OCR
Oxford Cambridge and RSA

Cambridge **TECHNICALS LEVEL 3**

IT

Cambridge
TECHNICALS
2016

Unit 7

Data analysis and design

A/507/5007

Guided learning hours: 60

Version **2 - revised May** 2016

*changes indicated by black vertical line

LEVEL 3

UNIT 7: Data analysis and design

A/507/5007

Guided learning hours: 60

Essential resources required for this unit: Learners must have access to detailed case studies or current involvement that provides a data analysis and design opportunity.

This unit is internally assessed and externally moderated by OCR.

UNIT AIM

This unit will enable you to develop the skills and knowledge required to actively use data analysis techniques to provide evidence and interpretation for decision making for a range of organisational needs. Organisations and individuals collect both quantitative and qualitative data and store it for current or future use. The data analyst examines, cleanses, transforms and models data in order to support decision making and understanding.

This unit is mandatory to the Data Analyst specialist pathway in the Level 3 Diploma suite of qualifications due to its relevance in conducting data analysis and design solutions to meet business requirements. The unit supports the development of skills, knowledge and understanding relevant to the role of a data analyst and the techniques required.

TEACHING CONTENT

The teaching content in every unit states what has to be taught to ensure that learners are able to access the highest grades.

Anything which follows an i.e. details what must be taught as part of that area of content. Anything which follows an e.g. is illustrative, it should be noted that where e.g. is used, learners must know and be able to apply relevant examples in their work, although these do not need to be the same ones specified in the unit content.

For internally assessed units you need to ensure that any assignments you create, or any modifications you make to an assignment, do not expect the learner to do more than they have been taught, but must enable them to access the full range of grades as described in the grading criteria.

Learning outcomes The Learner will:	Teaching content Learners must be taught:

1. Understand the purpose and stages of data analysis and design	1.1 Data types, i.e.:
	• qualitative
	• quantitative
	• structured
	• unstructured
	
	1.2 Stages of data analysis, i.e.:
	• investigate information requirements (e.g. market share, particulates in the air, testing of new drugs)
	• data collection (e.g. observations, interviews, review of existing data)
	• data organisation (e.g. digitalisation, transcription, sorting, data mining)
	• data storage (e.g. in–house, external)
	• data cleansing (e.g. errors, missing elements, duplicates)
	• data manipulation (e.g. arranging, collating, aggregating, interpreting, correlation)
	• presentation of findings (e.g. tables, charts, graphs, dashboard, reports)
	
	1.3 Importance of accurately defining information requirements, e.g.:
	• prevents time wasting
	• aids planning of:
	  o data capture
	  o data organisation and storage
	  o cleaning and manipulation
	  o presentation of results

Learning outcomes The Learner will:	Teaching content Learners must be taught:
2. Be able to investigate client requirements for data analysis	2.1 Investigate information requirements (e.g. business intelligence, scientific research, medical research, political) 2.2 Techniques (e.g. holding focus groups, preparing and distributing questionnaires and surveys to stakeholders, analysing current documents) 2.3 Qualitative data analysis, i.e.: • typology (e.g. activities, actions, relationships) • event analysis • logical analysis (e.g. flow charts, flow diagrams) 2.4 Quantitative data analysis i.e.: • mean • median • standard deviation • range
3. Be able to develop data design solutions to meet business requirements	3.1 Levels of data model design, i.e.: • conceptual: relationship between entities • enterprise: unique business requirements • logical: specific entities, attributes and relationship in a business function • physical: application and database specific implementation of the logical data model 3.2 Phases of logical data modelling, i.e.: • structure – set of rules (e.g. entities, attributes, relationships, queries) • manipulating (e.g. updating, retrieving, editing or deletion of content) • integrity – validation of accuracy

Learning outcomes The Learner will:	Teaching content Learners must be taught:
4. Be able to present data analysis and design solutions to stakeholders	4.1 Data design documentation, e.g.: • data flow diagrams (DFDs) • information flow charts • entity attribute relationship diagram (EARD) • hierarchical tree diagram • events • entity life history (ELH) 4.2 Presentation of solution, e.g.: • reflects all aspects of design • can be understood by audience (e.g. level of technical jargon used) • format (e.g. report or presentation supported by diagrams or models) 4.3 Evaluation of design solution (e.g. meets business requirements, achievable, manageable, extendable)

GRADING CRITERIA

LO	Pass	Merit	Distinction
	The assessment criteria are the Pass requirements for this unit.	To achieve a Merit the evidence must show that, in addition to the pass criteria, the candidate is able to:	To achieve a Distinction the evidence must show that, in addition to the pass and merit criteria, the candidate is able to:
1. Understand the purpose and stages of data analysis and design	P1: Explain the types of data that can be analysed	M1: Explain the importance of accurately identifying information requirements prior to data collection	
	P2*: Summarise the stages of data analysis *(*Synoptic assessment from Unit 1 Fundamentals of IT, Unit 2 Global information)*		
2. Be able to investigate client requirements for data analysis	P3: Establish the data analysis and design requirements for a specified business requirement		
	P4: Gather data for the specified business requirement using quantitative and qualitative techniques	M2: Develop the data requirements for the specified business requirement using different qualitative and quantitative data analysis methods	
3. Be able to develop data design solutions to meet business requirements.	P5*: Create the outline scope of the data design model for the specified business requirement. *(*Synoptic assessment from Unit 3 Cyber security)*		D1: Construct the logical data model for the specified business requirement
4. Be able to present data analysis and design solutions to stakeholders	P6: Prepare the data design documentation for a presentation to stakeholders	M3: Present the data design documentation to stakeholders	D2: Evaluate the logical data model against the original specified business requirement

SYNOPTIC ASSESSMENT

When learners are taking an assessment task, or series of tasks, for this unit they will have opportunities to draw on relevant, appropriate knowledge, understanding and skills that they will have developed through other units. We've identified those opportunities in the grading criteria (shown with an asterisk). Learners should be encouraged to consider for themselves which skills/knowledge/understanding are most relevant to apply where we have placed an asterisk.

ASSESSMENT GUIDANCE

LO1 Understand the purpose and stages of data analysis and design

P1: Learners should explain the four different data types identified in the teaching content, using appropriate examples they have researched. This can be in the form of a guide for new IT learners, a presentation with speaker notes or a report.

P2: Learners must summarise all of the stages of data analysis to include purpose and relevance of each stage to the production of useful and cost effective data. This could be presented as a presentation with speaker notes, a report or a guide to data analysts.

M1: Learners could use actual examples to highlight the importance of recognising the information requirements of a specific business need prior to data collection. Research may identify only issues arising from poor requirements planning but learners would be able to use such examples to emphasise the importance of accurately identifying requirements. This may take the form of a report or a presentation with speaker notes or a video presentation.

LO2 Be able to investigate client requirements for data analysis

P3: Learners should be given a scenario that will enable them to investigate the data requirements for a specified business need. If available, learners could provide evidence from a real current project. The evidence should include the business need, the qualitative and quantitative data to be gathered and their potential sources. The evidence could be presented in the form of a report, a set of recording documentation and summary or an oral presentation.

P4: Learners should select different qualitative and quantitative techniques that could be used to obtain the necessary data requirements for a specified business need. They could produce a brief report or presentation confirming selection with a brief rationale.

M2: Learners should use the quantitative and qualitative techniques selected in P4 to develop the data requirements for the specified business need. The outcomes may be presented as annotated diagrams, a report, or a set of completed analysis forms.

LO3 Be able to develop data design solutions to meet business requirements

P5: Learners should create content relating to all phases of the data design model. Evidence could include notes of meetings, notes of observations, diagrams, a data dictionary, a summary report or presentation with speaker notes.

D1: Learners must create a logical data model for the specified business requirement using appropriate terminology and techniques to include EARD, data dictionary, entity relationships and queries based on their design model.

LO4 Be able to present data analysis and design solutions to stakeholders

P6: Learners should create data design documentation to reflect the data analysis and design solution to meet a specified business requirement. They must produce a report or presentation that includes relevant diagrams to support and justify their explanations, ideally, using the design from P5 as supporting evidence and potentially the logical data model in D1.

M3: Learners must present their findings to the stakeholders. This could be as formal written report with relevant diagrams and a set of clear conclusions and recommendations but as it is being presented there should be some narrative, either verbal or written, to underpin the delivery documentation.

D2: Learners should evaluate their logical data design model against the original business requirements and justify any changes from the original specification, making further recommendations in the light of the presentation in M3 and any potential feedback they may have received as a result.

Feedback to learners: you can discuss work-in-progress towards summative assessment with learners to make sure it's being done in a planned and timely manner. It also provides an opportunity for you to check the authenticity of the work. You must intervene if you feel there's a health and safety risk.

Learners should use their own words when producing evidence of their knowledge and understanding. When learners use their own words it reduces the possibility of learners' work being identified as plagiarised. If a learner does use someone else's words and ideas in their work, they must acknowledge it, and this is done through referencing. Just quoting and referencing someone else's work will not show that the learner knows or understands it. It has to be clear in the work how the learner is using the material they have referenced **to inform their** thoughts, ideas or conclusions.

For more information about internal assessment, including feedback, authentication and plagiarism, see the centre handbook. Information about how to reference is in the OCR *Guide to Referencing* available on our website: http://www.ocr.org.uk/i-want-to/skills-guides/.

EMPLOYABILITY SKILLS

Employability skills	Learning outcome
Communication	P1, P4, P5, P6, M1, M2, M3, D1, D2
Problem solving	P1, M1, P2, P3, M2, P5, P6, D2
Time management	P2, P3, P4, P5, P6, M2, M3, D1, D2
Critical thinking	P1, M1, P2, P3, M2
Negotiation	P2, D2
Decision making	P1, P2, P3, P4, P5, P6, M1, M2, M3, D1, D2

MEANINGFUL EMPLOYER INVOLVEMENT - a requirement for the Diploma (Tech Level) qualifications

The 'Diploma' qualifications have been designed to be recognised as Tech Levels in performance tables in England. It is a requirement of these qualifications for centres to secure for every learner employer involvement through delivery and/or assessment of these qualifications.

The minimum amount of employer involvement must relate to at least one or more of the elements of the mandatory units. This unit is a mandatory unit in the Data Analyst pathway and the Application Data Technician pathway.

Eligible activities and suggestions/ideas that may help you in securing meaningful employer involvement for this unit are given in the table below.

Please refer to the *Qualification Handbook* for further information including a list of activities that are not considered to meet this requirement.

Meaningful employer involvement	Suggestion/ideas for centres when delivering this unit
1. Learners undertake structured work-experience or work-placements that develop skills and knowledge relevant to the qualification.	Learners may join a team engaged in data analysis and design, contributing to customer requirements, the collection of data, recording the data requirements, working alongside experienced analysts to construct elements of the logical data model and contributing to the preparation of materials for presentation to the stakeholders.
2. Learners undertake project(s), exercises(s) and/or assessments/examination(s) set with input from industry practitioner(s).	Data analysts from a business could provide ideas for projects, short, self-contained projects would enable learners to carry out real life activities in specified learning outcomes.
3. Learners take one or more units delivered or co-delivered by an industry practitioner(s). This could take the form of master classes or guest lectures.	A data analyst from a local business could give a guest lecture on: the purpose of data analysis and the stages which they undertake during the process and why. The reality of gathering client requirements using a case study as a basis, especially where there are conflicting requirements, or limited financing would all be of value. Examples of documentation could confirm the depth, range and quality of the content.
4. Industry practitioners operating as 'expert witnesses' that contribute to the assessment of a learner's work or practice, operating within a specified assessment framework. This may be a specific project(s), exercise(s) or examination(s), or all assessments for a qualification.	If you worked with a data analyst to set a project in point 2 above, they could be asked to be an 'expert witness' and contribute to the assessment of the learners' projects.

To find out more
ocr.org.uk/it
or call our Customer Contact Centre on **02476 851509**

Alternatively, you can email us on **vocational.qualifications@ocr.org.uk**