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**BIM312**

**DATABASE MANAGEMENT SYSTEMS**

**TERM PROJECT**

PHASE-1

**G9-PNo9:** University Club Membership Database System

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# Phase 1-Step 1:Requirement Analysis

University students' clubs are one of the most important things in the university life as it's also considered as a legacy from the senior students to freshman students sharing with them their experiences. A student club needs a database as much as any other facility as the need of storing data is increasingly necessary.

We think developing this database would actually help us gain real hands-on experience by using a full-fledged database management system and it would be skill boosting and fun experience because it has a good potential.

In our journey of gathering information and requirements for our database, after thinking about the functionalities of this database and consulting some of our friends who manage certain clubs in the university considering them as our customers we came up with following requirements and functions.

## Requirements and Functionalities

This university club membership database stores and keeps track of the club's members, subunits, committees, events and workshops that are organized by the subunits each semester or year. The database will be used by the committee members and sometimes the members to study the club's status, members, events, achievements and goals in order to make future plans and draw a map to achieve the club's short and long term goals.

1. ‌ The system stores each member's unique ID, Name, gender, faculty, department, year, birthdate, phone number, email, address, and status (active or passive member)
2. ‌The members of the club can join subunits which are like sub clubs each subunit is focussed on specific field. Those subunits are managed by some member of the club and each one of them has unique identifier, name and a capacity of members that can join.
3. Subunits organize workshops in which they provide seminars, courses and all other educational activities that can be joined by any member of the club whether he/she is a member of the subunit or not. Each workshop has unique identifier, unique Name (even if the workshop is organized several times if will labeled as name + the year/month it took place), type which indicates what kind of workshop it is, starting date, ending date, time, tutor/specialist and a capacity of members that can join.
4. ‌ Subunits also organize events; an event can be organized by one or more subunits also a subunit can organize one or more events which are attended by any member. An event has a unique identifier, Name, date and a time.
5. ‌ The club has committees like administrative board, economic board and so on. Which also have their unique identifier, unique name and a foundation date. Each committee has members and a manager. A member can only join one committee.
6. We want to keep truck of the budget that is issued to each subunit on different times for different purposes. We store each budget's amount, type (type can be a descriptive word for the reason that budget was issued) and date.

## Some of the Possible Queries:

1. How many members does the club have?
2. Who are the managers of the subunits?
3. What events took place in a given date?
4. How many members attended a given event?
5. Who are the members of a specific committee?
6. What is the budget spent on a given SUBUNIT?
7. What are the workshops organized by a given subunit?
8. When did a given member started their duty as a manager?
9. For how long a given member was a manager of a given subunit?
10. Who is the most active member (calculating how many events and workshops they attended)

# Phase 1 – Step 2: Entity-Relationship (E/R) Diagram

## Entity Sets:

* MEMBER (from the 1st point)
* SUBUNIT (from the 2nd point)
* COMMITTEE (from the 5th point)
* EVENT (from the 4th point)
* WORKSHOP (from the 3rd point)
* BUDGET (from the 6th point)

## Atributes & Primary Keys:

* MEMBER **(MemID**, Name, Sex, Faculty, Department, Year, Bdate, Phone, Email, Address, State)
* SUBUNIT **(SubID**, **Name**, Capacity)
* COMMITTEE (**ComID**, **Name**, StartYear)
* EVENT (**EvID**, **Name**, date, Time)
* WORKSHOP (**WID**, **Name**, Type, Tutor, Time, Capacity, StartDate, EndDate)
* BUDGET (BudID, Amount, Type, IssuedDate)

## Relationships:

* **MANAGES**, a 1:1 relationship type between MEMBER and COMMITTEE. MEMBER participation is partial. COMMITTEE participation is total. Users didn’t mention that in their requirements but we found it appropriate to add the StartDate and EndDate attributes to this relationship type.
* **HAS A,** a 1:N relationship type between MEMBER and COMMITTEE. MEMBER participation is partial. COMMITTEE participation is total as users indicate in the requirements list. After consulation with users we decided to add Position attribute (which describes member’s position in the committee) to this relationship type.
* **MANAGES**, a 1:1 relationship type between MEMBER and SUBUNIT. MEMBER participation is partial. SUBUNIT participation is total. We found it appropriate to add the StartDate and EndDate (indicates when a member started and finished their duty as the manager of the sub unit) attributes to this relationship type like we did it in MANAGES relationship between MEMBER and COMMITTEE.
* **HAS A**, a M:N relationship type between MEMBER and SUBUNIT. MEMBER participation is partial. SUBUNIT participation is total. This indicates that a SUBUNIT can have several MEMBERs and a MEMBER can join several SUBUNITS as understood from the requirements.
* **ORGANIZES**, a 1:N relationship type between SUBUNIT and WORKSHOP. SUBUNIT participation is partial. WORKSHOP participation is total, after consulting the users we decided that a SUBUNIT can organize several Workshops that are related to their field of interest and only one SUBUNIT is enough to organize a workshop.
* **TAKES**, a M:N relationship type between MEMBER and WORKSHOP. MEMBER and WORKSHOP participations are partial; this indicates that several members can take/participate in several workshops.
* **ORGANIZES**, a M:N relationship type between SUBUNIT and EVENT. SUBUNIT participation is partial. EVENT participation is total, that indicates that several SUBUNITs might team up to organize an event and of course a single SUBUNIT can organize many events as required.
* **ATTENDS**, a M:N relationship type between MEMBER and EVENT. MEMBER and EVENT participations are both partial; several members can attend several events.
* **IssuedTo**, a 1:N relationship type between SUBUNIT and BUDGET, which is also the identifying relationship for the weak entity type “BUDGET”, considering a budget entity may only make sense and be worth storing if its issued to some SUBUNIT as the users pointed out. SUBUNIT participation is partial. BUDGET participation is total.
* **MANAGES**, a 1:N relationship type between MEMBERS and BUDGET, which is also the identifying relationship for the weak entity type BUDGET. It shows that there is a specific member who is responsible of the budget. MEMBER participation is partial. BUDGET participation is total.

## [**E/R Diagram**](https://github.com/RadwanH/University-Club-Membership/blob/main/Diagrams/ER-Diagram.drawio.png?raw=true)

(you click the title to see the diagram on the web of better view / it is attached as a .png file as well)

