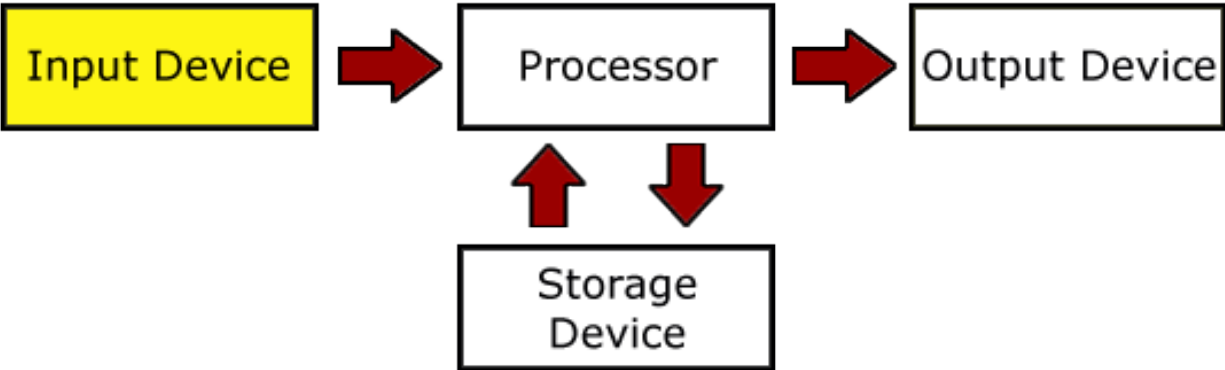


<p>1.4 Types of peripheral devices – input and output</p>	<p>1.4.1 Know about types of output peripheral such as monitor (screen size, resolution), printer (laser, inkjet, 3D), plotter, data projector, speaker, control device and when they would be used</p> <p>1.4.2 Know about types of input peripheral such as keyboard, mouse, tracker ball, joystick, graphics tablet, scanner, digital camera, webcam, microphone, touch screen, OMR reader, OCR reader, bar code scanner, biometric scanner, magnetic stripe reader, chip and pin, sensor and when they would be used</p>
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1.4.2 Input Devices

Input devices are hardware devices that allow data to be entered into a computer.

Input devices are part of the four main hardware components of a computer system. The Image below shows where input devices fit into a computer system:



There are many different kinds of input devices. They are split into two categories manual input devices and direct input devices.

Manual Input devices: Data is input into the computer by hand. Manual input devices require humans to do most of the work needed to get data into the system. (eg.) Keyboard, Mouse, Tracker ball, Joystick, graphics tablet, digital camera, Webcam, microphone, touch screen, chip and pin.

Direct Input devices (automatic input devices): Data is input into the computer directly by a machine or device. Direct input devices do not require much human interaction to get their data into a computer system. (eg.) Barcode scanner, Magnetic stripe reader, OMR reader, OCR reader, biometric scanner, Sensor.

The following section will help summarize each of the input devices. For each one you will see

- Information about the device
- Uses of the device
- Advantages of the device
- Disadvantages of the device

1. Keyboard:

The keyboard is the most common and widely used input device. It is made up of buttons called 'keys'. The keys are arranged into sections:

- Alphabet keys
- Function or F keys (F1, F2, F3)
- Numeric keys (one set above the alphabet keys and a numeric keypad on the right)
- Arrow keys
- Command keys (insert, delete, home, end, page up/down)

Keyboards are used to input **Text**, **numbers** and **instructions** into the computer.

Most keyboards use a **QWERTY** key layout. This name comes from the first six letters on the top row of the alphabet keys.



Special keyboards called “**Ergonomic keyboards**” have built-in-hand-rest which prevents health issues such as RSI (Repetitive Strain Injury).Ergonomic keyboards have natural shape to reduce stress on wrist and hands.



A **concept keyboard** is a specialized keyboard with no pre-set keys. It relies on a touch sensitive screen with the key or overlay displayed on the screen. Each key can be programmed with a wide range of different functions. The overlay is often used as a quick and easy way to input items with without needing to type anything or use a mouse. If you go to a fast food restaurant, the assistant will normally be using a concept keyboard. Pictures and icons can replace words and means that the assistant can quickly enter the order without having to use a keyboard.



Numeric keypads are used for entering numbers into a computer system. Some numeric keypads allow you to enter simple text and symbols. Numeric keypads are found in ATM (Automatic Teller Machines), telephones and chip and pin device. Electronic point of sale (EPOS) terminals has numeric keypads in case the barcode reader fails.



Uses of keyboard:

- Keyboards are used to enter text, numbers and instructions into applications like Word and Excel.
- Keyboards can also be used to enter commands(keyboard shortcuts) into the computer

Advantages of keyboards:

1. Enable fast entry of data.
2. Most computers come with a keyboard supplied
3. People need very little training to use keyboard.

Disadvantages of keyboards:

1. Keyboards are large and can take up a lot of desk space.
2. Keyboards are not suitable for creating diagrams.
3. Excessive use can lead to health problems such as repetitive strain injury (R.S.I.)
4. Entering data is slow compared to automatic methods. For example a barcode scanner will input data into the computer almost instantly.

Note:

H.W: Function keys provide shortcuts to frequently used commands. Make a list of function keys and their uses.

2. Mouse:

Mouse enables you to control what happens on the screen by moving the mouse on your desk and pointing, clicking and selecting items on the screen. A mouse is also called a '**Pointing device**'. Pointing devices are used to control cursor and click icons and options on Graphical User Interface (GUI) operating systems.



Types of Mouse:

Ball mouse (Mechanical mouse) – uses a ball under the mouse to detect movement.

Optical mouse –uses reflected light to detect movements

Note:

Wired and Wireless mice are available in the market.

Wireless mouse do not need a wire plugged into the computer, they are powered by batteries instead of computers.

Uses of Mouse:

1. Opening, closing, Maximizing and Minimizing programs and files.
2. Moving, grouping and deleting files
3. Controlling a pointer on a screen to select icons or move around the page.
4. Editing images in terms of size and position on the screen.

Advantages of Mouse:

1. Ideal for use with desktop computers.
2. Works well in conjunction with a keyboard for data entry.
3. It is small in size and do not take up much space.
4. Faster to select icons and options when compared to a keyboard.

Disadvantages of Mouse:

1. Excessive use can lead to health problems such as repetitive strain injury (R.S.I.)
2. Older style mouse which has roller balls can become clogged with grease and grime and lose their accuracy until cleaned.
3. Mouse needs a flat surface in order to work properly.
4. If the battery wears out in a wireless mouse, it cannot be used until it has been replaced

3. Tracker ball:

Tracker ball is similar to mouse but the ball is on top of the device. Screen pointers are controlled by rotating the large ball with your hand.



Uses of Tracker ball:

1. Tracker balls have the same functions as mouse.
2. They are much more comfortable to use than mouse. This means that people with painful hand and wrist problems can use a tracker ball.

Advantages of Tracker ball

1. They are more comfortable than mouse because there is less wrist movement required. They are more ergonomic.
2. More accurate than other pointing devices
3. Can be used even when there is no flat surface available.

Disadvantages of Tracker ball

1. More expensive than mouse.
2. More difficult to learn to use than a mouse.

4. Joystick:

Joysticks have similar functions to that of mouse and tracker ball to control a pointer on a screen. Joysticks are also popular devices for gaming.

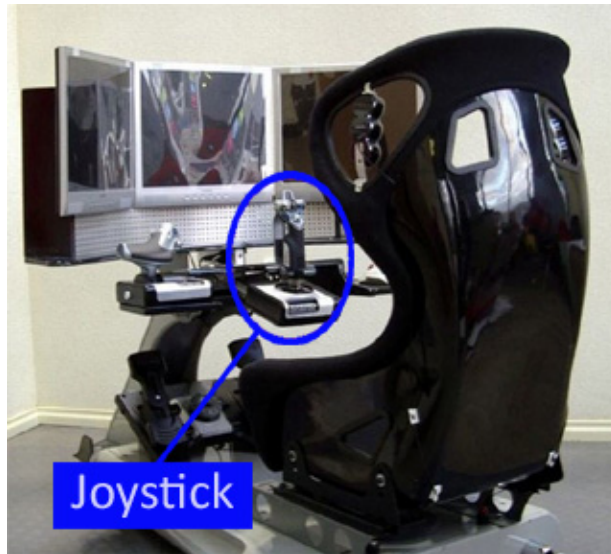


Uses of Joystick:

1. To control characters or objects in video games.
2. To control **industrial machinery** such as cranes.
3. They are used in **simulators**.(eg.) Trainee pilots use joysticks to control the simulate plane.



To operate cranes



Flight simulators

Advantages of joystick:

1. They give a better gaming experience for racing or flying styles of computer games.
2. Easier to control an on screen cursor or move an in-game character.

Disadvantages of joysticks:

1. Difficult to input text with joystick than with keyboard.
2. Not as easy to control an on screen cursor when compared to using a mouse.
3. People with hand/wrist issues can find them painful to use.

5. Graphics tablet:

Graphics tablet or **Graphics pad** is a flat rectangular pad, which can be drawn on with a special pen called stylus. Whatever is drawn on to the tablet can be seen on a computer screen. Anything drawn onto the tablet can be saved as images.



Uses of Graphics tablet:

A graphic tablet is used mainly for **computer aided design and drawing (CAD)**. This device allows designers to produce digital images much more accurately than if they were using a mouse.

Graphics tablets are also often used by graphics designers, illustrators.

Advantages of graphics tablets

1. It is much more natural to draw diagrams with a pencil type implement (the stylus) rather than with a mouse
2. A great level of accuracy can be achieved

Disadvantages of graphics tablets

1. Not really suitable for general selection work such as pointing and clicking on menu items
2. Graphics tablets are much more expensive than a mouse

6. Scanners

Scanners can be used to convert images or text on paper into a digital format that can be used by the computer.

There are three types of scanner:

- Flatbed scanners
- Handheld scanners
- Sheet-fed scanner



Flatbed scanner: The image is laid flat on the scanner's surface and is captured in a similar manner to that of a photocopier.

Hand-held scanner: It reads the image while being dragged over it.



Sheet-fed scanner: It feeds the image in through rollers. The scanner reads the image as the paper goes through. The image must be printed on a flexible sheet of paper.

Uses of Scanner:

1. Used to convert printed images on paper to electronic form.
2. Old photos and important documents can be scanned into the computer. This means you still have a copy if the original is damaged or lost.

Advantages of scanners

1. Flatbed scanners are very accurate and can produce reasonably high quality images.
2. Any image which is digitized by the scanner can then be included on electronic documents.
3. Images once digitized can be enhanced with a graphics application.

Disadvantages of scanners

1. The accuracy of the data input is unlikely to be verified.
2. Images lose some quality in the scanning and digitizing process.
3. The quality of the final image is dependent on the quality of the original image.

7. Digital Camera

Digital cameras store digital photographs on a memory card and these images can easily be transferred onto a computer for viewing or editing. Most digital cameras have a built in screen to allow for previewing the digital photograph. This is useful so that the photographer can decide which images to keep and which to delete.



The picture made by a digital camera is formed by a quantity of very small dots of different colors called **pixels** or **picture element**. These are the number of dots that make up the image. The digital camera image quality is measured in 'Megapixels'. The picture quality is related to the density of the dots making the picture, so the higher the megapixels the higher the quality of the image.

Uses of Digital camera:

1. Used to capture digital images, which can be transferred to a computer for editing.
2. By connecting directly to a photo printer, images can be printed straight from the camera (no need to upload to a computer).

Advantages of digital camera:

1. Digital images can be improved and edited easily using editing software.
2. Digital images can be easily transferred through Bluetooth, Emails and mobile phones.
3. Memory cards in digital cameras can store thousands of digital photographs.

Disadvantages of digital camera:

1. A corrupted memory card may result in lost photos.
2. The battery can run out meaning that you cannot take any more photographs until it is recharged.

8. Web Cameras (Webcam)

A web camera is an input device because it captures a video image of the scene in front of it. Webcams are similar to digital cameras in their functions but they are directly connected to the computer.

Webcams can capture both digital images and videos. These images and videos are sent directly to the computer where they can be stored and used.



Uses of Web cameras

1. Web cameras are used to hold video-conferencing meetings over the internet.
2. Used to conduct face-to-face conversations and job interviews over the internet.
3. Webcams are widely used in burglar alarm and other security equipment.
4. Sometimes used to allow drivers to view the traffic conditions on roads and plan a different route if the traffic on a road is too congested.

Advantages of Web cameras:

1. Digital photos and video can be displayed on wide variety of devices, such as smart phones and television screens. This allows access in a wide range of locations and by several people at the same time.
2. Video conference business meetings and job interviews can be conducted very cheaply over long distances.
3. Digital video can be broadcast over the Internet so that TV programs can be available on demand.

Disadvantages of Web cameras:

1. High quality photos and videos can be very large files. When these are sent by email or broadcast over the Internet, this uses bandwidth and slows down the network.
2. The image/video quality can be sometimes poor (low resolution).
3. They do not have their own storage and so must be permanently fixed to the computing device.

9. Microphone

A microphone can be used to input sound. The sound is detected by the microphone and an electrical signal is transmitted to the computer. Analogue-to-digital converter (ADC) is used to convert this analogue data into digital data so it can be stored and manipulated.

Computers have been programmed to do **voice recognition**. Voice recognition software enables the computer to know **who is talking but not what has been said**. Voice Recognition can be used like a fingerprint to identify a person.



Speech recognition is often used for **voice command systems**. For example to control a computer, navigate telephone menus, etc. These require that the voice first be recognized. A microphone is used to input the spoken words, which are then analysed by the program. The sound is compared with other sounds stored in the computer, to find the matching word; this match may be interpreted as a command. This is an unreliable process because a user can make words sound different at different times, and different users will say the same words differently. As a result, the software may have to be trained to recognize a particular user.

Uses of Microphone

1. Used to input sounds/speech for use in a range of applications. For example
 - **Narration** in presentations or in web sites
 - **Voice-over's in movies**

- **Speaking over the internet using VoIP**(Voice over Internet Protocol)
 - **Conducting video conferencing**
2. Used in speech recognition software. For example
 - **Converting speech into text** for use in Word processors (useful for people who do not have use of their hands)
 3. **Hands-free mobile phones** use a microphone to allow people to hold conversations without using their hands (this makes driving much safer).
 4. Used in **gaming** (along with headphones), so that gamers can talk to each other.

Advantages of Microphone:

1. Faster to read in text than to type it in using a keyboard.
2. Microphones are very cheap to buy.
3. Makes driving safer because people do not need to take their hands off the steering wheel in order to use their mobile phone.

Disadvantages of Microphone:

1. Not accurate as using keyboard.
2. Microphone will only pick up sounds that are very close.
3. Fairly fragile.