# Project assessment: Design and model a relational database

## Criteria

### Unit code and name

ICTDBS416 | Create basic relational databases.

ICTPRG431 | Apply query language in relational databases.

ICTSAD501 | Model data objects

### Qualification/Course code and name

ICT40120 | Certificate IV in Information Technology

## Student details

### Student number

881299424

### Student name

Ramazan Carpan

## Assessment declaration

*Note: If you are an online student, you will be required to complete this declaration on the TAFE NSW online learning platform when you upload your assessment.*

This assessment is my original work and has not been:

* plagiarised or copied from any source without providing due acknowledgement.
* written for me by any other person except where such collaboration has been authorised by the Teacher/Assessor concerned.

### Student signature and date

Ramazan Carpan 15/05/2024

Version: 20210920

Date created: 20 September 2021

Date modified: 20 September 2021

For queries, please contact:

Technology and Business Services Skills Point

Ultimo

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This assessment can be found in the: [Learning Bank](https://share.tafensw.edu.au/share/access/searching.do?doc=%3Cxml%2F%3E&in=P7ac4831b-430a-4b8d-8b56-f7b32ed5b9cf&q=&type=standard&sort=rank&dr=AFTER)

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## Assessment instructions

Table 1 Assessment instructions

| Assessment details | Instructions |
| --- | --- |
| **Assessment overview** | The objective of this assessment is to assess your knowledge and performance in designing and modelling a relational database. |
| **Assessment event number** | 1 of 4 |
| **Instructions for this assessment** | This is a project-based assessment that assesses your knowledge and performance of the unit.  This assessment is in four parts:  Analyse database requirements  Design the database  Validate data model  Resolve issues  And is supported by:   * Observation checklist * Assessment feedback (not included here) * Supporting documents within the assessment   **Note**: This assessment may contain links to external resources. If a link does not work, copy and paste the URL directly into your browser. |
| **Submission instructions** | On completion of this assessment, you are required to submit it to your Teacher/Assessor for marking. Where possible, submission and upload of all required assessment files should be via the TAFE NSW online learning platform.  It is important that you keep a copy of all electronic and hardcopy assessments submitted to TAFE and complete the assessment declaration when submitting the assessment. |
| **What do I need to do to achieve a satisfactory result?** | To achieve a satisfactory result for this assessment you must answer all the questions correctly.  If a resit is required to achieve a satisfactory result it will be conducted at an agreed time after a suitable revision period. |
| **What do I need to provide?** | * TAFE NSW student account username and password. * Computer or other device with word processing software and internet access * Writing materials, if required |
| **What the Teacher/Assessor will provide** | * Access to this assessment and learning resources, including the student workbook and any supporting documents or links. * Equipment, materials and industry software packages, including CASE tools for creating entity-relationship (ER) diagrams * Software development environment * Client documentation * Entity relationship diagram (ERD\_MtPleasantSoccerClub\_MH\_20191102.pdf) and client requirements documentation (ClientRequirements\_MtPleasantSoccerClub \_AK\_20191013) for Part 4. |
| **Due date**  **Time allowed**  **Location** | Refer to UAG  Indicative time to complete assessment:   * In class: 30 minutes * Out of class: Seven hours   Assessment is to be completed in and out of class. |
| **Assessment feedback, review or appeals** | In accordance with the TAFE NSW policy *Manage Assessment Appeals,* all students have the right to appeal an assessment decision in relation to how the assessment was conducted and the outcome of the assessment. Appeals must be lodged within **14 working days** of the formal notification of the result of the assessment.  If you would like to request a review of your results or if you have any concerns about your results, contact your Teacher/Assessor or Head Teacher. If they are unavailable, contact the Student Administration Officer.  Contact your Head Teacher/Assessor for the assessment appeals procedures at your college/campus. |

## Specific task instructions

The instructions and the criteria in the tasks and activities below will be used by the Teacher/Assessor to determine if the student has satisfactorily completed this assessment event. Use these instructions as a guide to ensure the student demonstrates the required knowledge and skills.

You may have the option to record your participation and submit as video evidence. If you are submitting video evidence, you must:

* provide a video clearly meeting all requirements listed below and in the Observation Checklist
* ensure you have access to the equipment and resources required to participate in the demonstration
* follow the [Video recording instructions (pdf)](https://share.tafensw.edu.au/share/items/744af7d4-a241-45e2-adb0-0e13f2fe4950/0/?attachment.uuid=01c3c87a-4599-48c2-91f0-68a00b5bbb4c), which includes useful tips, links to resources and a demonstration video.  
  URL: <https://share.tafensw.edu.au/share/items/744af7d4-a241-45e2-adb0-0e13f2fe4950/0/?attachment.uuid=01c3c87a-4599-48c2-91f0-68a00b5bbb4c>.

### Scenario

You are currently employed as an ICT Technician with [Gelos Enterprises](https://share.tafensw.edu.au/share/items/d0b458dc-3922-409d-b1fe-9a2f785f4a38/0/GelosEnterprises.zip/index.html) (Gelos) in the Development team. Sandra Williams, the proprietor of a large medical practice, has commissioned Gelos to design, develop and test the database for a new Medical Practice Management system. After a thorough investigation of the day-to-day operations of the Medical Practice, a business analyst has defined the business rules and business data for the medical practice. (Note: the database should NOT be extended to meet any other hypothetical requirements that are not described by these business rules)

Download and unzip the [resource folder](https://share.tafensw.edu.au/share/items/e08936de-a951-4b19-be3f-11ccf6bd2d31/0/?attachment.uuid=fc910fa5-1d22-4c19-909e-2f5aa9963f51) (Cl\_Database\_AE\_Pro\_Appx.zip), which contains documents you will need for this assessment.

You have been supplied with Gelos' [Communication Procedure](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=55d8c18c-98ab-44da-a3ca-a904133bab2d) (GE\_Communication\_procedure.pdf) and [Records and Information Management (ICT) Procedure](https://share.tafensw.edu.au/share/items/5f1cec7b-1d03-446a-85b7-edb42692c34e/0/?attachment.uuid=5a225cb2-b9c3-47b3-82f1-10aff2c72d2e) (GE\_Records-Information-Management-ICT\_procedure.pdf), which you must follow when creating and naming your reports and communicating with the client.

## Part 1: Analyse database requirements

Carefully read, review and analyse the supplied business rules and business data of the medical practice (MedicalPracticeBusinessRules.docx). Develop a Client Requirements report for the manager of the medical practice, using the [Gelos report template](https://share.tafensw.edu.au/share/items/02285ff1-cfb2-4af4-b402-fdc23bf4bf11/0/?attachment.uuid=3c6a096c-b36f-4cb1-b0fe-f4a64dca7b83) (GE\_Report\_template.dotx). Your report must use correct terminology, technically appropriate language and an appropriate format and layout to present the content.

Your report must include the following:

1. Summarise the business domain of the medical practice.

Critically analyse the supplied information, then determine and outline the business requirements.

Create a System Context Diagram identifying the system boundaries.

Develop the functional requirements of the database:

* + What specific operations will the database perform? For example, produce a listing of appointments for a given practitioner on a given date.

**Submit the following for Part 1:**

* Client requirements report

## Part 2: Design the database

Develop a database design document for the client using the [Gelos report template](https://share.tafensw.edu.au/share/items/02285ff1-cfb2-4af4-b402-fdc23bf4bf11/0/?attachment.uuid=3c6a096c-b36f-4cb1-b0fe-f4a64dca7b83) (GE\_Report\_template.dotx) that includes the following items.

Note: You must follow the naming conventions as outlined (Naming-Conventions.pdf).

### Task 1

Using an appropriate Data Modelling tool, develop a Chen Entity Relationship Diagram (Chen ERD) that enforces the business rules of the Medical Practice and addresses the approved functional requirements identified in Part 1 of this assessment. Ensure that your Chen ERD indicates the following:

* All entities necessary to implement the business rules and the functional requirements of the Medical Practice
* The relationships between the entities, indicating their:
  + connectivity
  + cardinality
  + optionality.

### Task 2

Using a word processor, develop a Relational Data Model (RDM) that extends the Chen ERD that you developed in Part 2 Task 1 and indicates the following:

* Each table required, including:
  + its name
  + all attribute (or column) names
  + its Primary Key constraint
  + its Foreign Key constraints, indicating the referenced table
  + any Alternate key(s) the table may require or use.
* Normalisation of the RDM to *fourth normal form* *(4NF)*.

### Task 3

Develop a data dictionary for the database describing, for each table, the following meta-data:

* The table name
* The attribute (column) names
* A description of the contents of the attribute
* The data type of each attribute
* The format of the attribute’s data
* The range of the attribute’s data (if any)
* Whether the attribute is required (or nullable)
* Whether the attribute is a primary key, foreign key or alternate key
* The table that any foreign key attribute references.

Sample data dictionaryUse the ‘Sales System – Sample Data Dictionary’ below as a guide to the development of your data dictionary.

Figure 1: Sales system sample data dictionary

### Task 4

Using an appropriate data modelling tool, develop a Crow’s Foot Entity Relationship Diagram (CF ERD) that integrates the Chen ERD (developed in Part 2 Task 1), the RDM (developed in Task 4 above) and the data dictionary (developed in Part 2 Task 3). Compare the initial normalisation and ensure all documents are consistent.

Ensure that your CF ERD indicates the following:

* Each of the tables required for the database including:
  + the name of the table
  + the columns in the table
  + the primary key
  + the foreign key(s)
  + any alternate key(s)
  + the data type of each column.
* The relationships between the tables including their:
  + connectivity
  + cardinality
  + optionality.
* The normalisation of the database to *fourth normal form (4NF).*

**Submit the following for Part 2:**

* Database design document including:
  + Chen entity relationship diagram
  + relational data model
  + data dictionary
  + Crow’s Foot entity relationship diagram.

## Part 3: Validate data model

You will participate in a role play, which will be observed by your Teacher/Assessor or can be digitally recorded and submitted as evidence.

Your demonstration will be used as part of the overall evidence requirements of the unit.

You should refer to the list of criteria provided in the Observation Checklist to understand what skills you need to demonstrate in this section of the assessment. This Checklist outlines the Performance Criteria, Performance Evidence and Assessment Conditions your Teacher/Assessor will be marking you on.

### The role play scenario

As the ICT Technician, you need to meet with the Medical Practice Manager (the client) to discuss the database design and submit your report for approval.

### Role of the student being assessed

During the role play you must demonstrate listening and questioning techniques, speaking concisely where relevant. Follow the Gelos Communication Procedure.

1. Validate the data model with the client.
2. Ask for feedback on the data model and respond appropriately.
3. Submit your requirements report to the client to obtain final approval.

### Role of the person in supporting role

Ask a colleague or another student to act as the Medical Practice Manager (the client). Make sure they have the scenario instructions to work from. Ensure there is enough information so that they can effectively contribute to the role play. This person must provide responses in the context of the scenario.

### Time allowed

The role play should take approximately 10-15 minutes to complete.

## Part 4: Resolve issues

A new trainee at Gelos has designed a database for a client, Mount Pleasant Soccer Club. The Software Development Team Leader, Christina Kaiser, has given some feedback that the design is not correct; she has asked you to check their design and update the model as required.

You have been supplied with the client requirements (ClientRequirements\_MtPleasantSoccerClub\_AK\_20191013.docx) and your co-worker's ERD (ERD\_MtPleasantSoccerClub\_MH\_20191102.pdf). You need to ensure the database design is normalised as much as possible before it is implemented, however you also have to fit it in around your workload of database design and development for another client.

1. Use the [Task planner template](https://share.tafensw.edu.au/share/items/02285ff1-cfb2-4af4-b402-fdc23bf4bf11/0/?attachment.uuid=835f8127-6e40-4e9a-b7a7-cbd9fd039eed) (GE\_Task-Planner\_template.docx) to cover how you and the trainee will efficiently achieve the necessary tasks to complete the database, along with your current workload.
2. Normalise the data and redevelop the ERD, reconciling any differences.
3. Write an email using the [Gelos email template](https://share.tafensw.edu.au/share/items/02285ff1-cfb2-4af4-b402-fdc23bf4bf11/0/?attachment.uuid=2a6ed3d4-ca14-427f-8583-ceb6bcb08c1b) (GE\_Email-template.docx) to provide written feedback to your co-worker on their database design. Negotiate with them to complete other tasks in developing the database, taking into account their capabilities.

**Submit the following for Part 4:**

* Task planner
* Normalised ERD
* Email to co-worker

## Observation checklist

The observation checklist will be used by your Teacher/Assessor to mark your performance in Part 3. Use this checklist to understand what skills you need to demonstrate in the role play scenario. The checklist lists the assessment criteria used to determine whether you have successfully completed this assessment event. All the criteria must be met. Your demonstration will be used as part of the overall evidence requirements of the unit. The Teacher/Assessor may ask questions while the demonstration is taking place or if appropriate directly after the task/activity has been completed.

Table 2 Observation checklist

| Task # | Task/Activity performed | S | U/S | Assessor comments (Describe the student’s ability in demonstrating the required skills and knowledge) |
| --- | --- | --- | --- | --- |
| **1** | Validates data model with client |  |  | *Date of observation:*  *Assessors are to record their observations in enough detail to demonstrate their judgement of the student’s performance against the criteria required.*  Q1 *Enter question to support observation* *(Optional)*  *Comments/responses*  Q2 *Enter question to support observation* *(Optional)*  *Comments/responses* |
| **2** | Spoke concisely and listened to and questioned client to obtain and respond to client feedback |  |  |  |
| **3** | Submitted data model to client for final approval, following communication protocols |  |  |  |

## Assessment feedback

*NOTE: This section must have the Teacher/Assessor and student signature to complete the feedback. If you are submitting through the TAFE NSW online learning platform, your Teacher/Assessor will give you feedback via the platform.*

### Assessment outcome

Satisfactory

Unsatisfactory

**Assessor feedback**

Has the assessment declaration for this assessment event been signed and dated by the student?

Are you assured that the evidence presented for assessment is the student’s own work?

Was reasonable adjustment in place for this assessment event?

*If yes, ensure it is detailed on the assessment document.*

*Comments*:

### Assessor name, signature and date

### Student acknowledgement of assessment outcome

*Would you like to make any comments about this assessment?*

### Student name, signature and date