

Element 1: Initiate computer system

THE COMPUTER SYSTEM

What is a computer?

A computer is an electronic machine that accepts information (*data*) processes it according to specific instructions and provides the results as new information.

The computer can store and manipulate large quantities of data at a very high speed and even though it cannot think, it can make simple decisions and comparisons. For example, a computer can determine which of two numbers is larger or which two names comes first alphabetically and then act upon that decision. We all have to remember that it is a machine and that it can't solve problems on its own. It must be provided with instructions in the form of a computer program.

A program is a list of instructions written in a special language (*code*) that the computer understands. The language tells the computer which operations to perform and in which sequence to perform them.

DATA

Data are raw facts (material) which are entered into the computer for processing.

INFORMATION

Information is data that has been processed into a useful form.

THE DATA PROCESSING CYCLE

Four words sum up the operations of a computer.

1. **Input**
2. **Output**
3. **Processing**
4. **Storage**

INPUT – This is the entering of data into the computer for processing using an input device (e.g.) Keyboard

PROCESSING – This is the manipulation or conversion of data into information by the processor (CPU).

OUTPUT – This is the result of processing passed on to the user with the use of an output device (e.g.) Monitor

STORAGE – This is the storing or saving of data & information for future use on storage mediums (e.g.) Floppy disk (diskettes), Hard disk (C: drive)

DIAGRAM REPRESENTING THE DATA PROCESSING CYCLE

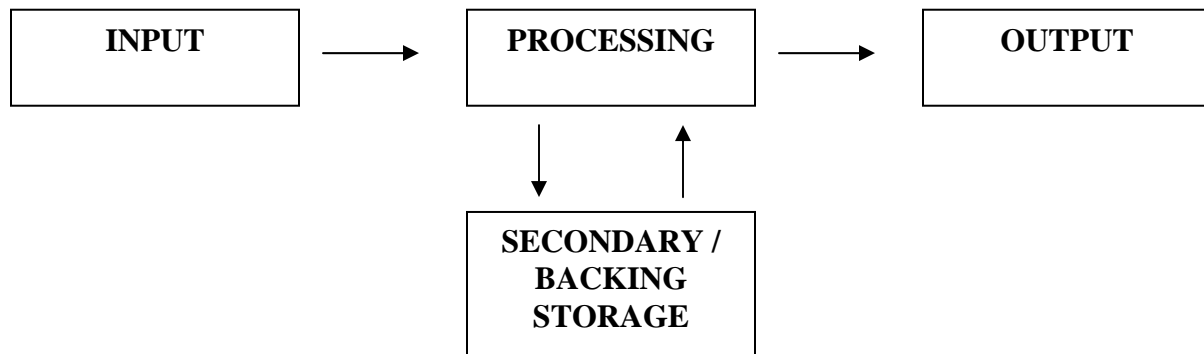
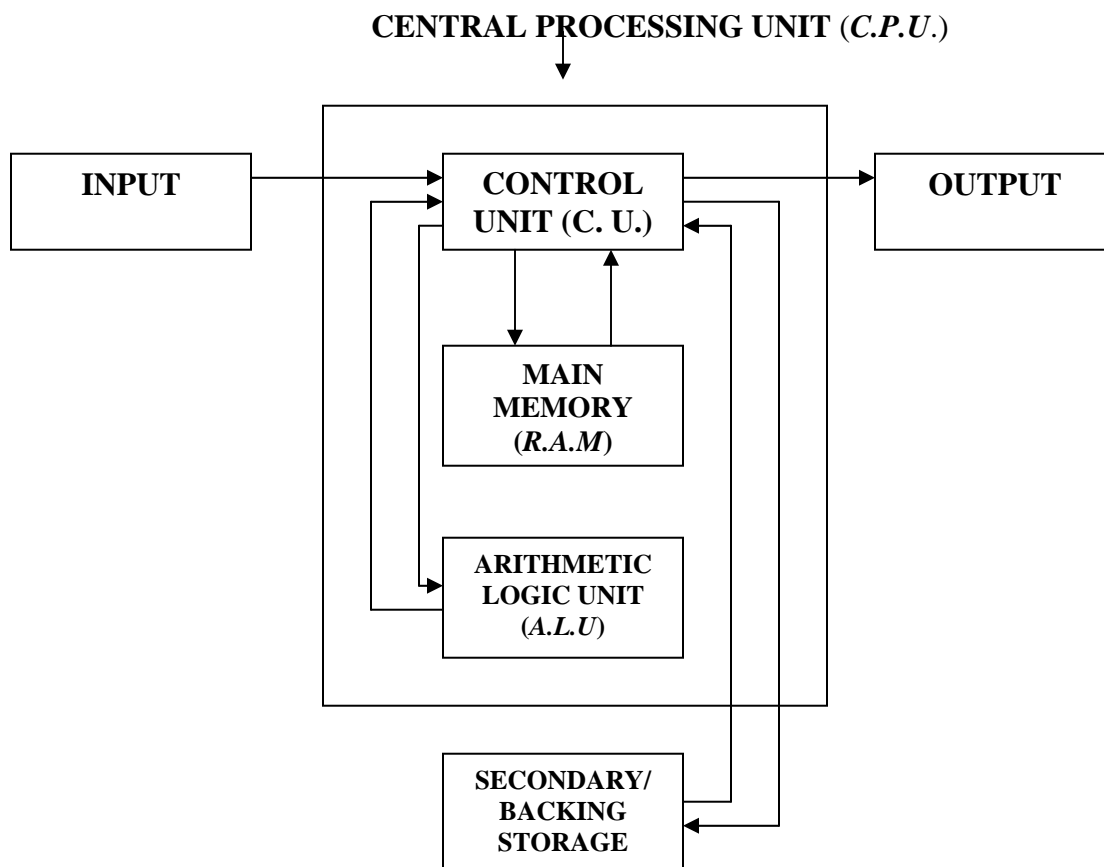


DIAGRAM SHOWING THE BASIC COMPONENTS OF A COMPUTER SYSTEM & THE DIRECTIONS IN WHICH DATA / INFORMATION FLows THROUGHTOUT THE SYSTEM



INTRODUCTION TO WINDOWS OPERATIONS

BOOTING

When the computer is turned on it is said to boot up or goes through a process of booting. This is the process of starting or resetting a computer that loads the operating system into memory.

There are two types of booting.

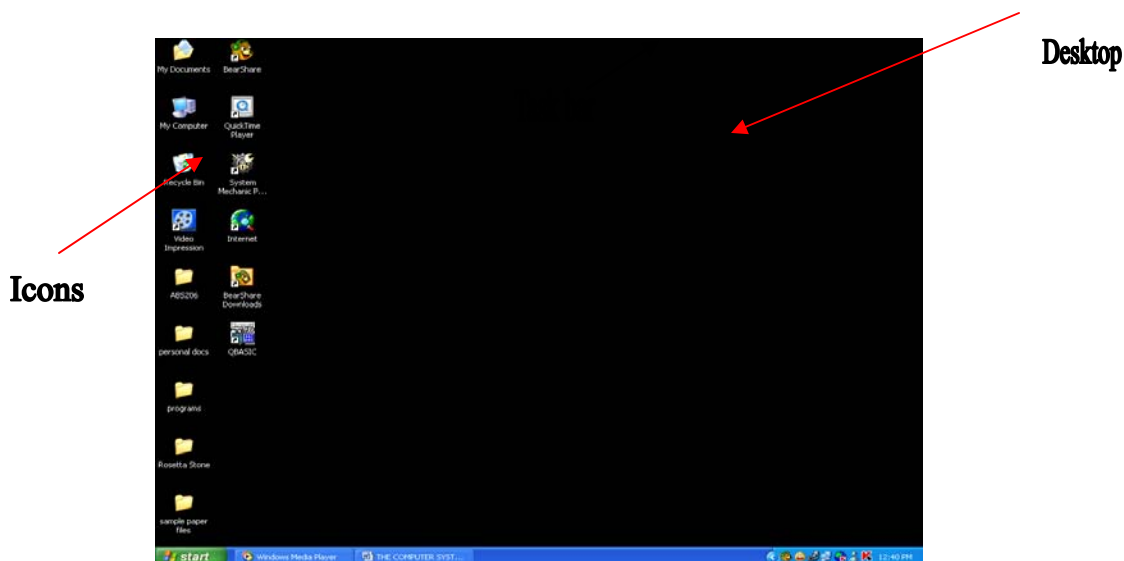
1. **Cold boot** – this is the process of turning on a computer that has been off.
2. **Warm boot** – This is the process of resetting or restarting a computer that is already turned on by pressing the reset button or by using the combination of Ctrl +Alt + Del keys (depressing them all at once)

OPERATING SYSTEM

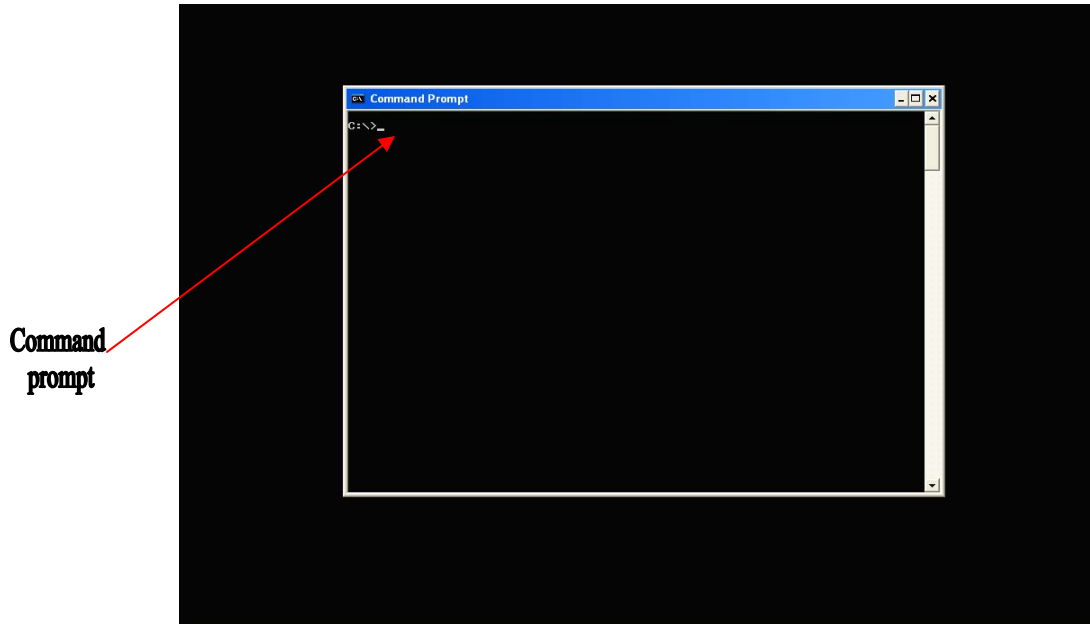
An operating system controls and manages all operations of a computer. It translates codes into english and vice versa so that users can communicate with the computer. The point of communication between the user and the computer is called a user's interface.

There are two main types of user interfaces:

1. **Graphical User Interface (GUI)** – This interface allows users to communicate with the computer by using a mouse to click on and select little pictures on the computer screen called icons or choosing options from a menu. This interface is the most common and is very user-friendly. (Eg.) Microsoft Windows XP & 2000.



2. **Command Line Interface** – The user communicates with the computer by using commands, which have to be memorized and typed exactly as stated in the program rules; you will not get the desired result if you leave out a comma or a full stop. (Eg.) Microsoft DOS (*disk operating system*).



THE COMPUTER DESKTOP

This is the entire background of the windows computer screen that you see when the computer has boot up or you exit a file or program. The desktop normally has little pictures on it called icons.

ICONS

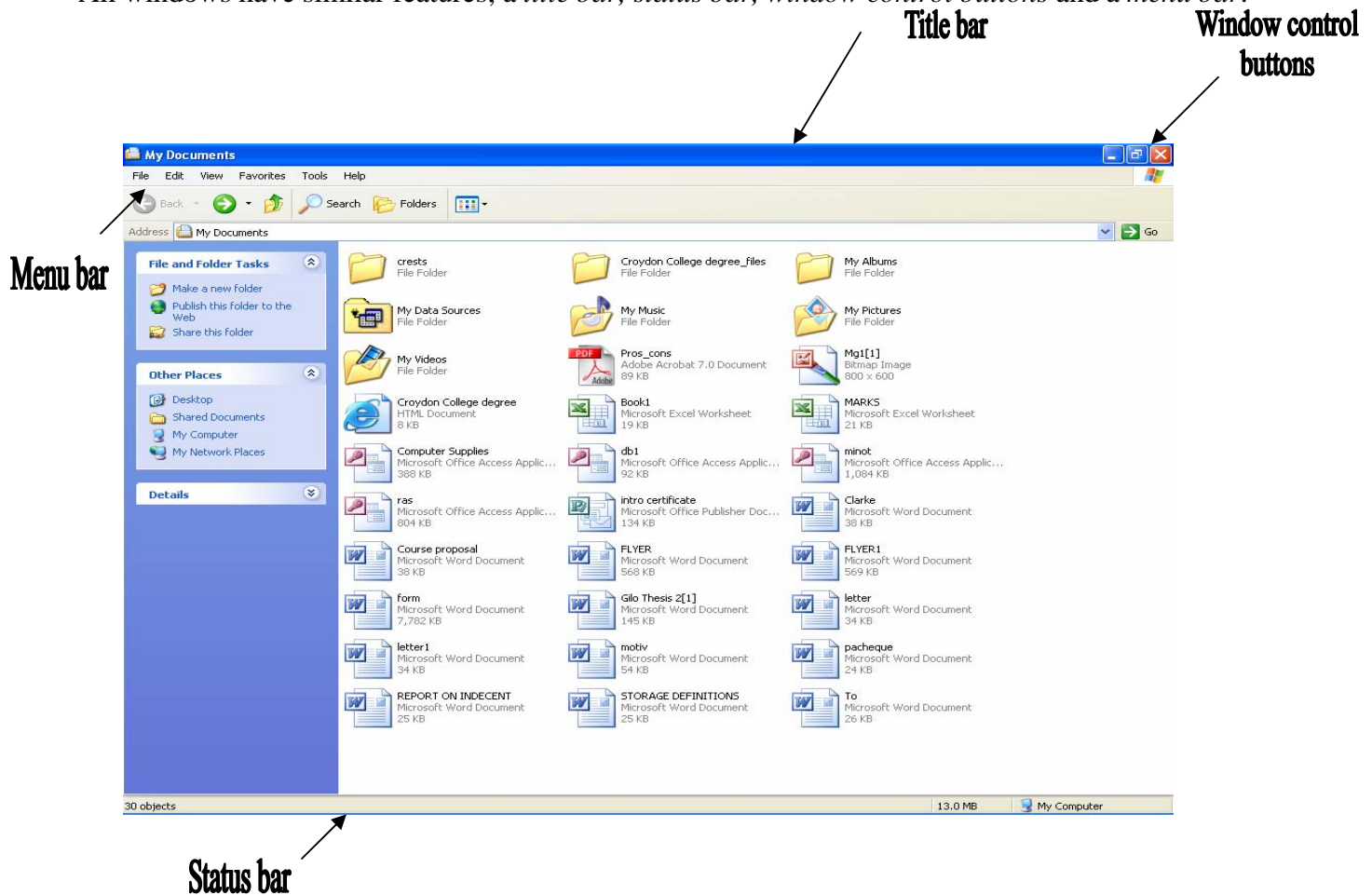
This is a small pictogram (*symbol representing an object or concept by illustration*) which represents a file, folder, application or device on a computer operating system. Icons are found on the toolbars and the menus of computer application software.

TASKBAR

This is the horizontal bar at the bottom of the computer screen with the start button and several icons. The taskbar shows all files and programs that are opened on the computer. When windows are minimized they go to the taskbar.

WINDOW

When using Microsoft Windows operating system all files and programs opened, is opened in a window. All windows have similar features; a *title bar*, *status bar*, *window control buttons* and a *menu bar*.

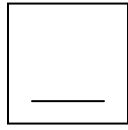


Menu Bar – This provides the user with a list of options to choose from. Each word on the menu bar supplies list with a number of choices for the particular application / program you are using.

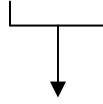
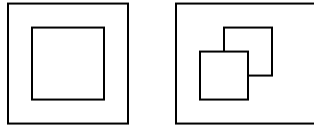
Status Bar – This bar provides information about objects within the particular window you are working with. It normally tells the number of objects or pages in a document and the size of the files listed.

Title Bar – This tells the user the name of the file or program that is currently opened.

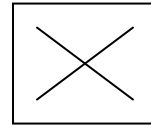
Window control buttons – These are used to control the window. They allow you to *Minimize*, *Restore/Maximize* & *Close* the window that is currently opened.



MINIMIZE



RESTORE/ MAXIMIZE



CLOSE

Equipment is powered up correctly

Depending on the computer you are using, what you have to type to get in to your computer may be different, but the basics are the same for most computers.

1. Switch on system by pressing the power button and the computer will then “Boot Up”
2. A login dialog box may prompt you to enter information such as user name and password.
3. You will now be at your desktop.



Most modern computers provide features or interfaces that make user interaction with the computer quite simple compared to the early days of computers when only computer specialists were able to use them. The computer is meant to simulate your working space or office and the desktop (Windows 95/98 desktop as shown in the diagram), being one of those metaphors, is meant to suggest that in the office environment you are currently located on the top of your desk. Other interfaces include dialog boxes, drop-down menus and overlapping windows. An example of a

dialog box would be the login prompt referred to earlier. Other metaphors you will encounter include *files, documents, spreadsheets, notepad, and recycle bin.*

One of the main controls to become aware of on your desktop is the **Start Button**, which is usually in the left bottom corner of your screen. Familiarise yourself with the desktop and the various means to access your files and documents. There are a number of drop-down menus available on the desktop that provide access to the application software as well as other applications. Take some time to familiarize yourself with navigating the desktop and use the help feature provided.

PARTS OF THE COMPUTER SYSTEM

No matter the features of a computer it is no good by itself. Therefore we will look at the things that come together to make having a computer worthwhile. The combination of all these things will complete the Computer System. The computer system is made of four parts:

- ✧ Hardware
- ✧ Software
- ✧ Data
- ✧ Users

HARDWARE

The term hardware refers to the physical parts of the computer system. Therefore, any part of the system that you can touch; you can call it computer hardware. Hardware includes:

- ✧ Central Processing Unit
- ✧ Input Devices
- ✧ Output Devices
- ✧ Storage Devices

The Central Processing Unit (CPU)

This is most times referred to as the brain of the computer, because it controls and coordinates all the functions of a computer, similar to how your brain controls and coordinates the information that comes into your body. For smaller computers such as personal computers, the CPU is contained on one silicon chip called a microprocessor. On larger computers such as the IBM mainframe, the CPU may consist of several circuit boards.

The three main manufacturers of CPUs are:

1. Intel Corporation
2. Advanced Micro Devices (AMD)
3. Cyrix



INPUT DEVICES

Input devices are peripheral devices through which data is entered and transformed into machine-readable form. They accept data from outside the computer and transmit it to the CPU. Your choice of input device depends on the type of data you want to send to the CPU. Here are some examples of Input devices:

- ✧ Keyboards
- ✧ Scanners
- ✧ Light Pen
- ✧ Microphone
- ✧ Digital Cameras
- ✧ Web Camera

OUTPUT DEVICES

An output device receives data in a machine-readable form from the CPU and transforms it into human-readable form. Below are examples of output devices.

- ✧ Monitors ✧ Plotters ✧ Modem
- ✧ Printers ✧ Speakers ✧ Data Projectors

STORAGE DEVICES

Storage devices records and retrieves data on storage mediums, storage mediums are the actual material on which data is stored; such as floppy disks, CDs etc. There are two main categories of storage:

Primary Storage

This falls into two main categories:

1. Random Access Memory (RAM)
2. Read Only Memory (ROM)

Random Access Memory – this is the computer's main storage. It stores programs and data that are currently being worked on; data can be read from and written to this memory. Information stored in RAM is erased when the computer is turned off; therefore data stored in RAM is temporary or volatile.

Read Only Memory – this contains information that is stored by the manufacturer at the time of manufacturing and is permanent. Data stored in ROM can only be read from once it has been saved.
(eg) An original music CD.

Secondary Storage

Secondary storage provides a place to store programs and data when they are not being processed. This type of storage is needed because RAM is limited and volatile. Examples of secondary storage medium include:

- ✧ Magnetic disks (floppy, hard disk)
- ✧ Optical disks (CDs, DVDs)
- ✧ Magnetic Tapes

SOFTWARE

Software is a sequence of instructions to the computer. Computer software is divided into two categories:

- ✧ System Software
- ✧ Application Software

SYSTEM SOFTWARE

The System Software is a program or set of instructions that manages the resource of a computer system.

There are two types of system software:

- ✧ Operating Systems
- ✧ Utility Programmes

OPERATING SYSTEMS

Between the application software and your hardware lies the operating system. This is a set of programs that conducts communication between the various hardware devices and the application programs that are on the computer. Example if an application program issues a print command, then that command must be interpreted by the operating system and then sent to the CPU. The CPU will then instruct the printer to take a certain action.

Particular application software are written to run with particular operating systems. For example, Microsoft Word (*application software*) can only run with a Windows (*operating system*) operating environment.

Popular operating systems are:

- ✧ MSDOS
- ✧ WINDOWS XP
- ✧ UNIX

MSDOS – This is the first operating system designed for PCs, everything you needed the computer to do, you had to type in a command. MSDOS is a single user, single task operating system. Single user means that only one person can use the computer at any one time: single task means that only one task can be done at a time.

WINDOWS – The windows environment is an upgraded and user-friendly form of MSDOS. Now instead of having to remember all the commands, you simply click on an icon; this is called a Graphical User Interface (GUI). Windows is a single user operating system but unlike MSDOS, it's multitasking. This means that several tasks can be done at once. (eg) You can type a document, listen to music and be sending information to be printed.

UNIX – UNIX is a multitasking, multi-user operating system originally developed to be used in minicomputers. Universities and Internet service providers use the UNIX operating system seeing that they have to provide service to several users at one time. One disadvantage of UNIX is that it does not have a GUI and the commands are not easy to remember.

UTILITY SOFTWARE

Utility programs perform tasks related to the maintenance of your computer's health, hardware or data. Some are included in the operating system, which comes with your computer; others can be bought in a separate package. Utility programs perform tasks such as:

- ✧ Virus Protection – programs are designed to prevent, detect and remove viruses from your computer.
- ✧ Back-up – duplicating files from hard drive to another disk or tape
- ✧ Screen saver – animation or blank screen displayed when there is no keyboard or mouse activity for a period of time.
- ✧ Data compression – reducing the size of a file.

APPLICATION SOFTWARE

Unlike the Operating system which runs the computer, the Application software is designed to help people perform specific tasks. Application software falls into the following categories:

1. General Purpose
2. Custom Written
3. Customization of General Purpose
4. Specialized Packages

GENERAL-PURPOSE APPLICATION SOFTWARE

This is used by a large number of people in a variety of jobs and personal situations. There are five major general purpose application software which have together earned the name of the Big Five. They are:

- ✧ Word Processing
- ✧ Database Management
- ✧ Communication
- ✧ Spreadsheet
- ✧ Graphic Presentation

Word Processing

This is using the computer to create, store, manipulate and print letters, essays, reports and any other document that would have originally been created with a typewriter. Two examples of word processing application software are: Microsoft Word, and Corel Word Perfect. With a word processor, the display screen resembles a blank sheet of paper and the keyboard represents your pen.

Spreadsheet

This is the application of choice for documents in which you have to organize numeric data such as budgets, financial statements, grade sheets and sales records. Examples of electronic spreadsheet are Microsoft Excel, Lotus 123 and Corel Quattro Pro.

Database Management System (DBMS)

A database would be your choice to manage lists that have less to do with calculating numbers and more to do with sorting and organizing information such as membership registers and address lists in various orders. Examples of database management software are Fox Pro, Microsoft Access and Corel Paradox.

Graphics Presentation Software

Graphic presentation software describes programs that are used to improve the visual presentation of information or for creation of new and different forms. Business persons often use it to produce bar charts, graphs and even to create logos and business cards. You can use it to make fliers, cards, calendars with personal photos. Examples of this type of software are, Adobe Photoshop, Adobe Illustrator, Corel Draw, Microsoft Photo Editor and Microsoft Publisher.

Communication Software

A communication program allows your computer to communicate with other computers. It ensures that computers follow rules for sending and receiving data. Examples of communication software include Eudora Light, Microsoft Outlook and MSN Messenger.

CUSTOM WRITTEN SOFTWARE

Custom written software is one that has been designed or created by the programmer to meet the unique need of a single user or organization. For example a school could hire a programmer to create a program to meet the specific accounting needs of the school. This would be custom written software.

CUSTOMISATION of GENERAL PURPOSE SOFTWARE

Imagine buying an outfit that you like in a department store, but it is not exactly your fit. What do you do? Find a tailor or dressmaker to adjust it for you. Similarly, you may find a software package that you

like, but it does not fit all your needs. The user can get a programmer to tailor the software according to the organization's needs.

SPECIALISED SOFTWARE PACKAGE

These are created for specific work areas, for example, architecture, banking or medicine. An example of this is what is called an expert system; this system works by using the knowledge and rules of a specific subject area. (e.g.) a doctor could employ an expert system that asks a patient a series of questions and then make a diagnosis.

USERS

Last, but certainly not least is the final piece, which makes up the computer system. It is people (users) that use the computer to solve problems, so without them, the computer would be useless.