Faculty of Engineering & Built Environment
School of Electrical Engineering and Computing
COMP1140: Database and Information Management

Assignment 1: Mega Pizza Project – Requirement Analysis and Conceptual Design

Draft Due in class week 4

***Due**: 10pm, Friday, 17th July 2020*

WORTH 15% of final course assessment mark.

1. Background

Mega Pizza is a pizza outlet in Newtown. After years of managing the records manually, *Mega Pizza* has decided to computerise its records. You are tasked to design a database for the shop.

The proposed database system is developed in various modules, including requirements analysis, conceptual database design, logical database design, and physical database design. In this assignment 1, you are required to develop user requirements specification and the conceptual database model for Mega Pizza's database based on the business requirements provided in this document and related discussions in lectures.

Your lecturer will act as your client and you can query them for possible information and clarifications.

2. Main Features and Business Requirements

Order Processing

Mega Pizza takes orders via phone as well as through walk-in customers. Mega Pizza provides both delivery and pickup services. When a customer orders, the customer's phone number is entered to the system along with the id of the staff taking the order. If the customer has previously ordered, the name and address appear on the screen. The customer is then asked for his/her name and address, and then the order is taken. If the customer has not ordered before or if the name and address given do not correspond with what are recorded in the computer, a new customer record is created and the order is taken. For each phone order, the time the call was answered as well as the time the call was terminated is recorded. For each walk-in order, the time the customer walks in is recorded.

For a phone order, after the order has been taken, a verification process occurs whereby the staff dials the number given and confirms the order with the customer. If it is not confirmed, the customer is recorded as a hoax and the order is kept on hold (if and until the customer calls back in which case the verification process takes place before hoax is removed and order goes through).

Each order contains date of order, the items ordered, quantity of each item, price of each item, total amount due, payment method, order status, type (phone/walk-in), and description. If the payment is via card, a payment approval number is recorded. For a phone order, if the order is a pickup order, the pickup time is recorded; if the order is a delivery order, the delivery time and address and the driver who delivered the order are recorded.

Menu Items, Ingredients and Suppliers

Each item in the menu has an item code (unique), name, size and a current selling price. An item in the menu is made up of a number of ingredients. The ingredients and quantities used for the item are recorded in the database.

Each ingredient has a code (unique), name, type, description, stock level at current stocktake period, date last stocktake was taken, suggested current stock level, reorder level, and a list of suppliers who supply the ingredients. A supplier can supply many ingredients. Each ingredient can be supplied by many suppliers.

A stocktake is taken each week, where the actual levels of ingredients in store are recorded. This is then compared with suggested levels (based on orders for the week). This report is used by the store manager to order ingredients for the following week. Information about ingredient orders needs to be maintained in the database, including order number, date of the order, date received order, total amount, order status, description, quantity and price of all ingredients, supplier number, and ingredient code.

Employees

Employees at the store can be divided into two types: those who work in the shop are paid hourly and those who carry out deliveries are paid by the number of deliveries. For each employee, there is an employee number, firstname, lastname, postal address, contact number, tax file number, bank details (bank code, bank name, account number), payment rate, status, and a description. Drivers also have a driver's license number. Hours are not regular and a record is kept for each time an employee works – a shift (start date, start time, end date, end time). The orders a driver delivers during a shift is kept on the record.

Payment rates for shop workers and drivers are maintained in the database. Employee payments are made for each shift to the employee's bank account. Employee payment record needs to be maintained in the database. It includes gross payment, tax withheld, total amount paid, payment date, payment period start date, payment period end date, and bank details of the employee.

3. Assignment Tasks (individual assignment)

The proposed database system is developed in various modules, including requirements analysis, conceptual database design, logical database design, and physical database design. In this assignment 1, you are required to complete the first two stages of the database design, i.e., to develop user requirements specification and the conceptual database model for the database based on the business requirements provided in this document and related discussions in lectures. There are two parts to be completed in assignment 1 as described below.

You are required to write and submit a report that includes ***all*** the content of the two parts that are described below. The report must be in Microsoft Word.

Part 1: Requirements

In this assignment, you are required to develop a user requirements specification truly fulfilling the data requirements (identify what types of data needs to be stored in the database), transaction requirements (identify the important and frequent database operations – data manipulation and queries), and business rules (which is based on this document and elaborations in lecture) for the Mega Pizza's database mentioned above.

Assignment submission format for the Requirements part: The requirements document **MUST** have the following sections:

- Data Requirements – outlining the major data items
- Transaction requirements – outlining the data manipulation and queries
- Business Rules

Hint: Sample requirements documents are discussed in weeks 2 and 3, and are available in appendices A and B of your main textbook.

Part 2: EER Model with data dictionary

Draw an EER model for the requirements identified in Part 1. The EER Model must be shown in UML notation which is discussed in class and provided in our text. Please note: other notations (other than UML) will NOT be accepted, i.e., zero mark will be given for the EER model part if a notation other than UML is used.

The EER Model should be accompanied with a data dictionary which includes entity type table, relationship type table and attribute table.

Assignment submission format for the EER Model with Data Dictionary part: The document **MUST** have the following sections:

- EER Model
- Documentation – Data dictionary details (description of entities, relationships and attributes)

Sample format for documenting the data dictionary is provided below.

Data Dictionary Format: Use the format described in your main text in documenting the data dictionary. Following provides samples for reference only.

ENTITY TYPES

Entity Name	**Description**	**Aliases**	**Occurrence**
Collection	A collection is a physical collection of items in the library located at a particular physical location		Physical area of the library is divided into a set of collections
…			

RELATIONSHIP TYPES

Entity name	Multiplicity	Relationship	Multiplicity	Entity name
PhysicalCopy	0..*	LocatedIn	1..1	Collection
…				

ATTRIBUTES

Entity Name	Attributes	Description	Data Type & Length	Nulls	Multi-valued	Derived	Default
Student	studentId	A unique id given to every student	char	N	N	N	

Hint: Sample EER models and documentation is provided in Chapter 16 of your text.

The lecturer will discuss the details of the requirements in class as well as act as the client of the system. You need to implement all the details mentioned in lecture as well as described in this document. You are encouraged to ask questions to the lecturer to clarify requirements.

Method of submission: Both softcopy submission and hardcopy submission are required:

- zip all required files into one zip file. The file name MUST be identified by 4 sections: your first name, your surname, and your student number, ass1 e.g., simonlee_1234567_ass1.zip
- It must be submitted to Moodle -> Assessment 1 -> Assignment1 Upload

Note: Ten percent of the possible maximum mark for the assessment item will be deducted for each day or part day that the item is late. This applies equally to week and weekend days. Assessment items submitted more than nine days after the due date will be awarded zero marks.