OPERATING SYSTEM INTRODUCTION

Computer Software can roughly be divided into two types:
   a). Application Software: Which perform the actual work the user wants.
   b). System Software: Which manage the operation of the computer itself.
The most fundamental system program is the operating system, whose job is to control all the computer's resources and provide a base upon which the application program can be written. Operating system acts as an intermediary between a user of a computer and the computer hardware.
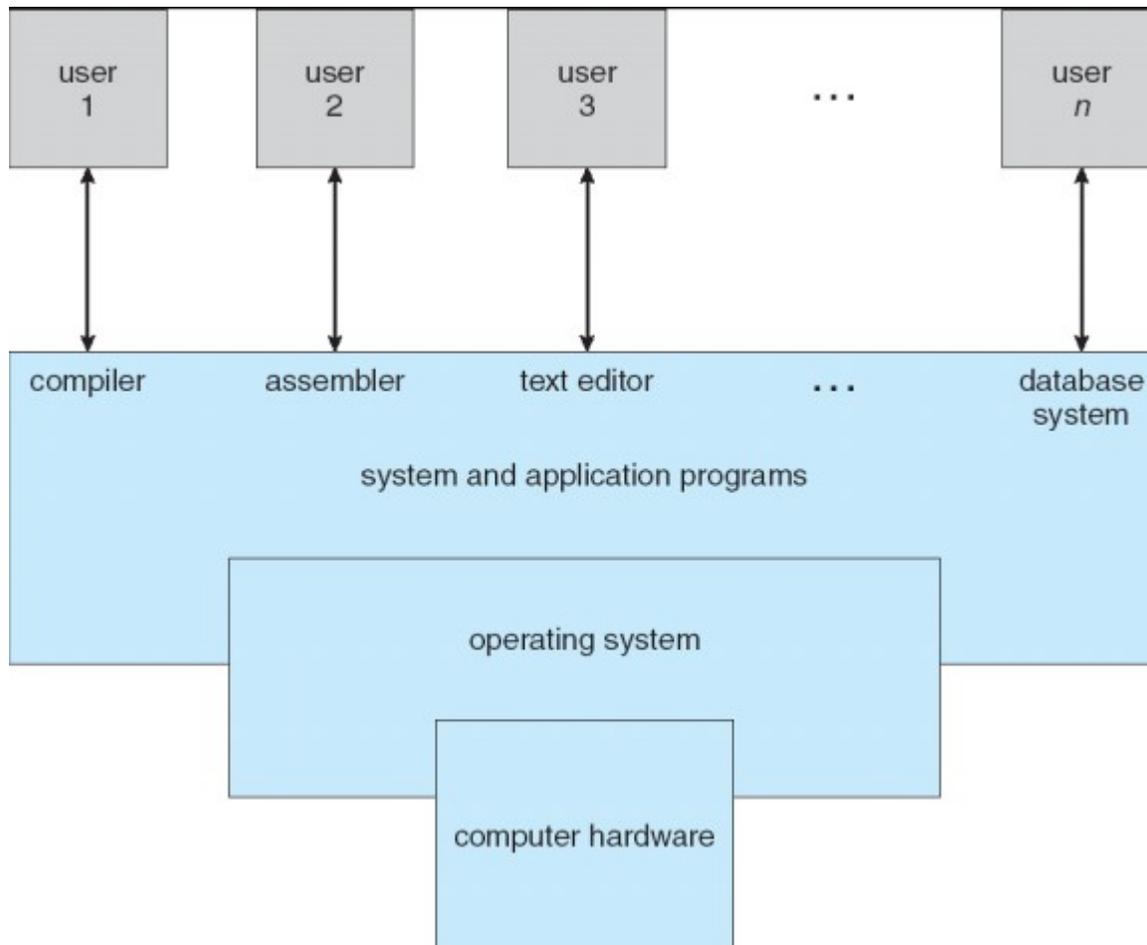

Fig 1.1 Abstract view of the components of a Computer System.

A computer system can be divided roughly into four components: *the hardware, the operating system, the application program, and the users* as shown in the fig 1.1

An operating system is similar to a **government.** Like a government it performs no useful function by itself. It simply provides an environment within which other programs can do useful work.

Two views of the Operating System:

Operating System as an Extended Machine or Virtual Machine(or As a User/computer interface)

The operating system masks or hides the details of the Hardware form the programmers and general users and provides a convenient interface for using the system. The program that hides the truth about the hardware from the user and presents a nice simple view of named files that can be read and written is of course the operating system. In this view the function of OS is to present the user with the equivalent of an extended machine or virtual machine that is easier to program than underlying hardware. Just as the operating system shields the user from the disk hardware and presents a simple file-oriented interface, it also conceals a lot of unpleasant business concerning interrupts, timers,memory management and other low level features.

The placement of OS is as shown in fig1.2 A major function of OS is to hide all the complexity presented by the underlying hardware and gives the programmer a more convenient set of instructions to work with.
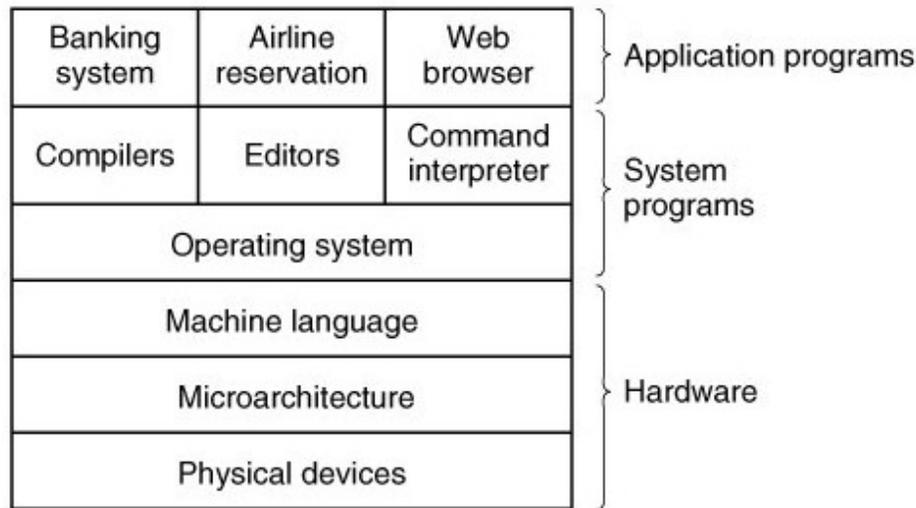

Fig1.2: Computer system consists of Hardware, system program and application program

Operating System as a Resource Manager

A computer system has many resources. Modern computers consist of processors, memories, timers, disks, mice, network interfaces, printers, and a wide variety of other devices. In the alternative view, the job of the operating system is to provide for an orderly and controlled allocation of the processors, memories, and I/O devices among the various programs competing for them.

Imagine what would happen if three programs running on some computer all tried to print their output simultaneously on the same printer. The first few lines of printout might be from program 1, the next

few from program 2, then some from program 3, and so forth. The result would be chaos. The operating system can bring order to the potential chaos by buffering all the output destined for the printer on the disk. When one program is finished, the operating system can then copy its output from the disk file where it has been stored to the printer, while at the same time the other program can continue generating more output, oblivious to the fact that the output is not really going to the printer (yet).

Figure 1.3 suggests the main resources that are managed by the OS. A portion of the OS is in main memory. This includes Kernel or nucleus. The remainder of main memory contains user programs and data. The allocation of this resource (main memory) is controlled jointly by the OS and memory management hardware in the processor
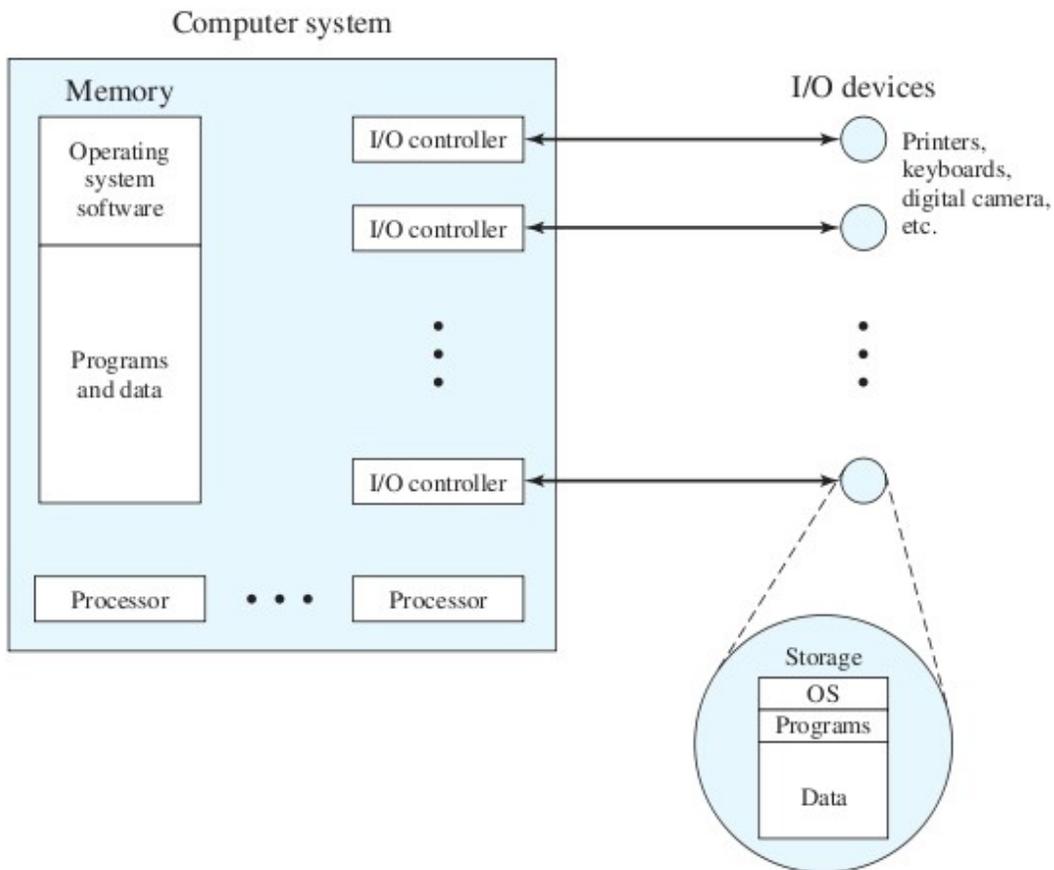

Fig1.3: The Operating system as Resource manger