

Cambridge **TECHNICALS LEVEL 3**

IT

Unit 2 – Global information
DELIVERY GUIDE

Version 2

Cambridge
TECHNICALS
2016

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INTRODUCTION

This Delivery Guide has been developed to provide practitioners with a variety of creative and practical ideas to support the delivery of this qualification. The Guide is a collection of lesson ideas with associated activities, which you may find helpful as you plan your lessons.

OCR has collaborated with current practitioners to ensure that the ideas put forward in this Delivery Guide are practical, realistic and dynamic. The Guide is structured by learning outcome so you can see how each activity helps you cover the requirements of this unit.

We appreciate that practitioners are knowledgeable in relation to what works for them and their learners. Therefore, the resources we have produced should not restrict or impact on practitioners' creativity to deliver excellent learning opportunities.

Whether you are an experienced practitioner or new to the sector, we hope you find something in this guide which will help you to deliver excellent learning opportunities.

If you have any feedback on this Delivery Guide or suggestions for other resources you would like OCR to develop, please email resources.feedback@ocr.org.uk.

OPPORTUNITIES FOR ENGLISH AND MATHS SKILLS DEVELOPMENT AND WORK EXPERIENCE

We believe that being able to make good progress in English and maths is essential to learners in both of these contexts and on a range of learning programmes. To help you enable your learners to progress in these subjects, we have signposted opportunities for English and maths skills practice within this resource. We have also identified any potential work experience opportunities within the activities. These suggestions are for guidance only. They are not designed to replace your own subject knowledge and expertise in deciding what is most appropriate for your learners.



English



Maths



Work

Please note

The timings for the suggested activities in this Delivery Guide **DO NOT** relate to the Guided Learning Hours (GLHs) for each unit.

Assessment guidance can be found within the Unit document available from www.ocr.org.uk.

The latest version of this Delivery Guide can be downloaded from the OCR website.

UNIT AIM

The purpose of this unit is to demonstrate the uses of information in the public domain, globally, in the cloud and across the internet, by individuals and organisations. You will discover that good management of both data and information is essential, and that it can give any organisation a competitive edge.

This unit will provide you with a greater understanding of how organisations use information sources both internally and externally and the types of information you will encounter. The skills gained by completing this unit will give you knowledge of the functionality of information and how data is stored and processed by organisations. You will also learn about how individuals use information of various types.

This unit will help you to understand the legislation and regulation governing information that flows into and out of an organisation and the constraints and limitations that apply to it. You will also learn the relationship between data and information.

Knowledge gained in the study of this unit will also help prepare you for relevant industry qualifications such as VM Ware.

The activities within this teaching and learning resource must not be used for summative assessment purposes. As part of our teaching we expect support to be given to your learners; such support is not permissible for summative assessment and is likely to be considered malpractice.

Unit 2 Global information

L01	Understand where information is held globally and how it is transmitted
L02	Understand the styles, classification and the management of global information
L03	Understand the use of global information and the benefits to individuals and organisations
L04	Understand the legal and regulatory framework governing the storage and use of global information
L05	Understand the process flow of information
L06	Understand the principles of information security

To find out more about this qualification please go to: <http://www.ocr.org.uk/qualifications/cambridge-technicals-it-level-3-certificate-extended-certificate-introductory-diploma-foundation-diploma-diploma-05838-05842-2016-suite>

**2016 Suite**

- New suite for first teaching September 2016
- Externally assessed content
- Eligible for Key Stage 5 performance points from 2018
- Designed to meet the DfE technical guidance

RELATED ACTIVITIES

The Suggested Activities in this Delivery Guide listed below have also been related to other Cambridge Technicals in IT units/Learning Outcomes (LOs). This could help with delivery planning and enable learners to cover multiple parts of units.

This unit (Unit 2)	Title of suggested activity	Other units/LOs	
LO1	Types of information storage media	Unit 18 Computer systems hardware	LO1 Understand the components of a computer system
LO1	Accessibility of world wide web information formats	Unit 2 Global information	LO2 Understand the styles, classification and the management of global information LO4 Understand the legal and regulatory framework governing the storage and use of global information
LO2	Information styles and their uses	Unit 2 Global information	LO1 Understand where information is held globally and how it is transmitted LO4 Understand the legal and regulatory framework governing the storage and use of global information LO5 Understand the process flow of information LO6 Understand the principles of information security
		Unit 10 Business computing	LO3 Be able to use tools to edit and analyse data
LO2	Information management	Unit 2 Global information	LO4 Understand the legal and regulatory framework governing the storage and use of global information
LO3	Information system structure	Unit 2 Global information	LO2 Understand the styles, classification and the management of global information
LO4	UK and global accessibility legislation relating to the storage and use of information	Unit 2 Global information	LO1 Understand where information is held globally and how it is transmitted LO2 Understand the styles, classification and the management of global information
LO4	UK legislation and regulation relating to the storage and use of information	Unit 10 Business Computing	LO4 Be able to present data analysis outcomes
LO5	Information sources and data types	Unit 2 Global information	LO3 Understand the use of global information and the benefits to individuals and organisations LO4 Understand the legal and regulatory framework governing the storage and use of global information
LO5	Impacts affecting the flow of information in information systems	Unit 2 Global information	LO2 Understand the styles, classification and the management of global information LO4 Understand the legal and regulatory framework governing the storage and use of global information
LO6	Risks and impacts	Unit 3 Cyber security	LO1 Understand what is meant by cyber security LO2 Understand the issues surrounding cyber security
LO6	Protection measure policies	Unit 3 Cyber security	LO3 Understand measures used to protect against cyber security incidents

KEY TERMS

Explanations of the key terms used within this unit, in the context of this unit



Key term	Explanation
Data	Data is information that has been coded and structured in some way, ready for processing, storage, transmission, etc. Data has no context and has no meaning. Examples of data could include: shoe size stored in the stock database of a shop, a date, etc.
Global divide	The divide that exists in terms of access to information between different countries and different types of holders of information across the world.
Green IT	The practice of reducing energy use by IT equipment and thus improving sustainability. This relates to both individuals and organisations. The main purpose of Green IT is to increase the sustainability of IT equipment and operations. Examples of Green IT range from an individual using their PC power settings to automatically switch off the screen after a certain time with no keyboard/mouse activity, up to the virtualisation of a large, global organisation's data stores to reduce the number of servers in their data centres.
Holder of information	Any individual or organisation that holds information.
Information	Information is data that has been given context and meaning in some way (e.g. by processing, storing or transmission). An example of information is: a shop receipt showing the model, price and size of shoes, together with the time and date of the purchase.
Information formats	The different ways in which information can be presented using world wide web (www) technologies. Examples of information formats are: web pages; RSS feeds; podcasts; blogs; and social media channels.
Information style	The style of information, regardless of the technology used. For example, the audio information style could be represented by spoken instructions, an MP3 music file, a DVD soundtrack or a podcast. Many, but not all, of the information styles will have a corresponding information format on the world wide web.

MISCONCEPTIONS

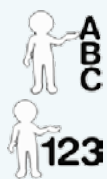
Some common misconceptions and guidance on how they could be overcome



What is the misconception?	How can this be overcome?	Resources which could help
That static web pages and dynamic web pages are the same	Learners need to know and understand the differences between static and dynamic web pages, including the difference between client side and server side functionality.	http://techwelkin.com/difference-between-static-and-dynamic-web-pages



SUGGESTED ACTIVITIES

LO No:	1		
LO Title:	Understand where information is held globally and how it is transmitted		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
Holders of information	<p>Learners could work in pairs to create lists of possible holders of information (e.g. individual citizens, businesses, educational institutions, governments, charities, health care services and community organisations) and details of their location around the world; this could include carrying out research. Tutors could provide each pair with a specific location (e.g. country, area within a country) to ensure good coverage of the range of locations and categories of holders of information within the world population.</p> <p>Each pair of learners could then share their findings with the rest of the group. This could be through a presentation, via a common table structure or a shared data structure. Once this has been achieved, tutors could summarise the group's findings, identifying the range of holders and locations. At this point tutors could introduce the concept of a global divide (i.e. the way in which location affects both the technologies available and access to information).</p> <p>Using the combined group data on holders and their locations, learners could look for patterns, similarities and differences within the group's research findings; this could include details of both the technologies available and access to information. Learners could share their findings as a whole group.</p> <p> Tutors could summarise the key findings on patterns, similarities and differences between different holders of information across the global divide, including the effect of location on the technologies available and the effect of this on access to information.</p>	3 hours	
Types of information storage media	<p>Tutors could introduce the topic and provide learners with a representative list of information storage media (to include examples of paper media, optical media, magnetic media and solid state media). The items on the list could be discussed by learners either in small groups or as one large group. Tutors could support this discussion to check for understanding and to address any questions raised.</p> <p>Individual learners could then familiarise themselves with the different types of information storage media by creating a table of the characteristics for each type using the list given by the tutor. Learners could develop their understanding by researching the different types, finding their own examples, the key characteristics (e.g. cost, energy consumption, robustness, data density, weight, environmental considerations etc) and some possible uses for each example.</p> <p> To develop their understanding, learners could use a chart or diagram to show the advantages and disadvantages of each type for given purposes and applications. Tutors could provide learners with two or three worked examples, as a starting point for this task.</p>	3 hours	Unit 18 LO1

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Types of information access and storage devices	<p>Learners could be presented with information on a range of different device types (to include their characteristics, advantages and disadvantages). Learners could discuss the devices in small groups and produce a list of questions that they have. Learners could develop their knowledge and understanding by carrying out research to find answers to their questions. Tutors could collate the questions (and any answers) and present findings as frequently asked questions (FAQ). This could help address misunderstandings and provide a further resource for the next task.</p> <p>The learners could then recommend the best devices for use by given information holders and for given purposes. Tutors could provide a scenario based on a single organisation, but including a wide range of information holders and locations. Learners could be asked to explain their recommendations in terms of the benefits and limitations of each type of information access and storage device (e.g. cost, robustness, screen size, power source etc).</p> <p>The task could be extended by asking learners to explain why, for each recommendation, they rejected alternative types of information access and storage devices.</p>	3 hours	
The Internet	<p>Tutors could begin by finding out the level of understanding of the learners, through discussion and targeted questioning. Tutors could take this opportunity to explain the relationship between the Internet and the world wide web. Once this has been done, misconceptions could be addressed and gaps in understanding filled by the tutor.</p> <p>Learners could develop their knowledge and understanding of the characteristics of the different types of Internet connection by selecting appropriate connection types for 5 to 10 situations provided by the tutor (e.g. satellite connection for a charity worker in a disaster zone, following an earthquake when breaks in cables and optical fibres can disrupt information access).</p>	1 hour	
Types of world wide web technology networks	<p>Learners could visit either a local web design business or a local business that uses a wide range of www technologies. Alternatively, an outside speaker could be invited to talk to learners. Learners could prepare questions in advance. These could be based on research or generated through group discussion.</p> <p>Following this, learners could develop their knowledge and understanding by producing a detailed information booklet on the three www network technologies (i.e. Internet, intranet and extranet). This leaflet could include a comparison of the three network technologies, together with a description of the characteristics of each and examples of how each type could be used and for what purpose.</p>	2 hours	




Title of suggested activity	Suggested activities	Suggested timings	Also related to
World wide web information formats 	<p>Learners, working in small groups, could record on a large sheet of paper all of the information formats they have used on the world wide web. Tutors could provide a few examples to start (e.g. web pages and RSS feeds). Learners could then add their own examples of each format (e.g. RSS feed could be the BBC news feed). N.B. static web pages and dynamic web pages should be considered as two separate www information formats.</p> <p>Learners could share their examples with the whole group. Tutors could facilitate this to help prevent duplication and to reduce the overall time taken. Learners could add to their own group's work during the sharing exercise. These large sheets could be shared and used by all learners for the tasks that follow, including those on advantages and disadvantages for individuals and organisations.</p> <p>In the same small groups, learners could develop their understanding of the purpose of each information format example by discussion and by research into further examples of each information format. Learners could further develop their understanding by researching how each format meets the need of a range of different holders of information.</p>	3 hours	
Accessibility of world wide web information formats 	<p>To introduce this topic, tutors could show the RNIB video 'Technology for life'. This shows a range of individual and organisational uses of assistive technology, including some accessible www information formats suitable for blind and partially sighted people.</p> <p>RNIB: https://www.youtube.com/watch?v=w_EPBr_EJ9M</p> <p>Learners could develop their knowledge and understanding of the case for web accessibility by reading the W3C Web Design and Applications: Accessibility web page: http://www.w3.org/standards/webdesign/accessibility.html</p> <p>Learners could further develop their understanding of how each www information format could be made accessible to people with a wide range of disabilities, by carrying out individual research. The resource above includes many links that learners could follow as part of this research.</p> <p>Tutors could finish this activity by highlighting the connections between accessibility based on disability (as covered in this section) and accessibility across the global divide (e.g. between developed and developing countries).</p>	2 hours	Unit 2 LO2, LO4



Title of suggested activity	Suggested activities	Suggested timings	Also related to
Advantages and disadvantages for individuals of world wide web information formats 	<p>Working in pairs, learners could use the combined group data on holders of information, from the first task in this Learning Outcome, to identify at least 10 individual holders of information.</p> <p>To develop their knowledge and understanding individual learners could research the potential advantages for individuals of using www technologies (networks and information formats). To further develop their knowledge and understanding learners could investigate the potential disadvantages for individuals of using www technologies by researching the consequences of the loss of personal data.</p> <p>Following the investigation of the advantages and disadvantages, learners could discuss their findings in small groups and then share their research with the larger group. Tutors could summarise the outcome of the research and draw out common ideas and research findings.</p>	2 hours	
Comparison of technologies 	<p>The activities above on media and devices could be extended. Learners could select the most suitable media and devices for scenarios provided by tutors. After this learners could justify their selections.</p> <p>Tutors could further extend the scenarios to include the Internet and www technologies (networks and information styles). This would help to consolidate the learning from this Learning outcome.</p> <p>To close this activity, tutors could reintroduce the concept of the global divide. This could be through tutors taking on the role of an expert in this area (hot-seating) and answering questions from the group of learners.</p> <p>Global divide resource: West, D.M. (2015) 'Digital divide: Improving Internet access in the developing world through affordable services and diverse content'. Brookings Institution, USA. http://www.brookings.edu/~media/research/files/papers/2015/02/13-digital-divide-developing-world-west/west_internet-access.pdf</p>	3 hours	

SUGGESTED ACTIVITIES

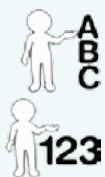
LO No:	2		
LO Title:	Understand the styles, classification and the management of global information		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
Information styles and their uses	<p>Learners could develop their understanding of information styles (see the list below) and their uses by carrying out research and creating a multimedia presentation (with text, images, animated images, sound and video). Learners could include: a description of each information style; a few good examples of each information style; and a brief explanation of the purpose each style has been used for.</p> <p>Information styles:</p> <ul style="list-style-type: none"> • Text (different character sets e.g. Western, Cyrillic, Arabic, etc) • Graphic (e.g. logo, photograph, diagram) • Video (e.g. instructions on how to carry out a software update, live broadcast of a music festival) • Animated graphic (e.g. pop-up book character, operation of the human heart) • Audio (e.g. spoken instructions, music track) • Numerical (e.g. profit, date and time) • Braille text (e.g. written report printed on a Braille printer) • Tactile images (e.g. NASA's Hubble Space Telescope images converted into tactile images for people who cannot explore the images by sight) • Subtitles (e.g. translated speech for a film in a foreign language) • Boolean (e.g. yes or no answer on a form) • Tables and spreadsheets (e.g. simple database tables and spreadsheets) • Charts and graphs (e.g. identifying trends, making comparisons). <p>Learners could develop their understanding by presenting their work to a small group. Learners could also benefit from giving/receiving verbal feedback and answering/asking questions of their colleagues in their group.</p> <p>As an extension, learners could also develop their understanding that different styles of information are used for different purposes, by producing a 'rogues' gallery' showing examples of poor use of information styles for a range of clearly identified purposes. Learners could explain why the information style used is not suitable for the purpose in each example.</p>	4 hours	Unit 2 LO1, LO4, LO5, LO6 Unit 10 LO3





Title of suggested activity	Suggested activities	Suggested timings	Also related to
<p>Information classifications</p> <p>See Lesson Element Information classification</p>	<p>Tutors could introduce this activity by providing learners with definitions of the 10 information classifications:</p> <ul style="list-style-type: none"> • sensitive • non-sensitive • private • public • personal • business • confidential • classified • partially anonymised • completely anonymised. <p>Learners could develop their knowledge of the information classifications by identifying a few examples of each, which should include basic details of the context that it is used in (e.g. my college's overall sixth form results are public and they are used to compare the overall results with other colleges). Learners could record their information in a table.</p> <p> Learners could develop their understanding of the issues related to information classification and the impact this can have on information management, by reading news stories, watching news reports and studying case studies, such as those produced by the Information Commissioner's Office. Tutors could provide a template on which learners could record their findings. Learners could share these with the rest of the group.</p>	2 hours	



Title of suggested activity	Suggested activities	Suggested timings	Also related to
<p>Quality of information</p>  	<p>Learners, working in small groups, could first research the characteristics of information. Learners could then develop their knowledge of the characteristics of information by discussing their findings and agreeing the 10 most important characteristics in their group. Learners could then develop their understanding by agreeing a definition for each of their top 10 characteristics; learners could also explain the reasons for selecting each characteristic.</p> <p>Tutors could facilitate a whole group discussion in which learners further develop their understanding by agreeing a top 10 information characteristics list based on the whole group's ideas. Tutors could keep a record of this list and add to it if necessary to create a list that could include: timely, accurate, reliable, valid, unbiased, cost-effective, meets user needs, up-to-date and relevant.</p> <p>Learners, working in small groups, could develop their understanding of why it is important for holders of information to have access to good quality information by investigating the information used by a given holder of information (e.g. a large supermarket, a hospital, an international charity) and considering what could happen if some of this information was not of high quality. Learners could use the top 10 information characteristics list to help. Learners could also suggest the consequences for information holders of having poor quality information.</p> <p>Tutors could finish by summarising the outcome of the investigations and draw out common ideas regarding the importance of good quality information, whilst highlighting the impacts of poor quality information.</p>	3 hours	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Information management	<p>Tutors could begin this task by explaining the main steps and activities in information management:</p> <ul style="list-style-type: none"> • collecting, storing and retrieving information • manipulating and processing information • analysing information • securing information • transmitting and communicating information. <p>Learners could develop their knowledge of the steps and activities involved in the management of information by collecting several examples of each of the main steps and activities listed above; this could be achieved through discussion, research or from case studies of existing information management systems used by holders of information.</p> <p>Learners could develop their understanding of how the management of information impacts on holders of information in different ways by studying the following resources:</p> <p>The principles of good data and information management (in the UK public sector): http://www.ukeof.org.uk/documents/ukeof-advice-note-1</p> <p>Information Principles (in the UK public sector): https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/266284/Information_Principles_UK_Public_Sector_final.pdf</p> <p>Next learners, working in small groups, could develop their understanding of how the management of information impacts on holders of information in different ways, by researching and creating an advice leaflet for small businesses about the impact of information management on them as holders of information. Tutors could use this as a starting point for LO4 and the legal issues.</p>	2 hours	Unit 2 LO4



SUGGESTED ACTIVITIES

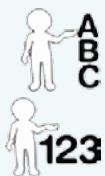
LO No:	3		
LO Title:	Understand the use of global information and the benefits to individuals and organisations		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
Data versus information	<p>"Drowning in data, yet starved of information" (Ruth Stanat (1990) <i>The Intelligent Corporation</i>)</p> <p>Tutors could use this quotation as a place to start a discussion with learners about data, information and knowledge.</p> <p>After the initial discussion, tutors could use the Teach-ICT 'Data, Information & Knowledge' PowerPoint presentation below to develop learners' understanding. Learners could finish this activity by writing their own definitions of data and information. These could be shared within small groups or with the whole group.</p> <p> Data, Information & Knowledge (PowerPoint presentation): http://www.teach-ict.com/as_a2_ict_new/ocr/AS_G061/311_data_info_knowledge/data_info_knowledge/theory/ppt1/kid1.ppt</p>	1 hour	
Categories of information used by individuals that hold information	<p>Working in pairs, learners could develop their knowledge by researching one category of information used by individual holders of information (i.e. communication; education and training; entertainment; planning; financial; research and location dependent). Learners could then identify 5 to 10 detailed examples in the category of information that they are researching.</p> <p>Learners could develop their understanding by describing the ways that different individual holders of information could use that category. This could be presented as a short report to be shared with the whole group. Tutors could combine these short reports to produce a single document or learners could save them in a shared area.</p> <p> Tutors could extend this activity further, by asking learners to make notes from a whole group discussion on the categories. These notes could highlight the benefits and limitations of each category for individual holders of information. Learners could record their notes on copies of the reports produced above.</p>	3 hours	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
<p>Categories of information used by organisations that hold information</p> 	<p>Tutors could introduce learners to the various categories of information used by organisations that hold information (i.e. knowledge management and creation; management information systems (MIS); marketing, promotion and sales; financial analysis and modelling; contact management; decision-making; internal and external communication; and big data).</p> <p>Learners could develop their understanding by working in small groups to identify the benefits and limitations of different categories of information for organisations that hold information. This could be achieved through discussion, research and questioning tutors and other learners. Learners, working in small groups, could record the results of this in the form of a report, detailing at least three benefits and limitations of each different category. Tutors could provide feedback on each small group's report before it is shared with the larger group.</p>	4 hours	
<p>Stages of data analysis</p> 	<p>Tutors could begin by explaining the purpose of data analysis: to find answers to questions that will be based on good quality information from carefully selected and sourced data.</p> <p>Tutors could develop learners' knowledge by outlining the eight stages of data analysis, explaining the function of each stage:</p> <ol style="list-style-type: none"> 1. Identify the need (e.g. What information is needed? What do we want to find out?) 2. Define scope (e.g. content, detail, timescales, constraints) 3. Identify potential sources (e.g. sales figures, customer surveys) 4. Source and select information (e.g. determine accuracy and reliability of sources, selecting the best) 5. Select the most appropriate tools (e.g. charts, graphs, regression, trend analysis) 6. Process and analyse data (e.g. set up a spreadsheet to produce a graph) 7. Record and store information (e.g. write a report based on the results of the processing) 8. Share results (e.g. send the report to stakeholders). <p>Learners could develop their knowledge of the different stages by presenting the eight stages of data analysis in the form of a diagram for a given scenario.</p>	2 hours	


Title of suggested activity	Suggested activities	Suggested timings	Also related to
Data analysis tools	<p>Tutors could emphasise that this activity is focused on Stage 6: Process and analyse data. Learners will need to understand how to select and use different data analysis tools, depending on the context (e.g. type of data, form of data, what information needs to be found, etc).</p> <p>Tutors could allocate approximately one hour to each of the five data analysis tools: data tables; visualisation of data; trend and pattern identification; data cleaning; and geographic information system/location mapping.</p> <p>Tutors could model the way in which each of the five data analysis tools can be used well. Tutors could explain the reasons for selecting each tool modelled. Tutors could also explain why alternative data analysis tools were rejected.</p> <p>Learners, working in small groups, could develop their knowledge and understanding by researching both good and bad examples of using each data analysis tool. Tutors could support this research by questioning learners, checking for understanding and addressing any questions raised. Individually, learners could then develop their understanding of the use of each tool by producing an evaluation of the good and bad examples that their group has found. Learners, in the same small groups as before, could further develop their understanding by discussing each of the bad examples of use, with the aim of suggesting either a more suitable data analysis tool or a better use of the same data analysis tool in that context. Tutors could further develop the understanding of the learners by presenting a synthesis of the results of the small group discussions to the larger group.</p> <p>As consolidation, learners could develop their understanding of the use of data analysis tools by extracting meaningful information from good examples, provided by tutors. Tutors could base all of the examples on a single scenario, using: a data table; a pie chart; a line graph (showing a clear trend or pattern); a table of data both before and after data cleaning; and a map with information superimposed (e.g. local feeder primary schools shown around a large secondary school).</p>	5 hours	





Title of suggested activity	Suggested activities	Suggested timings	Also related to
Information system structure	<p>Tutors could start by explaining what an information system is. Tutors could use this definition: an information system collects data, processes data, stores data, analyses data and shares the information generated with decision makers. Tutors could emphasise the link to the eight stages of data analysis at this point.</p> <p>Learners, working in pairs, could for each example develop their understanding by researching a few examples of information systems and identifying the data collected, the data processed, the data stored, the data analysed and the information shared.</p> <p>Tutors could show examples of open and closed information systems (but without naming them as such), using diagrams to show the inputs, processes and outputs in each case. Tutors could introduce the concept of the open and closed information system structures: a closed structure is totally independent of any other system; whereas an open system is dependent on inputs from another system and/or another system is dependent upon its output.</p> <p>Learners, in pairs, could develop their understanding of information system structure by identifying the open and closed systems from the examples. Tutors could hold a mini plenary to recap learning, to discuss the characteristics of information systems and to check for understanding. Tutors could emphasise the link between good quality information and good information systems; the two usually go hand in hand. Tutors could also explain that the characteristics of a good information system are similar to the characteristics of good quality information: e.g. reliable, unbiased, valid, relevant and accurate.</p> <p>Working in small groups, learners could further develop their understanding by researching and discussing the benefits and limitations of both open and closed information system structures. Learners could use examples provided by the tutor as a starting point. Tutors could extend the understanding of learners by presenting a synthesis of the results of the small group discussions to the larger group, followed by a tutor-led discussion as a plenary.</p>	3 hours	Unit 2 LO2




SUGGESTED ACTIVITIES


LO No:	4		
LO Title:	Understand the legal and regulatory framework governing the storage and use of global information		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
UK legislation and regulation relating to the storage and use of information	<p>Tutors could introduce learners to the UK legislation and regulation relating to the storage and use of information. Learners could develop their knowledge and understanding by carrying out individual research in this area. Tutors could provide each learner with a piece of legislation or regulation to research.</p> <p>[N.B. It is important that learners are aware of the most recent legislation when studying this Unit – tutors must check that any resources used cover the latest UK legislation.]</p> <p>Two useful resources are listed below.</p> <p>Practical advice for Northern Ireland Business on IT – data protection and legal issues: https://www.nibusinessinfo.co.uk/content/data-protection-and-legal-issues</p> <p>Teach-ICT OCR AS ICT G061 web pages – section 3.1.7: The role and impact of ICT: http://www.teach-ict.com/as_a2_ict_new/ocr/AS_G061/AS_G061_home.html</p> <p>Learners could develop their understanding of the impact of legislation and regulation on holders of information whilst working in pairs or small groups. They could research the ways in which holders of information adapt the way they work, in order to comply with the legislation and regulation. Learners could create a presentation to share this information with the larger group.</p> <p>Information Commissioner’s Office website for organisations: https://ico.org.uk/for-organisations/</p> <p>Information Commissioner’s Office website for the public: https://ico.org.uk/for-the-public/</p> <p>Learners could develop their understanding of the consequences of legislation and regulation for holders of information by researching news articles on cases where a holder of information has not complied with the UK legislation and regulation.</p> <p> Teach-ICT.com – news articles sorted by topic: http://www.teach-ict.com/news/newsttopics.htm</p> <p>Teach-ICT.com – news videos sorted by topic: http://www.teach-ict.com/news/newsvideos.htm</p>	4 hours	Unit 10 LO4

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Consolidation	<p>Working individually learners could develop their knowledge and understanding by producing a legal guide (clearly focused on the use and storage of information) for new staff in a large UK-based organisation. Learners could develop their knowledge of the different legislation and regulation by outlining the following in their legal guide: Data Protection Act (DPA) 1998; Regulation of Investigatory Powers Act (RIPA) 2000; Protection of Freedoms Act 2012; Privacy and Electronic Communications Regulations 2003 (amended 2011); Freedom of Information Act 2000; Computer Misuse Act 1990; Information Commissioner’s Office (ICO) codes of practice; and Copyright, Designs and Patents Act 1988.</p> <p>Learners could then further develop their understanding of the impact and consequences of legislation and regulation on holders of information by extending their legal guide to include ‘impact’ and ‘consequences’ sections. In these new sections, learners could provide advice for new members of staff on what they need to do (impacts) and also what could happen if they do not comply with the legislation and regulation (consequences).</p> 	2 hours	
UK and global accessibility legislation relating to the storage and use of information	<p>Tutors could begin this topic by displaying the following quotation from the UK Equality Act (EQA) 2010: “include steps for ensuring that in the circumstances concerned the information is provided in an accessible format”.</p> <p>Tutors could unpick the quotation above to make it more accessible to learners. Tutors could then explain the implications and consequences for holders of information. Learners could develop their understanding by researching the implications and consequences of the EQA by referring back to the activities on accessibility (LO1) and information styles and their uses (LO2). Learners could further develop their understanding by adding a section to their legal guide entitled ‘The Equality Act 2010’.</p> <p>Out-Law.com – Disabled access to websites under UK law: http://www.out-law.com/page-330</p> <p>Learners could develop their understanding of the actions that holders of information can take to comply with the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD). Learners, in pairs, could achieve this by researching to find evidence to support this statement: “Under the UNCRPD, access to information, communications and services, including the internet, is a human right.”</p> <p>World Federation of the Deaf – UN Convention on the Rights of Persons with Disabilities: http://wfdeaf.org/human-rights/crpd/article-9-accessibility http://wfdeaf.org/human-rights/crpd/article-21-freedom-of-expression-and-opinion-and-access-to-information</p> 	2 hours	Unit 2 LO1, LO2


Title of suggested activity	Suggested activities	Suggested timings	Also related to
Global information protection legislation and regulation	<p>To introduce this topic, tutors could explain that many other countries have legislation and regulation relating to information security and data protection that is similar to that in the UK. Tutors could also highlight that, just as there is a global divide in terms of access to information, there is also a global divide in terms of legislation and regulation relating to the storage and use of information.</p> <p>Learners could develop their knowledge and understanding of global information protection legislation and regulation by researching a range of countries around the world. Learners could record their findings in a table that could be shared with the larger group, so that learners are able to compare and contrast a range of countries.</p> <p>DLA Piper – Data protection laws of the world: http://dlapiperdataprotection.com/#handbook/world-map-section</p>	2 hours	
Green IT See Lesson Element Green IT	<p>Tutors could begin by explaining the global pressures on organisations to adopt green IT practices in order to improve their sustainability and to reduce their carbon footprint.</p> <p>Learners could develop their knowledge of the rationale for green IT and the global benefits by carrying out research.</p> <p>Global Action Plan: Green ICT Handbook – A Guide to Green ICT: https://www.liv.ac.uk/media/livacuk/sustainabilitynew/documents/Green-ICT-Handbook.pdf</p> <p>Learners can develop their understanding by explaining the benefits of green IT for organisations in a short report. Learners could use examples from the case studies on the John Lewis Partnership in their report. The case studies are included in the Green ICT Handbook above.</p>	2 hours	







Title of suggested activity	Suggested activities	Suggested timings	Also related to
Data flow diagrams (DFD)	<p>Tutors could begin by showing the BA-Experts YouTube tutorial on data flow diagrams to introduce the topic: https://www.youtube.com/watch?v=KA4rRnihLlI</p> <p>Tutors could emphasise that learners do not need to be able to draw data flow diagrams for the examination. Tutors could explain that learners should understand the components of a DFD and how they are used to show the flow of information in information systems.</p> <p>Tutors could provide learners with examples of (Context) Level 0 data flow diagrams. Working in pairs, learners could develop their knowledge of (Context) Level 0 DFDs by taking turns to describe the flows of information in each diagram.</p> <p>Tutors could show the video again, this time focusing learners on the rules for drawing a Level 1 data flow diagram (see the connectivity rules below). Tutors could explain the difference between (Context) Level 0 and Level 1 DFDs.</p> <p>Tutors could model how a Level 1 DFD can be produced from part or all of a (Context) Level 0 DFD (see the example from the resource below). Tutors could liken the process to zooming in on Google Maps, where the level of detail increases each time you zoom in.</p> <p>Learners, working in pairs, could develop their understanding of the components of a DFD and how they are used to show the flow of information, by drawing a few Level 1 DFDs from the example (Context) Level 0 data flow diagrams used earlier. N.B. Tutors could explain that although learners do not need to be able to draw data flow diagrams in the examination, this drawing exercise could help them to understand the connectivity rules, which they should know for the examination.</p> <p> Drawing Leveled Data Flow Diagrams (DFDs): http://www.visual-paradigm.com/tutorials/leveled-dfd.jsp</p>	3 hours	



Title of suggested activity	Suggested activities	Suggested timings	Also related to
<p>Impacts affecting the flow of information in information systems</p> 	<p>In this activity learners could develop their understanding of both the use and justification of different information sources and data types and the interpretation of DFDs.</p> <p>For this activity tutors could provide learners with a small number of scenarios which outline the process flows of information within an organisation; these should include data flow diagrams.</p> <p>Learners could analyse the flows, identifying the information sources and data types involved and making a judgement on each one used. Learners could extend this to include a few suggested alternative information sources and data types, together with a justification of these.</p> <p>Finally learners could combine the understanding gained in this Learning Outcome with that from other LOs. Learners could develop their overall knowledge and understanding of information systems by writing a short report on the impacts affecting the flow of information in information systems, to include reference to the following:</p> <ul style="list-style-type: none"> • Information sources • Data types • Data flow diagrams • Information quality (LO2) • Legislation and regulation (LO4) • Information classification (LO2). 	3 hours	Unit 2 LO2, LO4

SUGGESTED ACTIVITIES

LO No:	6		
LO Title:	Understand the principles of information security		
Title of suggested activity	Suggested activities	Suggested timings	Also related to
Principles of information security 	<p>To introduce the topic, learners could develop their knowledge of the principles of information security by carrying out research and then writing their own definition of information security.</p> <p>Learners could develop their understanding of the aims of information security by justifying each of the three principles: confidentiality, integrity and availability. This could be as a presentation to other learners or as a short video or podcast.</p>	1 hour	
Risks and impacts	<p>Tutors could start this topic by showing the TED Talk video, below, on risks. After watching the video learners can develop their understanding by discussing these and other risks that they are already aware of. Tutors could take this opportunity to correct any misunderstandings and to answer any questions.</p> <p>TED talk by Avi Rubin – All your devices can be hacked: http://www.ted.com/talks/avi_rubin_all_your_devices_can_be_hacked</p> <p>Learners could further develop their understanding of the risks to holders of information by researching news stories and news videos on each of the following types of risk:</p> <ol style="list-style-type: none"> 1. unauthorised or unintended access to data (e.g. espionage, poor information security policy) 2. accidental loss of data (e.g. human error, equipment failure) 3. intentional destruction of data (e.g. computer virus, targeted malicious attack) 4. intentional tampering with data (e.g. fraudulent activity, hacking). <p>Teach-ICT.com – news articles sorted by topic: http://www.teach-ict.com/news/newsttopics.htm</p> <p>Teach-ICT.com – news videos sorted by topic: http://www.teach-ict.com/news/newsvideos.htm</p> <p>Learners, working in pairs, could record their research in a table which includes the following columns:</p> <ul style="list-style-type: none"> • Type of risk (from the numbered list above) • Name of holder of information • Classification of information affected (e.g. sensitive, personal, public) • Date of news report • Description of what went wrong • Was anyone charged or prosecuted? <p>Learners could further develop their understanding of the risks by exchanging examples with other pairs and discussing them in small groups.</p>	4 hours	Unit 3 LO1, LO2

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Risks and impacts (cont...)	<p>Tutors could then extend the learners' understanding of the risks by presenting a summary of the results of the research discussions to the larger group. This could be followed by a tutor-led discussion as a plenary. Tutors could generate a complete list of the things that went wrong as a result of the failures in information security and use this to introduce the work on the impacts.</p> <p>Learners, working individually, could develop their understanding of the impacts of breaches in information security on holders of information, by extending their research so that they have examples that cover all of the main types of impact:</p> <ul style="list-style-type: none"> • loss of intellectual property • loss of service and access • failure in security of confidential information • loss of information belonging to a third party • loss of reputation • threat to national security. <p>Learners could use the following extension activity to extend their understanding of both the risks and impacts of breaches in information security on holders of information.</p> <p>Learners could research the issues raised by recent cases of failures of information security associated with:</p> <ul style="list-style-type: none"> • The UK Office for Nuclear Regulation 2012 • Edward Snowden 2013 • eBay 2014. 		
Protection measures	<p>Tutors could introduce the learners to the notion of how to reduce risk. Tutors could explore an example of a risk with the group and then ask the learners for suggestions about measures that could be taken to reduce or minimise risk to information security.</p> <p>Learners, working in small groups, could record the measures on large sheets of paper. Tutors could explore more examples with the group; learners could add their suggested measures to the sheet.</p> <p>Tutors could explain the three types of protection measures: policies, physical protection and logical protection. Learners, in their small groups, could then discuss each measure and highlight each one according to its type (using three different colour highlighters to represent the three types). Tutors could answer questions and address misconceptions as the learners are carrying out this task.</p> 	1 hour	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Protection measure policies	<p>Tutors could provide learners with a case study, involving an organisation that has suffered a breach of information security. Tutors could adapt a news story to create the case study, or they could base it on a real example from the Information Commissioner's Office.</p> <p>Learners could develop understanding of different policy measures that could be used in this case, by discussing how the policies listed below would have been effective in preventing the breach:</p> <ul style="list-style-type: none"> • staff access rights to information policy • responsibilities of staff for security of information policy • disaster recovery policy • information security risk assessment policy • effectiveness of protection measures policy • training of staff to handle information policy. <p>Tutors could discuss these policies with the larger group as a starter activity. Learners could then discuss other policies that will improve the information security of the organisation.</p> <p>Following this, learners could further develop their understanding by writing a report on the case study. Learners, working in small groups, could include in the report a brief outline of the impact and consequences of the breach, together with a more detailed set of suggested policies. Learners could describe and justify each policy, clearly stating how it would help information security.</p> <p>Learners could further develop their understanding by reading the following resource.</p> <p> Ernst & Young: Data loss prevention (page 15, What about policies and standards?): http://www.ey.com/Publication/vwLUAssets/EY_Data_Loss_Prevention/\$FILE/EY_Data_Loss_Prevention.pdf</p>	2 hours	Unit 3 LO3
Physical protection measures	<p>Tutors could begin by recapping the difference between physical protection measures and logical protection measures.</p> <p>Learners could develop their understanding of physical protection measures by carrying out research on each of the following forms of physical protection:</p> <ul style="list-style-type: none"> • locks, keypads and biometrics used on workstations or server room access • placing computers above known flood levels • backup systems in other locations • security staff • shredding old paper-based records. <p> Each learner could share their findings with the group. Learners could then develop their understanding of the justification of the use of physical measures, by taking part in a detailed discussion of the effectiveness of each of the physical measures. Learners could make notes during the discussion or tutors could make an audio recording.</p>	2 hours	

Title of suggested activity	Suggested activities	Suggested timings	Also related to
Logical protection measures	<p>Tutors could begin by emphasising that, when researching logical protection measures, learners should focus on developing their understanding and justification of:</p> <ul style="list-style-type: none"> • tiered levels of access to data • firewalls (hardware and software) • anti-malware applications • obfuscation • encryption of data at rest • encryption of data in transit • password protection. <p>Learners could develop their knowledge of the logical protection measures by finding definitions of the seven measures listed above. Tutors could check for misunderstandings and answer questions at this stage.</p> <p>Tutors could then provide learners with either the same case study as for the policies activity above or use a different one. Through discussion of the case study and their own research, learners could develop their understanding of the use of logical protection measures by applying it to the case study. Working in small groups, learners could present a description of each measure, together with a justification (related to the case study) of the use of the seven logical protection measures. Tutors could provide detailed feedback on each small group's work.</p> <p> To further develop learners' understanding, tutors could ask learners to identify and describe the protection measures suitable for a given situation within an organisation or for a given individual e.g. use of an encrypted hard drive on a laptop used by the personnel manager of a supermarket chain.</p>	2 hours	
Consolidation of protection measures	<p> To further develop learners' understanding of protection measures, tutors could ask learners to identify and describe the protection measures suitable for a given situation within an organisation or for a given individual; this should include protection measures of all three types. Tutors could provide a range of scenarios, with learners selecting the most appropriate measures in each case; learners could also explain their reasons for each selection.</p>	1 hour	



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