HACETTEPE UNIVERSITY
COMPUTER ENGINEERING DEPARTMENT

BBM 473 – DATABASE MANAGEMENT SYSTEMS LABORATORY

Implementation of ER Diagram and Relational Schema Phase 1

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GYM MANAGEMENT SYSTEM

Project Definition

This system stores information about trainers, customers, lessons, programs, fitness tools, membership types, exercises and physical alignments. The customers are registered this system with choosing membership type for payment and assigning their age, fat rate, name, surname, weight, height and credit card information. After that, they should choose their trainers.

Customer can purchase lesson but if the quota of lesson is full, it can not be purchased . Trainers may have more than one or zero customer as their trainer and they may give more than one lesson. They only can give that specific lesson if they have profession about it.

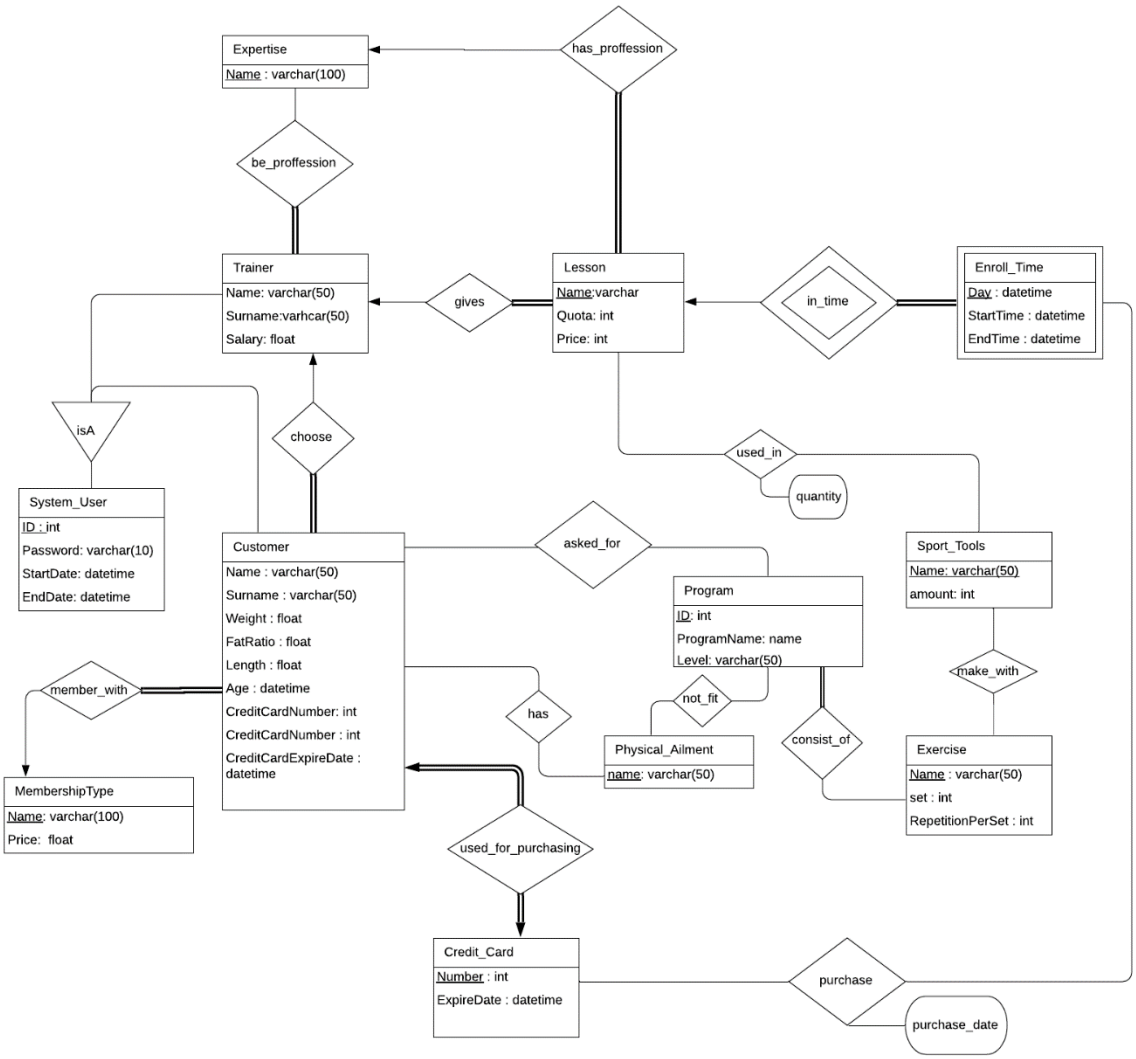
The lessons can be taught in different days like section system. They may have more than one tools to use in the lesson.

The tools are used in customer's programs also (e.g. dumbbells, treadmills etc.).

The programs can be created before request of customer, or vice verse. They actually consist of the exercises, they can have more of them. If a customer has a physical alignment (may have more than one), they can't get some of these programs.

Basic Designed ER Diagram

It's just added to make our design more understandable (To show weak entities, merged relations in schema designing etc.)



Maintenance After Proposal 0

While making design of that system, I detailed about 2 things:

- A customer can not get the program which it's not fit with him/her ailment
- A trainer can not give a lesson if he/she doesn't have a profession about it.

The Role of Entity & Relationship Sets

This design of the system includes 11 entity schemas and 8 relationship schemas.

NOTE: Our design contains just 1 one-to-one relationship in order to avoid redundancy and provide suitability as real-world database applications. Using one more one-to-one relationship causes awkwardness and inconvenience in our design.

These entities are:

- **System User:** This entity provides to store information of user ids, their passwords to enter the system and their enter to the gym and quit from the gym.
- **Trainer:** This entity provides to store trainer's id (primary key), name, surname, salary and expertise. The trainer id is inherited from system user.
- **Customer:** This entity provides to store customer's id (primary key), their trainer's id (foreign key), their membership type (primary key), name, surname, weight, length, age, fat ratio, credit card number(foreign key) and it's expire date.
- **Membership Type:** This entity is used to know that customer's membership type like 3 months, 1 year or monthly. It includes membership type name (primary key) and its price. This information provides us to know what time does customer's membership will be finished.
- **Program:** This entity includes their id (primary key) and their difficult level. Customers only could request exercise program from their trainers. They get it under permission of own trainer.
- **Exercise:** This entity includes their name (primary key), amount of set and repetition per set.
- **Physical Ailment:** It has just a name (primary key). It is used by **Program** and **Customer.** It is used to know, if a customer has some x ailment, it cannot get that program isn't fit into these x ailment.
- **Profession:** It has just a name (primary key). It is used by **Trainer** and **Lesson.**
- **Lesson:** It has a name (primary key), trainer id (foreign key), profession name (foreign key), quota and price.
- **Enroll Time:** It is actually a weak entity. It has a day (distinctive key) and lesson name. Lesson name and day are primary key together.
- **Sport Tools:** It has amount and name (primary key). It's used by **Lesson** and **Customer**.

And relations are:

- **Be_profession**: It is used between **Profession** and **Trainer.** A Trainer can have more than one profession and at least have one. A profession can belong to more than one trainer.

- **Asked_for**: It is used between **Customer** and **Program.** A customer may get more than one program or none. A program may be gotten by more than one customer or nobody.
- **Has**: It is used between **Customer** and **Physical Ailment**. A customer can have more than one ailment and a physical ailment may be had by more than one customer or nobody.
- **Not_fit**: It is used between **Physical Ailment** and **Program.**
- **Consist_of**: It is used between **Program** and **Exercise**. A program should include at least one exercise and an exercise may be included in more than one program.
- **Make_with**: It is used between **Sport Tools** and **Exercise.** An exercise can be implemented with more than tools or nothing. A sport tool may be in more than one exercises or not.
- **Used_in**: It is used between **Sport Tools** and **Lesson**. It has also amount information of using sport tools in the lesson. A sport tool can be used in more than one lesson or not. A lesson may be taught with more than one tools or not.
- **Purchase**: It is used between **Credit Card** and **Enroll Time**. A customer may have purchased more than one lesson or none. Also purchasing date is stored in this relationship.