

Input and output devices essay sample

[Technology](#), [Computer](#)



Overlay Keyboards

In many applications only a small number of different entries need to be made. It is faster to press a marked key than to enter a string of data. You are also less likely to make mistakes.

The overlay keyboard works by having a membrane keyboard that has a number of areas/ keys on it. An overlay is put on top of the keyboard so that the user can select a specific for a particular entry. The computer is programmed to respond to each key in an appropriate manner.

Touch Screens

In some applications the concept keyboard application is replaced by a touch sensitive screen.

The user touches the screen and the computer is programmed to respond in an appropriate way.

One advantage of this method is that the program can change the screen layout at any time, and is possible to have several different menus (a bit like swapping the overlays on an overlay keyboard). These kind of terminals are used when the fast selection of information is important.

Pointing Devices

Not strictly speaking input devices but pointing devices can be used to control a computer or select items from a menu. These include a mice, joysticks, tracker balls and touch screens.

Sound Samplers

These will convert an audio signal into a digital form that can be stored and processed by a computer.

Video Digitisers

These will convert a video signal into a digital form that can be stored and processed by a computer. These are useful for capturing pictures of three dimensional objects.

Scanners

These will convert an image on a flat sheet of paper into a digital form that can be stored and processed by a computer.

The speed, resolution, data transfer rate and connector interface are essential features of a scanner.

How a scanner works

For a black and white picture the scanner measures the reflected light from each position on the paper (Say at 100 dots per inch). If the reflected light is above a certain level the dot is assumed to be white which is recorded as the digit 1.

If the reflected light is below the certain level the dot is assumed to be black and recorded as the digit 0. The picture is thus made up of a string of 0's and 1's like 01101101110011010101100. This is in digital form.

For a grey scale picture each dot may be one of several different shades of grey and this cannot be represented by just 0's and 1's is used to represent a shade. So for example

11111111= White

11111110= Light grey

00000001= Dark grey

00000000= Black

Using an 8-bit code like the one above gives us 256 different possible codes and so 256 possible shades of grey.

For a colour picture a similar technique is used. Normally 3 different lights are shone on the picture and the reflected light from each is used to measure the colour value.

Different colours are then represented using a collection of 0's and 1's as above. An 8-bit code will give us 256 colours. A 16 bit code will give us 65536 colours.

Data capture

Input methods that use a keyboard usually involve the transcription of the source data from the source document. This process clearly creates extra work, and if verification is employed to reduce errors made during transcription then the workload and the time taken is increased still further

Documents readers are an automated method for putting data from the source document without the use of a keyboard.

In most cases the data will be read by the document reader and stored on magnetic tape or disc ready for batch processing.

Optical Mark Reading (OMR)

Here the marks are detected optically measuring reflected light. The readers use CLOCK MARKS to determine which areas of the card to read, so the cards can vary in size and in format. Coding methods need to be employed to allow the marks to represent different types of data so the range of the data that can be represented is limited.

The original source document can be pre-marked by the computer so that turnaround documents can be used (i. e. Documents that are produced by the computer, have some information added and then are re-input to the computer). Special care needs to be taken over correction procedures so that badly marked or damaged documents do not cause confusion in the system.

Advantages Disadvantages

- Fairly reliable - Unsuitable for alphabetic data
- No special marking equipment needed
- Can be used for turnaround documents

Optical character recognition (OCR)

Here carefully produced characters can be read by the machine. It is possible for documents typed on a normal typewriter or computer printer or even carefully hand printed documents to be read. The reliability of the reading depends on the clarity of the shape of the characters. The reader will expect a particular design of character (font) to be used.

OCR is now quite common, and examples of OCR turnaround documents may be found on Gas and Electricity bills where the bill has figures printed on by the computer which can be read by OCR and enable the transfer of funds to take place.

Advantages Disadvantages

- Natural method for non-technical users -Cost of OCR readers
- Data may be read by people -Not as reliable as OMR
- Careful hand printing may be used

Magnetic Ink Character Recognition (MICR)

Here the characters are printed in special ink, which may be magnetised.

Fonts used enable accurate reading of data.

The typical example of this is it is used on bank cheques.

Kimball tags

Commonly used in fashion shops

Bar Codes

Commonly used in supermarkets

Magnetic Strip

Used for credit cards

Voice Recognition

Not yet good enough to become widely adopted

Handwriting Recognition

Progress being made on this but mainly used in specialist applications and with something other than normal handwriting e. g. PDAs.