Cambridge International AS & A Level Information Technology
9626
For examination from 2017

Topic 1.3 Quality of information

A DIVISION OF
CAMBRIDGE ASSESSMENT

Contents

Introduction

How to use this guide

The aim of this guide is to facilitate your teaching of Cambridge International AS & A Level Information Technology, syllabus topic 1.3 Quality of information. This is part of syllabus topic 1 Data, information, knowledge and processing, and looks at the different factors that affect the quality of information.

Section 1 lists some key terms used in this topic and their definitions. Section 2 provides the basic theory that you will need for teaching this topic, including illustrative examples. Section 3 indicates what your learners need to know, understand, or be able to do for this topic in the examination. Section 4 lists some useful websites relevant to the topic for you or your learners to use. Section 5 provides activities for you to carry out with your learners to consolidate, and to check learning.

Learning objectives

Reading this guide should help you guide learners to cope with the following syllabus learning objectives:

- understand how accuracy, relevance, age, level of detail and completeness of the information can affect its quality

Prior knowledge

Before you begin teaching this topic:
- When looking for definitions of quality in resources such as textbooks and the internet make sure you only look at computing or information technology resources as quality can be interpreted in many ways. - The key concept here is quality of *information*.

1. Key terms

Word/phrase	Meaning
accuracy of information	A measure of the information's accuracy based upon the accuracy of the underlying data
age of information	A measure of whether information is up-to-date or out-of-date
completeness of information	A measure of how much of the relevant information is available
level of detail of information	A measure of whether the information has an appropriate level of detail. Too much detail makes it difficult to extract the information required. Too little detail might not provide the information needed
quality of information	A measure of the information's fitness for purpose
relevance of information	Information that meets the need of the user by providing a solution to a problem or task

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2. Theory

2.1 Introduction

In this topic we look at the quality of information. In this 'information age', we can obtain information as easily as speaking into a smartphone and asking for information on any given topic. Most businesses make use of information in order to make decisions on aspects of their work. If the information is not of high quality then the decisions made will not benefit the business.

In this section we look at six aspects of information by which we can judge its quality, as well as ways in which we can make sure the information we use is of good quality.

2.2 What is quality of information?

Quality of information is its fitness for purpose. If it is fit for purpose, that is, good enough to do the job it was intended for, then the information is regarded as being of good quality.

2.3 Accuracy of information

The accuracy of information relies on the underlying data: if the collected data is inaccurate then the information produced will also be inaccurate. The following table gives examples of ways in which inaccurate data can occur, and ways this can be prevented:

Source of inaccuracy	Prevention
Questions in questionnaires/interviews may be unclear so that the respondents misunderstand them, or badly phrased so that the respondents think they know the answer the questioner wants, resulting in similar answers from different respondents.	It is important to spend time preparing questionnaires or interview scripts so that the questions elicit the types of response required.
Questions may be open-ended, allowing the respondents to produce answers which cannot be quantified.	A number of questions need to be of the 'closed' type, i.e. allow a limited range of responses.
A multiple-choice type question may not give enough options to allow respondents to answer the question properly.	The question should either be refined to limit the number of different responses, or a sufficient number of responses should be offered.
The respondents selected for the study may not be very representative	Great care should be taken to broaden the scope of the data collection so that different groups are surveyed.
The people collecting the data may make errors when collecting it	It is essential that data collectors are meticulous and methodical.
People can make errors when entering the collected data into the computer.	Validation and verification should be used to check data.
Data being collected automatically by sensors is dependent on technology.	The computer/microprocessor needs to be set up properly to accurately interpret the readings.

> **Example**
>
> **Student records**
>
> A student's birth date is June 22nd 2003. If the student record database has a field for date of birth that is formatted to the European format, typing 22/06/2003 would be correct.
>
> If we typed in 24/06/2003 (i.e. made a typing error) this would be inaccurate because it is the wrong date of birth.
>
> Typing in 06/22/2003 would also be inaccurate because it is the American way of representing dates, not the European way that the database has been set up to accept.
>
> Data can be inaccurate in terms of **form** (in this case mm/dd/yyyy) or actual **content** (typing in inaccurate data).

2.4 Relevance of information

Relevant information is information that meets the need of the user: information that can help towards finding a solution to the problem or task. The first step is to select your sources. For example, relevant sources in an education environment should be selected so that non-academic, commercial, as well as biased resources are ruled out. Having judged which **sources** are relevant, the next step is to read through the sources selecting relevant **information**.

Students have a great deal of information to learn for their AS levels. They take a lot of notes and are given handouts by their teachers to read. Suppose the teachers spent some time each week discussing current affairs? What was discussed might prove very interesting to learners but it isn't relevant to what they need to pass their IT exam.

> **Examples**
>
> **Travel**
>
> A student might find it interesting to find out how long it takes to travel by train from Chicago to New York. This information will not be relevant if, however, the student wants to travel by bus from home to school.
>
> **Library**
>
> If you are phoning the library to reserve a book it wouldn't be very useful or relevant to you if the librarian started to tell you the opening and closing times of the library on each day of the week.

2.5 Age of information

In order to be accurate and relevant, information needs to be up-to-date. Often information changes with time, so information which is out-of-date can produce inaccurate results. Businesses that base their planning on out-of-date information are likely to make bad decisions. This could affect their future profits and their share price, and as a result the value of the company will reduce. It is important that where planning is involved, only accurate and up-to-date information is used.

> **Example**
>
> A colleague's PC has developed faults and he asks you to recommend a computer to replace it. If your current PC or laptop is three years old then you may not be in a good position to advise them. Your laptop might have a 500Gb hard disc with 4Gb RAM. Today's laptops are more likely to have a 1Tb hard disc and 16Gb RAM. You would probably lose the respect of your colleague by giving them this out-of-date information.

2.6 Level of detail of information

In order to be helpful in solving your problem the information you use needs to have the correct level of detail. If there is too much detail, this makes it difficult to find the exact information you require, and you may not get an overview of the problem. If the information is not detailed enough, you may not find the information you need.

> **Example**
>
> **Finding the best way to get from one town to another by public transport**
>
> Too much detail could be:
>
> - Not only telling you that you could get the train or bus, but telling you all of the different routes you could take and how the choice of each one would affect the time it took to get to your destination.
> - Telling you exactly how many minutes your train or bus would spend at each stop and the names of all the places you would stop at.
> - Telling you the exact time that the bus or train would take in-between stops for every possible route you could take.
>
> Not enough detail could be:
>
> - Telling you that the best way would be to go by train without telling you which station to get the train from, or how to get to the station.
> - Telling you to get the train without telling you the time the train leaves or what time you would expect to arrive.
> - Telling you the exact time that the bus or train would depart without telling you how long it would take or when you would arrive.

2.7 Completeness of information

In order for information to be useful it needs to be complete. If you only have some of the information you require then you will find it very difficult to solve your problem or complete a task. If you are asking your learners to create a webpage and you don't give them all the information to include in it, their results will also be incomplete and they will be unsuccessful in creating the webpage.

Example

Looking back to the example about buying a new PC:

If you recommended a laptop with 1Tb of hard disk space but did not say how much RAM it should have or what type of processor or the manufacturer, this would be incomplete information, and therefore not very helpful to your colleague.

3. Exam preparation

This topic requires learners to understand the meaning of the term 'quality of information' and understand the different factors that affect this:

- accuracy
- relevance
- age (up-to-date, out-of-date)
- level of detail
- completeness.

Students must learn all these in order to be able to answer any exam questions which may come up on this topic.
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4. Further resources

Useful websites

www.teach-ict.com/as_a2_ict_new/ocr/AS_G061/311_data_info_knowledge/
data_info_knowledge/theory_data_info_know.html

https://newstrainers.wordpress.com/2009/11/10/data-becomes-information/

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5. Class and homework activities

5.1 Activities for consolidating this topic

The following activities are suggested to consolidate your students' learning after they have studied this topic:

5.1.1 Sentences with missing words.

Give learners a sheet with definitions of the different factors, with particular words left out. They have to complete the worksheet by filling in the missing words. You can include a list of the missing words on the worksheet, and learners select from these when completing the definitions, if you wish.

5.1 2.Questions with alternative answers.

Think of several questions on what is meant by the quality of information. Put both a correct and an incorrect answer to each of these questions on sheets posted on the walls of your classroom. Ask learners a question and, perhaps, select a pair of learners to go to the correct answer and explain why they think it is correct. Do this with other questions, asking a different pair each time. If they have chosen the wrong answer, you might feel it fair to give the pair 10 seconds to reconsider.

5.1.3 Web diagram

Create a large web diagram with incorrect explanations of the factors – learners have to correct the explanations.

5.1.4 'Who wants to be a millionaire?'

Ask the learners to set 'Who wants to be a millionaire' questions, either writing them individually, and asking each other in pairs, or writing in groups for the other groups. You could be the presenter and imitate the television programme.

5.1.5 Hot seating

Towards the end of a lesson place one of your learners in the 'hot seat' at the front and facing the rest of the class. The other learners then ask questions. They are only allowed to ask questions they know the answers to. If a learner asks a question that the hot-seat learner doesn't know the answer to – they have to give the answer themselves. If they are wrong – they go in the 'hot seat'!

5.2 End of topic test questions

1.   a)   List four factors which affect the quality of information. [2 marks]
     b)   Choose two factors and describe these in detail. [4 marks]