CLASSIFICATION AND FUNCTIONS OF OPERATING SYSTEMS

Joseph Waithaka Marwa

TOPIC: Introduction to Operating Systems

August 06, 2023

Introduction to Operating Systems

(Philip, 2021, P. 25) An operating system is a software program that acts as an interface between the user of a computer and the computer hardware. It can also be defined as the set of programs that control and supervise the hardware resources of a computer and provides services to other system software. The operating system provides common services that are needed by users and applications.

The purpose of an operating system is to provide an environment in which a user may execute programs. It act as a resource manager and allocates resources to specific programs and users as necessary for their task. Some commonly required resources are input/output devices, memory, file storage space, CPU time among others. The operating system controls and coordinates the use of hardware among various application programs and users. It provides the means for proper use of the resources in the operations of the computer system.

An operating system generally is a control program that controls the execution of user programs to prevent errors and improper use of the computer. The fundamental goal of a computer system is to execute programs and solve user problems. The primary goal of the operating system is to provide convenience for the computer user.

Classification of Operating Systems

(High Flyer Series, P.20) Operating systems can be classified into three (3) categories according to the number of users who can access and use the system, number of tasks the operating system can execute and according to the interface it provides the users.

i. Number of Users

Under this classification the operating system is further categorized into two classifications

Single User Operating System: This operating system allows only one user at a given time to have access the computer. Examples include among others; Microsoft Disk Operating System (Ms DOS), Windows 95/98/2000 etc.

Multi-User Operating System: This operating system allows two or more users to have access to a computer at the same time. Examples include, Windows Server Operating System, Linux, Nove, Uni, Windows NT etc.

ii.   **Number of Tasks**

Under this classification the operating system is further categorized into two classifications

Single Tasking Operating System: This operating system allows only one program to be executed at a given time. Examples include, Microsoft Disk Operating System (Ms-DOS).

Multi-tasking (Multithreading) Operating System: This operating system allows a single CPU to execute more than one program at a time. Examples include; Ms Windows XP, Vista, 7, 8, 10, 11 etc.

iii.   **Interface**

Under this classification the operating system is further categorized into three classifications

Command Line Interface (CLI): with tis type of interface, the user interacts with the computer by typing a command at the command prompt found in the command line. This interface allows the user to type in commands and instructs the computer on what to do. Example of operating system includes Ms-DOS.

Menu Driven Interface (MDI): This type of interface allows the user to select commands/options from a list or menu using a keyboard or a pointing device such as a mouse. Example includes MS Editor.

Graphical User Interface (GUI): This interface represents commands as small pictures referred to as icons on the screen. The interface uses the concept of WIMPs (Windows, Icons, Menu and Pointers). Examples include; Ms Windows XP, Vista, 7, 8, 10, 11 etc.

Functions of Operating System

The operating system provides certain services to programs and to the users of those programs. Some of these functions include;

Job Scheduling: The operating system prepares, schedules, controls and monitors tasks submitted for execution to ensure the most efficient processing.

Memory Management: The operating system controls the usage of computer memory space to ensure that it is optimized.

Resource Control/allocation: the operating system allocates computer resources such CPU time, main memory, secondary storage, input/output devices for use by application programs.

I/O Management (Handling Input/Output): The operating system helps the computer to manage input and output devices of the computer.

File Management: The operating system enables the computer to create folders, rename files, move files between storage devices among other file manipulation activities.

Error Handling: The operating system provides error detection routines to ensure the smooth operations within the CPU.

Interrupt Handling (Priority Management): The operating system establishes and enforces a process priority system. This facilitates a smooth running of activities.

User Interface: The operating system provides the user wit an interface for easier communication and interaction with the system.

References

J Makori, J Mwende and K Munene (2018) Longhorn Publshers, Information Communication Technology an Introduction Course for TVET students.

Philip Ndeda (2021) CPA Foundation Level Study Text – Information Communication Technology.

High Flyer Series & Publishers Ltd, KCSE revision in Computer Studies