KAU SV

FINAL REPORT
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VERSION 1

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Phase 1: Project description

1.1 Introduction

The KAU Sports Village is an essential part of King Abdulaziz University. It provides a space for physical activity, entertainment, and various sports, helping to promote a healthy and active lifestyle. However, managing and handling the KAU Sports Village can be challenging, especially with its increasing popularity. To handle these challenges, we should develop a new application for the KAU Sports Village.

This new application will provide many features to improve the experience of using the KAU Sports Village facilities. It will provide users with information on the availability of facilities, event calendars, and class schedules. Users will be able to reserve spaces for various activities, such as basketball courts, fitness rooms, and swimming pools, making it easier to plan to go to the KAU Sports Village.

The application will make users log in using their KAU accounts, providing a more personalized and smooth experience. It will also offer the ability to reserve seats to watch matches and other events. These features will make it easier for users to stay up to date with the latest KAU Sports Village activities and ensure that they have an excellent experience when visiting it.

1.2 Project description and objectives

The project should improve multiple sectors in KAU Sports village by improving the connection between the employees or the students and the village activities, as well as improving and simplifying the GYM experience for the trainers and participants.

Our objective is to increase the connection between KAU employees and students in the sports village by:

1. Increase attendance to the activities that take place in the village such as Saudi university competitions or local championships.
2. Simplifying the process of booking a field or playground for any KAU participant.
3. Increasing participation in any competition available for KAU participants or booking a seat to watch the competition.
4. Decreasing the waiting time to enter the GYM, and reducing the overwork on the couches.
5. Improving the couch's ability to manage and help the participants at the GYM.
6. Improving the GYM participant's results by tracking the food.

1.3 Project team

Faisal Al Ragheeb: team leader.
Abdullah Alharbi
Zayed Mohammed
Faisal Othman
All members participated in all sections.

1.4 Project goals

The purpose of our application is to organize the sports village and make it more accessible to students and university staff. In addition, we intend to achieve the following goals:

- Offering possibilities for students and university employees to join the sports village, as well as making it simple for them to participate in various activities.
- Raising student and university employee turnout by posting the application on university websites and placing advertising in campus corridors.
- reducing congestion at the entrance and exit points.
- Promotes and arranges university events and services in the sports village.

1.5 Scope and sources of domain analysis information

The project aims to improve the experience of the sports village visitors and employees by: gathering information about the sports village and publishing it in one place with a schedule for any competition and all the match details with a map to simplify the process, including a booking system for multiple uses as booking a seat to watch a match or booking a playground or participating in university competitions, for the GYM participants it will include a QR code to enter the GYM and provide a workout plan for each participant with a food tracker to improve the results. The project should be delivered by 2024.

To gain a comprehensive understanding of the University's sports village, it is essential to conduct interviews with stakeholders such as university officials, gym trainers, sports coaches, and other staff members involved in the daily operation of the village. These interviews can provide valuable insights into the challenges associated with the village, the current processes, and opportunities for improvement.

Conducting surveys among current and potential users of the village can also provide valuable insights. These surveys can gather information about the user experience, opinions about the village, and suggestions for improvement. The data obtained from these surveys can be used to enhance the user experience and make informed decisions about the village's future development.

Inspiring from other software that provides the same functionality such as “365 scores” in scheduling the matches, any GYM application that provides a QR code entry system like “fitness time”, in addition to a food tracker like “myfitnesspal”, for booking it depends on the need if it’s a playground or a seat in the stadium we can simulate other simple booking systems for each purpose.

1.6.1 Included

The application provides:

- Log in system
- Maps
- QR code system
- Activity schedule
- Booking system
- Workout plan
- Food tracker

1.6.2 Excluded

- Payment method
- Purchasing sports equipment
- Other branches
- Hiring new staff

Phase 2: Business requirements specifications

2.1 Domain analysis

For the domain analysis it's possible to implement some features from other apps as in "365 scores" we will implement the activities schedule, and "MyFitnessPal" we will implement food tracking, also in "fitness time" we will implement training plan as will as entry QR code.

2.2 Requirements

2.2.1 Functional

- R1: The system should provide the option for the user to log in.
- R2: The system should allow users to register an account.
- R3: The system should allow users to reserve tickets.
- R4: The system should allow users to sort sports by kind.
- R5: The system should allow users to keep track of upcoming activities.
- R6: The system should provide users with access to an interior map of the Sports Village.
- R7: The system should allow users to add their favorite types of sports to their favorites list.
- R8: The system should specify a capacity for each event.
- R9: The system should allow the user to view account information.
- R10: The system should send notifications to the user in case of new activities or events.
- R11: The system should provide the option for the user to log out.

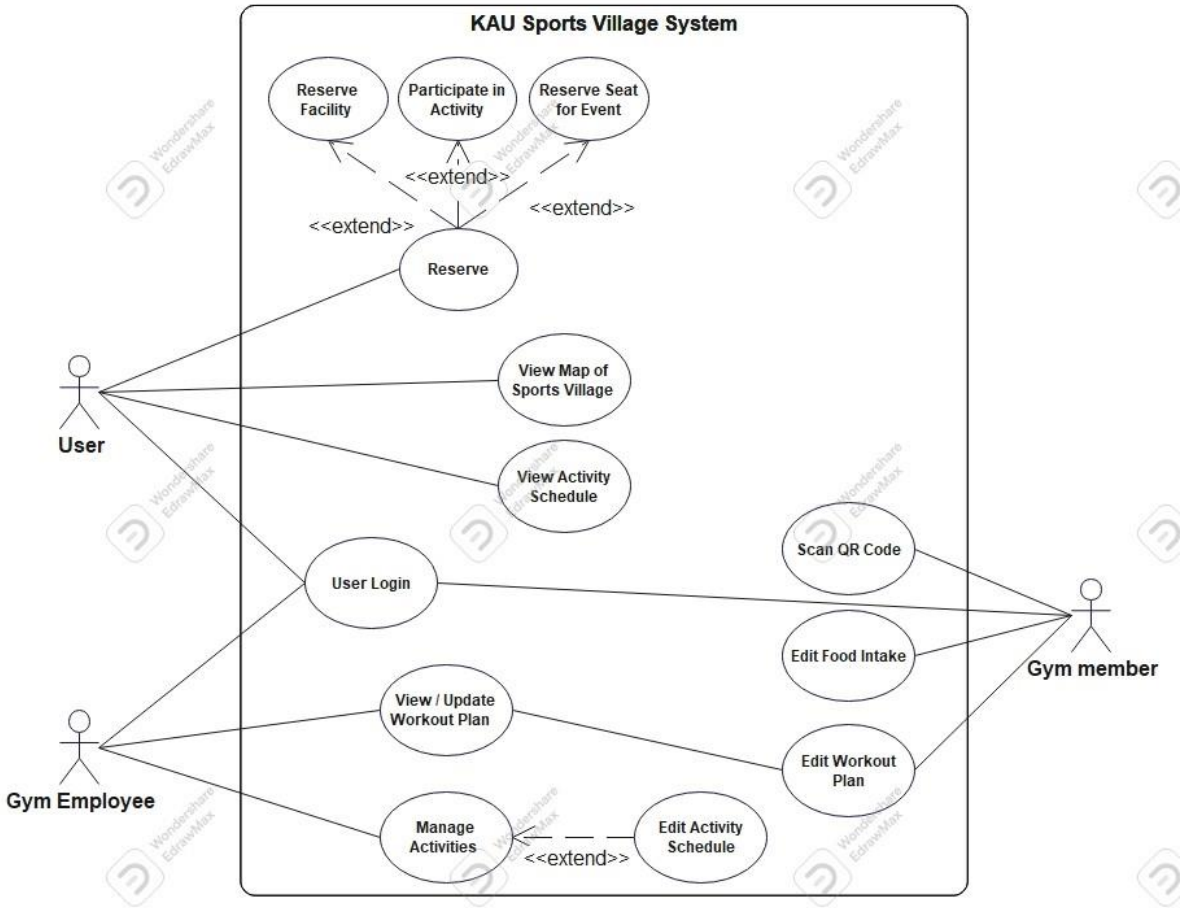
2.2.2 Non-functional

- R1: The system should allow users to select from several languages. (English and Arabic)
- R2: The system should be able to run on any platform. (Computer or phone)
- R3: The system should be accessible around the clock.
- R4: The system should send a confirmation message to the user.
- R5: The system should provide the user with a QR code to access the gym.
- R6: The system should require the user to create a strong password to secure personal information by making it 8 digits long and a combination of numbers and capital characters.

2.3 Techniques for gathering data

As mentioned in 1.5 gathering data will mainly focus on interviewing the workers in the village and the visitors and possible users for the facility, it may take the form of face-to-face interview or an online survey that may take less time and reach more users.

2.4 UML Use case Diagram



2.5 Use case description

Food intake
Brief description: measuring the nutrition the user consumed.
Actor: User.
Precondition: the user should be a gym member.
Basic flow of events: 1. The user should log in to his account. 2. The user should select his food from the database. 3. The user should customize the selected food. 4. The user confirms his selection.
Extensions: • The user didn't find the food he is looking for; He can customize the ingredients himself. • The user cannot connect to the database; The system displays a message "system error, please try again later".
Postcondition: Display the nutrition and calories consumed.
Special requirements: The user is required to have internet connection.

Workout plans
Brief description: The user builds his workout routine from a selected database.
Actor: User.
Precondition: The user should be a gym member.
Basic flow of events: 1. The user should log in to his account. 2. The user should select the working day. 3. The user should select his workout from the database. 4. The user should select the number of sets & reps. 5. The user confirms his selection.
Extensions: • The user didn't find the workout he is looking for; The system displays similar workouts that may have different name. • The user couldn't connect to the database; The system displays message "system error, please try again later".
Postcondition: Display the selected workout based on the day.
Special requirements: The user is required to have internet connection.

Reservations system
Brief description: The reservation System allows users to book facilities, seats to watch events, and more.
Actor: User & gym facility.
Precondition: The user has the app and is logged in.
Basic flow of events: 1. The user opens the app and logs in. 2. The user selects the “Reservations” option from the menu. 3. The user chooses what type of place to reserve. 4. The user selects the time for the reservation. 5. The system displays the availability of the place at the selected time. 6. The system confirms the reservation via email to the user.
Extensions: • The selected time is unavailable; The system suggests another time for the user.
Postcondition: The reservation is confirmed in the system and the user gets confirmation via email.
Special requirements: 1. The user is required to have internet connection. 2. The app must handle any modification and cancelation that occurs. 3. The app must have the real-time information feature of the sports village.

Activity schedule
Brief description: Real-Time Information feature provides users with up-to-date information about the facilities, event calendars, class schedules, and more.
Actor: User.
Precondition: The user has the app and is logged in.
Basic flow of events: 1. The user opens the app and logs in. 2. The user selects the “Real-Time Information” option from the menu. 3. The app displays the latest information from the Sports Village to the user, such as class schedule information.
Extensions: • The app can't deliver real-time information; The system displays message containing the cause. • The user can't find the desired information easily; The user can use the filter and search for the information
Postcondition: The user is getting Real-Time Information on the desired Information of events, availability of facilities, updates, etc.
Special requirements: The user is required to have internet connection.

2.6 Difficulties & risks

The risk analysis of KAU Sports Village Software is comprised of technical, security, financial, and reputational risks.

Technical risks:

- Compatibility issues with different operating systems and devices
- Insufficient technical resources to accommodate high traffic during peak hours.
- Integration challenges

Security risks:

- Vulnerabilities in the login and registration system
- Data breaches due to weak encryption or unauthorized access to the database
- Privacy concerns

Financial risks:

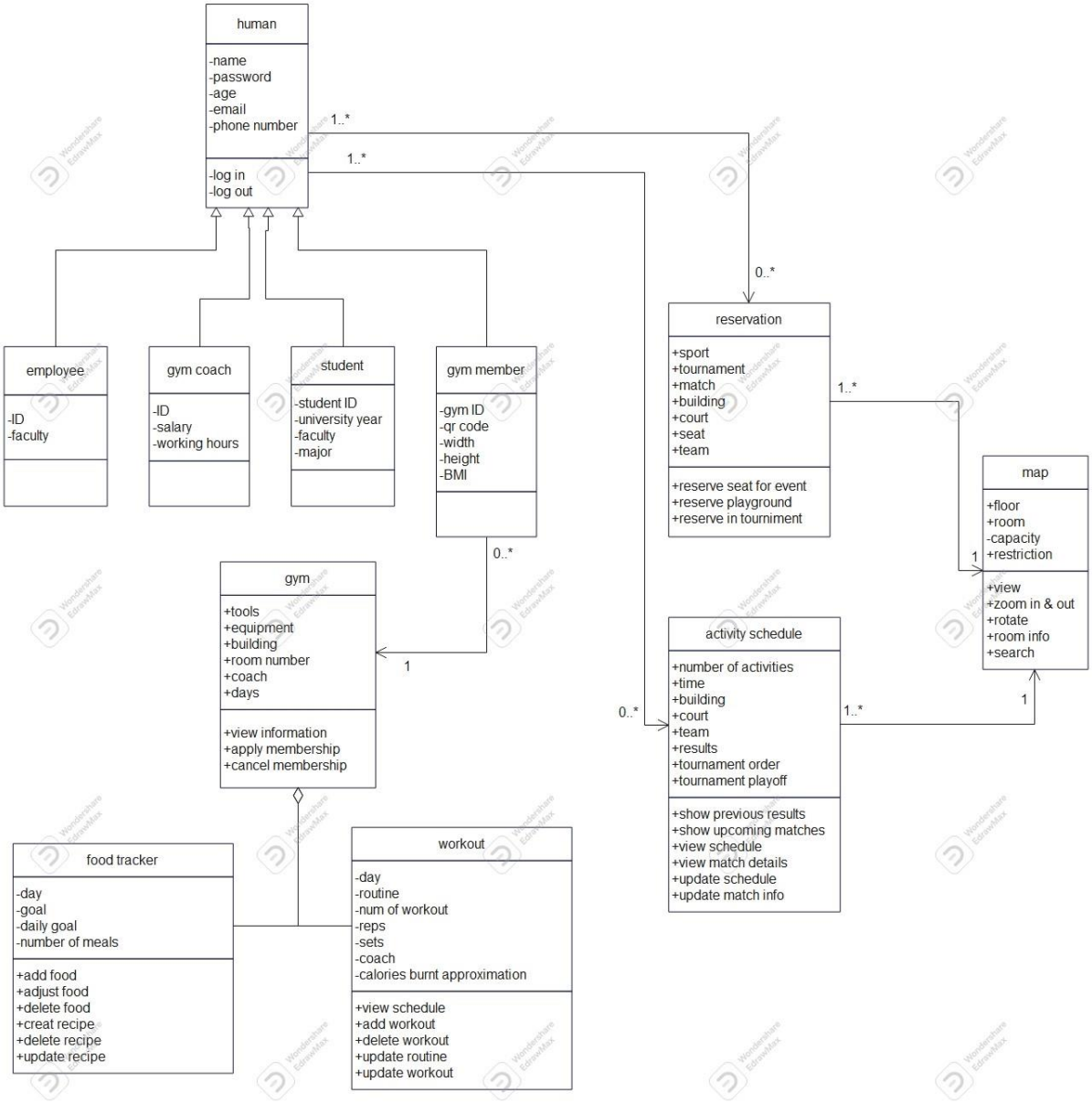
- Budget constraints for development, maintenance, and updates of the app

Reputational risks:

- Negative user feedback or ratings impacting the brand image of the KAU Sports Village.
- Poor app performance, leading to user dissatisfaction and lack of trust in the app.

Phase 3: Design and structuring

UML Class diagram

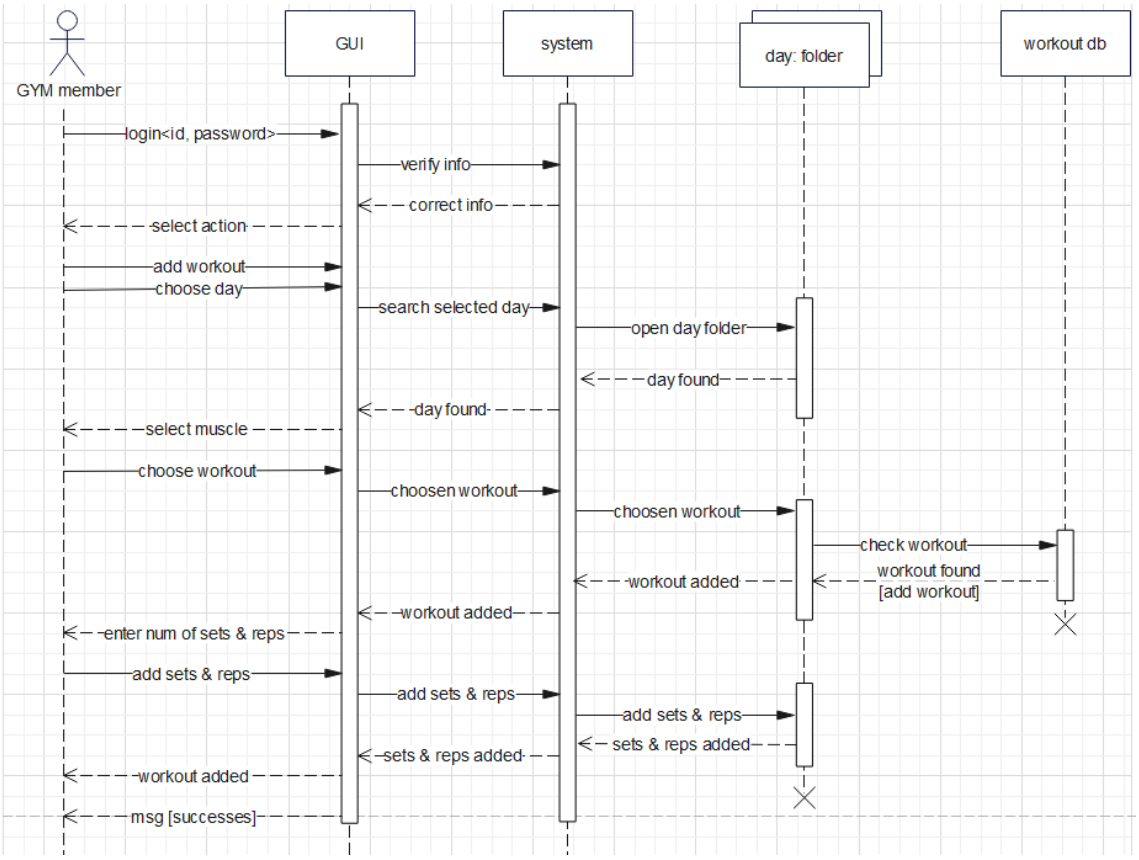


Phase 4: Modeling, Interaction and Behavior

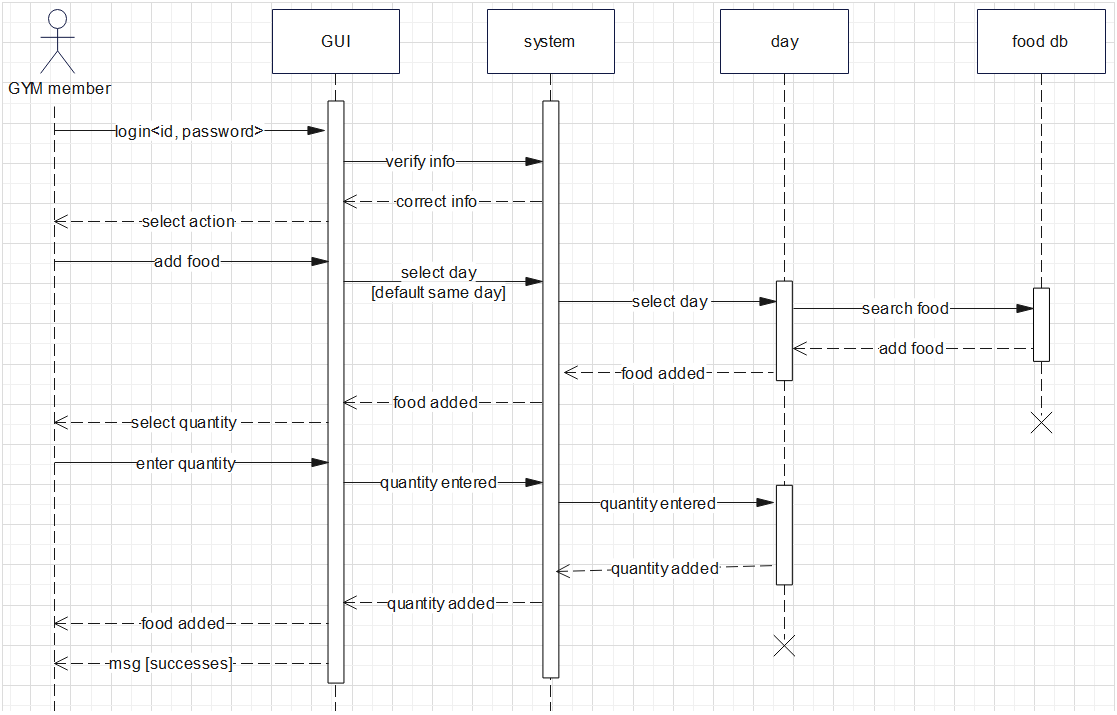
4.1 Interaction Diagram

4.1.1 Sequence Diagram

1) "add workout" sequence

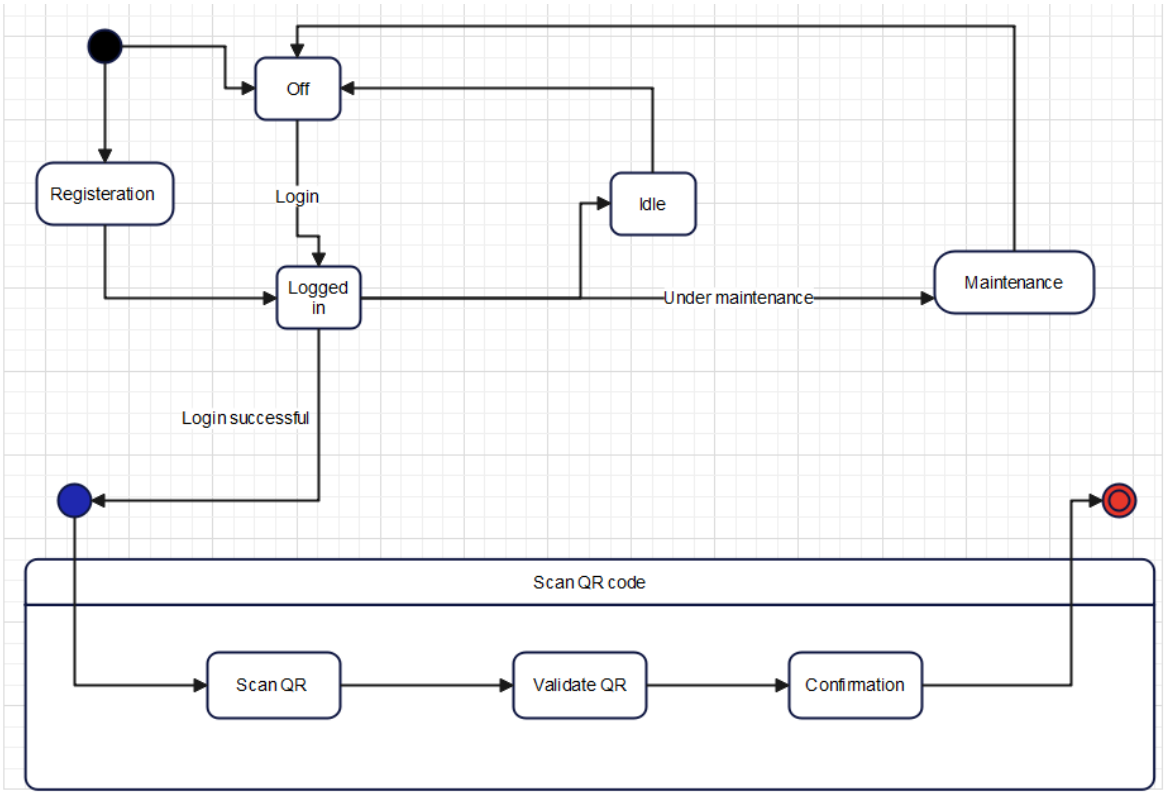


2) "add food" sequence

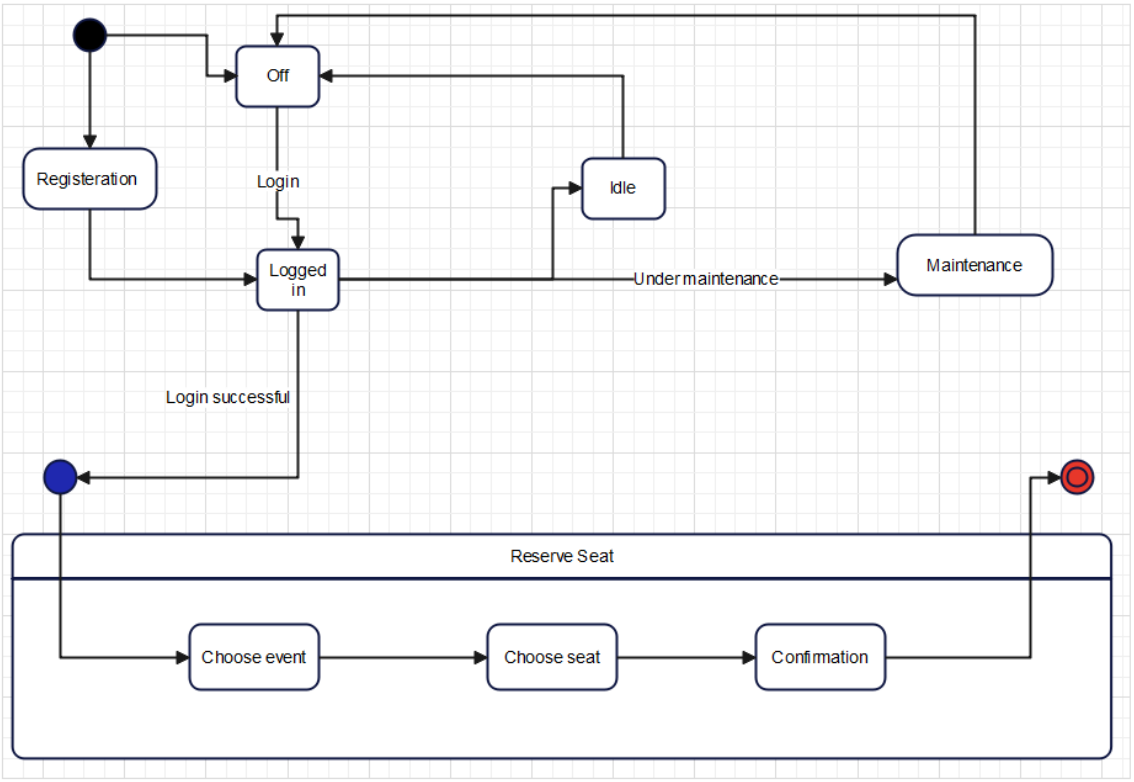


4.1.2 State Diagram

1) Scan QR code state diagram

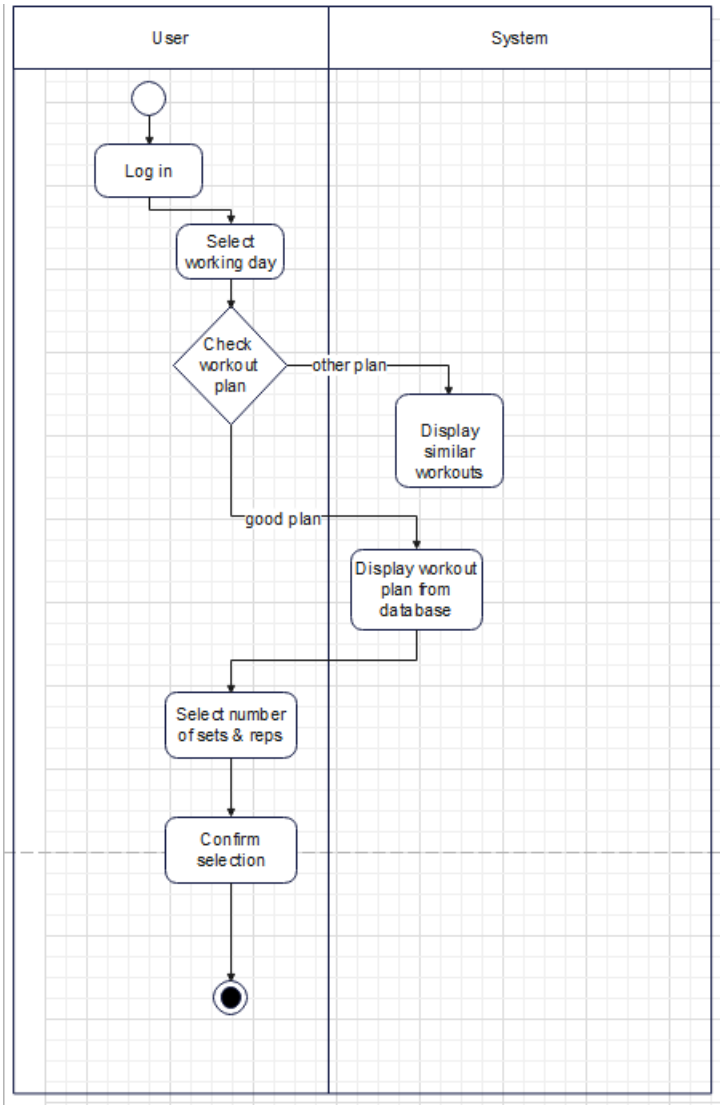


2) seat reservation state diagram

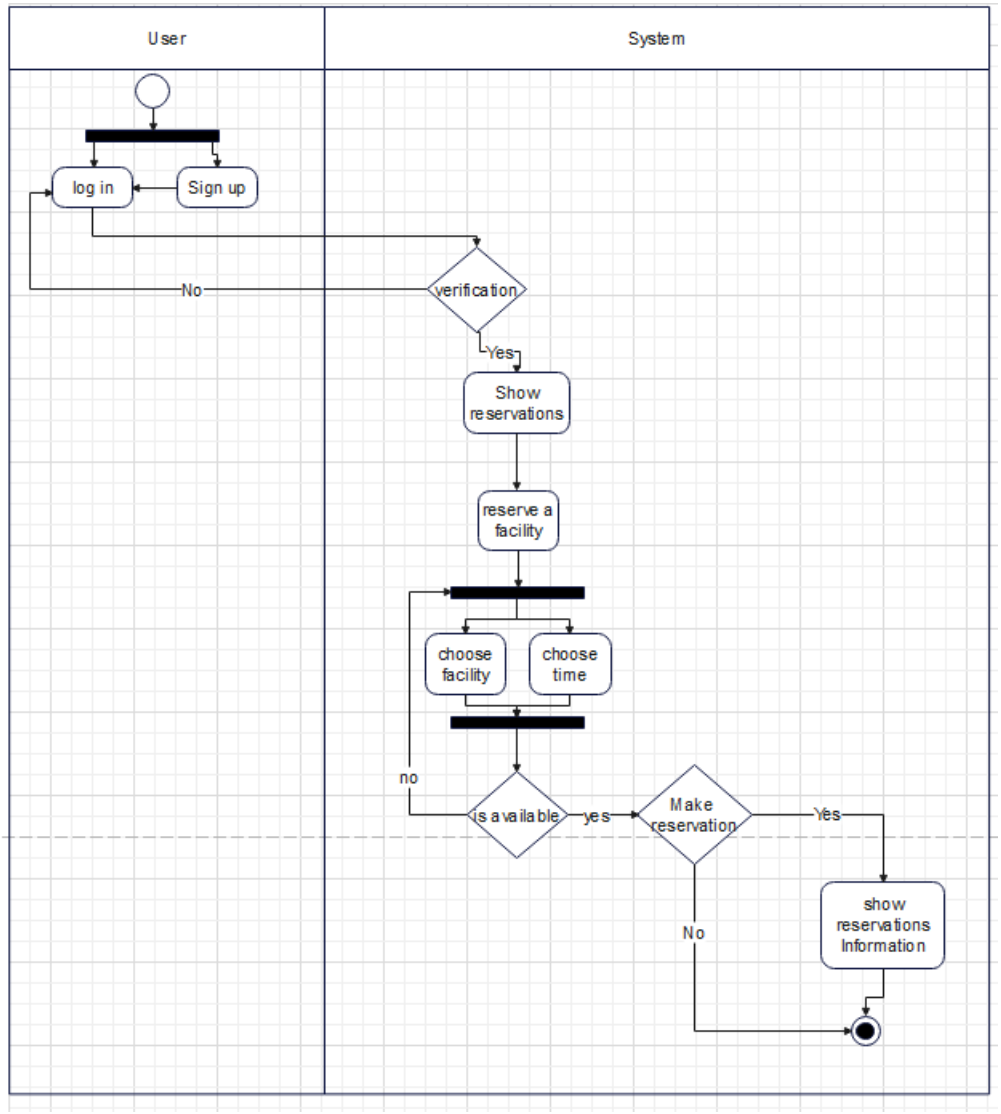


4.1.2 Activity Diagram

1) "add workout" activity diagram



2) "reserve facility" activity diagram



4.2 Testing

4.2.1 objectives

Our objective in this testing is extracting as much error as possible that has major impact on the systems functionality as a whole, as well as check the requested requirements functional and non-functional and checking the main features in the system, as an initial test it should also check the overall performance and security of the system, to save the users information.

4.2.2 Testing strategy

The initial strategy is to apply testing only on the major functionalities in the system to insure that the most commonly used functionalities are working fine without flaws or bugs. 3 of the major functions we will focus on in the initial testing are: Reservation system, activity schedule, QR code. The output must achieve the full functionality to be considered successful.

4.2.3 testing approach

The testing approach we will be taking will be on to main groups, one is us the development team which will use the white box approach to extract any possible flaws and bugs since we have the accessibility to the code, the other main group will be the potential users to the system by giving them a test access using black box approach.

Test Plan 1:

System: KAU SV.

Test case name: reserve a playground.

Description: testing the ability to reserve a playground.

Test scenario: check system's reaction when user decide to reserve a playground.

Precondition: user has a valid KAU account.

Test case ID	Test scenario	Test steps	Test data	Expected results	Actual results	Pass/fail
1	Test system's reaction when user wants to reserve a free playground	1.login 2.choose reservation option 3.choose reserve a playground 4.choose the playground 5.choose the time to be reserved	Playground availability at the selected time User ID and name	Playground is free and reserved successfully	Reservation completed	Pass
2	Test system's reaction when user wants to reserve an occupied playground	1.login 2.choose reservation option 3.choose reserve a playground 4.choose the playground 5.choose the time to be reserved	Playground availability at the selected time User ID and name	Playground is occupied and cannot be reserved at the selected time	Reservation error, select another time	pass

Test Plan 2:

System: KAU SV.

Test case name: display activity schedule.

Description: testing the activity schedule feature by checking if it can display the activities correctly.

Test scenario: check system's reaction when user tries to see the activity schedule.

Precondition: user has a valid KAU account.

Test case ID	Test scenario	Test steps	Test data	Expected results	Actual results	Pass/fail
1	Test system's reaction when user checks activity schedule when there are activities	1.choose activity schedule option	Activities in schedule Activities time & date Activities participants teams	List of activities in the schedule with the time and date and participants teams	Activities list displayed with time and date and activity participants	Pass
2	Test system's reaction when user checks activity schedule when there are activities	1.choose activity schedule option	Activities in schedule Activities time & date Activities participants teams	No activities in schedule to be listed	Activities list is empty	pass
3	Test system's reaction when user selects activity to see activity details	1.choose activity schedule option 2.select activity	Activity's time & date Activity's building Activity's playground Activity's participants teams	Shows time and date of the activity and a count down to the activity start and the building and number of playground with the participated teams	Activity's details will be shown (time, date, count down, building, playground, participated teams	pass

Test Plan 3:

System: KAU SV.

Test case name: Generate QR code.

Description: system generates unique QR code for the user every time the user selects QR code option.

Test scenario: check system's reaction when user tries to get a new QR code for entering the sports village.

Precondition: user has a valid KAU account, user is a gym member, user phone is the default phone.

Test case ID	Test scenario	Test steps	Test data	Expected results	Actual results	Pass/fail
1	Test system's reaction when user tries to get a QR code to enter the gym	1.login 2.choose QR code option	User ID User name User membership user default phone	System generates new QR code to enter the gym	New QR code generated with access to the gym	Pass
2	Test system's reaction when user tries to get a QR code to enter the gym but not on default phone	1.login 2.choose QR code option	User ID User name User membership user default phone	System display's message that its not the default phone and to change it contact with the sports village	Message displayed " not default phone, if you want to change the default device contact sports village	pass
3	Test system's reaction when user tries to get QR code while not a gym member	1.login 2.choose QR code option	User ID User name User membership	System display's message that you are not a gym member	Message displayed "you are not a gym member"	pass