

Data, Information, and Knowledge

Data

- 📖 Raw facts and figures
- 📖 Letters, numbers, combination of both letters and numbers
- 📖 Values which on their own have no meaning

Examples of Data

 150170

 English

 23

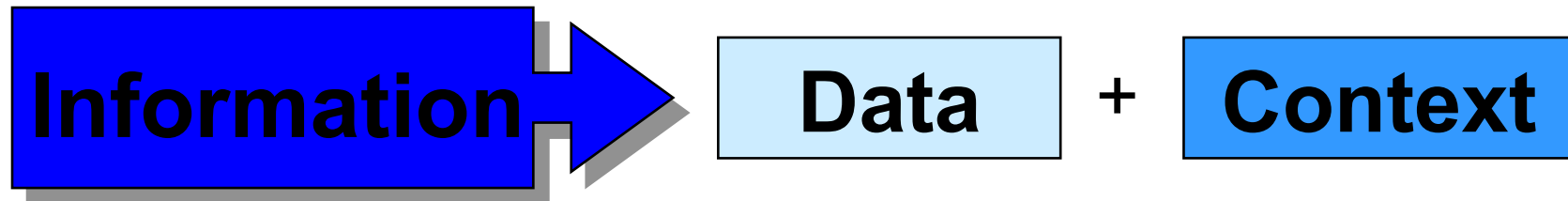
 1066

The above data has **no** meaning

Information

- 🖥️ Data which is given meaning by its context
- 🖥️ Processed into a form which is useful to the user

Formula for Information



Examples of Information

- 🖥️ Lisa's date of birth is **15/01/70**
- 🖥️ The exam is through the medium of **English**
- 🖥️ Only **23** days until payment is required
- 🖥️ The computer costs **£1066**

The above phrases have meaning

Information (Data + Context)

- 🖥️ Lisa's date of birth is **15/01/70**
- 🖥️ The exam is through the medium of **English**
- 🖥️ Only **23** days until payment is required
- 🖥️ The computer costs **£1066**

The above phrases have meaning

Knowledge

- ▢ Derived from information by applying rules to it
- ▢ Decisions can be made if you can apply knowledge to the information

Knowledge

- ~ Knowledge is the result of interpreting information

“We need to order more ink cartridges for the printer” may be the knowledge acquired after counting the number of unused cartridges left

- ~ We use knowledge to build up sets of rules:

“It is promising snow and ice next week so we need to place a larger order for de-icer and anti-freeze.”

Difference Between Information and Knowledge

- ~ Information is based on facts
- ~ Knowledge is based on rules, and these rules are based on probabilities, not certainties

High atmospheric pressure is information. Weather forecasters interpret this information eg high pressure means settled weather

Value Judgements

The weights of 9 pupils in year 12 are listed below:

Robert	11st 6lb	Sam	9st 9lb	Nia	10st 9lb
Huw	10st 7lb	Sara	7st 5lb	Katie	8st
Mari	9st 1lb	David	14st 4lb	Joe	12st 2lb

Draw a table with the following headings and put each person in the correct category:

Underweight	Average	Overweight

Value Judgements (use white board pen)

Underweight	Average	Overweight

Sources of Data

- ~ Data gathered from source
- ~ Data gathered indirectly
- ~ Data passed on/purchased
- ~ Data from data set

Data Gathered from Source

- ↻ Collected as part of a transaction
 - Loyalty card
- ↻ Collected in a survey
 - recorded on an OMR form
 - recorded in an interview or questionnaire
- ↻ Collected by sampling
 - Data from sensors eg weather station, traffic statistics

Data Gathered Indirectly

- Data used for a purpose different to that for which it was originally collected
a credit card firm uses data about each transaction to bill the customer. If the data is then used to find out about their spending habits to send them focused adverts, then this is using the data indirectly.

Data Passed On/Purchased

- ~ Data Passed on/Purchased
these are methods of acquiring the data, and the data then being used in a method different to that originally intended

Data from Data Sets

↗ Data produced by the processing of source data

- the source data from a supermarket might be the number of cans of Baked Beans at the beginning of the month and the number at the end.
- the result of processing is the number sold during the month

↗ Archives

Using previously collected data eg the names and addresses of people who attended an IT course

Effect of Quality of Data Source on Information Produced

↗ Unreliable Questionnaires

If the wrong individual is asked then the data, though accurate, cannot be relied upon eg asking a vegetarian his/her views on meat.

↗ Incomplete Data

Goods can leave a store in many different ways - the main one being sales recorded by bar code readers. If management relied upon this data alone then the information would be inaccurate. Goods are also stolen or damaged.

Effect of Quality of Data Source on Information Produced

↗ GIGO (Garbage In Garbage Out)

If the data source is incorrect, then the resulting information will be incorrect

↗ Factors affecting the quality of the data include:

- **Relevance** (if the information is not relevant)
- **Age** (if the information is out of date)
- **Completeness** (if some of the information is missing)
- **Presentation** (if the information cannot be found because of the way it has been presented)
- **Level of Detail** (Too much or too little detail - both have an effect)

Coding of Data

- ↻ Changing the original data into a shortened version in order to store it in the computer

storing months of the year as Jan, Feb, Mar

storing male and female as M and F

Problems of Coding Data

- ↻ Data not necessarily precise
eg Hair colour which is light brown coded as brown
- ↻ The user needs to know the codes
If the user is not aware of the codes then he/she cannot interpret the data

Benefits of Coding Data

- ~ Less storage space required
If Tue is stored instead of Tuesday then less storage space required
- ~ Searches can be quicker and more precise
As less data is being stored it is faster to search and to make comparisons between pieces of data
- ~ Easier validation
With a limited number of codes it is easier to match them against rules and make sure that only codes that exist are entered
- ~ Can be easier to remember

Short codes can be easier to remember than full names

Costs of Producing Information

⚡ Hardware

- To collect, process and output the data
- Storage space to hold the data
- Purchase and maintain equipment

⚡ Software

- Required to store and process data
- Software licences and maintenance agreements

⚡ Manpower

- People employed to collect, enter and maintain data
- Staff training
- People required to analyse and prepare reports on data

Information as a Commodity

- ↻ Information is used for a variety of purposes:
 - Decision Making
 - Planning
 - Control
 - Recording Transactions
 - Measuring Performance
- ↻ Costs must not outweigh the benefits
the greater the benefit the higher the cost you will be prepared to pay

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