**CLASSIFICATION AND FUNCTIONS OF OPERATING SYSTEMS**

Joseph Waithaka Marwa

TOPIC: Introduction to Operating Systems

August 09, 2023

**Introduction to Operating Systems**

A computer can best be described as an electronic device that accepts data as input, processes it, and produces information as output. For a computer therefore to process any data input, there must exist software programs that will be responsible for execution. One such software program is the operating system which is defined as the system software that runs and enables application software to be installed. A computer system is further classified into Application software and System software. Operating systems fall under the system software.

For an easier understanding of the operating system, we look at it as the driving force that enables computers and computing devices to function, communicate and transfer information and data. This becomes the power behind running applications on computers. Whereas the operating system is paramount, computers perform and execute tasks through application software installed.

**Features of Operating Systems**

An operating system consists of a number of features which include but are not limited to the following;

1. Provides a platform for running applications
2. Handles memory management and CPU scheduling
3. Provides file system abstraction
4. Provides networking support
5. Provides security features
6. Provides user interface
7. Provides utilities and system services
8. Supports application development

**Classification of Operating Systems**

Since there are a number of operating systems developed to support different users and applications, they are further classified into different classifications. These classifications are according to the task processing methods, the modes of users, and the interface used.

1. **Task Processing Methods**

Operating systems can be categorized under processing methods such as multiprocessing, multiprogramming, multitasking, batch processing, real-time, and time-sharing operating systems among others.

Multiprogramming Operating System, a single computer processor executes different tasks simultaneously, this is most preferred in a multi-user environment. Multitasking operating systems enable and support the running of various programs or tasks at the same time.

The batch processing operating system tends to group tasks into groups (batches) which are then processed together. These groupings could include programs, data, and/or systems commands.

Real-time operating systems and time-sharing operating systems.

1. **Modes of Users**

Under this classification, operating systems are further classified as single-user operating systems that allow only one user at a time to access and interact with the computers and also allow one user program to run. Multi-user operating systems allow more users to run programs at the same time and also share computer resources.

1. **Interface**

An interface is a program that enables users to interact with the computer. Under this classification, the operating system is further categorized into a command line interface (CLI) operating system which allows the user to type in commands and execute or run programs, and a graphical user Interface (GUI), which provides the computer user with a visual way of interacting with the computer using items such as windows, icons, and menus.

**Functions of the Operating System**

The operating system plays a fundamental role in providing several functions to programs, applications, and users. These functions are necessary for providing the user with an operational and functional environment with computers. The functions can be described as follows;

**File management**: The operating system ensures that user files are well-organized and controlled to enable the user to have easy access to these files. They are organized into directories, folders, sub-folders, and files.

**Program/task Execution**: Users and program instructions are executed as tasks by the operating system. The operating system ensures that tasks with high priority are executed first and followed by tasks with low priority. It also allows users to install, run and open application programs.

**User interface**: the operating system provides users with an interface where they are able to give instructions and or use computer hardware and software resources with ease.

**Resource management**: computers have a number of resources that the operating system manages to ensure maximum utilization and control. Such resources are allocated to the various computer programs and/or devices.

**Error management and handling**: The operating system ensures that the users are protected from system and program crashes by managing the errors users encounter during the execution of programs or tasks. The operating system handles the errors and allows users to continue working with the computers without system failures.

**Input and output devices handling**: The operating system ensures that the computer user is able to give instructions through the input devices and also access information through the output devices. The main responsibility of the operating system is to provide management services for the input and output devices to interact with the system unit.

**Security**: The operating system integrates security features into users' programs and data by ensuring that there exists a security level to these data and programs to protect them from unauthorized access. This is achieved by having password protection to data and programs activated and firewalls to protect from network access.

**References**

# [Great Learning Team](https://www.mygreatlearning.com/blog/author/greatlearning/) (2023), Operating System: Definition, Types, and Functions, *classification and functions*.

# Vikas Sharma (2020), Operating System: Classification of Operating System.

Indeed Editorial Team (2023), Operating System: Types of Operating Systems (with functions and examples).

Knowing Computers, Operating System: Classification and Functions of Operating System.