

EMPL4005

INFORMATION, DATA AND ANALYSIS

Data, Information, Knowledge
Understanding and Wisdom

- **Data:** Symbols

Data is raw. It simply exists and has no significance beyond its existence (in and of itself).

- **Information:**

Data that are processed to be useful; provides answers to "who", "what", "where", and "when" questions.

- **Knowledge:** application of data and information; answers "how" questions
- **Understanding:** appreciation of "why"
- **Wisdom:** evaluated understanding.

Ackoff, R. L., "From Data to Wisdom", Journal of Applied Systems Analysis, Volume 16, 1989 p 3-9.

Data

- What do the numbers (123424331911) (211192) or perhaps the letters 'aab' mean to you?
- Probably nothing - this is because they have no specific meaning or application. They are examples of **DATA**.

Data

- Data consist of raw facts and figures - they do not have any meaning until they are processed and turned into something useful
- Data comes in many forms, the main ones being letters, numbers and symbols

Data

- It is essential that **DATA** is available because it is the first step in creating meaningful **INFORMATION**
- The three data items on the earlier slide could represent some useful information:

DATA	INFORMATION
123424331911 ----→	Your winning lottery ticket number
aab -----→	Your A level results
211190 -----→	Your date of birth

There are two kinds of data

- Qualitative data uses words or images to describe something.
 - Not in numerical form e.g. open-ended questionnaires 'What did you think of our service?'
- Quantitative data uses numbers, or categories, that can be labelled with a number.
 - This type of data can be used to construct graphs and tables of raw data.

Information

- Information is data that has been processed in such a way as to become meaningful to the person who receives it.
- **INFORMATION = DATA + CONTEXT + MEANING**
- An example of Information:
- **Data:** 21041926 - this has no meaning or context
- **Context:** It is a British date

Information

- This allows us to register it as 21st April 1926 but it still has no meaning and is therefore not information
- **Meaning:** The birth date of Queen Elizabeth II
- This gives us all the elements required for it to be called 'information'

Knowledge

- **Scenario:** Sales of widgets are 25% down on last year.
- **Data gathered:** for example, from competitor analysis, or a PEST (Political, Economic, Social and Technological) analysis.
- Data is processed to become information:

Knowledge

- **Information:** loss of sales is due to a competitor launching a rival product at a cheaper price.
- **Action:** reduce the selling price of our widgets.
- **Knowledge:** the price of our widgets too high in the current market or climate.
- **Knowledge** is having an understanding of the "rules".

Knowledge

- **Information** is the underpinning of **Knowledge**
- The difference between information and knowledge is certainty. Information is largely based on fact that cannot be disputed (as long as the data is correct!).

Knowledge

- However, knowledge is based on probabilities - what are the chances of a course of action being the best alternative, given a set of information....?
- The reason for this uncertainty is that there are many possible outcomes for a given set of information.

Understanding

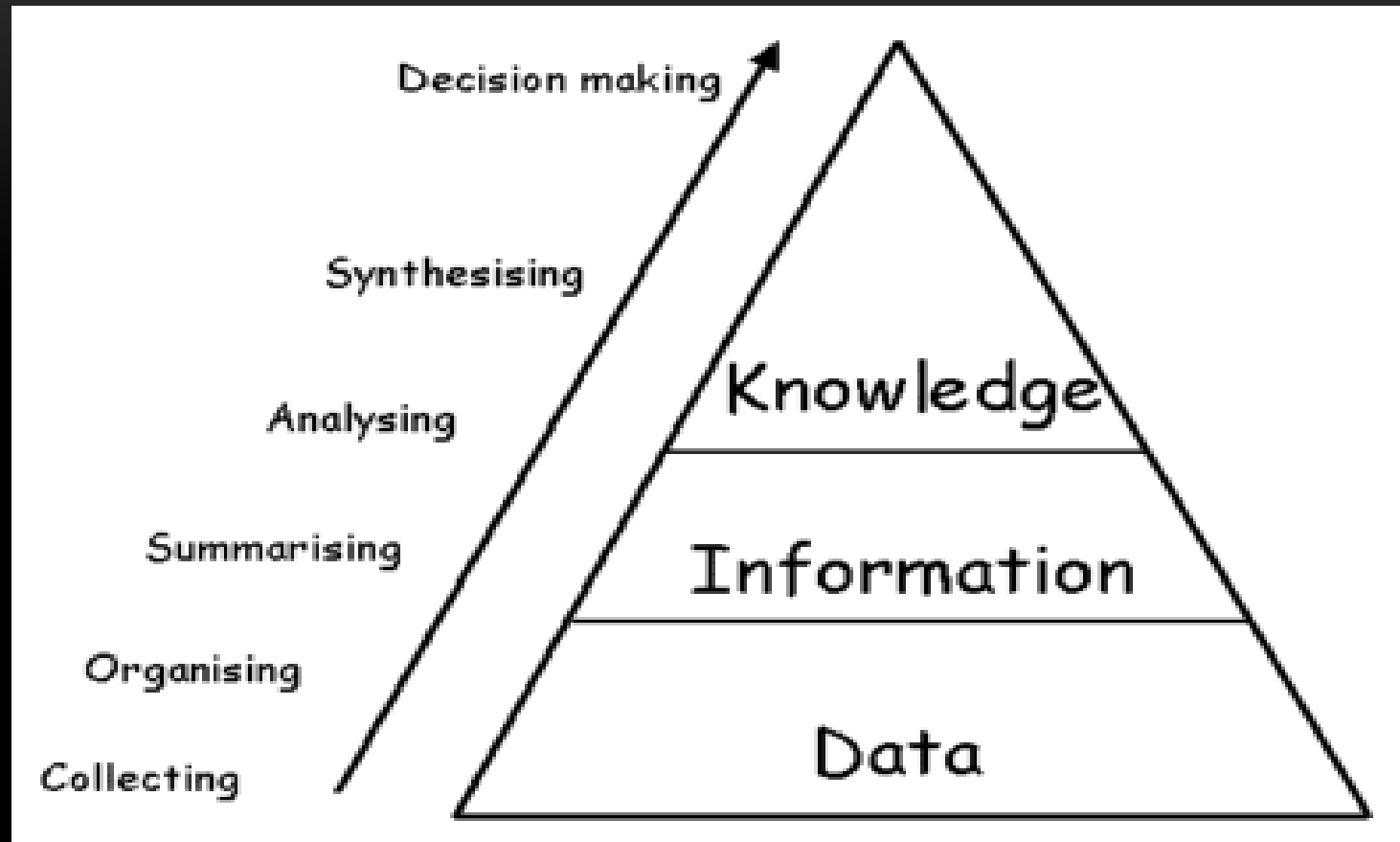
Understanding: An appreciation of **why**

“The difference between understanding and knowledge is the difference between "learning" and "memorising".

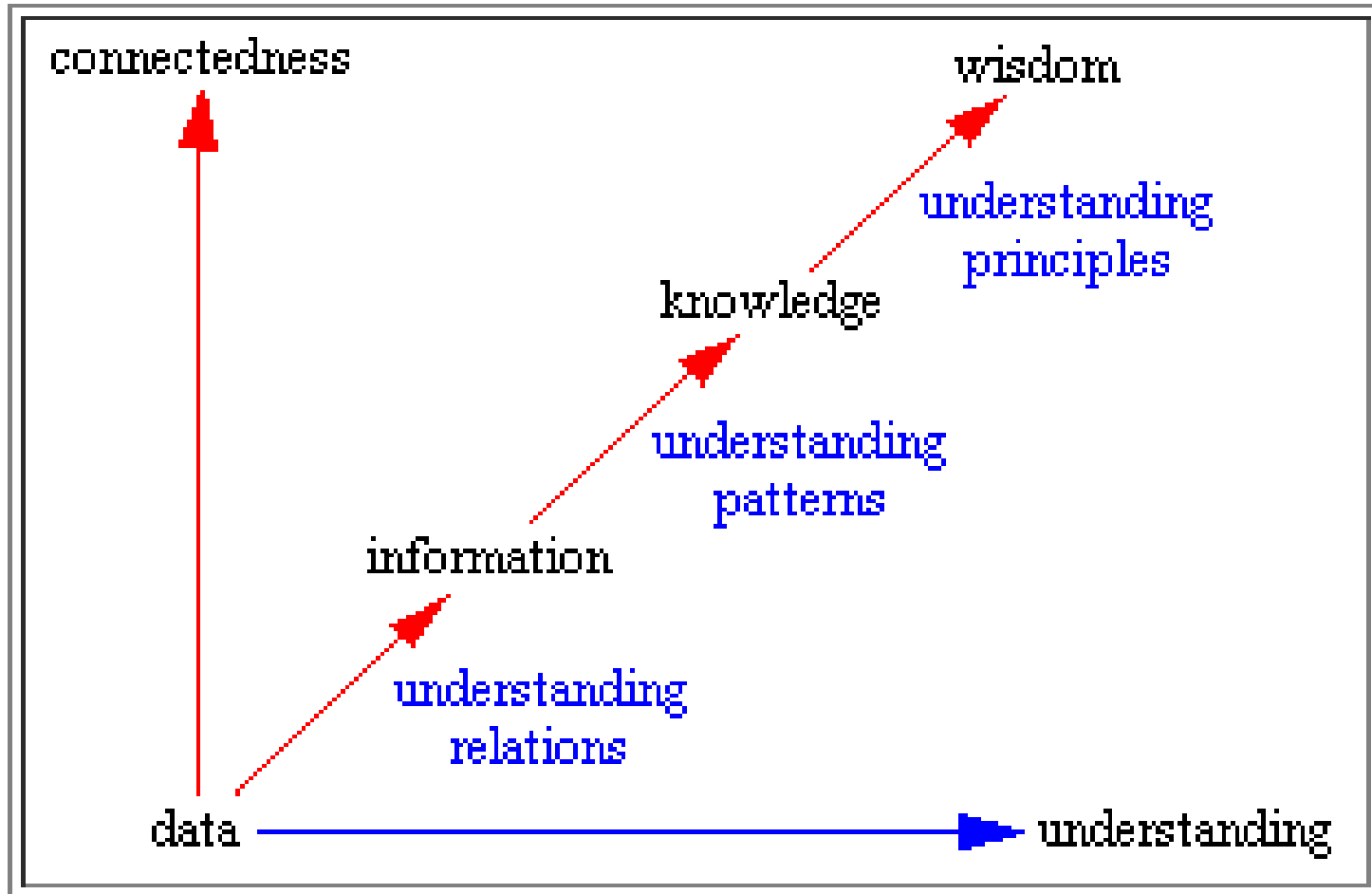
Wisdom

Wisdom: evaluated understanding.

“Wisdom is the process by which we also discern or judge between right and wrong, good and bad.”



The different aspects of knowledge (Allen 1999)



<http://systems-thinking.org/dikw/dikw.htm>



Summary

- **Data** is the collection of raw measurements
- **Information** is the result of processing raw data
- **Knowledge** is a conclusion of what to do when a particular set of information presents itself.