

# SEM -1

## SUB : COMPUTER APPLICATION-1

### Unit 1. BASIC ANATOMY OF COMPUTER

#### • What is a Computer?

A **computer** is an electronic device that accepts data from the user, processes it, produces results, displays them to the users, and stores the results for future usage.

**Data** is a collection of unorganized facts & figures and does not provide any further information regarding patterns, context, etc. Hence data means "unstructured facts and figures".

**Information** is a structured data i.e. organized meaningful and processed data. To process the data and convert into information, a computer is used.

### Functions of Computers

A computer performs the following functions –

#### Receiving Input

Data is fed into computer through various input devices like keyboard, mouse, digital pens, etc. Input can also be fed through devices like CD-ROM, pen drive, scanner, etc.

#### Processing the information

Operations on the input data are carried out based on the instructions provided in the programs.

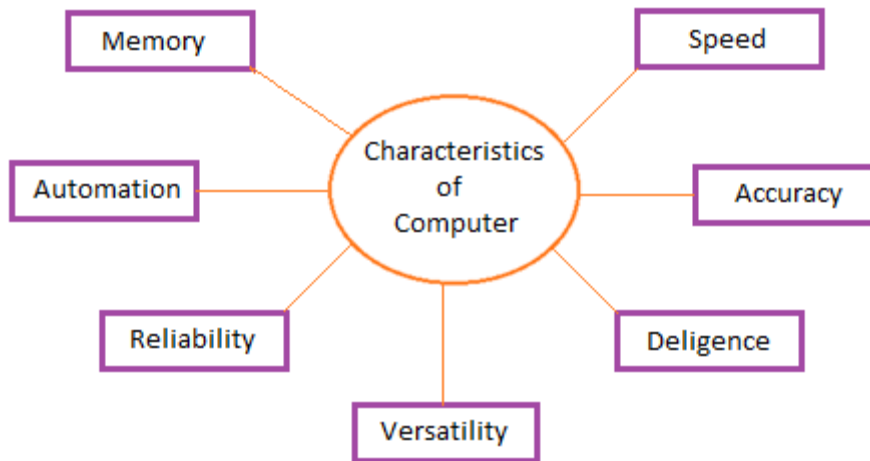
#### Storing the information

After processing, the information gets stored in the primary or secondary storage area.

#### Producing output

The processed information and other details are communicated to the outside world through output devices like monitor, printer, etc.

### Characteristics of the computer –



## Speed

A computer works with much higher speed and accuracy compared to humans while performing mathematical calculations. Computers can process millions (1,000,000) of instructions per second. The time taken by computers for their operations is microseconds and nanoseconds.

## Accuracy

Computers perform calculations with 100% accuracy. Errors may occur due to data inconsistency or inaccuracy.

## Diligence

A computer can perform millions of tasks or calculations with the same consistency and accuracy. It doesn't feel any fatigue or lack of concentration. Its memory also makes it superior to that of human beings.

## Versatility

Versatility refers to the capability of a computer to perform different kinds of works with same accuracy and efficiency.

## Reliability

A computer is reliable as it gives consistent result for similar set of data i.e., if we give same set of input any number of times, we will get the same result.

### Automation

Computer performs all the tasks automatically i.e. it performs tasks without manual intervention.

## Memory

A computer has built-in memory called primary memory where it stores data. Secondary storage are removable devices such as CDs, pen drives, etc., which are also used to store data.

## Application of computers

### Business



A computer has high speed of calculation, diligence, accuracy, reliability, or versatility which has made it an integrated part in all business organizations.

Computer is used in business organizations for –

- Payroll calculations
- Budgeting
- Sales analysis
- Financial forecasting
- Managing employee database
- Maintenance of stocks, etc.

### Banking



Today, banking is almost totally dependent on computers.

Banks provide the following facilities –

- Online accounting facility, which includes checking current balance, making deposits and overdrafts, checking interest charges, shares, and trustee records.
- ATM machines which are completely automated are making it even easier for customers to deal with banks.

## Insurance



Insurance companies are keeping all records up-to-date with the help of computers. Insurance companies, finance houses, and stock broking firms are widely using computers for their concerns.

Insurance companies are maintaining a database of all clients with information showing –

- Procedure to continue with policies
- Starting date of the policies

- Next due installment of a policy
- Maturity date
- Interests due
- Survival benefits
- Bonus

## Education



The computer helps in providing a lot of facilities in the education system.

- The computer provides a tool in the education system known as CBE (Computer Based Education).
- CBE involves control, delivery, and evaluation of learning.
- Computer education is rapidly increasing the graph of number of computer students.
- There are a number of methods in which educational institutions can use a computer to educate the students.
- It is used to prepare a database about performance of a student and analysis is carried out on this basis.

## Marketing

In marketing, uses of the computer are following –



- **Advertising** – With computers, advertising professionals create art and graphics, write and revise copy, and print and disseminate ads with the goal of selling more products.
- **Home Shopping** – Home shopping has been made possible through the use of computerized catalogues that provide access to product information and permit direct entry of orders to be filled by the customers.

## Healthcare

Computers have become an important part in hospitals, labs, and dispensaries. They are being used in hospitals to keep the record of patients and medicines. It is also used in scanning and diagnosing different diseases. ECG, EEG, ultrasounds and CT scans, etc. are also done by computerized machines.

Following are some major fields of health care in which computers are used.



- **Diagnostic System** – Computers are used to collect data and identify the cause of illness.
- **Lab-diagnostic System** – All tests can be done and the reports are prepared by computer.
- **Patient Monitoring System** – These are used to check the patient's signs for abnormality such as in Cardiac Arrest, ECG, etc.
- **Pharma Information System** – Computer is used to check drug labels, expiry dates, harmful side effects, etc.
- **Surgery** – Nowadays, computers are also used in performing surgery.

# Engineering Design

Computers are widely used for Engineering purpose.

One of the major areas is CAD (Computer Aided Design) that provides creation and modification of images. Some of the fields are –



- **Structural Engineering** – Requires stress and strain analysis for design of ships, buildings, bridges, airplanes, etc.
- **Industrial Engineering** – Computers deal with design, implementation, and improvement of integrated systems of people, materials, and equipment.
- **Architectural Engineering** – Computers help in planning towns, designing buildings, determining a range of buildings on a site using both 2D and 3D drawings.

# Military



Computers are largely used in defence. Modern tanks, missiles, weapons, etc. Military also employs computerized control systems. Some military areas where a computer has been used are –

- Missile Control
- Military Communication
- Military Operation and Planning
- Smart Weapons

## Communication

Communication is a way to convey a message, an idea, a picture, or speech that is received and understood clearly and correctly by the person for whom it is meant. Some main areas in this category are –



- E-mail
- Chatting
- Usenet
- FTP
- Telnet
- Video-conferencing

## Government

Computers play an important role in government services. Some major fields in this category are –





- Budgets
- Sales tax department
- Income tax department
- Computation of male/female ratio
- Computerization of voters lists
- Computerization of PAN card
- Weather forecasting

### What is personal computer?

A **personal computer** is a computer small and low cost, which is intended for personal use (or for use by a small group of individuals). The term "personal computer" is used to describe [desktop computers](#) (desktops). It is often shortened to the acronym PC or microcomputer, whose meaning in English is "personal computer". It is a very common type of machines.

Personal Computer (acronym PC) consists of a [central processing unit](#) (CPU) contains the arithmetic, logic, and control circuitry on an single (IC) integrated circuit; two types of memory, main memory, such as RAM, and ROM, magnetic hard disks (HDD) and compact discs and various [input/output devices](#), including a display screen, keyboard and mouse, modem, and [printer](#).



### . Other type of Computer



### *1) Keyboard*

Keyboard is the most common and very popular input device which helps in inputting data to the computer. The layout of the keyboard is like that of traditional typewriter, although there are some additional keys provided for performing additional functions.

Keyboards are of two sizes 84 keys or 101/102 keys, but now keyboards with 104 keys or 108 keys are also available for Windows and Internet.

The keys on the keyboard are as follows:

Sr.No	Keys	Description
1	Typing Keys	These keys include the letter keys (A-Z) and digit keys (0-9) which generally give same layout as that of typewriters.
2	Numeric Keypad	It is used to enter numeric data or cursor movement. Generally, it consists of a set of 17 keys that are laid out in the same configuration used by most adding machines and calculators.
3	Function Keys	The twelve function keys are present on the keyboard which are arranged in a row at the top of the keyboard. Each function key has unique meaning and is used for some specific purpose.
4	Control keys	These keys provide cursor and screen control. It includes four directional arrow keys. Control keys also include Home, End, Insert, Delete, Page Up, Page Down, Control(Ctrl), Alternate(Alt), Escape(Esc).
5	Special Purpose Keys	Keyboard also contains some special purpose keys such as Enter, Shift, Caps Lock, Num Lock, Space bar, Tab, and Print Screen.



## 2) Mouse

Mouse is most popular pointing device. It is a very famous cursor-control device having a small palm size box with a round ball at its base which senses the movement of mouse and sends corresponding signals to CPU when the mouse buttons are pressed.

Generally it has two buttons called left and right button and a wheel is present between the buttons. Mouse can be used to control the position of cursor on screen, but it cannot be used to enter text into the computer.

#### *Advantages*

- Easy to use
- Not very expensive
- Moves the cursor faster than the arrow keys of keyboard.



## PDA: Personal Digital Assistant

PDA is a mobile device without a keyboard, but with a screen to write or draw the words with the help of a pen-like stylus. They have the capabilities to take notes, read graphs, connect to the internet, upload and download. They are also known as palmtop, hand held computer.



## Features

- **Touch screen:** It may have one or two buttons to create the shortcuts for the app used. Otherwise, user has to enter a text by touching or using pen-like stylus.
- **Memory cards:** Earlier PDAs did not have a memory slot but now some PDAs may have memory card slot and USB flash drive slot.

- **Wired connectivity:** Earlier PDAs were able to connect to a personnel computer via serial ports or other devices. Now USB cables are used to connect them.
  - **Wireless connectivity:** PDAs have Bluetooth, and Wi-Fi which are wireless.
  - **Operating system:** Pre-installed operating systems are Palm OS, WebOS.
  - **Navigation:** Some PDAs may have built-in GPS and some may connect to GPS externally.
  - **Rugged PDAs:** Rugged PDAs have some extra features included such as barcode readers, radio-frequency identification readers, magnetic stripe card readers, or smart card readers
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- **Tablet computer, computer** that is intermediate in size between a laptop computer and a **smartphone**. Early tablet computers used either a keyboard or a **stylus** to input information, but these methods were subsequently displaced by touch screens.



○ iPad

The precursors to the tablet computer were devices such as the Stylator (1957) and the RAND Tablet (1961) that used a stylus for input into a larger computer. In 1968 [Alan Kay](#), a graduate student at the [University of Utah](#), promoted his vision of a small, powerful tablet-style computer that he later called the [Dynabook](#); however, Kay never actually built a Dynabook. The first true tablet computers were Cambridge Research's Z88 and Linus Technologies' Write-Top, which were introduced in 1987. The Z88 accepted input through a keyboard that was part of the main tablet unit, while the Write-Top accepted input through a stylus. Weighing 0.9 kg (2 pounds), the Z88 was much more portable than the Write-Top, which weighed 4 kg (9 pounds) because it came with an internal [floppy disk](#) drive.

# E-book reader

An e-book reader is a portable electronic device for reading digital books and periodicals, better known as e-books. The e-book reader is normally designed to operate over long hours by consuming minimal power. Most e-book readers rely on the e-ink technology for their displays.



# Smartphone

Smartphones are used to make phone calls and send text messages but they can also be used for accessing the internet and check your emails, search the internet and much more. There are many different brands of smartphones e.g.

- iPhones – made by Apple
  - Android Phones made by Samsung, HTC, etc.
  - Windows Phones made by Nokia
- The difference between each phone is that they have a different operating system developed by the different manufacturers. You can use your fingers to control the touch screen of your phone or you can also use a pencil like device called a stylus which makes it easier to use. You will find a stylus for sale in most electronic shops. A word you will see a lot of: Apps It is short for the word application. It is a shortcut that allows you to go directly to the programme or website you wish to access. It is represented by a picture or symbol. You will see lots of apps on your phone. \*Please note that the different brands of smartph



Brief introduction to :

- **VDU** may refer to any of the following:



1. Short for **visual display unit**, **VDU** is an older British term used to describe any device used with computers to display text and images. For example, a **flat-panel display** and a **projector** are both examples of VDUs. However, VDU is most commonly used to describe the **CRT monitor**, a now archaic standard that has been replaced by flat-panel display methods like **LED**.

Early VDUs had a 13" screen size. By the mid-1990s, 15" and 17" VDU screen sizes became more common, with some 20" screen sizes starting to emerge on the market. By the early 2000s, flat-panel monitors with 15" and 17" screen sizes gained popularity and started replacing CRT monitors.



2. Short for **video display unit**, **VDU** is a computing device that allows for input by a user and output to a display, like a computer monitor. A VDU consists of a display device and a **keyboard**, and could also include a **mouse**. In the United States, it is sometimes referred to as a video display terminal, or VDT.

Two of the earliest VDUs were the **Commodore PET** and the **Radio Shack TRS-80 Model 1**, both developed in 1977. Other examples of early VDUs include the **IBM 2260**, **Televideo 920C**, and **Texas Instruments Model 911**. Each of these VDUs were a single unit with a built-in display screen and keyboard.

- **HDD** stands for **Hard Disk Drive**. HDD is also known as Hard



disk, Hard drive, or

Fixed disk. HDD is a data storage device, which uses magnetic storage to store digital data and fetch it using rotating platters.

In the computer system, hard disk drives are used as the main storage device. It is an electromechanical device having non-volatile memory. HDDs are also capable of storing operating



system, large system files and are found in desktops, mobiles, and consumer electronics.

In 1953, IBM engineers created HDD so as to provide random access to the high capacity of data at a low cost. Initially, the size of the hard disk is the same as that of the refrigerator and it could store 3.75 Megabytes of data. As the technology advances, the size of hard disk decreases and by mid-1980s it is available in 3.5 inches size. In 2007, Hitachi released 1 TB hard disk while in 2015 HGST launched 10 TB hard drives. Seagate launched hard disks that use SMR (shingled magnetic recording) technology. Further, HGST made the first helium-filled hard disk drive. Helium is used because it is less dense, cooler, and lighter than air thus increase performance and drive density of hard disks.

### Hard drives are of 2 type:

- **Hard Disk Drive:** There have one or more rotating discs and magnetic storage.
- **Solid State Drives(SDD):** They don't have any moving part and have flash memory type storage.
- CDs and DVDs



- The **CD and DVD** are the versions of an optical disk which mainly differ in size and manufacturing method. Generally, a **DVD** can store more data than a **CD**, its one of the reason is that **CD** contain the polycarbonate substrate on only a single side while in **DVDs** it present on both of the sides

- **Blu-ray disc& Drive**

**Blu-ray disc, BD or BD-ROM**, is an [optical disc](#) format developed by thirteen consumer electronics and PC companies. These companies include [Dell](#), [Hitachi](#), [Hewlett Packard](#), [LG](#), [Mitsubishi](#), [Panasonic](#), [Sony](#), and [TDK](#). Blu-ray

was first introduced at the [CES](#) on January 4, [2006](#), stores up to 25 GB single-layer disc (50 GB on a dual-layer disc), and are the same size as a standard [CD](#). The picture shows a blue laser in a Blu-ray disc player.

Blu-ray was first backed by [Apple](#), Dell, [Philips](#), [Pioneer](#), [Sony](#), Sun, TDK, and other companies mentioned above. On February 19, [2008](#), Blu-ray beat out [HD DVD](#) in the high-definition disc format wars.

- **USB FLASH DRIVE** : A USB flash drive -- also known as a USB stick, USB thumb drive or pen drive -- is a plug-and-play portable storage

USB flash drives are often used for **storage**, data back-up and transferring of computer files. Compared with floppy disks or CDs, they are smaller, faster, have significantly more capacity, and are more durable due to a lack of moving parts.



- **Webcam and video cameras**

A **webcam** is a small digital **video camera** directly or indirectly connected to a computer or a computer network. **Webcams** come with software that needs to be installed on the computer to help users record **video** on or stream it from the Web.



### **Microphones and Speakers**

**Speakers** and **microphones** are both transducers -- components which transform energy from one type to another. A **speaker** turns electrical currents into sound waves; a **microphone** converts sound into electrical energy.



### 3) Joystick

Joystick is also a pointing device which is used to move cursor position on a monitor screen. It is a stick having a spherical ball at its both lower and upper ends. The lower spherical ball moves in a socket. The joystick can be moved in all four directions.

The function of joystick is similar to that of a mouse. It is mainly used in Computer Aided



Designing(CAD) and playing computer

### Light Pen

Light pen is a pointing device which is similar to a pen. It is used to select a displayed menu item or draw pictures on the monitor screen. It consists of a photocell and an optical system placed in a small tube. When the tip of a light pen is moved over the monitor screen and pen button is pressed, its photocell sensing element detects the screen location and sends the corresponding signal to the CPU.



### 4) Track Ball

Track ball is an input device that is mostly used in notebook or laptop



computer, instead of a mouse. This is a ball which is half inserted and by moving fingers on ball, pointer can be moved. Since the whole device is not moved, a track ball requires less space than a mouse. A track ball comes in various shapes like a ball, a button and a square.

## Printers

A **printer** is a device that accepts text and graphic output from a computer and transfers the information to paper, usually to standard size sheets of paper. ... The laser **printer uses** a laser beam reflected from a mirror to attract ink (called toner) to selected paper areas as a sheet rolls over a drum.

*“A printer is an external output device that takes data from a computer and generates output in the form of graphics / text on a paper”.*

- [Impact printers](#)
- [.Dot-Matrix Printers](#)
- [.Daisy-wheel printers](#)
- [.Line printers](#)
- [Drum printer](#)
- [Chain printers](#)
- [.Band printers](#)
- [.Non-impact printers](#)
- [.Ink-jet printers](#)
- [Laser printers](#)

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There are two types of printers.

## Impact Printers

An impact printer makes contact with the paper. It usually forms the print image by pressing an inked ribbon against the paper using a hammer or pins. Following are some examples of impact printers.

### Dot matrix

- The term **dot matrix** refers to the use of [dots](#) to form an image. In a dot matrix image, the quality is determined by the number of [dots per inch](#).

## Dot matrix printer

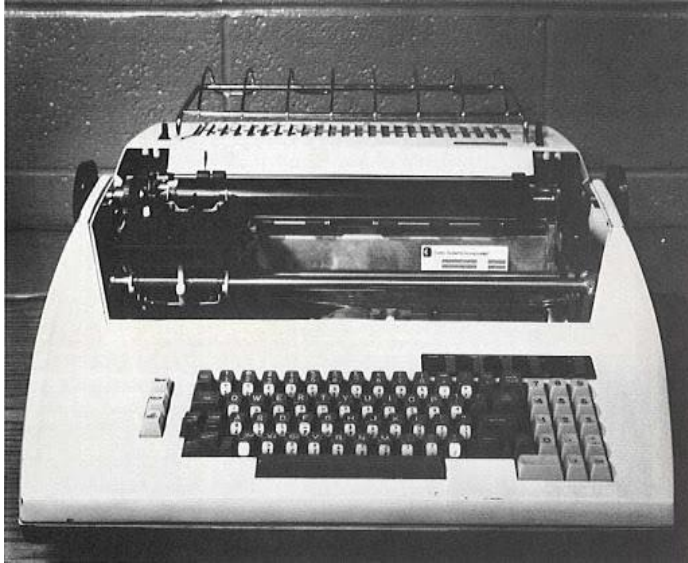


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- Alternatively referred to as a **pin printer**, **dot matrix printers** were first introduced by [IBM](#) in [1957](#). However, the first dot matrix impact printer was created by [Centronics](#) in [1970](#). Dot matrix [printers](#) use print heads to shoot ink or strike an ink ribbon to place hundreds to thousands of little dots to form text and images. Today, dot matrix printers are utilized far less than they used to be due to their low quality images and slow print speed compared to [inkjet printers](#) and [laser printers](#). However, they still see a lot of use in certain sectors such as auto part stores and package delivery companies.

- **Daisy-Wheel Printers**

In order to get the quality of type found on typewriters, a daisy-wheel impact printer can be used. It is called daisy-wheel printer because the print mechanism looks like a daisy; at the end of each “Petal” is a fully formed character which produces solid-line print. A hammer strikes a “petal” containing a character against the ribbon, and the character prints on the paper. Its speed is slow typically 25-55 characters per second.



### ➤ **Line Printers**

In business where enormous amount of material are printed, the character-at-a-time printers are too slow; therefore, these users need line-at-a-time printers. Line printers, or line-at-a-time printers, use special mechanism that can print a whole line at once; they can typically print the range of 1,200 to 6,000 lines per minute. Drum, chain, and band printers are line-at-a-time printers.



### ➤ **Drum Printer**

A drum printer consists of a solid, cylindrical drum that has raised characters in bands on its surface. The number of print positions across the drum equals the number available on the page. This number typically ranges from 80-132 print positions. The drum rotates at a rapid speed. For each possible print position there is a print hammer located behind the paper. These hammers strike the paper, along the ink ribbon, against the proper character on the drum as it passes. One revolution of the drum is required to print each line. This means that all characters on the line are not printed at exactly the same time, but the time required to print the entire line is fast enough to call them line printers. Typical speeds of drum printers are in the range of 300 to 2000 lines per minute.





### ➤ Chain Printers

A chain printer uses a chain of print characters wrapped around two pulleys. Like the drum printer, there is one hammer for each print position. Circuitry inside the printer detects when the correct character appears at the desired print location on the page. The hammer then strikes the page, pressing the paper against a ribbon and the character located at the desired print position. An impression of the character is left on the page. The chain keeps rotating until all the required print positions on the line have filled. Then the page moves up to print the next line. Speeds of chain printers range from 400 to 2500 characters per minute.



### ➤ Band Printers

A band printer operates similar to chain printer except it uses a band instead of a chain and has fewer hammers. Band printer has a steel band divided into five sections of 48 characters each. The hammers on a band printer are mounted on a cartridge that moves across the paper to the appropriate positions. Characters are rotated into place and struck by the hammers. Font styles can easily be changed by replacing a band or chain.



## Non-Impact Printers

Non-impact printers do not use a striking device to produce characters on the paper; and because these printers do not hammer against the paper they are much quieter. Following are some non-impacted printers.

### ➤ Inkjet printer

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#### Lexmark Inkjet Printer



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The most popular [printer](#) for home computer users that prints by spraying streams of quick-drying ink on paper. The ink is stored in disposable ink [cartridges](#), and often a separate cartridge is used for each of the major colors. These colors are

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usually [CMYK](#) (cyan, magenta, yellow, and black). The picture is an example of a computer inkjet printer.

Although **inkjet printers** themselves are often relatively inexpensive, the ink cartridges used in the printers can increase the overall cost of the printer.

## ➤ Laser printer

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HP Laserjet Printer



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The **laser printer** was first developed at [Xerox PARC](#) by [Gary Starkweather](#) and released in [1971](#) that utilizes [laser](#) technology to print images on the paper. Laser printers are often used for corporate, school, and other environments that require print jobs to be completed quickly and in large quantities. The picture is of an [HP LaserJet](#) printer and a good example of a laser printer. As the image shows, a laser printer is usually larger than an [inkjet printer](#) found in most homes.

## Thermal printer

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A **thermal printer** may refer to any of the following:

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## 1. A **thermal impact**

**printer** or **electrothermal printer** is a printer that uses heated pins to "burn" images onto heat-sensitive paper. These printers are commonly used in calculators and fax machines; and although they are inexpensive and print relatively fast, they produce low resolution print jobs.

2. A **thermal printer, thermal transfer printer, or thermal wax-transfer printer** uses thermal wax ribbon to melt colored wax on paper for a photo print. It was invented by [Jack Kilby](#).

### ➤ **Multifunction printer**

Alternatively referred to as a **MFP (multifunction printer)**, **AIO** is short for **All-in-One**. AIO describes a hardware device such as an All-in-One [printer](#) that is a printer, fax, and scanner all in one device. The picture is an example of a Samsung All-in-One

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printer that is a [fax](#), [laser printer](#), sheetfed scanner, and [flatbed scanner](#).



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## Advantages of All-in-One devices

- Take up less desk space and room by combining multiple devices (e.g., fax, printer, scanner) into one device.
- Less cords. Since the printer and the scanner are one device the AIO only requires one power cord and usually one [data cable](#) (e.g., [USB](#)).

Scanner :



Having a scanner in the office simplifies record keeping, but with so many types of scanners available, you'll need to pick which model best fits your needs. Flatbed scanners and production scanners offer versatility but take up a large space. Handheld scanners allow scanning any size item with just a compact device, but produce low quality images. Sheetfed scanners scan from loose papers, making them ideal for digitizing stacks of records, receipts or business cards.

## Flatbed Scanners

The most common type of scanner, flatbed scanners have a large glass surface and a lid. These scanners work best with flat objects, such as photos and papers, but you can also place larger items such as open books onto the scanner bed. Some models of flatbed scanner come built in to all-in-one devices, which function as printers, scanners, copy machines and fax machines.



## Production Scanners

Production scanners operate similarly to flatbed scanners, but offer far faster operation and the durability to last through high-volume work. These machines also feature a feed device for scanning multiple documents quickly. Unlike regular flatbed scanners, which are often priced at the consumer level, production scanners sell for thousands of dollars and are targeted to publishing companies and other businesses that need to scan numerous documents daily.



## Hand Scanners

Hand scanners or handheld scanners are small wand-shaped devices. You use a hand scanner by slowly dragging it over the entire surface area of the document you want to scan. Unlike flatbed scanners, hand scanners allow you to scan items of any size. Because they rely on a steady hand and due to their small size, however, they often offer lower quality output than a flatbed.



## Sheetfed Scanner

Sheetfed scanners scan loose papers placed in a tray by pulling them across a static scanning lens. These devices make it easier to scan a large stack of papers than a flatbed scanner, where you would have to insert and remove each page. Due to their design, however, they won't work to scan books or large papers that don't fit in the tray. Some sheetfed scanners feature additional trays designed for smaller items such as business cards.

