

COMPUTER STUDIES

COURSE

FOR

RUSTY READERS

(Theory & Practical)

By

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INTRODUCTION TO COMPUTERS

Introduction

Anciently, people used many ways of communication and doing business. Information was relayed from one place to another through smoke signals, horning and even sending a messenger. Sending a messenger was the trickiest because many times the message was not received on time. The messenger could get exhausted or attacked by wild animals or other enemies on the way.

Definition of a Computer

A Computer can be defined as an electronic device for inputting, processing and outputting of data and information. It accepts data from the outside and processes it to produce information.

A Computer can also be defined as a fast and accurate electronic device or data manipulation system that is designed and organized to automatically accept and store input data, process it and produce information under the direction of a guided step by step program of instructions.

History of Computers

The historical development of Computers is classified into various generations as shown below;

1. 1940–1958 The Computers used a vacuum tube to process data. They

Were very large

Were very expensive

Were very slow

Were unreliable

Needed extensive air conditioning

2. 1959–1960 The Computers used transistors to process data. They

Were less expensive

Were more reliable

Were smaller in size

Consumed less power

3. 1961–1970 The Computers used integrated circuits to process data. They

Were much smaller in size

Were faster

Were more reliable

Consumed less power

Were capable of multitasking and multiprogramming

4. 1971–1990 The Computers used large scale integrated chips to process data. They

Were small in size

Were much more faster

Were less expensive

Were user friendly

5. 1990 to current The Computers use magnetic bubble to process data. The major achievement in this generation is development of the Internet Technology

Parts of a Computer

A system is a set of components that are designed to work together to achieve a specific goal. A complete Computer System is composed of three major components namely;

Hardware – the physical or tangible components of a computer

Software – the programs that run the Computer System. They instruct the computer on what to do, how and when to do it.

Liveware / Orgware – the human part of the computer System i.e. the user or the computer Operator

Hardware

Computer Hardware enables the user to;

- a) Enter information into the Computer
- b) View the output on-screen
- c) Print out the work
- d) Store and process the information

Computer Hardware can be classified into;

-Input devices

Input devices are communication links between the computer and its user. They accept external data and transmit in into a form that is understandable to the Computer. Examples of such devices are;

*The Mouse (Manually operated user signal encoder) - is a hand held device that is used to issue commands and instructions into the Computer by activating certain spots on screen. It consists of two buttons, a rolling ball, an intelliwheel and a tail.

Common mouse terms and functions include;

- ❖ Pointing – it involves positioning the mouse pointer over an item e.g. point to the system clock to display date and time.
- ❖ Click – press and release the left button once. It selects an item
- ❖ Double click – press and release the left button twice in a rapid succession. It is used to open or display contents of double clicked object
- ❖ Right click – press and release the right mouse button once. It will display a floating menu/ pop up menu/ shortcut menu
- ❖ Dragging – point on an object, press and hold down the left mouse button, move to a new location then release
- ❖ Clicking out – pressing the left mouse button once and away from a selected item or menu to deselect or escape out of the menu
- ❖ Triple clicking – pressing and releasing the left mouse button thrice in quick succession. It has the effect of selecting a paragraph
- ❖ Right dragging – point an object, press and hold the right mouse button, move to a new location then release. A floating menu appears
- ❖ Hovering – clicking on an Icon and a short description appears

*The Keyboard – It contains an array of keys. It is used to send a series of commands and text typed in at prompt by pressing the appropriate key or combination of keys. The keyboard consists of the following common keys;

- ✓ Typewriter keys – the A – Z keys used to enter or type textual material or data into the Computer. They are usually known as QWERTY keyboard keys
- ✓ Caps lock key – locks the keyboard to permanently produce the uppercase version of typewriter keys
- ✓ Space key – a long elongated key that inserts spaces between words or characters
- ✓ Enter key – marks the end of a line or paragraph and the beginning of a new line or paragraph
- ✓ Shift key – used together with the typewriter keys to give the opposite case of those keys. It is also used to type the alphanumeric keys that share the numerical keys
- ✓ Numeric keys - are used to enter numerical characters (data) into the Computer
- ✓ Navigation/ cursor movement keys – used to move/ navigate the cursor to and fro in a page. Such keys include page up, page down, home, end and the four arrow keys.
- ✓ Backspace key – used to erase or delete characters to the left of the blinking cursor
- ✓ Delete key – used to erase or delete characters to the right of the blinking cursor
- ✓ Function keys – are labeled F1 to F12 and provide shortcut to commonly used commands. For example, F1 provides shortcut to help in most application programs
- ✓ Alphanumeric keys – give special characters that are neither numerical nor alphabetic. They include! @ # \$ % ^ & * ~: etc.
- ✓ Numeric keypad – it is toggled on or off by use of the Num Lock key. When on, it acts as a numeric keypad for fast entry of numbers. When off, it acts as navigation/ cursor movement keypad

*The Scanner – It is used to capture images and other existing documents for further processing or to incorporate them into other documents

*Automated Teller Machine (ATM) – a specialized form of input device for automatic payment. The customer inserts the ATM card into a machine, then keys in the PIN and the correct amount to be withdrawn. The transaction can be printed on a receipt which will show withdrawn amount and the ATMs balance.

*Point of sale terminal – consists of a numeric keypad and few function keys. The items' quantity and price of goods purchased by the customer are entered into the terminal directly. A terminal receipt is produced. Details of the sale are entered directly and the level of stock is decreased automatically. POSTs are commonly found on supermarkets

*Optical Mark Reader (OMR) – uses the concept of light passing to interpret marks made in a certain position on the document. They are mostly used to make examinations with multiple choice questions.

*Modem – Modem stands for Modulator Demodulator. It enables digital computers to communicate across analog telephone lines by converting digital signals (data) into analog signals (sound) and vice versa

*Bar code reader (BCR) – is used in supermarkets to control the stock and sale

*Digital Camera – used to capture images digitally

*Sound card and microphone – used to capture sound digitally

*Magnetic ink character reader (MICR) – used to facilitate cheque clearance in banks

-The Microprocessor/ Central Processing Unit (CPU)

It forms the “brain” of the Computer System. It controls and Co-ordinates all the other Computer devices. It consists of the subparts namely;

Control Unit – it fetches, decodes and executes programs and instructions

Arithmetic and Logic Unit (ALU) – It performs all arithmetic operations and logical comparisons

-Computer Memory

*Random Access Memory (RAM) – RAM is PC's primary storage area used to write, store and retrieve information and program instructions that are then passed to the CPU for processing. It can be both read into to store information and written into to store information. Its major functions are *to hold data waiting to be processed* and *to hold programs that are currently being executed*. RAM is;

- Volatile i.e. it loses its contents immediately the power goes off
- Expendable i.e. it can be upgraded to increase the machine's memory size. The larger the RAM size, the faster the Computer

*Read Only Memory (ROM) – ROM is a special memory that has data permanently written onto the chip during manufacture by using a special programming technique called a burner. It is used for programs and data that need to be present all the time. Its contents can be read from to retrieve information but cannot be written into to store information during the normal operations of a Computer. ROM is therefore produced by the manufacturer and is characterized by;

-High bit density

-Non volatile

-Low cost

The Computer's logic Unit works with only two states of On and OFF. For the computer to store information, the information must be in the two states of ON and OFF. Such states of ON and OFF are usually represented by the BINARY SYSTEM OF NUMBERS which uses only to digits “0” and “1”. 0 stands for OFF state where a 1 stands for ON state. Each 0 or 1 in the binary system of numbers is called a binary digit (bit). The bits are usually combined into groups of eight (8), called a byte. Each byte is used to represent a letter, number or a special character e.g.

character A is represented by the following combination of bits 11000001 (ASCII system), 8 bits = 1 byte

Bit 1 or 0

8 Bits - 1 Byte (1 Character)

1024 Bytes - 1 Kilobyte (1 KB)

1048576 - 1 Megabyte (1 MB)

100 Million Bytes - 1 Gigabyte (1 GB)

*The Secondary Memory – It is used for storing back up data and information. It is included in the Computer because of the following reasons;

Lack of enough memory space in the RAM to store all the required information

The main memory is volatile whereas the secondary memory is permanent

RAM is an expensive form of storage

Secondary storage devices include;

- Magnetic disks – which are written into and read from by the disk drives. They are of two types;
- Hard disks – which are rigid and usually fixed in the system unit. They have high capacity for storing data when compared to the floppy disks. They consist of platters arranged one on top of the other. A spindle holds several concentric disks called platters. Platters are coated with a magnetic material that holds data
- Floppy disks – which are made of plastic. Inscription of data is done on a magnetic coating. Information is recorded on a number of concentrated circles called tracks. Tracks are further subdivided into sectors. A group of sectors make up a cluster. A cluster is the smallest amount of disk space that can be allocated to hold a file

Care of diskettes

Keep diskettes away from extreme sunlight, heat or cold

Do not expose the diskettes head window

Protect the head window from finger prints, dust or smoke

Keep diskettes away from all magnetic sources such as radio speakers

- Magnetic tapes – they record information on to a tape similar to that used by tape recorders. Data is stored in blocks separated by inter block gaps. They are sequential access devices i.e. if the information is stored at the end of the tape, the program will have to read almost the entire tape

- Optical disks – they have high recording density than conventional magnetic disks. The optical disks are;
 - ✚ CD-ROMs (Compact Disks Read Only Memory). CDs are common media for both audio and data storage. They can store up to 700 MB of data whereas floppy diskettes can store 1.44 MB of data. The CDs are made from pre pressed disks and encased in plastic. Actual data is stored through pits or tiny indentation on the internal disk. To read the disk, the CD-ROM shines a laser beam onto the surface.

 - ✚ The DVD – stands for Digital Versatile Disk. DVDs provide digital information on disks that are the same physical size as the CD-ROM. They offer better sound and picture quality than videotapes. DVDs hold a capacity of 4.7 GB

-Output devices

Output devices are used to present whatever information is processed by the Computer e.g. the printer and monitor screen.

Computer Booting

Booting is the process by which the Computer loads system files into the main memory. This process also involves carrying out of diagnostic tests. There are two types of booting, cold and warm booting.

Cold booting is starting the computer by simply turning off the power button and then turning it on again. Warm booting is simply re-starting the computer. This is done by pressing CTRL + ALT + DEL keys or selecting Re-start option on the shut down dialog box. This resets to neutral state without performing the initial power up routines.

Computer Software

A software or program is a set of instructions that the hardware needs to function. It commands the computer what to do and how. Computer software can either be Operating Systems, Application software, compilers, assemblers and utility software.

□ System Software

These are programs concerned with effective performance of computer hardware. They make it easy for people to handle the computer. There are several types of System Software. They are operating systems, language translators, utilities/ service programs and communication software.

Operating system – this is the program that controls and co-ordinates the computer operations. Some operating systems are machine specific but there are some standard ones e.g. operating systems such as Ms DOS, Windows 95, Windows 98, Windows 2000, windows N.T and Novelle.

Types of Windows Operating System

Below we will look at some of the Microsoft Windows operating systems and how they evolved.

Windows 3x

This version of windows was heavy on DOS (Disk Operating System) such that when the Computer opened the DOS prompt (C>/ first appeared and you had to type in your instructions for the Computer from there. It consisted of a program manager or program file wherein you had all your icons. Windows 3.1 had many limitations. One was that file names could only have eight letters.

Windows '95

Windows '95 was released in 1995 amid much fanfare and hullabaloo. Windows '95 is still much used today in many computers because of its stability. It had many improvements over the 3x class of Windows. Most notable are the following;

Windows '95 did away with the concept of program manager therefore you no longer had to wade through many windows in order to get your favorite program, you can spread your work all over the desktop

Windows '95 also lets you use long file names, like *Comparing Majimbo with Centralized System of Government in the Kenyan setup* instead of something like **COMAJIMB.TXT**.

Windows '98

Windows '98 came in two editions. The first edition was unstable and tended to hang when certain programs were run. One of the things that distinguish Windows '98 from the other Windows is that it has a multi monitor capabilities.

Windows 2000 Professional

This version of Windows is mainly meant for the business environment which requires;

- ✓ Advanced security
- ✓ Reliability
- ✓ Networking features

Windows Me (Millennium Edition)

Windows Me is primarily targeted toward the individual home users, and not so much for businesses. It was first released in September 2000. Windows Me is the most radical upgrade in the Windows 9x family. The major improvements over the Windows '98 Second Edition include multimedia features such as;

- ◆ Automated video editor with high powered compression and simple import from video cameras. This means that you can make movies with this Windows upgrade

- ◆ New system-protection feature that include a wizard that restores a dysfunctional system to an earlier functional state. This system restore components backs up crucial system files when the computer is idle, making snapshots of the system every 10 hours of computing time. Additional snapshots can be created at any time by running the system restore wizard
- ◆ New easy set up feature which simplify home networking and broad b and access

In addition, the Universal Plug and Play specification will let windows communicate with devices such as refrigerators and wearable computers

Windows XP

This new Microsoft Windows operating system is touted as the best Microsoft has ever produced. It was officially launched on 25th October 2001. The XP is short form for eXPerience. The operating system is significantly more reliable and easier to use than any of its predecessors, including Windows '98 and the disappointing Windows Me. It has all the best features of sold Windows 2000 Professional but without the complexity. There are two varieties of Windows XP;

- * The XP Home Edition, and the

- * XP Professional

The XP Professional is more expensive than the Home Version but does everything the Home version does and adds better networking tools and security features. The advantages of the Windows XP over the other versions of Windows are that;

- It makes the PC boot up or shut down faster

- It is easier to install

- Navigation through folder and files is streamlined

- Setting up a home network is simplified

Once the network is set up, several family members can share a high-speed internet connection at the same time, leading to greater domestic harmony, or at least fewer fistfights. In fact XP makes it easier for several family members and guests to share a single PC without messing up one another's files and settings, or compromising their privacy.

Job scheduling
Error handling
Job sequencing
Control Input/ Output
Resource management/ allocation
Memory management
Running application software

Minimum system requirements for Windows XP

- Windows XP requires a PC with a processor clock speed of at least 233 MHz, and 300 MHz is a practical minimum
- Although Microsoft says that XP will work on PCs with as little as 64 MB of system memory (RAM), 128 or more is better
- You will need at least 2 GB of free hard-disk (HDD) space, and a CD-ROM or DVD drive
- Generally, XP is compatible with PCs and peripherals bought in January 2000 or later. An older PC may not be able to take advantage of all the new XP features

Safety measures in a Computer Laboratory

Below are safety precautions to be considered in order to avoid accidental injury to the users and damage of Computers in a Computer Lab.

- Don't expose the computer to smoke or dust. This may cause abrasion on the mother board.
- Avoid eating and drinking on the Computer Lab. Spilling of drinks may cause electrical faults on the system
- Don't move unnecessarily because you may accidentally knock down peripheral devices
- Always follow instructions clearly when starting or shutting down the Computer to avoid data loss and damage to the computer
- Don't open up the system unit or any peripheral devices especially when the power is on

□ Application Software

These are programs written to solve specific problems and can be divided into two major groups;

*User application programs – These are custom programs written to meet a user's specific needs. This may be done by in-house programmers or a software house under contract

* Application packages – These are ready-made programs purchased by the user. They cover common business applications. They include spreadsheets (used for preparation of budgets, planning etc.), word processor (used for preparation of documents), databases (used to set up data bases).

File Extensions

They identify the source program of a file. The system adds these extensions automatically once the document has been saved .The file name and the file extension are separated by a dot. Below are examples of file extension.

DOC-Ms Word Document

MDB-Access Database

XLS-Excel Spreadsheet

PPT-Power Point

SYS-System files

COM-Command files

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