Software Requirements Specification

for

Swimming Pool Management Software (SPMS)

Version 1.0 approved

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The purpose of this document is to give a detailed description of the requirements for the Swimming Pool Management Software (SPMS). It will illustrate the purpose and complete declaration for the development of the system. It will explain system constraints, interface and interactions with other external applications.

1.2 Document Conventions

The format of this SRS document is straightforward. Boldface is used for Headings and Subheadings. The remaining document is written in the font 'Times New Roman'.

1.3 Intended Audience and Reading Suggestions

This document is written for those who want to manage a Swimming Pool. The document is intended to be used by the Software Users (Non-Members, Members, Course-Coordinators, Managers, Committee Members, Event Managers and Managers of the Swimming Pool), Documentation Writers, Developers, Project Managers and Testers.

One can get an overview of the Document by going through the Table of Contents and skip to a desired Topic. Otherwise, one can read the Document in the order it is written as it is suitable for understanding the Document and Software.

1.4 Product Scope

The Swimming Pool Management Software is software to be used by a Swimming Pool Club and different people related to it such as Members, Non-Members, Managers, Event-Managers, Course-Coordinators and Committee Members. Its purpose is to smooth the ongoings of the Swimming Pool Club Management and to be more user-friendly than the conventional method of maintaining hard copies of different documents. The main goal of the Software is to save time for all the people using the software as using software is much more efficient than the conventional method. The software also helps the Swimming Pool Club economically in the long term as it is much more efficient to maintain software than to maintain handwritten/printed documents.

1.5 References

[1] IEEE Software Engineering Standards Committee, "IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications", October 20, 1998.

[2] https://en.wikipedia.org/wiki/Software_requirements_specification

2. Overall Description

2.1 Product Perspective

The Swimming Pool Management Software is a software developed to facilitate the ongoings of a Swimming Pool Club. The software will help automate different processes which would take a lot of manhours and manpower if done manually. It helps in managing the different aspects of a Swimming Pool Club such as maintaining the memberships of different customers, managing time slots for different events, courses and competitions. It also makes sure that slots for two different events/courses/competitions don't clash.
Automation of such processes which otherwise would require a humongous amount of manhours is a major motivator for the Product. The Product intends to ease the workload of the management and help them in smoother operation of their Swimming Pool Club..

2.2 Product Functions

By accessing the software, users can perform the following functions. It can be used to do the following activities:

- Apply for membership
- Book Swimming Pool Slots
- Enroll in Swimming Courses
- Participate in Swimming Competitions
- Pay Pool Membership Fees and Competition Participation Fees.
- View Pool Time Table
- Administer the Pool by adding courses, competitions and slots.
- Rescheduling Pool activities.
- Making posts among Pool Members.
- Notify about the changes in Pool Timetable.
- Give remainders to registered users for Pool Activities.

2.3 User Classes and Characteristics

There are six types of users that interact with the system: non-members, members, committee-members, course- coordinators, Event Manager and the Pool manager. Each of these six types of users has different use of the system so each of them has their own requirements.

- A non-member can access the web portal to view Notices and competitions, apply for membership, enroll in courses, participate in swimming competition and buy tickets to a competition.
- A member can access the web portal to view Pool Calendar, cancel his/her membership, enroll in courses, participate in swimming competition, choose pool slots, book pool for activities, and make posts in the forum as well as view notices and public posts made in the forum.
- The manager can approve/disprove proposals of a committee member. In addition, he can approve/disapprove requests for membership, course enrollment and participation in competition
- An Event Manager has all the powers of a committee member. In addition he can also decide the format of the competition.
- A committee member can access the web portal to view Pool Calendar, propose to add/remove/reschedule courses, swimming competitions, pool slots and view both public/private posts from the public forum, put up notices or comment in the forum.
- A course-coordinator can access the web portal to view Pool Calendar, add/remove/reschedule classes of his/her swimming course, view both public/private posts from the public forum, put up notices or comment in the forum.

2.4 Operating Environment

The software is a Web application that also makes use of a relational database. It is designed to work flawlessly and without issues on any major Operating Systems Windows 10/Linux/Mac OS which can smoothly run any modern web browser.

2.5 Design and Implementation Constraints

There will be four major constraints in developing this product:

- The user interface must be intuitive enough so that no training is required by members, non-members, manager, event manager, course-coordinator and committee members.
- A good form of integration between the database and the application.
- Making real-time updates to the database and allowing access at the same time.
- Memory requirements should not be high, a limited amount of memory can cause issues if the database is too large.
- The software and the database will be password-protected so that no unauthorized person can access it.

2.6 User Documentation

A readme.md file will be available with the software along with six types of short presentations which are to be used by the different types of people who will use the software.

2.7 Assumptions and Dependencies

The software will be made with the following assumptions:

- The users have computers with Windows 10/Linux/ Mac installed.
- Users should not tamper/experiment with the source code/executable file of the software.
- The user should have good knowledge about the basic attributes of an object and fill in the details in the forms properly.
- The software requires a printer (optional).

The main dependencies of the working and performance of the software are:

- The python and all other platforms should be functioning properly.
- All the tools on which the software is dependent must be working properly.
- The software will also depend on the database and the interaction of the python application with the database.

3. External Interface Requirements

3.1 User Interfaces

The home screen will contain a login and signup button. On clicking the Login button, users will be provided options to choose from i.e. login via social accounts, username and password etc. After logging in the page will be displayed in accordance with the role of the user. The page for each user will contain the different functionalities which the user can use.

3.2 Hardware Interfaces

Any computer which can run a modern browser will suffice.

3.3 Software Interfaces

Language used :- Python(Flask) for backend and HTML, CSS, JavaScript for frontend
Platform :- Any operating system with a modern browser installed
Database :- SQLite

4. System Features

4.1 Apply for membership: I

4.1.1 Input:

Anyone desiring to be a member of the pool can apply for membership providing details like name, date of birth, address, phone number, photo, medical certificate etc.,..

4.1.2 Output:

The applicant gets his computer generated member id and is notified about his fees.

4.1.3 Process:

The manager verifies the details provided by him and approves/disapproves his application. If it is approved, then the applicant becomes a member and gets his member id. The SPMS database adds the member id to the member list of the swimming pool.

4.2 Enroll in Course :I

4.2.1 Input:

Anyone desiring to enroll in any swimming course will open the SPSM Application to see the list of courses and may apply for enrollment in a course providing details like name, date of birth, address, phone number, photo, medical certificate.

4.2.2 Output:

The applicant gets his computer generated course enrollment id.

4.2.3 Process:

The manager verifies the details provided by him and approves/disapproves his application. If it is approved, then the applicant is enrolled and course enrollment id. The SPMS database adds the enrollment id to the enrollment list of the course I applied for.

4.3 Participate in Competition: I

Swimming competitions will be organized by the Pool Committee once in a while. The event manager decides the format of the competition and its schedule. Events may include freestyle, backstroke, breaststroke, butterfly for 20 m, 50m, 100 m, 200 m for men and women.

4.3.1 Input:

Anyone desiring to take part in any swimming competition will open the SPSM Application to see the list of competition and may apply for a competition providing details like name, date of birth, address, phone number, photo, medical certificate. He can provide his course id if he has taken part in any course.

4.3.2 Output:

The applicant is notified about the participation fees and gets his computer generated participation id. If the applicant has a course enrollment id, then he/she

does not need to pay participation fees.

4.3.3 Process:

The manager verifies the details provided by him and approves/disapproves his application. If it is approved, then the applicant is enrolled and participation id. The SPMS database adds the participation id to the participation list of the participation applied for.

4.4 Spectate Competition:

4.4.1 Input:

Anyone desiring to spectate any competition can open the SPMS Application and buys tickets by providing the number of tickets to be bought.

4.4.2 Output:

The person is given tickets of unique id on payment of required ticket prices.

4.4.3 Process:

Number of available tickets are checked via a computerized procedure and are given to the buyer if tickets are available and tickets prices are paid.

4.5 Book Pool for a Party: I

A member can book the pool for a party or any other event.

4.5.1 Input:

A member desiring to book the pool for party or any other event have to visit SPMS Application and enter the date and time duration for the party.

4.5.2 Output:

If the booking is successful, then that date and time will be reserved in pool calendar with the applicant's member id, the applicant gets a unique booking id and No classes will be held and other members cannot use the pool during the event and they will be notified about that accordingly and requested to book another slot in its place.

4.5.3 Process:

Computerized checking is made if the booking can be granted to the applying member (Booking should be made 2 weeks in advance and the number of bookings made in that month are less than 5) and if it is granted then a booking is made with that member id and the pool calendar is modified and all other pool activities on that day are canceled and all stakeholders are notified via email.

4.6 Cancel a Booking:

4.6.1 Input:

A member desiring to cancel a booking should go to the SPMS Application & enter his unique booking id.

4.6.2 Output:

The booking is canceled and the pool calendar is modified as required.

4.6.3 Process:

The calendarium removes the booking from the pool calendar and redeems the previously canceled events due to the booking and all stakeholders are notified via email.

4.7 Book Pool Slots: I

4.7.1 Input:

A member desiring to book a pool slot must go to the SPSM Application and view the pool calendar and give suitable slots accordingly.

4.7.2 Output:

If his/her request is approved, then he/she gets access to that particular slot or another request is made to choose available slots.

4.7.3 Process:

The Calendarium checks whether the required slot is full or not and thus approves/disapproves of the request accordingly. Also a member can have a maximum of 5 hours allotted per week. If it is approved, then the Calendarium updates the SPMS database and the relevant slot information accordingly.

4.8 Pay Membership fee: I

4.8.1 Input:

A member desiring to pay the pool fees must login to the SPMS Application and then upload the transaction receipt for verification.

4.8.2 Output:

If verification is success the membership status will be updated else reason for will be notified.

4.8.3 Process:

The SPMS database is updated accordingly.

4.9 Cancel Membership:LI

4.4.1 Input:

A member desiring to cancel his/her membership should login to the SPSM Application and click on the cancel membership option after entering his/her member id and attach a document stating his/her reason for cancellation of membership.

4.9.2 Output:

The member id is made invalid, thus canceling his/her membership.

4.9.3 Process:

The SPMS database is updated accordingly, removing his/her member id from the database and any swimming course/ pool slot/ pool event he/she had registered for. The manager is notified about the reason for cancellation.

4.10 Add Pool slot: LIa

4.10.1 Input:

A Pool Manager can enter the SPMS portal with his/her unique id and enter the slot to be added with its timings and details like whether it is meant for all

members or only ladies or children etc...

4.10.2 Output:

A new slot id is generated and appears on the pool calendar and all members are notified about the new slot and its details as well.

4.10.3 Process:

The Calendarium checks if the slot timings are preoccupied or not and if available, then it modifies the pool calendar. The SPMS database generates a new slot id and is updated accordingly.

4.11 Remove Pool slot:LIb

4.11.1 Input:

A Pool Manager can enter the SPMS portal with his/her unique id and enter the slot id to be removed.

4.11.2 Output:

The Pool calendar is modified and all members registered for that slot are notified.

4.11.3 Process:

The Calendarium frees the pool calendar from the slot reservation. The SPMS database deletes the slot and retrieves information about the members registered to notify them about slot cancellation via email.

4.12 Reschedule Pool slot:LIc

4.12.1 Input:

A Pool Manager can enter the SPMS portal with his/her unique id and enter the slot id to be rescheduled with its new timings and details like whether it is meant for all members or only ladies or children etc...

4.12.2 Output:

The Pool calendar is modified and all members registered for that slot are notified.

4.12.3 Process:

The Calendarium checks if the new slot timings are preoccupied or not and if available, then it modifies the pool calendar. The SPMS database is updated accordingly.

4.13 Add Swimming Course:Ia

4.13.1 Input:

A Pool Manager can enter the SPMS portal with his/her unique id and enter the course to be added with its timings and course coordinator id

4.13.2 Output:

A new course id is generated and appears on the pool calendar and all members are notified about the new slot and its details as well.

4.13.3 Process:

The Calendarium checks if the course timings are preoccupied or not and if available, then it modifies the pool calendar. The SPMS database generates a new

course id and is updated accordingly.

4.14 Remove Swimming Course:Ib

4.14.1 Input:

A Pool Manager can enter the SPMS portal with his/her unique id and enter the course id to be removed.

4.14.2 Output:

The Pool calendar is modified and all members registered for that slot are notified.

4.14.3 Process:

The Calendarium frees the pool calendar from the course reservation. The SPMS database deletes the course and retrieves information about the persons registered to notify them about slot cancellation via email.

4.15 Reschedule Swimming Course:Ic

4.15.1 Input:

A Pool Manager can enter the SPMS portal with his/her unique id and enter the slot id to be rescheduled with its new timings.

4.15.2 Output:

The Pool calendar is modified and all members registered for that slot are notified.

4.15.3 Process:

The Calendarium checks if the new course timings are preoccupied or not and if available, then it modifies the pool calendar. The SPMS database is updated accordingly.

4.16 Arrange for Swimming Competitions:I

4.16.1 Input:

A Pool Manager can enter the SPMS portal with his/her unique id and enter the competition to be added with its timings and details.

4.16.2 Output:

A new competition id is generated and appears on the pool calendar and pool Application and all members are notified about the new competition and its details as well.

4.16.3 Process:

The Calendarium checks if the competition timings are preoccupied or not and if available, then it modifies the pool calendar. The SPMS database generates a new competition id and is updated accordingly.

4.17 Modify Membership form:

4.17.1 Input:

The Manager will enter the SPMS Application with his unique id and go to the change membership form option, and make the required changes.

4.17.2 Output:

The membership form is modified.

4.17.3 Process:

The membership form is changed.

4.18 Approve Membership:

4.18.1 Input:

The Manager will enter the SPMS Application with his unique id and view the documents of a person who has applied for membership like medical certificate and approve/disapprove.

4.18.2 Output:

If the manager approves the applicant gets a unique member id.

4.18.3 Process:

On approval, the manager informs the SPMS database that generates a unique member id and adds it to the database with the details of its applicant. The membership id is sent to the applicant via email.

4.19 Propose addition of Pool slot:

4.19.1 Input:

A Pool Committee member can enter the SPMS portal with his/her unique id and start a private discussion to add a slot to be added with its timings and details like whether it is meant for all members or only ladies or children etc...

4.19.2 Output:

When the committee members agree a new slot id is generated and appears on the pool calendar and all members are notified about the new slot and its details as well.

4.19.3 Process:

The Manager checks if the slot timings are preoccupied or not and if available, then he adds the slot to the pool calendar. The SPMS database generates a new slot id and is updated accordingly.

4.20 Propose removal Pool slot:

4.20.1 Input:

A Pool Committee member can enter the SPMS portal with his/her unique id and start a private discussion for the slot to be removed.

4.20.2 Output:

When the committee agrees the Pool calendar is modified and all members registered for that slot are notified.

4.20.3 Process:

The Manager frees the pool calendar from the slot reservation. The SPMS database deletes the slot and retrieves information about the members registered to notify them about slot cancellation via email.

4.21 Propose reschedule Pool slot:

4.21.1 Input:

A Pool Committee member can enter the SPMS portal with his/her unique id and start a private discussion for the slot id to be rescheduled with its new timings and details like whether it is meant for all members or only ladies or children etc...

4.21.2 Output:

When the committee agrees the Pool calendar is modified and all members registered for that slot are notified.

4.21.3 Process:

The Manager checks if the new slot timings are preoccupied or not and if

available, then it modifies the pool calendar. The SPMS database is updated accordingly.

4.22 Propose Swimming Course: Lia

4.22.1 Input:

A Pool Committee member can enter the SPMS portal with his/her unique id and start a private discussion for the course to be added with its timings and course coordinator id.

4.22.2 Output:

On the agreement of the committee a new course id is generated and appears on the pool calendar and all members are notified about the new slot and its details as well.

4.22.3 Process:

The Manager checks if the course timings are preoccupied or not and if available, then it modifies the pool calendar. The SPMS database generates a new course id and is updated accordingly.

4.23 Propose removal Swimming Course:lib

4.23.1 Input:

A Pool Committee member can enter the SPMS portal with his/her unique id and start a private discussion for the course id to be removed.

4.23.2 Output:

On the agreement of the committee the Pool calendar is modified and all members registered for that slot are notified.

4.23.3 Process:

The Manager frees the pool calendar from the course reservation. The SPMS database deletes the course and retrieves information about the persons registered to notify them about slot cancellation via email.

4.24 Propose rescheduling Swimming Course:lic

4.24.1 Input:

A Pool Committee member can enter the SPMS portal with his/her unique id and start a private discussion for the slot id to be rescheduled with its new timings.

4.24.2 Output:

When the committee agrees, the Pool calendar is modified and all members registered for that slot are notified.

4.24.3 Process:

The Manager checks if the new course timings are preoccupied or not and if available, then it modifies the pool calendar. The SPMS database is updated accordingly.

4.25 Propose Swimming Competitions:

4.25.1 Input:

A Pool Committee member can enter the SPMS portal with his/her unique id and start a private discussion for the competition to be added with its timings and details.

4.25.2 Output:

On the committee agreement a new competition id is generated and appears on the pool calendar and pool Application and all members are notified about the

new competition and its details as well.

4.25.3 Process:

The Manager checks if the competition timings are preoccupied or not and if available, then it modifies the pool calendar. The SPMS database generates a new competition id and is updated accordingly.

4.26 Select Class timings: Ia

4.26.1 Input:

The course coordinator can enter the SPMS portal with his/her unique id and enter the course timings.

4.26.2 Output:

The course timings appear on the pool calendar and all members are notified about the new slot and its details as well.

4.26.3 Process:

The Calendarium checks if the course timings are preoccupied or not and if available, then it modifies the pool calendar. The SPMS database is updated accordingly.

4.27 Cancel Classes:Ib

4.27.1 Input:

The course coordinator can enter the SPMS portal with his/her unique id and enter the course id and class timings to be canceled. Be removed.

4.27.2 Output:

The Pool calendar is modified and all persons registered for that course are notified via email.

4.27.3 Process:

The Calendarium frees the pool calendar from the course reservation. The SPMS database deletes the class timings and retrieves information about the person registered to notify them about class cancellation via email.

4.28 Reschedule Classes:Ic

4.28.1 Input:

The course coordinator can enter the SPMS portal with his/her unique id and enter the course id to be rescheduled with its new timings

4.28.2 Output:

The Pool calendar is modified and all persons registered for that course are notified.

4.28.3 Process:

The Calendarium checks if the new course timings are preoccupied or not and if available, then it modifies the pool calendar. The SPMS database is updated accordingly.

4.29 Take Extra Classes:Id

4.29.1 Input:

The course coordinator can enter the SPMS portal with his/her unique id and enter the course id and the extra class timings.

4.29.2 Output:

The Pool calendar is modified and all persons registered for that course are notified via email.

4.29.3 Process:

The Calendarium checks if the extra class timings are preoccupied or not and if available, then it modifies the pool calendar. The SPMS database is updated accordingly.

4.30 Post in Portal:

4.30.1 Input:

A member or pool committee members (also includes Course Coordinator and Event Manager) or Manager can enter the SPMS portal with his/her member id and go to the suggestion page and post complaints, suggestions or discussions regarding the pool. He can make the post public or private.

4.30.2 Output:

A post is made with his name on the SPMS portal.

4.30.3 Process:

A public post can be viewed by anyone whereas a private post can be viewed by only pool committee members and course coordinators.

4.31 View Posts in Portal:

4.31.1 Input:

A member or pool committee members (also includes Course Coordinator and Event Manager) or Manager can enter the SPMS portal with his/her member id and view public posts in the portal and give comments in reply to a post which again can be made public or private.

4.31.2 Output:

A post is made with his name on the SPMS portal, if he/she makes a comment.

4.31.3 Process:

A public post can be viewed by anyone whereas a private post can be viewed by only pool committee members and course coordinators.

4.32 Put Notice in Portal:I

4.32.1 Input:

A pool committee members (also includes Course Coordinator and Event Manager) or Manager can enter the SPMS portal with his/her Pool Committee member id and view public/private posts in the portal.

4.32.2 Output:

A notice is put upon the SPMS Application.

4.32.3 Process:

The notice is made visible to everyone visiting the Application.

4.33 Setting Format of event:

4.33.1 Input:

An Event Manager can enter the SPMS portal with his/her Pool Committee member id and set the format of the Event he is in charge of.

4.33.2 Output:

Event format is set and everyone enrolled is notified.

4.33.3 Process: Format of the event is set in the database.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The software should perform smoothly and efficiently. The performance of the software will greatly depend on the processor and speed of accessing data from the database if a large amount of data is stored. The software uses a few computations that are not computationally heavy but are very much dependent on the database and processing and data handling power of the computer if huge data is stored.

5.2 Security Requirements

It ensures that the software is protected from unauthorized access to the system and its stored data. It authenticates users before giving access to data or any other uses.

5.3 Software Quality Attributes

The user interface should be intuitive enough so that the user doesn't face any confusion while using it. It should be easily maintainable and extensible. It should be reliable as it will contain a lot of sensitive information for different users. The authentication system must be correct to prevent unauthorized uses

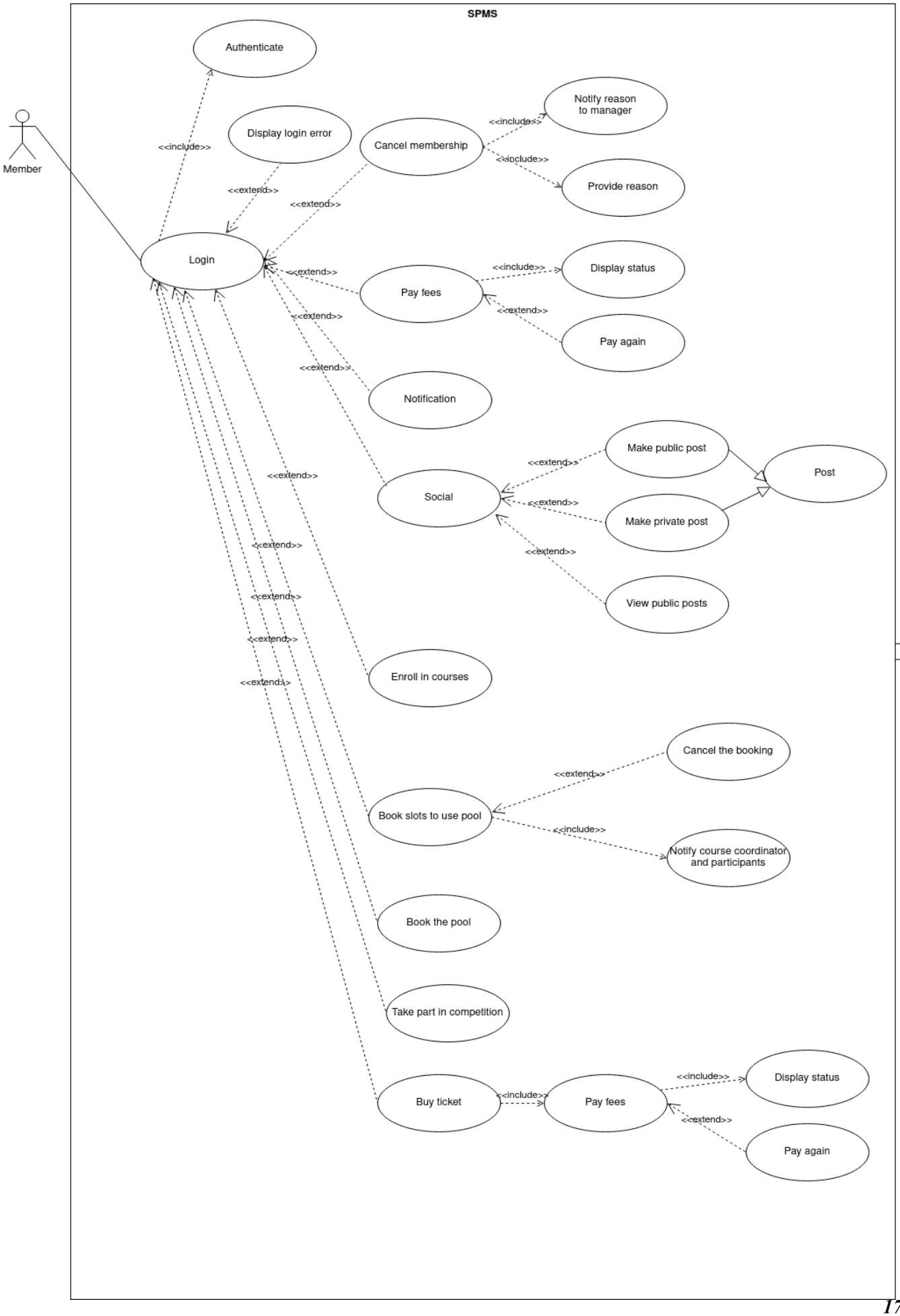
6. Other Requirements

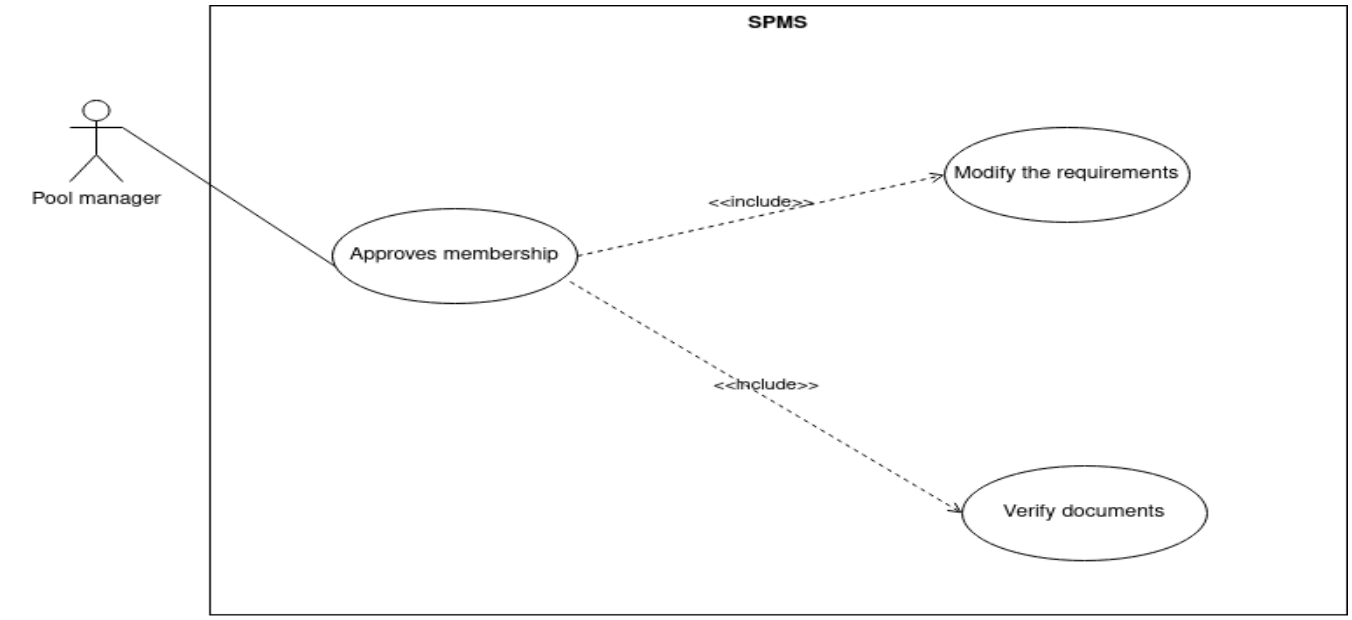
The use of the software will be guided by the rights a user is provided.

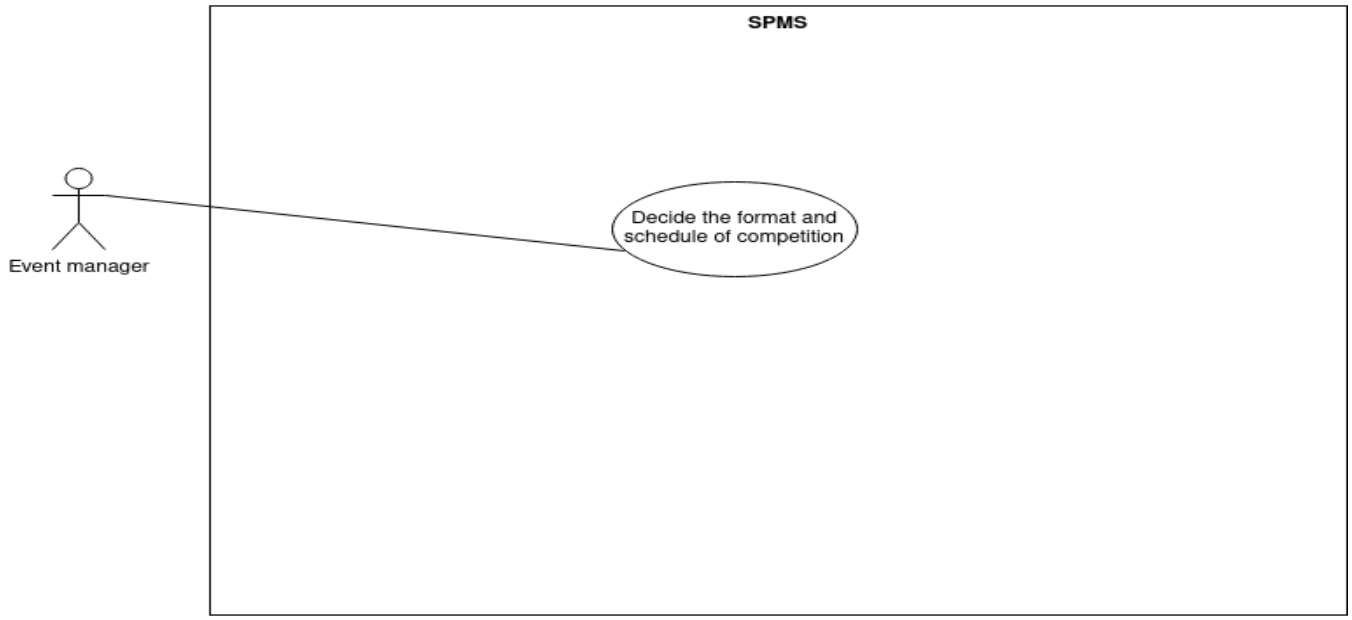
No legal issues must be there with the use of the software. However, the tools used here have some specific licenses. The License terms must be followed to avoid any legal issues in the future. A user manual will also assist the software so that the users can get best out of the software.

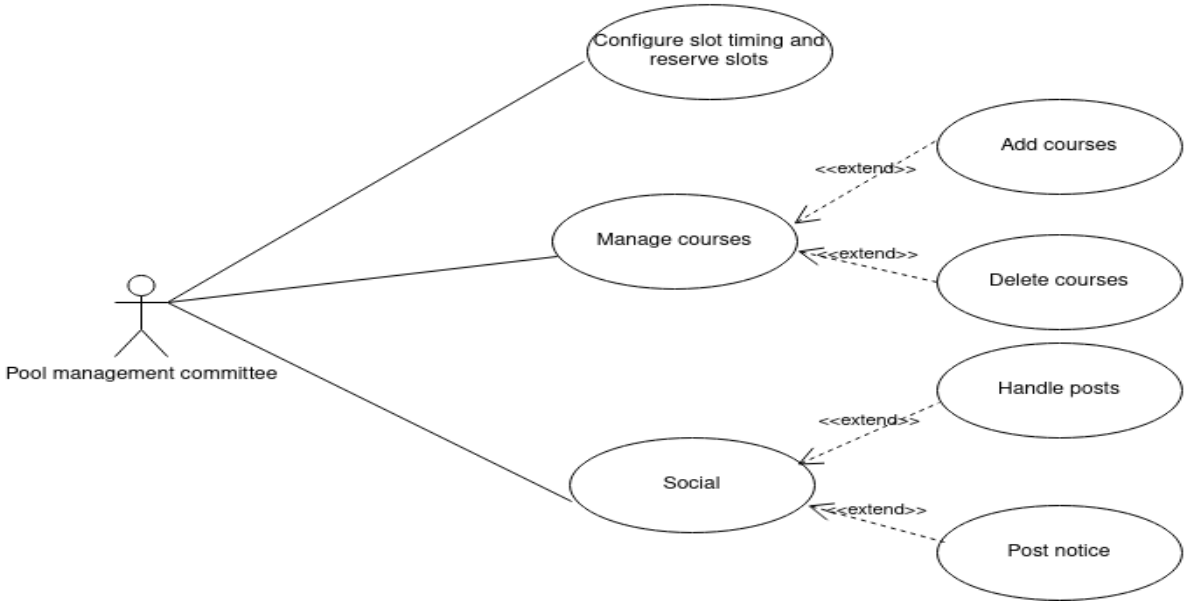
Appendix: Analysis Models

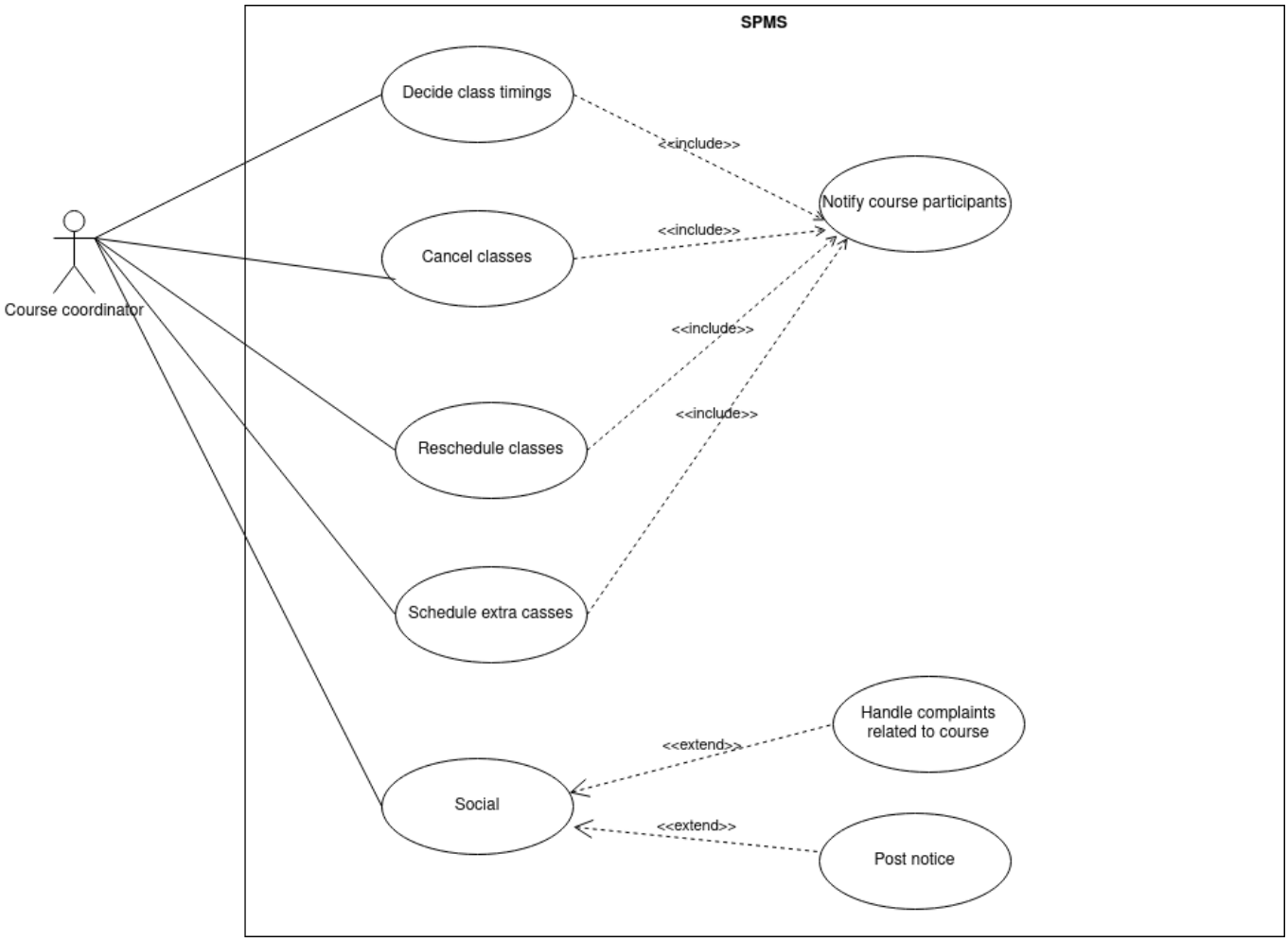
1)Use Case Diagram for SPMS


SPMS
Member
Authenticate
Display login error
Cancel membership
Notify reason to manager
Provide reason
Login
Pay fees
Display status
Pay again
Notification
Social
Make public post
Make private post
Post
View public posts
Enroll in courses
Book slots to use pool
Cancel the booking
Notify course coordinator and participants
Book the pool
Take part in competition
Buy ticket
Pay fees
Display status
Pay again
<<include>>
<<extend>>

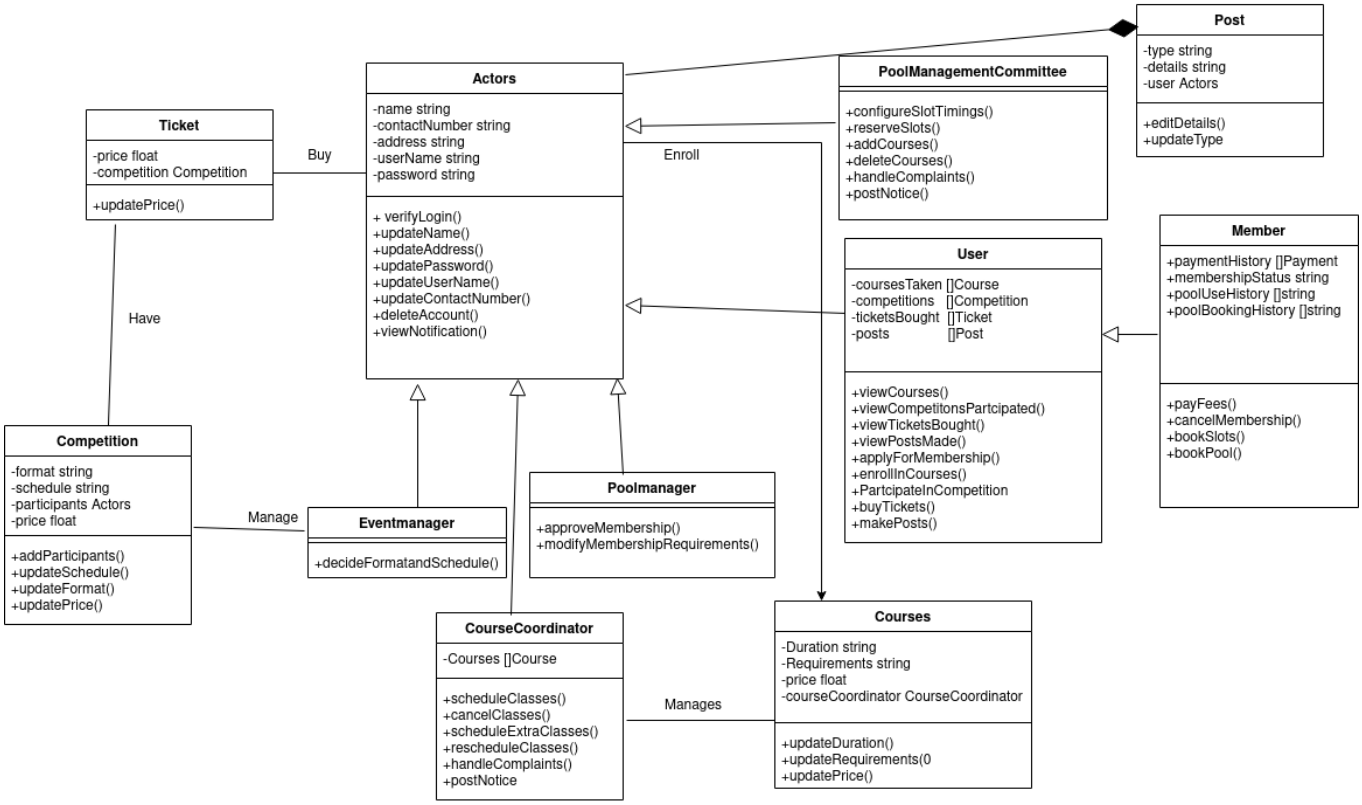

SPMS
Pool manager
Approves membership
<<include>>
Modify the requirements
<<include>>
Verify documents


SPMS
Event manager
Decide the format and schedule of competition

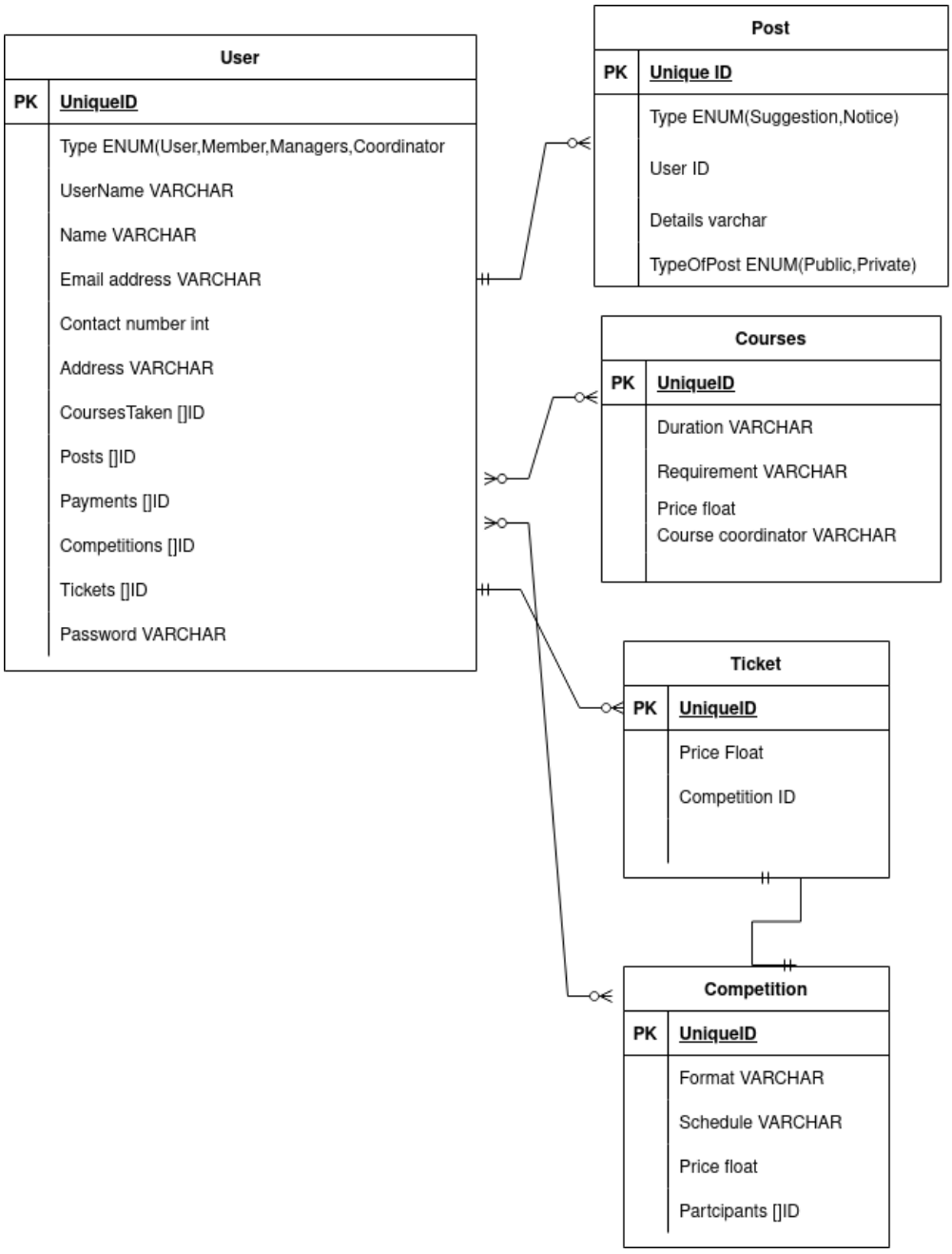

Configure slot timing and reserve slots
Add courses
<<extend>>
Manage courses
<<extend>>
Delete courses
Pool management committee
Handle posts
<<extend>>
Social
<<extend>>
Post notice


SPMS
Decide class timings
Cancel classes
Reschedule classes
Schedule extra casses
Social
Notify course participants
Handle complaints related to course
Post notice
Course coordinator
<<include>>
<<include>>
<<include>>
<<include>>
<<extend>>
<<extend>>

2) Class Diagrams for SPMS



3)ER Diagram for SPMS



Appendix: To Be Determined List

- Can implement live streaming of competition online

Thank You