I discovered some ICT teachers are teachers of other subjects owning laptops and that makes them think they can teach ict!!. in no way can a teacher of “.....................” become an ICT teacher. Mind you computer studies is a science subject that’s why all the inventors like john nappier , Pascal blaisé , Charles Babbage and Ada loverace were all mathematicians and physicists not “..................”

The second challenge is the administrators who totally look at ICT as a mere subsidiary and then treat it like GP who is given one or no lesson a week

Thirdly , teachers of ICT are part timers who hunt in about 5 schools a week thus having less or no time to the students

This book is designed in away to enable a student grasp the content with or without an instructor I thus recommend a copy to you

DEDICATION

Many people have done a lot in my life, you deserve the honor!! on top of the un mentioned but considered for the matter of this publication recognize ;

Mr Lugoloobi Ronald the Defacto father(BISHOPS SS MUKONO)

Mr sebuufu William (HM HELM SS KISOGA)

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EVOLUTION OF COMPUTERS

The origin of mathematics is traced in the ancient days where inhabitants had belief that whatever God (Allah) had created in the environment was a tool for mathematics, no wonder In Egypt (misiri) where River Nile existed papyrus became a tool to Pythagoras theorem and letter exported to Greece where the word *μάθημα* transliterated as *mathema* present day arithmetic was seriously taken as a subject of instruction.

Chinese mathematics made early contributions, including a place value system. The Hindu-Arabic numeral system and the rules for the use of its operations, in use throughout the world today, likely evolved over the course of the first millennium AD in India and were transmitted to the west via Islamic mathematics through the work of Muḥammad ibn Mūsā who wrote the book al-Khwarizmi transliterated into the term ALGEBRA,

Much of the mathematical inventions were done by The Arabic and Islamic wise men, it was time for other denominations to wake up first were the Catholics with the Roman system of numbering which was commonly termed as com putare , ‘com’, which means ‘together’ and ‘putare’, which may means ‘add, calculate, count, or estimate’. Thus the word computatrum meaning Compute

The need for a device to do calculations along with the growth in commerce and other human activities explain the evolution of computers. Computers were preceded by many devices that mankind developed for their computing requirements. However, many centuries elapsed before technology was adequately advanced to develop computers. To understand the recent impact of computers, it is worthwhile to have a look at the evolution of computers.

**Sand Tables**

In ancient times, people used fingers to perform the calculations such as addition and subtraction. Even today, simple calculations are done on fingers. Soon, mankind realized that it would be easier to do calculations with pebbles as compared to fingers. Consequently, pebbles were used to represent numbers, which led to the development of *sand tables* they are known to be the earliest device for computation.

A sand table consists of three grooves in the sand with a maximum of 10 pebbles in each groove. To increase the count by one, a pebble has to be added in the right-hand groove. When 10 pebbles were collected in the right groove, they were removed and one pebble was added to the adjacent left groove. Afterwards, sand tables were modified extensively and these modifications resulted in a device known as *Abacus.*

**Abacus**

Abacus emerged around 5000 years ago in Asia Minor and it is still in use in some parts of the world. The word 'abacus' was derived from the Arabic word 'abaq', which means 'dust'. An abacus consists of sliding beads arranged on a rack, which has two parts: *upper* and *lower* The upper part contains two beads and the lower part contains five beads per wire. The numbers are represented by the position of the beads on the rack. For example, in the upper part of the rack, a raised bead denotes 0, whereas a lowered bead denotes digit 5. In the lower part, a raised bead stands for 1 and a lowered bead stands for 0. The arithmetic operations like addition and subtraction can be performed by positioning the beads appropriately.

**Napier Bones**

From 1614-1617, John Napier, a Scottish mathematician, made a more sophisticated computing machine called the *Napier bones* This was a small instrument made of 10 rods on which the multiplication table was engraved. It was made of the strips of ivory bones, and so the name Napier bones. This device enabled multiplication in a fast manner, if one of the numbers was of one digit only (for example, 6 × 6745). Incidentally, Napier also played a key role in the development of logarithms, which stimulated the invention of *slide rule*, which substituted the addition of logarithms for multiplication. This was a remarkable invention as it enabled to perform the multiplication and division operations by converting them into simple addition and subtraction operations.

**Slide Rule**

The invention of logarithms influenced the development of another famous invention known as *slide rule* In 1620 AD, the first slide rule came into existence. It was jointly devised by two British mathematicians, Edmund Gunter and William Oughtred. It was based on the principle that actual distances from the starting point of the rule is directly proportional to the logarithm of the numbers printed on the rule. The slide rule is embodied by two sets of scales that are joined together, with a marginal space between them. This space is enough for the free movement of the slide in the groove of the rule. The suitable alliance of two scales enabled the slide rule to perform multiplication and division by a method of addition and subtraction.

**Pascaline**

In 1623, Wilhelm Schickard invented the 'calculating clock', which could add and subtract, and indicated the overflow by ringing a bell. Subsequently, it helped in the evolution of Pascaline In 1642 AD, Blaise Pascal, a French mathematician, scientist and philosopher, invented the first functional automatic calculator. It had a complex arrangement of wheels, gears and windows for displaying numbers. It was operated by a series of dials attached to the wheels with each wheel having 10 segments (numbered from zero to nine) on its circumference. When a wheel made a complete turn, the wheel on its left advanced by one segment. Indicators above the dial displayed the correct answer. However, the usage of this device was limited to addition and subtraction only.

**Stepped Reckoner**

In 1694, Gottfried Wilhem von Leibniz, a German mathematician, extended the Pascal's design to perform multiplication and division and to find square root. This machine is known as *Stepped Reckoner* .It was the first mass-produced calculating device, which was designed to perform multiplication by repeated additions. Like its predecessor, Leibniz's mechanical multiplier worked by a system of gears and dials. The only problem with this device was that it lacked mechanical precision in its construction and was not very reliable.

**Punch Card System**

In 1801, Joseph Marie Jacquard, a French textile weaver, invented a power loom with an automatic card reader. This power loom used a series of cards with holes punched at different positions. To automate the weaving process, these cards were placed between the needles and the thread, thereby creating different patterns. This idea of using punched cards to communicate with machines was an important step in the development of computers. The presence or absence of a hole in a punched card represented the two digits of the binary system, which is the base for all modern digital computers .

**Difference Engine**

In 1822, Charles Babbage, a professor of mathematics, devised a calculating machine known as *difference engine*, which could be used to mechanically generate mathematical tables. The difference engine can be viewed as a huge complex abacus. It was intended to solve differential equations as well. However, Babbage never made a fully functional difference engine and in 1833, he quit working on this machine to concentrate on the analytical engine.

**Analytical Engine**

Analytical engine is considered to be the first general-purpose programmable computer. Babbage's innovation in the design of the analytical engine made it possible to test the sign of a computed number and take one course of action if the sign was positive and another if the sign was negative. Babbage also designed this device to advance or reverse the flow of punched cards to permit branching to any desired instruction within a program. This was the fundamental difference between the analytical engine and the difference engine. Lady Ada Lovelace helped him in the development of the analytical engine. She not only helped Babbage with financial aid, but also, being a good mathematician, wrote articles and programs for the proposed machine. Due to her contributions, she is known as the 'first programmer'. However, Babbage never completed the analytical engine, but his proposal for this device reviewed the basic elements of modern computer such as input/output, storage, processor and control unit.

**Hollerith's Tabulator**

Herman Hollerith invented the punched-card tabulating machine to process the data collected in the United States' census . This electronic machine was able to read the information on the cards and process it electronically. It consisted of a tabulator, a sorter with compartments electronically controlled by the tabulator's counter and a device used to punch data onto cards. This tabulator could read the presence or absence of holes in the cards by using spring-mounted nails that passed through the holes to make electrical connections. In 1896, Hollerith founded the Tabulating Machine Company, which was later named as IBM (International Business Machines).

**Other Developments**

In the process of the development of automating computers, many scientists and engineers have made significant contributions.

* In 1904, Sir John Ambrose Fleming worked to develop the first thermionic valve, which is also known as *vacuum tube*. Thermionic valves were based on Thomas Edison's 'Edison effect' of light bulbs. The first light bulbs were very short-lived and were prone to darken. This darkening was termed as Edison effect. Sir John Ambrose Fleming worked to develop the first rectifier and in 1904, he developed thermionic valves. Fleming named the device 'a valve' because it allowed electrical currents to pass only in one direction. Since this is a two-element vacuum tube, it was also called as *diode*. These diodes were the cornerstone of the first-generation computers.
* In 1906, Lee de Forest, an American inventor, introduced a third electrode into the diode (vacuum tube). The resulting triode could be used both as an amplifier and a switch and its ability to act as a switch created a tremendous impact on digital computing.
* In 1931, Vannevar Bush, an American electrical engineer, built the *differential analyser* to solve differential equations. Nevertheless, the machine was cumbersome because this device used drive belts, shafts and gears to measure movements and distances.
* In 1938, Claude Shannon, a student at MIT, recognized the connection between the electronic circuits and the Boolean algebra. He transferred the two logic states to electronic circuits by assigning different voltage levels to each state. Shannon also provided electronics engineers with the mathematical tool they needed to design digital electronic circuits. These techniques remain the cornerstone of digital electronic design to this day.

**MARK-I Computer**

From the year 1937 to 1944, Howard Aiken, an American mathematician, under the sponsorship of IBM, developed MARK-I. It was essentially a serial collection of electromechanical calculators and had many similarities to Babbage's analytical machine. This electronic calculating machine used relays and electromagnetic components to replace mechanical components. MARK-I was capable of performing addition, subtraction, division, multiplication and table reference. However, it was extremely slow, noisy and bulky (approximately 50 ft long, 8 ft high and weighed 5 tons).

**ABC Computer**

In 1939, John Vincent Atansoft and Clifford Berry formulated the idea of using the binary number system to simplify the construction of an electronic calculator. At the end of 1939, they built the first electronic computer named as ABC (Atansoft Berry Computer). It is considered the first computing machine, which introduced the idea of binary arithmetic, regenerative memory and logic circuits. This computer used electronic vacuum tubes and the circuitry was based on George Boole's Boolean algebra.

**Colossus**

In 1944, Alan Mathison, a British mathematician, along with some colleagues, created a computer called the *colossus*, which comprised 1800 vacuum tubes. It was one of the world's earliest working programmable electronic digital computers. Colossus was a special-purpose machine that suited a narrow range of tasks (e.g. it was not capable of performing decimal multiplications). Although colossus was built as a special-purpose computer, it proved flexible enough to be programmed to execute a variety of routines.

**ENIAC**

In 1946, John Eckert and John Mauchly of the Moore School of Engineering at the University of Pennsylvania developed Electronic Numerical Integrator and Calculator (ENIAC). Like the ABC computer, this computer also used electronic vacuum tubes for its internal parts. It embodied almost all the components and concepts of today's high-speed, electronic digital computers. This machine could discriminate the sign of a number, compare quantities for equality, add, subtract, multiply, divide and extract square roots. ENIAC consisted of 18,000 vacuum tubes, which required around 160 KW of electricity and weighed nearly 30 tons. It could compute at a speed 1000 times that of Mark-I, but had a limited amount of space to store and manipulate information.

**EDVAC**

John Eckert and John Mauchly also proposed the development of Electronic Discrete Variable Automatic Computer (EDVAC). Although, the conceptual design of EDVAC was completed by 1946, it came into existence only in 1949. The EDVAC was the first electronic computer to use the stored program concept introduced by John Von Neumann. It also had the capability of conditional transfer of control, that is, the computer could stop any time and then resumed again. EDVAC contained approximately 4000 vacuum tubes and 10,000 crystal diodes.

**EDSAC**

The Electronic Delay Storage Automatic Calculator (EDSAC) was also based on John Von Neumann's stored program concept. The work began on EDSAC in 1946 at Cambridge University by a team headed by Maurice Wilkes. In 1949, the first successful program was run on this machine. It used mercury delay lines for memory and vacuum tubes for logic. EDSAC had 3000 vacuum valves arranged on 12 racks and used tubes filled with mercury for memory. It could carry out only 650 instructions per second. A program was fed into the machine through a sequence of holes punched into a paper tape. The machine occupied a room, which measured 5 meters by 4 meters.

**UNIVAC**

The Universal Automatic Computer (UNIVAC) was the first commercially available electronic computer. It was also the first general-purpose computer, which was designed to handle both numeric and textual information. It was manufactured by the Eckert-Mauchly Corporation in 1951 and its implementation marked the real beginning of the computer era. UNIVAC could compute at a speed of 120–3600 μs. Magnetic tapes were used as input and output media at a speed of around 13,000 characters/s. The machine was 25 by 50 ft in length, contained 5600 tubes, 18,000 crystal diodes and 300 relays. UNIVAC was used for general-purpose computing with large amounts of input and output.

GENERATIONS OF COMPUTER DEVELOPMENTS

What Are the Five Generations of Computers?

The term generations refers to various stages of development, improvements advancements computers have undergone. Each of the five generations of computers and the technology developments that have led to the current devices that we use today. Our journey starts in 1940 with vacuum tube circuitry and goes to the present day -- and beyond - with artificial intelligence.

First Generation (1940-1956) Vacuum Tubes

The first computers used vacuum tubes for circuitry and magnetic drums for memory, and were often enormous, taking up entire rooms. They were very expensive to operate and in addition to using a great deal of electricity, generated a lot of heat, which was often the cause of malfunctions.

First generation computers relied on machine language, the lowest-level programming language understood by computers, to perform operations, and they could only solve one problem at a time. Input was based on punched cards and paper tape, and output was displayed on printouts.

The UNIVAC and ENIAC computers are examples of first-generation computing devices. The UNIVAC was the first commercial computer delivered to a business client, the U.S. Census Bureau in 1951.

What to note about First generation computers

Hall mark

The computers used vacuum tubes. The vacuum tube was an extremely important step in the advancement of computers. Its purpose was to act like an amplifier and a switch. Without any moving parts, vacuum tubes could take very weak signals and make the signal stronger (amplify it)Physically, First generation computers were very large. Machines with hundreds of thousands of vacuum tubes were built, taking up space of several floors in big buildings. They weighed about 30 tons

They used punched cards and paper tape for input.They used magnetic drums for memory.The had memory size of approximately 2kilobytes of RAM .They used binary number system.Speed was about 10,000 instructions per second.**Software:** First generation computers used machine language, the lowest-level programming language understood by computers.**Setbacks:** They broke down frequently (Required standby technicians)Needed very many people to operate due to their huge size.High level of training was required before useThey produced a lot of heat and burned out.They consumed a lot of powerThey produced a lot of noise.They had limited primary memory, and so they were very slow.They were very expensive to buy setup and maintain.They were not portableManual assembly of individual components into one functioning unit required.Air conditioning required

**Examples of first generation computers:**ENIAC - Electronic Numerical Integrator and Computer (1946) was the first electronic digital computer. It had over 18,000 vacuum tubes. EDVAC - Electronic Discrete Variable Automatic computer (1947) was built for the U.S. Army's Ballistics Research LaboratoryThe UNIVAC (1951) (UNIVersal Automatic Computer) was the first general-purpose electronic digital computer designed for commercial use.

**Second Generation (1956-1963) Transistors**

Transistors replaced vacuum tubes and ushered in the second generation of computers. The transistor was invented in 1947 but did not see widespread use in computers until the late 1950s. The transistor was far superior to the vacuum tube, allowing computers to become smaller, faster, cheaper, more energy-efficient and more reliable than their first-generation predecessors. Though the transistor still generated a great deal of heat that subjected the computer to damage, it was a vast improvement over the vacuum tube. Second-generation computers still relied on punched cards for input and printouts for output.

Second-generation computers moved from cryptic binary machine language to symbolic, or assembly, languages, which allowed programmers to specify instructions in words. High-level programming languages were also being developed at this time, such as early versions of COBOL and FORTRAN. These were also the first computers that stored their instructions in their memory, which moved from a magnetic drum to magnetic core technology.

The first computers of this generation were developed for the atomic energy industry.

Hallmark.

A transistor is a semiconductor device used to amplify and switch electronic signals. It is made of a solid piece of semiconductor material.The invention of the transistor replaced the vacuum tube and paved the way for smaller and cheaper computers.**Physical setup:** The computers reduced in size as compared to first generation computers, and could now fit in one room. A typical second-generation computer contained 10,000 transistors hand soldered and connected by wires. They still used punched cards for input and printouts for outputMemory size expanded to approximately 32kilobytesThe computers increased in processing speed and reliability - Speed was about 30,000 instructions per secondTransistors consumed less power as compared to vacuum tubes**SOFTWARE**

Second generation computers used assembly and high level programming languages such as FORTRAN (FORmula TRANslator) which allowed programmers to specify instructions in words.**SETBACKS**: They produced less noise but their cost was still very expensive.High level of training was required before use.Transistors gave much heat that could damage other components.Commercial production was difficult and costly.  
The computers could still run only one application program at a time (Multi-tasking was not possible)Air-conditioning was required.Manual assembly of individual components into a functioning unit was required.  
**EXAMPLES OF SECOND GENERATION COMPUTERS:**IBM 305 RAMAC.(1956), was the first commercial computer that used a moving head hard disk drive (magnetic disk storage) for secondary storage. RAMAC stood for "Random Access Method of Accounting and Control". The IBM 1401, - was a variable word length decimal computer that was announced by IBM on October 5, 1959The CDC 6600 was a mainframe computer from Control Data Corporation, first delivered in 1964. It remained the world's fastest computer from 1964–1965.

Third Generation (1964-1971) Integrated Circuits

The development of the integrated circuit was the hallmark of the third generation of computers. Transistors were miniaturized and placed on silicon chips, called semiconductors, which drastically increased the speed and efficiency of computers.

Instead of punched cards and printouts, users interacted with third generation computers through keyboards and monitors and interfaced with an operating system, which allowed the device to run many different applications at one time with a central program that monitored the memory. Computers for the first time became accessible to a mass audience because they were smaller and cheaper than their predecessors.

HallmarkIntegrated Circuits. An integrated circuit (IC) was just a combination of thousands of transistors and tiny wires onto a small "chip" made of semi-conductor material such as silicon. Physical setupThe computers extremely reduced in size due to fabrication of various circuit elements in a single chip. As a result, the computer could now fit onto a desk and the monitor became the largest visible part of the computer. For the first time, Electronic computers became accessible to a mass audience because they became cheaper.

Technology: The keyboards and monitors replaced punched cards for input and output.Magnetic hard disks were developed for storage purposesMemory size expanded to approximately 2 megabytes of RAMThe computers became more reliable because of elimination of soldered joints and need for fewer inter-connections.Speed increased to 5 million instructions per secondIntegrated Circuits consumed a lower electric power. The noise produced by the computers reduced drastically.

Software: Simple programming languages like BASIC were introduced.  
Multi-tasking was now possible. (Users interfaced with an operating system which could run different applications at the same time.)

Setbacks: Highly sophisticated technology required for the manufacture of IC chips.They required Air-conditioning in many cases due to the heat produced.If any component in an IC fails, the whole IC has to be replaced by a new one.Operations were at a low voltage because ICs function at fairly low voltage.Quite delicate in handling as these cannot withstand rough handling or excessive heatExamples of third generation computers:Popular developments in the third generation include:The PDP-8 was the first commercially successful minicomputer. It sold more than 50,000 systems for $18,000. The HP-2115 which was made by Hewlett-Packard (HP)Fast minicomputers such as IBM 360 series and ICL 19000 seriesAnother very good development that came up in this generation (1969) was The Advanced Research Projects Agency Network (ARPANET),The world's first operational packet switching network The ARPANET is the core network of a set that came to become the global Internet. The network was created by a small research team at the United States Department of Defense.Fourth Generation (1971-Present) Microprocessors

The microprocessor brought the fourth generation of computers, as thousands of integrated circuits were built onto a single silicon chip. What in the first generation filled an entire room could now fit in the palm of the hand. The Intel 4004 chip, developed in 1971, located all the components of the computer—from the central processing unit and memory to input/output controls—on a single chip.

In 1981 IBM introduced its first computer for the home user, and in 1984 Apple introduced the Macintosh. Microprocessors also moved out of the realm of desktop computers and into many areas of life as more and more everyday products began to use microprocessors.

As these small computers became more powerful, they could be linked together to form networks, which eventually led to the development of the Internet. Fourth generation computers also saw the development of GUIs, the mouse and handheld devices.

Hallmark:Microprocessors are VLSI devices. Very-Large-Scale Integration (VLSI) is the process of creating integrated circuits by combining thousands of transistors into a single chip.The microprocessor brought the fourth generation of computers, as thousands of integrated circuits were rebuilt onto a single silicon chip. Invention of the microprocessor was made by a team at Intel Corporation.

Physical setup: The physical size of computers kept on reducing generation to generation. With the development of micro-chips, what in the first generation filled an entire floor could now fit in the palm of the hand.

Technology: The fourth generation computers saw the development of the mouse and handheld input devices.The Fourth generation computers were more powerful, they could be linked together to form networks.A vast variety of Storage memory media used such as Floppy disks (1971),Optical Compact Discs(1982), USB flash drive disks(2000), etc.Memory size progressively expanded up to more than 8 Gigabytes of RAMThe computers became very reliable.   
i.e. Computers can work for a long time   
without breaking down.

There has been development of extremely fast computers referred to as super computers with speeds over 100 million instructions per second.Further developments in this fourth generation include the merging of Telecommunication and Computing Technology.They don’t require air conditioning because they have inbuilt cooling mechanisms.This generation also saw the development of Laptop and Palmtop computers which were portable and suitable for mobile business.

oftware: Operating systems based on the Graphical User Interface (GUI) were developed.A GUI is a user Interface in which visual images such as icons and buttons are used to issue commands. Setbacks: Highly sophisticated technology required for the manufacture of VLSI chips.In a microprocessor chip, the various components are part of a small semi-conductor chip and the individual component or components cannot be removed or replaced, therefore, if any component in a microprocessor fails, the whole microprocessor has to be replaced by a new one.Operations at low voltage as microprocessors function at fairly low voltage.Quite delicate in handling as these cannot withstand rough handling or excessive heatExamplesThe Xerox Alto (1973) was the first computer to use a GUI.The IBM 5100, portable computer that appeared in September 1975.The Apple Macintosh (1984), was a mouse-driven computer at a much cheaper price.

Fifth Generation (Present and Beyond) Artificial Intelligence

Fifth generation computing devices, based on artificial intelligence, are still in development, though there are some applications, such as voice recognition, that are being used today. The use of parallel processing and superconductors is helping to make artificial intelligence a reality. Quantum computation and molecular and nanotechnology will radically change the face of computers in years to come. The goal of fifth-generation computing is to develop devices that respond to natural language input and are capable of learning and self-organization.

Hallmark: Artificial intelligence (AI) is the ability of machines to have human capabilities, such as the five senses (to see, hear, feel, taste, smell), plus, understanding, communication, reasoning, learning, learning from past experiences, planning, and problem solving. In future, computers are to be applicable in almost every imaginable place at home, office, factory, church, etc.

Physical setup:

The physical size of computers in this generation can be customized to any shape of interest – be it as small as a pen or in the shape of a human being.

The goal of fifth-generation computing is to develop devices that respond to natural language input and are capable of learning and self-organization.

Technology: There is use of coordinated parallel processing; where computers have many microprocessors being used side by side.We shall see the development of many gadgets like remote control and optical input devices.Secondary Storage Hard disk drives which can store Terabytes of Data. RAM will continue to increase to 8GB, 16GB, 32GB, 64GB,128GB e.t.c.The computers to become 99% reliable.More development of Notebook and Mobile computers which can store power for a long time, hence becoming too mobile.More networking containing millions of interconnected 4th Generation computers.Technology (cont) Molecular computers expected, Composed of millions of DNA (Deoxyribo Nucleic Acid ) strands in plastic tubes. Information-processing tools-such as enzymes and proofreading mechanisms are going to be taken in large numbers of DNA molecules and used as biological computer processors.Diligent Robots will be highly used in many areas such as factories where repetitive tasks are done.Computers to have Quantum computation and molecular and nanotechnology.

Software: Fifth-generation programming languages (5GLs) will be used.5GLs are based around solving problems using controls given to the program, rather than using an procedure written by a programmer, They contain visual tools to help develop the programs. Visual Basic is an example of a 5GLThere will be a wide variety of computer Operating Systems and Application programs designed to solve specific tasks in a user-friendly manner.

Setbacks and Demerits of Fifth Generation ComputersComputer Obsession and addiction is seriously spoiling the writing and thinking abilities of human beings.Computer Crime such as hacking and online theft is on the rise due to misuse of 5th Generation computer technology.Robotics in the fifth generation will cause unemployment as machines take on the jobs people could do.TOSY Ping Pong Playing Robot (2007) is a humanoid robot designed to play table tennis against a human being.Hospital Robots are becoming more useful to hospital staff; from supporting surgeons to paying bedside visits to patients. The iPad (2010) is a tablet computer designed and marketed by Apple Inc., with a flat touch screen. It is primarily operated by touching the screen rather than using a physical keyboard.

Knowledge about the history/evolution of computers gives us a deeper understanding of the origin and the gradual Mechanical to Electro-mechanical to Electronic technological changes, which have brought about the kind of computers we see today, and helps us to predict how they will be in future.As mention earlier on the term computer is derived from a latin word “computare” which means to count or calculate .computers today are small, fast, reliable and extremely useful. Back 1977 that was not the case however ,they both operated in basically the same way .They received data ,stored processed data an then output data similar the same way our own brains function.

What is a computer?

A computer is an electronic device that accepts user input (data), processes it under special instructions (programs), to produce the desired meaningful output (information).

Alternatively, a computer can be defined as a programmable machine that receives input, stores and manipulates data, and provides output in a useful format.

A computer is an extension of human mind , which can perform several tasks with great speed. Computers are just like a dumb servant who cannot take decision by itself ,they do what they are told to . A computer therefore, performs five major functions namely:

Storage

Input

Processing

Output

Communicating

**THE COMPUTER SYSTEM.**

A system is a set of things working together for a common goal. Failure of one of the system components may imply failure for the whole system.Since computing requires input, processing, storage and output, there are many items that do something specifically at each of the stages.The computer system basically consists of hardware, software, and human ware, facts (data/information), communication and procedures.

WHY DO PEOPLE PREFER COMPUTER SYSTEMS FOR DATA PROCESSING.

Speed : A computer is a very fast device it can perform in few seconds. the Same amount of work that a human being can do in a full day.. The speed of a computer is measured in microseconds (6) ,nanoseconds(10-9) and picoseconds (10-12). A super computer is capable of performing several billion arithmetic operations per second

Accuracy  
Computers are very accurate. The errors in made computing are due to the users but not technological weakness. If a user enters wrong data, the computer gives wrong Information. This trend is described as GIGO (Garbage In, Garbage Out)

Versatility   
Modern Computers can perform different kinds of tasks at the same time. For example you can play music while typing a document at the same time. this is also known as multi-tasking.

Spontaneous  
the computers are automatic. They do not need any supervision in order to do tasks when instructed. the computer is automatic machine ,because if the user initiates an instruction ,they carry on ,until the job is finished ,without any human assistance. However, computer being machines cannot initiate themselves rather they have to be instructed before and this is what we call programming.

. .

Deligence: A computer is free from dullness and lack concentration.It can continuously work for hours without creating any error human beings in doing regular types of jobs , which requires great accurancy .Computer can perform the the number of calculations with exactly the same accurancy and speed as the first one

Versatility : Vesratility is a most important characteristic of the computer .It means the capacity to perform many different types of tasks .You may used to prepare payroll slips Next moment you may use it for inventory management or to prepare electric bills .A computer is capable of performing almost any task if task can be reduced to series of logical steps .

Storage :A computer can store data and information .And recalled almost as long as you require it .for nay numbers of years .Because of it’s secondary storage capacity .Data and information can be retrieved as long as desired by the user abd can be recalled , as when required .The information recalled would be as accurate as on the day when it was fed to the computer .

Artificial intelligence: A computer is not a magical device .It is no intelligence of its own .User can determine what tasks the computer will perform .So a computer cannot take its own decision as you can

Reliability: a computer is constant in all the tasks it does perform. All the output is dependable and results carry meaning

COMPUTER SYSTEM HARDWARE

Computer hardware devices are tangible /touchable components of a computer .Computer hardware devices can be categorized in the following ways:

By purpose : here we look at the main purpose of the hardware in relation to data processing.

Input hardware devices

Output hardware devices

Processing hardware devices

Storage hardware devices

Communication hardware

Power management hardware.

By connection: here we base on how the device is connected, where its plugged and how it functions.

Wired devices

Cordless devices / wireless

External devices

Internal devices

Peripheral devices

Serial devices

Parallel devices

Categories of computer hardware by purpose

INPUT DEVICES

These Are devices that generate s ,feed, compose and enter data into the computer in form that a CPU can mathematically execute these. such as keyboard ,scanner mouse or digitizer tablet among others .

Input devices are further put into the following classifications

**Pointing input hardware devices (spatial input devices)**

Devices with which one can move or control a cursor or pointer on a GUI (graphical user interface).pointing input devices include.

**Mouse**

Is a hand held pointing device of computers , involving a small object fitted with one or more buttons and shaped to sit naturally under the hand .

The underside of the mouse houses a device that detects the mouse ‘s motion relative to the flat surface on which it sits .The mouse’s 2D motion is typically translated into the movement of a cursor on the display.

Advantages of using a mouse include

A mouse is user-friendly for computer beginners

A mouse is easy and convenient to use with a graphical interface

Using a mouse to select items or move to particular position on the screen is faster than using a keyboard.

Disadvantages of using a mouse include

It is not easy and convenient to input text with a mouse

Issuing commands by using a mouse is slower than b y using a keyboard.

It needs some practice in order to control a mouse property .

A mouse is not accurate enough for drawings that require precision

A mouse needs more desk space to operate when compared with rackball or a touchpad.

There are basic types of mice

Mechanical

Has a rubber or metal on it’s underside that can roll in directions .mechanical sensors within the mouse detect the direction the ball is rolling and move the screen pointer accordingly

Opto mechanical

Same as a mechanical mouse, but uses optical sensors to detect motion of the ball

Optical

Uses a laser to detect the mouse’s movement.one must move the mouse along a special mat with a grid so that the optical mechanism has a frame of reference. Optical mice have no mechanical moving parts

They respond more quickly and precisely than mechanical and opt mechanical mice , but they are also more expensive

Mice connect to PC s in one of different ways :

Serial connection:

They connect to an RS-232C serial port, one of the COM ports on the back of the computer(a DB-9 or a DB-25 male connector)

Bus connection

The bus connections was originally developed to help alleviate the problem of the COM port .It connects to the computer through a small round connector(female mini-DIN-9) on the back of the expansion card installed on the motherboard .Because an expansion card had to be configured and installed on the motherboard, these mice were considered much more difficult to install.Now they are pretty well obsolete .They did free up a COM port, but they still took up an IRQ as well as an expansion slot

PS/2 connection

The PS/2 mouse seems to be the answer to both problems.It’s a type of serial mouse but it connects to a PS/2 connector (female mini-DIN-6) that is hard –wired directly to IRQ12.

It installs as simply as any serial mouse ,doesnot use up a COM port and needs no expansion card installed.Not only that, but it uses a fairly obscure IRQ that was mostly unavailable to other devices.

Cordless connection

A cordless connection mouse uses infrared technology to do away with the cord. It seems like it would be good idea because the cord mouse can be a real pain.It drags across the top of the desk, gets caught and hangs up in the other cords, or anything that might be lying on your desktop.

They also have a receptor that must be visible to the mouse (line of sight), if anything is in the way, the mouse won’t respond .This can be sometimes cause a little stress unless you keep a very tidy desk cordless mice are more expensive than other types.

To effectively use a mouse, on has to learn seven technologies that include

Point

Drag

Drop

Click

Double click

Left click

Right click

**Tracker ball**

Diagram missing

Is an input device where a finger is used to rotate a ball.This moves a pointer on the screen.(it is very like an upside –down mouse) need less room to use a tracker ball than a mouse

Advantages

Does not need as much desk space as a mouse

Is not tring since less motion is needed

Disadvantages

Requires fine control of the ball with just one finger or thumb

Repeated motions of the same muscles are string and cause carpal tunnel syndrome.

Touch screen

Is a screen through which data can be input just by touching it with a finger.Items are selected just as they would be with a mouse pointer or a light pen.The equipment can be made secure from theft.Often choosen for user-friendly selection from a menu of items for non-specialist users.Eg for information in a theme park, museums

Advantages

It’s natural to do reach out and touch something

Disadvantages

It’s tiring if many choices must be made

Tourch pad (Glide Pad)

Diagram missing

Drag a finger a long the surface of a touchpad and it acts like a mouse,movin g pointer on gthe computer screen. Touch pads may be connected to a PC (microcomputer) or built into a laptop

Advantages

Doesnot need as much desk space as mouse.

Can readily be built into the keyboard.

Has fiter resolution.That is , to achive the same cursor movement onscreen takes less movement of the finger on the glidepad that it does mouse movement.

Can use either buttons or taps of the pad for clicking.

Disadvantages

The hand tires faster with a mouse since there is no support

Some people don’t find the motion as natural as mouse

Pointing stick

A pointing device that looks like a pencil eraser between the G ,H , and B keys.It is moved with the forefingers, while the thumb is used to press related keys located in front of the space bar

Graphics tablet(or digitizing tablet)

A graphic drawing tablet used for sketching new images or old ones.Also called a graphics tablet,” the user contacts the surface of the device with wired or wireless pen or plunk.Often mistakenly called a mouse, the puck is officially the “ tablet cursor” .

Stylus

A pointed intstrument used as an input device on pressure-senstive screen

Light pen

A light sensitive stylus wired to a video terminal used to draw pictures or select menu options .The user brings the pen to the desired point on screen and presses the pen button to contact screen pixels are constantly being refreshed.

When the user presses the button ,the pen senses light, and pixels being illuminated at that instant identifies the screen location .

Advantages

Can use handwriting instead of typing

Can use gestures instead of typing commands small size

Diasadvantages

Must train device to recognize handwriting

Must learn gestures ot train devices to recognize the ones you create

Can lose the pen, which is not usually attached to the device

Cyber glove

It is an input for virtual reality environment.Varoius sensors technologies are used to capture physical data such as bending of fingers .Often a motion tracker, such as a magnetic tracking device or interial tracking device, attached to capture the global rotation data of the glove.

These movements are then interpreted by the software that accompanies the glove, so any movement can mean any number of tghings .gestures can then be catogerized into useful information such as to recognize sign language or other symbolic functions

Eye gaze/eye tracking

Eye tracking follow the eye movements of a person looking at any viaual such as a printed ad, an application’s interface or page on a web site .It is used to analyze the usability and effectiveness of the layout.

B.**Text input hardware devices**

Are devices with one can enter text into a computer.Text refers to character data , or to one of the segments of a program in memory.Text input hardware devices include

Keyboard

Keyboards are designed for the input of written text , and also control the operation of the computer. Physically ,computer keyboards are an arrangement of rectangular buttons or keys

Keyboards typically have charactrers engraved or printed on the keys , in most cases ,each press of a key corresponds to a single to a single written symbol.

However , to produce some symbols requires pressing and holding several keys simultaneously , or in sequence; other keys do not produce any symbol, but instead affect the operation of the computer, or the keyboard itself.

A keyboard is made up of various special buttons that perform specific functions .these buttons include:

Control key :Is akey .which when pressd in combination with another key, will perform a special operation. .The control key is a special modifiers key ,it is used in the same fashion as shift key.

Functional key:Is akey on computer or terminal keyboard which can be prorammed so as to cause an operating system command interpreter or application program to perform certain actions . eg F1 for Help

Alt key :

I s either of two keys located next to the space bar, used to change function of a key pressd.The A lt key is a modifier key, it is used in the same fashion as shift key. For example simply pressing A will type A, but if you hold either Alt key while pressing A , the computer will perform an Alt –A function, which varies from the program to program.

Caps lock

Is a key on a computer keyboard. Pressing it causes the keyboard to go into a mode in which letter keys are interprented as caplital letters by default. The caps lock doesnot affect the number or punctuation keys

Space bar

Is a key on an alphanumeric keyboard in form of a horizontal bar in the lower-most rows, significantly wider than other keys.It’s main purpose is to conveniently enter the space eg between words during typing.

Shift key

Is either of two modifier keys on the Qwerty computer keyboard, located on the edges of row below the home row, used to type an alternate “upper” character, when there are upper and lower characters shown on a key.The shift key will also capitalize the letter keys

Modifier key

Is a special key on a computer keyboard that modifies the normal action of another key when the two are pressed in combination

For example ,<Alt> +<F4> in Microsoft windows will automatically close the program in an active window. In contrast , pressing just F4 will probably do nothing unless assigned a specific function in a particular program. By themselves modifier keys usually do nothing.

Advantages of using keyboards for data input include:

It is not necessary to buy additional equipment because most computer systems are normally supplied with keyboards.

Entering data and instructions with keboard is generally faster than with pointing devices.

Keyboards are more reliable and usually produce fewer errors than other input methods such as voice input and optical character recognition.

Disadvantages of using keyboards for data input include:

It takes a lot of time to practice in order to type quickly accurately .

Btyping speeds are still very slow when compared with computer speeds.

Handwriting recognition

The ability of a computer to receive inteligible handwritten input .The image of written text may be sensed “off line” from a piece of paper.

Alternatively , the movements of pen tip may be sensed “on line” for example by pen- based computer screen surface.

Optical character recognition

The process of converting scanned images of machine-printed or handwritten text(numerals, letters and symbols) into a computer processable format, also known as optical character recognition(OCR).

Typical OCR system contains three logical components: an image scanner, OCR software and hardware, and an ouput interface. The image scanner optically captures text images to be recognized .Text images processed with OCR software and hardware.

The process involves three operations : document analysis(extracting individual character images), recognizing these images(based on shape) and contextual processing(either to correct misclassifications made by the recognition algorithm or limit recognition choices)

Speech recognition

Ability of computer systems to accept speech input and act on it or transcribe it into written language.Current research efforts are directed toward applications of automatic speech recognition(ASR) , where the goal is to transform the content of speech into knowledge that forms the basis for linguistic or cognitive tasks ,such as translation into another language.

Chorded keyboard

(Also called a chord keyboard or chord ing keyboard ) is a computer input device that allows the user to enter characters or commands formed by pressing several keys together ,like playing a chord on a piano.The large number of combinations available from a small number of keys allows text commands to be entered with one hand, leaving the other hand free to do something else(such as manipulating a mouse). A secondary advantage is that it can be built into a device(such as a pocket-sized computer) that is too small to contain a normal sized keyboard

GKOS keyboard

The GKOS keyboard standard for small portable terminals is intended for replacing the QWERTY where there is not enough room for large number of keys but still all QWERTY functions are required .Typical aplications are small wireless devices,cellular terminals/browsers and tablet PCs.As of 2006, it is not used in any commercial applications except Chrichton bar coding personal organisers.

Keyer

Is a device for signaling by hand, by way of pressing one or more switches.Modern keyers typically have a large number of switches but not as many as full-size keyboard, typically between four and fifty . A keyer differs from a key board in the sense that there is no board, the keys are arranged in a cluster.Akeyer may take the form of single telegraph key for Morse code.

In this use, the term “to key” means to turn on and off a carrier wave typically. For example, it is said that one “keys” the transmitter interrupting some stage of amplification with a telegraph key.

Bar code readers

A bar code is a set of parallel printed lines of differing thicknesses which are used to store coeded information about an item

Diagram missing

Bar codes are read using a bar code reader, which can be in form of a hand-held “wand” or a stationery laser scanner over which the bar code is passed.This method of data entry is used in big shops and supermarkets and in libraries.

Advantages

A fast method of data entry

Eliminates possible human error

Disadvantages

Scratched or crumpled barcodes may cause problems

QR code reader

(abbreviated from Quick Response Code) is the trademark for a type of two dimensional bar cods in which information is represented by black and white dots (so-called “square data dots” data pixels).It looks as below

Diagram missing

To read information off QR code, a QR code reader is used on smart phones, android phones or by modern bar code readers

QR codes can contain more than just a simple link to a website:Use them to link to a video, you face book profile or a MP3 file –anything a modern smart phone is capable of doing .Directly take your visitors to the relevant content, without the bother of typing in complicated URLs

QR codes have become common in consumer advertising.smartphones users install an application with QR code scanner that can read a displayed code and convert it to a URL directing the smartphone’s browser to the website of a company, store or product associated with that code providing specific information

QR codes are now over much wider range applications, including commercial tracking, entertainment and transport.ticketing, product/ loyalty marketing

It can also be used in storing personal information for use by government.

Users may receive text, add a vCard contact to their device, open a uniform Resource Identifier(URI), or compose an E-mail or text message after scanning QR codes.

QR codes also may be linked to a location to track where a code has been scanned.

MICR reader

Characters are printed using special magnetic ink , which contains iron oxide . As the documents passes into MICR reader , the ink is magnetized, so that the shapes of characters can be recognized electronically. The characters have to be printed in a special front style.The main use of MICR is to input data from bank checques . The cheque Number, branch sort code and the Account Number are printed in magnetic ink at the bottom.The amount gets typed in later .All cheques received get fed into an MICR reader and the data automatically input to bank’s computer systems

Advantages

Documents are difficult to forge

It is fast and cuts out human error

Documents can still be read after written on , folded ,spilt on etc

Disavantages

MICR readers and encoders are expensive

The system can only accept a few characters

Others include

Telegraph key which(-20WPM Morse code)

Vibroplex(30-80 WPM Morse)

Gaming input hardware devices

A device with which one can play a game on personal computer

Joystick

Is a computer peripheral or general control device consisting of a hand held stick that pivots about one end and transmits it’s angle in two or three dimensions to a computer.Joysticks are often to control games , usually have one or more push buttons whose state can also be read by the computer.

Game pad (or joy pad)

Also called joy pad, is a type of game controller held in the hand ,where the digits (especially thumbs) are used to provide input.Game pads generally feature a set of action buttons handled with the right thumb and a direction controller handled with the left .

Others include:

Paddle

Power pad

Image ,video input hardware devices

Are devices that are used to record viedo, images and other moving activities with one late downloads to the computer for storage, saving , copying onto media, or otherwise in anyother form.

They include among others

Image scanner

Diagram missing

Is a device used to digitize graphics, hand held scanners may be passed over pictures.Flatbed scanners remain still while the picture is scanned.As well as digitizing pictures, scanners may be used for capturing text from images(see OCR).It is also used as photocopying devices

3D scanner

A graphics input system that recordsx, y and Z coordinates of real object.contact is made with various points on the object’s surface by a light sensor, sound,robotic intstrument or pen

Digital camera

A photograph can be taken by a digital camera and then downloaded into the computer from the camera.

The re is no need to buy film .Some digital cameras are as surveillance cameras eg taking pictures of speeding cars

Digiatal camcorder

A light weight hand held video camera, especially one that records data in digital from onto storage device such as a videotape DVD or harddisk

Webcam

Is a digital video camera that can be directly connected to a computer.It usually takes a digiatal picture at a regular intervals and uploads the picture to an internet website

Web cams are used for teleconferencing, users communicate with each other using mcrophones and speakers as well as web cams to see each other on their monitors.

Digital video recorder

Digram missing

A digital video recorder(DVR) (or personal video recorder)

A digital (PVR) is a device that records video without video tape to hard drive-based digital storage medium.

Digital video camera

Diagram missing

Can record video in digital form so that it can be downloaded to a computer for editing

Audio input hardware devices

Are devices with which helps a user to record sound waves into digital files on a computer. Examples include:

Dictaphone

Is a sound recording device most commonly used to record speech for later playback or to be typed into print.

Microphone (see also speech recognition)

Diagram missing

Is the input device used(in union with software such as “sound recorder”) to turn sound waves into digital files that a computer can understand

The other include:

Digital audio recorder

Others specialized devices include

Midi instruments

Refers to normal musical instruments which have a midi port for input into midi interface in the computer. The music can then be stored as a file, displayed on screen and edited ready for play back.

Sensor

Chemical response to the physical environment or movement can be converted to electrical signals in the sensor that can be translated and used by the computer.

Various sensors can be used to measure heat, light, sound,pressure,strain, acidity(PH), oxygen concentration, humidity ,pulse, water level , water flow, speed,tit or simply whether something likea door or a valve is open or shut.

Remote control

Emits a beam of infra red light, which caries data signals. Commly used for input to TVs and VCRs and now becoming used by computers as a wireless method of communication.

**OUTPUT DEVICES**

What is an output device?

A device ,such as a printer,video display, or speaker that presents / reproduces data from a computer to a user

Output from a computer takes the following forms

Display

Print

Emit light

Sound

Output devices include

Monitor

The computer monitor is an output device that is part of your computer’s display system.A cable connects the monitor to a video adapter(video card) that is installed in an expansion slot on your computer’s motherboard. This system converts signals into text and pictures and displays them on a TV -like screen(the monitor). The computer sends a signal to the video adapter, telling it what character, image or graphic to display.The video adaptor converts the signal to a set if instructions that tell the display device(monitor) how to draw the image on the screen.

Cathode Ray Tube(CRT)

Diagram missing

The CRT , or Cathode Ray Tube is the picture tube of your monitor .Although it is a large vacuum tube, it’s shaped more like a bootle.The tube tapers near the back where there is a negatively charged cathode, or electron gun shoots electrons at the back of the positively charged screen, which is coated with a phosphorus chemical

This excites the phosphorus causing them them to glow as individual dots called pixels (picture elements).The image you see on the monitor’s screen is made up of thousands of tiny dots (pixels). The distance between the pixels has a lot to do with the quality of the image . If the distance between the pixels on the monitor screen is too great, the picture will appear fuzzy or grainy

**Video tehnologies**

Video technologies differ in many different ways , How ever the major 2 differences are resolution and the number of colours it can produce at those resolutions

**Resolution**

Resolution is the number of pixels that are used to draw an imageon the screen. If you could count the pixels in one horizontal row across the top of the screen, and the number of pixels in one vertical column down the side, that would properly describe the resolution that the monitor is displaying .It’s given as two numbers

If there were 800 pixels across 600 pixels down the side , then the resolution would be 800 x 600 .Multiply 800 times 600 and you wil get the number of pixels used to draw the image(480000 pixels in this example). A monitor must be ma tched with the video card in the system.The monitor has to be capable of displaying the resolutions and colours that the adaptor can produce.It works the other way around too

If your monitor is capable of displaying a resolution of 1024 x768 but your adaptor can only produce 640 x480, then that’s all you are going to get. When we talk about the different technologies , we are going to talk about the video card and monitor that make up that display system.Also, standards describe the basic number of colours and resolutions for each technology, but individual manufacturers always take freedom, providing options and improvements that are designed to make their product more appealing to the user .This is , of course how new standards come about.

Monochrome

Monochrome monitors are very basic displays that produce only one colour.The basic text mode in DOS is 80 characters across and 25 down. When graphics were first introduced, they were fairly rough today’s standards, and you had to manually type in a command to change from text mode to graphics mode.Today’s adaptors still basically use the same methods.

CGA/EGA

The colour graphics Adaptor(CGA) introduced colour to personal computer.In APA mode it can produce a resolution of 320x200 and has palette of 16 colours but can only display 4 at a time.With the introduction of the IBM Enhanced Graphics Adaptor(EGA) , the proper monitor was capable of a resolution of 640 x350 poixels and could display 16 colours from a palette of 64

VGA

Up until VGA , colours were produced digitally.Each electron beam could be either on or off .There were three electron guns, one for each colour, red, green and blue(RGB).This combination could prouduce 8 colours. By cutting the intensity of the beam in half, you could get 8 more colors for a total of 16.

IBM came up with the idea of developing an analogue display system that could produce 64 different levels of intensity . Their new vdeo graphics Array adaptor was of a resolution of 640x480 pixel and could display up to 26 colours from a palette of over 260000.This technology soon became the standard for almost every video catd and monitor being developed.

SVGA

Manufacturer began to develop video adaptors that added features and enhancements to the VGA standard .Super VGA is based on VGA standards and describes display systems with several different resolutions and varied number of colors .When SVGA first came out it could be defined as having capabilities of 800x600 with 256 colours or 1024 x 768 with 16 colours.How ever , these cards and monitors are now capable of resolutions up to 1280x 1024 with palette of more than 16 million colours

XGA

IBM developed Xtended Graphics Array. It improved upon the VGA standard(also developed by IBM) but was a proprietary adaptor for use in micro channel Architecture expansion slots.It had it’s own coprocessor and bus-mastering ability, which means that it had the ability to excute instructions independent of CPU.

It was also a 32-bit adapter of increased data transfer speeds.XGA allowed for better performance, could provide higher resolutions and more colours than the VGA and SVGA cards at the time

However it was only available for IBM machines. Other video card manufacturers later incorporated many of these features.

In terms of resolution pixel size, monitors are classified as:

VGA(Video Graphics Array)=640x480 pixels

SVGA(Super Video Graphics Array)=800x600

XGA(Extended Graphics Array)=1024x768

LCD monitor

Diagram missing

Smaller ,lighter and using much less power than a normal CRT monitor makes them ideal for portable laptop computers.Also used in watches and calculators.For the scientists amongst you this is all to do with the polarization of light by an electromagnetic filed applied to crystal.This produces a liquid crystal display(LCD)

Note :a page displayed on a computer’s screen is refered to as a soft copy

Speakers

For playing music or speech from programs, CD-ROMs and musical instruments.

Printers

Diagram missing

Is an output used to write a copy after a days processing .A copy normally printed is referred to as a hardcopy. Printers come in different types depening on the nature of work as designed by the manufacturer.Printer is categorized in several ways the most common distinction is the IMPACT AND NON-IMPACT printers

Impact printers

These uses a printing metal called hammer embossed with a character strikes a print ribbon ,which presses the characters image into paper. In other types the hammer strikes the paper and pressese it into ribbon chatacters created through impact printing can be formed by either a solid font or dot matrix printing mechanism. In other words it produces a hardcopy out it’s print mechanism comes in touch with the print surface or media

Non impact printers

It refers to one that produces a hardcopy output without it’s print mechanism comes into contact with surface.The most popular non impact methods today utilize thermal transfer, ink jet

Types of printers

Daisy wheel printer

Like type writer but with the performed letters on the ends of spokes to form a wheel.The letters strike an inked ribbon onto paper.

Advantages of using the daisy wheel printer

Good (type writer quality) resolution

Diasdavantages

Very slow 1/2ppm(page per minute)

Very noisy

Can only print the characters provided on the wheel and no graphics(line drawings, pictures)

It prints only in in one colur(monochrome) only.

Dot matrix printer

Is a set of steel pins that strike an inked ribbon onto paper producing a sequence of dots.Low resolution 72 dpi( dots per inch )can just see the dots .

Advantages of using a dot-matrix printer

Quite fast- 1 ppm(papers per minutes)

Slightly noisy

Can print any shape of character(font) stored in the computer memory and any graphics, all on the same page.

Some are capable of printing low quality colours on the same page

Using multiple ribbons

Ink jet printer

Fire a jet of liquid ink through tiny holes.High resolution -300 to 600 dpi for almost professional quality, sharp printing.Fast 3 ppm

Advantages of using ink jet printer

Very quiet

Full black and colour print on same page

It has very high resolution between 300-600 dpi

Thousands of colours are created by mixing tiny dots of cyan,magenta and yellow(CMY( ink on paper

Better printers have separate black ,cyan, magenta and yellow catridges for faster replacement when empty

Disadvantages

It is very expensive in the long run to replace the catridges after being used up.

Laser printer

Diagram missing

It works like a photocopier, prowdered ink is fussed onto paper by heat and pressure.Very high resolution 600 to 1200 dpi for full professional quality.First laser printer introduced by IBM the IBM 3800.The first colour versions came onto the market in 1988.

Advantages of using laser printer

Very fast 6-16 ppm for multiple copies.

Almost silent

It prints many copies before the catridge is used up

Disadvantage

Colour laser printers are quite expensive but are cheaper to run than colour inkjet printers.

Braille printer

By converting text into braile code, this printer ;produce patterns of raised dots on paper for use by the blind

Thermal Transfer printer

It is a kind of non-impact printer.In electro thermal printing characters are burned on to a special paper by heated rods on a print heat.They transfer ink from high quality graphic

Multifunction printer

Diagram missing

As its name implies, a multifunction printers can usually operate as a fax machine, copier and scanner I addition to their traditional printing duties

Factors to consider before buying a printer

Resolution

Printer’s resolution helps determine the quality of images it can produce. Higher resolution means higher quality images.Printer resolution is measured in dots per ich (dpi). Generaly 600dpi resolution works great for text documents while you will probably want 120 dpi or better resolution for printing images.

Speed

A printer’s speed determines how quickly it can print pages.speed is measured in two ways ; in character per second (cps) or in pages per minute(ppm). Either way you want a higher number if you want faster printer.Printers usually slow down quite a bit when printing pages with a lot of acomplicated graphics, ot colour images

Ink catridges and toner

Computers are a lot faster than most printers are, so they send information faster than the printer can accept it .A printer buffer or spooler fixesthis problem

Memory

Laser printers have their own memory, or RAM , just like a computer.This memory is used to store pages before they are printed.Memory is important for printing complex or high resolution images.Most laser printers have any w here from 2 mb to 8mb of memory.

Print buffer and spooler

Computers are a lot faster than most printers are, so they can send information fater than the printer can accept it . A printer buffer or spooler fixes this problem.A print buffer works like dam: it holds back the information and relesese it at a rate that th e printer can handle

**Graphics plotter**

Uses high precision motors controlled by the computer t draw on paper wkith coloured ink pens.Used for drawings where a high degree of accurancy is required such as building plans, printed circuit boards and machine parts

Light Emitting Diode(LED)

Small low power devices, which emit light.Used to indicate various events such as power on or hard disk in operation and monitor other control applications.

Relay switches and motors

A computer can be programmed very easily to frun switches on and off at required times .For example to control traffic lights or electric motors in a robot arm.Used in the automobile industry to spray body shells or to assemble and weld parts together, or to assemble delicate electronic components on a printed-circuit borad for colmputers, radios and almost anything else you can think of.

**Storage devices**

Data

Are numbers ,characters , images, or other outputs from devices to convert physical quantities into symbols , in a very broad sense.Such data are typically further processed by human or input into a computer, stored and processed there, or transmitted(output ) to another human or computer.

Data is relative term, data processing commonly occurs by stages and the processed data from one stage may be considered the raw data of the next.

Information is the summarization of data.Technologically, data are raw facts and figures that are processed into information,such as summaries and totals.But since information can also be the raw data for the next job or person, the two terms cannot be exactly defined, and both are used interchangeably

It may be helpful to view information the way it is structed and used namely, data, text, preadsheets, pictures, voice and video

Data are completely defined fileds

Text is a collection of words

Spreadsheets are data in matrix(row and column) form

Pictures are lists of vectors or frames of bits

Voice is contious stream of sound waves

Video is asquence of image frames

Computer storsge

Computer storage or computer memory, refers to the computer components, devices and storage media that hold binary information (in base two) for some interval time.

In casual language, memory refers to forms of storage which are fast, but lose their contents in a case power loss and

Storage refers to forms which are slower, but suitable for long term retention .

Ancient examples of storage media include

Papyrus

Paper(painted or written with pencil).Today paper is mainly produced from wood from wood pulp, in ancient times, old clothes were used .

Modern paper was invented in France around the 14th century

Clay and stone(carved or incised)

Wax tables

Chalk

Quipu

Examples of storage media in the 19th centry

Photographic film

Wax for recording cylinders

Shellac compound and later vinyl for analogue disk records

Plastics sheet for Dictaphone recorders

Steel wire for magnetic wire recorders

Magnetic tape

Rigid magnetic disks and cylinders

Floopy magnetic disks

Pressed optical media for writable CDs and DVDs

Flash

Storage formats

A format is a transformation where the original information translated into features in a physical media.Historically there has been hundreds of storage media and formats

Natural language format

Hierographic

Hierographic are system of writing used by ancient Egyptians using a combination of logographic ,syllabic and alphabetic elements .

Ideographic

Ideographic (from Greek “to write”) are said to be graphical symbol that represent words or morphomes.They are composed of visible elements arranged in avariety of ways, rather than using the segments phoneme principle of construction used in alphabetic langauges.

Phonetic

Magnetic storage

Magnetic tape formats

Reel –to-reel audio tape recording

8-track catridge

Compact audio Tape cassette

Digital Audio Tape

Floppy disk

Optical media formats

Compact disks

DVD

Magneto-optic storage

Magneto-optical drive

Write once read many

Primary storage

Refers to a storage location that is very fast but losses data easily and it is volatile.Examples of primary storage include:

Random Access Memory

Is an example of primary volatile memory in the system unit. Contents in RAM can be updated, adjusted and modified .RAM is directly connected to central processing unit.items in RAM that are needed for future use must be saved to storage device before the computer id tuned off .The two basic types of RAM are dynamic RAM and static RAM .RAM chips are usually packaged on small circuit board that is inserted into the mother board

Read Only Memory

ROM is an exampleof non –volatile memory.ROM chips containing data, instructions or information, which is recorded permanently by the manufacturers are known as firmware variations of ROM chips include

Programmable read only memory (PROM),which is a type of ROM chip on which permanent items can be placed.

Erasable Programmable read only memory (EPROM), or electrically erasable Programmable read only memory .

EEPROM are ROM chips designed to be modified by users

Virtual memory , with virtual memory (VM) , the operating system allocate a portion of storage medium, usually the hard disk , to function as additional RAM . The area of the hard disk used for virtual memory is called a swap file.The amount of data and program instructions swapped or exchanged at a given time is called a page.

Cache memory

Cable memory speeds the processes of computing by storing frequently used instructions and data

BIOS , contains basic input and output system, which is a sequence of instructions the computer follows to load the operating system and other and other files when the computer is turned on.

CMOS

Complementary metal oxide semiconductor is used to store configuration information about the computer, which includes amount of memory , types of disk drives,keyboard, monitor, cureent date and time etc.CMOS chips use battery power to retain information even when the computer is turned off. The CMOS chip is updated whenever new components are installed.

Functions of primary memory

It stores programs and files under cureent use

It stores files needed for complete boot process of the computer

It determines efficiency and performance of a computer

It provides extra space for the CPU while processing data by swapping files in and out of the the hard diskdrive.

It established the basic communication between basic input and output devices on a computer eg mouse, keyboard and monitor etc.

It stores a log of frequently visited files which increases the speed of accessing that particular file

It stores file and documents before they are stored permanently

Primary memory enbles the user to recover work in memory for the last 5 minutes in case of pwer cut

Very important for user to take a purchase decision of a computer set.eg amount of RAM , amount of video card RAM BIOS etc

Data storage is divided into many categories depending on :

Amount of data stored

Method of data access

Technology used to store data

Whether the storage medium is fixed or removable

Whether the storage is internally or extremely connected

Whether the storage medium can hold data for a short time for a long period of time

Whether the storage medium is volatile or non-volatile

Whether the storage medium is fast or slow at being accessed

Whether the storage medium can be expanded or not in terms of storage capacity.

The punch card(or Hollerith card)

Is a recording medium for holding information for use by automated data processing machines.Made of stiff cardboard, the punch card presents information by presence or absence of holes in predefined postions on the card.

In the first generation of computing, from the 1920s into the 1950s, punch cards were the primary medium for data storage and processing. They were an important medium , particulary for data input, well into, the 1970s

Magnetic Tape

Data is stored as magnetic fluctuations along the length of specially coated plastic tape, similar to the common audiotape.It varies from 200to 3600 feet and 1 ½ inches wide.The coded data is processed ( or translated) into useful information by the computer.Data is accessed sequentially as the first to store will be first to access and the last will be the last to access in that order.Information stored on the tape cannot be modified , changed or updated at any one time .Magnetic tapes are still used in the mainframe and minicomputer as an ideal for backup copies of data.

Advantages of using a tape for data storage

Can hold thousands of megabytes(MB) of data depending on the length of the tape.

Useful for daily backups of all work and programs on a large network.

Can be set to run automatically during the night and then will only be needed in an emergency.

Advantage of using tape

Very slow, as need to wind tape (perhaps a long way) to find any specific position of data to view

DSDD-Double-Sided or Double Density

2HD-Double –side, High Density

The 5 ¼ inch diskette has capacity ranging from 360kb to 1.2 mb

The 3 ½ inch diskette has a capacity ranging 720 kb for a singlesided

1.44 mb for a double sided

Compared with the 5 ¼ inch diskette, the 3 ½ inch has the following advantages:

It is more durable because it is covered by an inflexible plastic jacket that protects the disk from contamination and bending covers on it.

It can contain more data in a small space

It’s floppy drives are smaller and lighter and therefore require less power to operate and generate a lot of heat.

The drives afre faster and data is easier to transfer during storage and retrieval .

Care and maintance of floppy diskettes

For proper use of the floppy diskettes , one must study the following aspects

Keep diskettes away from magnet fileds, such as near wire telephones, loud speakers, and other appliances, which contain magnets.

Do not keep heavy objects on top of the diskettes

Do not fold or bend diskettes

While labeling or writing on diskettes use left tip pen , not pencil or ballpoint pen .

Do not pull out the diskette from it’s drive then the drive light is still on.

Do not use alcohol thinners, to clean the disk surface.

Do not touch the disk surface

Data security

Besides protect the physical medium you are using to store data , you must also consider whatyou can do to safeguard the data itself. If the disk is kept from physical harm, but the data gets erased, you still have a major problem.

So what can you do to safeguard the data on which you rely?

Write protect

This keeps your files away from being overwritten with new ones.For floppies and many other kinds of removable media, you can do this physically

Backup

Make multiple copies of important data often .The more important that files are, the more copies in more places you need

Anti- virus

Use an anti-virus continuously program continuously.computer viruses are tricky computer programs that can erase your data and even whole your system. Most viruses are merely annoying and are created as practical jokes.But there are a number of a very damaging viruses out there

Hard disk

Diagram missing

Made of stronger material(aluminium) and fixed permanently together with it’s drive mechanism inside the computer.Data is stored magnetically. Spining at the required speed all the time .It is very much faster to acess than floppy disk or CD-ROM faster than 1 MB per second).It can hold thousands of megabytes(gigabytes) of data.It is used for storing all programs and work files for every fast access by the computer

Drive types

Drive types are categorized by their interface with the motherboard

IDE(Intergrated Drive Electronics )

The mostcommon type of hard drives you will find in most PCs is the IDE or one of it’s variations.Previous to the IDE ,hard drive s had to be connected to the computer via a controller card.This card was inserted into the ISA slots on the motherboard. And 2 different ribbon cables attached to drive

One cable was the controller cable, transferring control information to the hard drive, relaying information from BIOS , telling the drive which sectors to postion it heads over and when to read or write .The other was the data cable ,which transferred data to and from the drive

The most notable improvement the IDE offered was moving the controller circuitry right onto the drive itself .The drive was attached to an interface card(sometimes called a paddle board) which was nothing more than a direct connection to the ISA bus.Often the connector for the IDE was on the same interface which provided controller circuitry for the floppy drive , joy stick, serial and parallel ports

ATA(Advanced Technology Attachment)

Also labeled the ATA the ATA the IDE bus can only support 2 drives. By setting jumpers on the drives itself, one is designated “master” and the other “slave”. This prevents conflicting controller information by disabling the controller on the slave drive, and using the controller and using the controller circuitry on the master for both drives. Until IDE was actually standardized, manufacturers often came up with their own enhancements and versions which sometimes created compatibility problems when trying to hook up more than one drive. Because ATA conformed to the same standards that the BIOS did at the time, storage.

The standard was not limited to hard drives , however, it was discovered to be an excellent interface for other storage devices, such as tape drives and CD-ROMs.

EIDE(Extended Integrated Drive Electronics)

An improved version of the IDE is the EIDE overcame the 528 MB barrier with LBA (Logical Black Adresssing). If the BIOS supports it, the hard drive’s controller sends back a long list of logical addresses , each representing a single sector on the drive .

The problem is the BIOS must remain backwards compatible with legacy devices.It has to be able to translate the long list of logical address blocks to and from the CHS(cylinders, heads, sectors/track) translation method.Having to remain backwards compatible has always been the anchor slowing down many of the advancements in computer technology.

The EIDE technology is much more efficient using the newer 32-bit bus (opposed to the 16 bit ISA), and the 40 pin connectors for the ribbon cable have been intergrated right onto most current motherboard s .EIDE supports separate channel s; primary and secondary ,each of which can support devices designated master and slave

EIDE , also called fast ATA-2 , makes use of Direct Memory Access.(DMA) which allows a drive to write directly to memory bypass the CPU

Further development to the IDE include

ATA-4 (UDMA33) , which uses 3 synchromous DMA channels than doubles the performance of EIDE from 16.5 mb /seec to 33 mb/sec

ATA -5 (UDMA66),which uses a special data cable and allows for 66MB/ sec

The use these two models, your drive, your BIOS , and the connections to the motherboard all must conform to the standatrd.If they don’t , the drives will still act as typical EIDE devices.

Partitioning

The process of creating two or more smaller on a harddisk drive that function like separate hard drives (virtual drives). It makes storing and retrieving information on hard drives more manageable.

Cluster size:is a function of the partition size.The bigger partition the bigger the cluster size remaining in more wasted space.(using the FAT file system, a cluster is the smallest allocation unit available .Any remaining in a cluster after a file is saved goes unused

Maintenance

Be aware of file management and organization

Maintain a regular schedule of deleting .TMP, .CHK, .$$$, .BAK files, and temporary internet files, as well as moving unwanted programs and files

Use a scanning utility to check for, and repair, cross-linked files , lost clusters or bad sectors on monthly basis, Microsoft provides a utility called scandisk with DOS and windows that does a good job of this.Just type SCANDISK at the DOS prompt, or choose it from the system Tools section in Windows95/98/200

Defragment your hard disk drive periodically. As programs and files are removed from your harddrive and new ones added , they become defragmented, spread out on your hard drive in non-contiguous sectors.

You may notice a decrease in the hard drive’s performance , as the read/write heads to jump all over the place trying to piece together files that are in scattered sectors. Again , your operating system may provide the answer.

You can type DEFRAG at the DOS prompt , or choose Disk Defragmenter from system Tools.

Always keep a copy of your drive settings from CMOS (it’s good to make a copy of all your CMOS settings)

Develop a system of boot disks or recovery disks

Be careful of bumps, kicks, jolts and shakes. Remember the heads are very close to the disk surface, and if they touch(head crash) they damage those sectors

Removable disks(zip) hard drives

Two sizes most common are 100MB and 250 MB each and being about the same physical size have become a popular replacement for the floppy disk as a mobile means of storage.

Compact disk(CD-ROM)

Diagram missing

Use laser(light) technology to store data ,comes with the data already on it for readingonly (ROM=Read Only Memory) and hence can not be written for every storage.Like a floppy disk ,it has to spin up to correct speed each time it is accessed .

Advantages of using a CD –ROM

Much faster to access than a floppy but currently slower than a hard disk(single speed 15 KB per second so a 40X speed CD ROM is 40 times faster, and they are getting faster).

Can hold 650 MB of data and more.

Useful for distribution of today’ Large programs and information libraries , which you can then copy(call or in part on your hard disk.

Also widely used by music industry as t hey give better quality sound and do not wear out like audiocassettes tapes.

It is the safest form of storage, provided that you don’t attack it with a sharp or heavy object.

For software providers, an optical disk is a great way to store the software and data that they want to distribute or sell.

Writeable once CD-R and rewriteable CD-RW disks and associated read/write drives are now available.They have been used to replace both the standard floppy disk drive and the CD-ROM drive on some makes of laptop computers

Blue ray

Refers to the blue laser to read the disc, which allows information to be stored at greater density than is possible with the longer-wave length red laser used for DVDs.

The major application of blue ray discs is a medium for video materials such as feature films .Besides the hardware specifications, Blue ray disc is associated with a set of multimedia formats. Generally, these formats allow for the video and audio to be stored with greater definition than on DVD.

Usual (Pre-BD-XL)Blue ray discs contains 25 GB per layer, with a dual layer discs (50 GB) being the industry standard for feature-length video discs.Triple layer discs (100 GB) and quadruple lkayers (128 GB) are available for BD-XL re-writer drives

Digital Versatile Disk(DVD)

(Also known as Digital Video Disk) is a very large capacity CD with similar access speed.It can store up 17 GB of data, which is more than enough to store 8 music albums with full video presentation, or 4 feature length films.A DVD drive can also read a normal CD-ROM . writeable DVD drive are currently quite expensive but will very likely to replace the standard video cassette tape in the future.

|  |  |
| --- | --- |
| DVD Format | Description |
| DVD-ROM | The original standard DVD-ROM stands for Read Only Memory .This means you can only read information from a DVD ; you can’t add new information. |
| DVD-R | If you have a DVD-RW drive you can permanently store information on a DVD-R(DVD-Recordable)dic.The information you write or burn to a DVD-R is permanent and can’t be changed or erased  DVD-RW drives can also write to DVD-R discs |
| DVD-RW | If you have a DVD-RW drive you can use DVD-RW (Re-writable)discs, which can be re=written up to 1000 times.You can also modify and erase information on a DVD-RW disc .DVD-RW disc have more compability problems with the older DVD players and DVD ROM drives  DVD-RW drive can also write to DVD-R DISC. |
| DVD+R | If you have a DVD+R W drive you can permanently tore information on DVD+R (DVD+ Recordable ) disc. The information you write or burn to a DVD+R is permanent and can not be changed or erased  DVD+RW drives can also write to DVD+R W discs |
| DVD+RW | If you have DVD+RW drive you can use DVD+RW discs which can be rewritten to up to 1000 times.You can also modify and erase information on a DVD+RW DISC.  DVD+RW discs have some compability problems with the older DVD players and DVD ROM drives  DVD+RW drives can also rewrite to DVD+R discs |
| DVD RAM | DVD RAM is a rewritable DVD format that can be re=written to many times. DVD RAM discs are beginning to look like an orphan format ,since they won’t work in most DVD players |

Optical disk

Looks and is used just like a floppy disk but contains a compact disk inside. Unlike a CD-ROM drive, the optical disk drive is able to both read an write to this disk many times. With 100 megabtyes capacity it is most suitable for for the large picture files created on modern computers and for storing phtographs in a digital camera. Optical drives are currently very expensive.

Advantages of using optical disks

Physical

An optical disks is much sturdier than tape or floppy disk.It is physically harder to break or melt warp

Deligancy

It is not sensitive to being touched,though it can get too dirty or scratched to be read.It can be cleaned.

Magnetic :It is unaffected by magnetic fields

Capacity:Optical disks hold much more data than floppy disks.

Disadvantages of using optical disks

Cost

The main disadvantages has been cost.The cost of a CD-RW drive has dropped drastically and quickly.

Duplication

It is not as easy to copy an optical disk, as it is a floppy disk.You need the software and hardware for writing disks

Care of optical disks(CDs,DVDs)

Your CDs and DVDs are not going to last forever.they certainly store data looner than floppy disks.Miss handling your optical disk quickly make your data unreadable.Even fingerprint can do damage over time.

Data loss comes from

Physical damage-breaking ,melting,scratching

Blocking of laser light by dirt,paint,ink glue

Corrosion of reflecting lay er

Here are some of the do’s and don’ts for keeping your CDs and DVDs healthy

Cleaning

Keep it clean

Handle by edges or center hole

Put it back in it’s case as soon as you ar funished with it .No lying around on the desktop.

Remove dirt and smudges with a clean cotton cloth by wipping from the center to the outer edge, NOT by wipping around the disk.

Wipping in the circle can create a curved scratch , which confuse the laser

For sturborn dirt, use isoprophyl alcohol or methanol or DVD/CD detergent.

Labelling

Don’t use an adhesive label.The adhesive can corrupt your data in just few months

Don’t write on or scratch the data side of the disk-ever

Don’t scratch the label side

Don’t write on the label side with a pencil or pen(scratches)

Don’t write on the label side with a fine -point marker or with any solvent based marker. Use markers for CDs solvent may dissolve the protective layer.

Storage

Store optical disks upright on edge, like a book, in a plastic case designed specifically for them.Not flat for long periods

Store in acool, dark environment where the air is clean and dry NO SMOKE low humidty.

How you treat it

Keep away from high heat and high humidity , which accelerate corrosion.

Keep out of sunlight or other sources of ultraviolet light

Keep away from smoke or other air pollution

Don’t bend it

Recording

Check disk for flaws and dirt BEFORE recording on it.

Only open a recordable disk just before you plan to record on it

After recording , make sure the disk words as you expect:Read data, run programs

While recording , it is better to use the right transfer rates for the destination devices for playback. Please, understand the transfer rates below

Other storage devices

Magnetic strip

A short strip of magnetic tape for storing a small amount of data simplest type has a personal id(PIN) permanently stored on it .eg credit card,cash point card –used to withdraw cash from the Automatic Teller Machines(ATMs) on the walls of banks . Other can be written to as well, perhaps top store a running total eg phone card, debit card, libray cards

Smart card

Diagram missing

Contains a processing microchip to provide it with intelligence as well as memory it is really a tiny computer , eg The SIM card used in a mobile phone identifies you a a PIN number, identifies and connects to your service provider and provides a menu of options , as well as storing phone numbers and phone settings . A chip on the card itself tracks changes , like deducting purchases from the amount entered originally on the card. Smart cards are already used in Europe and at colleges instead of using handful coins at vending machines and at Landromats

Optical cards

A chip on the card holds information like health records and auto repair records .They can hold more data than the smart cards since they don’t need to do any processing.

Microchip

There are many chips inside a computer, some perform all the processing tasks(eg the intel Pentium CPU), and some are used for the storage of data as internal memory.They have fastest Access of all storage media.Because of this , all files read from the hard disk into memory are also copied into a separate memory “cache” and the text time you attempt to load them from the harddisk , the computer will look in the cache first . There are two types of internal memory :

Read Only Memory (ROM)

Stores instructions that are used by the CPU

Tells the CPU how to be the kind of computer It is , for example a windows, Macitosh , or Play station computers.

Tells the CPU how to work with the different parts of the computer.

ROM can alsoprograms that directly accessed by the CPU .One such program is self test when the computer is first turned on .The self test tests to see if all the parts on the main circuit board(motherboard) are working coreectly.

The instructions are built into the electronic circuits of the chips

The instructions in ROM are called firmware.

To change the instructions in ROM you need to usually change the chips or do some other special process that is normally not available to an average user.

The instructions in ROM are non-volatile,They stay in ROM even when the computer is turned off.

**Access information is random access.**

Random access means that any piece of information in ROM can be accessed at any time without access other information first. It is a lot like the tracks of music CD . You can access any track at any time and in any order.

In other kind of access is sequential access .You must access the information in order that they are located. This is a lot like music tape. You must play the songs in order, or you have to first forward past songs to get to the one you want.

**Random Access Memory**

Store data and instructions that are used by the CPU to perform some tasks.

These instructions afre usually loaded into RAM froma secondary storage device.

RAM is also used to store instructions that tell the computer how to work is with it’s parts.These instructions usually called drivers

The instructions in RAM are constantly changing ,depending on the needs of the CPU ie dynamic.

The instructions in RAM are volatile.

When the computer is turned off, information in RAM disappears

Information in RAM needs to be saved to secondary storage before the computer is turned off.

Access to information id random access

Differences between ROM and RAM

|  |  |
| --- | --- |
| RAM | ROM |
| Main memory | Low level memory |
| Necessary to process information(example:work with a file) | Necessary to perform the most basic functions (example :start the computer) |
| Volatile :if not saved , data disappears when you shut off the computer’s power.it’s temporary | Non –volatile:Data remains even when you shut off the computer’s power.It’s permanent |
| Often discussed when buying a computer | Seldom mentioned when buying a computer. |
| You can read from and write to it ,Comparable to a notepad | You can read from it , but you can’t write to it.Comparable to a novel. |

Note

The first RAM chip introduced by Intel .It was called 1103 and had a capacity of 1-k-bit, 1024 bit

Flash memory

Several different brands of removable storage cards, also called memory cards, are now available.These are solid-state devices(no moving parts) that read and write data electrically, instead of magnetically.

USB drive

This new type of flash memory storage device does not yet have generally accepted name.Each company calls it something different, including flash drive, flash pen, thumb drive, key drive, and mini-USB drive.

Mass storage

Business es with very large sets of data that need easy access use sets of catridges with robot arms to pull out the right one on command.

Processor components

The central processing unit (CPU)

The central processing unit also called the brain of a computer, refers to a computational engine found in the computer whose major purpose is to process data. The central processing unit(CPU). Is the electronic device that interprets and carries out the instructions that tell the computer how to work.

Generally speaking the central processing unit performs a number of functions include:

It controls devices under it’s care

It helps in all the stages of data processing

It is the chief brain of the computer which performs logical computational and comparissions of data.

It is determines how fast the computer performs a given function

It is used as yardstick to determine type and model of computer

It helps the user to work with many programs at the same time

It controls which part to handle which category of task within the computer

It stores data temporarily for the computer.

The central processing unit carries out instructions in a series of machine cycles also called e-time.The four basic operations of the machine cycle.

Fetching

Is the process of obtaining a program instruction or data item from memory.The time taken to fetch is called instruction time, or I –time.

Decoding

Is the process of translating the instruction into commands that the computer understands.

Executing

Is the process of carrying out commands

Storage :is the process of keeping data in the CPU location temporary.

Note :The time taken to decode and execute is called execution time .

On a personal computer, the CPU is usually contained on a single chip and is often called a microprocessor. A microprocessor usually contains the control unit, the arithmetic unit and logic unit, registers and system clock.

Control unit

The control unit directs and coordinates most of the operations in the computer.

Arithmetic logical unit

Specifically , the ALU performs the arithmetic , comparission and logical operations.Arithmetic operations include addition, subtraction ,multiplication and division. Comparision operations involve comparing one data item to another, and determine if the first item is greater than, or less than the other item.Logical operations work with conditions and logical operators such as AND, OR, and NOT.

**Registers**

Are high-speed tempory storage locations used to hold data and instructions. A microprocessor contains many different types of registers, and each performs a specific function

Common types of registers include

Program counter, which holds the address of the next instruction to be fectched from the memory

Instruction register, which holds the current instruction fectched from the memory

Instruction decoder, which interprets , or decode the instructions currently held in the instruction register

Accumulator,which holds the data item to be processed and the reults of arithmetic and logical operations.

Status register:which holds a collection of condition flags , which describe the status of the most recent operations carried out by the ALU

STRUCTURE OF THE CENTRAL PROCESSING UNIT

DIAGRAM MISSING

Other terms related to data processing

System clock speed

The system clock controls how fast all the operations within a computer take place.The system clock generates regular electronic pulse or ticks, that segt the operating pace of components in the system unit .The speed at which a processor executes instructions called clock speed or clock rate.

How a CPU works

A CPU is similar to a calculator, only much more powerful.The main function of the CPU is to perform arithmetic and logical operations on data taken from memory or on information entered through some devices such as a keyboard,scanner, or joy stick

The CPU is controlled by alist of software program. Software instructions entering the CPU originate in some form of memory storage device such as a hard disk , floppy disk, CD-ROM ,or magnetic tape.

These instructions then pass into the computer’s main random access memory, where each instruction is given a unique address or memory location. CPU can access specific pieces of data in RAM by specifying the address of data it wants .

As a program is executed, data flow from RAM through an interface unit of wires of called the bus, which connects the CPU to RAM .

A processing unit called the instruction decoder that interprets and implements software instructions then decodes the data

From the instruction decorder the data pass to the arithmetic/logic unit(ALU) ,which performs calculations and comparisions

Data may be stored by the ALU in temporary memory locations called registers where it may be retrieved quickly .

The ALU performs specific kperations such as addition, multiplication, and conditional tests on the data in it’s registers sending the resulting data back to RAM or storing it in another register for further use. During this process, a unit called the program counter keeps track for each successive instruction to make sure that the CPU in the correct order follows the program instructions.

Branching instructions

The program counter in the CPU usually advantages sequentially through the instruments.However special instructions called branch or jump instructions allow the CPU to abruptly shift to another instruction location out of sequence

These branches are either unconditional or conditional . An unconditional branch always jumps t a new , out of order instruction stream .A condtional branch tests the result of a previous operation to see if the branch should be taken .

For example , a branch might be taken only if the result of a previous subtraction produced a negative result .Data tested for conditional branching are stored in special locations in the CPU called flags.

The system unit

The system unit is the core of computer .Usually ,it is a rectangular box inside which are many components that process information .The important of these components is the central process unit unit CPU ,or microprocessor ,which acts as the central computer .Another component is the Random Access Memory ,which temporally stores information during and after executions

Almost every part of a computer connects to the system unit .

using cables .The cables plug into specific ports (openings of the system unit) ,usually on the back of the system .

Mouse

A mouse is a small device used to point and select items on the computer screen .Or the mouse is the primary device for navigating and interacting with the computer.

A mouse usually has two main buttons ,primary button(usually the left button) and a secondary button (usually the right button ) .Many mice also have a wheel like button between te two buttons ,which allows you to scroll smoothly through screens of information .when the mouse is moved a point on the screen moves in the same direction .The pointer’s appearance changes depending on where it’s poisoned on the screen.

Common terminologies about the mouse

Clicking .It is an act of pressing the left hand button of the mouse

Right clicking. It is an act of pressing the right mouse button

Dragging .Is an act of pointing at an item ,then hold down the left mouse as you move the muse

Dropping.This refers to the release of the left button mouse after dragging an item.

Scrolling .It is an act of navigating the window page up orf down by moving the wheel like button .

Double clicking .Is the act of pressing a computer mouse twice quickly without the mouse moving.

Keyboard

A keyboard is used mainly for typing text into the computer .Like keyboard typewriter ,it has keys for letters and numbers but also has special keys ;

The function keys,found on the top row (F1-F10/12)

The numeric keypad on the right side of the keyboard allows you enter numbers quickly ,when the Nulock tuned on.

The navigation keys ,such as the arrow keys allow you to move your position within a document or webpage.

Monitor

It is sometimes reffered to as the visual display unit .It is an output device that displays information in form ,having text and graphics .The portion of the monitor that displays information is called the screen.There are two basic types of monitors ;

Cathode Ray Tube (CRT) monitors.

Digram missing

The Liquid Crystal Display(LCD) monitors

Digram missing

Advantages of LCD monitors over CRT monitors

They electromagnetic radiations emitted by the LCDs is neglible

In terms of images LCDs offer better brightness than CRT displays

LCD take small space than the CRT monitors

LCD TVs have exceptional image stability ,meaning you can sit close and not experience eye fatigue.

Advantages of CRT monitors over LCD monitors

It has alarge image view compared to the LCDs

It is cheaper than the LCD monitors

Produces the very best colour and gray scale

They operate at any resolution without the need for scaling the images.

Speakers

These are output that are used to play sound .They may be inbuilt into the system unit or can just be connected using cables.It helps the user to listen to music and hear any sound effect in the computer .

Printers

It is an output device that output the text data onto paper .There are two main types of printers that are ink jet printers and leaser jet printers .They can print black and white or colour .The leaser printer s generaly faster and are able to handle heavy use.

THE CONCEPTS OD DATA AND INFORMATION

Data:

Refer to collection of unprocessed ,meaningless ,raw facts and figures, numbers and symbols.data is not a good basis for planning or decision making eg.

Musical notes

Letters A,B,C etc

Numbers eg 1,2,3

INFORMATION

Information refers to processed /organized /meaningful/summarized data .Eg processed report,musicwords like cat ,boy from combined letters.

FORMS OF DATA

Text data

Sound data

Graphical data

Numerical

The difference between data and information

Other forms of data includes

Currency .data expressed in monetary valve

Number (0-9)

Date and time

Memo

Text,data constructed from letters of alphabet, or a combination of leeters of alphabet and numbers

Image

Voices

The concept of data processing

The processing is the activity of muniplation of raw facts to get meaningful information

Or data processing is the process that involves transformation of data into information.

Information processing cycle

These are steps that are taken to convert raw facts ,which are data into information .it starts with data collection .

The 4 basic operation s of information processing cycle are input, processing ,output,storage/distribution

A computer is the machine that perform the cycle

The sequences of events that make up the information processing cycle include.

Input :it involves entering data into the computer

Processing :it involves performing operations on the computer

Output : it involes presenting the results to the computer user

Storage:it involves saving or keeping of data for future use .it can be done on an external storage media or intenal.

Steps of information processing cycle

Data collection or the data origination

This is looks at the sources of data which could be from customers,source,documents like receipts invoice etc.

Preparation stage

This involves getting data ready for input through coding ,editing etc

Data inputing :this involves entering of data into the current system ,upon which data is validated so that correct results are given at the end of the cycle .The commonly used input devuces are ;key board ,mouse,scanners,baecode readers and others.

Processing : under this stage a computer processes the entered data ,which makes data usable .The system used for processing ,as long with data entered will decide the kind of out ,which the user will get.

Outputting :this stage involves transmission and communication of the processed information to the user .There are different forms in which output can be given to the user .it can be inform of a print ,report, and it can be inform of a video ,images or graphics .

The commonly used output devices include; the monitor ,speakers , headphones, printers, and others.

Storage:After data has been processed,it is now stored for future use.Its canbe stored on either internal storage media hard disk ,CDs,DVDs ,floopy disk drive kept for future .At the same time retrieving the data is an easy tasks as kept for future. At the same time retrieving te data is an easy task as well.The processed information can be stored for future refrence.

Information processing systems

Batch processing system

A batch processing system is one where fdata are collected together in a batch before it is being processed .The method of data entry for the early computers was using purched card ,which were bandled in batches ,and hence the term batch processing .This system is most suitable where large amount of data is to be handled on regular basis

Example of batch processing

Payroll system and report card systems

Advantages of batch processing system

Jobs can be scheduled for time when the computer is not busy

The computer is only used for a certain period of time for the job.

It is suitable to such application as payroll, and the preparation client, patients or customer bills

A computr using batch processing can process large volume batches lof instruction or files sequentially

Batch processing allows volumes odf work tp process without hands-monitoring

Disavantages batch processing system

It involves an exepensive computer and large number of trained staff

It requires sorting ,and reqires sequential file organization

There is always a delay before work is being processed and returned

Since the master file is updated only periodically ,there is a potential for master file to become out of date if transacting are not processed frequently.

There is no interacting ,onc a batch process begins ,an operation cannot interjecting himself into process without stopping the process completely.

Real-time processing systems

A real time processing system is one that processes data without significant delay .Examples of real time processing system;and missile defense system ,electronic fund transfer systems and ticket reservation system.

Advantages of real-time processing system

There is no significant delay or response

Information is always update

Output from the computer can be used to adjust and improve input.

Disadvantages of real-time processing system

The computer can be dedicated sorely to the task

The computer must be continually online

Interactive processing systems

An interactive processing systems is one that involves communication between the user and the computer during processing .Examples of an interactive processing system include ;

Electronic fund transfer sysytems ,ticket reservation systems , and point of sale systems

Advantages

EFTPOS terminals provide much faster method of payment than cheques and credit cards .

Disadvantages

There is a risk that the debit cards can be stolen or forged

Some people believe that cards encourage people to spend more.

Time sharing processing system

This is a processing where the central processor serves two or more users with different requirements at the same time .in this case the CPU is therefore available to a variety of users connected to the central computer via communication links .Time is therefore allocated usually to all users to be to accomplish their tasks.

Advantages of time sharing system

The problem of die time is solved since the processor cannot wait for solver peripherals .

Inquires are possible since the files are held online.

Better services provided given the pace at which information is realized or vailed.

Disadvantages

Users do not control over the central processor

The response time is a bit slower given many tasks to be accomplished

Multi-tasking system

This is one that can handle a number of jobs at the same time.An example of multi-tasking system is typing in word processing while listening to music on CD-ROM

Advantages

Multi-tasking can greatly increase productivity as many tasks are run at the time thus reducing time

Work is less tedious

Disadvantages

It can be a source of stress that can impact on people’s healthy and wellbeing.

Multi-tasking can lead to demployees to lower their intelligence

Because some projects or work require a person’s undivided anttention

Methods of data processing

1.Manual systems

It refers to the system of data process which does not make useof stored program computing equipment or

This is where data processing is carried out manually by human clerks whose effort are aided by some calculating tools like logrithims ,calculators such as card -programmed calculators,pens,rulers etc

Advantages

Cheap

Simple to understand

Power failure doesnot affect system

Disadvantages

Slow .it takes a lot of time to find particular information and put it in more useful way

Rigid information is normally kept in predefined order and may not be transformed to another from easily

2.Elecronic /computerized processing system

This is where data input is first converted into machine sensible form machine language by relavant input media before processing and automatically processed by computer under the influence of a set of instructions (programs)

Advantages

There is high rate of efficiently and productivity .

The running costs become lover in the long run

Computers can share information or data with other computers

Computers can store large amounts of data for future use

Tasks can be completed in shortest time possible

Customers services can be improved due to efficiently management and opereations

The reliability of modern computers enable computers to produce consistent results.

Diadvantages

There is loss of face to face interaction among the staff

Initial investments coasts may be high

There is health effects associated with the use of computers for data processing such as eye strain,backache etc

It requires sprcialised staff hence increased extra coasts

Virus attacks that can affect the computer system hence data loss

Failure may araise when computers cannot be used either because they are mulit-functioning or damaged which can bring an organization to halt if there no backups.

WORLD OF ICTs

Information Technology and Information Communication Technology

Information Technology

Is the combination of computer and communication technologies to process data into information

Or

Is defined as the science that supports the activites involving creation,manipulation and communication of information together with it’s related methods,management and application

Information Communication Technology is defined as the convergence of information technology, telecommunications and data networking technology into a single technology

Uses/application of ICTs in Business.

1. Record keeping. The computers can be used in keeping of records. There also programs such as quick books, pastel, tally and others that are used in keeping of the organizations records
2. Communication. Computers provide a business with a vast array of communication methods that include; chatting, instant messaging etc.
3. Research. Computers can be used to carry out research through the internet about the products to offer and information about the competitors.
4. Budgeting and forecasting. Computers help in preparation of the budgets
5. Used for advertising. Through the use of websites it makes company information to be availed to everyone worldwide.
6. Accounting. Companies use computers and accounting programs such as quick Books, Tally Pastel etc in preparation of financial statements like incomes statements, balance sheet etc.

Uses /application of ICTs in education

Take college classes online(i.e., cyber classes)

Produce assignment and reports

Learn to speak a foreign language

Help youngsters to read, write, count and spell

Preparation of documents. In higher education lecturers require their students to turn typed documents.

Self education .In addition to books, videos and other materials ,self directed learners often use computers to continue their education outside the class.

Computer based training, which includes:

Computer Assisted Instructions (CAI) , so that teachers can use computer and other IT equipment to present teaching materials in a more interesting way.

Computer Assisted Learning (CAL) ,so that the students can use computer s and appropriate software to learn at their own pace .

Computer Assisted Assessment (CAA),which may reduce the time and labour to mark the answer sripts.

Distance learning through computer-based training and web-based training .Simulations of expriments or real –life situations that may be hazardous

Electronic library system for searching ,borrowing ,and returning books

The school Adminstration and Management system(SAMs) for keeping records of students and producing report cards or other related documents.

Edutainment, which is a type of education software that combines education with entertainment

Advantages of using ICTs are learning and teaching include ;

A CAI and CAL package that usually contains multimedia effects making learning more interesting and interactive .

Students can learn by themselves when teacher students learn by themselves when teacher is not available

Students can usually learn and proceed at their own pace

Students can usually get their results or feedback immediately after they have answered the question or taken an action.

There are rich educational resources on CD-ROMs and the internet

Teachers can present subject matter and explain abstract concepts more clearly with multimedia

Teachers can explain experiments that are difficult to perform or dangerous in nature through simulations software .

Advanced instructions can be given to students in areas where the teacher may not be qualified.

Disadvantages of using IT in teaching and learning include

Face to face interaction between students and teachers may be reduced.

Students can only follow what the CAL packages are predefined offer

Uses/applications of ICTs in office

Create memos ,letters and report

Calculate payroll ,prepares income statements and balance sheets

Track inventory and generate invoices and receipts

Present projects and ideas by means of presentation graphics software

Use of facsimile ,electronic –mail ,electronic bullrtin ,and video conferencing.

Use of document processing system to facilitate data entry

Use of telecommuting, so that employees can work away from company’s place standard workplace

Create websites to provide selected information advertise products and services , and conduct e-commerce.

Applications of IT in banks/finance sector

1.Automated Teller Machine(ATM)

An automatic teller machine(ATM) is a self service bank machine attached to a host computer through a tephone network

Services available through an ATM include

Make deposit of cash and checks

Withdraw cash

Transfer money between accounts

Application for a check book

Obtain account balances

2.Make deposit ,witdraw cash and transfer money between accounts

3.recieve information on bank account balance

4.Online banking

5.Transfer money electronically among different accounts

6.Loan and credit card applications

7.Obtain credit card statements , bank statements, and account balances

8.Download monthly transaction information

9.Use of magnetic ink character recognition(MICR) to process cheques

10.Use of microfilm and microfiche to record transactions

Electronic commerce (e-commerce) is a financial business transaction that occur over an electronic network ,such as the internet.

Online shopping and banking are two popular types of e-commerce that uses either electronic money(e-money) or electric data interchange(EDI)

E-money is a means of playing for paying for goods and services over the internet

EDI is a set of standards that control the transfer of business data

And information among computers both within and among companies

E-commerce business can be grouped into three basic models :

Business –to consumer (B2C) e-commerce consists of sale of goods to the general public

Consumer-to-consumer (C2C) e-commerce occurs when one consumer sells directly to another , such as in an online aution

Business-to-business (B2B) e-commerce consists of business providing goods and services to another business

Advantages of e-commece include:

Transactions can occur instantaneously and globally ,thus time for participants on both ends

Transactions can occur 24 ours per day

Business have acces to millions of people with internet connections

Business have ability to gather customer information analyze it,and react if appropriate

Information can be changed and be available quickly

Customers can compare prices easily

Feedback can be immediate

Manufacturers can buy and sell directly, avoiding the cost of middle men

Distubution costs for information is reduced or eliminated

Use Applications of ICTs in art,leiure and entertainment

Play computer games

Listen to music

Watch a video or movie compose and edit video

Retouch a photograph

The interet can be usd to book tickets for concert or visit tol the cinema

Read a book or magazine online

Plan a vacation

Digital camera have revolutiopnised the hobby of photograph,photo editing software allows images to edited and manipulated.

**Uses/Application of ICTs in industries / technical and scientific**

Data sensing and logging

Robotics to feedback form the outside world

Robots are are best used for jobs that require :

Repetitive tasks

Lifting heavy equipment

High degrees of precision

Spray painting

Quality control

Sewing machines in large industries are computerized .

Design systems:computer programs are used to design the model of product on the computer.This process is called computer aided Design.we can test the designed product with the help of computer.

Automated production systems:computer -controlled robots are used to assemble cars.The system work faster than human beings .Another popular and efficient use for computer-controlled robots .

Computer aided design and computer-aided manufacturing

Computer-aided designing (CAD) software is mainly used for creating engineering ,architectural,and scientific drawings.

Three –dimensional(3-D) CAD programs even allow users to rotate designs of 3-D objects in order to view them from different angles

Popular CAD software includes Autodesk AutoCAD and Microsoft Visio Technical

Uses /applications of IT in health care

Maintain patient records in hospitals and clinics

Medical imaging,tests and medical procedures where specified components of the human body is scanned

Monitor patients vital signs in hospital rooms and at home.

Computer Assisted Medical tests

Research and diagnose medical conditions

Implant computerized devices(eg pacemakers ) that allow patients to live longer

Use computerized –controlled devices during operations that require great precisions (eg laser eye surgery and heart surgery)

Telemedicine through computer-aided surgery for training prior to perform sugery on live humans

Uses /applications of ICTs in politics and governance

Website communication, government ministries design websites that talk about specific ministries and the services they offer.thus if you want to get information from the government ministry you just have to go online and download the information.

Video conferencing equipments such as projectors that help in public workshops,seminars and conference.

Digital cameras help capture images that are useful in courts of law in case the government wants evidence .

Distributing payments .state and fedral offices use computer or didtribute payements ot it’s people ,thus can be done electronically like social security payements.

Record keeping,this canbe done through creating database management systems for public employees, it’s citizens.

Uses of internet

Computers use the internet for electronic commerce ,also called e-commerce including advertising ,selling ,buying ,distributing products and providing customer service

In addition companies use internet for business-to-business transactions ,such as exchanging financial information and accessing complex databases.

Businesses and institutions use the internet for voice and video conferencing and other forms of communication that enable people to telecommunicate (work away from office using a computer).

The use of electronic mail(e-mail) speeds communication bewteen companies , among workers , among individuals.

Media and entertainment companies use internet for online news and weather services and broadcast audio and video including live radio television programs.

Online chat allows people to carry on discussions using written text.

Instant messaging enables people to exchange text messages in real time.

Scientists and scholars use the internet to communicate with colleagues , perform research ,didtribute lecture notes and course materials to students, and publish papers and s

Indiviuals use the internet for communication , entertainment,finding information , buying and selling goods and services.

Disadvantages of internet

It has led to high level of moral degradation

It has led to high levels of virus infection

It has promoted high level of forgery

It has promoted high level of pornography

High levels of spamming

The internet is addictive

Implications of using ICTs

Positive implications

Enhancement of of efficiency –ICT has brought the ability among workers to produce good results by using the available time, money, supplies etc in most effective.

Communication. This has been enhanced by the development in the communication industry eg E-mail, skype, facebook etc

Networking . This is basically use of computer and other resources thus eliminating duplication of data and other resources in thee organization

Security. Computers have generally improved security through computer development of security conscious gadgets like automated gates CCTV cameras

Service delivery. It has stimulated a sustainable flow of information and interlinking the various stake holders within various businesses

Entertainment .For example playing computerized music , games, computer games etc

Enhancement of employment opportunities eg computer teachers, software engineers etc which has created employment opportunities.

ICT explore and facilitates scientific research eg. Solving the problems of physics and engineering design , explore relations of biological and physiological processes

Negative implications of ICTs

Health problem . Computers have affected health standards of human life for instance light from the screen affect eyes, sitt5ing down causes back pain etc

Fraud. This is where one commits unacceptable activity as the way of getting organization’s information or data without permission from the owner eg stealing money from one account to another in the bank.

Moral degradation .Through the pornography literature, message ,clips etc which have led to loss of cultural values.

Cost of production .This is because computers are ex pensive to buy and maintain hence m increased prices.

Unemployment . It has negatively affected the society by replacing the workers with no computers.

Computer viruses .These are considered the greatest nightmare because they attack once the computer system and destroy it within a minute leading to loss of information.

Death and accidents .They cause death an d accidents due to computer explosions.

Over reliance on computer. This has come up due to over dependence on computer making them do everything hence ca7using mental decadence

GREEN COMPUTING

Green computing green IT & ICT sustainability , refers to environmentally sustainable computing or IT .Green computing is environmentally responsible use of computers and related resources

Green computing involves the implementation of energy –efficient central processing units(CPU), servers and peripherals as well as reduced resources consumption . and proper disposal of electronic waste.(E-waste)

Goals of green computing

Reduce the use of hazardous materials.

Maximize energy efficiency durimng the product’s life time.

Promote the recyclability or biodegradability of defunct products and factory waste .

There is a need to make the use of computers as energy -efficient as possible.

How green computing is being applied

Power-down the CPU and all peripherals during extended periods of inactivity.

Power –up and power energy intensive peripherals such as laser printers according to need.

Ues Liquid Crystal Display (LCD0 monitors rather than Cathode Ray Tube(crt) monitors.

Use notebook computers rather than desktop computers when it is posiible

Use the power management features to turn off hard drives and display after several minutes of not in use.

Minimize the use of papers and property recycle waste papers.

Dispose e-waste according to federal ,state and local regulation.

Employ alternative energy sources for computing working workstations, servers, networks and data centers

Advantages of green computing

Reduced energy usage from computing helps lower carbon dioxide emission that comes from fuel used in power plants and transportation.

Conserving resources means less energy is required to produce ,use and dispose of n products .

Saving energy and resources saves money.

Green computing even includes changing government policy to encourage recycling and lowering energy use by individuals and business

Reduce the risk existing in the laptops such as chemical known to cause cancer ,nerve damage and immune reactions in humans

Disadvantages of green computing.

It is costly , energy efficient equipment are expensive.

It requires extra training to use some gargets that are energy efficient.

TOPIC 2

COMPUTER MANAGEMENT

It consists of the following

Booting processing

File management

Common utilities

Print management

BOOTING PROCESS

Booting is the process of starting or reseting a computer involves loading an operating system into memory.

There are two methods of booting on a computer .They include

Cold booting :is the process of turning on a computer on a computer after it has been powered off completely.

The steps that occur during a cold boot using the windows operating system are

The power supply sends and electrical signal to the motherboard and other devices located in the system unit.

The CPU resets itself and looks for the ROM that contains the BIOS (Basic Input and Output System).

The BIOS executes the Power –On Self Test (POST) to make sure that the computer hardware is connected properly and operating correctly.

The results of POST are compared with data in a CMOS (Contemporary metal semi-conductor ) chip on the motherboard .

If the POST is completed successfully ,the BIOS looks for the program that loads the operating system

Once located the boot program is loaded into0 memory and executed , when then loads the kernel of the operating system into RAM

The operating system loads system configuration information , and the reminder of the operating system is loaded into RAM , and the desktop and the icons display on screen.

Warm booting :Alternatively referred to as a soft bot , a warm boot is one method of reseting a computer system that is already powered on .

Warm boot can be accomplished by press the CTRL –ALT-DEL keys simultaneously, or by selecting the restart command from an operating system menu. warm boots run faster than turning a m computer off and on gain.

Reasons for restating a computer include:

Commonly used to recover from errors that cannot be removed.

When a computer locks or freezes

After installing of a certain new software program.

After installing a new hardware device like a flash disk

After uninstalling a hardware device

After uninstalling a software program

When the computer slows down

After changing the CMOS or BIOS

When a compuiter has a virus ,it can restart itself

FILE MANAGEMENT

What is a file ?

A file is a collection of locally related records or filoes is a single document saved as single entity .It is one of the basics organisations information.

A file name is a name by which a file is identified .File names usually have three parts i.e Disk drive designation, a label and an extension which indicates file type or nature eg system file (sys,text/document file (txt/doc) and executable file (exe)

Categories of file organization

Serial file organization

Is a file organization where records are not in any specific order. Records location is tiresome consuming.

Sequential file organization

Is a file organization where records are organized in a specific logical order. Records can be organized in either ascending or descending order.Records access becomes very fast and very efficient dealing with huge volumes of data.

Indexed sequential

Allows records to be accessed sequentially in ascending key file

Sequence, and also at random typical of magnetic disks

Random file organization

Indivuals or records are stored randomly without following particular sequence of the key field.

Inverted files

Is a file organization where no single key can retrieve a record ,but rather a combination of keys .

Items possessing specific feature are grouped together to form an inverted file

A combination of keys known as “attributes” are used to search for a record.

Files are not arranged in any particular sequence on the storage medium.

Direct Access method

Files are not arranged in any particular sequence on the storage medium .

New files do not need to be sorted and can be in any of the following forms:

Full index

Partial indexing

Self indexing

Algorithmic address generation

TYPES OF FILES

Mater files

These consists of records that are relatively permanent .Basic characters include:

Remain in the system indefinitely

Contains primary /basic data

Records occurrence remains active for long time period of time eg cost

Accounts files , Employees files ,inventory files etc

Scratch files

Also called work files or temporary files

These are files that contain temporary files

These are files that contain temporary files duplicates or subsets of master or transactions

Files. Scratch files arwe usually created ,used and disposed off. I.e they are single task files eg. Re-stored customer files

Table files

File used to store tabular data thar changes relatively infrequently y .they are typically loaded , as is , into the programs that use them. Eg payroll tax system tables and insurance actuary tables.

Other types of files

Program files, these are n o typical of the following extensions exe, com, DLL and DRV for machine language instrument files (program)

Data file

Master files ,transaction files, scratch files , and tables files all contain data

They are typical of the following extensions

Doc (4 document files),DAT ,DBF and MDB (4 Database ) and XLS and WKS (4 spread sheets)

ASCII files (American Standard Code for Information Interchange)(as-key)

Files for text only without any graphics

They process the extension .TXT

Image files

They are files with digitized graphics eg arts photographs. They are typical of the following extensions, TIF , EPS, JPG, GIF and BMP

Audio files

Files with digitized sound data. Common extensions are WAV, MID etc.

Video files

Digitized video files for conveying moving clips/images over the net eg .AVI and MPG files.

Etc files

Expected questions under file management.

Distinguish between a file and folder

A file is a single document saved as a single entity.

A folder is a virtual container within a digital file system, in which groups of files and other folders can be kept and organized.

File extension refers

State ways you can safe guard against file loss in your computer

Data encryption

Inserting a password

File and folder locks

Backing up data

Use of biometric devices

Sensitizing users

Use of data recovery software

Penalizing offenders

Use of anti-virus program

Activation of firewalls

E one function of file extension to a user

Is commonly used to imply information about the way data can be stored in the file .

Mention two default icons found your computer desktop .

My computer

My document

Recycle bin

internet explorer

My network places

How do you rename a file on your desktop

Right click file

Select name

Type the file name

Give one function of screen burn out saver screen on your computer.

Reduces the rate of screen burn of CRT monitor

It is used for entertainment

It is used for security purpose

Used for advertisement used to create log in menu for certain

When Microsoft windows Xp is installed on a computer ,it creates four system folders

Documents and settings, This folder contains a sub folder for each user profile-each user has logged on the computer or who logged on a network domain through the computer. Windows Xp may create multiple profiles for one person if that person logs on in different ways .For example , you might have one folder for when you are not logged on to the domain.

Program files –This is the folder where most programs install the files they need in order to run .When you install a new program ,you are generally given opportunity to change the installation folder, if you accept the default , the program is installed in in this location .

Temp .The operating system and various other programs might store temporary files in this folder .

My documents , This folder is a convenient place to store documents , spreadsheets and other files you want access quickly.

My pictures, This folder of my documents has special capabilities for handling picture files

My music, This folder of my music has special capabilities for handling music files.

Folder types included

Documents

Pictures

Photo Album

Music

Music artist

Music Album

Videos

COMMON UTILITIES

What are utility computer programs ?

Utility programs are part of system software which are designed to configure , analyze , optimize and maintain a computer in it’s working operations.

States uses of utility programs in your computer

Anti-virus utilities: scan for computer viruses and remove them .

Backup utility : can make a copy of all information stored on a disk and restore either the entire disk.

Data compression utilities :output a smaller file when provided with a stream or file.

Disk checkers :scans the content of a hard disk to find files or areas tha ………………………………………………

Disk cleaners: finds files that are unnecessary to computer and decide to delete.

Disk compression utilities: transparently compress/ uncompress the contents of a disk, increasing the capacity of the disk.

Disk defragmenters: increase efficiency by moving data to one side of the disk.

Disk partitions :divides an individual drive into multiple logical drives.

Disk space analyzers :to get the size of each folder / sub folders and files in folder or drive, showing the distribution of the used space .

Disk storage utilities: ensures that data is stored data files arranged in order of ascending .it also helps the computer to re-arrange data files.

Archive utilities : output a stream or single file when provided with a directory or set files . Archive utilities , unlike archive suites , usually do not include compression or encryption capabilities.

File mangers: provide a convenient method of performing routine data management tasks , such as deleting , renaming, cataloging, un cataloging, moving, copying , merging etc

Cryptographic utilities : encrypt and decrypt streams and files

Hex editors: directory modify the text or data of a file.

Memory testers: check memory failures

Network utilities: analyze the computer’s network connectivity, configure network settings ,check data transfer or log events.

Registry cleaners: clean and optimize the windows registry by removing old registry keys that are no longer in use .

Screen savers: were desired to prevent phosphor burn-in on CRT and plasma monitors modern screen savers are used primarily for entertainment or security.

System monitors :for monitoring resources and performance in a computer system.

System profilers: provide detailed information about software installed and hardware attached to the computer .

Sorting utility : for organizing files in any choose order

Merging and combing utility: merges or combines different file in one .

Diagnostic utility: compiles technical information about computer’s hardware and certain system software programs and then prepares a report g outlining any identified problems .

Debuggers :helps a computer to find out errors and fixes it.

Data recovery: enables the user to get back all the data that might have been deleted or lost by virus from the computer .

System recovery : enables the user to get back to the last best known configuration settings of a computer.

Uninstall utility : it enables the user to remove an application program and it’s associated attributes from the system.

Print management

You can print from windows explore r without first opening file . this can be great timesaver if you have several documents that don’t need to be changed -just printed using the default print settings .

To print from windows explorer , open the folder that contains the file you want to print on the short menu.

If necessary , turn on your printer , and navigate to the computer fundamentals practice folder in windows explorer , then the part II folder , then the lesson 02 folder

1.Right click b the AW what’s New file

Windows personalizes the open with command on the short curt menu .

The next time you click open with, submenu appears , showing programs you have used with this command , you can click one of these programs, or you can click choose program to open with dialog box .

Windows keeps track of the previous 15 files you opened, so you don’t have to navigate through folders again to reopen a file you recently opened .To quickly reopen a file , click start menu and then click the name of the b desired on the My Recent Documents menu.

TOPIC 3

COMPUTER LAB CARE AND MAINTAINCE

It contains the following

Computer literacy

Secure lab environment

Servicing and maintaince of computer system

Computer literacy

Computers literacy is defined as the knowledge and ability to use a computer s and related technology efficiently , with a range of skills .Skills may be categorized into three ways

Basic computer skills

Knowing how to switch on the computer

Being able to use a computer keyboard

Being able to use a mouse to interact with elements on screen of computer

Being able to shutdown the computer properly after use .

Intermediate skills

Functional knowledge of any application

How to use e-mail

How to use the internet

Installing software

Navigating a computer ‘s file system

Advanced skills

Programming a computer

Understanding the problem of data security

Use of computer scientific research

Fixing software problems

Repairing computer system.

System start –up

Start-up programs

These are programs that start automatically every time the computer is being turned on. Some of these programs are visible ub the system Tray(lower right hand corner of your computer ). Many start up programs particularly malicious spyware and adware will not be visible in the system Tray , instead m the start up programs will be running in the background eating into your system memory and causing your computer to run slower .Many start up programs are critical to running your computer- don’t disable them useless you know for sure they are not necessary .

Location opening and application program

What is an application program?

An Application program is defined as software that is designed to perform a specific activity for the user. For example word processing software ,spreadsheet , presentation software etc.

How to locate a missing application

Click “start menu” at the button left corner . A menu appears .

Click “Find” or “search” .The “search the results “ windows .

Opens

View the “what do you want to search for “ menu on the left.

Click “All files and folders”. A search pane opens up .Type the name or part of the name of program you want to search for in the top box .

Click the arrow at the end of the “Look in” box .A menu of all your computer file locations opens up . Choose “Local Hard Drives” from the list .This is usually C if you only have one hard drive . It may be two letters if you have two hard drives .Add any other information like size if you know it .if not just click search .

Your computer will now search for the program. Each finds a copy of the program or any other file containing the right side of the program window .

Click ”stop” when your program is displayed wait until the computer finishes searching the program on the computer .

Look at the files listed .The tittle and file path will be displayed .can’t see the fi le path click view at the top of the search page . Click “Details” on the menu .Pay attention to the full file name .The path will tell you where to find your missing file .

Click on the program name to go right to the program.

When you want to use a program on your MS windows .equipped computer , you first have to open it

How to open a program on the computer

Go to your “ Start” button and click it. This is located at one end of your task bar.

Scroll up “All programs” and wait for the program menu pop up .If you have previously used the program ,then it may also be found some where in the row above

Locate the program that you want to open and click on it. Depending on where your desired program is stored , you may have to look for it on the secondary menus .For example if you want to use a calculator , you first have to go to “Accessories” and then locate the calculator on the secondary pop up menu.

Secure Lab Environment

The computer lab is a place where students learn practical uses for computers , such as programming or how to use spreadsheet program

The following factors must be considered when preparing computer laboratory.

Security of computers , programs and other resources

Reliability of the source of power

The number44 of computers to be installed and availability floor space.

The maximum number of users that the laboratory can accommodate .

Safety precautions of practices in the computer laboratory

Just like any other science laboratory , the computer laboratory should be setup with safety precautions in mind . Measures should be put in place to protect the machines from theft or destruction and users from accidents .The laboratory must be aware of correct behavior and safety rules that they should observe in order to avoid accidents ,danger or injury .

Computer laboratory safety measures can be divided into :

Those that are meant to protect the users

Those that are meant to protect the computers

Behavior in the computer laboratory

The following rules must be followed in and around a computer laboratory.

Avoid smoking or exposing computers to dust. This is because smoke and dust contain small abrasive ps that can damage computer components and cause wearing of moving parts.

Avoid carrying food and beverages to computer room. Food may fall into the moving parts of the computer and damage them .Liquids may spill into computer causing rusting or electrical faults .

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

At all times follow the correct procedure for starting and shutting down the computer to avoid loss of data and damage to computer programs .

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

Measures that protect computers

Burglary proofing the room

This involves fitting grills on doors ,windows and the roof to deter forcefull entry into the computer room. Installing an intruction detection alarm system and employing security guards also increases the level of security alertness against theft of computers and their accessories .

Installing fire prevention and control equipment

The recommended extinguishers are the gaseous type and should be non-liquid/ non- power based .This vis because liquids may cause rusting and corrosion of computer friction and wear off moving parts .The ps can also cause disks to crash.

Providing stable power supply : by installing the surge protectors, power extensions and power backup generator .

Installing lightening arrestors on the computer room

The room should be well laid out with enough space for movements. Computers should be placed on stable ,wide enough desks to avoid accidentally knocking them down. Cables should be aid in trucks away from the user’s parts to avoid stumbling on them .

Dust and dump proofing the computer room. Dust can be controlled by fitting good window curtains and air conditioning system that filters dust ps from the air entering the room .Also computers should be covered with dust covers when not in use. On the other hand , dampness or humidity in the laboratory can be controlled b y using dehumidifies .High humidity leads to rusting of metallic parts of a computer

Cables and power sockets should be well insulated and of the correct power rating to avoid short circuits that can damage computer components.

The users should not eat or drink in the computer laboratory. Food ps may fall in moving computer parts like the keyboards and clog them while liquids may pour into electrical circuits and cause short circuits

Measures to protect thee user

All cables should be insulated to avoid the danger of electric shock to the users .

Cables should be laid away from user parts to avoid tripping on them .

Providing standard furniture to avoid poor posture machine use which may led to strain in jury and limb fatigue .The table should be right relative to the seat to provide comfortable hand positioning . The seat should have an upright backrest and should be high enough to allow the eyes of the user to be same level with the top screen .

Providing antiglare screens (light filters) and adjustment screen to avoid eye strain and and fatigue caused by over Bright Cathode Ray Tube (CRT) monitors . however , modern float panel displays such as the Liquid Crystal Dispay (LCD) do not strain the eye hence need not be filtered screen

The room should be properly ventilated to avoid dizziness caused by lack of adequate oxygen and allow the computers to cool.

The walls of the computer room should not be painted with over bright reflection oil paints and screens should face away from the window to avoid glare caused by bright backgrounds

Overcrowding in the computer room is not allowed . This may cause suffocation .

Running and playing in the computer room is not allowed .

Software security measures in the computer lab

Computer s shared by many users in the lab should have security software installed .This software may limit , trace or block certain activities or may quickly restore computers back to their original . Eg Deep freeze

Laboratory computers should be assigned with a unique , authorized login for authentication before granting like network acess

There should be use group policy or security software to prevent to malicious software from being installed and executed .

Computer labs in schools should use class room management software installed to manage and remotely control student computers.

Computer labs in schools witth high number of computers

Examples of lab security tools

Disk drive locks

CPU enclosures and plates

Computer locks desktop

Convert locks to protect your USB drives and disk drive locks to block the access

PC tab alarm

General laboratory rules and regulations

Below are the suggested rules and regulations for lab users

Students are prohbited to access the lab unless they are permited by the teacher or instructor.

Don not remove any hardware from it’s original postion

Do not attempt to repair or tamper with any equipment in the lab

Scan any diskettes that are to be used in the lab

Report any problem to the teacher

Do not remove or load any software in any computers in the laboratory

Do not change any settings in the computer

Do not bring in bags , foods and drinks in the lab

Turn off the computers after use in a proper way .

The lab should be kept clean and tidy all the time , leave the shoes out if possible.

Internet facility is strictly for academic purposes

Switch off alln the power supplies before leaving the lab

Avoid noise tom allow concentration

Incase the lab is well aerated , windows should be kept closed to avoid insects from damaging the computers.

Avoid playing with in the computer laboratory.

Servicing and maintenance

Importance of servicing and maintaining a computer

To ensure that the computer continuously work

To ensure performance and efficiency of a computer

To have a working computer

To take out dust that spoil ssome internal parts

Inorder to upgrade and update the computer’s life is guaranted

To reduce –costs of lonf run replacement and repairs

Computer upgrades are useful in adding new features on your machine thus making the machine more user friendly .

Cleaning the computers

Cleaning of computers and their peripherals help to keep the components and computer in good working condition and help keep computers from spreading of germs .

How to clean a computer laboratory

Shutdown all the computers , and turn off all power strips still on to avoid the risk of electrical shock or damage any components

Wipe the keyboards .accordding to Dr. Gerba of Arizona University ,there are about 95,600 bacteria per square inch on the average computer keyboard .Since there are likely dozens of different people touching the key board in your computer lab, wipe them down thoroughly and often with antimicrobial wipe .Using key board duster to remove crumbs andd other ps from in between keys.

Clean each mouse .A mouse has an everage of 10,600 bacteria per square inch , according to Dr.Gerba .use antimicrobial wipes gently cleanses the computer mouse to avoid getting it too wet .

Clean the tops of the computer desks .As mentioned earlier desktops are one of the biggest culprits of bacteria . use antimicrobial wipes them at least once a day.

Wipe buttons .There are several buttons on a computer to where well as the monitor that always being on touched by new fingers .clean them gently with antimicrobial.

Dust the monitors .Use dryer sheets tto remove any dust from the monitors .

Sweep the floors .The floors is likely to be riddled with crumbs and other bits of trash. Sweep the floor with a broom if you have a tile or hardwood floor.use a sweeper or vacuum for carpeted floors.

Wipe down the chairs .About once a week , clean the chairs with some antimicrobial wipes , as these are another commonly overlooked home to bacteria.

Changing tools used in computer cleaning

Antimicrobial wipes

Water or rubbing alcohol

Portable vaccum ;sucking the dust , dirt ,hair ,cigarettes and others out of computers can be the best method of cleaning a computer ,do not use standard vacuum it generates a lot of static electricity that damage your computer .

Cotton swabs, cotton swabs moisture with rubbing alcohol or water is excellent tools for wiping hard to reach areas in your keyboard,mouse, and other locations.

Foam swabs, whenever possible, it is better to use lint –free sawbs such as foam swabs.

SOFTWARE UPDATE

A software update provides bug fixes and minor software improvements and is made available by free download. Software updates sometimes includes new drivers to support the latest hardware such as printers ,CD drives aand DVD drives .A ssoftware update sometimes called a software patch because it is applied over software that you already have installed.A software update does not provide a full software package installation.

Ways of software update

Update your PC software .visit the developers website and search for the new updates , look for updates meant for your operating system that can easily download and install .

Expect to pay a fee for some software updates .Some of the companies that do this will sell updates to current owners of the earliest version of the program at a discount.

Use the automatic update feature of your anti-virus program.

Start your ant-virus program and click on “update”. The program will take care of the details .You can also enable the program to download new update automatically whenever you go omnline

Watch for prompts from you programs, especially anti-virus programs , will send a pop up box informing you that it is time to search for updates or that a new update is available.

Prepare your computer tto large downloads .Some software updates are large files that will take a long time tto download. Adjust your memory cache to fit the size of the file you need to download.for internet explorer select “internet” options from the menu , click the “general “ tab and select “ settings”, adjust the slider to amount of momery you need .For netscape , select in the following order , “Edit” “preferences”, “Advanced “ and “Cache” .Adjust the memory cache.

SOFTWARE UPGRADE

A software upgrade is a purchase of newer version of software you currently use of more fully –featured version of your current software .

Or

The term software upgrade refers to the replacement of a product with a newer version of the same .product.

Common hardware upgrade

Installing additional memory(RAM)

Adding larger hard disks

Replacing microprocessor cards or graphics card

Installing new versions of software

Common software upgrade

Changing the version of operating system

Changing the version of an office suite.

Changing the version of an anti-virus programs or various other tools .

Reasons for upgrading updating software

Updating software ensures that your computer has the most up to date information.

Updating software is also important because it puts in place limitations and changes to the security of the product. This way the program works to protect your senstive information .

Accessing new features .It helps your computer to access new features that have not been existing in the current version.

Bug fixes . some bugs are major that the software is rendered effectively

Useless for it primary purpose.

Security updates .To ensure t hat the computer security is updated to make the computer secure.

External dependence . sometimes external pressures can force you to upgrade your software.

SYSTEM INSTALLATION

Installation(or set up) of a computer program(including device drivers and plug ins), refers to the act of making a program ready for execution .

Installer ;an installer is a computer program that loads files, such as applications, drivers or other software onto the computer . Some installers are especially made to install files they they contain, other installer are general purpose and work by rendering the contents of a software package to be installed.

Common activities performed during software installation.

Making sure that the required system requirements are present

Checking for existing versions of the software

Creating or updating the program files and folders .

Adding configuration data such configuration files ,window registry entries or environment variables.

Making the software accessible to user , for instance by creating links , short curts or bookmarks

Configuring components that run automatically such as windows s

Configuring components that run automatically such as windows services

Performing product activation .

Types of system installation

Attended installation :It is the most common form of installation .An installation process usually needs a user who attends it to make choices such as accepting or declining an end user license agreement, specify preference such as the installation location . supplying passwords or assisting in product activation.

Silent installation : Installation that does not display messages or windows during it’s progress. All silent installation is unattended but not all unattended installation is silent .The reason behind asilent installation may be convenient,malware is always installed silently.

Headless installation :installation performed without using a computer monitor connected .Since a headless connection doesnot need a user at the location of the target computer, unattended headless installer may be used to install computer software on a multiple machines at the same time.

Scheduled or automated installation:an installation process that runs at a prest time .For instance a system administrator willing to install a later version of computer program that is being schedule that installation to occur when that program is not running.

Clean installation :Refers to the one that is done without interfering eleme nts such as old version of the computer program being installed r leftovers from a previous installation,

Which the target disk partion is erased before the installation

Network installation : An installation of a program from a shared network resource.

How to install A new operating System on a computer

If your computer has got challenges and you want to reinstall your current operating system or install a totally new one, it is simple but very time consuming .

How to reinstall ,upgrade, or start a fresh installation of an operating system on a computer.

Requirements .

A computer

A CD or disk with an operating system

Some basic knowledge that may help you install very well

A powersource to power on the PC

STEPS

Decide what you would like to do: Are you going to reinstall your operating system because of problems ,upgrading your current version , or are you installing an operating system on a new computer .Make sure that you have a new operating system install program .Windows and Mac require that yyou purcharse CD or DVD ROMs , Ubuntu and Linux are free and can be install from a flash drive too.

Backup your data :If your installing your operating system it is likely that you nedd to wipe the disk.Backup your data before doing so, as so every thing on the disk will be destroyed .If you simply upgrading , it is okay tto skip this step , but advisible tto save at leat the most important files on yyour computer.

Completely wipe all information from the hard disk : This will ensure that you do not carry problems over into the new install. For instructions on how to do this watch the video at new installations of windows and Linux offer tot replace data on your entire hard disk drive. So completely wiping it prior to installation. Is necessary

Boot up

Turn on your computer and quickly enter the boot menu.the owner’s manual for your computer or motherboard should have instructions on how to do this .select the drive that contains the setup disk (and be sure you have installed it) save t he settings and exit.

Start the installation

It may take the install program a few minutes tto load , this is normal .Once it has loaded , following the onscreen instructions .If you are installing new operating on a new computer or reinstalling due to a problem ,wipe the hard disk.be sure you have sdaved every thing that you would like to save.Be sure you have save .before starting the process.

Sit back and wait

This installer may ask you for some information while it’s installing, but for the most part,just waiting is okay Near the end of the installation , the installer will ask you for last minute information , like your name, the alarmed by this , none of this information , like you name ,the name of the computer,password and time zone etc. Do not be alarmed by this information can be used to identify you, it’s all for personal preference.

Enter the product ID

If you are installing a consumer operating system lke windows ,it will probably require you to enter the product ID ,look at the back of the CD case for the product ID , or indeed, on the case of the computer if the computer came with OEM version of windows, if you are installing Linux ,this will not apply to you if it an open source variant of linux(for example Backtrack, Ubuntu, Fedora) , but will if it is closed source variant of linux(for example Red Hat , HPUX, SuSE etc

Reboot

Once you reboot the computer will finalize every thing as log you in.At this point , you may need tto Install drivers , insert any disks that came wuth your computer or it’s parts that are NOT an operating , and allow the drivers to be installed(if necessary)

Allow updates

This is especially important in windows. Allow the computer to seek updates and install them .Look for a”top 10 things to do “ list for that operating system.

Install ant-virus software.

If you are using windows with out anti-virus software while on the web, you are extremely vulunerable to all kinds of malicious programs. Before you don’t have any look for vast anti-virus, it’s free

Use it

If you are done, now what you do is totally up to you. Set password and install programs, customize, create user accounts etc. if you have ant files you backed up, you may restotre them now or just enjoy the clean slate and redo everything , whenever you like.

Uninstalling software

In the event that you wish tto remove software from the computer commercial products build in an uninstall routine when they are installed .The best method of accessing this routine is to :

Open the control panel

Click the start button

Move the mouse pointer until it is on top of the word settings

A sub-menu will appear that contains the control panel

Move your mouse to right until the arrow is over the control panel folder.

Click add or remove program icon will then allow you to uninstall software from the list.

Carefully choose the software package that you want to remove and then click the “ Add/Remove “ button.

The computer will take care of the rest, it is a really good idea to make sure that you don’t have the program running m on the computer when you install it.

**Computer Trouble Shooting**

Trouble shooting is a form of problem solving often applied to repair failed products or process. It is a logical, systematic search for the source of a problem so that it can be and so the product or process can be made operational again

How to trouble shoot a computer

Restart the computer

Many software problems will correct themselves when you restart your computer.

Check the cable wires

In case there is any hardware device that is not responding when a computer is switched on, make sure it is plugged in

Check the power source

Plug in the lamp into the power source outlet that is connected to your computer make sure it is working

Disconnect peripheral devices

Peripheral devices such as printers, speakers can be disconnected and restart the computer.

Listen to unusual sounds

Check while listening properly if m there is any unusual sound and then check it out.

Look inside your computer and check for wire that aren’t connected plugged in the properly or other faulty connections .

Start the computer from the external start-up disk such as the system software CD that came with your computer.

FINE TUNNING A SYSTEM

Fine tuning refers to the circumstances when the parameters of a model must be adjusted very precisely in order to agree with observation.

Fine tuning a computer system

Steps

Double click on the system icon in the control panel. The system properties dialog box appears .

Click once on the advance page tab at the top of system properties dialog box.

In the performance segment of the advanced page (the entry on top of the page) .Click once settings .The performance option dialog box appears .

Click once on the advanced tab of the performance option dialog box . shows the content of the advanced tab:processor scheduling , memory, usage and virtual memory.

Notice that at the button of the page there is an entry for defining the virtual paging size for your windows Xp system . Click once on the change button .The virtual memory dialog box appears .

The purpose of this daiolog box is to define the size of the paging file your system will use .You can for example toggle windows Xp professional to not provide any paging file by selecting No paging file option (although it will save on the disk space , It will inhibit your system’s overall performance). The best selection in this area is to select the system managed size because Windows Xp will calculate the size of your virtual paging file for you.After you select the option you want for this specific option , click once on set in the paging file size for selected file drive section .

Click once on OK to close the virtual memory dialog box, then select OK in the two other dialog boxes until the main desktop is shown again .

Reboot your system , and PAGEFILE .SYS will be created. You will notice that the file appears in the partition as defined in the virtual memory dialog box. Your system should now run more efficiently when several concurrent applications are in use at the same time

**How to fine tune Application performance in Window**

Here is how you modify the application performance using the following steps:

Go to start>control panel

Click on “system and security” icon

Click system in the right window , then click “performance information and Tools” on the left pane

Under control panel home , click “Adjust Visual Effect” .This opens the performance option dialog box

On the Advanced tab , select “Background services” for the computer running as server. Other wise , stick to programs if you want your computer to be optimized for running applications such as Ms Excel

Click ok

TOPIC 4

COMPUTER WORD PROCESSING I

Word processing software Also known as a word processor is a software application used to create, edit, format , save and print documents that contain text and graphics .The process to prepare and print documents by using the computer programs is called word processing .The computer programs that are used for this purpose are called word processing software

Examples of word processing software

Free and open source software

Abi word

Apache Openoffice Writer

Document Editor

Calligra Words

GNU Texmacs

Groff

JWP is a Japanese word processor , designed primarily for the English speaker who is reading or writing in Japanese

K word

Lyx

LibreOffice writer

Ted

Proprietary software

Apple pages , part of it’s iwork suite -Mac

Applix Word –Linux

Atlantis Word Processor-Linux

Documents To Go-Andriod, Ios , windows mobile , Symbian

Final draft screen display word processor

Frame maker

Gobe productive word processor

Han /Gul(a.k.a HWP)

IA writer-Mac, ios

Ichitaro - A Japanese word processor produced by JustSystem

ICopy

InteliTalk

Istudio publisher-Mac

Kingsoft writer-wuindows and Mac

Lotus Word Pro –windows

Mariner writer-Mac

Mellel-Mac

Mathematical –technical and scientific word processing

Microsoft word –windows and Mac

Microsoft word processor

Microsoft write –windows and Mac (a stripped-down Version of word)

Orancle OpenOffice Writer

Since windows 1.01 source code available from Microsoft as an example

Word perfect

Freeware

Atlantic Nova

Baraha Free Indian Language Software

IBM Lotus Symphony

Kingsoft Writer Personal Edition

Madhyam

TextMaker 2008

Online

Adobe Buzzword

Etherpad ,Real time

Google Docs

Microsoft office Online –free online service

Zcubes –free online services

Zoho writer

Historical

1st Word / 1st word plus A tari ST family and Acorn

Apple Works ne Claris Works Word processing-windows and Mac also an older and unrelated application for Apple II.

AM Jacquard systems running Type –Rite, it’s own proprietary software

Ami

Apple writer World processor –Apple II and III series

Apricot Computers super writer

Atari writer-Atari 8-bit family

Bravo

Bank street writer

Chi writer

Basics features of word processing software

Word wrap :Allows a user to type continually without pressing the enter key at the end of each line.

Find and search:Allows a user to locate all occurences of a particular character , word, or phrase.

Replace :Allows a user to substitute existing characters, words, or phrases with new ones

Macros :Allows a user to record or save frequently key strokes and and instructions ,which can be executed later by running the corresponding macros .

Clip art gallery: Allows a user to insert drawings , diagrams, and photographs into a document.

Mathematical formulae typesetting :Allows a user to typeset complex mathematical formulae within the program.. Indices of keyboards and their page numbers

Tables of contents :with section titles and their page numbers

Tables of figures :with caption titles or page numbers

Cross –referencing: with section or page numbers

Footnote numbering: it is placed at the bottom of the page to provide information to the reader.

Most word processors have ability to create and import tables,text and graphics from other programs

Copying and editing :The duplication or moving of blocks of text within the document.

Thesaurus : A built –in-allows a user to search for synonyms without leaving the word processors

Font specifications, Allows you to change fonts within a document. Forexample you can specify bold, italic, font color and underling

File management: many word processors contains file management capabilities that allow you to create, delete, move and search for files

Print :Allows a user to send the document to the printer to get a hand copy.

**TOPIC 5**

TOPIC 6

COMPUTER SOFTWARE

Software refers to scientific coded programs /instructions needed for a computer to work .there are two categorize/forms of computer software is

System software

Application software

Diagram missing

SYSTEM SOFTWARE

It refers to a category of software that enables the computer to work and as well control devices connected to it

Or refers to the software perform tasks related to the operation and performance of the computer system. It is divided into three ie

Operating system

Utility programs

Programming language

Such software is usually provided by the computer manufacturer , as it needs a close understanding of functioning and architecture of the computer hardware

**Functions of system software**

Booting the computer

Making sure that all hardware elements are working properly

Performing operations such as retrieving loading executing and storing application programs

Storing and retrieving files

Performing a variety of system utility functions

Operating system

Is a system software that performs daily activities of a computer OR these are programs that manage the computer resources

Examples include:

Windows 3.1

Windows 95

Windows NT (New Technology)

Windows ME(Millennium Edition)

Windows XP

Windows Vista

Windows 7 , 8, 8.1, windows 10

Windows server 2003

Ubuntu

Unix

Linux

Novell OS

Mac 05

Types of operating system

Windows operating system eg windows 95 , 98, NT ,ME

Networking operating system

Embedded software

Function of Operating System

It helps in processor management eg multitasking and time and sharing

Control the use of peripheral device

It provides environment that enables installation of application software.

Controls the booting process of computer.

Protects the computer software and hardware

It helps in file management

It helps in encoding devices to work with computer(configuring of devices)

Forms of operating system

Command user interface

Instructions are enterered directly by the use of a keybaord .It is very dicfult to learn and master the instructions.

Graphical user interface

Instruction are entered entered by the use of mouse in a way of clicking GUI software is :

User friendly

Interface is almost similar with CUI OS

No need to memory commands

Disadvantages of GUI

Requires much more memory and as well as the processor

Requires much more desk space to hold the files

Difficult to automate for expert users.

Utility programs

Is a system software needed to enhance housekeeping routine of the computer or

These are part of system software which are designed to configure, analyse optmise and maintain a computer in it’s operation .

Functions of the utility programs

It detects and protects a computer against computer viruses

It reduces screen burnout (ghosting ) by playing screen saver

It increases desk space by compressing data files

It checks disk errors and sometimes fix them

It stores the system functionality(ie system store)

It enables computers to sort files in order

It enables a user to merge files

It defragments hard disks

It enables a user to encrypt files.

PROGRAMMING LANGUAGES

Refers to the language used to write a compiler instruments program sotware.A person who writes a program is called a programmer.

Functions of a software programmer

He writes a computer program

He maintains program

He upgrades a computer.

Program languages

High level programming language

Low level programming language

Low level language

Is a computer program written in machine code for a language understood by a computer.

High level language

Is a computer program written in official language (known to man) but should be converted to machine code for a computer to understand

Common terms used in programming

A compiler:is a program which translates a source code program from high level language to low level language which can easily be understood by the computer

An interpreter: this is a program that translates the source program line by line while the program is running from high level to low level language.

The assembler:this translates instructions from assemble langague to machine code language or the binary code .

The linkers:these combine compiled programs and determine where the program will be located in the memory

Language processor:these have translate high level languages to machine code languages which the processor can understand .They are used to work backwards to the processor.

Language editors :are application used to write computer language like notepad, touble c , borand, ANS etc

Examples of high level language include.

C, C++, C # , FOTRAN(Formular Translation), COBOL(Common Bussines Orinted Languge), BASIC (Beginers All Purpose Symbolic Instruction Code), PASCAL , HTML, Java script, Java modula.

APPLICATION SOFTWARE.

I s software program that performs a specific and user function.For example typing a letter.

Example of application software

Ms Word,Ms excel, Ms Powerpoint, Ms Access and Adobe photo shop

Categories of application software

Word processing software

An application software with which a user creates, edits save, format, and print letters , reports and other documents .Eg word processing software, EZ word, word perfect.etc

Spreadsheets

An application software with which a user can organize data in rows and columns create graphs and perform calculations eg Ms excel , Lotus 123 ,Visicalc

Presentation software

An application which a user can orgainise content on a slide for viewing by the audience.Ms powerpoint,Harvad grahics , corel presentation.

Data base software

An application with which one can store lots of data future manipulation.

Desktop publishing software

Application software with which one can design publications like news papers, wedding cards , certificates etc

Imaging software

Application software with which done can edit and retouch photograph.

Accounting software

An application software with which a user can carry out accounting functions like preparation of books of accounts.

Video editing software

An application software with which one create edit, format and author a video/movie

Common terms in relation to software

Freeware

Refers to copyrighted software that’s is provided to the user for free.It is available as download from the internet eg computer games

Shareware

Refers to copyrighted software that’s is available for trial after the user is freeto buy and obtain toll features . It commonly refered to as software demo.

Public domain software

Refers to copyrighted software that’s is provided to the general public for free

Software suite

Refers to the collection of software packages sold as single intergrated unit.examples include:

Microsoft office suite

Adobe OS suite

Foxit office suite.etc

Custom software

Is a software program that is made on request by the user who dertermines its content and functionality eg payroll applications,report programs. Custom software is also called tailored software.

Off-shelf software

Is a software program made and content determined by the manufacturer eg Ms Office suite.

Multitasking :is where many tasks can be perfoemed by the computer at the same time

Software piracy:refers to illegal duplication of software

Commercial software :refers to copyrighted software that is available after buying.

A software update: provides bug fixes and minor software improvements and is made available by free download .Software updates sometimes include drivers to support the latest hardware such as printers , CD and DVD drives , . A software update is some times called a software patch because it is applied over software that already have installed .A software update doesnot provide full software package installation.

A software upgrade:is a purchase of newer version of software you currently use of more fully featured version of your current software.

TOPIC 7

ELECTRONIC SPREADSHEETS

Introduction to spreadsheets

A spreadsheet essentially a ledger sheet that lets you enter ,edit and manipulate numeric data.

There are types of spreadsheets

The manual spreaddheets

Electronic spreadsheets,

A manual spreadsheet is a type of apreadsheet that is used by book keepers as ledger book with many sheets of paper divided into rows and columns on which various amounts are entered manually using a pen or pencil

An electronic spreadsheet on the other hand is prepared using a computer program that enables a user to enter values in rows and culomns similar to ones manual spreadsheets to manuplate them mathematically using formulae.

Common words used in spreadsheets

A worksheet

Is a grid of columns indicated by letters and rows indicated by numbers.

A workbook

Is a collection of columns and rows (called labels) are displayed in gray buttons across the top and left side of the worksheet .

A row :is the horizontal arrangements of cells from left side to the right of the worksheet

A column:is the vertical arrangement of cells form top to bottom.

A cell :is the intersection of rows and columns

A cell address: that is the column letter and the row number eg. A11 cells can contain text, numbers, letters and mathematical formulas.Formula:it is a mathematical equation that will calculate results . For example of a simple formula =a3-c6/d2 or =(b2+d8)

Function : a function is a preset formula .A formula in Excel begins with an equal sign(=) followed by function’s name it’s arguments .The function name tells Excel what calculation to perform . Forexample the sum function is written as=SUM(B2:D8)

Examples of spreadsheet software.

General

Visi Calc, this was the first type of spreadsheet to be developed for personal computers

Lotus 123, this is an intergrated software with spreadsheet module

Microsoft Excel

VP planner

Open office etc

Lotus improv

Online spreadsheets software

EditGri , access, collaborate and share spreadsheet online , with API support.

Google spreadsheet , as part /the google Docs and spreadsheets.

Think Free online Calc, as part of the Think Free Office online office suite., using java.

Jotspot Tracker , acquired by the Google Inc.

Standalone spreadsheets

As Easy as- from Trius, Inc. Windows version cureently available as freeware

Mariner Calc or Macintosh

Abykus

Multi-dimensional spreadsheet

Lotus Improv

Javelin

Quantrix Modeler

Spreadsheet software that are parts of suites

Framework –for Ms windows was one of the big three spreadsheet(the other being Lotus 123 and Excel)

Apple i works , for Ms windows and Macintosh

Ability office spreadsheets for Ms windows

Acel spreadsheets, included with Ex-Lex Office Pro and many other suite softwareLicensed as freeware

Word perfect office Quattro pro-for Ms windows . Was one of the big three sspreadsheets.(the others being Lotus 123) and Excel)

Kingsoft office spreadsheets 2012, for Ms windows .Both free and paid for versions are available . It can handle Microsoft Excel.XLS and xlsx files .and also produce other file formats such as .et, .text ,.csv, .pdf, and .dbf . it support multiple tabs , VBA macro and pdf converting

Marinerpark Mariner Calc, for Apple Macintosh . Full featured and light weight.

Microsoft office excel, for Ms windows and Macintosh . The propriety spreadsheet leader.

Microsoft works spreadsheet, for Ms windows previously DOS and Macintosh )only allows one sheet at a time.

Planmaker , for MS windows , Linux , Windows mobile , and windows CE , part of softmake suite.

Quattro pro, part of wordperfect office

StarOffice , Calc, cross platform,starOffice was originally developed by the German company star division which was purchased by sun in 1998. The code was made open source and became OpenOffice.org . Sun continues developing the commercial version which periodically integrates the open source code on their own and third part code tlo make new low price versions .

Features of spreadsheets software

General

Cell formatting , cells may be formatted specifying font, font color, style size etc.

Multiple worksheets, provides many sheets within the workbook

Searching and sorting :provides ability to search for any phrase, text, number.

Importing and exporting , spreadsheet may be emailed as an attachment from within spreadsheets application

Functionality

Formulas

Functions (including all javascript functions )

Custom functions /macros (using pure javascript)

Charts :line graphs ,bar graphs ,pie graphs, etc

Cell formatting, (using full CSS)

Cell formats(numbers, strings, currencies, dates, times)

Cell merging (rows and columns)

Cell locking

Copy/paste/cut with single cells or ranges of cells

Custom column groups

Custom names for rows and columns)

Custom styles for columns , rows and column groups

Integration of images from the web.

Operations like deleting and inserfting columns/rows

Javascript as common data format

Usability

Keyboard navigation with cursor keys

Live preview of the calculated results while typing

Common keyboard shortcut for copy/cut/delete and paste

Automatic highlighting for links

Javascript as human readable data format

TOPIC 8

INTERNET AND WORLD WIDE WEB

What is internet?

The internet is a world wide connection of millions of computers connected to a thousands of network

These computers communicate. That is they share , exchange , and transmit data to one another

An intranet

An organization that has many computers usually owns and operates a private network . thus a intranet is a private network with in an organization where computers are connected using the very connections and protocols used for internet to allow sharing data to insiders.

Characteristics of an intranet

Intranets can be connected to internert to provide connectivity to the taff and users

Intranets are restricted to provide security unlike public access networks

Only authorized staff can connecte to the intranet

Organization restricts communications between its intranet and the global internet

The restrictions keep the data in the intranet computers confidential and inaccessible to outsiders

Advantages of intranet

Work force productivity : intanets can help employees to quickly find and view information and applications relevant to their roles and responsibilities

Time: with intranets , organisations can make more information available to employees on a pull basis ie employees can think to relevant information at a timr which suits them rather than communicating by emails

Communication : intranets can serve as powerfull tools for communication with in th eorganisation both holizontal and vertical

An extranet

An extension of an intanet especially over the world wide web enabling communication bewtween insititution and people it deals with by providing limited access to the intranet

Who runs it?

No body owns or control the internet. It is a global information system similar. In some respects to telephone networks that allow anybody to call any other number anytime, anywhere.Each network is run by it’s own operating center subject to the laws in their country and international conventions who pool resources occasionally to establish common standards for hardware ,software, and telecommunications technologies.

How did it come to be

The internet was born in the era of the cold war. At that time the US department of defence was interested in establishing a communication system using computer ,radio and satellite networks that will be able to work around power outages in the event of nuclear attack.

How will the government communicate if the communication network is destroyed ? The answer was to do way with a centralized communication network and come up with separate networks where each will be independently responsible for getting messages across through any route.

An experiment network called the ARPAnet was setup in 1968 to enable scientists and researchers in universities to collaborate on this project.Some universities were later permitted during the 1970s to connect their local area network to ARPnet .

Demand grew as networking spread among schools .With the invention of the first e-mail program in 1972. , academic resources started using the network not only for long-distance computing but more to exchange information and gossip with their colleagues

Connected by security risks, the military broke off and established a separate network in 1983. By the late 1980s the National Science Foundation Commissioned it’s own network called NSFNET to share it’s information resources for scholary research.

Major universities were connected to five computer centres using telephone lines.To avoid the cost of laying down telephone cables for every institution to connect directly to the computer centres, regional networks were created .This resulted in a chain that allowed schools to connect to their nearest neighbor, thus permitting their computers to forward messages from one link to another.

How does it work

This ability of computers and networks all over the world to share information was made possible by two important communication protocols-the transmission control protocol (TCP) and the internet protocol(IP).Together they make the internet known as a “packet-switched network”

Speed and efficiency are essential , as you will soon find out. Many breakthoughts in internet and computer technologies are guided by the principle of sending and receiving data in the shortest time possible

The data is broken down into packets for faster transmission. As the packets travel in IP envelopes routers examine the address of these envelopes and determine the most efficient path for senind each packet to the nearest available router until these research their final destination.

Since the traffic load on the internet constantly changes every second, the packets may travel in different routes and arrive in different order. At their destination, the TCP will reasonable the packets into their original from according to their numbered order. If a packet is missing the TCP determines that the file or message was corrupted in transit and will request for retranission .

What is an internet address

Aa you have learned how messages are transmitted from one computer to another , every computer in the internet must have a unique and specific address.An internet or IP address, as it is sometimes called, consists of four numbers separated bu periods the smallest address would be 0.0.0while get before while the biggest would be every 1234.5678.101.1211 . Don’t worry , only computerare expected to remember all these numbers without getting confused , For humans , uses the Domain Name System(DNS)

What are domains ?

Like IP address which are numerical, the alphabetical doiman names are also separated by periods or dots.

Domain names have the format, hostname.subdomain.top level doiman.My school’s domain name, for example, is mwiri.sc.ug . This meaning structure will give you clues about the address .mwiri is the name of the host computer,sc signifies that is an educational institution. Here are existing top level domains in the internet

.com – commercial

.edu- educational

.net- network

.org- organization

.gov-government

.mil-millitary ]

Other countries sometimes add their codes at their the end , such as .au for Australia , .ph for Philippines, for France and Ug for Uganda .

Internet services

Most of these internet services operate on the client/server model or concept. A computer is a client if it is sending files. Another way of putting it is you, your computer , and the corresponding software for each type of service are all clients

A server allows a computer to offer a service to another computer. The computer on which the server software runs is also called a server . To again access t internet most people open an account with an internet service provider(ISP)

Internet services include:

Electronic mail

E-mail , so far, is still the most popular service of internet.Ideally allows the transfer of messages, documents, and images among others across the internet.

Mailing list

Listerv , a popular type of mailing list, is short for list server and is based on the e-mail protocol.As an electronic mailing list it is very convenient when somebody wants to send a message or newsletter, for example, to many people at once.

Newsgroup

This is internet equivalent to a discussion group or an electronic bulletin board.There are news groups or more ,from education technology to stamp collecting and mountaineering .Some newsgroups are moderated , others are not

Chat

Another popular form of communication over the internet unlike e-mail and newsgroup,chat allows people to converse in real time , people may actualy see you type your questions and responses . Chats are also organized in chat channels and chat room accounts different factors. There are chat rooms for techies cat lovers,singles etc

FTP

File Transfer Protocol is the standard method for transferring files whether downloading or uploading, to and from the computer on the internet. It is fairly simple to use and is the most popular way to download software and other files from the internet

Telnet

telnet is short for terminal emulation. It is one amazing feature of internet . that lets you use the resources of another computer in another part of the world .This is done by remotely logging to the distant computer which called the host .

The world wide web

The world wide web is one of the lateset information service to arrive on the internet but arguably the technology that revolution the internet.It is the fastest growing and most exciting feature.People who surf or browse are describing activities on the WWW

Uses of internet

Companies ,individuals and institutions use the internet in many ways

Companies use the internet for electronic commerce, also called e-commerce, including advertising, selling , buying , distributing products and providing customer service.

In addition, companies use the internet for business-to-business transactions, such as exchanging financial information and accessing complex databases.

Businesses and institutions use the internet for voice and video conferencing and other forms of communication that enable people to telecommute(work away from the office using a computer). The use of electronic mail(e-mail) speeds communication between companies, among workers, among other individuals .

Media and entertainment companies use the internet f.or online news and weather services and to broadcast audio and video, including radio and television programs.

Online chat allows people to carry on discussions using written text.

Instant messaging enables people to exchange text messages in real time

Scientists and scholars use the internet to communicate with colleagues, perform research, distribute lecture notes and course materials to students and pulish papers and s

Individuals use the internet for communication, entertainment, finding information , and buying and selling goods and services

What is the different between the internet and the world wide web?

The Net consists of cables , computers, satellites, and networks. Companies are able to communicate using different software and protocols with each other, connected either by cable or wireless technology.The web, on the hand, is an abstract concept that exists in cyberspace

Who invented it?

The father of the world wide web is Tin Berners-Lee, a physicist working at CERN , the European physics laboratory in Switzerland.In 1989 he developed a network protocol called Hyper Transfer Protocol(HTTP) as way for physicists to send documents over the internet to share research information. He also credited as the man who coined the words “world wide web” and defined standards as the uniform resource locator (URL) and Hypertext Markup language(HTML).

What is a web page?

It is a document written in HTML code that contains text and links to other pages, files, or parts of the document .The earliest web pages were all text documents and present there are still text based browsers like Lynx. Although Tin Berners-Lee also wrote the first multimedia browser in 1990, graphical user interface(GUI) browsers did not become popular until mosaic came along in 1993

What are browsers ?

Browsers are viewer programs that display web pages. These are also browsers to view e –mails, newsgroup discussions etc. The most popular GUI browser are Netscape and internet explorer. Marc Anderson , the Founder of Netscape, also the brains of Mosaic.

Web browsers interpret HTML codes how to display text , graphics, links and multimedia files in a page.When your computer loads a web page , that is an THML file, you don’t see these codes unless you give the view of the page source command. To see what the HTML code for this page looks like pree ctrl and U at the same time, or click on the word view in the tool bar above and select page source.

Not all files on the web can be displayed by browser.There are , for example there are applications that perform specific tasks when you click on thr appropriate link

Websites , homepages, and URL

A website is a collection of web pages in the web. Home page, as the name , suggests, is the main or opening page of a website. You will notice that several websites use the word Home or an image of a house to guide surfers back to the main page

The URL or Uniform Resource Locator is the specific address of a web page , like [www.bensonmusa.tk](http://www.bensonmusa.tk)for this particular page. If you look up at your location tool bar, you will see this address displayed. Some times, the URL of another website is all you need to go to that site.Try this , click and delete the URL of this page and in it’s place and hit enter. You can always click on the back button to return to this page.

URLs are also used newsgroups, FTP , and telnet to access other addresses and files.

Text

Plain text files are identified by the file name extension of .txt. The beauty of plain text files can be translated by any text editor and word processor program, whether your computer has Notepad, Microsoft word Or word perfect.

HTML. Files is in the format are called webpages and have extensions of either html or htm. The formatting instructions that tell the browser how to display the page are called tags . For example , to align a sentence on the center , the sentence will with <center> and end with </center>

DOC and WPD .These are file extensions of the most common word processor formats , namely Microsoft word for .doc and wordperfect for .pwd. Since web browsers do not typically support this format, your computer will be asked or prompted by what application to open or save this file

Image

There are at least 10 computer graphic format out there but the two types will you often come across in the web are .gif developed by compuserve and .jpeg by the joint photographic Experts Group.

Gif images are efficient in that there is no distortion when during compression and decompression. Thus they take up less kilobyte space and there load faster , but are limited to 256 colours only

JPEG can contain a million colours and are ideal for photos or pictures .JPEG graphics usually don’t support transparent backgrounds and show shadow features. Some JPEG files have extensions of jpg

The world wide web consortium(W3C) has introduced .png . PNG stands for portable network graphics and was designed to be fast loading, efficient, and patient-free. Never wbsites will likely use this format

Sound / Audio

These are .wav and .ra audio files .Each format requires a different software player , fortunately , most of these come with your multimedia PC , or built-in with your browser, or may be downloaded at mimimal cost.Theseplayers have panel control s to stop ,playand pause using the same symbols found on regular cassette players and VCR. The more elaborate ones have volume control, counter and channel sector . You can even choose and download custom -designed skins . if you want say , a zebra stripe , theme or metallic look for your control

Wave form, is the most common, and both Netscape and internet explorer are able to play this audio file type

MIDI, which stands for musical instrument digital interface , is a music synthesizer format that takes up a lot less space than waveform

RealNetworks.com, developed what is called “ real time” audio streaming “ which allows the internet to function like a radio broadcasting music and videos in real time

Mp3 is short for MPEG-1 layer-3 , a technology that compresses digital audio files like CD music without losing sound quality .It’s flexible formats makes the MP3 easy to download, copy and play on any sequence you want

Video

Both netscape communicator and internet explorer have built-in players for video file type players .mpg, .avi and .mov and .qt

AVI( audio video interleave) was developed by Microsoft and is naturally, the most common format in windows .Although there are less and less video files in this format now still comes in hany at times

MPEG , developed by the Motion picture Expert Group, is an emerging digital video format with aplications on the web, CDs cable Tv, direct satellite broadcasts, and high-definition television (HDTV).

Animation

Animation helps make a page appear more alive , although too much of it can cause headcahes. A programming language like Jvascript can create DHTML effects like pop-up windows, scrolling text, buttons or images that change colours when your mouse moves over them

Video and animation samples

These samples , unless otherwise specified, are copyright-free materials

Why use the internet in education

There are many advantages to using the services of internet, particularly the tols and resources on the web, in education instructional materials such as syllabi, lecture notes , presentations, assignments, and announcements could be made available online.

The internet puts the concept of anytime, every where into higher level as far as learning is concerned .Students will be able to learn at their own pace .

Both students and teachers will also benefit from being able to research any topic from the library catalogues , topical databases , and the world wide web. Anonymous FTP and telnet will allow them to access public databases maintained by government institutions.

Services like e-mail and mailing lists can support communication between teacher and student, among peers(teachers to teachers student to student)

Using a combination of email and the web, teacher and s tudents can coolabrate on research and creative projects and even with those who don’t live in the same city country.

Netiquette

There are guidelines on how one must behave in cyberspace . In the internet these responsibilities are defined by what is called Netiquette . For example, it is considered rude to type your message in all capital letters because it is equivalent to shouting.

Spamming

Is another bad conduct , it means sending unwanted messages to newsgroups and emails..Spams are the internet equivalent of junk mail like chain letters and commercial ,messages.

Flames

Are messages written in anger. People are always cautioned from being provoked as the instantaneous transmission of messages in emails , chat and newsgroups may cause irreparable damage to relationships and reputations.

There are different versions of netiquette on the web, and there are even specific guidelines for e-mail and news groups. I will feature two of the most popular ones, that is the most referred to . Note that the bottom line of many such guidelines boils down to respecting other people’s views, resource(including time), space, and privancy , among other things from general to specific these are the:

Commandements of computer use .

Computer ethics institute in Washington DC

Thou shalt use a computer to harm other people

Thou shalt not interfere with people’s computer work

Thou shalt not snoop around people’s computer files

Thou shalt not use computer to steal

Thou shalt not use a computer to bear false witness

Thou shalt not copy or use proprietary software for which you have not paid

Thou shalt not use other people’s resources without authorization or proper compensation.

Thou shalt not appropriate other people’s intellectual output

Thou shalt think about sequences of the program you are writing or the system you are designing

Thou shalt always use a computer in ways that ensure consideration and respect for your fellow humans

Core rules of netiquette:by Virginia shea( expects from book netiquette published in 1994)

Rule 1:remember the human

Rule 2: Adhere to the same standards of behavior online that you follow in real life

Rule 3:know where are in cyberspace

Rule 4: respect other people’s time and bandwidth

Rule 5:Make yourself look good online

Rule 6:share expert knowledge

Rule 7: help keep flame wars under control

Rule 8:respect other people’s privancy

Rule 10:be forgiving of others people’s mistakes

E-mail: The Basics

Background and definition

Electronic mail refers to a communication software program that allows user to send messages to other people on internet. Electronic ,mail or e-mail involves electronic transmission of messages , leters and documents.

In it’s broadcast sense electronic mail includes point to point service such as telegraph and facsimile(fax) systems . It is commonly thought of however ,

In terms of computer-based message systems where the electronic text file that is received can be edited , replied to , excerpted , or even pasted into another electronic document that can be used or manipulated by a word processor, desktop publishing systems, or other computer programs

Advantages of using e-mail

Basic e-mail is text-based and therefore easy to generate

To date this is medium of communication has become more versatile through MIME capabilities and web-based e-mail that allows users to send and receive binary files as attachments like grahics, spreadsheets , presentation, videos, sounds, webpages and executable programs.

E-mail messages can also carry hypertext links that will lead to web pages with the click of the mouse button.

It is fast medium of communication

Electronic mail is a relatively free , flexible, speedy and low cost tool for one-on-one and one –on –several communication

One can subscribe to news and information services through e-mail

All e-mail software have file management features that enable users to organize their messages in folders, ie Inbox, sent , draft and trash.

In addition, one can also add folders and label these anyway they want, ex .” friends,” f”amilies,” work and so on.

All mailers have address book features that may be sorted in alphabetical order either according to last name, first name or e-mail address.

Disadvantages

May be intercepted as it passes many routers and networks during transmission.

One may receive junk mail that may include bullying information

Through e-mail, there is a great possibility of money laundry.

It is expensive in the long run where one has to continuously pay for services so as for services so as to check mail etc

Loss of user password brings untold trouble to the user as /she can not sign in

Incase one comes to learn of a user password may turn out risky as the other mail can check mail of the genuine user.

Is another source of computer viruses that are transmitted through infected e-mail attachments

Basic Eimail features

The basic e-mail message contains the following parts

Inbox =list of messages received

Outbox=lists the messages you have composed but sent

Sent=lists of copies of all sent copies for reference purposes is typeset.

Send=sends the message you have composed

Compose=activities the screen onto which a message to be sent is typeset

Attachment=helps you to attach other files and folders to accompany the directly composed messages.

To

Email address of recipient, ex. [nicymunya@gmail.com](mailto:nicymunya@gmail.com), [bensonmusabe@gmail.com](mailto:bensonmusabe@gmail.com)

From

E-mail address of sender

Subject

Topic of message; Meeting Next Week

Date :will appear in recipient’s e-mail and sender’s file copy , but not in the compose message format ex, March 16, 2000 2:36:57 PM

EST ex.Mon, 20 Mar 2000 23:15:44-0600

CC:

“Carbon Copy”- adopted from business communication protocol when typewriters ruled the day. E-mail address (es) of other people who are furnished acopy of message.

BCC

Blind CC - is when recipient doesnot need to know who else got a copy of the message. May or may not appear in sender’s file copy depending on e-mail software used.

Attachments

In some e-mail small resource a small e-mail (software) this appears as a paper clip symbol ex. Logo.gif ( gif indicates as a JPEG file ) ex. Photo1.jpeg (the extension identifies ) ex.printer.doc is the extension for a word document ex.happy.exe

(when in doubt Don’t open any exe attachments ,these are notorious carriers of viruses.This particular is a worm or Trojan horse)

Body

This where the body of message goes, ex. We look forward to hearing your ideas about the school safety program on Monday, march 20 at 10:00 am at the board room .As you have requested we are attaching some photos and background information about our school.

Signature. Personalized information about sender ex; Musabe Benson, Tel(+256)758490493ex. “I find that the harder I work, the more luck I seem to have”-Maganda Moses

Note

Confidently

Your privacy always the first thing you should worry about , never assume that your messages will not be read by people other than the intended recipient , so be carefull copies of your messages

Dwell in your computer server(ISP) or may be intercepted as it passé many routers and networks during transmission . For e-mail you send and receive in your office , your employer has rights and access to all your files as well, bypassing your password controls, since they own resources .Those who receive your e-mail may also forwad it to others without your knowledge or permission

Paaword security

Be careful with your passwords . Although we prefer to use passwords that are easy to remember you sholudnot come up with anything that can easily identified with you like children’s names, mother’s maiden name, address phone number, birth date, etc. Since com.puter programs may also be used to decode password, don’t pick a word from dictionary . Experts recommend a good password has six to eight characters with numbers, for example , cache200 or dig\_199 . It may not be hacker-proof but you can at least minize your risks

Check the privancy statements of the site how they are going to use I nformation gathered from you.Responsible sites will advise you if check boxes for options. If you are goingh to share data with other companies.Others give you check boxes for options if you want to receive announcements and the like from them and their sponsors . It’s your call

The most popular web-based e-mail

Hotmail

Yahoo

Excite

Mail.com

Netscape web mail

AOL

Eudora mail

Their communication characteristic is the presence of ads,. Many of these offer powerful features, which, when properly harnessed , is like having a component office assistant that never sleeps. Here are the most common through not all may be available at the same time .

Calenders :For reminders of payement deadlines , special occasions and appointments

E-cards:Many web-based mail providers offer electronic greeting cards services so you can send birthday or anniversary greetings .some featurelink products and services site so you can order flowers and gifts online .

Mail forwad :allows you to all incoming mail to be forwad to another e-mail address .This is usefull if you want to avoid confusing people every time you change ISPs or E-mailaddress .

Vacation : responder: Is the equivalent of answering machines of informing senders that are on vacation or weather for a certain period of time, and therefore unavailable to respond to their e-mail until you get back .

POP mail: access allows the person with multiple e-mail accounts to access all from one.

Block sender:is used when you don’t want to receive mail from specific address.

Bulk mail filter:very useful to weed out spam mail, particularly unsolicited commercial mail , although this may also filter mail friends who like to send group or bulk mail

Voice mail and fax: Yes, you can receive voice and fax messages through e-mail

Instant messaging and mail alerts: options for people who want to be notified through their computer, mobile phone , and handheld computers whenever an email goes in. Extras include receiving stock quotes and weather reports .MSN service is a freeware that works with Hotmail. And outlook express .

Chat : Instant messaging also alerts you when friends are online so you can chat.AOL’s instant messager is another freeware which can even be enjoyed by those who donot have AOL accounts.If you have a good set of speakers/ headphone, mic, and audio player Yahoo and Excite also offer free voice chat.

Custom News: For those who want to read new but prefer not to clog their In-box, Netscape, Microsoft,Hotmail , Excite and Yahoo lead you the news and information page usually when you exit or log out from your e-mail account.You can customize this for headlines news, sports news.You can add news by topic such as health, education, travel, technology, entertainment, and by countries from various online services like PC magazine, CBS, and MSNBC. Extras include weather reports, TV schedule , top ten movies, horoscope, cartoons , maps and directions, etc

These pages of course have the ubiqutitous search engine directories yellow pages, and people finder. You can even choose your colours.A lot of people make these their portals , the default or homepage, that is the first page they see when they open their browsers.

Homepage: Yahoo throws in 5MB of free space for your website in Geocities .Online tutorials, wizards, free clipart, search engines, counters, and other goodies are available.Xoom offers unlimited space for website hosting and similar tutorials , free downloads and tols . Netscape gives registered members 11MB of space. MSN feature top picks from among members’ homepage every day and a list of model homepages .To support free this free hosting e Yahoo/Geocities , Netscape and MSN use pop-up ads which most people find annoying .Xoom, uses banner ads frame

Introduction to the world wide web

The web short form of world wide web(which gives us an acronym www)is the name for one of the ways that the internet lets people browse documents connected by hyphertext links. The principle of the web is based on using hyperlinks to navigate between documents (called webpages) with a program called a browser. A web page is a simple text file written in markup language called HTML that encodes the layout of the documents, graphical elements , and links which connect formatted documents to one another , the web uses the HTTP protocol to link documents hosted on distant computers called severs. On the internet the identified by the unique address called URL which can be used to locate any resource on the internet no matter which server may be hosting it.

Web browsering

A web browser

Is an interface that helps a computer user to gain access to all the content that is on the internet and the haard disk of the computer. It can view images e tc. The major web broswers are Mozilla, google chrome, internet explorer opera mini and safari

Types of web browsers

Internet explorer

This is most widely used browser by the people around the world, it is was developed by the Microsoft in 1994 and released in 1995 as a supportive package o Microsoft windows line of operating system. It is presently known as window internet explore

Mozila firefox

It is owned by Mozilla corporation . It is the second most popular browser after internet explore .It is used on the most operating system. It support tabbed browsing that allows a user to open multiple sites in a single wimdow.

Safari

This is a web browser from Apple, Inc .It is compatible with Mac OSX operating system, Microsoft windows and iphone OS Grammar Checking in an interesting built-in features, which perform a grammar check on the typed text and gives suggestions to correct your sentence if wrong.

Opera

This browser was developed by opera software in 1996.It is well known browser that is maily in internet activitated mobile phones , PDA .It is compatible with many and smart phones . It is compatible with many operating systems such asr linux, Mac OS X and Microsoft windows. Opera is the fastest browser in the world . It also has common functionins lke zoom and fit to width, content blocking tabs and sessions.

Google chrome

This web browser was developed by google.It has soon become the fourth mostly widely used web browser with a market share of 1.23% . The browser options are very similar to that of safari the setting locations are similar to that of internet explorer 7, and windows design are based on windows vista

Netscape Navigator/Netscape

It was developed by Netscape communication corporation and was popular in the 1990s. It was compatible with almost every operating system .

Features of web browsers

Refresh button: refresh buttons is used to force the web browsers to reload the webpage

Stop button: cancels web browser’s communication with the server and send web page reloading.It also very useful in blocking the malicious sites from loading if accidentally entered.

Home button:Loads predefined home page.You can select any page as browser’s home by clicking on tools menu and select options

Book marks button: custom user buttons that redirect to chosen website, very useful to configure web mail and other often visited sites .

Integrated search: Integrated search engine is relatively a new feature in web browsers; It allows you select your favourite search engines and doing a quick search by typing in the search term.

Tabbed browsing : Browser tab opening many websites on a single web browser’s window. Very helpful when reading several websites at the same time .

Web address

A web address identifies the location of specific webpage on the internet e.g [www.bensonmusa.tk](http://www.bensonmusa.tk) . URLs and domains provide you with information before entering the site.The internet is full the domain can give a hint at what type of websites you will be visiting.You can identify identify a domain by the last three letters in the Uniforms Resource Locator, commonly known as the URL . for example [www.ehow.com](http://www.ehow.com) is an URL , the domain is .com

Types of web addresses

.com This is most most common domain in which commonly refers to a business or commercial website. Many companies, stores and products use this as their domain.These websites can provide information about the companies, people or products.

.edu. If the domain is .edu, the website usually belongs to the place of education, like a university or college

.gov . The domain .gov refer to the government owned website. It could be for your country , state or government- sponsored organisations.

.net. Domain name used for internet adminstative sites

.mil. Domain for military sites

.org. Domain for organisations.

.aero.Doimain for airport industry

.jobs. Domain for employment related sites

.tel. services that involve connections between telephone networks and the internet.

Search engines

Search engines are online software programs designed to help a user to locate relvant websites and access required information .or Is a program which allows web web users to look for specific information documents of interest on the [www.eg](http://www.eg) Alta vista, google, yahoo Netiquette, info seek, Dog pile , Lycos, Excite, etc

Types of search engines

Crawler-based search engine. These use automated to survey and categories web pages .The programs used by the search engines to accesss your web pages are called “spiders” , crawler , robots, or bots. A spider will find a web page, download it and analyse the information presented on the web page. Examples of crawler based searchs are google ([www.google.com](http://www.google.com)), ask jeeves([www.ask.com](http://www.ask.com))

Directories .' A directory uses human editors who decide what category the sites belongs to,they place websites with in specific categories.In the directories’ database .The human editor comprehensively check the website and rank it based on the information they find using a predefined set of rules .There are two directories at the time of wring yahoo directory ([www.yahoo.com](http://www.yahoo.com))

Hybrid search engine

Hybrid search engines use a combination of both crawler based results and directory results.More and more search engines these days are moving to hybrid-based model.Examples are yahoo ([www.yahoo.com](http://www.yahoo.com)), google ([www.google.com](http://www.google.com))

Meta search engines: meta search engines take the results from all other search engines results and combine them into one large listing examples include, include Dogpile ([www.dogpile](http://www.dogpile) ([www.dogpile.com](http://www.dogpile.com)) crawler [www.metacrawler.com](http://www.metacrawler.com)

Specialty search engines: Specialty search engine have been developed to cater for demands of niche areas. There are many specialty search engine, include; Froogle ([www.froogle.com](http://www.froogle.com)) , yahoo shopping [www.shopping.yahoo.com](http://www.shopping.yahoo.com) , Bizrate ([www.bizrate.com](http://www.bizrate.com)) , pricegrabber ([www.pricegrabber.com](http://www.pricegrabber.com)), Pricespy pricegrabber ([www.pricespy.com](http://www.pricespy.com))

Websites

A website is a collection of pages in the web or

This is an internet location location on computer/sever on which a hyper link document is located

Types of wbsites

Community building websites, These websites build online communities of people who want to interact with other socially or meet people who share their interests . The best known website of this type is probably Myspace.com, facebook.com f.or sharing and discussing mutual interests, there are online forums for any particular subject you can think of forum websites can be a great source of information and help for small business persons.

Archive site: used to preserve electronic valuable contents that are on the very of extinction. For example internet archive which since 1996 has preserved billions of old and new pages and google groups which since early 2005 had preserved over 845000000 messages posted to Usenet news/ discussion groups

Blog site: sites generally used to post online diaries, comments or views that include; discussion forum eg blogger.

Content site: These sites create and sell of original content to end-user (e.g slate, about.com)

Corporate website: used to provide information regarding business organization service

E-commerce site: These are designed for purchasing or selling services such as amazon.com, CNS store and overstock.com

Community site:sites where persons with similar interests communicate to each other through chatting and messaging or through social message board such as Myspace, facebook, Twitter etc

City site: A site that shows information a bout a certain city or town and events that take place.

Gripe site: A site devoted to the crique of a person , place, corporation, government or institution.

Information site: Contain content that is intended to inform vistors but not necessary for commercial purpose such as Encycopedia, most governmement, educational and non-profit institutions have an information site.

Dating website: A site where the user can find other single. People looking for long range relationships, dating or just friends. Many of them are pay per services such as eHarmony and Match.com but there are many free or partially free dating sites. Most dating sites. Most dating sites today have the functionality of social networking websites

Gallery website: A website designed specifically for use as gallery these may be an art gallery or photo gallery and commercial or non-commercial in nature.

Cloud computing

Cloud computing refers to the use and access of multiple server-based computational resources via a digital network. Eg WAN , internet connection using world wide web.

Cloud users may access the server resources using a computer, notebook,pad computer, smart phone, or other device.In cloud computing , applications are provided and managed by the cloud server and data is also stored remotely in the cloud configuration.

Users do not download and install appications on their device or computer, all processing and storage is maintained by the cloud provider or by a private organization .

How it works

A cloud user needs a client device such as a laptop or desktop computer , smart phone , other computing resouces with a web browser or other approved access route access a cloud system via the world wide web.

The user will log into the cloud at a service provider or private company such as their employer .Cloud computing works on client basis using web browser protocols . The cloud providers server-based applications and all data services to users. If the user wishes to create a document using a word processor the cloud provides a suitable application running on the server which displays work done by the user on the client we browser display.

Risks that are associated with computing

Information security and user’s privancy. Using a service of cloud computing to store may expose the user to potential violation of privanct.

Data migration problems when changing the cloud provider.

There is no defined standard between the operator and such a change is extremely complex.The case of blankrupty of the company of the cloud be extremely dangerous for users.

Continuity of service. A malfunction can affect is a large number of users at once because these services are often shared on the network.

International ,political and economic problems.: May araise when public data are freely collected and privately stored from cloud users.

No guarantee is given to the users for a free future access

Advantages of cloud computing

Cost effeicient:Cloud computing is probably the most cost efficient method to use, maintain and upgrade .Traditional desktop software costs companies a lot in items of finance.

Easy access to information:once you register yourself in the cloud, you can access the information from anywhere, where is an internet connection

Automatic :software integradation : In the cloud software integration is usually something that occurs automatically . This means that you do not need to take additional efforts to customize and integrate your applications as per your preference.

Back and recovery: since all your data is stored in the cloud backing it up ans restoring the relatively much easier than storing than storing the same on physical device.  
  
it allows you customize your options with great ease you can handpick just those services and software applications that you think will best suit your particular entreprise .

Quick deployment: cloud computing give you the advantage of quick deployment .Once you opt for this method of function .Your entire system can be fully functional in a matter of few minutes.

Easily sclable:Companies can add or subtract resources based on their needs

Device and location independence:Enable users to access systems using a web browser regardless of their location .

Relieves burden of IT professionals and fees up their time office

A physical storage centre is no longer needed

Multi-tenancy enables sharing of resources and costs across a large pool users.

Centralization ofd infrastructure in location and with lower costs such as real estate, electricity.

Reliability is improved if multiple redundant size is used which makes well designed cloud computing suitable for businesses community and disaster recovery.

Disadvantages of cloud computing

Technical issues, though is true that information and data on the cloud can accessed any time and from anywhere to all, there are times when this system can have some serious dysfunction , this technonlogy is always prone to outages and other technical issues

You will need a very good internet connection to be logged, unto the server at all times.You will invariably be stuck incase network and connectively problems

Security in the cloud before adopting this technology, You should know that you will be surrending all your company sensitive information to a third party cloud service provider.

This should potentially put your company to a very big risk.

Less control comes when sharing over all your data and information

Dependency on third party to ensure confidentially of data and information.

Prone to attack, storing information in the cloud make your company vulnerable to external hack attacks and threats .As you are well aware, nothing on the internet is completely secure

TOPIC 9

ELECTRONIC PRESENTATION SOFTWARE

Introduction to electronic presentation software

Software that is used tol create presentations , which can coomunicate ideas and other information group of audience in form of slides

OR

Software program that is used to display information normally on the form of a slide show.

Examples of presentation software

Harvard graphics : It was one of the first consumer applications software program that allowed the user to incorporate text.

IBM Lotus Freelance Graphics. Lotus freelance graphics is an information graphics and presentation program developed by Lotus software .It allows users to create and compile text, digital images, diagrams and charts

Keynote (presentation software).Keynote is a presentation software application developed as part of the iwork productivity suite by Apple Inc.

Microsoft powerpoint: It is a commercial presentation program that was developed by Microsoft powerpoint provides three types of movement i.e Entrance, Transactions and custom animation

Openofice.org Impress. It is a program similar to Microsoft powerpoint. In addation to being able to crteate PDF files from

Presentations, It is also able to export presentations to files allowing them to be played on any computer with flash player installed.

Corel presentations:Corel presentations can be a handy tool for creating effective and in-depth presentation .This program includes a number of templates and different types of side shows to help layout and enusers’ show properly

Prezi : prezi is a webbased presentation and storytelling tool that uses a single canvas instead of traditional slides. Text, images, videos and other presentation objects are placed on the infinite canvas and grouped together in frames

Other examples of presentation software includes

Adobe (Aldus)Presentation

Apple keynote

Customshow

Ease

Flowboard

Gnome pinpoint(open source)

Google Docsharvad graphics

Hewlett Packard Bruno (software)

LibreOffice

Kingsoft presentation

Sliderocket

slideWiki

PowToon

COMMON TERMS USED IN PRESENTATION

Slide : A slide is an individual page in a presentation

Slide layout: refers to the physical arrangement of the slide

Slide sorter: it is a facility in presentation that enables a user to arrange slides in a required order

Slide master: it is a slide that controls appearance of other slides presentation

Animation:these are visual effects applied to individual items on the slide such as graphics , titles or bullet points.

Transation loop: It is a facility in presentation that enables presentation to run automatically until a user presses escape.

Or these are visuial movements as a one slide changes to another

Action button: A button on slide that is programmed to link one slide to another .

Normal view: is also commonly known as slide view .It is the main networking window in the presentation.The slide is shown full size on the screen

Template: Template can be predesigned to be applied to a presentation to give it all a full designed professional look.

Fill effects fill in background of Autoshape, Text, box, or word Art you want to change lke backgrouind, these can include gradients, patterns, pictures,solid colors or textures

Features of presentation software

Insert slide feature, It allows you to insert a slide anywhere IN A presentation .At the beginning , middle or end.

Good layout management system: presects or customized layout designing

Macros: For adding interactive features

Deletion of inserted slide : it allows the removing of the slides

Spell checker and dictionary support

Slide show system : It allows you view the presentation in a full size screen

Animation: which allows you apply different visual effects on an object

Principles of a good presentation

Use simple background

Text should be clear and that it can be seen from distance

Three should be no clash between text color and the background color

Use a picture that tells the story.keep the audience with pictures rather than endless bulleted slides.

Use minimal effects

Insert your picture in the appriopriate place.

Pace presentations.A good presentation should be well paced such that it flows smoothly while presentations

For Automatic presentation rehearse the timing .

Uses /functions of presentation software

Learning solution:It combines both audio and visual both aspects make it easier for the audience to understand.Even normal teaching becomes so effective

Marketing strategy, it makes it easier for people in marketing , advertising aand sales to make presentation for motivation of their subordinates

Corporate training session

It is essential ingredient of every corporate training session.Top executives use it to train their subordinates.

Application of presentation

Confrences

Workshops

Sales and marketing departments

In schools

Churches in displaying sermon scriptures

TOPIC 11

INTRODUCTION TO DATABASES

A database is a collection of interrelated data, which allows the user to receive,update and manipulate data very easily as required . OR refers to the collection of related information stored in a structured format. OR is a collection of data stored in fields and records in an organized way

Types of databasese

The database is divided into two categories

Flat file database, this refers to the database that is simple table.It is just to maintain simple records for example

|  |  |
| --- | --- |
| Name | Team |
| Witaaka Samson | Panther |
| Aluka Esther | Lion |
| Nambafu Allan Peter | Kob |
| Kibuye Davis | Crane |
| Ssekyonda steven | Lion |
| Nanokha dan | Panther |

Advantages of a flat file database

Easy to understand since it contains single data

Easy to implement

Less hardware and software requirement

Less skills required to implement a flat file database

Disavantages of a flat-file

Less security since it is easy to extract.

Data inconsistence

Redundancy

Sharing information is cumbersome task.

Show for data

Relational database

It is a database file that consists of more than one tables and the relationship can be created between tables on the common field realational database

Advantages of relational database

It is easy to manage endless sets of data in tables in table without having to go back and re-enter data second time

It is easy to create separate records for each type of data stored

Relational databases have ability to access , update and to share information among users.

It has ability to scale the database to size of a large organization

It has ability to program a query to search all tables for the exact information you need.

Relational database can interface with many third party tools

Security control and authorization can be easily implemented.

Disadvantages of relational database

Once the database is created , it can be easily changed

It has complex applications and systems that are difficult to understand.

It takes time to enter all the information and set up a program.

There is need to hire specialized people to create a retional database

There is need to database adminstrators to maintain the database once it is built.

Securing your data against unauthorization access in order to meet the regulatory standards can be expensive

Some relational database has limits on the field length

When you design the database you have to specify the the amount of data to fit in the field.

Terms used in database

Record , This is a row in a table that contains information about a given person, product or event.

Field , this is a column in atable that contains a specific piece of information within a record

Data entry: this process of getting information into a database, usually done by people through typing it in the way of data entry form to simplify the process.

Database management

Database management sytsem can be defined as software package with computer programs that control the creation , maintance and of a database. OR this is an application package which permits the creation, storage, management and retrieved of data in the database.

Examples of database management system

Lotus Approach

Operaoffice.org Base

Corel Paradox

Microsoft Access

Dbase

Fox pro

Oracle

DATABASE Mac

Calpoint

Interbase

Filemaker

File pro

Front Base

Gemstone(database)

IMB business System 12

IBM DB2 Express

Mimer SQL

Microsoft Jet Database Engine

Model 204

MSDE

MSQL

One Tick

Advantages of using electronic database system

It is easy to enter and retrieve data in a short period of time

A database stores data that is consistent and reliable since at each satge , It is checked for consistency and reliability.

A database is flexible since it can redesign to hold thousands of data

A database can be used to many people at the same time

Data is frequently updated after each simple entry

Data is automatically saved as soon as it is entered into a database.

Data can be retrieved in difrent formats eg form, table, reports etc.

Features of database

Calculated fields, Able to create powerful dynamic databases that calculated field formulas to automatically update your data.

Permission and access, Maintain your data by the use of f permission based access.Manageand assign previlleges to add, modify and deletion of information.

Import and export data between database and applications, share data between two databases or from other applications like Microsoft Excel.

Customizable views and printable reports,Create custom views to filter and sort data for data analysis.Print reports using customizable, professionally designed formats.

Rich set fields types, specify text, numeric, file attachment, images and compound fileds.

Tables /file structure

This is a database that is used to hold related records.Tables are recognized in rows and columns with each row representing while each column represents common fields in each records.

Querries and query language

A query is a database tool used to search or question a database on specific records. Because a query is a question posed on the database , it returns a result for the user.

Forms /screen input, A form is agraphical interface that resembles an ordinary paper forms to collect data, however , a database enables the user to view and enter data into a table.

Reports , most database systems provide a user with a tool for generating reports from an underlying table or a query

Macros , Some database software provide the user with atool called macro that can be used to automate frequently performed procedures or tasks.

Programming module, when your database becomes more and more complex, you may need a more powerful tool than the macros to automate your database operations further.Some database software come with their own computer language associated with them.

Data types in a database

Integer, a term integer used to refer to data type which represents some fine subset of mathematical integers.An interger is specified in the program as a squencence of digits without spaces or thousands separators, optionally prefix with + or -

Booleans , is a data type having two valves usually denoted true or false , intended to represent the truth values of logic and Boolean algebra.

Characters, a unit of information that corresponds to a unit , symbol such as in an alphabet written form of natural langauge . examples of characters include , letters, numerical digits and common punctuation marks .(such as “” or “)

Floating point numbers, floating point dscribes a system for representing real numbers which supports a wide range of values .Numbers are in general represented approximately to affixed number of significant digidts and scaled using an exponent .The base for scaling is normally 2, 10 or 16

Common field types ued in database

Text , It is used to store characters , numbers , special characters etc

These fields are used to store names of perssons, addresses , telephone numbers.

Number, these are fields made up of nu metric numbers 0 to 9 be manipulated mathematically.

Memo, This is a field made up of alphanumeric( both alphabetic and numeric) data .instead of using text use this data type if you need to enter several paragraphs of text because it accommodates a maximum of 32000 characters.

Currency, used to identify numeric values that have decimal or fractions.Use this data type field especially when dealing with monetary values such as fees balance, sales etc.

Date / time , this is to identify as either a date or time. This is because date/time values can be manipulated mathematically in a database.

AutoNumber, this is a numeric value used if you wish MS Access to automatically increment the values in field

Yes/No, this is a logical field where an entry is either a yes or no , true or false. For example a field require to answer whether you are male or female

OLEobject, OLE stands for linking and embedding. This type of field is mostly used with graphical user interface application for inserting graphical objects such as pictures, drawing s , charts etc

TOPIC 12

SYSTEM SECURITY , ICT ETHICAL ISSUES AND EMERGING TECHNOLOGIES

Computer system security

Computer security involves safeguarding computing resources, ensuring data intergrity , limiting access to authorized users , and maintaining data confidentiality.

Security and data integrity threats

The range of means by which the security and integrity of computing resources ca be threatened is very broad , and encompasses.

Operators error (for example a user unintentionaly deleting the wrong file)

Hardware or media failure (either as a result of wear –and -tear, old age or accidental damage)

Theft or sabotage(of haedware and / or dataor it’s media)

Hackers (who obtain unauthorized online access via the internet)

Malware (any form of virus, and including Trojan e-mail attachments that users are encouraged to open )

Power surges and /or outages (which are one of the most common means of hard disk corruption and hardware damage)

Food ,fire storm or other natural disasters

Fraud embezzlement (misappropriation)

Industrial espionage

Terrorism

At the end of this topic you must be able to handle the following questions

Forms off computer security(Data and Physical security)

Authentication.It refers to the verifying the identity of user logging onto a network.Password, didgital certificates , smart cards and biometrics can be used to prove the identity of the user on the network.

Intrussion detection. Is the art and science of sensing when a system or a network is used inappropriately or without authorization.An intrustion detection system (IDS) monitors computer system and activities.

Data encryption.Is a security measure by which the data is transformed to another unreadable format to prevent unauthorized access by users .The data has to be dencrypted to make it readablewhen it reaches the final destination.Encryption is done by software and cryptographic software.

Anti-virus software, is a computer program that detects, prevents and takes action to disarm or remove malicious software programs such as viruses and worms from a computer .To prevent the most current viruses you update your anti-virus software regulary.

Authorization, is a security measure used in the network design to prevent users from gaining information , files or resources that are beyond their security clearance .It also prevents outsiders from gaining access to the network.

Firewall , on the computer, this security software acts much like a guard when it looks at network traffic destined for received from another computer.The firewall determine if that traffic should continue on it’s destination or be stopped.

Other methods used to ensure computer security

Don’t run programs of unknown origin, Never run a program unless you know the source of the program or the author

Disable hidden filename extensions, windows operating system contain an option to hide file extensions for known file types .The optioned is enabled by default, but you can disable this option in order to have file extensions displayed by windows.

Turn off the computer or disconnect it from the network when not in use.

Make a boot disk incase your computer is damaged

Don’t open unknown email attachments

Computer security can also refers to maintaining of the hardware, software and data

Physical security threats

There is need to safe guard the computer equipment from hazards like.

Water

Fire

Lightening

Dust

Short circuits

Magnetic fields

Poor handling and dropping

And extreme temperatures by use air conditions

Internal security of the machine

Computer viruses

What is a computer viruses?

A computer viru is a program designed specially to damage, infect and affect other programs or data or cause irregular behavior of the computer with out the permission of the user. Or

Computer viruse

Computer virus is a computer program that can replicate itself and spread from one computer to another.The term virus is also commonly but erroneously, used to refer to other types of malware,including but not limited to adware and spyware programs that do not have a reproductive ability.

How viruses are spread on stand alone computer

So being a standalone computer not connected to any network doesnot mean the computer cannot be infected through the information cannot be leaked via the network to external persons.Computers viruses can be spread through

Floppy disks

USB keys

Email attachments, however, there is also physical security of the computer itself and and that where it gets interesting depending on who and what you’re trying to secure the program

How computer viruses are spraed on stand network computers

The following are not the only possible means of infection, but are same common and likely networked computers can be infected:

Web pages, either via a download, web code or across-site scripting (CSS), attack, web pages can be a source of viral infection,As browsers gain more features and functions more methods for virus propagation appear.

By posing s something useful (known as a Trojan horse) ie a download , a gift from a friend etcetc. Curent scam is a gift card or an ecard email that tries to run a malicious script when opened. Because we gave the computer the command to open the file , the virus has an

By emailing itself, will search for anything fitting an email address xzy.com and then send itself there.

By infecting a clean file without the owner’s knowledge , lost of viruses can be spread thi way, by people downloading files files from safe sources that have been hacked by people intent on spreading viruses

By using networks, if one computer on a local area network or wirless network is infected, this type of virus will infect every computer on the network if not n blocked by a suitable firewall

By using removable media, usually disks , USB drives , external hard drives, floppies, CDs e tc are not checked by the virus scanning when they are inserted , so a virus hiding on one can got onto the computer unquestioned.

Most viruses are spread by freaks or people who hack computers and write viruses because they are essentially twisted people who enjoying causing damage. Some are more targeted, ie stealing information or money, destroying particular programs . All of them have potential to do great damage aaaand there are more ways to spread them than mentioned above .

SOURCES OF VIRUSES

Research has shown that viruses can be introduced into computer systems from variety of sources . Some of the most common sources are the following

Contact with contamined systems

Any disketes used on a contamined system could become contaminated, If the same diskettes are used on another system , then the virus will spread

Pirated software

The use of pirated software introduces the risk that the software may be contaminated by virus code or amended gto perfoem some other destructive function which may affect your system .

Infected prioprietary software

There have been instances of virus programs being introduced and contaminating software under development in laboratories and then being installed onto diskettes conataing the finished software product.The number of recorded instances of this is still very low , but the possibility that cellophone wrapped diskettes bought from an approved supplier could be contained still exists.

Fake games

Many people like playing gamses on the computer and for the same reason games programs spead very fast . It can take less than two years for a game program to spread to Australia, South Africa and Europe.There are even some some games that pose as software eg hotsex.exe these games infect the system as they are installed

Freeware and shareware

Both freeware and shareware are commonly available from Bulletin board systems( BBS) .Generally a registration fee is requested , to be sent directly to the author , Such programs should be treated with caution initially used in a controlled environment until is clear that the program actually does what it is supposed to do and does not contain, either virus or destructive code

Updates of software distributed via networks

Software distributed vial networks are fairly obvious targets for virus anonymous propagation

How are viruses activated

Viruses are activated in three ways . these are

Opening an infected file

Running an infected program

Starting up the computer within an infected disk .

Types of computer viruses include the following

Boot sector viruses

Is a viruses which executes when a computer starts up because it resides in the boot sector of the floppy disk or the master boot record of hard disk(MBR)

A file virus

This attaches itself to program files , and is loaded into memory when the infected program is run .

Macro virus

This uses a macro language of an application (eg word processor or spreadsheet) to hide virus code.

Logic Bomb

Is a virus that activates when it detects a certain condition

Time Bomb

Is a kind of logic bomb that activates on a particular date

Worm

This copies it self repeatedly in memory or on a disk drive until memory or disk space remains, which makes the computer stop working.

Trojan horse

Is the program that hides within or looks like a legitimate program but executes when certain conditdion or action is triggered

Polymorphic virus

This modifies it’s program code each time it attaches it self to another program or file so that even an anti-virus utility has difficulty in detecting it .

Precautions that should taken to guard against computer

Ensure that there is a policy to ensure the usage of computer and their protection and regulations

Ensure that the e-mail is from a trusted source before opening or executing any e-mail attachment

Install an anti-virus utility and upadate it’s virus definitions frequently for detecting and removing viruses

Never start up a computer with a floppy disk in a floppy drive

Scan all floppy disks and files for possible virus infection before opening them

Set the security level for macros in an application so that the user can chose whether or run potentially unsafe macros

Write protect the recovery disk before using it

Back up important files regulary

Sharing of diskettes

Steps taken if a virus attacks is detected

Identify and isolate PCs and disks which could be affected

Seek the advice of a specialist to perform the following tasks:

Identification of virus code on affected disks

Removal of virus code from all affected disks

Evalation of the security procudures to ensure that the future virus attacks are minimized

Determine how the virus was introduced to the system

Look out for any infected disks that may have left the site

DATA PROTECTION IN A COMPUTER

Application can always be reinstalled , but your data is the most important thing on your computer or network .Here’s a look at 10ways you can protect that data.

Save as you work ,you should always save your work as you go and learn how to use the auto save features in your application

Make a backup, Before you make changes to critical data always make a duplicate.Even if you just made a backup yesterday make another

Keep a copy of your data office , Diligently backing up your data is good practice but keep a copy of your data offsite. If there were a fire or other disaster your onsite data backup could be lost as well.

Refresh your archive, Years ago you archived your data to a zip drive,Now you decide to use that can read your data ? As technology changes , it is a good idea to transfer your data to current data storage standard so that you aren’t stuck with irretrievable data IST provides a backup services

Never open email attachments by habit., if your email reader has an option to automatically open attachments you should disable that feature.Always run any attachments any download files through a virus scanner first

Never trust disks from other people, Any time you reciecve a file on anytype of media check it first for viruses

Update , make sure you have the lateset updates for your software especially for your virus checking software .Make it a habit to regulary check for updates and enable automatic updates for software that offers that feature.

Protect your passwords , the key to your identity is your password.Anytime your account access the network you are responsible fro any activtity from that account .Remember change your password on a regular basis

Protect your computer, use a secure operating system which requires user to be “authentical”. As an added benefit these operating systems also restrict what indivual users can see and do on the system .

Perform regular maintenance, leran how to use the utilites that diagnose your system for problems.It is a good idea to run a disk-scanning program, defragment yourhard drive, or whatever else your system might need .These utilities can prevent little problems from becoming big problems, and will keep your system running at top speed.

COMPUTER CRIMES

Computer crimes refers to the illegal or unauthorized use of computer technology to manipulate crtical user data.

Or computer crimes can be defined as unauthorized /illegal use of commit a crime

Computer crimes are criminal activities , which involves the use of a information technology to gain an illegal or unauthorized access to computer system with intent of damaging , deleting or alerting computer data. Computer crimes also include the activities such as electronic fraud ,m misuse of device , identity theft and data as well as system interface.The different types of computer crimes have measured the introduction and use of newer and more effective security measures .

Hacking, the activity of breaking into a computer system to gain an unauthorized access is known as hacking .The act of defeating the security capabilities of a computer system in order to obtain an illegal access to information stored on a computer system is called hacking .The unauthorized revelation of passwords with intent to gain unauthorized access to the private communication of an organization of a user is one of the widely known computer crimes .Another highly dangerous computer crime is hacking of IP address in order to transact with a false identity , thus remaining anonymous while carrying out the criminal activities.

Phishing, is the act of attempting to acquire sensitive information like usernames, passwords and credit card details by disguising as a trustworthy source ,Phishing is carried out through emails or by luring the users to enter personal information through fake websites .Criminals often use websites that have a look and foel of some popular website, website which makes the user feel safe to enter their details there .

Computer Viruses, Computer viruses are computer programs that can replicate themselves and harm the computer systems on network without knowledge of the system users.Viruses spread to other computers through network file system , through the network,internet or by the means of removable devices like USB devices and CDs, compuetrs viruses are after all forms of malicious codes written with the aim to harm a computer system and destroy information .Writting computer viruses is a criminal activity as virus infections can crash computer systems, thereby destroying great amounts of critical data. B

Cyber stalking , the use of communication technology, mainly the internet, to torture other individuals is known as cyber stalking .False accusations,transmission of threats and damage to data and equipment fail under the class of cyber stalking activities cyber stalkers often target the users by means of chat rooms .online forums and social networks to gather user’s information and harass the users on the basis of information gathered .Obsence emails , abusive phone calls and other such serious effects of cyber stalking have made it type computer crime.

Identity theft (computer fraud)

This is one of the most serious frauds as it involves stealing money and obtaining other benefits from the use of false identity.It is the act of pretending to be some one else by using someone else’s identity as ones’s own.Financial identity theft involves the use of a false identity to obtaining goods and services and a commercial identity theft is the using of someone else’s business name or credit card details for commercial purposes. Identity cloning is the use of another user’s information to pose as false user .illegal migration, terrorism and blackmail are often made possible by means of identity theft.

Computer industrial espionage , this act involves the stealing of made secrets or spying on persons through technological means for bribery, blackmail or corporate/personal advantage.One notable variation of this crime is termed the back, pump and dump. An account is created with an online brokerage company and muiltitudes of other accounts are hacked into used to purchase particular stocks .When the stocks’s value goes up, the stock is sold through the original online account .other methods include using spyware software(such as a Trojan horse) to find out log ins and passwords , electronic eavesdropping and use of computerized surveillance to obtain company accses

A computer virus transmitter, this refers to someone who creates a malicious virus to infect computers from functioning properly, run annoy programs and / or gain access to the victims personal data.This type of software is commonly known as malware.Persons can unknowingly download these programs through websites , emails and pop up windows.Common types of malware are called adware, spyware and Trojan horses(see resources below)

Software piracy, is one of the most common computer crimes. Copying software for distrubition or personal use is considered an illrgal act.Programs that are not protected with encryption keys (installation ID Number), malware protection or other types of anti-piracy methods are easy to copy.

Knowingly selling, is the act of distributing or buying child pornography (under age 18) through internet is crime.The internet has been used as atool for child prostitution pedophiles have used chat rooms to lure minors onto illegal sexual encounters.Prosecution of these crimes is difficult due to the anonymous nature of the internet (see resources below)

Phreaking , it is an act of internet getting into a communication system illegally to make telephone calls without paying for them .The action of using bad and mostly illegal ways in order transfer to not pay for some sort telecommunications bill , order transfer or other service .It often involves usage of highly illegal boxes and machines in order to defeat the security that is set up to avoid this sort of happening .

ETHICS IN GENERAL

Ethics is a set of moral principles that govern the behavior of a group or indivual. Therefore, computer ethics is set of moral principles that regulate the use of computers .Some common issues of computer ethics include intellectual property rights (such as copyrighted electronic content), privancy concrens, and how computers affect society.

Computer ethics is a system of moral standards or values used as a guildline for computer users.

The ten commandements of computer ethics

The United States Institute of computer ethics has come out with the ten commandments of computer ethics.These principles consider the effective code of conduct for the proper use of information technology.The ten commandments of computer ethics are :

You shall not interfere with people’s computer work

You shall not snoop around people’s computer files

You shall not use computer to steal

You shall not use a computer to bear false witness

You shall not copy or use proprietary software for which you have not paid

You shall not use other people’s resources without authorization or proper compensation.

You shall not appropriate other people’s intellectual output

You shall hink about sequences of the program you are writing or the system you are designing

You shall always use a computer in ways that ensure consideration and respect for your fellow humans

Guidelines on the E-mail and internet usage

Use only individual e-mail address to forward individual opinion

Keep the identity name and password a secret to avoid the misuse of your e-mail without your knowledge.

E-mail must be active to promptly reply the necessary actions needed for any matters .

Ensure the total mail kept in the box is within the computer storage capacity

Scan files regulary to avoid the transmission of virus from one computer to another .

Do not send e-mails that contain classified information which can used to tarnish other people or country .

Choose a suitable time to search the internet to save access time and cost.

Beware or prohibited sites which could affect one’s moral organization or nation.

Print only relevant documents that you think can be used in future

**Unethical computer code of conducts**

With the advancement of ICT , it is easy to retrieve your information from the internet .You may not realize that when you fill a form on the internet, your information may be exposed and stolen.

Examples of unethical computer code of conducts include.

Modifying certain information on the internet, affecting the accurancy of information

Selling information to other parties without the owner’s permission.

Using information without authorization.

Involvement in stealing software.

Invasion of piracy

Intellectual property refers to any product of human intellect that is unique and has value in the market place.This covers ideas , inventions, unique name, computer program codes and many more.

Ethical computer code

Examples of ethical computer code of conducts include

Sending warning about viruses to other computer users

Asking permission before sending any business advertisements to other.

Using information with authorization

Intellectual property (IP) is a legal field that refers to creations of the mind such as musical , literacy , and artistic works , inventions , and symbols , names , and designs used in commerce , including copyrights, trademarks , patents and related rights .Under intellectual property law, the holder of one of these abstract “properties” has certain exclusive rights to the creative work, commercial symbol, or invention by which it is covered .

Intellectual property(IP) is the information and original expression that brings it’s original value from creative ideas with a commercial value .Intellectual property allows the people to have fully independent ownership for for their innovations and creativity lke that for t heir own physical .By safeguarding such innovations , can lead to the owner of IP can be encouraged for further innovations to the benefit of the society in general.It may not be possible to protect IP and obtain intellectual property rights unless they have been applied for the sanction obtained

Essential Elements of Intellectual property Rights

The Agreement provides for norms and standards in respect the following areas of intellectual property.

Copyrights and related rights

Trade secrets

Geographical indications

Industrial designs

Lay out designs of integrated circuits

Protection of undisclosed information(tradae secrets)

Patents for inventions

Plant varrities

In general these properties are are termed as intellectual property. Intellectual is an asset that can be bought or sold , licensed and exchanged,.But of course unlike other properties , intellectual property is intangible , rather it cannot be identified by it’s specific paraments .These properties are protected on a national basis

PATENTS

COPY RIGHTS

A copyright is asset of exclusive of rights granted to the author or creator of an original work .This is for materials , asthetic material, literacy, music , film , sound recording , broad casting , software and multimedia .Copy right is sanctioned to prevent others from

Copying the work

Publishing and selling copies commercially

Renting or lending the work in a free market

Doing or demonstrating the work in public

The test for such originality consists of two conditions, work must originate from the inventor and not a copy from other works . And 2. Invention or work must have adequate amount of creativity

TRADE MARKS

A trade mark is an identification symbol which is used in the courses of trade to enable the purchasing people (buyers) to distinguish one trader’s goods from the similar goods of other traders . These marks also symbolize distinctly the quality of the products .These marks are in the form of cefrtain wordings or can be in the format of logs, designs, sounds , etc Examples:NIT, Kodak

TRADE SECRETS

A trade secret means information , which is kept confidential as a secret .This is generally not known in the relevant industry , offering an advantage to it’s owner over other competitors .Unlike other types of intellectual property , this trade secret is fundamently a do-it , your self type of protection.For engineers, inventors , and designers , the trade secrets are to maintained secretly .Such trade secret include some formulae , programmers , methods , progress or data collections etc if there is any improper disclosure or use of the trade secret by another person , the inventor may claim and recover damages rsulting from illegal use .

EMERFGING TECHNOLOFGIES

The connect of emerging technologies involves the innovations and advancements in the use and discovery of new technology more amazing and advanced

Application areas of specific emerging technologies

Artificial intellegene, artificial intelligence is the ability of computers to reason and think like a human

Various tools of artificial intelligence are also being widely deployed in home land security .For example , speech and text recognition, data mining and e-mail filtering . Application s are also being developed for geture recognition (understanding the sign of language by the machines ).Individual voice recognition, global voice recognition (from variety of people in a noisy room), facial expression recognition for interpration of emotion and verbal queues

Robot navigation. It refers to the ability a robot to move from one place . Th e machine can be programmed to carry out certain tasks while locomotion from one place to another .

Obstacle avoidance , the ability of machine to defend itself from danger .It can be through detection and emission of guarding tools or chemicals, alarming .

Optical character recognition , it is the mechanical or electronic conversion of scanned images of handwritten , typewriter or printed text into machine -encoded text .It is widely used as a form of data entry from some sort of original paper data source

Speech recognition, it is the translation of the spoken words into text .It is also known as automatic speech of recognition . Speech recognition is a technology that can translate spoken words into text .The systems analyze the person’s specific voice and voice and use it to fine tune the recognition of that person’s speech , resulting in more accurate transcription .

A facial recognition system , It is a computer application to automatically identifically or verifying a person from digital image or video frame a video source .One of the ways to do this by comparing selected facial features from the image and a facial databases

Computational creativity, is the study and simulation by computational means of behavior , natural and artificial which would be observed in humans beamed creative .

The goal of computational creativity is to model, simulate or replicate creativity using a computer , to archive one of several ends

To construct a program or computer capable of human-level creativity.

To better understand human creativity and formulate an algorithmic perspective on creative behavior in humans

To design programs that can enhance human creativity with out necessarily being creative themselves .

Handwriting recognition, it is the ability of a computer to receive and interpret intelligible handwritten input from sources such as paper documents , photographs, touch-screens and other devices

Computer vision , is a field that includes methods for acquiring , processing , analyzing and understanding images and in general -dimensional data from the real world in order to produce numerical or symbolic information eg in the forms of decisions

Virtual reality (VR) , is a term that applies to computer simulated environment that can stimulate physical presence in places real word as well as in imaginary worlds .Most current vitual treality environment are the primarily visual experiences , displayed either on a a computer screen or though special stereoscopic displays .

DIGITAL FORENSIC

These involves the discovery and investigation of material found in digital devices , often in relation to computer crime , digital foresnsic investigations have a variety of applications ,The most common is to support to refulte a hyphothesis before crimianal or civil courts

Digital forensic process

Digital forensic process investigations consists of 3 stages , acquisition analysis and reporting .

Aquistion , it involves forensic duplicate of the media often using a write blocking devices to prevent modification of the original

Analysis stage, an investigator discovers evidence material process of investigatuion can vary between investigations, but common methodologies include conducting key searches across the digital media recovering deleted files and extraction of registry information

Reporting , when an investigation is complete the data is presented usually in the form of written report.

Branches of digital forensic

Digital forensic includes several sub-branches relating to the in vestigation of various types of devices

computer forensic

the global computer forensic is to explain the current state of a digital artifact , such as computer system , storage medium and electronic document . computer forensic can deal with abroad range of information

Application of computer forensic

Investigate and uncover evidence of illegal activities conducted via a computer such as credit card fraud , intellectual property theft and computer system intrusion (hacking)

Investigate and uncover evidence of crimes that weren’t directly committed via a computer the accused might have stored evidence on the computer storage media

Detect and close the computer system security holes through legal hacking

Computer foresinic experts are often called cyber cops , cyber investigators, or digital detectives

Disadvantages of computer forensic

Pirancy concern, it may happen in some cases where the piracy of clients .if compromised . But in some circumstances it becomes almost impossible for computer foresnics professional to maintain the secrey of the data or the information.

It is also possible that some sensitive data or information, that is important to the clients may in order to find the evidence .The forensic professionals must maintain the concern that data or information with possible evidence is not destroyed

There are also chances of introducing some malicious programs in the computer system that corrupt the data at a later stage of time .

Physically extracted and relevant evidence may be destroyed or lost .The custody of data is acquired as the evidence is the responsibility of computer foressnic team.

Costs , it is also possible in some cases that the operations cost may exceed, Step should be taken to minimize the costs.

The maintance costs, the costs to maintain a laboratory conataining approptiate computers , computer analysis tools, software and security implements to safeguard information can be encormous.

Data encryption, a number of issues concerning data corruption of importatnt data are necessary to note .In the process of carrying out computer forensic process, data may get corrupted .

Mobile device forescnic

Mobile device forensnic is a sub-branch of digital forensic relating to recovery of digital evidence or data from mobile device. It differs from computer forensic in that mobile device will have inbuilt communication system (eg GSM) and usually a storage mechanism .Investigations usually focus on simple data such as call data and communication (SUMS) /e-mail rather than in-depth recovery of deleted data.Mobile cdevices are also useful in providing location information either from the inbuilt GPS/location tracking or via cell site logs , which track the device within their range.

Network forensics

Network forensics is concerned with monitoring and analysis of computer network traffic , both local and WAN /,internet , for the purpose of information gathering , evidence collection intrusion detection

Data foresnics

Data forensic is a branch of digital forensic relating to the forensic study of databases and their metadata . Investigation use database contents , log files and in RAM data to build a time line or recovery relevant information.

CAREER IN THE ICT INDUSTY

People trained in the computer industry are bond to enjoy the widest availability of jobs as time goes on and the more varied a person’s set of skills are the more likely he is to land well paying and well satisfying career of his dreams

3D animation or graphic designing specialist, a postion where you design and create either a graphic or 3D animation for software programs , games , movies , web pages .Postion may also require that you work on existing graphics , animation and movies etc done by other people .If you wish to get into graphic design or arts , it is a must that you learn major graphics programs such as Adobe photoshop.

Data entry,a job that commonly require employee to take information from hard copy to or other source and enter it into an electronic format .Postion may aaaaaalso be taking electronic data and entering it into a database fro easy sorting and locating .

Repair and fix specialist , a job reqires you fix and repair computer and replacing it with good component

Database specialist ,a job that require creating , testing and maintaining one or more databases .It requires a familiarity with or extensive knowledge of databases at place of employment .For example Microsoft Access ,Foxpro, MySQL, SQL and Sybase

Security Expert, test and find vulnerabilities in a system , hardware device or software.

Electronics Technician or enginer, Assembling, testing and repairing electronic equipment.This is career needs a strong understanding basic and advanced electronics , there is need to get formal education in electronics and electro-mechnanical or self teach by your own electronic system

Hardware specialist , a career requires a hardware designer , circuit design ,embedded system, firmware etc .Is a job that requires you design and create a complete hardware package or portions of a hardware device

Quality Assurance (QA) , system analyst or tester. This career requires that the employee test out features of a product for any problems or usability issues.

Networking, or system developer, Computer networking careers involve designing setting up and maintaining a network .

Webmaster or web developer, a job where a person creates maintains or completely designs a webpage.

**Preparing for career in ICT industry**

The road to a career in computing field starts as early as possible.Individuals who are seriously interested and committed to pursuing a computer should begin while as they are young and in high school college .After college , the study of ICTs may even become lifelong endeavor.

Ways one should prepare for an ICT /IT career

College /university preparation

Most of the people working professionally in the ICT/IT industry posses an undergraduate degree at every least .These degrees encompasses maths , computer engineering or science, electrical engineering , information systems ,or software enginering , still others hold advanced degrees .The degrees holders all have onr trait in common, they all started preparing for their careers along time before beginning their undergraduate studies .

Students truly interested in computing careers should formulate a plan to apply to colleges that feature computing degrees of interest and location that are convenient

Working together with industry professional /industrial training .

This is an effective way of getting students understand ICT careers better because they make them learn it’s applications practically

Club sponsorship , find a computer science club or become a member of existing club.

Internships, look for work experience (either volunteer or paid) at employment sites or bservation during breaks.

By carrying out field trips to aeras where ICT /IT activities are being conducted for example in telecommunication companies.

Student fairs, participate in the local student’s fairs and other competitions in career of computer to make you acquire the experience

Join organisations , student have interests in the career of IT should organizations in order to get more work experience and develop a familiary with this career

TOPIC 10

**DATA COMMUNICATION AND NETWORKING**

Data communication refers to one computer transferring data from ,instructions to another computer or some other computers

Computer mediated communication ,it is used defined as any communicative transaction that occurs through the use of two or more networked computers .Computer mediated communications can be divided into two modes :-

Synchronous and

A synchorus data communication mode.

Synchronous , is a mode of communication where data is transmitted at irregular intervals or in blocks .

Asynchronous communicationwhere data is transmitted at irregular intervals or one bit at a time.

**Elements of Data communication**

There are only four basic elements needed for data communication system.

1. **Sender :**  The computer or device that is used for sending data is called sender, source or transmitter. In modern digital community system, the source is usually a computer.
2. **Medium:** the means through which data is sent from one media to another is called ***transmission medium.*** If the receiver and transmitter **with a building a wire connects them.** If they are located at different locations they may be connected by telephone lines, fiber, optics or microwaves.
3. **Receiver:** the device / comp that receives the data is called receiver. It can be a computer, printer or machine.
4. **Protocols:** these are rules under which data transmission take place between sender and the receiver.

The basic models for computer for consist of:-

A sending device that initiates an instruction to transmit data , instruction or information .Eg computer A which sends out signals to another computer eg computer B

Communication device that converts data , instructions or information from a sending device into signals that can be carried by communication channels eg modem A which converts the computer digital signals into analog signals

Communication channel, path over which the signals are sent eg a standard telephone line , along which the analog signals are sent.

Communication channels takes the following methods :-

The manner in which data is transmitted from one location to another is called data transmission mode .There are 3 ways or mode of transmitting from one location to another and these are :-

Simplex channel

It refers to a channel whose direction of transmittion is unchanging .For example a radio station is a simplex channel because it always transmits the signals to it’s listeners and never allows them to transmit back.

The message source is the transmitter, and destination is the receiver

**Advantage**

Cheapest communication method.

**Disadvantage**

Only allows communication in one direction

**Half duplex channel**

This is a single physical channel in which the direction may be reserved?

Message may flow in two directions, but never at the same time , in a half duplex system. In a radio call , one party speaks while the other listens , speakingsimultaneously results in a garbed sound that canmot br understood, email services, fax machine .Wireless communication is an example of half duplex

**Advantages**

Enables two way communication

Costs less than full duplex

**Disadvantages**

Only one device can transmit at a time

Costs more than the simplex

**A full duplex**

Allows simultaneous message exchange in both directions. It really consists of two simplex channels , a forward channel and reverse channel , linking the same points .An example of full duplex is a telephone set /calls in which one user can talk and another one listens at the same time .

**Advantages**

Enable two ways communication simultaneously

**Disadvantages**

It is the most expensive method in terms of equipment because of two bandwidth required .

A communication device that receives the signals from the communication channel and coverts into a form that can be understood by the receiving device, Eg modem B which converts th analog signals to digital signals .

A receiving device (i.e computer B ) that accepts the signals

Communication software ,instructions and information between computers.

**DATA COMMUNICATION TOOLS**

There are devices that and connections that connect the communication circuits between the data and it’s destination

**Types of data communication tools**

Computer define

Mobile phones (hand phone /cell phone) - a device that can make and receive calls over link while moving a round geographical area.

**Internet**

**Comparision between electronic and manual data communication tools**

|  |  |
| --- | --- |
| **ELECTRONIC** | **MANUAL** |
| They cover a relatively large geographical area | They cover a limited area |
| They favor an immediate feedback | They don’t favor an immediate feedback |
| They can be used at any time |  |

DATA TRANSIMMISION

This is a physical transfer of data from one point to point to multipoint communication channels .There fore data communication across the network can be in two forms:-

Analog and Digital signals

**ANALOG SIGNAL**

This is the transfer of data in form of electrical signal or continuous waves ,Analog signal is measured in logs and it’s frequently in hertz (HZ)

Advantages

Allows multi transmission against the cable

Suffers les alternation

Disadvantages

Suffers from electronic magnetic interface

Can only be transmitted in one direction with sophiscated

DIGITAL SIGNAL

This is refer s to data in digits form or transfer of data in discrete values .They consist of binary didgits which are 0’s and 1’s

Equipment is cheaper that analog signal

The signals can be transmitted on a cable.

Digital suffers from attenuation

**Techniques of data communication**

There are two ways of sending data from the sender to the receiver ie

Parallel transmission

Serial transmission

Parallel transmission

Each bit of character or data has separate channel and all of characters transmitted simultaneously .Here the transmission is parallel character per character

Serial transmission

This refers to the transmission where data is sent as one bit at atime having a single channel the entire bit.

DATA TRANSMISSION MEDIA

There are pathways that connect computers .Other devices and components on the network .Each transmission media requires specialized network hardware that has to be compatible with that media .It c.ould be convenient to construct the network or only one media it would impose a combination of media types.

There are types of media ie wireless and wired media

WIRED MEDIA

Network media and cabling

Cable is the medium through which information usually moves from one network device to another.There are several types odf cable ,which are commonly used with LANs

The following sections dicuss the types of cables used in netwaorks and other related topics

Unshielded Twisted Pair (UTP)

Diagram missing

Twisted pair cabling comes in two varities : shielded and unshielded. Unshielded twisted pair (UTP) is the most popular and is generally best option for school networks

Consist of two insulated copper wires arranged in a regular spiral pattern to minimize the:

Electromagnetic interference between adjacement pairs

Low cost ,small size, and ease of installation

Low frequency transmission medium

Limited distance ,usually less than 100 meters

The most popular and is generally the best option for school networks

Categories of UTP cable

Category 1 voice only (telephone wire)

Category 2 data to 4 mbps (local talk)

Category 3 data to 10 mbps (Ethernet )

Category 4 data to 20 mbps (16 mbps token ring)

Category 5 data to 100 mbps (fast Ethernet )

Category 6 cable is widely used for a 10mbps Ethernet network

10BaseT is the IEEE 802.3i standard specification for 10mbps .

Ethernet transmission over UTP (category 3,4 or 5 )

The standard connector for UTP cable is RJ45 connector which looks like a large telephone modular connector

Unshielded Twisted pair connector

Diagram missing

The standard connector for unshielded twisted pair cabling is an RJ-45 connector.This is a plastic connector that looks like a large telephone style connector a slot allows the RJ-45 connector to be inserted only one way .RJ stands for registered jack, implying that the conector follows a standard borrowed from the the telephone industry .This standard designates which wire goes with each pin inside the connector

Shielded twisted pair (STP) cable

A disadvantage of UTP is that it may be suscreptible to radio and electrical frequency interference .Shield twisted pair (STP) is suitable for environments with electrical interference

Coaxial cable

Diagram missing

Coaxial cabling has a single copper conductor at it’s center.A plastic layer provides insulation between the centre conductor and a braided metal shielded.The metal shielded helps to block any outside interference from fluorescent lights motors , and other computers :

Like the wire used to connect to TV or VCR

Has an inner conductor surrounded by a braided mesh

Both conductors share a common center axial , hence the term “co-axial”

Band width of upto 400 MHZ

Highly resistant to signal interference

Used for long distance (300-600)

Quite bulky and sometimes difficult to install

The most common type of connector used in coaxial cables is the BNC (Bayonne –Neil-Councilman) connector

**Has two types of coaxial cables:**

Thin coaxial cable

Refers to as thinnet

10 base2 is the IEEE standards for Ethernet running on thin coaxial cable

The 2 refers o the approximate maximum segment length being 200 meters

It is popular in school networks, especially linear bus networks

**Thick coaxial cable**

Refers to as thicket

10base 5 is the standard for Ethernet running on thick coaxial cable

The 5 refers to the approximate maximum segment length being 500 meters

Has an extra protective plastic cover that helps keep moisture away from the centre conductor

Difficult to bend and install

Used for long distance linear bus networks

Coaxial cable conectors

Diagram missing

The most common type of connector used with coaxial cables is the Bayone-Neil-Concelman (BNC) connector .Different types of adapters are available for (BNC) connector including a T-connector , barel connector , and terminator . Connectors on the cable are the weakest points in any network .T help avoid problems with your network always use the BNC connectors that crimp, rather than screw, onto the cable

Fibre optical cable

Diagram missing

Fiber optical cabling consists of a centre glass core surrounded by several layers of protective materials , it transmits light rather than electronic signals eliminating the problem of electrical interference.

Costs of a center glass core surrounded by several layers of protective materials

Immunity to environment interference

Greater capacity (bandwidth of up to 2 GBPS

Used for distance s up to 100 kilometres

Carry information at vastly greater speeds

Very expensive

Small size and lighter weight

Difficult to install and modify , require highly skilled installers

Adding additional nodes is diifcult

10 base refers to the specifications for fibre optic cable carrying Ethernet signals

**Facts about fibre optic cables**

Outer insulating jacket made of Teflon or PVC

Kevlar fibre helps to strengthen the cable and prevent breakage

A plastic coating is used to cushion the fibre centre

Centre (core ) is made of glass or plastic fibres

Fibre optic connector

The most common connector used with fibre optic cable is an ST connector .It is barrel shaped , similar to a BNC connector .A newer connector, the SC , is becoming more popular .It has a square face and is easier to connect in a confirmed space .

**WIRELESS MEDIA**

Microwave it’s transmission is the line of site transmission The transmission must be in visible contact which is the reciveing station this sets a limit on the distance between stations depending on the geography

Advantages

Cost saving, using microwave it is more expensive than using a leased line

Compatibility and reconfiguration flexibility

Substantial band with

Satellite

Infra-red

Advantages of wireless networks

**Mobility:** with a laptop computer or mobile device , access ca be available through out a school, at t he mall , on an airplane etc.

Fast up, if your computer has a wireless adaptor , locating a wireless network can be as simple as clicking “ connect to a network” in some cases , you will connect automatically to networks within range .

Cost , setting up a wireless network can be much more cost effective than buying and installing cables

Expandability, adding new computers to a wireless network is as easy as turning the computer on (as long as you do not exceed the maximum number of devices)

**Disadvantages of wireless network**

**Security**, be careful protect your sensitive data with backups, isolate private networks, provide strong encryptions and passwords , and monitor network access traffic to and from your wireless network.

**Interfrence** ,because wireless networks use radio signals and similar techniques for transmission , they are susceptible to interfence from lights and electronic devices

Inconsistent connections, wireless connections are not nearby as able as those through a dedicated cable .

Speed, the transmission speed of wireless network is improving , however , faster options (such as gigabit Ethernet ) of data a round a private network , a cabled conection will enable that work to proced much more faster

**Uses of computer communication**

VOIP(Voice Over Internet Protocol) commonly referred to as communication protocols, technologies, methodologies, and transmission technique involved in the delivery of voice communication and multimedia sessions over internet protocol (IP) networks such as the internet.

Voice mail, functions like answering machine and allows a caller to have a voice message, which is store in voice mailbox, for the called party.

Fax , a facsimile (fax ) machine is a device that transmits and receives documents sent or received via a fax machine a re known as faxes.Fax capacity can be added to the computer using a fax modem

Advantages of fax

Hard copies are available

Disadvantages of fax

Sending a big document can be slow

Wastefull papers when junk faxes are sent.

Email or electronic mail , is the transimission of messages via a computer network such as a local area network or internet .

BBS, a bulletin board system (BBS) is a computer that maintains a centralized collection of electronic messages.

Instant messaging, is areal –time communication services that notifies a user when one or more people are online and then allows them the user to exchange messages or files with them

Chat rooms, is a location on the internet sever that permits users to chat with each other by typing text on the computer .some chat rooms support voice and video chats

Newsgroup , also called a discussion group, is an online area where users conduct written discussions about a particular subject

Internet telephony, sometimes called voice over IP (VOIP) , is a web-based telephone service that allows a user to talk to others for just the cost of the internet.

Video conferencing , is a service on the internet that allows a meeting between two or more geograghical separated people who use a network or the internet to transmit audio and video .

Telecommuting, is a work arrangement so that employees may work away from the standard workplace of the country , but communicate with the office using some kinds of communication technology

Advantages of telecommunting

Reduce the time and expenses for travelling to and from work.

Eliminates travelling over sunafe weather conditions

Allows flexible work scheduled for employees

Provide a convenient, comfortable work environment for disabled employees or those recovering from injuries or illness

Reduces air pollution caused by vehicles driven to and from work

Disadvantages of telecommuting

Reduced commuting human face to face interactions among working staff.

Work has to stop if any components of communications systems fails to work.

Leisure time at home is replaced by work.

Data security may be jeopardized

Global positioning system (GPS)

Consists of one or more earth based recievers that accept s and analyze signals sent by satellite in oder to determine the receivers’ geographical location

Uses of GPS

To locate a person or an object

Ascertain the best route between two points

Monitors the movement of a person or object

Create map

Many cars and ships also use GPS to provide directions to a destination aand weather information

FTP ,(File Transfer Protocol) is an internet service that allows users to upload and download files with other computers

Blog , is the discussion or information site published on the world wide web and consisting of discrete entries (posts) typically displayed in reverse order (the most recent post appears first)

RSS(Rich Site Summary) RDF site summary, often dubbled really simple syndication is a family of web feed formats used to headlines , audio and video in standards formats.

Wiki , is a website which allows it’s users toad, modify or delete it’s content using a web browser usually with help of a simplified markup language or a rich text editor .Wikis are powered by wiki software.Most are created collaboratively

Internet , is a world wide web collection of networks linked together.

Web collobration, it provides an organization with the capability to work together with customers or originally via the consists of web-based tools with in we sites to assist an organization in areas of sales , new revenue generation opportunities and to enhance customer satisfaction.

INTRODUCTION TO COMPUTER NETWORKS

What is a computer network?

Is a connection of two or more computers for the purpose of routing, managing and sorting rapidly changing data

Two or more computers that are linked in order to share resources, exchange files , or allow electronic communications. Is a system for communication among two or more computers

**What networking can do**

Printer sharing

Printer spooling

Disk sharing

File sharing

Classification of networks

Computer network are set up in four major classes. These are

Local Area Network(LAN)

Diagram missing

Is a computer network covering a local area, like a home , office or small group of building such as a college.The topology of a network dictates it’s physical structure .The generally accepted maximum size for a LAN is 1000m2

LAN configuration consists of:

A file server stores all of the software that control the network as well as the software that can be shared by the computers attached to the network.

A workstation computers connected to to the file server. These are less powerfull than the file server

Cables : used to connect the network interface cards in each computer

Metropolitan Area Network or MANs

Diagram missing

It is network that combibes two or more LANs connected together . Are large computer networks usually spamming a campus or a city they typically use optical fibre connections to link their sites

Wide Area Network

Diagram missing

Is a computer network covering a wide geographical area , involving vast group of computers.The best example of WAN is the internet using WAN , schools in Uganda can communicate with places like Tokyo in a matter of minutes, without paying enormous phone bills

Wireless Local Area Network (WLAN)

Diagram missing

A LAN local area networks based on wireless network technology most referred as WiFi .Unlike LAN no wireless are used but radio signals are the medium for communication . Wireless network cards are required to be installed in the system for accessing any wireless network around

NETWORK ARCHITECTURE

Network architecture refrs to the the layout of the network , consisting consisting of rhe hardware, software, connectivity, communication protocols and model of transmission such as wired or wireless . these include :-

Client/server networks

Client/server network architecture is a network architecture where a single central computer acting as a server that directs multiple other computers , which are referred as the clients.

Client/server is a scalable architecture were by each computer or process on the network is either a client or a server.Server software generally but not always running the business purpose.

Client software on ther hand commonly runs on common PCs or workstations. Clients get all or most of their information and rely on the application server for things such as configuration files , stock quotes , and business application programs or to offload computer intensive application tasks back the server to keep the client computer free to perform other tasks

Advantages of clent/server network

Centralized , resources and data security are controlled through the server.

Scalability, any or all elements can be replaced individually as needs increase

Flexibility , new technology can be easily intergrated into system

Interoperability, all components (client/server network ) work together

Accessibility , server can be accessed remotely and across multiple plaforms

Disadvantages of client/server network

Expose , requires initial investment in dedicated server

Maintenance, large networks will require a staff to ensure efficient operation

Dependence , when server goes down, operation will cease across the network.

**A peer to peer(P2P ) computer network**

Diagram missing

Refers to the network, where any node is able to initiate or complete any supported transaction with other node.It is a network in which resources and files are shared without a centralized management source .All computers are considered equal, computers act like standalones , and clients are able to perform independently.

Advantages of peer to peer network

Less initial expense , no need for a dedicated server

You can access any file on the computer as long as it set to share folder.

Setup , an operating system (such as windows xp) already in place may only need to be reconfigured for peer to peer operations.

If one computer fails to work all the other computer connected to it continue to work.

**Disadvantages of a peer to peer network**

Decentralized , no central arsenal for files and applications

Without centralized network administration, it is difficult to determine who controls network resources .

Without centralized security, each computer must use separate security measures for data protection

More complex and difficult to manage as the number of computers on the network increases.

Without centralized data storage, data backups must be performed by users

NETWORK TOPOLOGIES

The physical topology of a network refers to the configuration of cables, computers , and other peripherals.Computer network topology is the way various components on a network (like nodes links peripherals etc) are arranged.

Or A physical topology defines the way in which computer ,printers, and other devices are connected to a network.

Forms of network topologies include:-

Diagram missing

Bus topology , a bus network is such that there is a single line (the bus) to which all nodes are connected and nodes connect only to this bus .

Advantages

Easy to implement and extend

Well suited for temporary networks (quick set-up)

Typically the cheapest topology to implement

Failure of one station doesnot affect others

Easy to connect a computer or peripheral to linear bus

Requires less cable length than a star topology

Disadvantages

Difficult to administer/ troubleshoot

Limited cable length and number of stations.

A cable break disable the entire network.

Maintenance costs may be higher in the long run.

Performance degrades as traditional computers are added

Entire network shuts down if there is a break in the main cable .

Terminators are required at both ends of the backbone cable.

Difficult to identify the problem if the entire network shuts down.

Not meant to be used as a stand –alone solution in a large building.

Diagram missing

Mesh topology

A network topology in which there are atleast two nodes with two or more paths between them . A special kind of mesh, limiting the number of hops between two nodes , is a hypercube

Advantages of mesh topology.

Data can be transmitted from different devices simultaneously

Even if one of the two computers fails, there is always an alternative present, therefore data doesnot get a affected .

Expansion and modifiacation in the topology can be done without disrupting other nodes.

Disadvantages of mesh topology.

There are high chances of redundary in many network connections.

Overall costs of this network are too high as compared to other networks

Setup and maintenance of this topology is very difficult

Difficult to administer.

**Ring topology**

Diagram missing

A network topology in which all the nodes are connected to each other in such away that they make a closed loop.These nodes and branches form a ring.If one of the nodes on the ring fails then the ring is broken and cannot work.A dual ring topology has four branches connected to it, and is more resistant to failure.

Advantages

Growth of the system has minimal impact on performance

All stations have equal have equal access.

Each node on the ring acts as a repeater, allowing ring networks to spam greater distances than other physical topologies.

Disadvantages

Often the most expensive topology

Failure of the one computer may impact others

Star topology

Diagram missing

A network topology in which peripheral nodes are connected to a central node, which rebroadcasts all transmissions received from any peripheral node to all peripheral nodes on the network, including the originating node. All peripheral nodes may thus communicate with all others by transmitting to, and receiving from the central node only.

Advantages

Easy to implement and extend, even in large networks.

Well suited for temporary networks (quick setup)

Centralized management.It helps in monitoring the network

Failure of the node does not affect the rest of the network

At the same time it is easy to detect the failure and troubleshootit.

Disadvantages

Too much dependency on the central device has it’s own drawbacks. If it fails the whole system goes down.

Maintenance costs may be higher in the long run.

Performance degrades as additional computers are added

Failure of central node can disable the entire network.

Requires more cable length than the linear topology

More expensive than the linear bus topologies because of the cost of the hubs etc.

Tree and hyper tree topologies

Diagrams missing

Are important special cases of star network topologies

A dvantages of a tree topology

Point to point wiring for individual segments

Supported by several hardware and software vendors.

Disadvantages of a tree topology

Overall length of each segment is limited by the type of cabling used .

Requirements for setting up a network

(Networking hardware)

Networking hardware includes all computers, peripherals, interface cards and other equipment needed to perform data processing and communications with in the network

This section provides information on the following components .

1.File server

A file server is a high capacity computer that provides various resources to the network.

The server requires:-

A very fast computer with a large amount of RAM and storage space, a fast network interface card , and a type back -up device

Network operating system such as windows 2000, XP , Novell Netware, Windows NT server, or Apple share

2.workstation , a computer in a network is called workstation or client. It requires a network interface card, not necessary need floppy disk drives or harddisks since files can be saved on the file server.

3.Network interface cards (NICs) , NICs provides the link between your computer and your network .It provides the physical connection between the network and the workstation.

Most NICs are internal , with the card fitting into an expansion slot inside the computer,others are build on the motherboard. The type of NIC affect the speed and performance of a network. Three common network interface connections exist, Ethernet cards, LocalTalk connectors,Token Ring cards

3.Hub or a concentrator

Diagram missing

A hub is a device whose primary function is to send and recive signals analog the network between the nodes connected to it,

It connects muiltiple devices to the network

It serves as a central meeting place for cables from computers, sserfvices and peripherals.

It is usually configured with 4,8,12,or 24 RJ-A5 ports.

The entire network shuts down if there is a problem on a hub.

4.A repeater

A repeater is a device that regenerates and amplifies signals to create long-distance networks.It simply receives, amplifies and rebroadcasts the signals.some repeatersprovide basic error checking.

A repeater can be a separate device or it can be incorporated into a concentrator .It is used to overcome distance limitations .

A bridge

A bridge is a device that links two homogenous packet-broadcast local networks.It accepts all packets from each network addressed to adevice on the other, buffers them, and retransmits them to the other network .It connects two or more networks using the same optimum performance on both sides of the network often used when LANs reach their capacity of nodes.

A switch

Diagram missing

A switch is a high-speed multi port bridge.Today, switches are replacing multi port repeaters or concentrators in a UTP environment. (Un shielded Twisted pair).

It is an intelligent hub that maintains a bridging table, keeping track of which hardware address are located on which network segment .

More efficient than any other type of hub.

It has ability to dedicate bandwidth to each port on it’s self.

A router

Diagram missing

Routers are similar to bridges in that they link two or more physically separate network segments.The network segments linked by a router, however, remain logically separate and can function as independent networks, routers

Translate information from oe network to another, similar to a super intelligent bridge ie. Receive information from a cabled network and transmit it wirelessly

Maintain a map of the network, select the best route for data.

Have information on source addresses, destinatination addresses and path distances

Segment bandwidth and segment status are contained in the routers’ routing table.

Can translate messages with different addressing methods

Can act as firewalls(many isp’s block traffic at the router level).

Direct signals traffic efficiently.

Can route messages between linear bus, star, and token ring topologies.

Can route messages across fibre optic, coaxial and twisted pair.