



**Unit Title: Data Modelling**

OCR unit number	18
Level:	3
Credit value:	9
Guided learning hours:	75
Unit reference number:	L/601/3203

Candidates undertaking this unit must complete real work activities in a work environment. Simulation is only allowed in exceptional circumstances (please refer to the centre handbook for further details).

**Unit purpose and aim**

This unit covers the use of logical data modelling techniques, including normalisation, in the design of data structures for computer systems.

Learning Outcomes	Assessment Criteria	Knowledge, understanding and skills
<p><b>The Learner will:</b></p> <p>1 Understand the concepts of logical data modelling</p>	<p><b>The Learner can:</b></p> <p>1.1 Describe entities and the types of attributes which can be assigned to them</p> <p>1.2 Describe the type of relationships which can exist between entities</p> <p>1.3 Explain the objectives of data normalisation and describe the Third Normal Form (3NF)</p> <p>1.4 Explain the purpose of keys</p> <p>1.5 Describe an application where un-normalised or de-normalised data may be used</p> <p>1.6 Describe the types of standard notation which can be used to represent data sets as logical data models</p>	<p>Candidates must be able to define an entity and the two types of entities.</p> <p>Candidates must be able to describe an attribute and the different types of attributes that can exist to include:</p> <ul style="list-style-type: none"> <li>• single</li> <li>• composite</li> <li>• single-valued</li> <li>• multi-valued</li> </ul> <p>Candidates must be able to describe:</p> <ul style="list-style-type: none"> <li>• one-to-many relationships (1:m)</li> <li>• many-to-many relationships (m:n)</li> <li>• one-to-one relationships (1:1)</li> <li>• many-to-one (m:1)</li> </ul> <p>Candidates must understand why data is normalised and explain why this is important to data integrity.</p> <p>Candidates must be able to explain the principles of</p>

Learning Outcomes	Assessment Criteria	Knowledge, understanding and skills
		<p>normalisation in particular the Third Normal Form (3NF)</p> <p>Candidates must be able to describe the following and when they are used:</p> <ul style="list-style-type: none"> <li>• primary Key</li> <li>• foreign Key</li> <li>• candidate key</li> <li>• composite key</li> </ul> <p>Candidates must be able to identify where de-normalisation of data would be appropriate.</p> <p>Candidates must be able to draw an EAR (Entity-Attribute-Relationship) diagram using standard notation.</p>
<p>2 Use data modelling techniques to create logical data models</p>	<p>2.1 Identify and name entities, assigning the correct attributes</p> <p>2.2 Identify and represent entity relationships, assigning the correct type</p> <p>2.3 Normalise a data set to Third Normal Form (3NF)</p>	<p>Candidates must know how to identify and select appropriate entities and attributes for a given scenario.</p> <p>Candidates must be able to identify the relationships between the selected entities and produce an appropriate EAR diagram</p> <p>Candidates must be able to implement the principles of 3NF.</p>
<p>3 Use data modelling techniques to refine logical data models</p>	<p>3.1 Identify entities which will be accessed for enquiry and/or update</p> <p>3.2 Identify access sequences and triggers</p> <p>3.3 Create access rules/methods</p> <p>3.4 Use a standard notation to describe the logical data model of a normalised data set</p>	<p>Candidates must be able to identify entities used for enquiry and/or update.</p> <p>Candidates must understand the meaning of sequences and triggers and how they are used.</p> <p>Candidates must understand access rules/methods available and how they are applied.</p> <p>Candidates must know the standard notation used within logical data modelling of normalised data sets.</p>

## Assessment

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Candidates undertaking this unit must complete real work activities in order to produce evidence to demonstrate they are occupationally competent. Real work is where the candidate is engaged in activities that contribute to the aims of the organisation by whom they are employed, for example in paid employment or working in a voluntary capacity.

Simulation is only allowed for aspects of units when a candidate is required to complete a work activity that does not occur on a regular basis and therefore opportunities to complete a particular work activity do not easily arise. When simulation is used, assessors must be confident that the simulation replicates the workplace to such an extent that candidates will be able to fully transfer their occupational competence to the workplace and real situations.

Internal quality assurance personnel must agree the use of simulated activities before they take place and must sample all evidence produced through simulated activities.

It is the assessor's role to satisfy themselves that evidence is available for all performance, knowledge and evidence requirements before they can decide that a candidate has finished a unit. Where performance and knowledge requirements allow evidence to be generated by other methods, for example by questioning the candidate, assessors must be satisfied that the candidate will be competent under these conditions or in these types of situations in the workplace in the future. Evidence of questions must include a written account of the question and the candidate's response. Observations and/or witness testimonies must be detailed and put the evidence into context ie the purpose of the work etc.

All of the assessment criteria in the unit must be achieved and clearly evidenced in the submitted work, which is externally assessed by OCR.

Evidence for the knowledge must be explicitly presented and not implied through other forms of evidence.

## Evidence requirements

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**All aspects of the assessment criteria must be covered and evidence must be available that shows where and how the assessment criteria have been achieved.**

### Assessment Criterion 1

Candidates must provide an explanation of the following:

- entities
- types of entity
- attributes and associated types eg:
  - single
  - composite
  - single-valued
  - multi-valued

Relationships that can exist between entities including:

- one-to-many relationships (1:m)
- many-to-many relationships (m:n)
- one-to-one relationships (1:1)
- many-to-one (m:1)

The objectives of data normalisation

The Third Normal Form (3NF) and how it is applied

Candidates must explain the rationale and use of keys to include:

- primary key
- foreign key
- candidate key
- composite key

Candidates must describe the terms un-normalised or de-normalised data and identify occasions when would be acceptable to use them.

For a given scenario candidates must describe the standard notation of EAR (Entity-Attribute-Relationship) and use it to draw a logical data structure for the scenario.

### **Assessment Criterion 2**

For a given scenario candidates must:

- identify and name entities and assign appropriate attributes.

Candidates must represent the relationships between the entities and attribute by producing an appropriate EAR (Entity- Attribute -Relationship) diagram and carryout and document normalisation of the data set to Third Normal Form (3NF) showing the steps taken.

### **Assessment Criterion 3**

From the given scenario candidates must identify the:

- entities which will be used for enquiry and/or update

Access sequences and triggers that will be required and provide evidence of creating the associated access rules/methods.

Candidates must produce a logical data model for the normalised data using standard notation.

**Candidates are encouraged to choose activities which will allow them to cover all or a majority of the criteria at one time. It is not necessary to use different activities for each element of the criterion.**

## **Guidance on assessment and evidence requirements**

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Evidence can reflect how the candidate carried out the process or it can be the product of a

candidate's work or a product relating to the candidate's competence. For example: The process that the candidate carries out could be recorded in a detailed personal statement or witness testimony. It is the assessor's responsibility to make sure that the evidence a candidate submits for assessment meets the requirements of the unit.

Questioning the candidate is normally an ongoing part of the assessment process, and is necessary to:

- test a candidate's knowledge of facts and procedures
- check if a candidate understands principles and theories *and*
- collect information on the type and purpose of the processes a candidate has gone through

- Candidate responses must be recorded

It is difficult to give a detailed answer to how much evidence is required as it depends on the type of evidence collected and the judgement of assessors. The main principles, however, are as follows: for a candidate to be judged competent in a unit, the evidence presented must satisfy:

- all the items listed, in the section 'Learning Outcomes'
- all the areas in the section 'Assessment Criteria'

The quality and breadth of evidence provided should determine whether an assessor is confident that a candidate is competent or not. Assessors must be convinced that candidates working on their own can work independently to the required standard.

## Additional information

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For further information regarding administration for this qualification, please refer to the OCR document '*Admin Guide: Vocational Qualifications*' (A850) on the OCR website [www.ocr.org.uk](http://www.ocr.org.uk) .