Level 1/2 Vocational

ICT

1.2.1 Why data must be fit for purpose

Data, information and knowledge

Data consists of raw facts and figures with no context (for example numbers or letters). When data is processed and given context, it becomes **information**. Our prior knowledge helps us make sense of this information. **Knowledge** is formed by applying rules to information, allowing it to be used meaningfully. Using data, information and knowledge effectively can lead to wisdom.

For example, the number '24' is data. When we're told it's a competition score, it becomes information. To gain knowledge, we need rules (the scoring system) to understand whether '24' is a good score.

Advantages and disadvantages of using ICT for storing data

Using ICT to store data offers significant advantages over traditional paper-based systems.

Advantages:

- **Speed and efficiency:** Data can be instantly sorted, searched and retrieved using queries.
- **Reporting:** Information can be easily formatted into reports that follow organisational house styles.
- **Accessibility:** Features such as enlarged text or screen readers can assist users with particular needs.
- **Security control:** Different access levels can restrict who views specific data.
- **Space saving:** Vast amounts of data can be stored digitally, reducing physical storage space and associated costs.
- **Cost reduction:** Automating tasks previously done manually saves staff time and reduces expenses.
- **Easier sharing:** Data can be shared quickly via email attachments, file transfer protocol (FTP) or screen sharing during online meetings.

Disadvantages:

- **Accessibility issues:** Data is unavailable during power cuts or if there is no Internet connection to online storage.
- **Health concerns:** Extended computer use can lead to health issues like repetitive strain injury (RSI), eyestrain and backache.
- **Security risks:** Data is vulnerable to theft, hacking and malicious software. Significant investment is needed to maintain data security.

The need for good quality data

Data must be fit for purpose to ensure effective decision-making. Poor-quality data can lead to errors and costly re-collection. Good data has several key characteristics:

- **Clarity:** The purpose of the data collection must be clear.
- **Accessible:** Easy for users to understand and use.
- **Consistent:** Formatted uniformly (for example dates).
- **Complete:** No missing information.
- **Accuracy:** Reliable and correct.
- **Timely:** Collected and available within a short, relevant period.
- **Relevant:** Directly relates to the required information.
- **Cost:** Good value for money in its collection and use.

File types

Files are given a **file extension** (for example .doc, .docx, .xls) when saved. This indicates the file's characteristics and tells the operating system which program should open it. Using the correct file extension is vital, as an incorrect one can corrupt the file.

Data compression

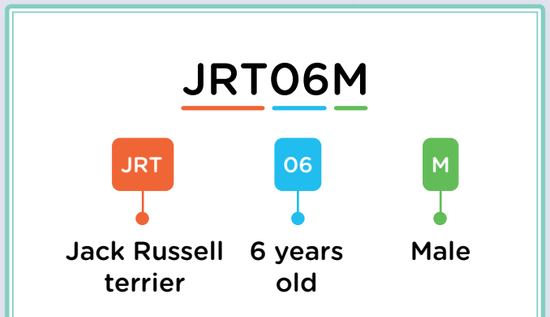
Compression reduces the size of a data file by using fewer bits to represent the data. This saves storage space and speeds up file transfer, especially for audio, video and image files. There are two types of data compression: lossy and lossless.

- **Lossy compression:** Permanently deletes unnecessary data. It is commonly used for audio and graphics, where slight quality loss is often unnoticeable. The original quality cannot be restored.
- **Lossless compression:** Uses algorithms to create reference points for recurring patterns, allowing the file to be fully restored to its original quality. It is used for text documents, executable programs and source code where no information can be lost.

Encoding data

Encoding data means changing raw data into a standardised code. This helps to organise data and ensures it meets its purpose.

For example, a dog kennel might encode 'six-year-old male Jack Russell terrier' as **JRT06M**.



Here are the benefits of encoding:

- **Saves computer memory:** Codes are shorter.
- **Faster input:** Less to type.
- **Fewer errors:** Reduced the chance of mistakes during entry.
- **Easier to sort, search and analyse:** A standardised format makes processing simpler.
- **Easier validation:** Rules can be applied to each part of the code (for example the first three letters must be a breed code).
- **Security:** Data is not easily understood without the code key.

File properties

File properties (also known as metadata) provide information about a file, such as its title, type, size, author and last modified date. They can be viewed by right-clicking on a file. File properties also show which application is configured to open the file and can help diagnose issues like file corruption.