2814ICT – DATA MANAGEMENT
7003ICT – DATABASE DESIGN
School of Information & Communication Technology
Trimester 1, 2021

Assignment Part 1:
Designing a Database for BigM

Aims

To gain experience in designing a database using Entity Relationship Diagram (ERD), Normalisation, and Relational Database modelling techniques.

Learning Objectives

In the process of this assessment task you will:

- plan, schedule and execute project tasks with a view to improving your personal and group productivity;
- gain awareness of the typical challenges related to the design of practical databases;
- learn that database design is an iterative process; and
- use the ERD, Normalisation techniques, and Relational models to develop elegant logical models for a database.

Due date:	Week 6, 23 Apr Fri 5:00 pm One submission per group, file named as 'a1-<Student_ID>.pdf'. Any student's ID in the group is fine. Each group member will have a short presentation or viva.
Late submission:	Any submission after the due date will receive **a deduction of 10% per day**. Standard university policy will apply for all late submissions. See the course website/profile for detail.
Marks:	(a) Group submission: a total 100 marks and it is worth 7% out of the total assessment, plus (b) individual viva/presentation: 3% out of the total assessment.
Extensions:	An extension will only be **considered** with supporting documentation from a health professional **and** if the problem/illness occurred **within the week prior to the due date**. If an extension is granted the extension will then equal the number of days specified on the doctor's certificate, with a *maximum limit of five (5) working days*.
Authorship:	This assignment is a **Group assignment** and it shall be completed by **the students in each group** only. The final submission must be identifiably the work of the individual group members. Breaches of this requirement will result in an assignment not being accepted for assessment and may result in the offending student or students being required to present before the Disciplinary Committee.

Introduction

The proprietors of BigM have approached you and asked if you could design a database to help them manage their business. The management has commissioned you (in your capacity as a Database Management System consultant) to analyse, design and develop an appropriate conceptual data model and relational database schema, based on the following information gathered about the current business activities.

Business Rules (for both 2814ict and 7003ICT students):

- BigM operates stores in many cities in Australia. Stores are referenced by store number. BigM also keeps store name, phone, fax, email for each store.
- Each store has several departments, for example, finance, accounts, sales, customer service etc. A department can appear in many stores. For each department, there is a department ID, department name, phone, and e-mail address.
- Each department has several employees. For each employee, BigM keeps a record of their employee ID, first name, last name, phone, date of birth, start date of his/her work, hourly rate, annual salary, and tax file number.
- Each store is managed by an employee as a store manager and each department is supervised by an employee. The department supervisor is also the supervisor for all the staffs within that department.
- Each store may be assigned a supervising store where all training, payroll, server application and help desk are located.
- BigM sells different products like CDs, cloths, computers, etc. For each product it stores product number, product description, product size and price.
- Customer may place orders in the store. Customer details are always taken at each order. A customer is referenced by a customer number, customer first & last names, and phone number, if available.
- A customer may order more than one product at a time, and they may order multiple copies of the same product. BigM also records the date a product arrives and the date when it is picked up by the customer. Note that these dates may be different for each product.

Additional business rules for **7003ICT** students only:

- Each supervising store generates pay slips for all staffs (in this store and other stores being supervised) on a fortnightly basis. For each pay slip, the store records a pay ID, supervising store ID, employee ID, pay date, number of hours and the gross payment.
- An inventory of the number of each product in each store is kept. BigM keeps track of the quantity of each product that is on order, as well as the number currently available in each store.

BigM understands that they may not have provided you with sufficient information. If you need to make assumptions about their organisation, please ensure that you record them.

Assessable Tasks

a) Group Submission

From the BigM business requirements specified above, prepare a document according to the followings:

1. Use the supplied template for your Assignment submission.
2. An appropriate *title page* that includes the signatures of all students in the group and an acknowledgement of all students and staff you have spoken to about the assignment.
3. *A table of contents* and page numbers.
4. A **logical ERD** using the **Crow's Foot** notation only. The diagram should include:
    a) all entities, attributes, and relationships (including names);
    b) primary keys (underlined) and *foreign keys* (italic) identified;
    c) cardinality and modality symbols; and
    d) assumptions you have made, e.g., how you arrived at the cardinality and/or participation for those not mentioned or clear in the business description, etc.
5. **Normalisation** of the relations which identifies:
    a) covert each table to a relation schema;
    b) dependency diagram or functional dependencies for each relation;
    c) the *level* of *Normalisation* achieved for each relation; and
    d) the *reasons* for any relation that is **NOT** maintained in 3NF.
6. A bibliography, containing all resources used to complete the assignment. If no resources have been used please indicate this appropriately.

b) Individual Presentation / Viva

In the week of the submission due date, students in each group will be required to attend the workshop/lab in-person/online. The tutor will assess each student via a brief presentation / viva.

Assessment Criteria and Marking Overview

Task a: The Group Submission	**Marks**
Presentation How clear and well-presented your submission is.	**10**
ERD Adherence to the standard of the course, assumptions made, inclusion of correct primary and foreign keys, appropriate entities, relationships, and attributes.	**60**
Normalisation Appropriate interpretation of each normal form, arguments for leaving the schema in the normal form you consider optimal.	**30**
Total	**100**
Out of 7% of the total assessment	**7**

Task b: Individual Presentation / Viva	**Marks**
Correct answers to questions related to the assignment / submission.	**3**
Sub-total	**3**
Out of 3% of the total assessment	**3**