Systems Development: Relational Database Systems: An Introduction

HIGHER NATIONAL DIPLOMA

系统开发：相关数据库（初级）

【英】苏格兰学历管理委员会（SQA）

Unit Student Guide

COMPUTING: Software Development

DH3D 35

中国时代经济出版社

SCOTTISH QUALIFICATIONS AUTHORITY

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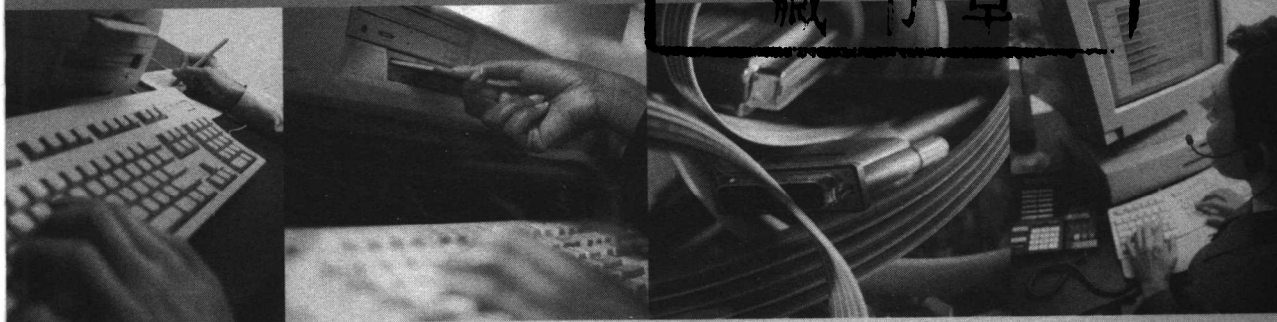
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苏格兰学历管理委员会著

Contents

1 Introduction to the Scottish Qualifications Authority

This Unit **DH3D 35: Systems Development: Relational Database Systems** has been devised and developed by the Scottish Qualifications Authority (SQA). Here is an explanation of the SQA and its work:

The SQA is the national body in Scotland responsible for the development, accreditation, assessment, and certification of qualifications other than degrees.

Its website can be viewed on:www.sqa.org.uk

SQA's functions are to:

- devise, develop and validate qualifications, and keep them under review

- accredit qualifications

- approve education and training establishments as being suitable for entering people for these qualifications

- arrange for, assist in, and carry out, the assessment of people taking SQA qualifications

- quality   assure   education   and   training establishments which offer SQA qualifications

- issue certificates to candidates.

In order to pass SQA Units, students must complete prescribed assessments. These assessments must meet certain standards.

The Unit Specification outlines the **five** Outcomes that students must complete in order to achieve this Unit. The Specification also details the knowledge and/or skills required to achieve the outcome or outcomes. The Evidence Requirements prescribe the type, standard and amount of evidence required for each outcome or outcomes.

2 Introduction to the Unit

The Unit is designed to enable you to:

- Understand the manipulation of normalised data structures

- Apply this knowledge in the design and use of relational database systems

- Solve problems and synthesise and evaluate solutions within the discipline of relational database systems.

This Unit is suitable for candidates wishing to specialise in the design and implementation of solutions based on relational information systems.

There are five outcomes in this Unit:

1. Explain the terminology and techniques used in the design of relational information systems.

2. Create a relational database design from user requirements.

3. Describe the issues involved in implementing a relational database system.

4. Implement structures and manipulate data in a relational database management system.

5. Use a programming language to interface with a relational database management system.

Further details can be found in Appendix 1 — Unit Specifications.

2.3 What do I Need to be Able to do in Order to Achieve this Unit?

Access to this Unit will be at the discretion of the Centre. It is recommended that you have an understanding of the role and application of databases. Furthermore, knowledge of a programming language (e.g. Visual Basic 6, unless advised otherwise by your tutor) is required.

This can be evidenced by having achieved one or more of the following Units:

• HN Unit Systems Development: Introduction

• HN Unit SQL: An introduction

The programming elements in Outcome 5 should not require you to acquire new or complex programming skills these are outside the scope of this Unit. Therefore, prior experience of procedural programming

is necessary, for example achievement of the HN Unit
Software Development : Event Driven Programming.

2.4 Approximate Study Time for This Unit

While the exact time allocated to this Unit is at the
discretion of the Centre, the notional design length is
80 hours.

2.5 Equipment/ Material Required for this Unit

In order to participate in the Unit, you will require
individual access to a personal computer or
workstation, which will include relational database
management system (RDBMS) software and a
programming language to interface with the chosen
RDBMS.

The supplied student material for this Unit has been
written for the Oracle RDBMS (from Oracle
Corporation) and the Visual Basic 6 programming
language (from Microsoft Corporation). In addition
some of the initial exercises require access to the
Microsoft Access database system.

However, your tutor may advise use of an alternative
RDBMS and programming language.

Further, at various points in the Unit, you will be issued
with pre-prepared Access Databases, SQL scripts and
Visual Basic programs.

You will need to complete the following Unit Student Guides to meet all the requirements of this unit:

- Unit Student Guide — Software Development: Relational Database Systems: An Introduction

- Unit Student Guide — Software Development: Relational Database Systems: Advanced.

**2.6
Symbols Used
in this Unit**

The various Learning Materials sections are designed so that you can work at your own pace, with tutor support. As you work through the Learning Materials (see Section 5), you will encounter symbols. These symbols indicate that you are expected to do a task. **These tasks are not Outcome Assessments.** They are exercises designed to consolidate learning or encourage thought, in preparation for the Outcome Assessment (see Section 3 — Assessment Information for this Unit).

Activity

1

This symbol indicates an Activity (A). Usually, Activities are used to improve or consolidate your understanding of the subject in general or a particular feature of it.

In this Unit, you are asked to undertake Activities, which take the form of practical exercises, making use of the provided database and programming environments.
Suggested responses to these Activities are to be found in Section 7 — Solutions to Self-Assessed Questions and Activities. You may have alternative solutions, which may be just as valid. You can discuss your solutions with your tutor.

The Activities will not serve their purpose if you refer to the responses prior to having attempted them.

Self-Assessed Question

1

This symbol indicates a Self-Assessed Question. Using a Self-Assessed Question helps you check your understanding of the content that you have already

covered. The Self-Assessed Questions in this Guide will often take the form of written answers or discussions with your tutor and colleagues.

Everything is provided for you to check your own responses. Answers to the Self-Assessed Questions are to be found at the back of the Unit Student Guide. Where suggested responses to Self-Assessed Questions are provided in the Unit Student Guide, **you are strongly discouraged from looking at these responses before you attempt the Self-Assessed Questions.** The Self-Assessed Questions throughout the Unit Student Guide will help you to prepare yourself for the formal assessments, and to identify topic areas in which you will require clarification and additional tutor support. The Self-Assessed Questions will not serve this purpose if you look at the answers before trying them!

Self-Assessed Questions and Activities are designed to be checked by you. No tutor input is necessary at this stage unless special help is requested, although from time to time your tutor may wish to view your responses to Self-Assessed Questions to see how you are progressing.

3

Assessment Information for this Unit

3.1
What Do I Have to Do to Achieve This Unit?

In order to achieve this Unit you are required to successfully complete five outcomes, understanding of which will be examined by an assessment:

- **Outcome Assessment 1**
  Demonstrate knowledge and understanding of terminology and techniques used in the design of relational information systems. Evidence will be gathered by means of a closed book test under supervised conditions.

- **Outcome Assessment 3**[1]
  Describe the issues involved in implementing a relational database system. You are expected to research the items for this Outcome (e.g. using publications and the Internet) and produce a written report on your findings. This report is constructed in a piecemeal fashion throughout the duration of the Unit. The requirements of this

1 For Outcome 3, you are expected to carry out your own research. You will be provided with the requirements early in the delivery of the Unit. A great deal of material can be found in publications and on the Internet. Your tutor may supply supplementary information and notes. However, it is strongly recommended that you carry out this research throughout the Unit and not leave it to the end. The report can be submitted in stages, which will allow your tutor to provide regular feedback.

Outcome will be made available to you early in the delivery of the Unit.

- **Outcome Assessments 2, 4 and 5[2]**
  Create a relational database design from user requirements (Outcome 2). From that design, implement a relational database and manipulate data within it (Outcome 4). Finally, use a programming language, interface with the created relational database (Outcome 5). These requirements are achieved through a single case study, undertaken over an extended period of time.

The order in which these outcomes are delivered, and at which point in the Unit the evidence is gathered (i.e. assessed), is at the discretion of your tutor. However, on the next page is a summary of the sections in this Guide that you need to cover before attempting the Assessments.

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2 The student material for this Unit is based on the Oracle RDBMS, which supports the Structured Query Language (SQL) SQL has three main components: Data Definition Language (DDL), used to implement a relational database; Data Manipulation Language (DML), used to manipulate data; and Data Control Language (DCL) to manage security. The programming language used to interface to the Oracle RDBMS is Visual Basic 6. Your tutor will advise you if a different RDBMS or programming language is to be used

Outcome Assessment Summary

Outcome	Assessment	Assessment Type	When
1	1	Closed book	After completing section 5.5.
2	2	Practical exercise in normalisation	After completing section 5.5.
3	3	Research and report	Tutor to issue instructions at the beginning of the Unit where a finish date is agreed.
4	4	Practical exercise in SQL	After section 5.9.
5	5	Practical exercise in linking to a database using a programming language	After section 5.10.