Assessment 1: The DIKW hierarchy

Aims

The aims of this assignment are:

- To critically define and evaluate interrelationships between data, information, knowledge and wisdom (DIKW)
- To critically analyse the potential drawback sof the DIKW hierarchy
- To apply the DIKW hierarchy to map various types of information systems.

Weight: 25%

Submission

Your final report should be submitted to LearnJCU, in either Word (.docx) or PDF (.pdf) format, and should:

- Be around 1500 words, excluding references (word counts 10% below or above the required word limit will be penalised by 10% deduction of the marks available. The word count must be accurately stated at the end of the written piece. Every printed element between spaces is to be counted including quotations and in-text references (but not including reference list or appendices)
- Be less than five (5) A4 pages and in 12pt Arial font

Overview

Concepts of data, information, knowledge and wisdom are the core building blocks of data science.

Russell Lincoln Ackoff (1989) was the first to systematically arrange these terms into a hierarchy – referred to variously as the **DIKW hierarchy, Knowledge pyramid, Knowledge hierarchy** and **Information hierarchy** – in his article 'From Data to Wisdom'. Even though this hierarchy is a 'taken-for-granted' notion in data science and information science, there are few disputes on the hierarchy.

The main aim of this assignment is to understand and evaluate these fundamental building blocks of data science, to critically review the potential drawbacks of the hierarchy and to apply them to map various types of existing information systems.

In this assignment, you are asked to research literature (systematically building your own DIKW hierarchy to critically conduct your research and formulate your response) to make a decision to answer each of the following five (5) tasks. For each task, you need to explicitly express your stand (that is, whether you `agree' or `disagree'), and justify your stand.

You must collect your own data (articles, blogs, etc), build information and knowledge from the data collected, and formulate your own wisdom to make a decision. There might not be an absolute answer for each of these tasks, but we will be looking at your stand and how you logically justify your stand with solid references.

You need to support your justifications using correct APA 6th edition formatting for both in-text citations and a reference list citing all references used at the end of your report.

Assessment tasks

Task 1 (5%):

According to the DIKW hierarchy, it is implicitly assumed that data can be used to create information, information can be used to create knowledge, and knowledge can be used to create wisdom. There is no wisdom without knowledge, there is no knowledge without information, and there is no information without data.

Do you agree or disagree with this view? Justify your stand.

Task 2 (5%):

According to the DIKW hierarchy, it is estimated that on average about 40 per cent of the human mind consists of data, 30 per cent information, 20 per cent knowledge, 10 per cent understanding, and very minimal wisdom. That is, there is less information than data, less knowledge than information, and less wisdom than knowledge. This is why the hierarchy is also called the knowledge pyramid.

Do you agree or disagree with this view? Can we have more information than data or more knowledge than information? Justify your stand.

Task 3 (5%):

Even though there are some debates on the hierarchy, it is a 'taken-for-granted' notion in data science and information science. What are possible criticisms and potential drawbacks of the hierarchy (including both your own opinion and an analysis of what you find in research literature)?

Investigate and research criticism and potential drawbacks of the hierarchy, and list three to five (3-5) of them with justification.

Task 4 (5%):

There are several types of data/information systems: transaction processing systems, management information systems, data warehouses, decision support systems, and expert systems.

Map the DIWK hierarchy to these types of information systems, and justify your mapping. For instance, you might start your response with 'Data warehouses are mapped to the information level in the hierarchy, because they are…', or 'Data warehouses are mapped to the knowledge level in the hierarchy due to…'.

Task 5 (5%):

Ackoff stated that "From all this I infer that although we are able to develop computerized information-, knowledge- and understanding-generating systems, we will never be able to generate wisdom by such systems."

Do you agree or disagree with Ackoff's statement? Justify your stand.

Sample report structure

Title page:

- Report title
- Subject code and name
- Your student ID and name

Task 1:

- Your stand
- Justifications.
- No more than one A4 page (12 pt font), around 300 words.

Task 2:

- Your stand
- Justifications.
- No more than one A4 page (12 pt font), around 300 words.

Task 3:

- Your stand
- Justifications.
- No more than one A4 page (12 pt font), around 300 words.

Task 4:

- Your stand
- Justifications.
- No more than one A4 page (12 pt font), around 300 words.

Task 5:

- Your stand
- Justifications.
- No more than one A4 page (12 pt font), around 300 words.

Reference list

- APA 6th edition style
- Not included in word count

Marking criteria for each task

- Readability (1%)
- Citation/Referencing (1%)
- Justification of your stand (3%)