

<b>Unit Title:</b>	<b>Data Modelling</b>
OCR unit number	18 (L/601/3203)
Level:	3
Credit value:	9
Guided learning hours:	75
Unit expiry date:	31/03/2015

Evidence for this unit can only be achieved through actual work in a work environment. Simulation is not permissible for any competence based unit.

## 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-normalized 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 should be able to define an entity and the two types of entities.</p> <p>Candidates should 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 should 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 should understand why data is normalised and explain why this is important to data integrity.</p>

Learning Outcomes	Assessment Criteria	Knowledge, understanding and skills
		<p>Candidates should be able to explain the principles of normalisation in particular the Third Normal Form (3NF)</p> <p>Candidates should 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 should be able to identify where de-normalisation of data would be appropriate.</p> <p>Candidates should be able to draw an EAR (Entity-Attribute-Relationship) diagram using standard notation.</p>
2 Use data modelling techniques to create logical data models	<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 should know how to identify and select appropriate entities and attributes for a given scenario.</p> <p>Candidates should be able to identify the relationships between the selected entities and produce an appropriate EAR diagram</p> <p>Candidates should be able to implement the principles of 3NF.</p>
3 Use data modelling techniques to refine logical data models	<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 should be able to identify entities used for enquiry and/or update.</p> <p>Candidates should understand the meaning of sequences and triggers and how they are used.</p> <p>Candidates should understand access rules/methods available and how they are applied.</p> <p>Candidates should know the standard notation used within logical data modelling of normalised data sets.</p>

## Assessment

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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.

In addition to the recognition of other qualifications, candidates may claim accreditation of prior achievement for any of the elements assessment criteria or complete units of competence, as long as the evidence fully meets the criteria and the candidate can prove that it is all their own work. It is important also that assessors are convinced that the competence claimed is still current. If the assessors have some doubts, they should take steps to assess the candidate's competence directly. An initial assessment of candidates is recommended.

All the learning outcomes and assessment criteria must be clearly evidenced in the submitted work, which is externally moderated by OCR.

Results will be Pass or Fail.

## 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 objectives have been achieved.**

### Assessment Criterion 1

Candidates must describe 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-normalized 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) .