# **Input Devices**

**Input** is any data or instructions entered into the memory of a computer. An **input device** is any hardware component that allows a user to enter data and instructions into a computer. The following is a list of the most common input devices which are nowadays found in a computer system.

## **QWERTY Keyboard**

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A **keyboard** contains keys that allow a user to enter data and instructions into the computer. All computer keyboards have a typing area that includes the letters of the alphabet, numbers, punctuation marks, and other basic keys. Many desktop computer keyboards also have a **numeric keypad** located on the right side of the keyboard. On notebook and many handheld computers, the keyboard is built into the top of the system unit. A standard computer keyboard is called a **QWERTY keyboard** because of the layout of its typing area which is similar to that of a typewriter.

## Advantages of using keyboards for data input include

- It is not necessary to buy additional equipment because most computer systems are normally supplied with keyboards.
- Entering data and instructions with keyboards is generally faster than with pointing devices.

#### **Disadvantages** of using keyboards for data input include

- It takes a lot of time to practice in order to type quickly and accurately.
- Typing speeds are still very slow when compared with computer speeds.

#### Mouse

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A **mouse** is the most widely used pointing device with a GUI environment on personal computers. A **mechanical mouse** has a rubber ball on its underside to detect movement of the mouse. An **optical mouse** uses devices that emit and sense light to detect the mouse's movement. A **cordless mouse** (either mechanical or optical) transmits data using wireless technology such as radio waves or infrared light waves.

#### Advantages of using a mouse include

- A mouse is user-friendly for computer beginners.
- A mouse is easy and convenient to use with a graphical user interface.
- Using a mouse to select items or move to a particular position on the screen is faster than using a keyboard.

Disadvantages of using a mouse include

- It is not easy and convenient to input text with a mouse.
- Issuing commands by using a mouse is slower than by using a keyboard.
- A mouse is not accurate enough for drawings that require high precision.
- A mouse usually requires a flat surface to operate.
- A mouse needs more desk space to operate when compared with a trackball.

## **Trackball** glossary pg. 130

A **trackball** is a stationary pointing device with a ball mechanism on its top.



## Advantages of a trackball include

 A trackball is good for limited desk space because the user does not have to move the entire device.

## **Disadvantages** of trackball include

- A trackball is usually not as accurate as a mouse.
- The ball mechanism of trackballs also requires more frequent cleaning than a mouse.

## **Touchpad** glossary pg. 130

Is a small pressure- and motion-sensitive area on a portable computer that you can use to move the mouse pointer. When you move your finger across the pad, the mouse pointer on the screen moves in the same direction. A touch pad is an alternative to a mouse.



#### Advantages of a touch pad include

- Easy and Fast one finger control.
- Ideal for portable devices

#### **Disadvantages** of using a touchpad include

Expensive & found in specific devices e.g. laptops

## **Touchscreen** glossary pg. 130

A **touch screen** is an *input/output* touch-sensitive display. Touch screens are often used for information kiosks located in department stores, hotels, airports, and museums. Touch screens are also used for ATM machines to allow easy access of bank accounts.



Advantages of a touch screen include

- No extra peripherals are needed except the monitor.
- A touch screen allows easy access to commands, which are usually identified by words or symbols on the screen.

## **Disadvantages** of a touch screen include

- Touch screens are not suitable for inputting a large amount of data because they require a lot of arm movements.
- Only items already on the screen can be selected.

## **Joystick**

A **joystick** is a pointing device with a vertical lever mounted on a base. The lever usually includes buttons called triggers, which activate certain events when pressed. Joysticks are mainly used for computer games and ultrasound scanners in hospitals.

## Advantages of using a joystick include

A joystick allows fast interactions required in most games.

## Disadvantages of using a joystick include

It is difficult to use a joystick to select objects accurately on the screen.

## **Bar code reader** glossary pg. 132

A **bar code reader** uses laser beams to read bar codes. A bar code reader reads a bar code by using light patterns that pass through the bar code lines. Bar code readers are widely used in a POS e.g. supermarkets, department stores, libraries, etc.

Advantages of using bar codes and bar code readers include

- The process of data entry is fast and accurate.
- Bar codes can be printed by normal printing methods.
- No need to write down or key in the name of the item or its actual price.

#### **Disadvantages** of using bar codes and bar code readers include

- A bar code reader may misread a bar code if there is any dirt or mark on the code.
- Only numbers can be coded.

## Magnetic Ink Characther Reader glossary pg. 131

A magnetic ink character recognition (MICR) reader can read text printed with magnetized ink. Magnetic ink character recognition is

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the banking industry for processing checks. The characters represent the check number, the bank number, and the account number of customers.

## Advantages of MICR readers include

- MICR is difficult to forge.
- Documents can still be read when folded or written on.

## Disadvantages of MICR readers include

- MICR readers and encoders are very expensive.
- The system can only accept a few different character sets.

## **Image Scanner** glossary pg. 131

A **scanner** is a light-sensing input device that converts printed text and graphics into a digital form that can be further processed by the computer.

Two popular types of scanners are:

A **flatbed scanner** works like a copy machine except that it creates a file of the document rather than a paper copy.



A **handheld scanner** can be manually passed over the image to be scanned. A portable device you can use to copy an image from paper to your computer. Hand-held scanners are ideal for capturing small images, such as signatures and logos. A hand-held scanner is smaller, less expensive, and more portable than a flatbed scanner.

Scanners are mainly used for **image processing**, which consists of capturing, storing, analysing, displaying, printing, and manipulating images. Many scanners also include optical character recognition (OCR) software, which can convert an image of text into a text file that can be edited.

#### **Advantages** of a scanner include

A scanner with appropriate OCR software can work as an OCR system.

#### Disadvantages of a scanner include

- A scanner is best for two-dimensional objects only, difficult to scan 3-D objects
- Scanned images usually take up a lot of storage space.

## **OCR** glossary pg. 131, 132

Most **OCR readers** include a small optical scanner for reading characters and sophisticated OCR software for analysing what is read.

Advantages of OCR readers include

- Written data and printed data can be read at the same time.
- Hard copies of documents can be read directly into a computer without retyping.
- The characters converted can later be edited by word processing software.

#### **Disadvantages** of OCR readers include

 OCR readers often do not work well with handwritten characters or those in unusual fonts.

## **Graphics Tablet** glossary pg. 35

A **graphics tablet** is a flat, rectangular, electronic plastic board, on which a stylus writes or draws. It is mainly used for computer-aided design and drafting by architects, mapmakers, artists, and designers. Each location on the graphics tablet corresponds to a specific location on the screen. A graphics tablet can be used to digitise drawing with great accuracy.

## Advantages of graphics tablet include

A stylus can be pointed to different positions on the tablet quickly.

## **Disadvantages** of graphics tablet include

 A stylus and a graphics tablet normally have to work together, and cannot work separately.

## **OMR** glossary pg. 131

**Optical mark recognition (OMR) readers** can sense hand-drawn marks such as small circles or rectangles made on pre-printed forms in certain places. The OMR reader first reads the answer key sheet to record the correct answers based on the patterns of light, and then reads the remaining documents and matches their patterns of light against the answer key sheet. OMR readers are often used for *marking multiple choice answer sheets*, capturing data from questionnaires, enrolment forms, and lottery tickets.

#### Advantages of OMR readers include

- OMR has a better recognition rate than OCR because fewer mistakes are made by machines to read marks than by reading handwritten characters.
- Large volumes of data can be collected quickly and easily without the need for specially trained staff.
- The cost of inputting data and the chance of data input errors could be reduced because it is not necessary to type the details for data entry.

#### **Disadvantages** of OMR readers include

- The OMR reader needs to be reprogrammed for each new document design.
- OMR readers are relatively slow.

- The person putting marks on the documents must follow the instructions precisely.
- Any folding or dirt on a form may prevent the form from being read correctly.

## **Digital Camera**

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A **digital camera** takes pictures and stores the images digitally, rather than on traditional film. Digital cameras use different media to store images, which include flash memory card, floppy disk and compact disc.



## Advantages of a digital camera include

- Save money for buying films and developing costs in the long term.
- Images taken can be reviewed.
- Unwanted images can be deleted immediately after the preview.
- Photographic images can be digitised directly without using a scanner.

## Disadvantages of a digital camera include

- Digital cameras are normally more expensive than ordinary film cameras with similar functions.
- Photo printing cost for digital cameras is generally higher than that for ordinary film cameras.

## Light Pen

glossary pg. 132

A **light pen** is a pointing device that can detect the presence of light.



Light pens are used by health care professionals (such as doctors and dentists) and design work.

#### Advantages of light pens include

- Using a light pen is more direct and precise than using a mouse.
- Light pen is also convenient for applications with limited desktop space.

#### **Disadvantage** of light pens includes

Light pens normally require a specially designed monitor to work with.

## **Pen Computing** glossary pg.

A computer that utilizes an electronic pen (called a *stylus*) rather than a keyboard for input. Pen computers generally require special operating systems that support handwriting recognition so that users can write on the screen or on a tablet instead of typing on a keyboard. Most pen computers are hand-held devices, which are too small for a full-size keyboard.

#### Advantages of pen computing include:

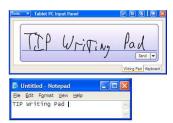
- Lightweight
- Portability
- Can be connected to home PC and data transferred onto it

## Disadvantages of pen computing include:

Stylus can be uncomfortable to use until you get used to it.

## **Handwriting Recognition**

Handwriting recognition is a technique which allows a computer system to recognize characters and other symbols written by hand in natural handwriting. The technology is used for identification



and also on devices such as PDA and tablet PCs. After one writes on a screen with a stylus, the computer turns that person's handwriting into digital text.

## **Advantages** of handwriting recognition include:

- Handwriting recognition works regardless of which language text is written in i.e. it is language Independent.
- It requires a minimal or no training to use.
- It has very minimal system requirements and provides immediate input.

#### **Disadvantages** of handwriting recognition include:

- Cannot recognize mathematical symbols
- Only understand linear structures
- It is very tiring for the arms.
- Handwriting needs to be clear for it to be recognised.