

Information Systems

Module Code: INFS-111

Programs: BCSS/BBIT

Software

- Computers are able to run using **two types of software**:
 1. System software- Consists of operating system and utility programs that control a computer system and allow you to use your computer. E.g. Operating system, utility programs
 2. Application software- includes all the programs that allow you to perform specific tasks on your computer. E.g MS Office

Operating Systems

- Is a collection of programs that manage and coordinate the activities taking place within the computer and it's the most critical piece of software installed on the computer.
- Is a software that carries out the computer's essential functions.
- The operating system provides an environment for hardware and software to work together.
- The operating system serves as an intermediary between the user and computer as well as between application programs and computer systems hardware

Activity

- In groups of **5** you need to complete the following Tasks
 1. Explain not less than **6** functions of an operating system (at most 10)
 2. Examples of Mobile and Personal computers operating system
 3. Explain not less than **5** functions done by utility programs
 4. Explain the following terms: packaged software, custom software, web application, open source software, shareware, freeware, public domain software. (Application software)

(About 20 minutes discussion)

Functions of an Operating system

1. Interfacing with users
2. Booting the computer
3. Configuring Devices
4. Managing and Monitoring Resources and Jobs
5. File management
6. Security
7. Multitasking
8. Multithreading
9. Multiprocessing and Parallel
10. Memory Management
11. Buffering and spooling

Interfacing with users

- Several types of user interface are used below are some examples:
 1. Command-based Interface- Commands are used to operate. Example of OS which use Command based include MS-DOS, UNIX and mainframe computers include MVS and BS2000
 2. Menu-driven Interface- It allows the users to select from menu. It is said to be an improvement of Command-based interface
 3. GUI- Is said to be the most popular Interface. It uses icons or menus to perform a function or run a program

Booting the computer

- The first task that the operating system is able to perform is to **boot** the computer when you switch on the computer.
- During the **booting** process the essential part or the core of the OS known as the **kernel** is loaded into the memory.
- The **kernel** remains in the memory the whole time the computer is on so that its available

Configuring Devices

- The operating system also configures all devices connected to a computer.
- **Device Drivers-** is a software that allows a device, such as a printer to communicate with the operating system. device, such as a printer, to communicate with the operating system. When you connect a new device to your computer, the operating system will usually recognize it and download the required driver automatically this is called “**plug and play**”. Sometimes, you might need to manually download drivers from a manufacturer’s Web site and install them.

Managing and Monitoring Resources and Jobs

- As you work on your computer, the operating system continuously manages the computer resources E.g disk space and memory and makes them available to devices and programs when needed.
- If a problem occurs E.g running too many programs or program stops functioning, it notifies a message to a user and rectifies the problem.
- **Scheduling routines** in the OS determines the order in which jobs are carried out and also to determine which Job is executed first if working with multiple programs

File management

- You are able to organize the files on a storage medium into folders to simplify file management.
- Usually the Operating System files are stored inside one folder and each application program is stored in its own separate folder inside a main programs folder(program files).
- Other folders designed for storing data files are created with the help of an OS.
- Files and folders are usually viewed in a hierarchical format. The top of hierarchy for any storage device is known as **root directory**.

Security

- A computer's OS provides passwords, biometric characteristics and other security procedures to prevent outsiders from accessing resources in your computer.
- Most OS have other security features installed such as firewall to protect against unauthorized access via Internet.

Processing Techniques for Increased efficiency

1. **Multitasking**- The ability of an OS to have more than one program open at a time. Although it allows users to work on multiple tasks, a single CPU cannot execute more than one task at a time. CPU rotates between tasks and it works so quickly that the user cannot be able to tell.
2. **Multithreading**- A thread is a sequence of instructions within a program that is independent e.g spelling check, printing and opening document in MS word. OS that support multithread has the ability to rotate between multiple thread.

Processing Techniques for Increased efficiency

3. Multiprocessing and Parallel processing- Both two terms need more than one CPU's in a computer in order to complete the task. The main difference between the two is that the multiprocessing, each CPU works on a different job while Parallel processing, the processors usually work together to complete one job more quickly.

Memory Management

- It involves optimizing the use of main memory (RAM). The OS allocates RAM to programs as needed and reclaims when programs are closed.
- One memory management frequently used by Operating System is **Virtual memory** which uses a portion of a computers hard drive as additional RAM.
- When amount of RAM required is exceeded, the OS moves the pages from RAM to VM.
- The only disadvantage of using VM is that its very slow.

Buffer and Spooling

- A **buffer** is an area in RAM or hard drive designed to hold input and output on their way in or out of a system e.g printing. Therefore printing buffer holds documents that are waiting to be printed.
- **Spooling** is the process of placing items in a buffer so they can be retrieved by appropriate device when needed. **Print spooling** allows multiple documents to be sent to a printer one at a time.

UTILITY PROGRAMS

- Is described as a software program that performs a specific task, usually related to managing or maintaining the computer system.
- Utility focuses on improving the functionality(e.g. hard disk management) of the OS while others provide additional functions (e.g. antivirus)

Utility Program functions

- File Management Programs
- Search Tools
- Diagnostic and Disk Management Programs
- Uninstall and Cleanup Utilities
- File Compression Programs
- Backup and Recovery Utilities
- Antivirus, Antispyware, Firewalls and Other Security Programs

File Management Programs

- Looking at the Folder and Files stored o a computer. It enables users to see the folders stored in the hard drive, USB or any other medium.
- Copying and Moving files and folders
- Renaming files and folders
- Deleting files and folders

Search Tools

- Search tools are usually integrated into file management programs.
- In Windows users can use **search box** located at the Top-right of Windows explorer window to search for files and folders in the current location.
- Internet search companies e.g. Google, Microsoft and Yahoo have developed desktop search tools that apply the technology used in their Internet search tools. E.g. email,

Diagnostic and Disk Management Programs

- Diagnostic programs evaluate your system, looking for problems and making recommendation's.
- Disk Management programs diagnose and repair problems related to the drive.
- Diagnostic and Disk management utilities built into the windows OS include programs to check hard drive for errors and programs to optimize hard ware by disk defragmentation.
- Disk defragmentation is done by rearranging the data on the hard drive so all files are stored in contiguous locations.

Uninstall and Cleanup Utilities

- Uninstall utility is used to remove programs in your computer.
- If a user deletes the program folder instead of uninstalling, extraneous data is left behind using up disk space and thereby slowing down the computer.
- Cleanup utilities such as Disk cleanup are designed to delete temporary files (deleted files in recycle bin, temporary Internet files, temporary installation files)

File Compression Program

- File compression programs reduce the size of the files so they take up less storage space on the storage medium. The most for user-compressed programs in Windows environment is the .zip format which is created using WinZip program.
- A file compression program is able to compress and decompress

Antivirus, Antispyware, firewall and other security programs

- Computer virus is a software that is designed to alter the performance the performance of a computer negatively.
- Spyware is a software program installed without user's knowledge that secretly collects Info and sends it VIA Internet.
- Phishing schemes try to trick users in supplying personal computers.
- There many security programs available such as antivirus programs (protect against malicious software), firewall(protect against someone accessing computer VIA Internet). Now Windows include Windows firewall and Windows Defender (Antispyware program

Application Software

- Classification of Functions:

1. General purpose, productivity or end-user applications assist a wide variety of users with common information processing tasks such as number crunching, word processing, business graphics, web browsing, electronic mail, scheduling or data management.
2. Business applications aim to automate common, generic business functions or processes. They include debtors, creditors, general ledger, inventory management, order entry and sales processing.
3. Scientific applications are focussed on the needs of scientists and researchers: astronomy, weather forecasting, geographical information systems (GIS), statistics, simulations, engineering drawings, etc.
4. Finally, there is a large category of miscellaneous applications that do not fit neatly in any of the above categories, such as computer-based training software or games.

Vertical and horizontal Classification

1. Vertical applications target a specific industry or sector with similar business processes. Examples are packages for video store management, medical practice management, pharmacists, retailers, commercial banks etc.
2. Horizontal applications are business applications that can be used by virtually any business because of the universality of the business needs, e.g. accounting applications, inventory management or debtors control.
- 3 Enterprise-wide systems, often called enterprise resource planning (ERP) systems, aim to fulfil all the information system requirements of a business. These systems consists of many different modules, covering all generic business processes, with a great degree of standardisation of interfaces and an integrated, corporate database. Popular ERP vendors are SAP, BAAN and PeopleSoft.
4. Inter-organisational systems (IOS) are systems that cross the boundaries of individual organisations. Examples are electronic data interchange (EDI), electronic funds transfer (EFT) or the Internet.

Organizational Level

- Transaction Processing Systems (TPS) perform the business process-related data processing tasks such as invoicing, statements, inventory, order and sales processing. They assist mainly clerical staff.
- Management Information Systems (MIS) assist the operations and line managers with the control of the business process activities, usually by means of standard, regular reports. Virtually all TPS incorporate a MIS reporting module.
- Decision Support Systems (DSS) are more interactive applications that actually assist with the decision making process of middle management (and professionals). Spreadsheets, geographical information systems (GIS) and expert systems are good examples of DSS.
- Executive Information/Support Systems (EIS or ESS) assist top-level executives with their daily information needs for top management control as well as their strategic decision making.

Application Software

- Application software are in a variety of forms:
 1. Packaged software
 2. Custom software
 3. Web application
 4. Open source software
 5. Shareware
 6. Freeware
 7. Public domain software