DATABASE MANAGEMENT SYSTEM PROJECT

Worked by : Argela Milo / SWE II

Abstract

In this project I have done a simple visualization of the database management system of a Gym. This is meant to show all the data of the components of the system and how they relate to each other. In this way the organization and control of the data will be more efficient and less confusing.

"Power Mode" Gym is located not only in Tirana but also in 3 other cities such as Durres, Elbasan and Vlore. For each gym center there is one manager. In order for clients to be part of the gym they firstly need to make a payment and buy a membership. The payment transactions are going to be stored in the system and also the information of membership name, price and duration also. In this way the clients can see from the system the membership details and which membership to choose. Each client will be trained by one instructor and currently at the gym work 5 instructors distributed in all cities where Power Mode Gym operates.

This system will not only help with data maintenance but also will make managerial tasks way easier. The whole purpose of this project is to understand the use of different programs and techniques to understand how a database management system is created and how to create Entity Relationship Diagrams, Relational Schemas and SQL.

Introduction

I chose the gym as a business for my project because I have always been curious about how management works there and thanks to this project I have come up with a general idea. The system I have created records the data of staff and clients starting from name, surname, age, gender, contacts and BMI value (for clients only). Since our gym operates in different cities then each gym in the respective city has a unique identification number and also a respective manager in each city. It is widely known that for fitness clients it is usually necessary to get protein and this I thought to include as an option in my gym. The system will record the data of each protein that will be sold to our gym.

Firstly, I did a draft of all the work starting from the business main points to focus and then asked my friend which owns a personal gym to explain me the most important parts of the gym to include in the project. The project work had started since the October when we were firstly introduced to the topic until now that we have learned the most important lesson in order to fulfil the project requirements effectively. After I

understood better which were the requirements I started with the
ERD and RS where resulted 8 entities and tables. All of the data was then added to the SQL part when I saw better how the system was created and how it looked.

In the end this system will help the manager of the gym to get daily reports and to manage the work between employees a lot easier, making them more coherent with what is happening at the gym.

The purpose of this project is :

1. To learn how to store and organize the data of Gym in database. **2.**
To keep track of the data stored in the database.
3. To make the collection of daily/monthly/yearly reports more efficient and easier. **4.** To be coherent if the gym is making profits or not.

Goals of this project :

1. To make the work of staff easier.
2. To search efficiently the data.
3. To monitor the staff tasks in record time.
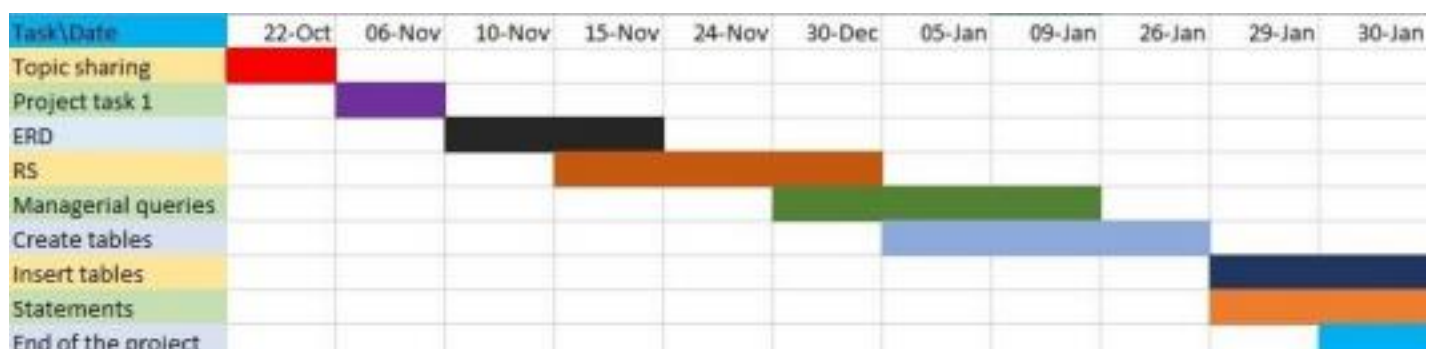**4.** To gain knowledge in this field.

Business Description

Power Mode Gym

The gym is located in cities Tirana, Durres, Elbasan and Vlore. Employees who work at each gym are managers and instructors. Each gym has respectively one manager and 5 instructors which are distributed in all cities. Currently in the gym of Tirana and Durres there are 3 clients, in Vlore and Elbasan there are 2 clients. Clients need to choose one of the 5 membership types which are: One day, Classic, Classic Plus, Elite, Elite Plus and Golden, and after they have chosen which membership they want, they need to do the payment in order to be registered to the gym. An extra option is the use of the proteins which are got from the protein suppliers.

GANTT CHART

This is how I have worked in period of time starting from the start of November until the last of January.

Task\Date	22-Oct	06-Nov	10-Nov	15-Nov	24-Nov	30-Dec	05-Jan	09-Jan	26-Jan	29-Jan	30-Jan
Topic sharing	■										
Project task 1		■									
ERD			■								
RS				■							
Managerial queries						■					
Create tables								■			
Insert tables										■	
Statements										■	
End of the project											■

The scope of the project

The period of time we have worked on this project is almost 3 months. We were firstly introduced to the project topic and were requested to choose our business. In all the lectures we have learned how to create and use ERD, RS and SQL so we were very well prepared.

Processes/Operations supported by the proposed database

The database will show :
1. Records of all clients which are registered at the gym.
2. All the payment data, if the clients have paid or not.
3. The Gym's profits for each gym.
4. Reports of instructor's salary.

List of the managerial queries the manager wants to know:

1. First and last name of the instructor whose salary is higher than the average of all salaries.

2. First name and last name of clients who are overweight (BMI>25).

3. Gym ID, name of the gym, first and last names of the managers who work at each gym. **4.** The salary of Danjela Hoxha.

5. The total profit from payments.

6. The membership type with price more than 60$.

7. The membership ID which is sold 2 or more times.

8. The client's ID that hasn't made the payment yet.

9. The membership ID, membership type and their prices from most expensive to least.

Entity Relationship Diagram (ERD)

ERD of the gym visualizes all the entities which are : MANAGER, GYM, INSTRUCTOR, CLIENT, MEMBERSHIP, PAYMENT, REGION and PROTEIN SUPPLIERS. Each entity is connected with other entities using many-to-many or one-to-many relationships. Entities have their attributes and all of them have at least one unique attribute which is going to be a primary key of the table. Some of the entities have composite attributes also.

ENTITIES AND THEIR ATTRIBUTES

1. GYM

=> gym_id : unique identification number of the gym (since there are more than one) =>
gym_name : name of the gym

2. REGION

=> region_id : unique identification number of the regions where gyms are located =>
region_name : name of the region

3. MANAGER

=> manager_id : unique identification number of the manager
=> name (composite) : first and last name of the manager =>
phone_nr : contact number of the manager

4. INSTRUCTOR

=> instructor_id : unique identification number of the instructor
=> name (composite) : first and last name of the manager =>
phone_nr : contact number of the manager
=> salary : salary of the instructor

5. MEMBERSHIP

=> membership_id : unique identification number of the membership
=> membership_type : type of the membership (name) => duration :
duration of the membership
=> price : price of the membership

6. PAYMENT

=> payment_id : unique identification number of the payment =>
payment_date : date when the payment transaction is done **7.**

CLIENT

=> client_id : unique identification number of the client
=> name (composite) : first and last name of the client =>
age : age of the client
=> gender : gender of the client
=> phone_nr : contact number of the client
=> BMI : BMI value of the client

8. PROTEINS

=> protein_id : unique identification number of the protein
=> protein_name : name of the protein the gym buys =>
price : price of the protein

Relationships between entities :

1. Manage (1:1)

A manager manages only one gym.
A gym is managed only by one manager.

2. Located (1:M)

A gym is located in one region.

One region can have more than one gym located in it.

3. Train (1:M)

One client can be trained by only one instructor.

One instructor can train more than one client.

4. SoldVia (M:N)

Each membership is sold through one or more payments.

Each payment is made for one or many memberships.

5. OccurredAt (1:M)

Many payments are done in one gym.

In a gym there are done many payments.

6. Buys membership (1:M)

One client does one or more payments.

Each payment is done only by one client.

7. Supply (M:N)

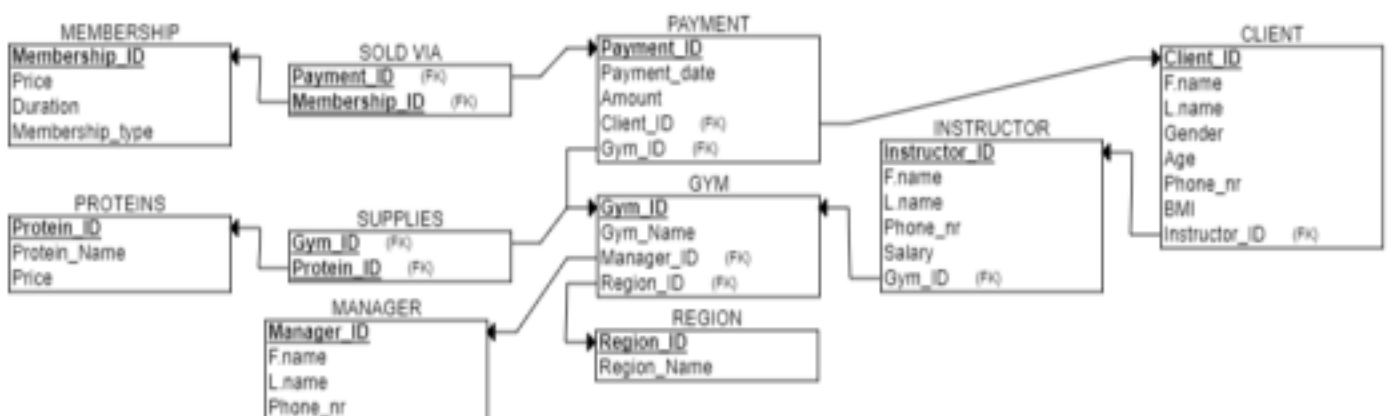Each protein supply one or more gyms.

Each gym is supplied by more than one protein.

8. Work (1:M)

One instructor can work only at one gym.

At one gym can work more than one instructors.

Relational Schema

For M:N relationships there is created a table which is connected to both entities and this table will have as foreign keys both primary keys of the entities and these will also be the primary keys for the relationship table. In 1:M relationships the entity which is at the many side will get as foreign key the primary key of the table at the one side.

Foreign keys :

SOLD VIA TABLE => Payment_ID, Membership_ID

PAYMENT TABLE => Client_ID, Gym_ID

CLIENT TABLE => Instructor_ID

INSTRUCTOR TABLE => Gym_ID

SUPPLIES TABLE => Gym_ID, Protein_ID

GYM TABLE => Manager_ID, Region_ID

Conclusion

At this point I have created an efficient database for the Power Mode Gym while storing a large amount of data which is very easy to view and access. This is a very good way to receive all the information needed for clients who do payment transactions and managers who manage the gym and request daily reports. Everything is stored at the certain tables and searching the information is made in record time.

In this way the business will have less problems regarding the management but also will grow its profits.