Title	**Design, develop and test a relational database solution using professional practice and project management methodologies**		
Level	**4**	**Credits**	**15**

Purpose	People credited with this unit standard are able to: describe and compare industry relevant project management methodologies, and build a network diagram to capture requirements from a brief; apply project management and planning tools using an industry relevant methodology to manage a database project to meet an organisational requirement in a specified brief; use industry relevant project methodology to incrementally design and test a relational database to address an organisational information system need for data analysis; apply cultural, professional, and ethical principles and practices, and comply with legal and organisational IT requirements for security, storage and retrieval of data in a database solution for an organisation; and reflect on personal communication and collaboration skills and behaviours to maintain relationships and achieve objectives when developing a database solution for a client. This unit standard has been developed primarily for assessment within programmes leading to the New Zealand Certificate in Information Technology Essentials (Level 4) [Ref: 2594].

Classification	Computing > Generic Computing

Available grade	Achieved

Guidance Information

1 Recommended skills and knowledge:
Unit 29790, *Use digital tools to create and monitor a project plan*; Unit 29787, *Produce and use a relational database to provide a solution for organisational use;* Unit 29793 *Investigate, plan, design and create digital outcome solutions to meet the requirements of a specified brief;* and Unit 29795, *Apply ethical behaviour when using digital tools*, or demonstrate equivalent knowledge, skills and experience.

2 Assessment, where applicable, will be conducted in and for the context of real or realistic situations and/or settings, and be relevant to current and/or emerging practice. The assessor may gather evidence over time from a range of scenarios rather than using one assessment where the learner has to demonstrate all of the required skills. Where naturally occurring evidence is used for assessment against this unit standard, a verifier's checklist is acceptable if accompanied by evidence that includes examples from the learner's performance.

The assessment context for this unit standard must be suitable to meet the criteria for level 4 in the NZQF Level Descriptors, which are available by searching for "level descriptors" at www.nzqa.govt.nz.

Assessment will consider ngā kaupapa o Te Tiriti o Waitangi (the principles of the Treaty of Waitangi) and implications for practice.

3 Any proprietary or open-source database and project planning software may be used for assessment provided it includes the features, or their equivalents, specified in the range statements.

4 A *brief* is a clear description of both the desirable outcomes sought and the constraints to be met by the solution, and will include meeting appropriate legal, ethical and moral considerations. It contains design specifications against which the success or otherwise of the solution can be evaluated, and a testing plan. The brief can be either created as part of the learner's employment (in the case of workplace assessment) or in response to the needs of a stakeholder, or to a set task. A *plan* outlines how the requirements of the brief will be realised, and may be written and/or graphic.

The brief contains requirements and specifications against which the success or otherwise of the project planning and management can be evaluated, and must clearly identify the outcomes required from the database, against which the success or otherwise of the database application can be assessed.

The brief will include the target users; the database specification which includes the system's purpose and functionality, entities, data entry requirements, and update/output requirements. The learner will devise the attributes and data validation requirements from the functionality requirements.

5 Experiential knowledge and concepts of project management and planning tools, which include project management methodologies, project lifecycle, and use of planning tools that underpin the theory and practice of project management, will be covered in an IT context to provide learners with a foundation for project management within the IT profession. The IT professional context is intended to provide opportunities for the learner to demonstrate an understanding of IT specific concepts, technical language and jargon, and communicate in a way that can be readily understood by non-IT professionals.

6 Definitions

Behaviours refer to respect, timeliness, discretion, confidentiality, commitment, cultural diversity awareness.

Collaborative digital tools refer to calendars, workflow systems, time trackers, planning tools, asynchronous and synchronous tools such as the wide range of conferencing, online forums and online learning tools.

Controls refer to user interface restrictions such as option boxes, check boxes, combo boxes, list boxes, text boxes); validation rules; dropdown lists; buttons.

Digital tools may be both hardware (digital devices) and software (applications and programs).

Ethics (or ethical principles and practices) refers to moral principles that guide user behaviour in the use of computers or digital devices.

Organisation refers to a specific entity which may be – in private, public, or community and voluntary sectors; a business, a discretely managed unit within a larger entity, a Māori organisation, or a special-purpose body.

Professional practice refers to the 'soft skills' of communication, collaboration, interpersonal skills, self-management, problem solving, reflection and ethical principles and practices.

Project is a defined series of coordinated tasks with a defined outcome, start and finish dates/times.

Project management methodology is a strictly defined combination of logically related practices, methods and processes that determine how best to plan, develop, control and deliver a project through to completion and termination. It is a systematic and disciplined approach to project design, execution and completion.

Project management tools refer to project management software; technical resources required for project; Gantt and bar charts; critical path method; cost schedule control system; logistics support analysis; life cycle cost analysis; spreadsheets.

Project planning tools refer to – brainstorms, mind-maps, idea banks, reflective journals and scrapbooks, plans of action, Gantt charts, flow diagrams, graphical organisers.

A testing plan lists various scenarios that should be executed against the application, and includes the initial state (database records), functions (queries, forms and reports) and features that need to be tested (buttons, links, navigation, displayed messages, error handling), data to be input, and the expected outcome for each test.

7 Legislation relevant to this unit standard includes but is not limited to the:

Copyright Act 1994
Copyright (New Technologies) Amendment Act 2008
Electronic Transactions Act 2002
Harmful Digital Communications Act 2015
Health and Safety at Work Act 2015
Official Information Act 1982
Privacy Act 2020
Protected Disclosures Act 2000
Unsolicited Electronic Messages Act 2007
and any subsequent amendments.

Current legislation and regulations can be accessed at http://legislation.govt.nz.

8 Reference
ACC5637 Guidelines for Using Computers - Preventing and managing discomfort, pain and injury. Accident Compensation Corporation - Department of Labour, 2010; available from Worksafe New Zealand, at https://www.worksafe.govt.nz/topic-and-industry/work-related-health/musculoskeletal-disorders/ergonomics/safely-using-computers-at-work/.

Outcomes and performance criteria

Outcome 1

Describe and compare industry relevant project management methodologies, and build a network diagram to capture requirements from a brief.

Performance criteria

1.1 Industry relevant project management methodologies are described and compared in relation to meeting the requirements of a brief.

Range includes two industry relevant methodologies; life cycle of concept; inception; construction; release; production; retirement; iteration workflow.

1.2 A network diagram of critical tasks is built to capture the requirements of a brief.

Range includes at least three task sequences; time estimates; resources; task dependencies; iteration path and project path.

Outcome 2

Apply project management and planning tools using an industry relevant methodology to manage a database project to meet an organisational requirement in a specified brief.

Performance criteria

2.1 Communication and collaboration skills are used to formulate a brief for a database solution.

Range includes but is not limited to – interviewing and documenting client requirements in terms of purpose, reports and forms, includes use of collaborative digital tools.

2.2 Industry relevant project management and planning tools, methodologies, and techniques are used to define project requirements in accordance with the brief.

Range may include the use of methodologies to incrementally define sprints.

2.3 Industry relevant methodologies are used to incrementally prepare and deliver client presentations to obtain feedback.

Range includes but is not limited to – incremental developments; obtaining and documenting feedback; use of digital tools to prepare and/or present information.

2.4 Progress of the project is monitored using digital tools, and the database is modified as necessary to accommodate variations and additional features.

2.5 Digital tools and methodologies used to contribute to the project implementation are evaluated in terms of their effectiveness and suitability in practice.

Outcome 3

Use industry relevant project methodology to incrementally design and test a relational database to address an organisational information system need for data analysis.

Range database design must outline how the requirements of the brief will be realised and may be written and/or graphic.

Performance criteria

3.1 Database structure is designed and created according to the requirements of the brief to enable data analysis.

Range attributes (fields) for tables;
field design may include but is not limited to – data types, formats, size, validation rules, formulas, normalisation;
keys include but are not limited to – primary key, candidate keys, foreign keys;
relationships may include – one-to-one, one-to-many, and many-to-many;
includes – data access permissions and security;
sufficient data is entered or uploaded to enable testing.

3.2 Queries to assemble data from multiple tables are developed according to the data analysis needs of the organisation.

Range includes queries to – calculate results from existing data; select data; assemble data from multiple tables; summarise data.

3.3 A user interface is developed to meet the data input and data analysis extraction needs of the organisation.

Range includes but is not limited to – input forms; reports; restricting selection of data with at least three different controls.

3.4 Data analysis reports are produced to meet organisational requirements.

Range includes – display of data extracts on the screen; exporting data extracts; printing reports; ad-hoc queries; a minimum of two tables; a minimum of two reports that include – title and column headings; the sorting and grouping of data; summaries.

3.5 The finished database is tested in terms of meeting the brief and organisational requirements.

Range includes – communicating with client to seek feedback, documenting outcomes, incremental modifications made.

3.6 Fit for purpose end user documentation is created to facilitate the operation of the database.

Range includes – purpose; use of screenshots; step by step instructions; non-technical language.

Outcome 4

Apply cultural, professional, and ethical principles and practices, and comply with legal and organisational IT requirements for security, storage and retrieval of data in a database solution for an organisation.

Performance criteria

4.1 Professional and ethical principles and practices are described and applied in relation to securely creating, collecting, storing and retrieving data in a database.

Range may include – codes of practice; ethical and unethical behaviour; legal responsibilities and compliance with regulations, legislation and internal policies; indigenous data sovereignty; access and control of data; privacy of data.

4.2 The Treaty of Waitangi/Te Tiriti o Waitangi is described in terms of relevance and implications for the storage and retrieval of indigenous data.

Range includes but is not limited to – indigenous data sovereignty; creation, collection, storage, access and control of data relating to Maori; principles of the Treaty of Waitangi/Te Tiriti o Waitangi - partnership, protection, participation.

Outcome 5

Reflect on personal communication and collaboration skills and behaviours to maintain relationships and achieve objectives when developing a database solution for a client.

Performance criteria

5.1 Behaviours, attitudes and language are used to contribute to maintaining relationships in an IT professional context when collaborating.

5.2 Own communication performance is reviewed to identify opportunities for future improvement when maintaining relationships in an IT professional context.

Planned review date	31 December 2026

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	28 April 2022	N/A

Consent and Moderation Requirements (CMR) reference	0099

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Toi Mai Workforce Development Council qualifications@toimai.nz if you wish to suggest changes to the content of this unit standard.