Data and Information

Unit R012 - Understanding tools, techniques, methods and processes for technological solutions

Data

- Data is **raw facts** and **figures before** they have been **processed**.

- Examples of Data:

72,000	110,000	128,000

- These numbers tell us nothing. They could be:
  - Footballers weekly wage
  - The number of members at a gym
  - The weekly sales of baked beans sold in a supermarket.

Information

- Information is data which has been processed by the computer.
- The term processed is giving data context and meaning and presenting it in an appropriate structure.
- **Data + Context + Structure + Meaning = Information**

Information Examples

Data	Structure	Context	Meaning
01012019	NN/NN/NNNN 01/01/2019	A UK date	New Years Day in 2019
30 40 50 60 70	Integer numbers	Miles per hour	Speed limits on different types of UK road
TRNB14	First two letters = Type of clothing Second two letters = Colour Last two numbers = UK size LLLLNN	A clothing shop stock code	A navy blue pair of trousers in UK size 14

Data V's Information

Data

- **Not Processed**
- **Does not** have a **context**
- Has **no structure**

Information

- **Processed**
- Has a **context**
- Has a **structure**

Data Types

- Before data can be processed, the way in which it is stored must be considered.

- Which type is chosen will depend on what data is to be stored:
  - **Text**
  - **Alphanumeric**
  - **Number**
    - Integer/Real/Currency/Percentage/Fraction/Decimal
  - **Date/Time**
  - **Limited Choice**
  - **Object**
  - **Boolean**

Data Type: Text

- Description
  - Text is **any** given **character**
- Example
  - **DB7&~?Ht5**
- How it could be used?
  - To **store names** of items or people
  - To **store phone numbers** to ensure spaces are kept and they start with 0

Data Type: Alphanumeric

- Description
  - **Alphanumeric** is any **combination** of **letters, space** and **numbers**.
- Example
  - **Abcx1234**
- How it could be used?
  - To **store post codes** as these contain numbers and letters

Data Type: Number - Integer

- Description
  - An **integer** is a **whole number**.
- Example
  - **1960**
- How it could be used?
  - To **store** the **number** of items in **stock**, lengths swam, number of tickets sold
  - **TV** channel **number**
  - **Years**

Data Type: Number - Real

- Description
  - **Real numbers** are numbers with a **decimal** point.
- Example
  - **12.30**
- How it could be used?
  - To **store height/weights**

Data Type: Number - Currency

- Description
  - **Currency** numbers show data in the format of money with a currency symbol **(£/$)** and with decimal places if needed.
- Example
  - **£9.99 / $450.00**
- How it could be used?
  - To **store** the **price** of an item.

Data Type: Number - Percentage

- Description
  - **Percentage** numbers show data with a percentage **sign** and with decimal places if needed.
- Example
  - **25%**
- How it could be used?
  - To **store** percentage **discounts** in a shop

Data Type: Number - Fraction

- Description
  - **Fraction** numbers, usually included in spreadsheet software to enable actual fractions to be input and manipulated.
- Example
  - $\frac{7}{8}$
- How it could be used?
  - To **store** the **result** of a **calculation**

Data Type: Number - Decimal

- Description
  - **Decimal** numbers show an exact number using a decimal point
- Example
  - **0.8**
- How it could be used?
  - To **store** the result of a **calculation**

Data Type: Date/Time

- Description
  - **Date/Time** allows data to be stored in specific **formats** of **dates** or **times**.

- Example
  - **29/01/1988 – 13:55**

- How it could be used?
  - To **show** a **date** – 29th January
  - To **show** a **time** – 13:55 or 1:55pm

Data Type: Limited Choice

- Description
  - **Limited choice restricts** the user to specific **choices** and can be used on an information gathering document
- Example
  - **Drop down lists / Tick boxes / Check boxes / Radio buttons**
- How it could be used?
  - To **select** an **option**
  - To **store days** of the week
  - To **select** a **payment** option

Data Type: Object

- Description
  - **Objects** can **store additional components**, usually found in spreadsheets.
- Example
  - **A graph or chart from a different source**
- How it could be used?
  - To **insert** a **chart** into a worksheet from a different file.

Data Type: Boolean

- Description
  - **Boolean** data is where there is only **two choices** of data.

- Example
  - **Yes/No**
  - **Male/Female**
  - **True/False**

- How it could be used?
  - To **store** the **gender** of a person
  - To **answer** a closed **question**

Importance Of Validity, Reliability & Bias

- When collecting and using data and information, it is important that the **validity**, **reliability**, and **bias** of it is considered.

- Data and information can be collected from a range of sources, which can be classed as either **primary** or **secondary**.
  - **Primary** data is data that is **collected first hand**.
  - **Secondary** data is data that has been **collected** through **other sources**.

Validity

- **Validity** means how **believable** the **data** and information **collected** is.
  - E.g. data that is found on a government or academic websites would almost certainly be valid, whereas personal websites may not be valid.

- One example of non-valid data and information could be that of "**fake news**".

- Fake news is information that has been **made up** by those **people** who have written it.

Reliability

- **Data** that is **correct**, and can be **verified**, is **reliable**. **Incorrect data** and information can be assumed to be wrong, out of date or **inaccurate**.
- The **reliability** of data taken from **secondary sources** can be sometimes **difficult to establish**.
- If data is taken from a **published source**, like a book, then it is **likely** to be **reliable**.
- **Reliability** should be considered when you are **collecting** your **own data**. It **depends** on the **collection method**, **type** of **questions** asked and **who** is **asked**.

Bias

- **Biased data** and info only gives **one point** of **view** or perspective.
- **Information** that may be **biased** may include; personal **opinion**, a statement that does not contain any fact, prejudiced either for or against a person, product or idea. E.g. "This is the best song ever"
- There are several ways to **check** the **bias** of information, for example:
  - Consider whether the information is **worded simply**, or **generalised**.
  - Consider whether the information is based on **emotions**, rather than **facts**.
  - Consider whether the information focuses on just **one side** of the discussion.
- **Secondary** sources can provide **data** that is biased but has **no real value** and is of **no use**.