

Laboratory 2

Title of the Laboratory Exercise: Requirement analysis and data modelling

1. Introduction and Purpose of Experiment

The requirements analysis phase produce both data requirements and functional requirements. The data requirements are used as a source of database design and should be specified as detailed and complete form as possible. In data modelling, the designers first create a conceptual model of how data items relate to each other. By doing this lab, students will be able to perform data modelling of the application.

2. Aim and Objectives

Aim

- To analyse the given application and create a data model

Objectives

At the end of this lab, the student will be able to

- Identify functional and data requirements from problem statement
- Create a data model from the data requirements

3. Experimental Procedure

- Read the problem statement and identify requirements
- Perform data modelling
- Document the requirements and ER diagram

4. Question

Students have to choose one of the following problem statements and develop the software solution. The Course leader is the customer. Contact the Course leader for any clarifications.

1. Hotel management system
2. Student information system
3. Restaurant management system
4. Bank management system

Perform the following based on the problem statement you have chosen

- a. Analyse the given application and list the functional and data requirements
- b. Perform data modelling based on the identified data requirements

5. Calculations/Computations/Algorithms

```
mysql >> select * from problem statements
>>>> where name = "Restaurant Management System" ;
```

Entity Relation Diagram

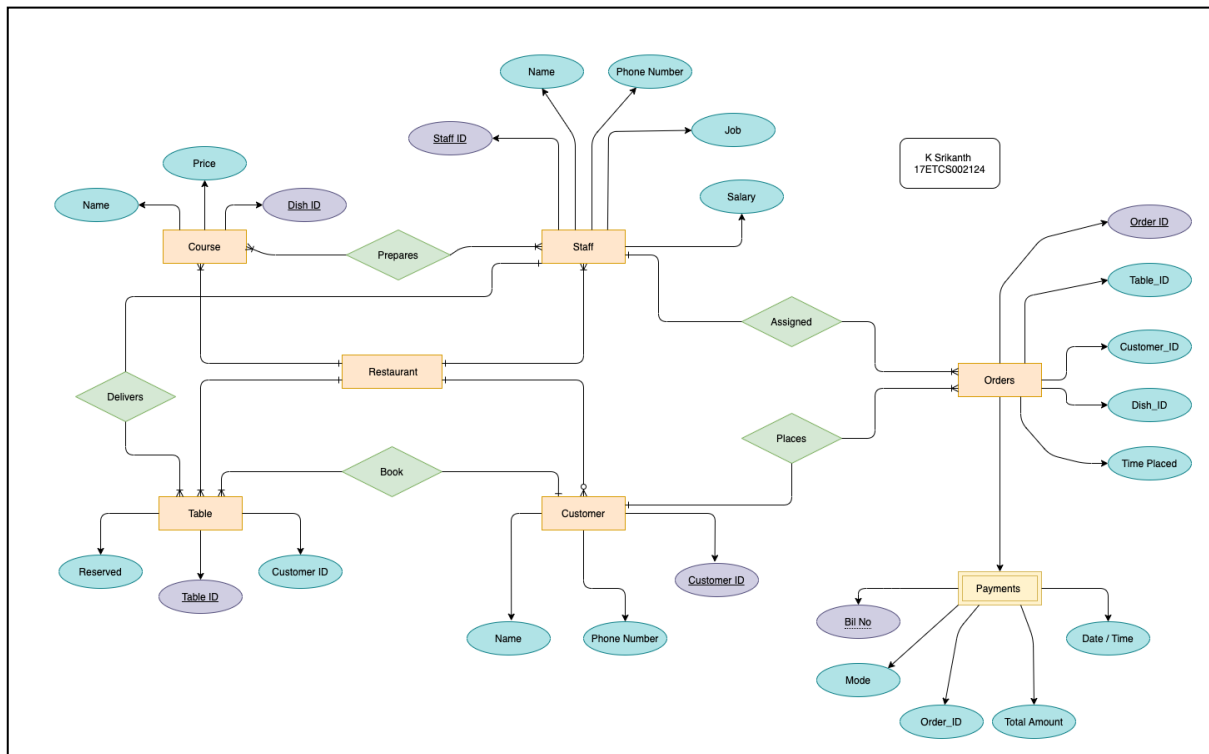


Figure 1 Entity Relation Diagram for Restaurant Management System

6. Presentation of Results

Functional Requirements

Table 1.1 Functional Requirement 1

Requirement Tag	FR1
Requirement Description	The system should have a interface where customer should be able to make reservation for a table
Dependent on Requirements	—
User/System interacting with the requirement	Customer

Table 1.2: Functional Requirement 2

Requirement Tag	FR2
Requirement Description	The customer should be able to order food.
Dependent on Requirements	FR1
User/System interacting with the requirement	Customer

Table 1.3 : Functional Requirement 3

Requirement Tag	FR3
Requirement Description	The system should be able to assign each order to concerned staff.
Dependent on Requirements	FR2
User/System interacting with the requirement	System

Table 1.4 : Functional Requirement 4

Requirement Tag	FR4
Requirement Description	The staff should pass the order to kitchen to process the customer order.
Dependent on Requirements	FR3,FR2
User/System interacting with the requirement	Staff

Table 1.5 : Functional Requirement 5

Requirement Tag	FR5
Requirement Description	The Staff should be able to deliver the order to concerned customer
Dependent on Requirements	FR2,FR3
User/System interacting with the requirement	Staff

Table 1.6 : Functional Requirement 6

Requirement Tag	FR6
Requirement Description	System should be able to keep a record of all customers
Dependent on Requirements	FR1
User/System interacting with the requirement	Staff

Table 1.7: Functional Requirement 7

Requirement Tag	FR7
Requirement Description	The System should be able to cancel reservation with customer ID
Dependent on Requirements	FR1
User/System interacting with the requirement	System

Data Requirements

Table 2.1: Data Requirement 1

Requirement Tag	DR1
Item Name	Customer Name
Item Description (Where/How used)	The Customer enters his/her name to interface.
Item type	String
User/System interacting with the item	Customer

Table 2.2: Data Requirement 2

Requirement Tag	DR2
Item Name	Customer Phone Number
Item Description (Where/How used)	The Customer enters his/her phone number to interface .
Item type	String
User/System interacting with the item	Customer

Table 2.3: Data Requirement 3

Requirement Tag	DR3
Item Name	Table Status
Item Description (Where/How used)	The System will reserves a table to a customer.
Item type	Bool
User/System interacting with the item	System

Table 2.4: Data Requirement 4

Requirement Tag	DR4
Item Name	Staff Name
Item Description (Where/How used)	The Staff enter his/her name to system.
Item type	String
User/System interacting with the item	Staff

Table 2.5: Data Requirement 5

Requirement Tag	DR5
Item Name	Job
Item Description (Where/How used)	The concerned staff will make a role to a staff member.
Item type	String
User/System interacting with the item	Staff

Table 2.6: Data Requirement 6

Requirement Tag	DR6
Item Name	Staff Salary
Item Description (Where/How used)	The concerned staff will allocated salary to a staff member
Item type	Double
User/System interacting with the item	Staff

Table 2.7: Data Requirement 7

Requirement Tag	DR7
Item Name	Staff Phone Number
Item Description (Where/How used)	Staff have to enter his/her phone number into system
Item type	Integer
User/System interacting with the item	Staff

Table 2.8: Data Requirement 8

Requirement Tag	DR8
Item Name	Course Name
Item Description (Where/How used)	Staff have to enter the meal name into system
Item type	String
User/System interacting with the item	Staff

Table 2.9: Data Requirement 9

Requirement Tag	DR9
Item Name	Staff Phone Number
Item Description (Where/How used)	Staff have to enter his/her phone number into system
Item type	Integer
User/System interacting with the item	Staff

Table 2.10: Data Requirement 10

Requirement Tag	DR10
Item Name	Time
Item Description (Where/How used)	System will set time to a customer order.
Item type	Date
User/System interacting with the item	System

Table 2.11: Data Requirement 11

Requirement Tag	DR11
Item Name	Order ID
Item Description (Where/How used)	System will set unique order ID to a customer order.
Item type	Int
User/System interacting with the item	System

Table 2.12: Data Requirement 12

Requirement Tag	DR12
Item Name	Table ID
Item Description (Where/How used)	System will set unique Table ID to a table
Item type	Int
User/System interacting with the item	System

Table 2.13: Data Requirement 13

Requirement Tag	DR13
Item Name	Customer ID
Item Description (Where/How used)	System will set unique Customer ID to a customer.
Item type	Int
User/System interacting with the item	System

Table 2.14: Data Requirement 14

Requirement Tag	DR14
Item Name	Dish ID
Item Description (Where/How used)	System will set unique Dish ID to a course meal .
Item type	Int
User/System interacting with the item	System

Table 2.15: Data Requirement 15

Requirement Tag	DR15
Item Name	Staff ID
Item Description (Where/How used)	System will set unique Staff ID to a staff member.
Item type	Int
User/System interacting with the item	System

Table 2.16: Data Requirement 16

Requirement Tag	DR16
Item Name	Mode
Item Description (Where/How used)	Customer can chooses the mode of payment
Item type	Bool
User/System interacting with the item	Customer

Table 2.17: Data Requirement 17

Requirement Tag	DR17
Item Name	Total Amount
Item Description (Where/How used)	System will generate total amount with customer ID (tagged).
Item type	Int
User/System interacting with the item	System

Table 2.16: Data Requirement 18

Requirement Tag	DR18
Item Name	Bill ID
Item Description (Where/How used)	System will generate Bill ID with customers order (tagged).
Item type	Int
User/System interacting with the item	System

7. Conclusions

“Restaurant Management System ”

The system consists of five entities and one weak entity with five relations among all the entities.

1. Customer

This entity consists of 3 attributes and one of the attribute is a primary key.

A. Customer ID : This attribute is used to stores the customer ID which is auto incremented and this attribute is also our primary key for this entity

B. Customer Name : This attribute contains the name of the customer.

C. Customer Phone number : This attribute contains the phone number of our customer.

2. Table

This entity consists of 3 attributes and one of the attribute is a primary key.

A. Table ID : This attribute is used to stores the table ID which is auto incremented and this attribute is also our primary key for this entity

B. Customer ID : This attribute is a foreign key from customer entity

C. Reserved : This attribute is used to know the status if a table is reserved or not via its table ID.

3. Staff

A. Staff ID : This attribute is used to stores a unique staff ID which is auto incremented and this attribute is also our primary key for this entity

B. Staff Name : This attribute is used to store staff name.

C. Staff Phone Number : This attribute contains the phone number of a staff member.

D. Role : This attribute describes the role of a staff member.

E. Salary : This attribute contains the salary of a staff member.

4. Course

A. Dish ID : This attribute is used to stores a unique Dish ID which is auto incremented and this attribute is also our primary key for this entity

B. Dish Name : This attribute contains the dish name.

C. Dish Price : This attribute contains dish price.

5. Orders

A. Order ID : This attribute is used to stores a unique Dish ID which is auto incremented and this attribute is also our primary key for this entity

B. Customer ID : This attribute contains the foreign key from customer entity

C. Dish ID : This attribute contains the foreign key from Course entity

D. Time Placed : This is attribute contains a time stamp to keep a record of time.

E. Table ID : This attribute contains the foreign key from Table entity

6. Payment

A. Bill No : This is a weak attribute derived from the parent attribute "Order" and this is primary key

B. Order ID : This attribute contains the foreign key from its parent entity

C. Mode : This attribute contains the option where customer can choose to pay via card or cash.

D. Time / Date : This attribute contains the time stamp.

E. Total Amount : This attribute stores the final amount of the customer order.

8. Comments

1. Limitations of Experiments

The limitations of this experiment would be that there is no industry standard notation for developing an E-R diagram and The E-R data model is especially popular for high level but to do low level it's not need to draw ER Diagram

2. Learning happened

Learned to create a model for a database management system.