Unit 2: Data and Spreadsheet Modelling

Delivery guidance

Approaching the unit

This unit covers different data manipulation methods that can be used to present information. The unit examines the role of data in organisations and how the quality of data can affect the decision- making process. Learners will use data processing methods to manipulate data and create a dashboard to present information and consider the effectiveness of the presentation method used in the dashboard, and its ability to provide information. Learners will be able to explore different data manipulation methods that can be used to present meaningful information.

When delivering the unit, you should use several example dashboards of varying quality to contextualise the content. The use of case studies and visiting speakers to provide insight into real-world application of the skills and knowledge in the unit would be a valuable tool.

Delivering the learning aims

Learning aim A investigates the characteristics of data, and how it is processed into information. It is important for learners to understand that data from different sources can be used to provide information, and the factors that affect the quality of data. The learning aim focuses on the ability of data modelling to impact decision making. The delivery of this learning aim will rely on the use of good quality case studies. The unit content is also ideally suited to guest speakers, who can provide insight into how data is collected from different sources and its impact on the organisations' decision- making process.

Learning aim B focuses on the use of different data manipulation methods and the development of a dashboard. Providing examples of dashboards would help learners focus on different presentation methods and features that can be used to present the dashboard. You will need to spend time working with learners to develop skills and understanding of the different data manipulation methods that can be used and the different presentation methods and features that can be used to present clear and accurate information on the dashboard so that accurate conclusions can be made.

Learning aims C examines the effectiveness of the dashboard. Learners will be asked to review the presentation methods used, and the effectiveness of the dashboard to enable users to draw conclusions. You will need to provide learners with examples of trends, patterns, and anomalies, so that they can understand each concept. Examples of how different presentation methods affect the presentation of the dashboard information, and their overall interpretation, would also be useful. This unit allows for a range of different delivery methods, such as:

- class and group discussions – for example learners can discuss what data they think organisations hold about them and how they use this data to make decisions.
- Individual or group presentations – for example learners can share their conclusions from different dashboards such as the trends, patterns and anomalies found.
- demonstrations – learners will need to be shown and practice using a range of different data manipulation techniques and presentation methods.
- case studies – for example, learners can look at specific organisations and how they have data to good or poor effect.

You can involve local employers in the delivery of this unit if there are local opportunities to do so.

Delivering the learning aims

Learning aim A

You can first introduce this unit by covering topic A1 so that learners get an understanding of the difference between data and information and how to convert data into information. You can also introduce learners to the idea that data must be processed before it can become information. You can then cover topic A2 which will allow learners to understand where data actually comes from and the factors that make the data reliable. Learners would benefit from real-life examples of this. For example, learners could list all of the different accounts that they hold and then list the information that is stored about them. Learners could possibly think about situations where they have had to collect data as part of their school studies and how they collected the data.

Once learners know what data is and how it is collected, they can then be introduced to topic A3. This will allow learners to understand the factors that impact on the quality of the data and the importance of considering these factors. In particular, the focus should be on how these factors impact decision making in organisations.

The teacher presentation and student book covers a range of different data sources, factors that affect the reliability of data, factors that affect the quality of data and different uses of data modelling.

Learning aim B

By covering learning aim A, learners will have a good understanding of what data is, where it comes from and the factors that affect its reliability and quality. In learning aim B, they will study how this data can be presented.

This learning aim can be started by covering B1. This is a practical part of the specification and learners will therefore need to be shown a variety of different tools. It is important that learners have a good understanding of the basics of spreadsheet software. A quick recap of the meaning of a workbook, worksheet, row, column, cell and cell reference will benefit learners. It would be useful if learners could be given some data for them to format. They should be shown how to format the text by setting the data types and formatting the cells. Learners should be shown how to create different charts and graphs and understand the difference between them. It would be ideal if learners could be given data in an external file such as a text file and then be shown how to import the data.

It is likely that learners will need some time to practice the different formulas and functions listed in the specification. If the concepts listed in B1 are new to learners, then it is suggested that learners practice these with smaller data sets first. It is suggested that teachers demonstrate the different formulas and functions (e.g. SUM, AVERAGE, IF, VLOOKUP) and then learners practice using them on another data set. The teacher presentation and student book gives a definition of a formula and the different types of functions. There is also lots of example data and examples of how the formulas and functions can be used on that data. The presentation also covers a definition of each type of chart and what each one is used for.

Once learners have learnt the different data processing methods from B1, they can then move onto topic B2. For this, learners will need to practice creating a dashboard. It would benefit learners if they could be shown a variety of different dashboards first. To start with, you may want to consider giving learners a dashboard that has been partially completed and then first ask them to complete a specific part. After this, learners can then start to create dashboards on their own. It may be useful to come up with ideas as a class about the different ways to summarise the data first.

Learning aim C

Learners should only start learning aim C after they have practiced creating their own dashboard in learning aim B. You can start this learning aim by covering topic C1. It is suggested that learners are given dashboards to use that contain obvious trends, patterns and anomalies first. This can be individual work or completed as a class. After this, learners can then be given dashboards where the trends, patterns and anomalies are harder to find. Learners should then be able to reflect on their own dashboard and try to determine what conclusions they can make.

Finally, the unit can be completed by covering topic C2. This topic should allow learners to draw conclusions about what they have learnt. It would be useful if learners could be shown examples of dashboards that contain inaccurate data and dashboards that contain accurate data. Learners can then be asked what conclusions can be made against the given data and the impact inaccurate data can have on decision making. A similar approach can be achieved by giving learners dashboards that make ineffective use of presentation methods and ones that make good use of presentation methods. Learners can then be asked them to discuss the impact of poor presentation techniques.

Assessment model

Learning aim	Key content areas	Recommended assessment approach
A Understand the role of data and information in organisations	**A1** Processing information **A2** Data sources and characteristics **A3** Quality of data and its impact on decision making	This unit is assessed through a Pearson Set Assignment.
B Create a dashboard using data manipulation methods	**B1** Data processing methods **B2** Producing a dashboard	
C Review the effectiveness of the dashboard to provide information	**C1** Drawing conclusions **C2** Review dashboard and presentation methods	

Assessment guidance

The unit is assessed by a Pearson Set Assignment (PSA). The assessment is set by Pearson and must be taken under controlled conditions before it is marked by tutors.

The PSA will consist of a scenario and three main activities that reflect the three main learning aims. Learners will be expected to demonstrate their understanding of the specification content within the context of the given scenario.

There are 60 guided learning hours assigned to the unit, of which 20 hours will be required for assessment.

Set assignments are available from September each year and are valid for one year only.

Delivery must cover all the unit content and prepare learners to produce evidence to meet the assessment criteria and assessment guidance in preparation for taking the PSA. Sample Assessment Materials are available on the Pearson website. These can be used or adapted to help learners prepare for assessment.

Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Introduction
Introduce this unit by showing the learners how different dashboards provide the user with different opportunities to understand information about different scenarios. It's important that learners understand the difference between data and information and the impact of the data processing process on the quality of information presented on the dashboard. Examples given may include: • web analytics dashboard • social media analytics dashboard • marketing and sales dashboard • customer support service dashboard • live chat dashboard.
Learning aim A: Understand the role of data and information in organisations
Learning aim A provides underpinning knowledge about the difference between the characteristics of data and of information. It explores ways in which data from different sources can provide different information, e.g. social media usage for user preferences and demographics, or shop loyalty schemes to collect and collate customer shopping habits. It would be a good opportunity to demonstrate real-life examples to the learners of how organisations use different data sources to provide information that they can explore further and utilise in their learning. **For A1**, explore the characteristics of data, and how it is processed into information. Examples of raw data in a different context would be useful to demonstrate that unprocessed raw data has no meaning, structure, or context. You should then show that data when processed into information has meaning, structure, context and can be used to make decisions, e.g. supermarkets use of data to identify bestselling products. **For A2**, to help the learners to understand how different sources of data are used to provide information, you could use a mixture of large- group discussions and small- group/individual activities exploring how different sources of data can provide information, e.g. social media usage for user preferences and demographics, or supermarket loyalty schemes to collect and collate customer shopping habits.

For A3, a mixture of large- group discussions and small- group/individual activities will help learners to understand the concept of the quality of data, how data modelling is used, and its impact on decision making, e.g. the source and data collected from customer services and how it improves the service.

Case studies:

The student book contains a case study about an organisation called Meta. The study focuses on how social media websites collect data. This case study is a great way for learners to understand how data is collected about them while using the sites and the possible risks.

The student book also contains a case study about an organisation called Fast Food Supreme. The study focuses on different ways the organisation collects data. Learners can use the case study to think about how the organisation can use the data to improve their operations.

Discussion topics:

Ask learners to imagine a world that does not collect data about them. How would that world look different from today? This will help learners to understand the variety of ways that data is collected about them.

The student book contains various activities. Activities include looking at data to assess how effective it is and why it needs to be processed before converting it into information.

Formative assessment activities:

Learners can choose or be given an organisation to research. They can write a brief report that considers the characteristics of data and information, where the organisation collects the data from, how the organisation uses the data to make decisions and how they would evaluate the quality and reliability of the data.

Preparing for summative assessment:

The student book contains a practice assessment. The scenario is an organisation called LuxaryCakes. Within this, learners are asked to spend 4 hours, producing a report to examine the different ways data is collected by organisations. It also gives learners a checklist of items to include.

Learning aim B: Create a dashboard using data manipulation methods

In learning aim B, learners will apply data manipulation and other data processing methods, using spreadsheet software, to create a dashboard to present a range of information.

For B1, learners must understand the different ways of presenting data, e.g. currency, cell formatting and chart types. Learners should explore how to use, and when to use, data manipulation methods such as formulae and lookup functions. Microsoft has a variety of Excel video training that learners might find useful. It is important that learners know how to manipulate and present data and providing the learners with examples of different ways of presenting data will help them identify the appropriate method to use.

Provide learners with real-world examples of data manipulation and other data processing methods used in practice so that they can determine the most appropriate data manipulation methods to use to present data.

For B2, learners should present the data in a dashboard explaining which data processing methods have been applied. Teachers should:

- provide examples/demonstrations of dashboards that summarises data set in different ways, e.g. presenting data in a percentage
- provide examples of the different ways of presenting data in the dashboard such as graphs or pivot tables.

To reinforce learning, give learners a scenario outlining the requirements and needs of a specific dashboard, and a suitable data set, so that learners can apply data processing methods and produce a dashboard.

Formative assessment activities:

A dataset for an organisation called RoadAware is available from the Pearson website at

quals.pearson.com/BTECINTL2IT.

The student book contains lots of small activities that can be used with the dataset. The activities will allow learners to use the tools that they have learnt in this learning aim and apply them to a specific scenario.

Preparing for summative assessment:

A dataset for an organisation called LuxaryCakes is available from the Pearson website at

quals.pearson.com/BTECINTL2IT.

This dataset can be used with the practice assessment that is available in the student book. Within this, learners are asked to spend 8 hours importing the data, analysing the data and then creating a dashboard to show the data that has been prepared. It contains a list of functions that should be included and what they should be used for.

Learning aim C: Review the effectiveness of the dashboard to provide information

In learning aim C, learners will explore how to review the effectiveness of the dashboard to provide information and draw conclusions.

For C1, a mixture of large- group discussion and small- group/individual activities on the characteristics of different types of information and how information can be used to draw a conclusion, e.g. on trends or patterns. Providing real- life examples of different trends and patterns would be useful to learners.

For C2, learners should judge the capacity of the dashboard to present information that enables a range of specific, relevant, and clear conclusions to be drawn, to ensure that the dashboard information is clear.

- Learners should be given examples of dashboards where inaccurate conclusions have been made.
- Examples of where dashboard information is unclear and could be misinterpreted and cause biased information.
- Provide learners with access to different dashboards so that they can develop an understanding of the most effective way of using data manipulation methods to present data in a dashboard to enable decision making.

Case studies:

The student book contains a case study about an organisation called Stream World. Learners can use the case study to think about what data the organisation would expect to see on a dashboard and the benefits of these to the organisation.

Formative assessment activities:

The student book contains various activities that allow learners to use data to determine patterns, trends and anomalies. Learners can also research two different dashboards. These can include one that uses effective presentation methods and one that does not. For each one, learners should assess how the

different presentation features will affect a person's ability to make effective decisions.

Preparing for summative assessment:

The student book contains a practice assessment. The practice assessment asks learners to review the dashboard that they have created in learning aim B. Within this, learners are asked to spend 8 hours reviewing the data from their dashboard in the context of the scenario. Learners are asked to describe the different trends, patterns and anomalies from the data.

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC International Level 2 Qualifications in Information Technology. Check the Pearson website for more information as titles achieve endorsement.

Textbooks

Smart M – *Learn Excel 365 Essential Skills with The Smart Method*: Fifth Edition: updated for the Jan 2021 (Smart Method Enterprise Ltd, 2021) ISBN 1909253472

Alexander M – *Excel Dashboards and Reports for Dummies*, 3rd Edition (John Wiley & Sons. Inc 2016) ISBN 1119076765

Cadwell R, Brandon L, Jarvis A– Pearson BTEC International Level 2 in Information Technology, (Pearson Education Limited, 2023) ISBN 9781292459110

Websites

https://support.microsoft.com/en-us/office/excel-video-training-9bc05390-e94c-46af-a5b3-d7c22f6990bb

This website provides valuable information on Excel basic data manipulation.

Pearson is not responsible for the content of any external internet sites. It is essential for teachers to preview each website before using it in class so as to ensure that the URL is still accurate, relevant and appropriate. We suggest that teachers bookmark useful websites and consider enabling learners to access them through the school/college intranet.