MIS – 375

Database Management Systems

Second Semester 2023

Final Project

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Table of Content

Report body

Executive Summary

In this report we will represent a technical solution (Database) for Department of Education Sport Stadium that solve their problems by keeping track of all their operations.

Problem Summary:

The Department of Education Sport Stadium has many operations which means there are many data generated on daily basis that need to be stored, managed, protected and shared between stakeholders.

Solution Summary:

Developing and implementing a relational database management system (RDBMS) in MySQL to be a centralized place to store all the information.

The **goals** of the database management system are the following:

remove problems related to data redundancy and inconsistency

solve data isolation problem / provide easy access of data for all stakeholders

solve security problem / solve integrity problems

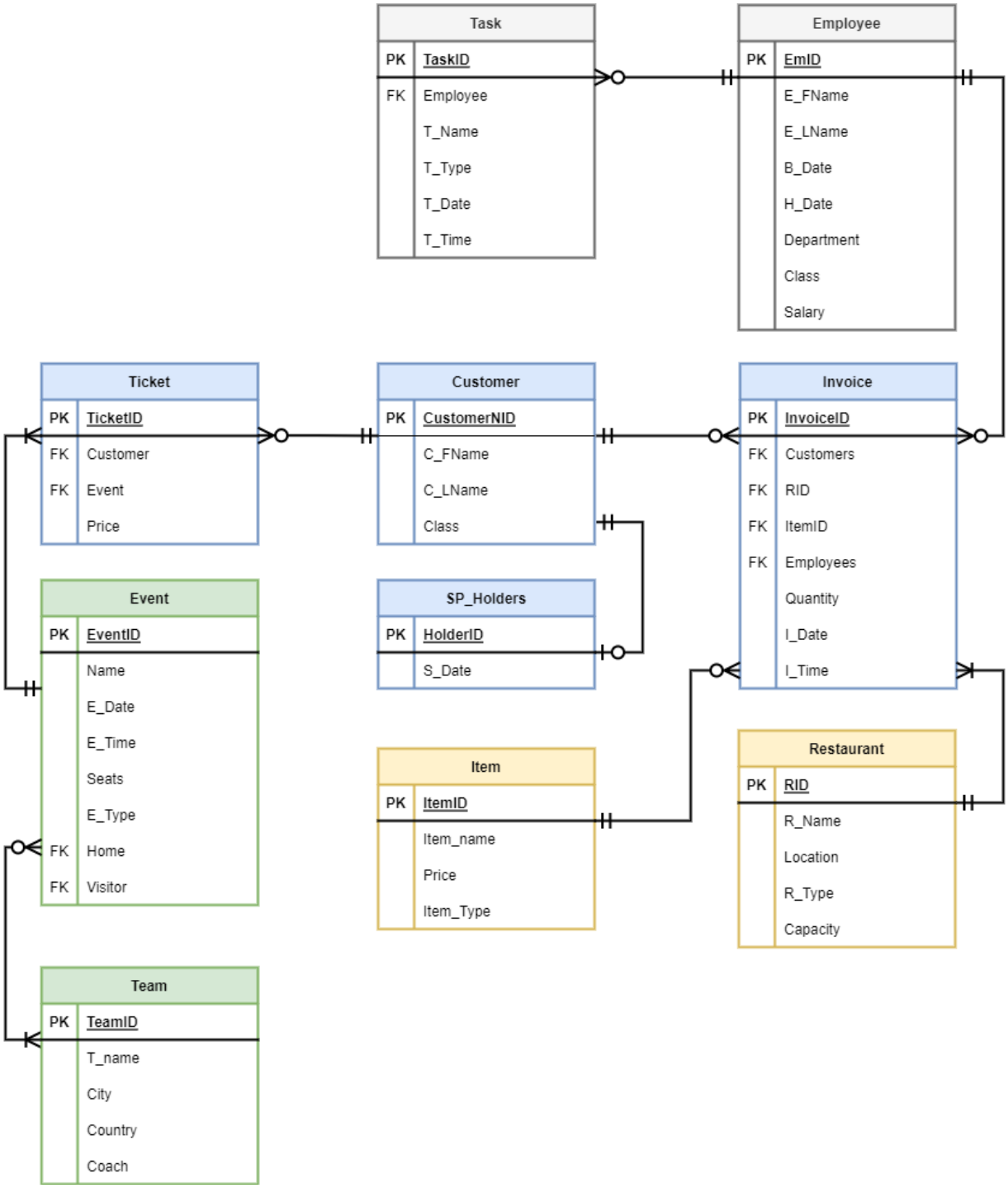
And the **benefits** are:

Increased productivity / Better decision-making

support planning for growth /improve customer relationship management

Better management of human resources / Easier recovery and Backup

Conceptual Database Design: ER Diagram



Logical Database Design

Customer (CustomerNID, C_FName, C_LName, Class)

Invoice (InvoiceID, Customers, RID, ItemID, Employees, Quantity, I_Date, I_Time)

Ticket (TicketID, Customer, Event, Price)

SP_Holders (HolderID, S_Date)

Event (EventID, Name, E_Date, E_Time, Seats, E_Type, Home, Visitor)

Team (TeamID, T_name, City, Country, Coach)

Item (ItemID, Item_name, Price, Item_Type)

Restaurant (RID, R_Name, Location, R_Type, Capacity)

Employee (EmID, E_FName, E_LName, B_Date, H_Date, Department, Class, Salary)

Task (TaskID, Employee, T_Name, T_Type, T_Date, T_Time)

Database Implementation

Customer (CustomerNID, C_FName, C_LName, Class)

Column Name	Key Type	Null/ unique	FK Table	FK Column	Data type	Max length
CustomerNID	PK	NN, U			INT	10
C_FName		NN			VARCHAR	20
C_LName		NN			VARCHAR	20
Class		NN			VARCHAR	4

Invoice (InvoiceID, Customers, RID, ItemID, Employees, Quantity, I_Date, I_Time)

Column Name	Key Type	Null/ unique	FK Table	FK Column	Data type	Max length
InvoiceID	PK	NN, U			INT	10
Customers	FK	NN	Customer	CustomerNID	INT	10
RID	FK	NN	Restaurant	RID	INT	10
ItemID	FK	NN	Item	ItemID	INT	10
Employees	FK	NN	Employee	EmID	INT	10
Quantity		NN			INT	10
I_Date		NN			DATE	
I_Time		NN			TIME	

Ticket (TicketID, Customer, Event, Price)

Column Name	Key Type	Null/ unique	FK Table	FK Column	Data type	Max length
TicketID	PK	NN, U			INT	10
Customer	FK	NN	Customer	CustomerNID	INT	10
Event	FK	NN	Event	EventID	INT	10
Price		NN			DEC	10

SP_Holders (HolderID, S_Date)

Column Name	Key Type	Null/ unique	FK Table	FK Column	Data type	Max length
HolderID	PK	NN, U			INT	10
S_Date		NN			DATE	

Event (EventID, Name, E_Date, E_Time, Seats, E_Type, Home, Visitor)

Column Name	Key Type	Null/ unique	FK Table	FK Column	Data type	Max length
EventID	PK	NN, U			INT	10
Name		NN			VARCHAR	20
E_Date		NN			DATE	
E_Time		NN			TIME	
Seats		NN			INT	20
E_Type		NN			VARCHAR	20
Home	FK	NN	Team	TeamID	INT	10
Visitor	FK	NN	Team	TeamID	INT	10

Team (TeamID, T_name, City, Country, Coach)

Column Name	Key Type	Null/ unique	FK Table	FK Column	Data type	Max length
TeamID	PK	NN, U			INT	10
T_name		NN			VARCHAR	30
City		NN			VARCHAR	30
Country		NN			VARCHAR	30
Coach		NN			VARCHAR	20

Item (ItemID, Item_name, Price, Item_Type)

Column Name	Key Type	Null/ unique	FK Table	FK Column	Data type	Max length
ItemID	PK	NN, U			INT	10
Item_name		NN			VARCHAR	20
Price		NN			DEC	10
Item_Type		NN			VARCHAR	20

Restaurant (RID, R_Name, Location, R_Type, Capacity)

Column Name	Key Type	Null/ unique	FK Table	FK Column	Data type	Max length
RID	PK	NN, U			INT	10
R_Name		NN			VARCHAR	20
Location		NN			VARCHAR	20
R_Type		NN			VARCHAR	20
Capacity		NN			INT	10

Employee (EmID, E_FName, E_LName, B_Date, H_Date, Department, Class, Salary)

Column Name	Key Type	Null/ unique	FK Table	FK Column	Data type	Max length
EmID	PK	NN, U			INT	10
E_FName		NN			VARCHAR	20
E_LName		NN			VARCHAR	20
B_Date		NN			DATE	
H_Date		NN			DATE	
Department		NN			VARCHAR	20
Class		NN			VARCHAR	20
Salary		NN			DEC	10

Task (TaskID, Employee, T_Name, T_Type, T_Date, T_Time)

Column Name	Key Type	Null/ unique	FK Table	FK Column	Data type	Max length
TaskID	PK	NN, U			INT	10
Employee	FK	NN	Employee	EmID	INT	10
T_Name		NN			VARCHAR	20
T_Type		NN			VARCHAR	20
T_Date		NN			DATE	
T_Time		NN			TIME	

Database Implementation in MySQL

NOTE: For the next part please refer to the text files in the zipped folder!

A. Creating the Tables

Solution in (**Tables FV.txt**) File

B. Inserting rows into each Table

Solution in (**Data FV.txt**) File

C. SQL script to delete the entire database

Solution in (**Deleting.txt**) File

D. SQL script to delete the data in the tables but retain the Table structure

Solution in (**Deleting.txt**) File

Note : All queries are working in MySQL 5.6

Tables (After creating and inserting rows)

Note : the following images are just a sample , please refer to the **zipped folder**

CustomerNID	C_FName	C_LName	Class
1000000001	Ahmed	Ahmed	NSPH
1000000002	Mahmud	Monir	SPH
1000000003	Mohammed	Assaf	SPH
1000000004	Omar	Tawfik	NSPH
1000000005	Ehab	Mohsen	NSPH
1000000006	Majed	Salem	SPH
1000000007	Salim	Saad	SPH

RID	R_Name	Location	R_Type	Capacity
6000001	Rest1	Section_1	concession stand	0
6000002	Rest2	Section_1	sit-down	50
6000003	Rest3	Section_1	sit-down	30
6000004	Rest4	Section_1	concession stand	0
6000005	Rest5	Section_2	concession stand	0
6000006	Rest6	Section_2	sit-down	50
6000007	Rest7	Section_2	sit-down	40

ItemID	Item_name	Price	Item_Type
7000001	Pepsi	4	Drink
7000002	Burger	26	Main dish
7000003	Fries	15	Snack
7000004	Gummies	9	Snack
7000005	Pop Corn	12	Snack
7000006	Pizza	30	Main dish

TaskID	Employee	T_Name	T_Type	T_Date	T_Time
8000001	9000001	Task_1	Complete	2019-01-01	10:30:12
8000002	9000001	Task_2	Complete	2019-01-01	11:30:12
8000003	9000002	Task_3	Complete	2019-11-01	12:30:12
8000004	9000003	Task_4	Complete	2019-12-04	13:30:12
8000005	9000004	Task_5	Complete	2018-01-01	10:30:52
8000006	9000005	Task_6	Complete	2017-01-01	10:30:35

HolderID	S_Date
1000000002	2019-02-01
1000000003	2018-04-15
1000000006	2019-07-30
1000000007	2017-08-04
1000000009	2023-01-01
1000000012	2023-01-15

TeamID	T_name	City	Country	Coach
5000001	Team one	Jeddah	Saudi Arabia	Ali Ahmed
5000002	Team Two	Jeddah	Saudi Arabia	Salem Ali
5000003	Team Three	Jeddah	Saudi Arabia	Talal khaled
5000004	Team Four	Makkah	Saudi Arabia	Jaber Ali
5000005	Team Five	Taif	Saudi Arabia	Belal Ahmed
5000006	Team Six	kuwait	kuwait	Mohammed Salem

EmID	E_FName	E_LName	B_Date	H_Date	Department	Class	Salary
9000001	Ahmed	Ali	1990-05-01	2019-01-09	Ticketing	Staff	7000
9000002	Ahmed	khaled	1990-04-02	2019-01-15	Ticketing	Staff	7000
9000003	Ahmed	Salem	1991-04-02	2018-01-15	Ticketing	Staff	7000
9000004	Ali	Salem	1982-04-02	2014-01-15	Ticketing	Manager	12000
9000005	Mohammed	shaker	1991-04-02	2018-01-15	Food Service	Staff	7000
9000006	Mohammed	Bkr	1991-09-02	2017-01-15	Food Service	Manager	11000

TicketID	Customer	Event	price
300001	1000000001	400030	40
300002	1000000002	400030	40
300003	1000000005	400027	56
300004	1000000005	400028	55
300005	1000000005	400026	56
300006	1000000008	400020	41

EventID	Name	E_Date	E_Time	Seats	E_Type	Home	Visitor
400001	Event_1	2020-01-25	23:00:00	2220	basketball	5000001	5000006
400002	Event_2	2020-03-22	18:25:00	6600	volleyball	5000012	5000010
400003	Event_3	2020-11-12	13:15:00	6700	volleyball	5000011	5000008
400004	Event_4	2020-10-04	11:30:00	2101	tennis	5000008	5000007
400005	Event_5	2020-05-03	09:30:00	2400	tennis	5000005	5000001
400006	Event_6	2020-10-15	20:30:00	2300	tennis	5000004	5000002

InvoiceID	customers	RID	ItemID	Employees	Quantity	I_Date	I_Time
2000001	1000000001	6000001	7000001	9000005	15	2020-03-17	17:30:41
2000002	1000000001	6000002	7000002	9000013	61	2020-03-17	14:44:41
2000003	1000000001	6000003	7000003	9000014	42	2020-03-17	19:38:41
2000004	1000000002	6000005	7000004	9000015	13	2020-05-11	13:31:41
2000005	1000000003	6000004	7000005	9000016	21	2020-09-17	17:30:41

Querying in MySQL

Note : the following Queries and images are just for illustration , please refer to the **zipped folder ,** Solution in (**Queries FV.txt**) File

```
-- Query A

-- Average ticket price report

SELECT Customer AS "Customer ID", AVG(price) AS "Average Ticket
price"

From Ticket

Group by Customer;
```

Customer ID	Average Ticket price
1000000001	66.0000
1000000002	60.5000
1000000003	66.0000
1000000005	65.7500
1000000008	45.3333
1000000009	96.0000
1000000010	193.0000

```
-- Query B

-- List of Employees ordered by hire date

Select E_FName AS "First Name" , E_LName AS "Last Name",
Department,
H_Date AS "Hire Date"

From Employee

Order by H_Date ASC ;
```

First Name	Last Name	Department	Hire Date
Saleh	shaker	Gift Shop	2013-01-30
Ali	Salem	Ticketing	2014-01-15
Jaber	Ahmed	Security	2014-05-04
Hamza	Ali	Maintenance	2015-05-04
Ayman	Ali	Food Service	2016-06-09
Mohammed	Bkr	Food Service	2017-01-15

```
-- Query C

-- list with total number of employees in each department


Select Department ,COUNT(Department) AS "Total number of
Employees"

From Employee

Group by Department

Order by Department;
```

Department	Total number of Employees
Food Service	7
Gift Shop	2
Maintenance	2
Security	2
Ticketing	4

```
-- Query D

-- list of all sporting events with Number of Customers in
Attendance

Select Event.Name, Event.E_Type AS "Sport_Type", Event.Home AS
"Home Team ID",

Event.Visitor AS "Visitor Team ID",

COUNT(Ticket.TicketID) AS "Number of Customers in Attendance"

From Event

JOIN Ticket

ON Event.EventID = Ticket.Event

Group by Ticket.Event

Order by Event.E_Date ASC ;
```

Name	Sport_Type	Home Team ID	Visitor Team ID	Number of Customers in Attendance
Event_30	volleyball	5000011	5000005	4
Event_1	basketball	5000001	5000006	2
Event_9	soccer	5000003	5000012	2
Event_28	basketball	5000003	5000005	3
Event_21	soccer	5000010	5000003	1
Event_2	volleyball	5000012	5000010	1
Event_26	basketball	5000011	5000005	1
Event_20	basketball	5000011	5000005	2
Event_5	tennis	5000005	5000001	2
Event_27	soccer	5000011	5000001	2

```
-- Query E

-- list of all the managers with their Salary

Select concat(E_FName,"   ", E_FName) AS "Manager Name",

Department,

CONCAT(FORMAT(Salary, 2)," ",'SR') AS Salary

From Employee

Where Class = "Manager"

Order by Salary DESC;
```

Manager Name	Salary	Department
Saleh Saleh	16,000.00 SR	Gift Shop
Hamza Hamza	14,000.00 SR	Maintenance
Ali Ali	12,000.00 SR	Ticketing
Mohammed Mohammed	11,000.00 SR	Food Service
Jaber Jaber	10,000.00 SR	Security

```
-- Query F

-- list of all foods on March 17th 2020

Select Item.Item_name AS "Food Name", Item.Item_Type,

Concat(FORMAT(Item.Price, 2), " " , "SR")AS Price,

SUM(Invoice.Quantity) AS " Total Quantity Sold ",

Invoice.Quantity * Item.Price AS "Total Sales  "

From Item

Join Invoice

ON Item.ItemID = Invoice.ItemID

Where Invoice.I_Date = "2020/03/17"

Group by Invoice.ItemID;
```

Food Name	Item_Type	Price	Total Quantity Sold	Total Sales
Pepsi	Drink	4.00 SR	15	60
Burger	Main dish	26.00 SR	61	1586
Fries	Snack	15.00 SR	42	630
Red Bull	Drink	11.00 SR	71	781

```
-- Query G

-- List with customers who have only attended one sporting event

Select Customer.CustomerNID AS "Customer ID",

Customer.C_FName AS "First name",

Customer.C_LName AS "Last name",

Event.E_Type As "Event Type"

From Customer

Join Ticket

ON Customer.CustomerNID = Ticket.Customer

Join Event

ON Ticket.Event = Event.EventID

Group By Customer.CustomerNID

Having COUNT(Ticket.Customer) = 1;
```

Customer ID	First name	Last name	Event Type
1000000003	Mohammed	Assaf	volleyball
1000000009	Sara	Ahmed	tennis

```
-- Query H

-- list of the season pass holder With the expiration date

Select SP_Holders.HolderID AS "Holder ID",

Customer.C_FName AS "First Name",

Customer.C_LName AS "Last Name",

DATE_ADD(SP_Holders.S_Date, INTERVAL 1 YEAR) AS "the Expiration
Date",

Count(Ticket.TicketID) AS "Number of attended events"

From SP_Holders

Join Customer

ON SP_Holders.HolderID = Customer.CustomerNID

Join Ticket

ON Customer.CustomerNID = Ticket.Customer

Group By Ticket.Customer;
```

(image in the next page)

Holder ID	First Name	Last Name	the Expiration Date	Number of attended events
1000000002	Mahmud	Monir	2020-02-01	2
1000000003	Mohammed	Assaf	2019-04-15	1
1000000009	Sara	Ahmed	2024-01-01	1
1000000016	Khaled	Sami	2023-04-01	2
1000000017	Ghada	Fadi	2024-06-01	2
1000000018	Mohab	Saaed	2024-09-01	2

```
-- Query I

-- list of the teams that have played at the stadium (Team Seven
did not play)

Select Team.TeamID AS "Team ID", Team.T_name AS "Team name",
Team.City, Team.Country, Team.Coach

From Team

join Event

On Event.Home = Team.TeamID

Group By Team.TeamID

Having Count(Event.EventID) > 0;
```

Team ID	Team name	City	Country	Coach
5000001	Team one	Jeddah	Saudi Arabia	Ali Ahmed
5000002	Team Two	Jeddah	Saudi Arabia	Salem Ali
5000003	Team Three	Jeddah	Saudi Arabia	Talal khaled
5000004	Team Four	Makkah	Saudi Arabia	Jaber Ali
5000006	Team Six	kuwait	kuwait	Mohammed Salem
5000008	Team Eight	Doha	Qatar	khaled Salem
5000010	Team Ten	Dubai	UAE	Mohammed Ahmed
5000011	Team Eleven	Manama	Bahrian	Mohammed Hamza
5000012	Team Twelve	Dubai	UAE	Mohammed Hassan

```
-- Query j

-- list of employees total sales Exclude less than 500SR
(Employee 9000015 < 500)


Select Employee.EmID AS "Employee ID", Employee.E_FName As
"First Name",


Employee.E_LName As "Last Name",


Invoice.Quantity,


SUM(Item.Price*Invoice.Quantity ) AS "grand total of food item
sales"


From Employee


Join Invoice


On Employee.EmID = Invoice.Employees


Join Item


On Invoice.ItemID = Item.ItemID


group by Employee.EmID


Having SUM(Item.Price*Invoice.Quantity ) > 500


Order by SUM(Item.Price*Invoice.Quantity ) DESC;
```

(image in the next page)

Employee ID	First Name	Last Name	Quantity	grand total of food item sales
9000016	Hattan	Abdullah	2	5264
9000017	Akram	Ali	4	4369
9000013	Ayman	Ali	2	2306
9000005	Mohammed	shaker	15	2143
9000014	Ashraf	Abas	42	2096

Views in MySQL

Note : the following Query and image are just for illustration , please refer to the **zipped folder ,** Solution in (**View FV.txt**) File

```
-- Creating view for Employees

Create View Employee_view AS

Select Employee.EmID AS "Employee ID",

Employee.E_FName AS "First Name",

Employee.E_LName AS "Last Name",

Task.T_Name AS "Task Name",

Task.T_Date AS "Task Date",

Task.T_Time AS "Task Time" ,

Task.T_Type AS "Task Type"


From Employee

Join Task

ON Employee.EmID = Task.Employee

Where T_Type = "Complete";


Select * from Employee_view;
```

(image in the next page)

Employee ID	First Name	Last Name	Task Name	Task Date	Task Time	Task Type
9000001	Ahmed	Ali	Task_1	2019-01-01	10:30:12	Complete
9000001	Ahmed	Ali	Task_2	2019-01-01	11:30:12	Complete
9000002	Ahmed	khaled	Task_3	2019-11-01	12:30:12	Complete
9000003	Ahmed	Salem	Task_4	2019-12-04	13:30:12	Complete
9000004	Ali	Salem	Task_5	2018-01-01	10:30:52	Complete
9000005	Mohammed	shaker	Task_6	2017-01-01	10:30:35	Complete
9000006	Mohammed	Bkr	Task_7	2015-05-01	14:30:15	Complete