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A BRIEF DESCRIPTION OPERATING SYSTEM

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ABSTRACT

Operating systems are used in computers, and computers are extremely useful in saving time, thus they play an essential part in people's life. Computers mostly utilize operating systems. Users may describe an operating system as a system that runs their application programs and provides a user interface through which they can interact with the computer's hardware. The majority of commercially available operating systems today include flaws in their code, as well as security flaws and vulnerabilities. The author chooses to create this review paper due to a lack of knowledge about operating systems. In this review article, the author discusses operating systems, their history and development, applications, functions and types, as well as their advantages and difficulties. The author thinks that this article will aid in the comprehension of operating systems. The architecture of the robotics operating system is also used to write robot software. New updates have been released to address problems and defects, allowing OS to offer its users with the safest computing environment possible. As a result, the future of operating systems seems promising.

KEYWORDS: *Computer, Hardware, Management, Operating System, Software.*

1. INTRODUCTION

Humans will be unable to succeed, manage, and utilize computer systems without operating systems. A computer database/operating program's system is a system that provides software resources, processor hardware, and other mutual facilities. Operating systems are the most active kinds of system software and are regarded as the primary programs that execute when hitting a device. Users utilize operating systems to run their applications programs. It also provides users with a suitable interface for interacting with computer hardware. Operating systems are also responsible for providing a multi-level secure execution platform, hosting device drivers, regulating input and output peripherals, managing data storage, assigning main memory to different programs, generating threads, and launching processes. Linux, Mac OS, Windows, Unix, and other operating systems are examples of operating systems[1].

Operating systems such as Windows and Linux, like any other technology, have difficulties in terms of computer security, since they encounter many viruses, mistakes, and flaws throughout the course of their lives. To address these issues, the developers of these operating systems provide updates to address these issues and offer the safest computing environment for its operators and applications programs. The author of this review article discusses operating systems, their history and development, their types and functions, their benefits and difficulties, and their applications[2].

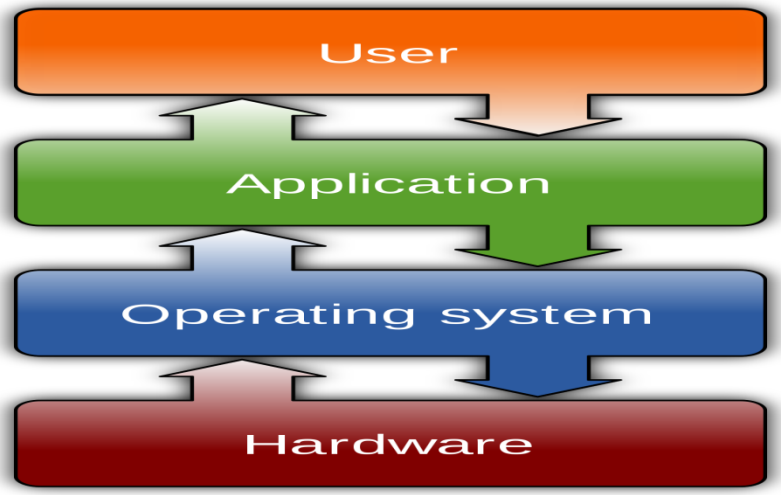

Figure 1:Representation of Architecture of operating system[3]

The design of operating systems is the interaction between computer software and hardware. Figure 1 depicts the operating system's design.

1.1 Various Type of operating system:

Figure 2 shows the many kinds of operating systems available today, including Mobile, Network, Distributed, Real-time, Multitasking, Multiprocessing, and Batch shown in Figure 2.

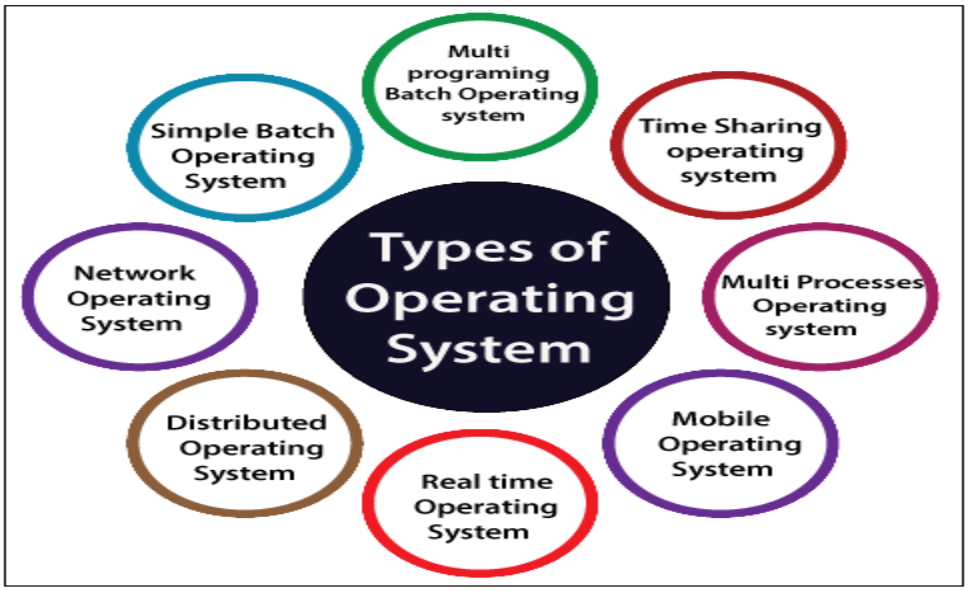

Figure 2: Various types of operating systems that are available in market[4]

a. *Mobile Operating System:*The systems that are intended to power wearable devices, tablets, and mobile phones are known as mobile operating systems. The following mobile operating systems are Android and iOS.

Advantages:

- It allows users complete access to all aspects of the device, including hardware and software.

Disadvantages:

- The upgrades are expensive and take a long time to complete.

*Network Operating System:*It's a networking solution that can help with application, security, groups, users, data, and a variety of other tasks. It's essentially a server that operates it.

Advantages:

- Centralized servers are very reliable.
- Servers may be accessible from a number of locations and platforms remotely..

Challenges:

- The cost of purchasing a server is expensive.
- It is necessary to preserve and update the information.

Distributed Operating System: It's a system that uses several mainframes spread over multiple computers to provide rapid computing to its workers.

Advantages:

- A user may utilize another resource that is available at another location by using the resource sharing feature.
- It provides superior services to its clients.

Real time Operating System: It is a system that operates on real-world applications and processes data in real time. RTOS include Windows CE, Vx Works, RT Linux, and QNX.

Advantages:

- This approach allows users to reuse their code.
- Priority scheduling is used in this system.

Multitasking Operating System: It's a system that enables several practices or activities to be completed at the same time using multiple CPUs. Sharing of time refers to the time on the mainframe that is shared by several operators.

Advantages:

- The idle time of CPU reduces.
- It removes the copy of software.

Disadvantages:

- Reliability is the main problem in multitasking.

b. Batch Operating System:

It is a system that does not interface with the computer directly. As certain computer procedures take a long time to complete. Work with a similar kind of need is collected together and executed as a collection to speed up the same process. Every operator creates a job on an offline device, such as a punch card, and delivers it to the computer operator in this format.

Challenges in Batch operating system:

- In this system, the interaction of user and job is less.
- Difficult to provide desired priority.

1.2 Operating System function:

In operating system, following tasks are shown in Figure 3.

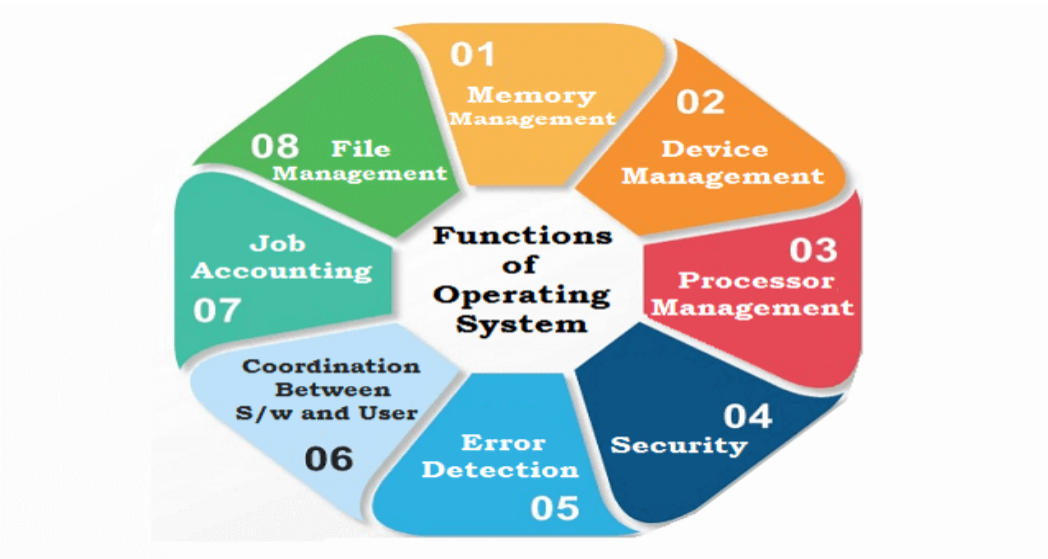

Figure 3: Various functions that are performed in operating system[5]

- *File Management:* This refers to the administration of file-related tasks such as file protection, sharing, name, organization, storage, and retrieval.
- *Job Accounting:* Job accounting may be defined as the keeping track of the resources and time spent by several operators.
- *Security:* Security is the function that protects a computer's papers and data from unauthorized access, danger, and viruses.
- *Process Management:* This is the management that creates and eliminates practices. It provides administration and communication tools, among other things.
- *Device Management:* This feature allows you to keep track of all of your instruments. Input/Output control is also part of this management. It also performs the task of device distribution.
- *Memory Management:* It is used in applications to allocate and de-allocate memory space.
- *Error Detection:* Error detection is the process of detecting a mistake produced by noise or other impairments during transmission from the transmitter to the receiver. The process of identifying errors in data and returning it to its original, error-free form is known as error detection.
- *Software-to-user coordination:* In this case, the user issues instructions to the system to coordinate it.

1.3 Benefits ofOperating System:

- The operating system is in charge of input and output management.
- It enables you to conceal hardware specifics by creating an abstraction.

- Graphical User Interface (GUI) may be utilized in the form of buttons and icons, making it simple to experiment with.
- A user may run programs and apps.
- The operating system is used to synchronize practices.
- The Operating System is in charge of resource allocation.
- The operating system acts as a link between the application and the hardware..

1.4 Challenges of Operating system[6]*:*

- If there is a problem with the operating system, the user may lose all of their data.
- The operating system is not completely secure since viruses may strike at any moment.
- Operating system software is prohibitively expensive for small companies, adding to their financial burden. Consider the example of Microsoft's Windows operating system..

1.5 Common desktops operating system:

The common desktop Operating system which is mentioned below:

- *Linux:* It is a free or low-cost operating system for its users[12]. It has a lot in common with UNIX. Linux is well-known for being a fast and well-organized operating system[7][8].
- *UNIX:* It was created in the 1970s. The C programming language is used in the UNIX operating system. It's a multi-user operating system that prioritizes adaptability and flexibility.
- *Mac OS:* Since 2011, Apple Inc. has been manufacturing and marketing the Mac OS operating system. Mac OS is primarily utilized in Apple's Macintosh PCs and workstations.
- *Windows:* The first version of Windows was released in 1985. It's a graphical user interface-based operating system that comes in a variety of flavors, including Windows XP, Windows 7, and Windows 8. It is a Microsoft-based operating system that is often found in personal and corporate computers. Because of the user-friendly Windows 95, it was mainly responsible for the rapid growth of personal computers.

1.6 Applications of Operating System in human life:

- *Human-computer communication:* As technology advances, it is becoming clear that people are attempting to interact with computers. People may become more connected as a consequence of technology advances such as social media, mobile phones, videoconferencing, chat rooms, and e-mail. It allows you to save time, effort, and money. Radio, television, and print media all played an important role in our everyday lives. In terms of production, control, storage, and broadcasting, computers have an effect on them as well. A document may be written on a computer, viewed on a screen, edited, printed on a printer, or sent to the rest of the world through the World Wide Web.
- *Computer's Impact on Education:* The introduction of computers into the educational sector resulted in a high quality of learning and instruction. We may use a computer to connect to the internet and link this information to a variety of ways in order to study any topic.

Computers are also used to facilitate interaction between students and instructors. Smart classrooms are also available at educational institutions[9].

- *Computer's newest trends and future expectations:* With the advent of computers, human life has altered dramatically. As a consequence, it's critical to emphasize the upcoming changes that computers will bring. Future changes will be focused on space travel, driverless vehicles, 3D printing, interest-based education, machine learning (ML), and artificial intelligence technology (AI)[10].

2. DISCUSSION

As previously stated, the operating system is the software that is used to run user programs and offer an interface for communicating with computer hardware. Many technologies, including as artificial intelligence, machine learning, and the internet of things[13], are now accessible on the market, and their inventors utilized operating systems to create them. People may also use the Robotics operating system framework to develop robot software. Introduction to operating systems, evolution and history, types and functions, benefits and challenges, and applications of operating systems are all covered in this article. This article, according to the author, will assist individuals who wish to learn about operating systems. Operating systems are important in human existence because without them, humans would be unable to utilize and manage computers. In today's operating systems, there are certain difficulties such as bugs, failures, and hardware issues. In light of this, developers are working hard to resolve these issues and offer their users with the safest computing experience possible. As a result, the operating system's future seems promising.

3. CONCLUSION

Currently, operating systems play a significant part in people's lives since computers and technology make work easier. An operating system is a system that runs user applications programs and provides a user interface for interacting with computer hardware. The following desktop operating systems are Linux, Unix, Windows, and Mac OS. People have shown a lack of knowledge about operating systems. The author chooses to write this paper in order to address this issue. The author of this review article addressed operating systems, applications, functions and types, as well as their advantages and difficulties. Operating systems are mostly used in computers, but robotics operating systems are increasingly being utilized to write robot software. Operating systems, like any other technology, are susceptible to bugs, viruses, and other problems. Updates are currently being developed to address these issues. Since a result, the operating system's future is bright, as it is employed in supercomputers and aids in the reduction of work load.

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