Computer - Software Types

Software is a collection of programs, data, and instructions that enable a computer system and its hardware's to do the tasks. A program is a set of instructions or programming statements.

Hence, software built using multiple statements. It is an important part of modern computing and is classified into different categories based on its capability and purpose. For example, word-processing software enables the user to create, edit and save documents. A web browser enables the user to view and share web pages and multimedia files.

Software Types

Some common types of software are as –

- System Software
- Application Software
- Utility Software
- Open Source Software

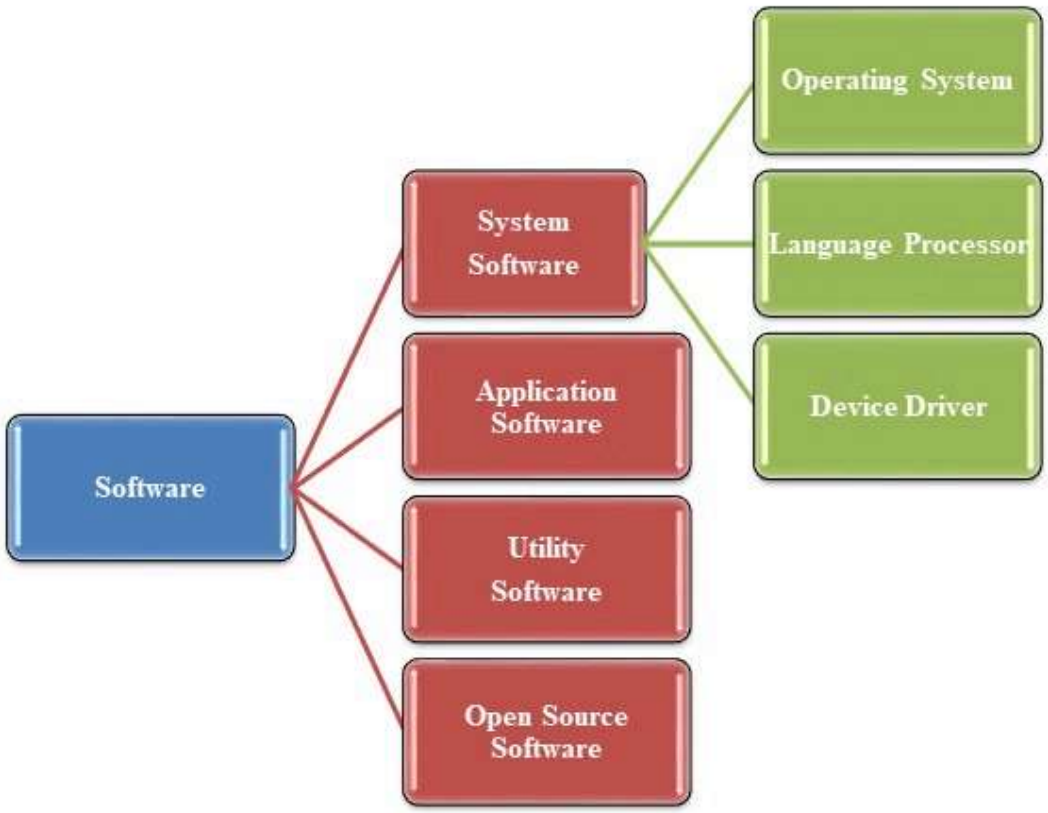


Fig: Software and its types

System Software

Software that enables a computer to run and activates required hardware or other parts of a computer to run is called **system software.** System software acts as **interface** between hardware and user applications. An interface is needed because hardware devices or machines and humans speak in different languages.

Machines understand only binary language i.e. 0 (absence of electric signal) and 1 (presence of electric signal) while humans speak in English, French, German, Tamil, Hindi and many other languages. English is the pre-dominant language of interacting with computers.

Software is required to convert all human instructions into machine understandable instructions. And this is exactly what system software does.

Based on its function, system software is of four types –

- Operating System
- Language Processor
- Device Drivers

Operating System

Generally, system software is responsible for functioning of all hardware parts and their interoperability to carry out tasks successfully is called operating system (OS).OS is the first software to be loaded into computer memory when the computer is switched on and this is called booting.

OS manages a computer's basic functions like storing data in memory, retrieving files from storage devices, scheduling tasks based on priority, etc.

Language Processor

As discussed earlier, an important function of system software is to convert all user instructions into machine understandable language. When we talk of human machine interactions, languages are of three types −

- **Machine-level language** − This language is nothing but a string of 0s and 1s that the machines can understand. It is completely machine dependent.
- **Assembly-level language** − This language introduces a layer of abstraction by defining mnemonics. Mnemonics are English like words or symbols used to denote a long string of 0s and 1s. For example, the word "READ" can be defined to mean that computer has to retrieve data from the memory. The complete instruction will also tell the memory address. Assembly level language is machine dependent.
- **High level language** − This language uses English like statements and is completely independent of machines. Programs written using high level languages are easy to create, read and understand.

Program written in high level programming languages like Java, C++, etc. is called source code. Set of instructions in machine readable form is called object code or machine code. System software that converts source code to object code is called language processor. There are three types of language interpreters −

- **Assembler** − Converts assembly level program into machine level program.

- **Interpreter** – Converts high level programs into machine level program line by line.
- **Compiler** – Converts high level programs into machine level programs at one go rather than line by line.

Device Drivers

System software that controls and monitors functioning of a specific device on computer is called device driver. Each device like printer, scanner, microphone, speaker, etc. that needs to be attached externally to the system has a specific driver associated with it. When you attach a new device, you need to install its driver so that the OS knows how it needs to be managed.

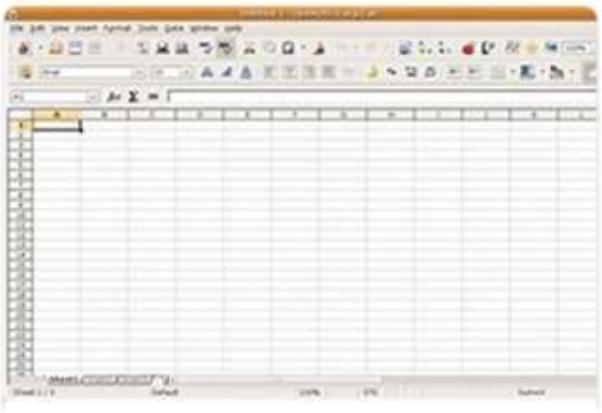
Application Software

Application software, sometimes known as "apps" or "applications," is a type of software that is created for certain tasks or functions such as productivity, entertainment, communication, or other reasons. Hence, software that performs a single task and nothing else is called **application software**. Application software is very specialized in their function and approach to solving a problem. So spread sheet software can only do operations with numbers and nothing else. Application software, as opposed to system software (such as operating systems and device drivers), is designed to fulfil the needs and preferences of end users. The following are some examples of common types of application software –

Productivity Software

- **Word Processing** – This application software allows users to create, edit, and format documents. Some popular word processing applications are Microsoft Word, Google Docs, and Apple Pages.

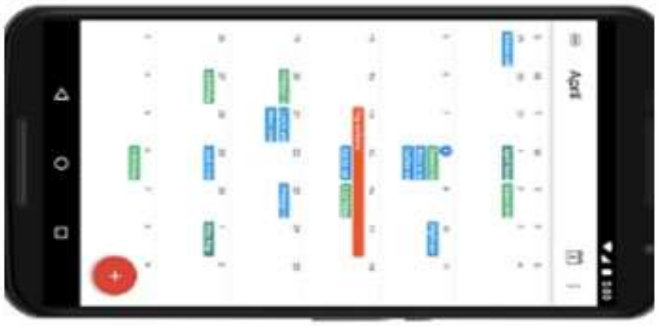
- **Spreadsheet Application** – This application software is used to create and analyzing spreadsheets. Some popular Spreadsheet applications are Microsoft Excel, Google Sheets, and LibreOffice Calc.



- **Presentation Software** – This application software is used to make slideshows and presentations. Some popular presentation applications are Microsoft PowerPoint, Google Slides, and Apple Keynote.

- **Project Management Software** – This application software is used to make teams plan, organize, and track projects. Examples - Trello, Asana, and Jira.

- **Calendar and Scheduling Apps** – This application software is used for time management and scheduling appointments, like Google Calendar, Microsoft Outlook, and Apple Calendar.



Graphics and Multimedia Software

- **Image Editing** – This application is used to edit and manipulate images. Examples are Adobe Photoshop, GIMP, and Canva.
- **Video Editing** – This application is used to create and editing of video. Examples are Adobe Premiere Pro, Final Cut Pro, and DaVinci Resolve.
- **Audio Editing** – This application is used for recording and editing audio. Examples are Audacity and Adobe Audition.
- **3D Modelling and Animation** – This application is used for creating 3D graphics and animations. Examples are Blender and Autodesk Maya.

Communication Software

- **Email Clients** – This application is used to send, receive, and manage email. Examples are Microsoft Outlook, Mozilla Thunderbird, and Apple Mail.
- **Instant Messaging Apps** – This application enables users for real-time text and multimedia communication. Examples are WhatsApp, Slack, and Telegram.
- **Video Conferencing Software** – This application is used to conduct virtual meetings and conferences. Examples are Zoom, Microsoft Teams, and Cisco Webex.
- **Social Media Apps** – These applications provide platforms for social networking. Examples are Facebook, Twitter, and Instagram.

Web Browsers

These application programs are used to access and navigate websites on the internet. Popular web browsers are Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari.

Gaming Software

These applications are designed for entertainment and gaming. Examples are Steam, PlayStation, Xbox, and mobile app stores.

Utility Software

Provides various utilities to perform specific tasks, such as –

- **File Compression and Extraction** – Examples are WinZip, 7-Zip, and WinRAR.
- **Backup and Recovery** – Examples are Acronis True Image and Time Machine.
- **Disk Cleanup and Optimization** – Examples are CCleaner and Disk Cleanup (Windows).

Education and E-Learning Software

These applications are designed to learning management systems (LMS); automate educational system, online education, and digital libraries.

Health and Fitness Apps

These applications are designed to keep track of health metrics, Yogas and Asans, dietary guidance etc.

Financial Software

These applications are specifically designed to manage personal finances, accounting, and taxation. Examples are QuickBooks, TurboTax, and Mint.

Travel and Navigation Apps

These applications are designed to assist travellers with trip planning, maps, and GPS navigation etc. Examples are Google Maps, TripAdvisor, and Waze.

In continuation of changing demands and preferences of users in different fields, application software continues to improve and diversify. Users can install and utilise these applications to do certain tasks and enhance their digital experiences on their computers, smartphones, tablets, and other digital devices.

Utility Software

Application software also known as utility programs or system utilities that assists system software in doing their work is called utility software. Utility software is intended to help users to manage and maintain their computer systems, as well as optimise performance and execute different system-related activities. These programmes are often used to

assure the efficient operation of hardware and software components, and improve a computer system's overall functionality and stability. Thus utility software is actually a cross between system software and application software.

Some common types of utility are as –

- **Antivirus and Antimalware Software** – These utilities keep safe the computer against malicious software, spyware, and viruses, as well as other types of security threats. Examples are Norton Antivirus, McAfee, and Malwarebytes.
- **Disk Cleanup and Optimization** – These utilities help to remove temporary or unwanted files. For example - CCleaner (Crap Cleaner) removes temporary files, cache data, and unused files to free up disk space. Defragmentation applications reorganise fragmented files on a hard drive in order to increase read/write access.
- **Disk Partitioning and Management** – Disc Management (Windows) and GParted (Linux) are utilities that enable users to create, resize, and manage partitions on their hard drives.
- **Backup and Recovery** – Backup utilities automatically create copies of vital data to prevent loss. Example: Windows Backup and Time Machine (Mac). Data recovery software recovers erased files and folders. Popular options include Recuva and TestDisk.
- **System Monitoring and Diagnostic Tools** – Task Manager (Windows) and Activity Monitor (Mac) offer real-time system resource monitoring to find and fix performance issues. Windows Memory Diagnostic and Apple Diagnostics (Mac) diagnose hardware issues.
- **Driver Updaters** – For hardware compatibility and performance, these programmes update out-dated or incompatible device drivers. Examples are Driver Booster and Driver Easy.
- **Password Managers** – Users generate, store, and manage complex, secure passwords with password management software. Examples are LastPass, Dashlane, and 1Password.
- **Firewall Utilities** – A firewall protects a computer or network by managing incoming and outgoing network traffic. Examples are Windows Firewall and third-party firewall solutions like ZoneAlarm.
- **Data Encryption Software** – These utilities encrypt sensitive data to protect it from unauthorized access. Examples are BitLocker (Windows) and FileVault (Mac).
- **Uninstaller Programs** – These utilities assist users in thoroughly removing undesirable apps as well as the files and registry entries linked with those applications. Examples are Revo Uninstaller and IObit Uninstaller.

Open Source Software

Software whose **source code** is freely distributed with a license to study, change and further distributed to anyone for any purpose is called **open source software**. Open source software is generally a team effort where dedicated programmers improve upon the source code and share the changes within the community. Open source software provides these advantages to the users due to its thriving communities −

- Security
- Affordability
- Transparent
- Interoperable on multiple platforms
- Flexible due to customizations
- Localization is possible

Freeware

A software that is available free of cost for use and distribution but cannot be modified as its source code is not available is called freeware. Examples of freeware are Google Chrome, Adobe Acrobat PDF Reader, Skype, etc.

Shareware

Software that is initially free and can be distributed to others as well, but needs to be paid for after a stipulated period of time is called shareware. Its source code is also not available and hence cannot be modified.

Proprietary Software

Software that can be used only by obtaining license from its developer after paying for it is called proprietary software. An individual or a company can own such proprietary software.

Its source code is often closely guarded secret and it can have major restrictions like −

- No further distribution
- Number of users that can use it
- Type of computer it can be installed on, example multitasking or single user, etc.

For example, Microsoft Windows is a proprietary operating software that comes in many editions for different types of clients like single-user, multi-user, professional, etc.