

Web Based Gym Management System for Everest Fitness Center

**I P T Nimesha
2025**



Web Based Gym Management System for Everest Fitness Center

**A thesis submitted for the Degree of Master of
Information Technology**

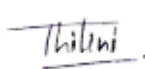
**I P T Nimesha
University of Colombo School of Computing
2025**



Declaration

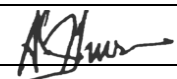
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Preface

This project development of the Web Based Gym Management System for Everest Fitness Center aimed to enhance the gym operations and give streamlining user experience. The motivation behind this software development project arose from the requirement gathering phase such as difficulties faced by gym owners, instructors when managing and scheduling the overall process. By implementing web-based system, it will be given digitize experience without time consuming and error prone.

Throughout the development phase, I encountered numerous obstacles and challenges. Therefore, it allowed me to strengthen my problem-solving skill and technical capacity. Also, it is deepened my understanding of the software development project areas like database management.

In addition to that, I would like to express my sincere thankful to my kind and dedicated supervisor Dr. T. A. Weerasinghe for her invaluable guidance.

Finally, I hope that this web-based system will improve the management of the Everest Fitness Center by providing effective and efficiency process.

Abstract

Nowadays, People go to the gym to maintain and enhance their physical health and fitness. It also offers mental health benefits and a healthier lifestyle. Therefore, gym industry has moved forward a part of the human trends specially, among teenagers. Also, by now, most of the ladies join fitness classes (Zumba/yoga). For that purpose, people find gyms to fulfill their hopes. So, the gym industry is relying on their gym members and students with their satisfaction. Hence, the gym should maintain a proper way to manage their working flow.

Web based gym management system covers the member management, student management, workout schedules management, fitness management, package management and reports generation.

The proposed management system is developed using PHP server-side programming language and MYSQL database language. AJAX, bootstrap and CSS are used for front end development. Apache NetBeans is used as IDE and XAMPP is used to run the project. Designing requirements are facilitated by Draw.io and Dia diagram. Considering the requirements and scope of the system, iterative waterfall model is selected as the software development process model. Various kind of fact-finding techniques have used to identify client's requirements clearly. Use cases, activity diagrams and ER diagrams depict the work flow of the system in the design stage and testing was conducted at the end of each stage.

The system has been successfully implemented, receiving positive feedback from the client. It effectively streamlines gym management operations, improving efficiency and user experience. Currently, the system is fully operational and actively being used to manage gym activities, demonstrating its effectiveness in meeting client needs.

Acknowledgements

I wish to express my sincere thanks to the respected personnel of the University of Colombo School of Computing, for giving me this massive opportunity to do this individual software development project. The development of web-based gym management system was a great opportunity for me to gain valuable and practical knowledge in software development.

Foremost, I offer my heartiest thankfulness to my supervisor Dr. Thushani A Weerasinghe for her great encouragement with guiding me throughout the project development dedicating her valuable time for necessary corrections of the documentations.

Further, my thank goes to Mr. Thilak Fernando, the owner of Salon Everest Fitness Center who helped gathering requirements and in conducting user acceptance tests and also thankful to staff members/instructors for their kind information.

Finally, I must thank my MIT friends, other loving supportive partners and everyone who genuinely supported, guided and helped me throughout of the project development process.

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List of Acronyms

AJAX	- Asynchronous JavaScript and XML
CSS	- Cascading Style Sheets
ER	- Entity Relationship
GMS	- Gym Management System
IDE	- Integrated Development Environment
PHP	- Hypertext Preprocessor
SDLC	- Software Development Life Cycle
UAT	- User Acceptance Testing
UML	- Unified Modeling Language
URL	- Uniform Resource Locator

Chapter 1 – Introduction

1.1 Project Overview

Everest Fitness Center is a well-recognized gym is situated in Kottawa area. They provide a variety of services to the members/students such as conduct daily workout sessions, conduct fitness classes and membership handling. But manual paper-based process is the major problem for them today. This is a burden to their day today activities. Therefore, major expectation of this developing system is to increase the efficient, accuracy of the work and reduce the heavy time-consuming paper works.

1.2 Motivation of the Project

They have not automated system and currently use a manual procedure to record all the details of the gym. This is the main problem and inefficient way of managing all the things of gym. In addition to that, they have many problems because of using manual way.

- ◆ Members have no such way to make an appointment other than making a call. Using a manual way, customer have to find a contact number and making a call to join the gym. It is very difficult way to customer and basic reason to decrease the customer satisfaction. Therefore, customer base is very low.
- ◆ Difficulties of growing up student base. (No such way to advertise about fitness classes – Zumba/Karate) Currently they have only advertised using a banner in front of the gym. Only lack of people views it. Therefore, they want a better way to introduce their class details.
- ◆ Members have no way to view the available schedules. In a manual way, instructor verbally tell to next session day to the member. This way is difficult to both parties due to the no way of proof.
- ◆ Once a payment has done, will receive a hand written receipt. They continue payment details in a book. Also, they give hand written receipt. When book and receipts are misplacing, payment details of the gym are lost.

- ◆ Owner failed to assign trainers with the time (poor scheduling) Trainers are specialized unique areas. Fat loss specialist, performance specialist and muscle building specialist are example of that. When member want to build muscle, owner should assign to him to the muscle building specialist, not fat loss specialist.
- ◆ Owner is difficult to update the member/instructor information because of they are paper records. (Time consuming). Currently, they have only paper-based work. There is may be duplicate records once they are checked. Also, it takes long time to find update record.
- ◆ Generating reports is done manually inefficient. (No proper way to report generation) In this manual way, they are normally checking monthly profit of the gym. But it is not a proper way. They can't make decisions and get prediction of that inefficient way.
- ◆ Unauthorized access of files and information (No proper security way) Everyone can access files and book due to the all the details are paper based.

Following Figure 1.1 is described the manual process of the gym.

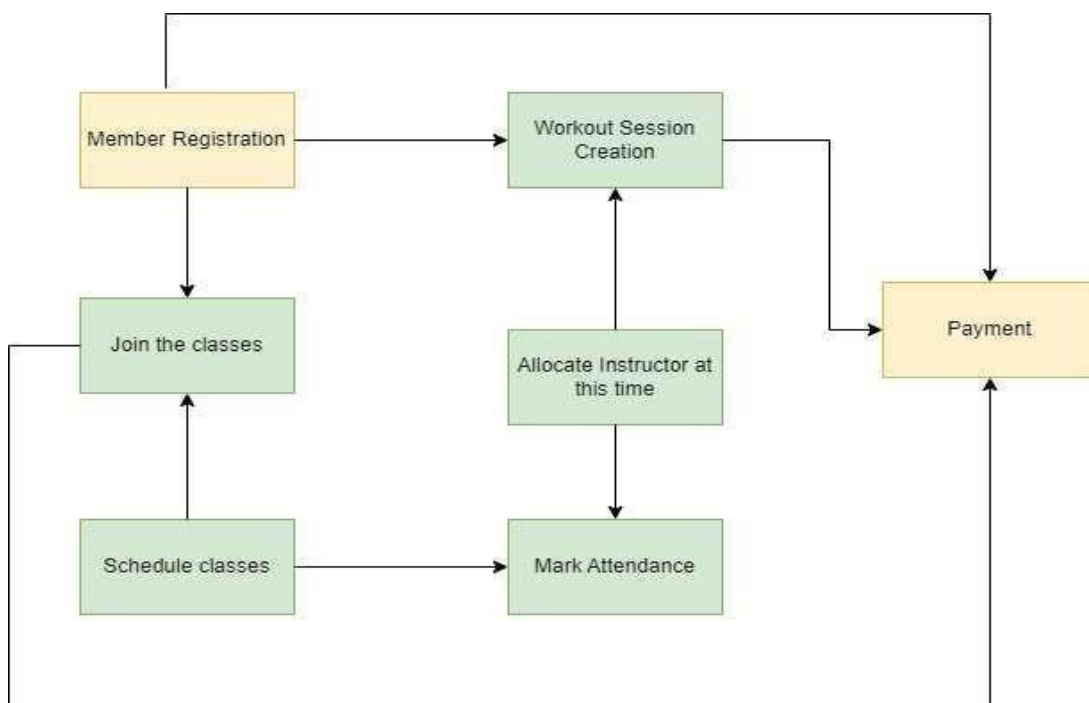


Figure 1.1 : Existing System Flow Chart

Above picture is described the manual process of the gym. Start the member registration, some members join the workout session and others join the classes. Then schedule classes and start allocating instructors for each. Also mark attendance and payment has done. According to that, this is a manual process. So, the intention of this project to overcome those problems by providing web-based system.

1.3 Objectives of the System

The selected objective is to provide a web-based gym management system called their name "Everest Fitness Center". The main goal is to reduce the difficulties of the manual process and develop their web-based system to increase the efficiency of the member registration and appointment scheduling process and thereby provide a better service to the gym users. Also, Everest Fitness Center aims to drive business growth, streamline operations and enhance member experience through their virtual facility. This solution helps to manage both interface and database. In addition to that below objectives of doing this project are to:

- ❖ Eliminate the paper-based work use at the gym premises such as usage of writing appointment details/student details, etc.
- ❖ Eliminate the data redundancy: Keeping appointment details at several places(notebook/paper) by several people (owner/gym instructor).
- ❖ Ease the management and decision making while improving gym's good name.
- ❖ Improve the gym members, students and instructors' satisfaction.
- ❖ Abolish the wastage of time, efforts and resources of the gym.
- ❖ Enhance staff/instructors' performance: using create job cards
- ❖ Optimize business strategies. Give schedule and allow upload their before after photos, comments, feedbacks through website. If it will be needed, yoga/Zumba class instructor can conduct online seminar and publish as a business strategy via website.

- ❖ Gather valuable insights: Collect and analyze gym member and student's data (Zumba/yoga classes students) to identify current trends and preferences.
- ❖ Personalized services: offering personalized training packages.
- ❖ Manage HR process automatically: manage schedules and attendance are prove it

1.4 Scope of the Proposed Project

The scope of the proposed system is major component which should be considered most. Web Based Gym Management System for Everest Fitness Center will cover the following overall main processes (modules).

- ❖ Member Management Module: -

Members are the main assets of the gym. When they register to the system, filling out the BMI checking with booking an appointment form, the system stores member information into the database. Member can search their historical data including reservations/payments/schedules through their login credentials. This module helps to provide a better member service. Further, the system is validated and avoid duplicated entries.

- ❖ Instructor Management Module: -

Instructor can log into the system entering their username and password. Instructor profiles maintain personal information, contact information, areas of expertise and availability. According to that, the system track availability and attendance. If the instructor finishes the available task, he/she should be closed the job card.

- ❖ Payment management module: -

When payment has done, the system is recorded payment data. Cashier can set up the automated billing schedule to collect monthly fitness class fees. Both members and students can visible required invoice.

❖ Fitness Class Management Module: -

Everest Fitness Center has Zumba, Karate and Yoga classes. The system provides all the information of the classes and allows to enroll to the student easily. It can define class time and dates, class modules, etc.

❖ Student Management Module: -

This module is designed to capture and record the student data and maintain student profiles and enrollment and registration process. Each students' details are stored in a database. When student enroll the fitness class, they should submit enrollment requirements to the system. After the submission and payment, student can enroll the classes.

❖ Workout Schedule Management Module: -

This module is facilitated to consider the personalized member training. If a member's BMI is healthy, he/she directly gets the basic workout session. All the members should start the workout with cardio training. If a member selects any other workout starting without cardio training, the instructor will assign a cardio training first.

❖ Report generating module: -

Reports use for making decisions and getting predictions. If a gym owner needs to check monthly income, he/she can generate monthly income report easily.

❖ Enable making appointments online: -

By introducing web-based gym management system, user can register and log into system. Before booking an appointment, they are automatically viewing the BMI checking during filling the form. This process is done by the system and all the data stored in database. This is faster and easier way to process scheduling than writing a book.

❖ To automate the gym facilities: -

Automating gym facilities are enhanced overall works with reducing time consuming. It will eliminate the paper-based process. Online membership management, workout schedule management, class management, package management are some of primary tasks by automate the system.

❖ To maintain the gym data in a systematic way: -

This will not happen data redundancy. Also, this web-based system handles a database. Owner can update data easily without time consuming and search specific data efficiently. This process is ensuring data integrity and security. Appointments details, members details, instructor's details, class details, machines inventory details, student details and all the details are recorded in the database. Also, they can be accessed quickly.

❖ To provide secure web-based access: -

Using a manual way, there is not a proper security way. Unauthorized parties can access the data. In a web-based system, given a username and password for a secure access. It requires unique username and strong password. The system validates login credentials whether it is right or wrong. Only authorized (validated logins) members can login to the system. Therefore, authentication and authorization are most important facts to the web-based system.

❖ To publish marketing advertisements more easily: -

Web based system is the best solution for publishing advertisements of the gym. It improves the interaction with the members and students. Gym owner can publish their excellent package details and members can get details without any difficulties through the website

1.5 Structure of the Thesis

After the introduction, this contains five main chapters. Each chapter describes about specific phases of SDLC and it demonstrate about specific functions related to work carried out within the project development process. The rest of this document is organized as follows.

Chapter 2 – Analysis:

This analysis phase focus on the requirement gathering, analysis of the requirement and specification including functional and non-functional requirement of the system of the system development life cycle.

Chapter 3 – Design:

The design phase includes design architecture and user interfaces relating to the system design and several user interfaces (UIs) were included along with the main designed diagrams as to provide a clear view of the system.

Chapter 4 – Implementation:

the chapter describes the process of transferring design into a real system. The implementation phase includes program codes, development tools, hardware and software environment etc. and describes how implemented the system.

Chapter 5 – Evaluation:

Before system is finalized, it should be tested properly using test plan and test cases. Test plan is used to verify and validate the system before delivering to working environment. Moreover, this phase will be discussed about the testing techniques.

Chapter 6 – Conclusion:

The conclusion includes lessons learnt and the information about further development of the overall project.

1.6 Summary

The first chapter of the thesis discussed the basics of the project. It presented the current problem, which includes inefficient manual processes. Hence, the utmost aim of this project is to supply a feature-rich web-based solution to manage limited resources efficiently and effectively for the Everest Fitness Center.

Chapter 2 – Background

2.1 Introduction

In software development life cycle, requirement analysis is a critical phase of the system. This is a major factor to complete the software system successfully without any misunderstandings. This analysis process includes both functional requirements and non-functional requirements. Therefore, requirement analysis is very important in a software development.

2.2 Data Gathering Techniques

There are various methods to analyze requirements. They are conducting interviews, observations, existing documents review and questionnaires.

2.2.1 Conducting Interviews

Interview is the most common approach for requirement gathering. It is very easy to gather information due to the interview is a face-to-face approach. So, it is a reliable approach. Also, it will be gathered true information using verbal response. Following information can collect through the interview (w3schools, nodate).

- About the gym and key process in it.
- Problems of currently manual way.

2.2.2 Observations

In this process, system analyst can observe the current working environment and a manual way. Using this technique, observing person wise activities is an important point. This also used to identify the basic functions of the proposed system.

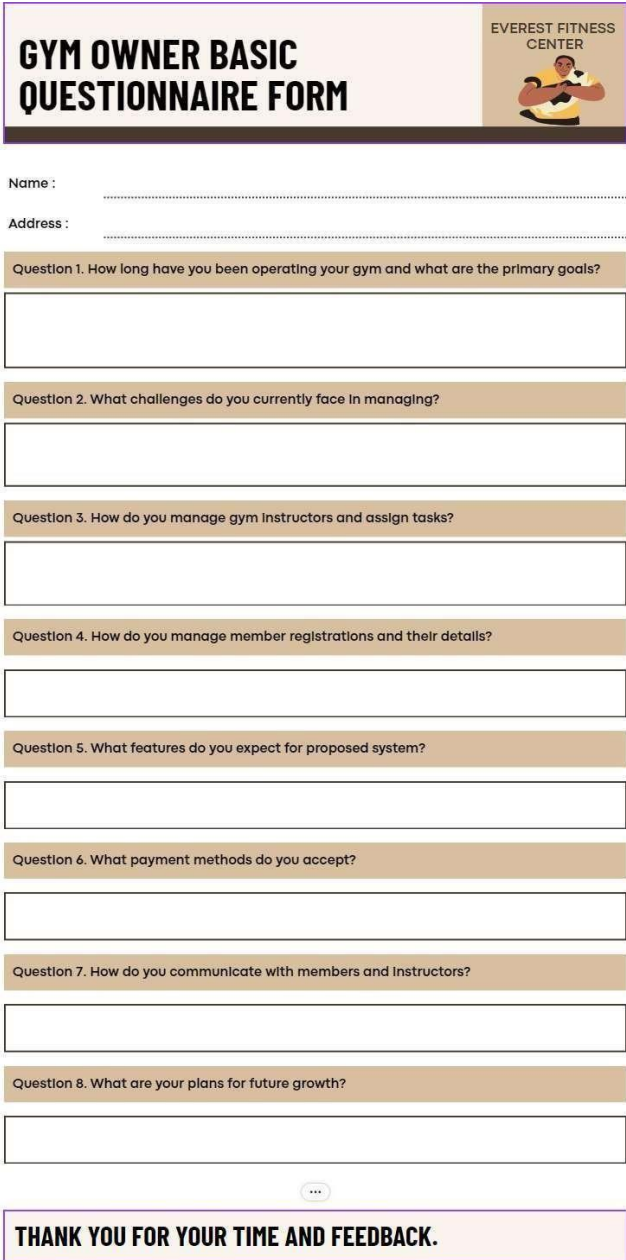
2.2.3 Existing Documents Review

Existing document review is very important when designing the user interfaces. This technique provides a better understanding about the web-based system.

2.2.4 Questionnaires

This is a fabulous approach to gather information. Users can fill up the question form which is asked about the system.

Following Figure 2.1 is described the gym owner basic questionnaire



The form is titled "GYM OWNER BASIC QUESTIONNAIRE FORM" and is associated with "EVEREST FITNESS CENTER", which is illustrated by a cartoon of a person lifting weights. The form includes fields for "Name" and "Address". It contains eight numbered questions, each followed by a text input area: Question 1 asks about gym operation duration and goals; Question 2 asks about current management challenges; Question 3 asks about managing instructors and task assignment; Question 4 asks about member registration management; Question 5 asks about expected features for a proposed system; Question 6 asks about accepted payment methods; Question 7 asks about communication with members and instructors; and Question 8 asks about future growth plans. The form concludes with a "THANK YOU FOR YOUR TIME AND FEEDBACK." message.

GYM OWNER BASIC QUESTIONNAIRE FORM

EVEREST FITNESS CENTER

Name : _____

Address : _____

Question 1. How long have you been operating your gym and what are the primary goals?

Question 2. What challenges do you currently face in managing?

Question 3. How do you manage gym instructors and assign tasks?

Question 4. How do you manage member registrations and their details?

Question 5. What features do you expect for proposed system?

Question 6. What payment methods do you accept?

Question 7. How do you communicate with members and instructors?

Question 8. What are your plans for future growth?

...

THANK YOU FOR YOUR TIME AND FEEDBACK.

Figure 2 1: Gym Owner Questionnaire Form

2.3 Existing System Use Case Diagram

Everest Fitness Center is a place where still has a current manual system. When maintaining instructors, members and students' details, they use paper-based document way. Registration details and schedules are the same procedure. When organizing the special events, they have no proper way to remind the date. Once the payment has done issue manual payment receipt.

Following Figure 2.2 is described the use case diagram for existing system.

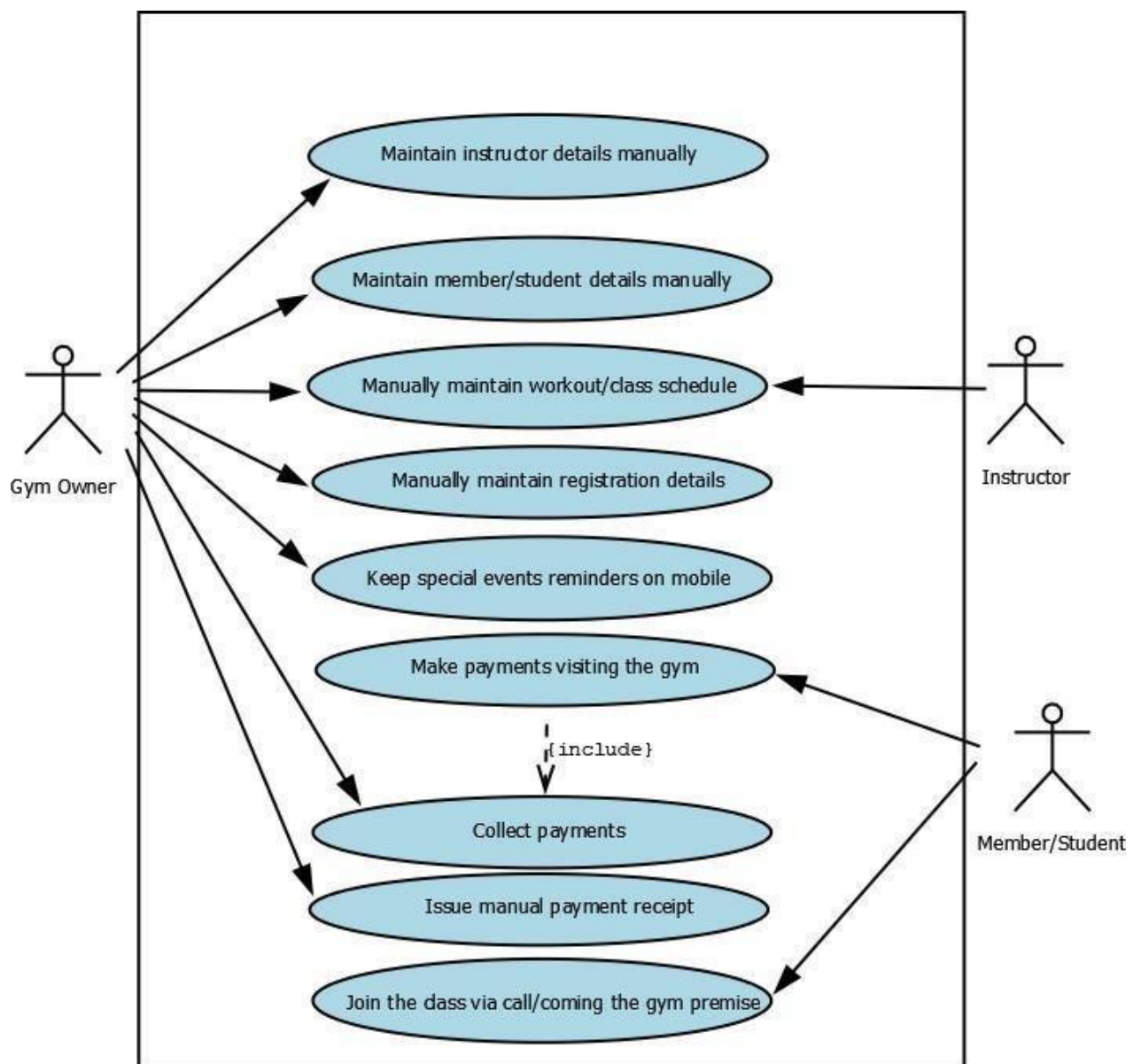


Figure 2 2: Use Case Diagram for Existing System

2.4 Top Level Hierarchy of Current System

This hierarchy diagram represents the structure of the gym management system, outlining different user roles and their key responsibilities. At the top level, the gym management system branches into registration/login, which serves as the gateway for all users. Below, various roles such as member, instructor, receptionist, cashier, administrator, and manager are depicted, each with specific functions. Members can manage their profiles, instructors create workout schedules, receptionists assign instructors, cashiers handle payments, administrators manage user permissions, and managers generate reports. This structured layout ensures efficient role-based access and streamlined gym operations.

Following Figure 2.3 is described the top-level hierarchy of current system.

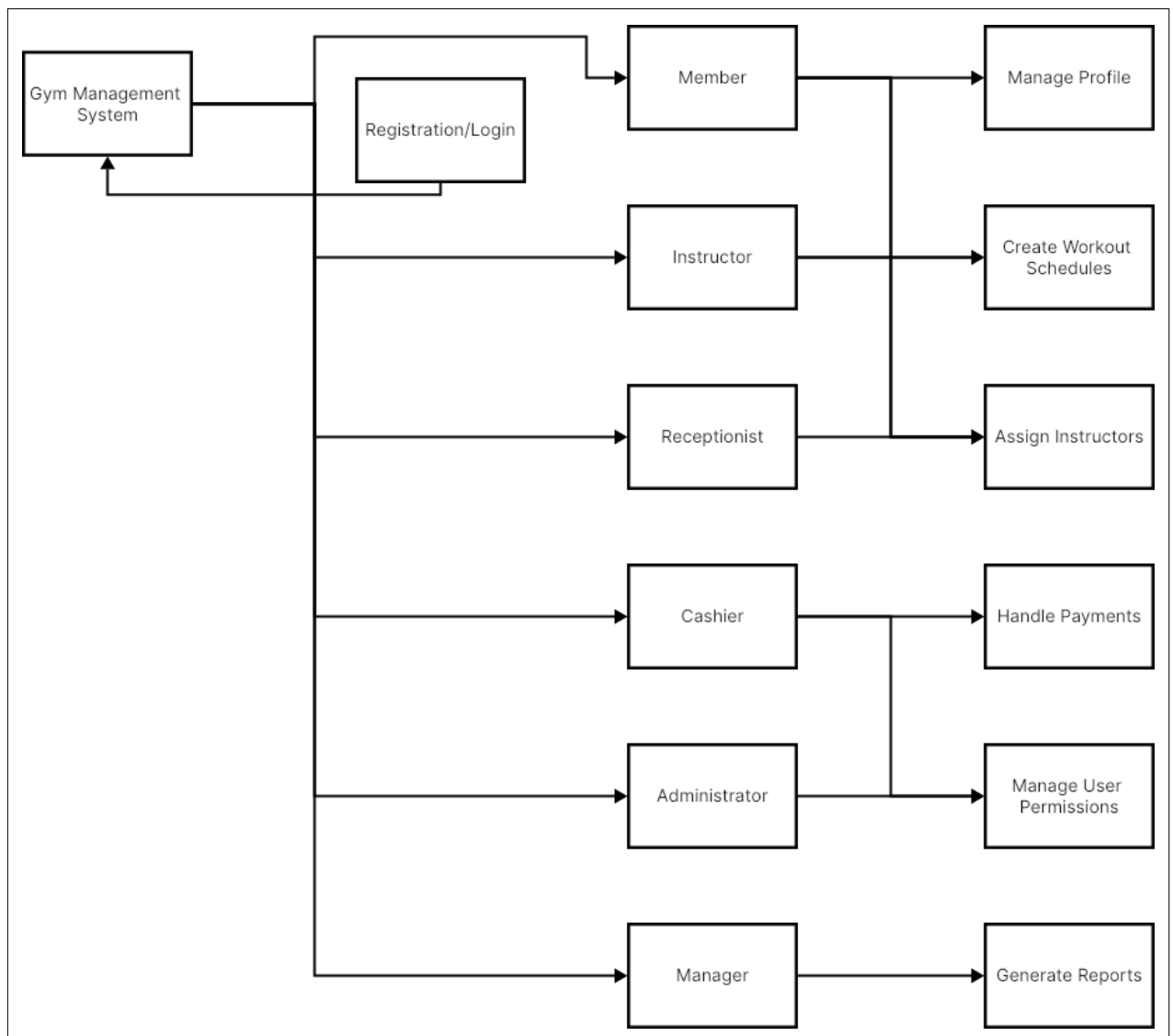


Figure 2 3: Top Level Hierarchy for Proposed System

2.5 Functional Requirements

Functional requirements are defined what the system should do. Simply, the basic functions of the proposed system. These are represented the operations of the executed system (Miller and Requirements Quest (Firm, 2009)).

- ✓ Manage gym member details
- ✓ Manage instructor details
- ✓ Manage student details of the Zumba/yoga classes.
- ✓ Manage fitness class details
- ✓ Manage workout schedule details
- ✓ Manage payments
- ✓ Manage job cards when assigning instructors
- ✓ Manage user access of the system
- ✓ Generate reports
- ✓ Manage registration details

2.6 Non-Functional Requirements

Non-functional requirements are related to the qualities of the system. The basic non-functional requirements are listed below:

- ✓ Security and authorization – The system is accessed can only authorized person with their correct authorization details.
- ✓ User friendliness - All the functional requirements and user interfaces should be familiar and understand by the system users.
- ✓ Accuracy and Reliability – Accuracy is very critical for decision making of the system when reports generating.
- ✓ Efficiency -. System should be recorded all the data and retrieve them quickly.
- ✓ Availability - System should be available within working hours.

2.7 Existing Similar Systems

Below are some similar systems currently available and considered as a base for the proposed gym management system of Everest Fitness Center.

LifetimeFitness

Lifetime Fitness is a web-based gym management software that provides one to one services and fitness checkup. It can give free personalized diet plan and individual training program for the members. It shows member pricing as three categories such as platinum membership, gold membership and silver membership. Also, members can write reviews and upload body transformations images. According to that this system manages membership handling, user profile handling and workout schedule handling. If a member wants to join to the gym, website gives only contact us form and phone number. Also provides social media links such as facebook and Instagram. In addition to that there is a juice and supplement bar at the gym (Lifetime Fitness, nodate).

Following Figure 2.4 is described the Lifetime Fitness home page.

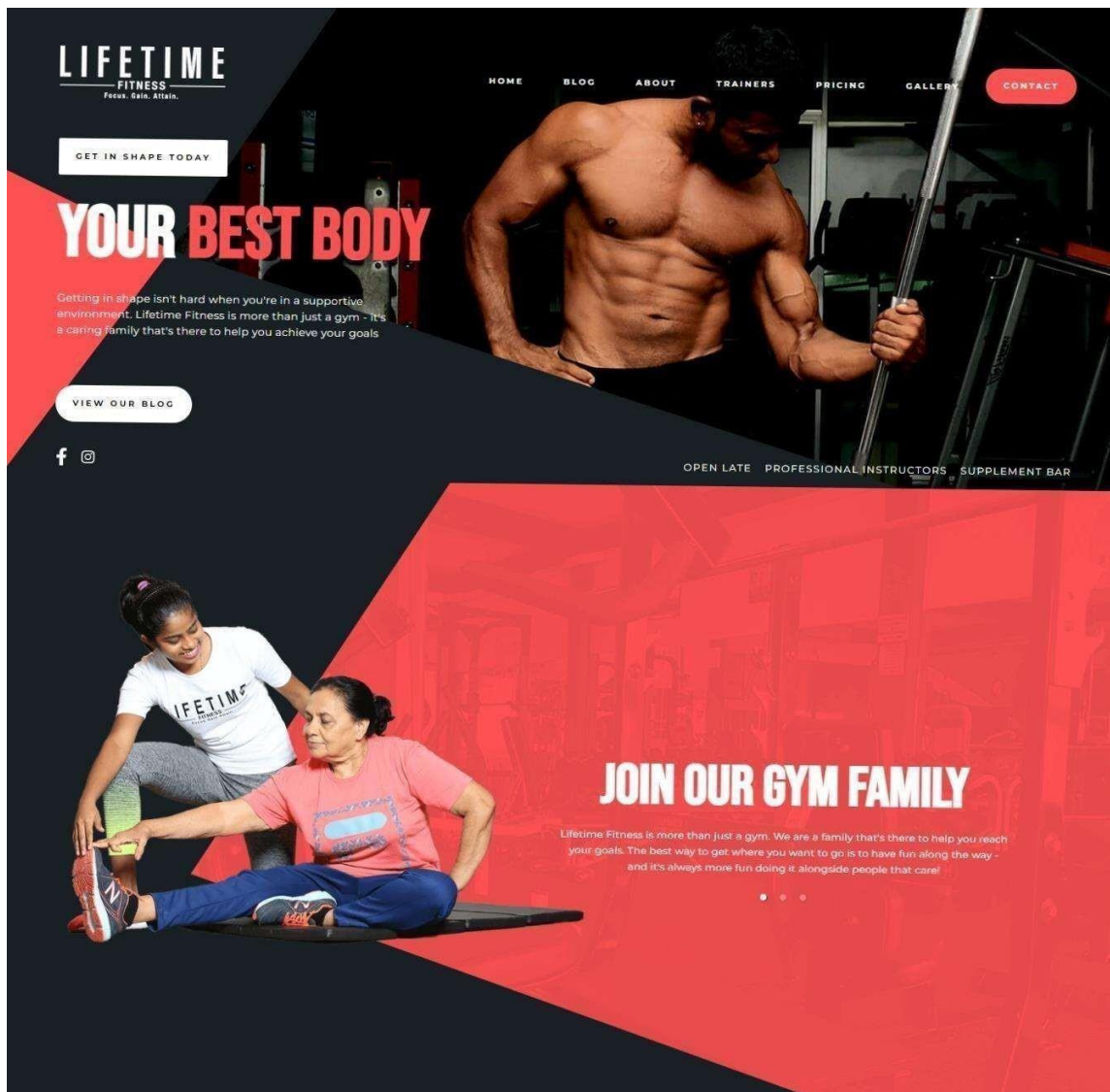


Figure 2 4: Life Time Fitness Home Page

Power World Fitness Centre

Power World Fitness Centre is a system for managing gym records and its branches. This website allows to register to the system by clicking register now button. If a member wants to get more details, it shows the call us button. The registration program can keep track of member data. It focuses member management handling. Also, the home page provides a BMI calculator. It enhances the system functionalities and members are tend to join the fitness club. They have many branches and when filling the registration form, they are showed as a drop-down list. Also, integrated email is used in contact form. It improves communication between members and management. Manage customer subscriptions and handle social media marketing tools (facebook, Instagram, tiktok) are increased brand awareness (Sri Lanka Gyms, nodate).

Following Figure 2.5 is described the Power World Fitness Centre home page.

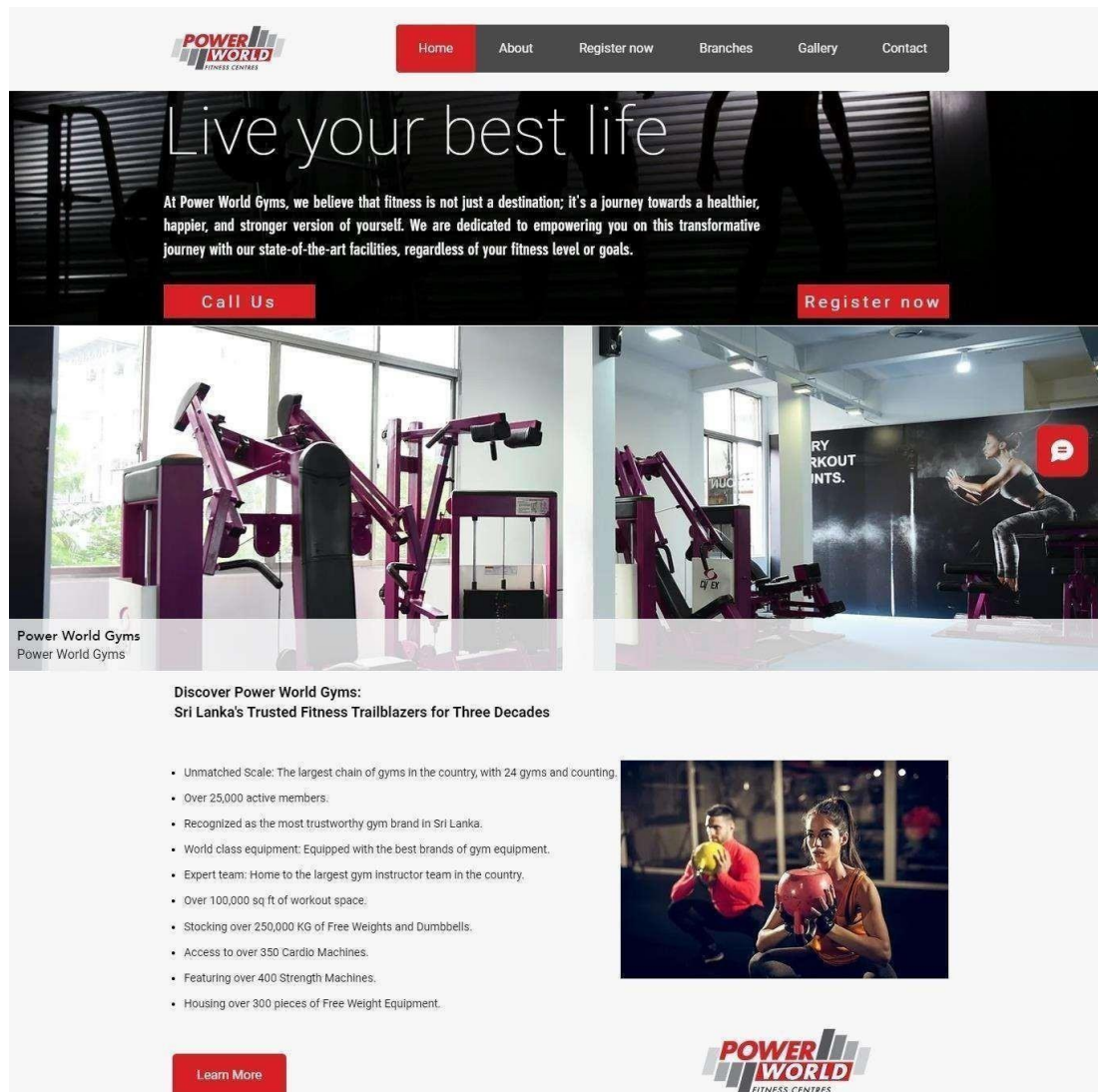


Figure 2 5: Power World Fitness Centre Home Page

Resistance Gym

Resistance Gym is a system for managing group training program, athletes training program and personal training program at the gym. It controls gym schedules as well as appointments. It allows to book an appointment through whatsapp and can directly register through website. Also, they introduce their annual and monthly pricing list. According to that it depicts they successfully manage member details and schedule their workout sessions. Also, the system keeps trainer's details appropriately and shows through about us page (Resistance Gym & Fitness training for athletes in Colombo, 2024). Following Figure 2.6 is described the Resistance Gym home page.

The image shows the home page of the Resistance Gym 2.0 website. The header includes the text "Limited Slots Only" and the logo "RESISTANCE 2.0". Navigation links for "Home", "Program", "Membership", "About us", and "Contact us" are present, along with a "Whatsapp us" button. The main banner features the text "Join The Resistance 2.0" with a lightning bolt icon, and two buttons: "Choose the RIGHT program for YOU" and "Contact Us". Below the banner is a registration form with a progress indicator showing steps 1 and 2. The form fields include "Name *", "Contact Number *", and "Email *". The "Training Program *" section has three radio button options: "One-on-one (Personal) training", "Athlete Performance training", and "Group training". The "Are you a member of the Colts Cricket Club? *" section has two radio button options: "Yes" and "No". A green "Next" button is at the bottom of the form.

1 ————— 2

Name *

Contact Number *

Email *

name@mail.com

Training Program *

☐ One-on-one (Personal) training

☐ Athlete Performance training

☐ Group training

Are you a member of the Colts Cricket Club? *

☐ Yes

☐ No

Next

Figure 2 6: Resistance Gym Home Page

Comparison proposed system with similar systems

Following table compares of the main functionalities in the above-mentioned systems with the proposed Everest Fitness Center.

Following Table 2.1 is described the comparison features.

	Resistance Gym	Power World Fitness	LifeTime Fitness	Everest Fitness
Member Registration	✓	✓	✓	✓
Workout Scheduling	✓	✓	✓	✓
Classes Arrangements	X	✓	X	✓
Attendance Managements	X	✓	X	✓
Students Managements	X	✓	X	✓
Instructors Managements	✓	✓	✓	✓
Simple and user-friendly interfaces	✓	✓	✓	✓
Generate Reports	✓	X	X	✓
Supplements shop management	X	X	✓	X
Ease of Navigation	✓	✓	✓	✓
Provide BMI Calculator	X	✓	X	✓
Provide social media links	✓	✓	✓	✓

Table 2 1: Comparison Features Table

2.8 Selected Methodology

There are many software development processes in the industry. Regarding the customer requirements, it is decided to select the most suitable development process and continue. The iterative waterfall process model is used to developed the proposed system due to the requirements are clear and fixed. This is a linear sequential model. Requirement analysis and specification, system design, system implementation, integration and testing, deployment and maintenance are identified phases of the iterative waterfall process model. Following section describes how to apply the iterative waterfall model (Figure 2.7) to the proposed gym management system.

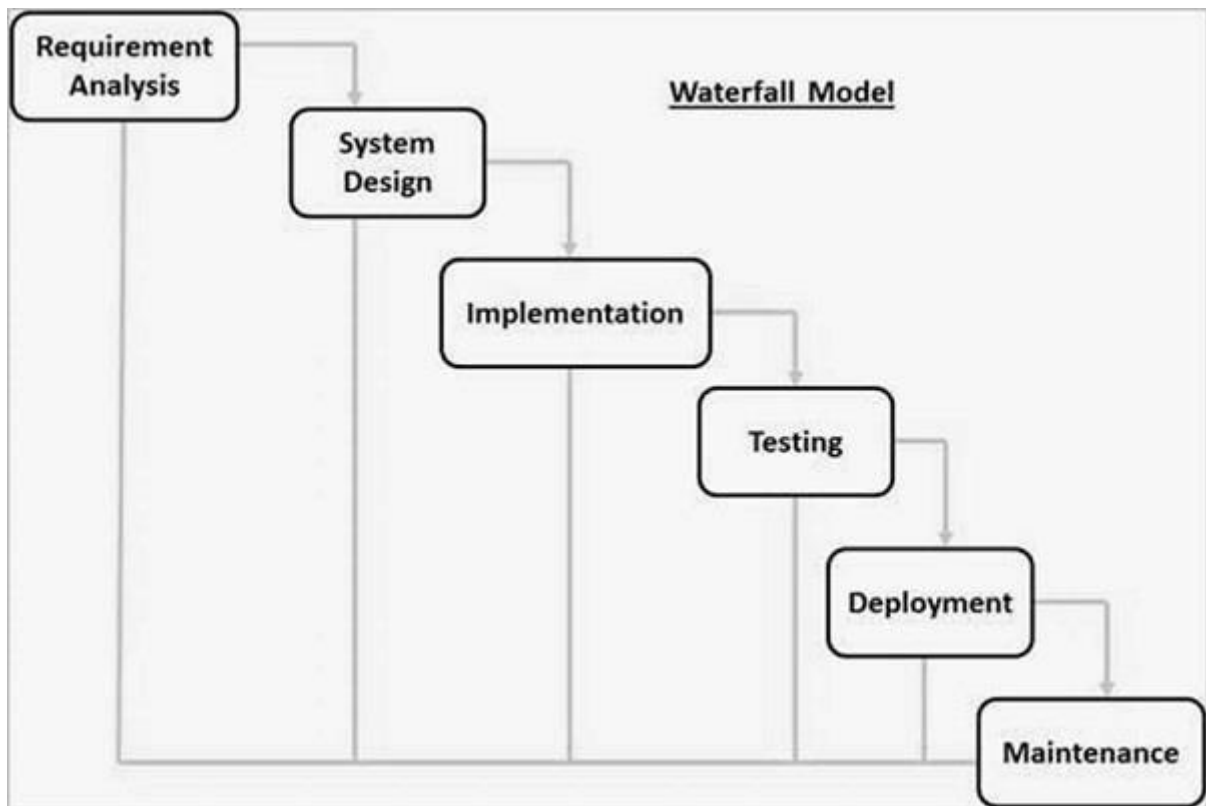


Figure 2 7:Iterative Waterfall Model

In the iterative waterfall model, each step must be completed before proceeding to the next. This rule ensures a structured development process. The steps are described below:

- Requirement analysis and specification

This process defines user expectations. It starts with input from the gym owner and other stakeholders, including instructors, developers, testers, and others. After gathering requirements, they are documented in detail, covering both functional and non-functional requirements.

- System Design

This phase outlines the architectural design, interfaces, modules, narratives, and data structure of the system. Once the requirements are analyzed, the design phase begins, defining the overall system structure and how its components interact, including the database.

- Implementation

This is the system development phase. Based on the system design and specifications, the implementation phase involves writing code and handling database queries. These are the primary tasks necessary to develop the system.

- Integration and Testing

Every system should be validated. After the implementation is complete, the validation of system functionalities and performance begins. Unit testing, system testing, and user acceptance testing are some of the testing methods used in this phase.

- Deployment

Once the testing process is successful, the system is prepared for deployment. Configuring the system environment and setting up the server are the main tasks in this phase.

- Maintenance

This phase involves software repairs, bug fixes, and upgrades. Simply put, it provides ongoing support to ensure the system remains functional and up to date.

2.9 Feasibility Study

Feasibility study means the assessment conduct before starting the project. It evaluates different kinds of areas such as financial, technical, ethical, legal, organizational and other aspects areas. It is minimized the risks and get a clear idea of the implementation process.

2.9.1. Financial Feasibility

Everest Fitness Center gym management system will be developed as a web-based application, accessible via desktop. This is a small-scale project. There are limited number of instructors and classes. Therefore, the in financial feasibility, minimizing the cost is essentially. For this purpose, Everest Fitness is decided to select MySQL database to store gym details. It will be minimized the maintenance costs.

2.9.2. Technical Feasibility

The following technologies will be used in developing the proposed system.

- ✓ PHP
- ✓ MySQL
- ✓ HTML
- ✓ CSS
- ✓ Bootstrap
- ✓ jQuery

Each of the technologies is freely available and technically managed, which makes the project technically feasible.

2.9.3. Ethical Feasibility

User authentication and access control mechanisms will be implemented to prevent unauthorized access to sensitive data. The proposed system will not conflict with the laws and regulations of Sri Lanka regarding handling personal information.

2.9.4. Resource Feasibility

Resources that use for the project are as below.

- ✓ As programming devices use a laptop
- ✓ Internet connection
- ✓ Programming and testing individual

As the project has required resources, this is resource feasible

2.10 Summary

This chapter focused on providing the system analysis of the current process and similar applications related to the process in the market. The chapter provided a detail of the market product comparison as well.

Chapter 3 – Design

3.1 Introduction

Design is also very important part of the system. This chapter describes the system's architecture through diagrams. It includes use case diagram, class diagram, sequence diagram and activity diagram. This is the place where entire UML structure of the system is described (GeeksForGeeks, 2022).

3.2 Justification of the Design

The deployment of the proposed system is a web-based management system. It is depended on several factors such as target audience, accessibility, user interface design and business environment. Some businesses are enough for standalone application. According to that, Everest Fitness Center is suitable for web-based system. Following are the basic reasons why selected the web-based approach (Mendes and Nile Spencer Mosley, 2011).

- **Accessibility**
Users can access the system anywhere with the internet connection. This is convenient for both gym instructors and members. Therefore, they always interact together through the system (Mendes and Nile Spencer Mosley, 2011).
- **Cross Platform Compatibility**
Users can access the system from any devices with a web browser.
- **Cost Effectiveness**
Consider the cost effectiveness, even there is an open-source solution. Also, some cloud-based hosting services offer flexible prices.
- **Security**
Web based system has an authentication mechanism. By validating the user access, it can be controlled the access of the system.
- **Ease of Updates**
These are real time updates. If one application is updated, other relevant applications are automatically updated.

Following Table 3. 1 shows the comparison of alternate solutions.

Feature	Online Purchased System	Network Based System	Standalone System	Web Based System
Accessibility	Depend on the provider	Limited local network users	Only a single device	Accessible from anywhere
Cross Platform Compatibility	Varies by provider/ may not support all devices	Limited	Only on the installed devices	Fully compatible via a web browser
Cost Effectiveness	Subscription costs	Hogh setup cost (hardware and software)	Lower cost with individual installations.	Cost-effective with minimal infrastructure requirements
Security	Depend on service provider	May be hardware failure	Risk of system crashes	Authentication mechanism
Ease of updates	Controlled by vendor	Require an IT team	Update each device separately	Automatic updates

Table 3 1: Comparison of Alternate Solutions

3.3 UML Diagrams for the Proposed System

3.3.1 Use Case Diagram

Use case diagrams are depicted who are the system users and what are the task of them. It means, the interaction of the system users and how they interacted with functionalities. Actors are defined as who are the system users and use cases are defined as what are the functionalities of them. Relationships are defined as how they interact with each other. (Visual Paradigm, 2019).

Main Actors of the Proposed System

Following Table 3. 2 shows main actors of the proposed system.

Actor	Description
Member	A person who participates in fitness activities and use gym facilities.
Instructor	Fitness trainer. A person who guides gym members.
Administrator	A person who manages system users, modules, making system backups and restoring them.
Receptionist	A person who manages the front-end desk of an organization. Register members/students, assign jobs to employee, create job cards are some of functionalities.
Student	A person who participates the yoga/Zumba class
Master	A person who conducts the yoga/Zumba class
Manager	A person who mainly manage the membership packages and fitness class catalog.
Cashier	A person who receives payments and updates the status

Table 3 2: Main Actors of Proposed System

Use Case Diagram for the Proposed System

This overall use case diagram represents a gym management system, showing different user roles and their interactions with the system. Members can manage profiles, browse workout plans while instructors create schedules and monitor members. Receptionist assign instructors and cashier handles payments and receipts. Administrator manage user permissions, while managers generate reports. Members submit reviews. Core functions like registration and login ensure seamless access, highlighting the structured workflow for efficient gym management.

Following Figure 3. 1 shows overall use case diagram for proposed system.

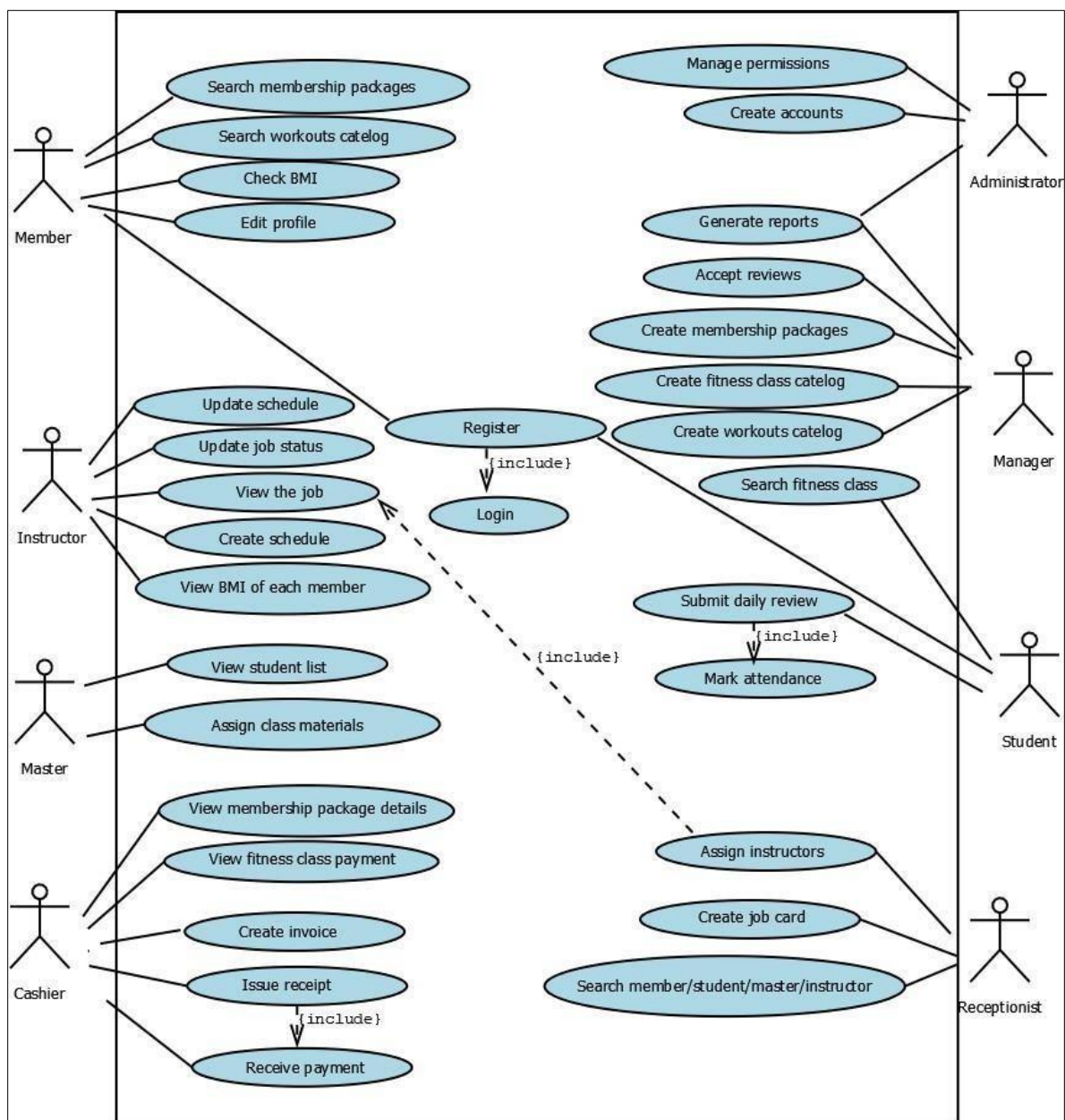


Figure 3 1: Overall Use Case Diagram for Proposed System

3.3.2 Use Case Narratives

Use Case Narrative for User Login

The login use case describes how users access the web-based gym management system by providing valid credentials. Visiting the loginpage, users are prompted to enter their username and password to log in. The system verifies the entered credentials. If valid, grants access to the user. Otherwise, an error message is displayed. A successful login ensures the user is authenticated, while unsuccessful attempts.

This table 3.3 shows use case narrative for user login.

Use-case Number	UC-01	
Use-Case Name	Login	
Priority	High	
Actor	All the users	
Description	This use case describes how actors log into the Web Based Gym Management System.	
Precondition	None	
Post-condition	If the use case was successful, the actor logged into the system. If not, the system state is unchanged.	
Basic course of Action	User Action	System Response
	1. The actor visits home page to login to the system. 3. The actor enters Username and Password, and then click on a login button.	2. The system prompts the login form to the actor to enter Username and Password. 4. The system verifies that Username and Password fields have been filled out and valid. 5. The system confirms successful login attempt of the actor. 6. Use case Exit
Alternate course of Action	4.1 If all the fields are not filled out and not matching with the Username and/or Password, the system notifies the actor a message as “Invalid Username or Password” and redirect to step 2 to reenter the fields.	

Table 3 3: Use Case Narrative for User Login

Use Case Narrative for Gym Member Registration

The gym member registration use case narrative outlines the process for a new member to register in the web-based gym management system.

Following Table 3.4 shows use case narrative for gym member registration.

Use-case Number	UC-02	
Use-Case Name	Gym Member Registration	
Priority	High	
Actor	Member	
Description	This use case describes how member registers to the Web Based Gym Management System.	
Precondition	Identified what is going to obtain workout/fitness/class or package.	
Post-condition	If the use case was successful, the member can obtain the workout/fitness/class/package through the system.	
Basic course of Action	User Action	System Response
	1. The actor visits online registration page to apply for membership and clicks Register button. 3. The actor enters details (First name, Last name, Address Line 1, Address Line 2, Address Line 3, Address Line 4, City, District, e-mail, NIC number, Contact Number 1, Contact Number 2, Image, Username, Password, Confirm Password).	2. The system prompts the registration form to the actor. 4. The system verifies that all the mandatory fields have been filled out and valid. 5. The system confirms successful registration with displays a message as “Registration successfully”. 6. Use case Exit
Alternate course of Action	4.1 If all the mandatory fields are not filled out and any of the entry/ ies are not valid, the system notifies the actor to fill or enter valid entry/ ies and redirects to basic course of action of step 2.	

Table 3 4: Use Case Narrative for Gym Member Registration

Use Case Narrative for Add User Roles

The add user roles use case narrative describes how an administrator assigns different roles within the web-based gym management system. After login, the administrator accesses the user role management section and fills out the required details.

Following Table 3.5 shows use case narrative for add user roles.

Use-case Number	UC-03	
Use-Case Name	Add User Roles	
Priority	High	
Actor	Administrator	
Description	This use case permits administrator to add user roles.	
Precondition	Administrator should login to the system.	
Post-condition	If the use case was successful, added user roles into the system.	
Basic course of Action	User Action	System Response
	1. The actor requests add new user role form page. 3. The actor inserts user role name to the form.	2. The system response or displays a form to be filled out for add user role. 4. The system verifies that all the mandatory fields have been filled out and valid. 5. The system confirms successful stored with displays a message as “inserted Successfully”. 6. Use case exit.
Alternate course of Action	4.1 If all the mandatory fields are not filled out and any of the entry/ ies are not valid, the system notifies the actor to fill or enter valid entry/ ies and redirects to basic course of action of Step 2.	

Table 3 5: Use Case Narrative for Add User Roles

Use Case Narrative for Add Membership Packages

The add membership packages use case narrative explains how a manager/administrator adds new gym packages to the system. The manager/administrator accesses the package management section, fills out the required details.

Following Table 3.6 shows use case narrative for add membership packages.

Use-case Number	UC-04	
Use-Case Name	Add Membership Packages	
Priority	High	
Actor	Manager	
Description	This use case describes how manager add Packages (duration, discount, main features) into the system.	
Precondition	None	
Post-condition	Packages information stored to the database successfully.	
Basic course of Action	User Action	System Response
	1. The actor wants to add a new package. 2. The actor requests add new packages form page. 4. The actor enters data to the form. 5. The actor clicks/presses on the save or insert button.	3. The system response or displays a form to be filled out for add packages. 6. The system verifies that the fields have been filled out correctly. 7. The system displays a successfully stored message. 8. Use case exit.
Alternate course of Action	6.1 If all the fields are not filled out, the system redirect to the form to re-enter the fields.	

Table 3 6: Use Case Narrative for Add Membership Packages

Use Case Narrative for Create Job Card

The create job card use case narrative explains how a receptionist assigns instructors to workout sessions and fitness. The receptionist accesses the job card tab, selects an instructor, and saves the assignment.

Following Table 3.7 shows use case narrative for create job card.

Use-case Number	UC-05	
Use-Case Name	Create Job Card	
Priority	High	
Actor	Receptionist	
Description	This use case describes how receptionist create a job card	
Precondition	Receptionist should login to the system	
Post-condition	If the use case was successful, Assign Instructors for the workout sessions.	
Basic course of Action	User Action	System Response
	1. The receptionist wants to create a job card. 2. The receptionist open assign job card tab. 4. The actor assign an instructor. 5. The actor click save button.	3. The system displays a creating job card form. 6. The system send notification to the assigned instructor. 7. Use case exit.
Alternate course of Action	3.1 If there are not any available instructors, the system displays a message.	

Table 3 7: Use Case Narrative for Create Job Card

Use Case Narrative for Report Generation

The report generation use case narratives outlines how administrators and managers generate reports for different time periods (daily/weekly/monthly). The actor navigates to the reports tab, specifies the desired timeframe, and clicks the generate button. The system processes the request and displays the report if all inputs are valid.

Following Table 3.8 shows use case narrative for report generating.

Use-case Number	UC-06	
Use-Case Name	Report Generation	
Priority	High	
Actor	Administrator, Manager	
Description	This use case describes how reports are generated.	
Precondition	Manager/ Admin wants to see reports.	
Post-condition	Generate annually/ monthly/ weekly/ daily reports.	
Basic course of Action	User Action	System Response
	1. The actor wants to generate report. 3. The actor clicks view report. 4. Then on the form the actor specifies the year/month/week/day and then clicks on the generate button.	2. The system displays reports tab. 5. The system verifies the field has been filled out correctly. 6. The system displays report. 7. Use case exit
Alternate course of Action	4.1 If have the server issue or any other unexpected problems, the system displays the error message as “error generating report” and try again.	

Table 3 8: Use Case Narrative for Report Generating

3.3.3 Entity Relations (ER) Diagram

This is a structure a database uses to plan, store and manage data.

Following Figure 3.2 shows entity relation diagram of the system.

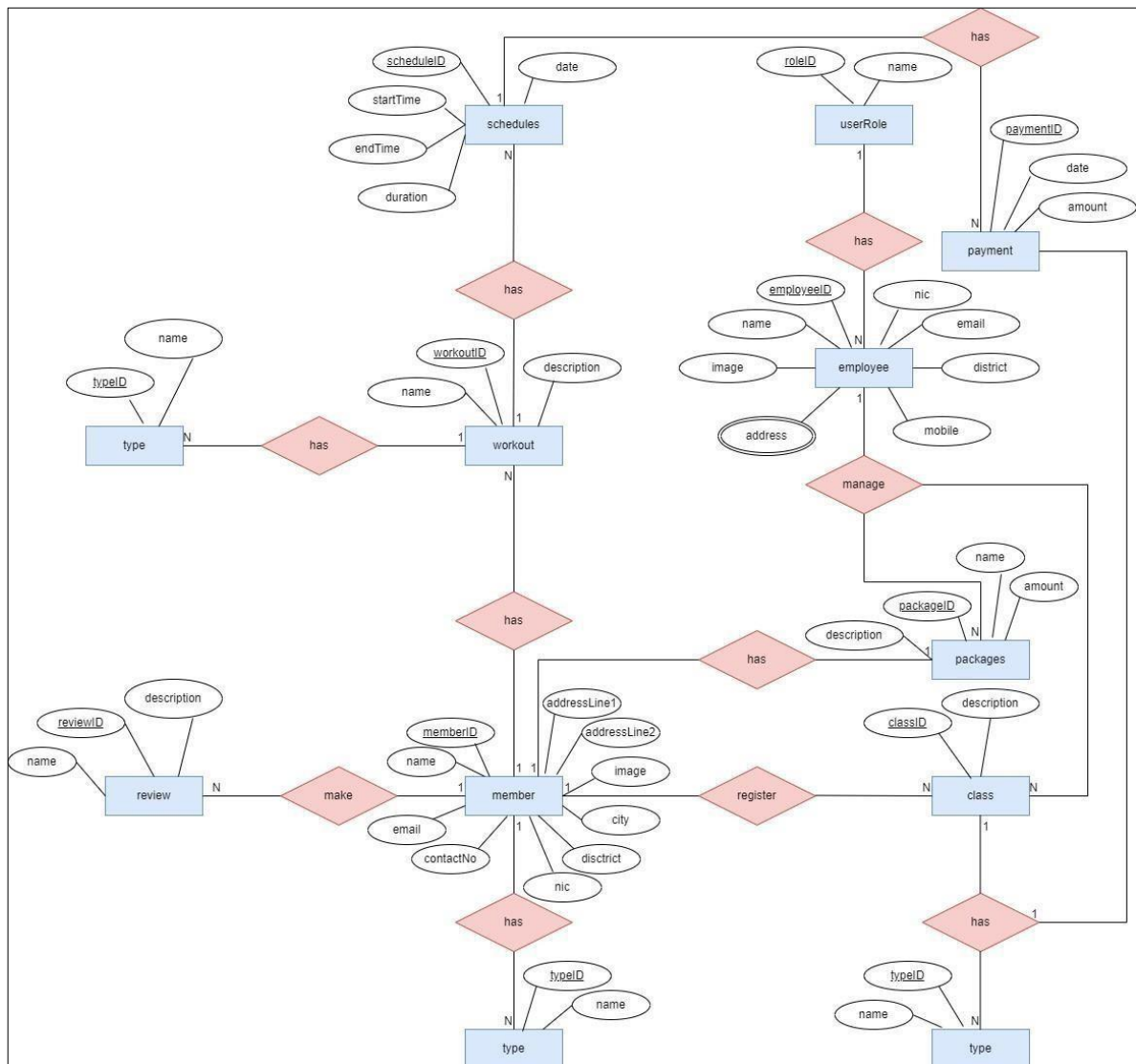


Figure 3 2: Entity Relation Diagram

3.3.4 Class Diagram

Class diagram describes the structure of the proposed system by indicating classes, attributes, functionalities, and their relationships. (SearchAppArchitecture, nodate)

Following Figure 3.3 shows class diagram of the system.

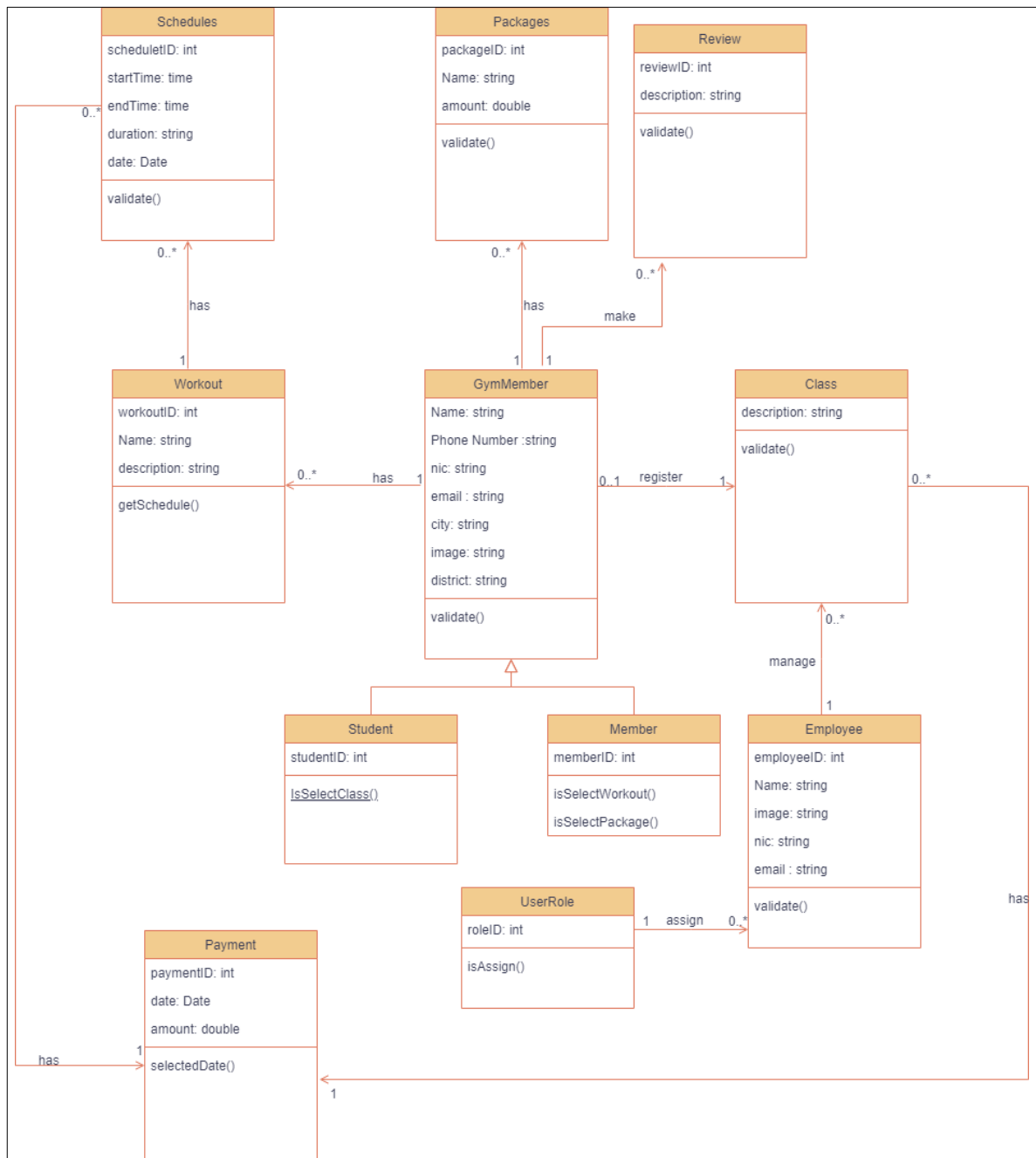


Figure 3 3: Class Diagram

3.3.5 Sequence Diagrams

The sequence diagrams illustrate the interaction among each object of the system.

Sequence Diagram for Member Management

Following Figure 3.4 shows sequence diagram for member management.

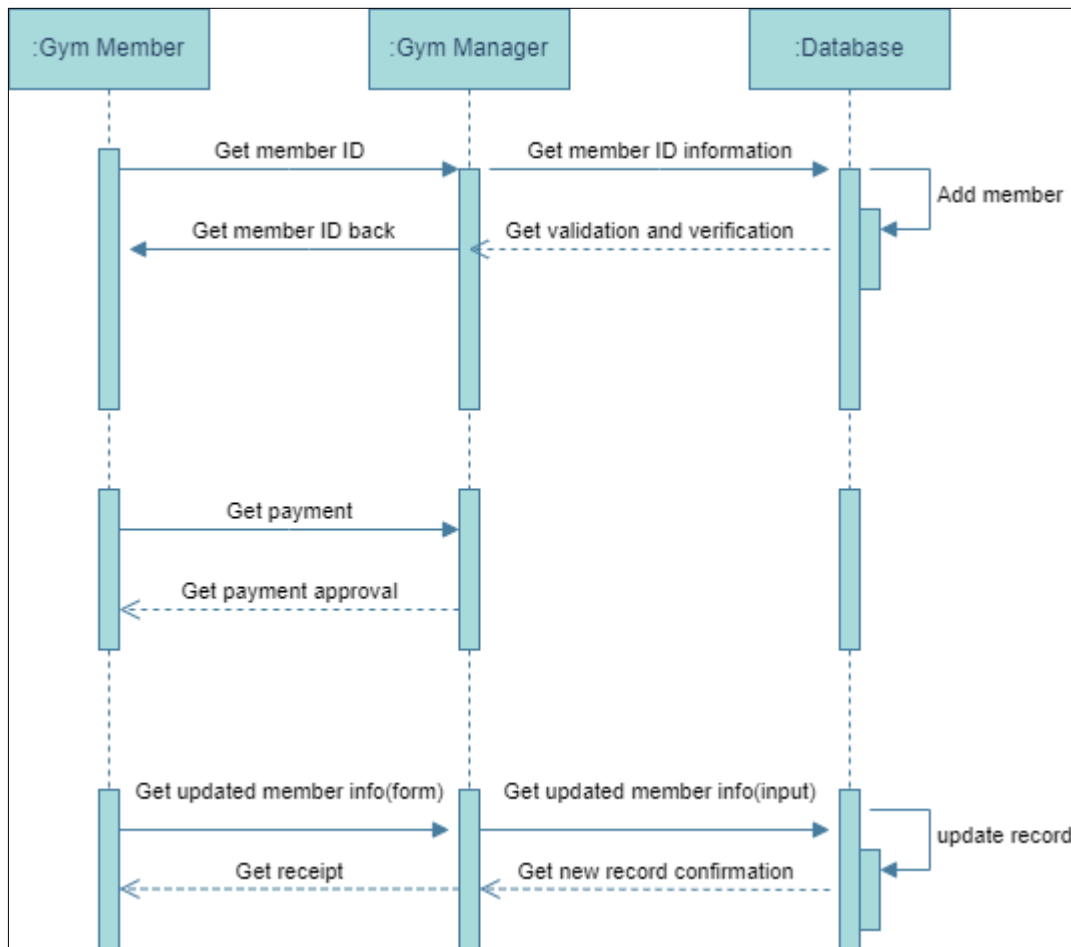


Figure 3 4: Sequence Diagram for Member Management

Sequence Diagram for Member Login

Following Figure 3.5 shows sequence diagram for member login.

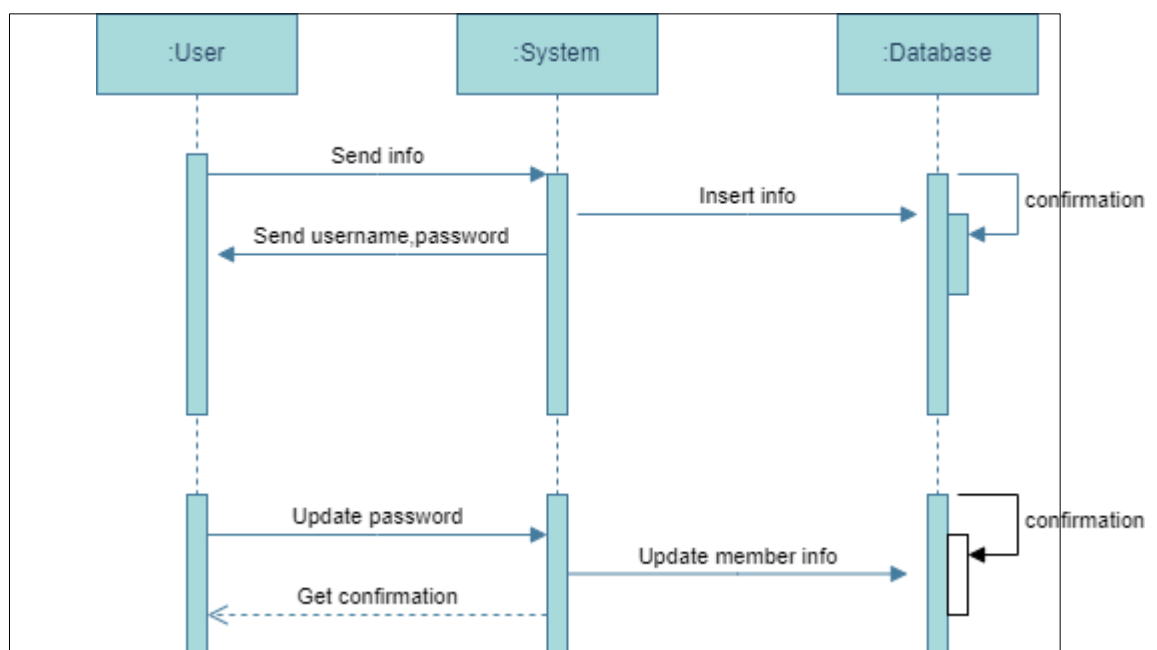


Figure 3 5: Sequence Diagram for Member Login

3.3.6 Activity Diagrams

Activity Diagrams describe how activities are coordinated to provide a service which can be at different levels of abstraction. Typically, an event needs to be achieved by some operations, particularly where the operation is intended to achieve a number of different things that require coordination, or how the events in a single use case relate to one another, in particular, use cases where activities may overlap and require coordination. (Fowler, 2004)

Activity diagram for user login

Following Figure 3.6 shows an activity diagram for user login.

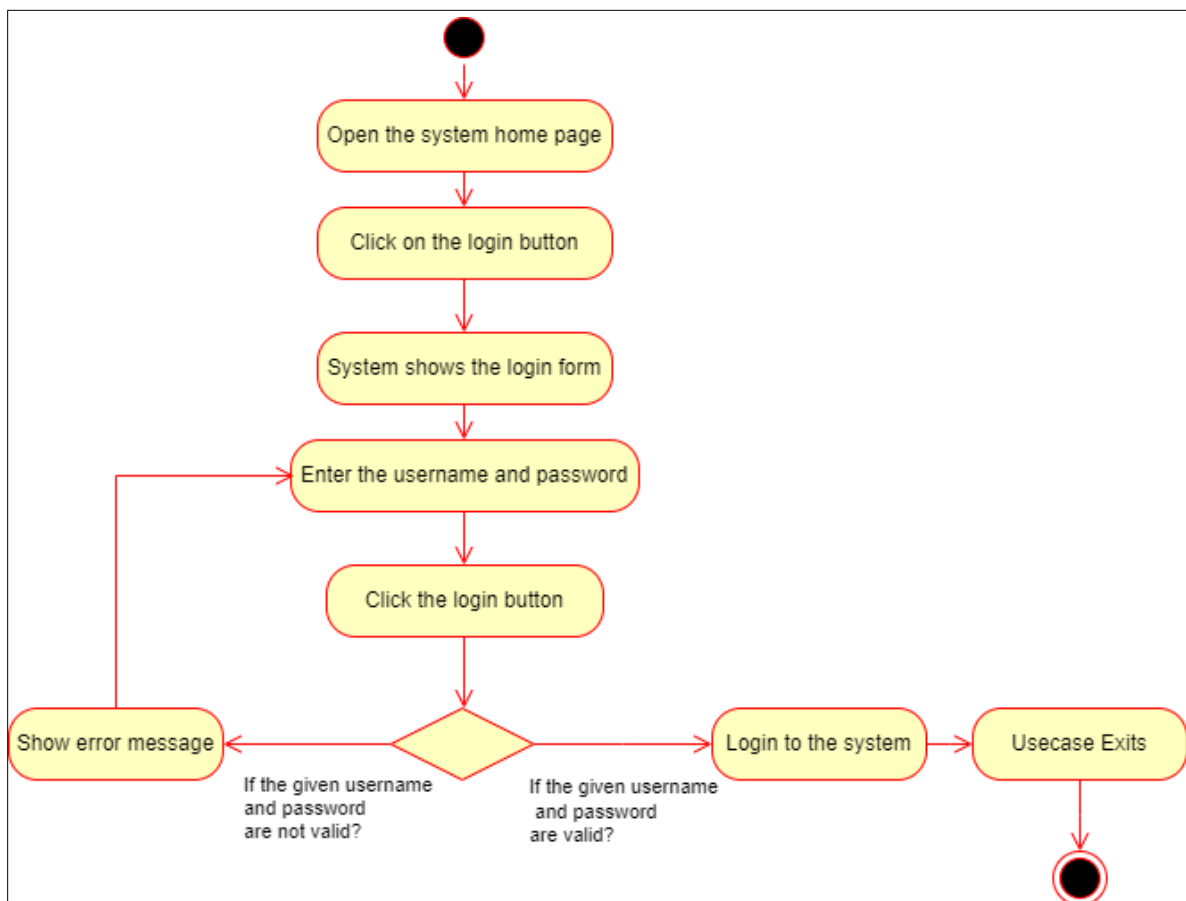


Figure 3 6: Activity Diagram for User Login

Activity diagram for register a new member

Following Figure 3.7 shows an activity diagram for register a new member.

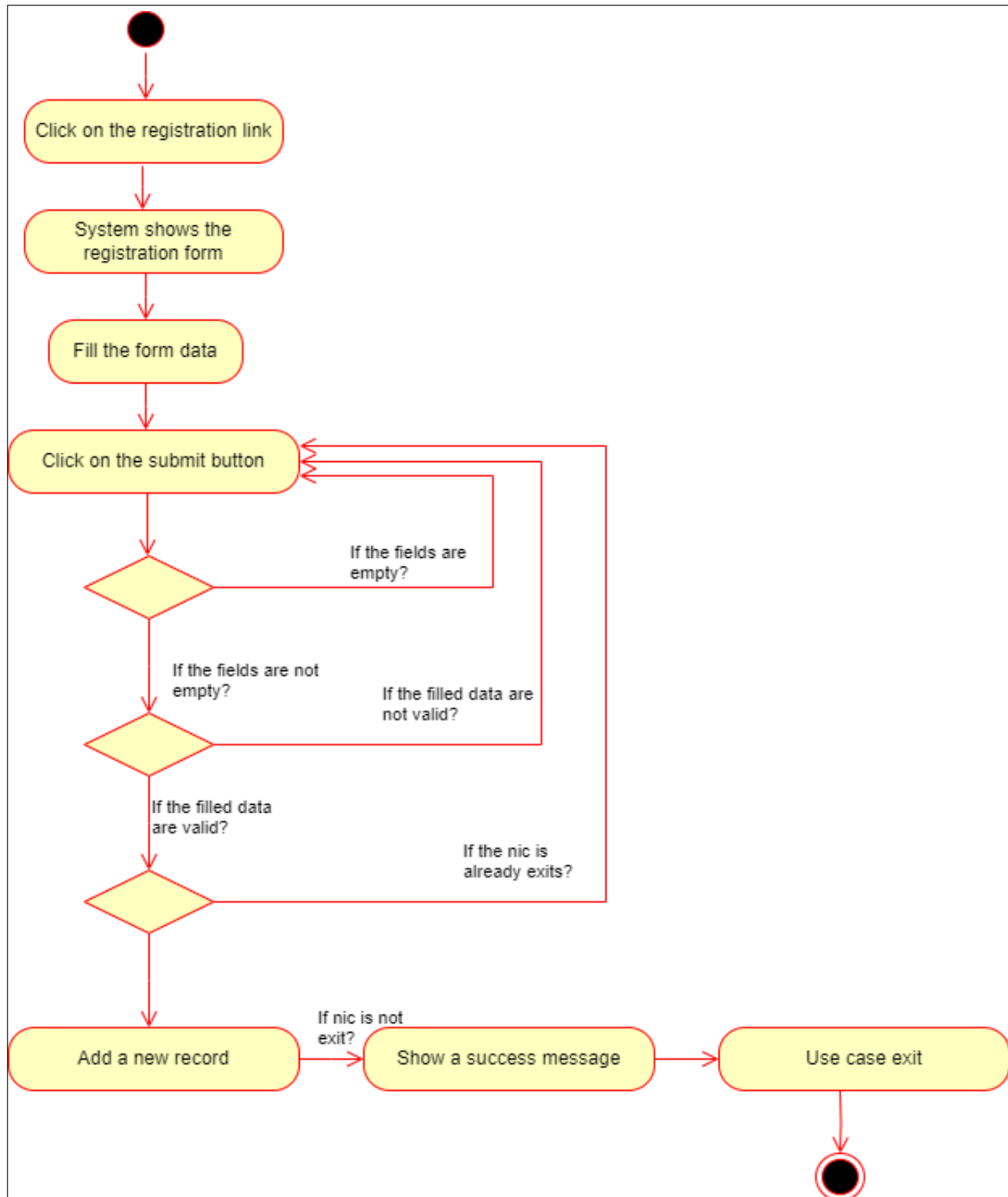


Figure 3 7: Activity Diagram for Register a New Member

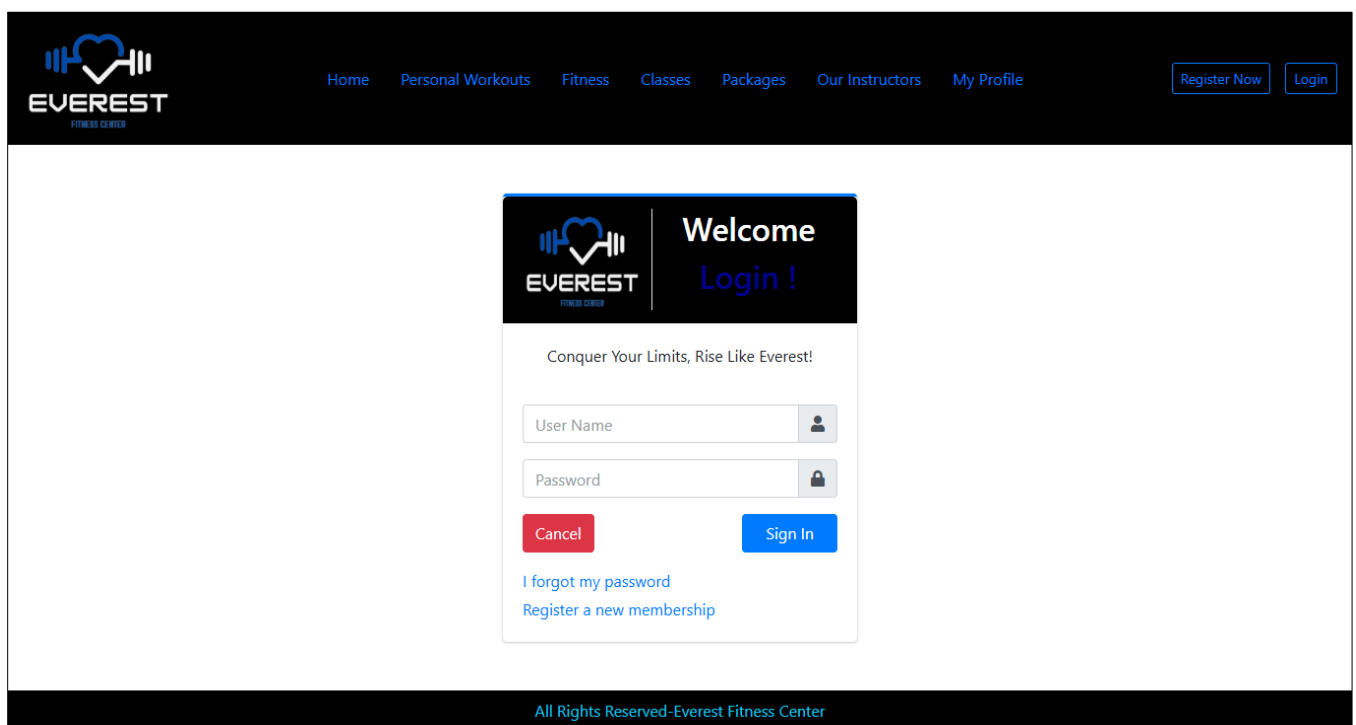
3.4 Prototype Design

User interfaces should be simply understood by users. The following are selected GUI mockups designed for the proposed system.

User Login

This form is used to login to the system by members.

Following Figure 3.8 shows login form.



The mockup shows a web interface for Everest Fitness Center. At the top is a dark navigation bar with the Everest logo on the left and a menu of links (Home, Personal Workouts, Fitness, Classes, Packages, Our Instructors, My Profile) in the center. On the right of the navigation bar are two buttons: 'Register Now' and 'Login'. Below the navigation bar is a large white rectangular area containing a login form. The login form has a dark header with the Everest logo and the text 'Welcome Login!'. Below the header is a motivational quote: 'Conquer Your Limits, Rise Like Everest!'. The form contains two input fields: 'User Name' and 'Password', each with a corresponding icon (a person and a lock). Below the input fields are two buttons: a red 'Cancel' button and a blue 'Sign In' button. At the bottom of the form are two links: 'I forgot my password' and 'Register a new membership'. At the very bottom of the page is a dark footer with the text 'All Rights Reserved-Everest Fitness Center'.

Figure 3 8: Login Form

Member Registration

This form is used to register a new member to the system.

Following Figure 3.9 shows member registration form.

Member Registration Form

Personal Information

First Name

Enter First Name

Last Name

Enter Last Name

AddressLine1

Enter AddressLine1

AddressLine2

Enter AddressLine2

AddressLine3

Enter AddressLine3

AddressLine4

Enter AddressLine4

City

Enter City

District

--

NicNumber

Enter NIC Number

Email

Enter Email

PhoneNumber1

Enter Phone Number1

eg: +94774563214

PhoneNumber2

Enter Phone Number2

eg: +94774563214

Profile Image

Choose File

No file chosen

Account Information

UserName

Enter User Name

Password

Enter Password

Confirm Password

Confirm Password

Password must include at least one
letter, one number with 8 characters or
more

Save

Cancel

Figure 3 9: Member Registration Form

Workout Reservation

This form is used to reserve a selected workout by registered members.

Following Figure 3.10 shows workout reservation form.

Welcome Sumedha Rathnapala !



HomePersonal WorkoutsFitnessClassesPackagesOur InstructorsMy Profile

Register NowLoginLogout

Reserve Your Workout

Member Information

Member Registration No:
R202502206

First NameLast Name
SumedhaRathnapala

NIC
885712460V

Workout Information

Workout Name:
Strength Training

Workout Charge:
5000.00

Select Date and Time

Select Appointment Date
mm/dd/yyyy

Select Available Slot
--

Calculate BMI

Enter Weight (Kg.)Enter Height (M.)

Your BMI

Reserve NowCancel

Time Slots

Slot-1 | 06:00:00 - 06:30:00

Slot-2 | 06:30:00 - 07:00:00

Slot-3 | 07:00:00 - 07:30:00

Slot-4 | 07:30:00 - 08:00:00

Slot-5 | 08:00:00 - 08:30:00

Slot-6 | 08:30:00 - 09:00:00

Slot-7 | 09:00:00 - 09:30:00

Slot-8 | 09:30:00 - 10:00:00

Slot-9 | 10:00:00 - 10:30:00

Slot-10 | 10:30:00 - 11:00:00

Slot-11 | 11:00:00 - 11:30:00

Slot-12 | 11:30:00 - 12:00:00

Slot-13 | 12:00:00 - 12:30:00

Slot-14 | 12:30:00 - 13:00:00

Slot-15 | 13:00:00 - 13:30:00

Slot-16 | 13:30:00 - 14:00:00

Slot-17 | 14:00:00 - 14:30:00

Slot-18 | 14:30:00 - 15:00:00

Slot-19 | 15:00:00 - 15:30:00

Slot-20 | 15:30:00 - 16:00:00

Slot-21 | 16:00:00 - 16:30:00

Slot-22 | 16:30:00 - 17:00:00

Slot-23 | 17:00:00 - 17:30:00

Slot-24 | 17:30:00 - 18:00:00

Slot-25 | 18:00:00 - 18:30:00

Slot-26 | 18:30:00 - 19:00:00

Slot-27 | 19:00:00 - 19:30:00

Slot-28 | 19:30:00 - 20:00:00

Slot-29 | 20:00:00 - 20:30:00

Slot-30 | 20:30:00 - 21:00:00

Slot-31 | 21:00:00 - 21:30:00

Slot-32 | 21:30:00 - 22:00:00

All Rights Reserved-Everest Fitness Center

Figure 3 10: Workout Reservation Form

Manage Workouts

This form is used to add workouts to the system by administrator/manager.

Following Figure 3.11 shows add workouts form.

Everest Fitness

Admin
Nimesha Gomas

Search

My Profile <

User Role <

Poya Day <

Instructor <

Workouts <

Fitness <

Class <

Services Management <

Package Management <

Home

Logout

Workout / Create

Create Workout Account

Workout Name

Enter Workout Name

Workout Description

Enter Workout Description

Workout Image

Choose File No file chosen

Save Cancel

Table of Workouts Details

Enter Workout Name

Search

Workout Name	Workout Image	Change Status	Status	
Cardio Training		Change	Active	Edit
Endurance Training		Change	Active	Edit
Muscle Building (Hypertrophy Training)		Change	Active	Edit
Strength Training		Change	Active	Edit

Showing 1 to 4 of 4 entries

Previous 1 Next

Dashboard-Everest Fitness Center

Figure 3 11: Add Workout Form

Following Figure 3.12 shows view workouts form.

Everest Fitness

Admin
Nimesha Gomas

Search

My Profile <

User Role <

Poya Day <

Instructor <

Workouts >

Create Workouts

View Workouts

Fitness <

Home

Logout

Workouts / View

Enter Workout ID

Enter Workout Name

Search

Workout Image	Workout Id	Workout Name	Workout Description
	1	Strength Training	Focuses on building muscle strength and endurance.
	2	Cardio Training	Improves heart health, stamina, and endurance.
	3	Muscle Building (Hypertrophy Training)	Targets muscle growth with controlled resistance exercises.
	4	Endurance Training	Improves cardiovascular and muscular endurance.

Dashboard-Everest Fitness Center

Figure 3 12: View Workouts Form

3.5 Summary

Chapter 3 focused on the design architecture of the proposed system. It refers to the high-level architecture, UML diagrams, and prototype designs of the system.

Chapter 4 – Implementation

4.1. Introduction

In implementation phase, requirements are transformed into real outputs of the system. It is used to suitable programming language, software and hardware development tools. After completed the previous phases, then starting the implementation phase and this is the executable part of the system.

4.2. Related Technologies

PHP is often considered easier to learn and use, especially for web development. It also can embed with HTML, which is useful for building dynamic web pages. PHP's syntax is simpler and more intuitive; therefore, it helps to fast development. PHP integrates well with databases like MySQL. PHP can integrate with XAMPP server for storing data. Ajax is used for updating web pages quickly without reloading and query act as a library in this gym management system. These technologies are discussed in the below section, (Schifreen 2009,p.208).

- XAMPP web server:

XAMPP is the most popular free and open-source software package mainly consisting with Apache HTTP server, MySQL database and interpreter for scripts written for PHP. PhpMyadmin is used to implement queries and Apache plays the role of the web server.

- PHP:

PHP stands for Hypertext Preprocessor. This is the main server-side scripting language which is used to develop the system. It is easily embedded with HTML and most powerful for making dynamic and interactive web pages.

- AJAX:

AJAX stands for Asynchronous JavaScript and XML. Ajax supports to update a part of a web page without reloading the whole page. It increases the system performance.

- HTML:

HTML stands for Hypertext Markup Language. It supports to depict the clear structure of the website and specific elements to handle front end.

- CSS:

CSS stands for Cascading Style Sheets. It describes how html elements should be displayed. For that purpose, in CSS, used ids to select them to apply necessary styles. CSS can handle the look and feel of the web interfaces adding styles (fonts, colors, spacing....).

- Bootstrap:

Bootstrap is a free and open-source front end web framework for designing responsive web applications. The goal of responsiveness that can resize the web page. It makes flexible layouts, flexible images and flexible spaces with texts. Bootstrap contains HTML and CSS based design templates such as forms, buttons, navigations, tables and other components.

- jQuery:

jQuery is a lightweight JavaScript library. It takes small code lines and utilize a large task. It is included JS code.

- NetBeans IDE:

NetBeans IDE is a development tool. It is an open-source software. It offers automatic code indentation, auto complete feature, matches opening and closing brackets, etc. Also, it helps to organize project file structure.

4.3. System Architecture

The proposed system architecture is client server architecture. Web browser is a client-side component. Gym instructors, members, students and other validated users can access the system through their own specific interface in a client-side component. Server side is system's backend application and database. This is the server-side component. Application server accepts the client server requests. Then execute the scripts and interacts with the database. After that, generates responses to the client requests. Client server interaction is depended on database queries or necessary computations. Client server architecture allows easy of maintenance. It can be performed updates simultaneously. Also, by centralizing the data, the system ensures the data integrity, consistency and security. Therefore, all the clients can access data without any inconsistencies and conflicts. In addition to that, security against unauthorized access and data breaches. Otherwise, resource sharing is an important fact in a client server architecture. This improves system performance and user experience.

Following Figure 4.1 shows system architecture of the system.

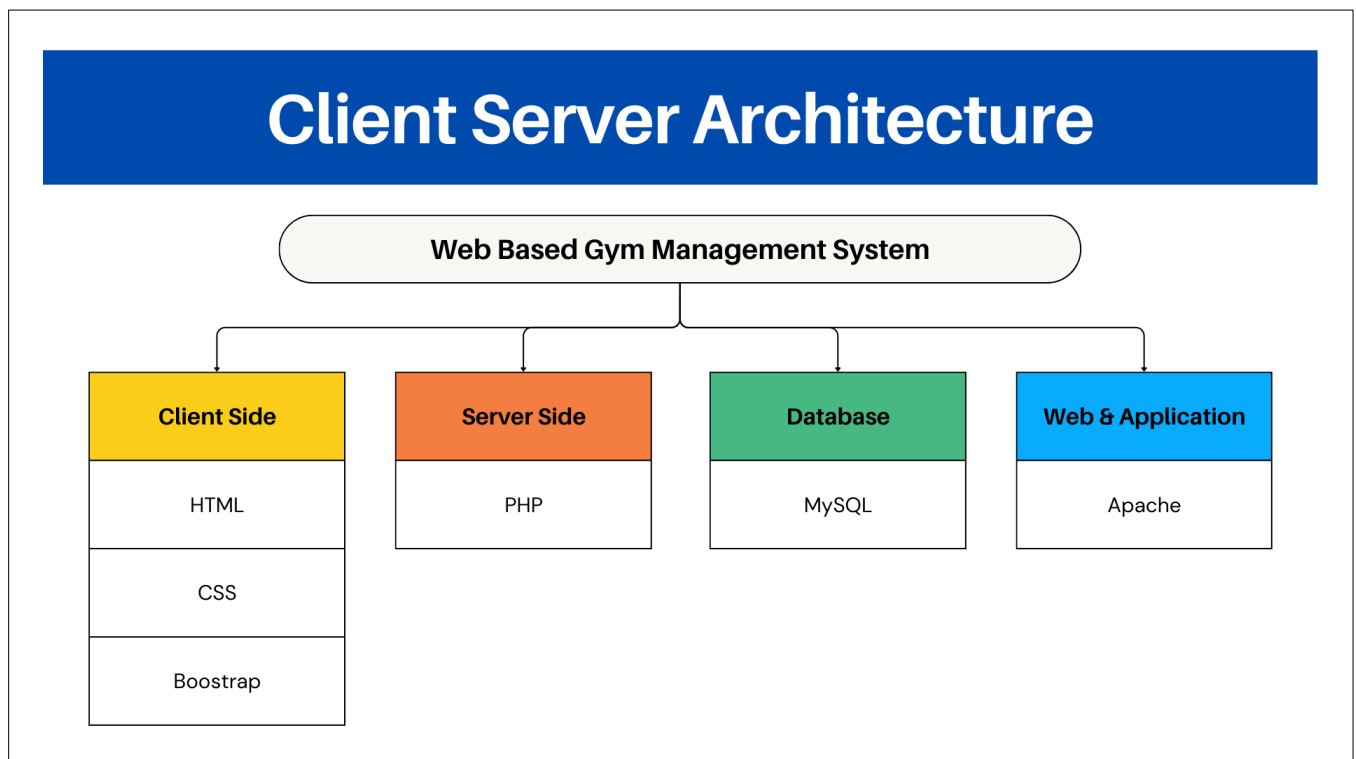


Figure 4 1: System Architecture of the System

4.4. Module Structure

A module is an individual component. It is interacted with other modules. Each module represents of their work flow independently.

Following Table 4.1 shows module structure of GMS.

Module	User
User and role	Administrator
Package handling	Manager
Scheduling	Manager, Receptionist
Member Management	Instructor, Manager
Payment	Member, Cashier
Report	Administrator, Manager

Table 4 1: Module Structure

The gym management process of Everest Fitness Center is mainly categorized into the following four modules.

- ✓ Personal workouts module
- ✓ Fitness module
- ✓ Classes module
- ✓ Fitness package module

Following Figure 4.2 shows system architecture of the entire system.



Figure 4 2: System Architecture of the Entire System

4.4.1. Personal Workouts Module

The process begins with a member selecting a workout and then registering and logging into the system. After registering, the member reserves a workout, and the cashier collects an advanced payment. The receptionist assigns an instructor by creating a job card, after which the instructor schedules the workout sessions. Finally, the cashier processes the payment and prints an invoice, completing the workflow.

Following Figure 4.3 shows personal workout module.

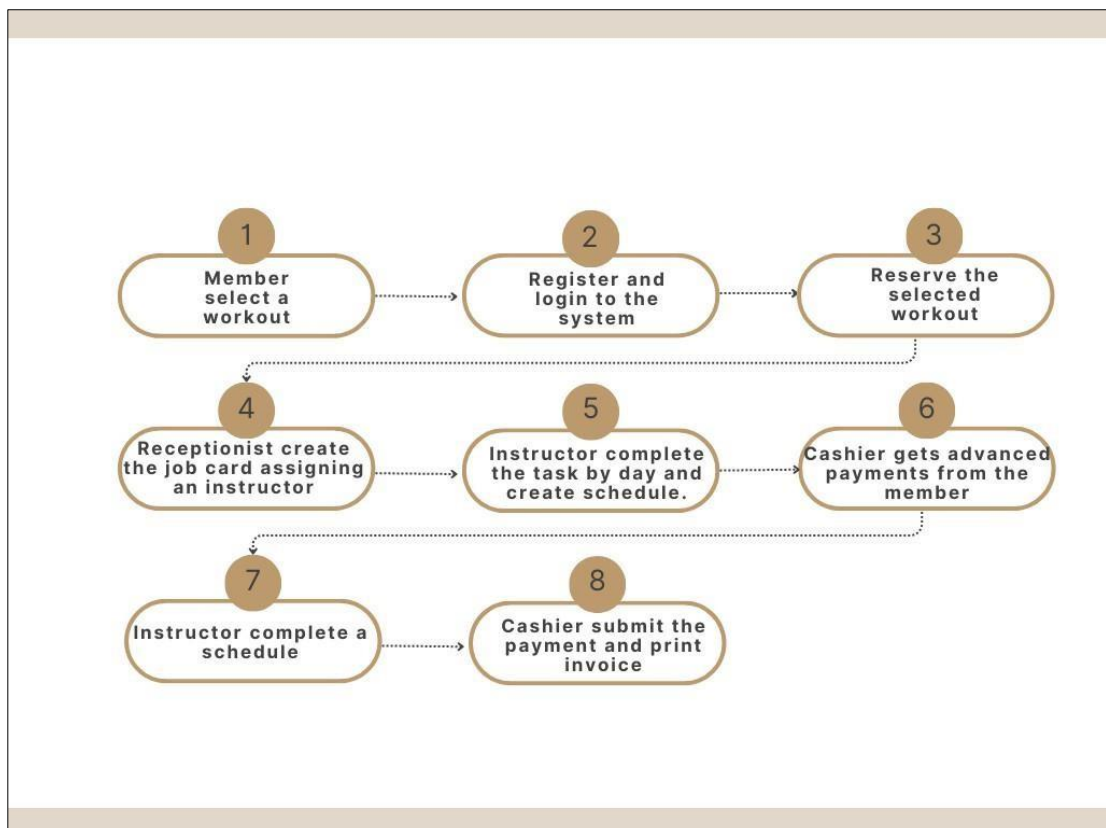


Figure 4 3: Personal Workout Module

4.4.2. Fitness Module

It starts with the member selecting a fitness program, registering, and reserving their chosen fitness session. The receptionist assigns an instructor by creating a job card, the instructor accepts it, and finally, the cashier processes the payment, generates an invoice, and submits it.

Following Figure 4.4 shows fitness module.

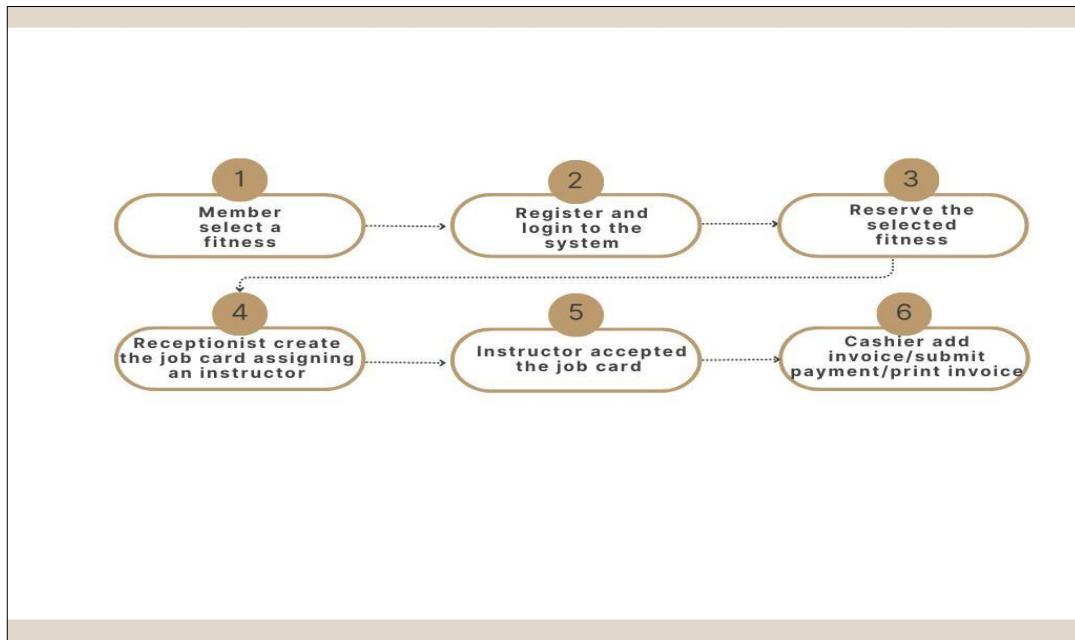


Figure 4 4: Fitness Module

4.4.3. Classes Module

A member starts by selecting a class they want to join. They then proceed to register and log in to the system. Once registered, the member joins the selected class. The receptionist marks attendance for the member. Finally, the cashier processes the monthly payments and prints an invoice.

Following Figure 4.5 shows classes module.

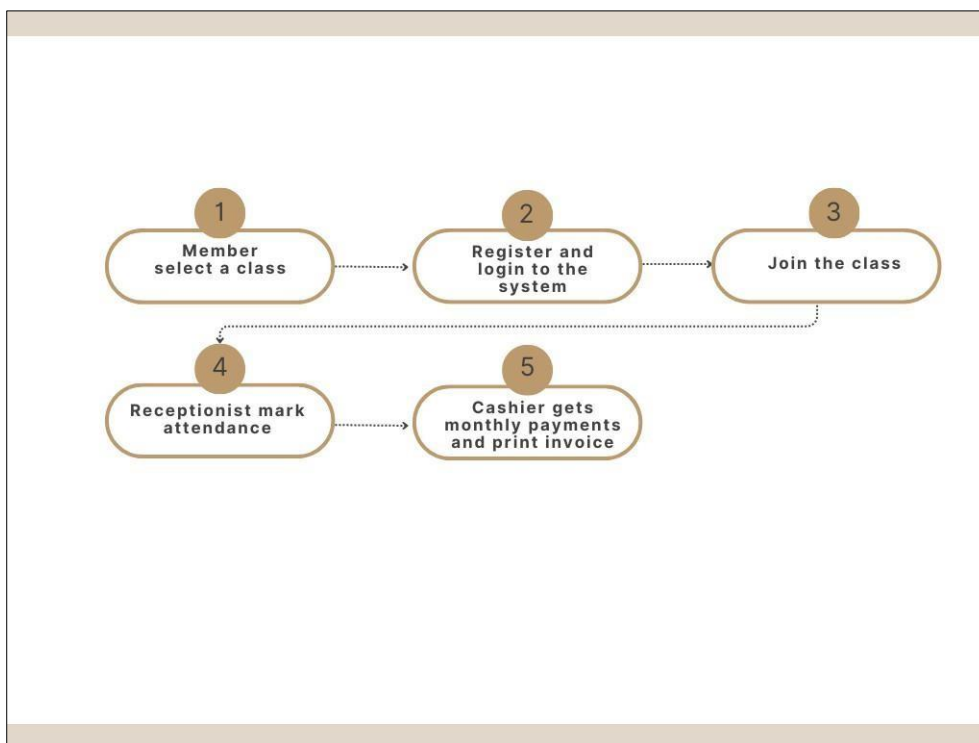


Figure 4 5: Classes Module

4.4.4. Fitness Package Module

The process begins when a member selects a package based on their preferences. They then proceed to register and log in to the system, allowing them to reserve the selected package. Once the package is reserved, the receptionist creates a job card and assigns an instructor to the member. The assigned instructor then creates a schedule for the member, ensuring a structured plan for their sessions. Finally, the cashier collects the payment from the member.

Following Figure 4.6 shows fitness package module.

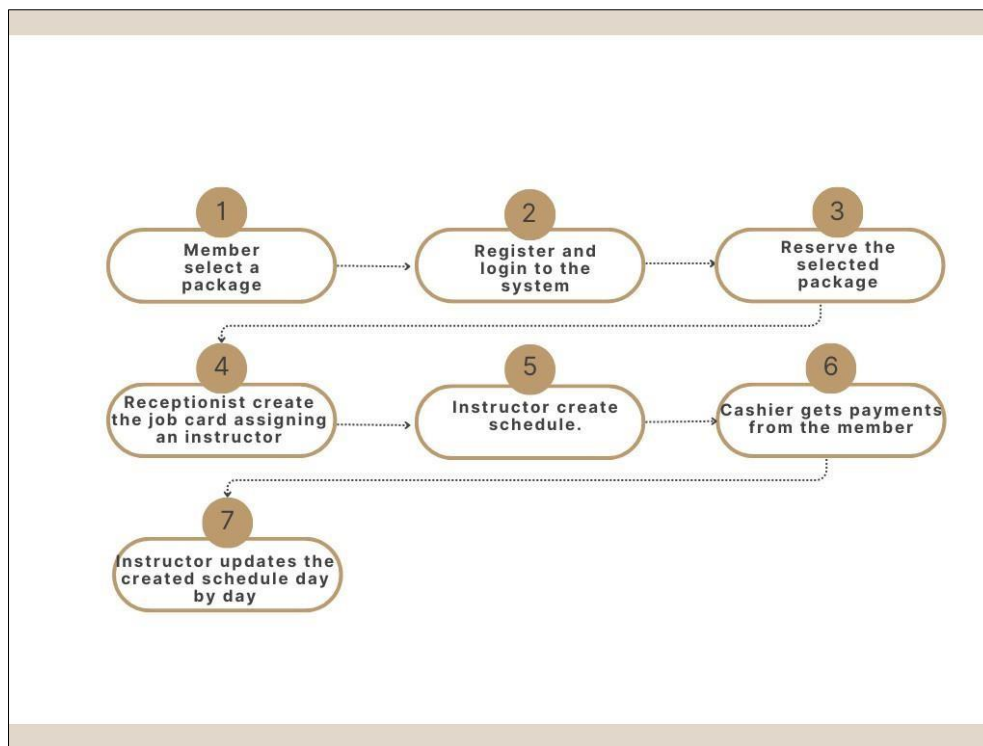


Figure 4 6: Fitness Package Module

4.5. Implementation Environment

The system implementation environment is mainly divided into two categories. There are software environment and hardware environment.

4.5.1. Software Environment

This Gym management system is used supported technologies. PHP is used for server-side programming language and JavaScript; AJAX and bootstrap is used as client-side technologies. Further XAMPP is used as webserver. When selecting development software, most of them are free and open source which will not cause much trouble when getting the copyrights of the system.

Following Table 4.2 shows software environment.

Software	Development
Operating System	Microsoft Windows 10 pro
Web Server	XAMPP 8.0.9 XAMPP control panel v3.3.0 Apache 2.4 PHP 8.0.9
Database Handling	phpMyAdmin 5.1.1
Coding	Apache NetBeans IDE 21.0
Design Diagrams	Draw.io/Dia diagram
Web browsers	Google Chrome
Documentation	MS Word Professional 2016/Adobe Acrobat Reader DC

Table 4 2: Software Environment

4.5.2. Hardware Environment

The hardware environment which is used for the development of web-based gym management system is listed below.

- Intel(R) Core (TM) i5-8250U CPU @ 1.60GHz 1.80 GHz
- 8GB RAM
- Display: 1366 X 768 resolution Monitor
- 1 TB Hard Disk

Following Figure 4.7 shows system information.

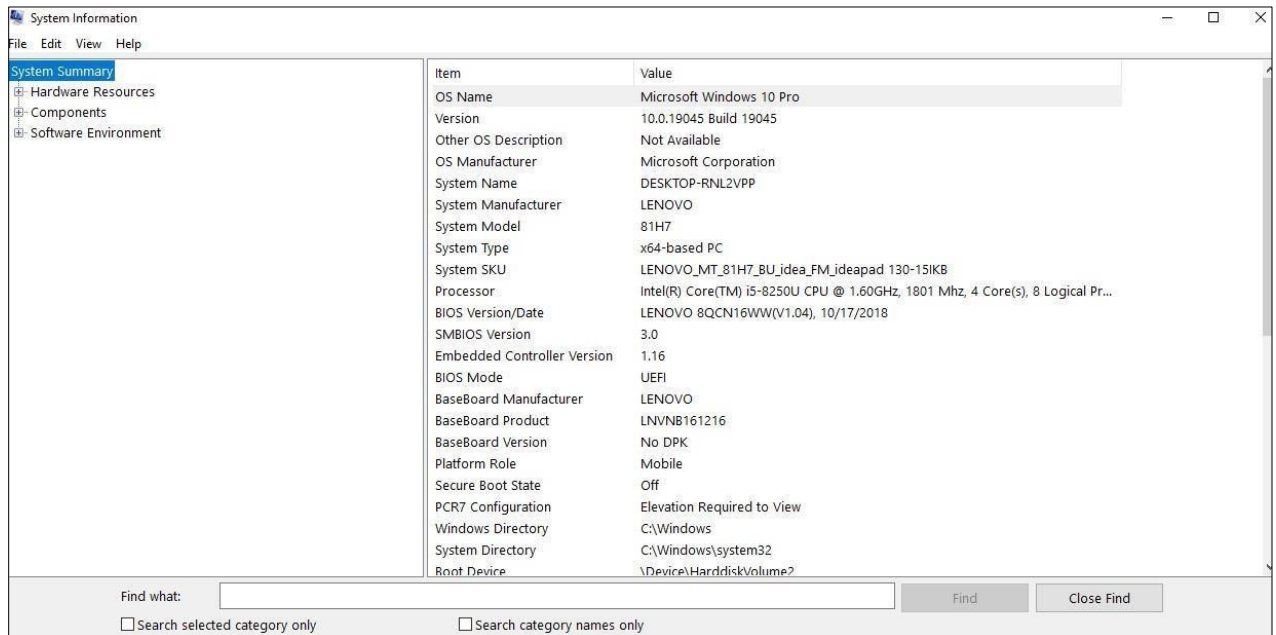


Figure 4 7: System Information

4.6. Major Codes Segments

The major code segments of the system have been briefly described as following with functionalities and comments of code lines.

User Login

Login form validates username and password. If given username and password are matching with user credentials, it will be successfully accessed by the user. Also, the following code segments show how creating a session when user login to the system. Sessions help to store information during the login.

Following Figure 4.8 shows login page code snippet.

```
<?php
include 'system/function.php';
extract($_POST);
if ($_SERVER['REQUEST_METHOD'] == "POST" && @$_action == "login") {
    $userName = dataClean($userName);
    $message = array();
    if (empty($userName)) {
        $message['userName'] = "User Name should not be empty..!";
    }
    if (empty($password)) {
        $message['password'] = "Password should not be empty..!";
    }
    if (empty($message)) {
        $db = dbConn();
        $sql = "SELECT * FROM tbl_members WHERE userName='$userName' AND password='" . sha1($password) . "'";
        $result = $db->query($sql);
        if ($result->num_rows == 1) {
            while ($row = $result->fetch_assoc()) {
                $_SESSION['MEMBERID'] = $row['memberId'];
                $_SESSION['FIRSTNAME'] = $row['firstName'];
                $_SESSION['LASTNAME'] = $row['lastName'];
            }
            $current = $_GET['current'];
            if (isset($_GET['current']) && !empty($_GET['current'])) {
                header("Location:$current");
            } else {
                header("Location:index2.php");
            }
        } else {
            $message['password'] = "User Name or Password Invalid..!";
        }
    }
}
```

Figure 4 8: Login Page Code Snippet

User Logout

This executes by using 'logout.php'. It destroys the session created for the specific user and redirects to login page.

Following Figure 4.9 shows user logout code snippet.

```
<?php

//start a session to read already assigned session
session_start();

//destroy already created all sessions
session_destroy();

header("Location:login.php");
```

Figure 4 9: Logout Code Snippet

Validate Password Strength

Password validation code segment executes when creating the member registration. Here, password length at least 8 characters. If it is not them display message as 'password too short'. Further including other validation steps are checked also.

Following Figure 4.10 shows password validation code snippet.

```
if (!empty($password)) {
    if (strlen($password) < 8) {
        $message['password'] = "Password too short!";
    }
}

if (!empty($password)) {
    if (!preg_match("#[0-9]+#", $password)) {
        $message['password'] = "Password must include at least one number!";
    }
}

if (!empty($password)) {
    if (!preg_match("#[a-zA-Z]+#", $password)) {
        $message['password'] = "Password must include at least one letter!";
    }
}

if (!empty($password)) {
    if ($password != $confirmPassword) {
        $message['confirmPassword'] = "Password not match";
    }
}
```

Figure 4 10: Password Validation Code Snippet

Validate Image before Uploading (file uploading)

This validation also comes in to effect that while creating member account, instructor account and administration panel while inserting data to the database.

Following Figure 4.11 shows image validation code snippet.

```
if (empty($message)) {
    $target_dir = "uploads2/";
    //return file name from a path(basename)
    $target_file = $target_dir . basename($_FILES["profileImage"]["name"]);
    $uploadOk = 1;
    //converts a strings to lowercase(strtolower), returns a file path information(pathinfo), return only extension(P
    $imageFileType = strtolower(pathinfo($target_file, PATHINFO_EXTENSION));
    $check = getimagesize($_FILES["profileImage"]["tmp_name"]);
    if ($check !== false) { //Multi-purpose Internet Mail Extensions
        $uploadOk = 1;
    } else {
        $message['profileImage'] = "File is not an image.";
        $uploadOk = 0;
    }
    if (file_exists($target_file)) { // Check if file already exists
        $message['profileImage'] = "Sorry, file already exists.";
        $uploadOk = 0;
    }
    if ($_FILES["profileImage"]["size"] > 5000000) { // Check file size-5mb
        $message['profileImage'] = "Sorry, your file is too large.";
        $uploadOk = 0;
    }
    if ($imageFileType != "jpg" && $imageFileType != "png" && $imageFileType != "jpeg" && $imageFileType != "gif")
        $message['profileImage'] = "Sorry, only JPG, JPEG, PNG & GIF files are allowed.";
        $uploadOk = 0; // Allow certain file formats
    }
    if ($uploadOk == 1) {
        if (move_uploaded_file($_FILES["profileImage"]["tmp_name"], $target_file)) {
            $photo = htmlspecialchars(basename($_FILES["profileImage"]["name"]));
        } else {
            $message['profileImage'] = "Sorry, there was an error uploading your file.";
        }
    }
}
```

Figure 4 11: Image Validation Code Snippet

Select available slot

Following Figure 4.12 shows dynamically loading slots code snippet.

```
<div class="form-group ms-2 mb-3">
    <?php
    $db= dbConn();
    $sql="SELECT * FROM tbl_time_slots";
    $result=$db->query($sql);
    ?>
    <label for="slot">Select Available Slot</label>
    <select class="form-control" name="slotId" id="slotId">
        <option value="">--</option>
        <?php
        //fetch assoc convert data associative array
        if($result->num_rows>0){
            while ($row=$result->fetch_assoc()){
                ?>
                <option value="<?php echo $row['slotId']; ?>" <?php if (@$_slotId == $row['slotId']) { ?> selected <?php } ?>><?php echo $row['slotId']; ?>">
                <?php
            }
        }
        ?>
    </select>
</div>
<div class="text-danger"><?php echo @$message['slotId']; ?></div>
```

Figure 4 12: Dynamically Loading Loading Slots Code Snippets

4.7. Reused Existing Codes

Reusable codes listing aims to maximize the efficiency of the system. In this step, used functions to fulfill it.

Database Connectivity

Following Figure 4.13 shows database connectivity code snippet.

```
function dbConn() {  
    $server = "localhost";  
    $user = "root";  
    $password = "";  
    $db = "gym";  
  
    $conn = new mysqli($server, $user, $password, $db);  
  
    if ($conn->connect_error) {  
        die("Database connection error" . $conn->connect_error);  
    } else {  
        return $conn;  
    }  
}
```

Figure 4 13: Database Connectivity Code Snippets

Clean Function

Following Figure 4.14 shows clean function code snippet.

```
function dataClean($data = null) {  
    // removes whitespace and other predefined characters from both sides of a string.  
    $data = trim($data);  
    // Removes backslashes  
    // stripslashes("Thank\s. Please v\isit again.");  
    $data = stripslashes($data);  
    // converts some predefined characters to HTML entities.  
    // < (less than) becomes &lt;  
    $data = htmlspecialchars($data);  
  
    return $data;  
}
```

Figure 4 14: Clean Function Code Snippets

4.8. Summary

This chapter refers to the implementation methodology of the proposed system. It includes the module interaction of the system, database design, and some of the major codes including the CURD operation of the project which used to develop the system.

Chapter 5 – Testing and Evaluation

5.1. Introduction

This testing & evaluation chapter describes the test plans, test results and user evaluation. Evaluation is a test process of the system. In this phases data should be confirmed to validate and verify. It is important to test data for the system performance and all the functionalities should be implemented correctly in this phase.

5.2. Related Testing Types

Testing approach is more important in evaluation process. It is the test strategy and defines how testing would be carried out. There are two techniques. They are proactive and reactive. In proactive process, find and fix the defects before the build is created and in reactive process, start the testing after design and coding are completed.

Evaluation can be started with planning testing strategies. Following test strategies are used for the software testing.

5.2.1. Unit Testing

Unit testing helps to test individual units/ components of the system. This focuses on the internal processing logic and data structures (GfG, Waterfall software testing, 2019).It helps to find out correctness of smallest parts such as functionalities, methods, classes, etc. When consider the scope of this phase, each unit is tested individually and identify defects. Unit testing can be used to proposed system components such as user authentication module, member registration module, fitness class scheduling module, payment module, etc. After testing the user authentication unit, system can get two expected outputs. They are authentication successful or failure message. This is the example for unit testing of proposed system.

5.2.2. Integration Testing

This testing process checks the combined units. This testing is carried out after unit testing and before the system validation phase. There are two ways in integration testing. They are top-down integration testing and bottom-up integration testing (Sri Lanka Gyms, nodate). In proposed system, user authentication can be integration testing. When member register with the valid credentials, the system integrates user authentication and verify details. According to that member registration module and user authentication module integrate to the testing.

5.2.3. System Testing

System testing tests the entire system. It ensures the system's functionality, performance, behavior, reliability, security and overall requirements. There are types of system testing such as performance testing, usability testing, load testing, regression testing and any other (Thomas Hamilton & Hamilton, what is system testing? types with example, 2024). When consider the member registration functionality, it can be verified functional testing. First input valid member details (name, contacts, address...) and submit the form. Then check the member is successfully registered and details are stored in the database. After the system verify viewing successful message of registration. According to that, system testing can be done in various types.

5.2.4. Acceptance Testing

This is a most significant testing. It evaluates the software meets the specified requirements by the end users. This process involves client side. In this testing, the overall system is tested by the client and if there are any minor modifications, developer will point out to implement. User interface usability testing is the one of the acceptance testing can be conducted using proposed system. When evaluate the user interface, Test user interface elements such as buttons, menus, etc. Also check the ease of navigation through screens, searching elements and other common performing tasks. After the acceptance testing, clients give their feedback.

5.3. Test Cases

Test Cases are specific conditions or scenarios designed to verify whether a software application functions as expected. Each test case includes inputs, execution steps, expected results, and actual results. Well-defined test cases help testers systematically validate different aspects of the system, ensuring high-quality software and minimizing defects before deployment.

Test Case for System Login

Following Table 5.1 shows test case for system login.

ID	Test Description	Test Procedure	Expected Result	Priority
1	Login to the system	Submit login form with empty fields	An error message will appear by displaying the error	High
2	Login in to the system (Negative)	Enter an invalid user name or password	An error message will appear by displaying the error	High
3	Login in to the system (Positive)	Enter a valid user name and password	User log in to the system	High
4	Display user name after successfully login	Login to the system with valid user name	Display logged username on the top status bar	High
5	Logout from the system	Click on the given logout button	The user can log out from the system	High

Table 5 1: Test Case for System Login

Test Case for Member Registration

Following Table 5.2 shows test case for member registration.

ID	Test Description	Test Procedure	Expected Result	Priority
6	Register to the system	Submit register form with empty fields	An error message will appear by displaying the error	High
7	Register to the system (Negative)	Enter an invalid email or NIC number	An error message will appear by displaying the error	High
8	Register to the system (Positive)	Enter a valid NIC and email	System accept NIC and email	High
9	Register to the system (Negative)	Already registered member, register again	Display message “Nic number already exist”	High
10	Register to the system (Positive)	Register to the system filling correct information and submit.	The member registered successfully. The message displays with generating registration number and open a link to view profile.	High

Table 5 2: Test Case for Member Registration

Test Case for Workouts Reservation

Following Table 5.3 shows test case for workout reservation.

ID	Test Description	Test Procedure	Expected Result	Priority
11	Select a personal workout (Positive)	Click reserve workout button.	Website shows the workout reservation form.	High
12	Create Reservation	Clicks on “Reserve Workout” button.	System displays workout reservation form	High
13	Create Reservation (Negative)	Submit reservation form with empty fields	An error message will appear by displaying the error	High
14	Create Reservation (Negative)	Select reservation date if it has not time slots	An error message will appear by displaying the error	High
15	Create Reservation (Positive)	Enter valid reservation date	System displays successful message with view button	High
16	View Reservation (Positive)	Click view reservation button	System displays appointments page in website	High
17	View processing Reservation (Positive)	System removes not accepted message	System adds pending reservations to the reservation list	High

Table 5 3: Test Case for Workout Reservation

Test Case for Fitness Class Management Module

Following Table 5.4 shows test case for fitness class management module.

Id	Test Description	Test Procedure	Expected Result	Priority
18	Add new fitness class (Positive)	Enter all fitness class details and submit	System shows “New fitness class added successfully” and displays it in the table.	High
19	Add new fitness class (Negative)	Add new fitness class without time duration	System displays error message “Time duration is should not be empty”	High
20	Add new fitness class (Negative)	Add new fitness class without instructor name	System displays error message “Instructor name is should not be empty”	High
21	Add new fitness class (Negative)	Add new fitness class without class fees.	System displays error message “Class fees is should not be empty”	High

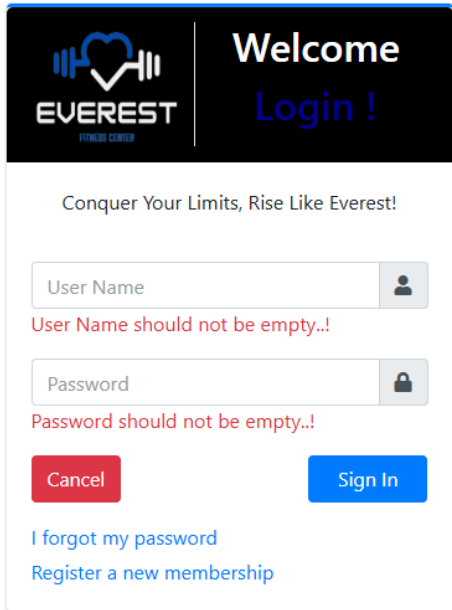
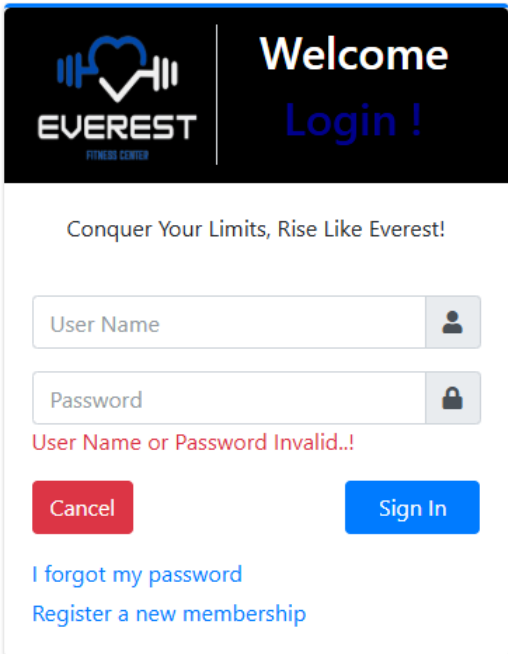
Table 5 4: Test Case for Fitness Class Management Module

5.4. Test Results

This refers to the documented outcomes of executing test cases during the software testing process. They provide insights into whether the system meets its requirements and functions as expected. Test results typically include details such as passed or failed test cases.

Test results for member login

Following Table 5.5 shows test results for member login.

Testcase ID	1		
Test Component	Login Page		
Test Case	Login to the system		
	Testing Steps	Actual Output	Status
	Leave both username and password input fields empty		Pass
	Enter invalid username and password		Pass

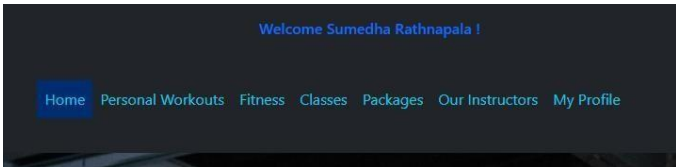
	Display username after successfully login		Pass
	View profile access after login		Pass

Table 5 5: Test Results for Member Login

Test results for member registration

Following Table 5.6 shows test results for member registration.

Testcase ID	2		
Test Component	Member Registration Page		
Test Case	Register to the system		
	Testing Steps	Actual Output	Status
	All inputs fields are empty		Pass

		Member Registration Form Personal Information First Name Enter First Name First Name should not be empty.! Last Name Enter Last Name Last Name should not be empty.! AddressLine1 Enter AddressLine1 AddressLine1 should not be empty.! AddressLine2 Enter AddressLine2 AddressLine2 should not be empty.! AddressLine3 Enter AddressLine3 AddressLine3 should not be empty.! AddressLine4 Enter AddressLine4 AddressLine4 should not be empty.! City Enter City City should not be empty.! District -- District should not be empty.! NicNumber Enter NIC Number NicNumber should not be empty.! Email Enter Email Email should not be empty.! PhoneNumber1 Enter Phone Number1 PhoneNumber1 should not be empty.! eg: +94776563214 PhoneNumber2 Enter Phone Number2 eg: +94776563214 Profile Image Choose File No file chosen Account Information UserName Enter User Name UserName should not be empty.! Password Enter Password Password should not be empty.! Password must include at least one letter, one number with 8 characters or more Confirm Password Confirm Password Confirm Password should not be empty.! Save Cancel	
	Enter first name and last name without capitalize first letter	Member Registration Form Personal Information First Name nimesha First Letter should be in uppercase Last Name perera First Letter should be in uppercase	Pass
	Enter invalid NIC format	NicNumber 97542135 Invalid Nic number	Pass
	Enter invalid email	Email apsara.com invalid email	Pass

	Enter invalid phone number	PhoneNumber1 077034798 invalid phone number eg: +94774563214 PhoneNumber2 Enter Phone Number2 eg: +94774563214	Pass
	Enter invalid password	Password Password must include at least one number! Password must include at least one letter, one number with 8 characters or more Save Cancel	Pass
	Enter wrong confirm password	Password Password must include at least one letter, one number with 8 characters or more Confirm Password Confirm Password Password not match Save Cancel	Pass
	Display registered successfully message after successfully registration	Registered successfully Your registered details can be seen on My Profile Page. Your Registration No: R2025030611 Welcome to Everest Fitness Center!! Login	Pass

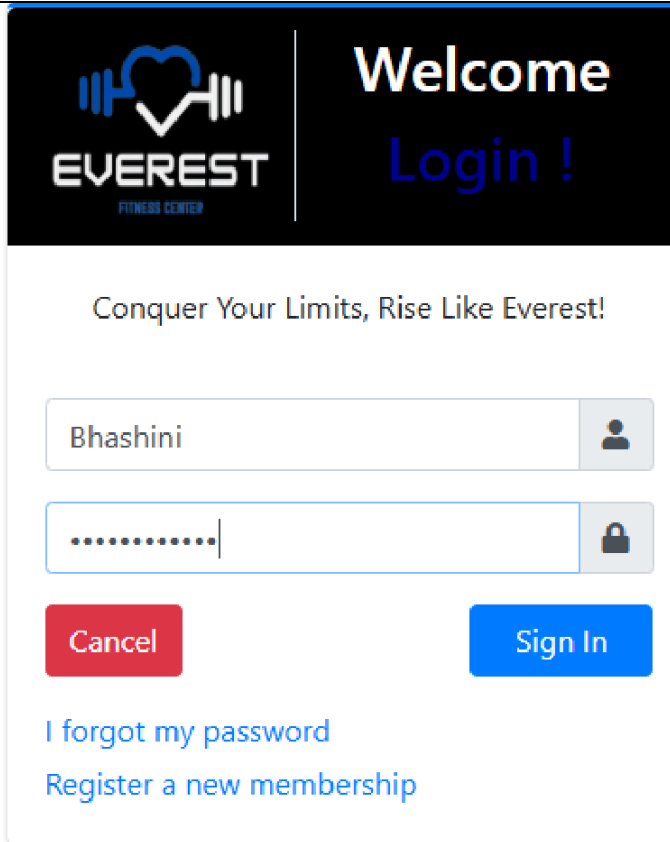
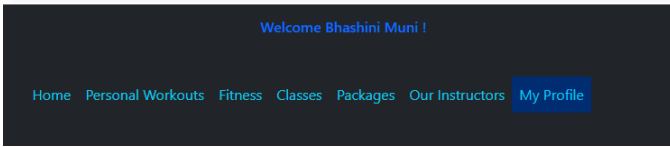
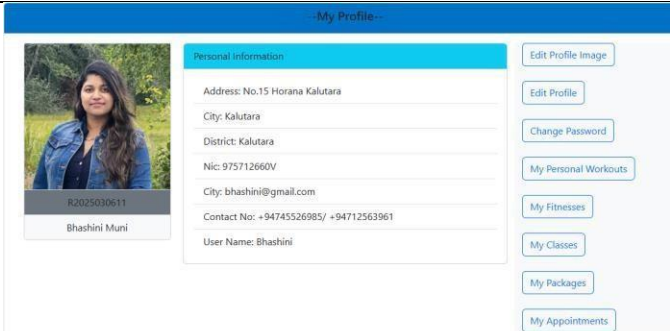
	Click login button after successfully registration	 The screenshot shows the Everest Fitness Center login interface. At the top, there's a black header with the Everest logo (a heart with a barbell) and the text 'Welcome Login!'. Below the header, a motivational quote 'Conquer Your Limits, Rise Like Everest!' is displayed. The main area contains a login form with a username field (containing 'Bhashini'), a password field (masked with dots), a 'Cancel' button, and a 'Sign In' button. Below the form are links for 'I forgot my password' and 'Register a new membership'.	Pass
	Login into the system successfully	 The screenshot shows the top navigation bar of the user dashboard. It features a dark blue header with the text 'Welcome Bhashini Muni!'. Below the header, a horizontal menu contains links: 'Home', 'Personal Workouts', 'Fitness', 'Classes', 'Packages', 'Our Instructors', and 'My Profile' (which is highlighted in blue).	Pass
	View my Profile page	 The screenshot shows the 'My Profile' page. On the left, there's a profile picture of a woman and her details: 'R2025030611' and 'Bhashini Muni'. To the right, there's a 'Personal Information' section with fields for Address, City, District, Nic, City, Email, Contact No., and User Name. On the far right, there are several buttons: 'Edit Profile Image', 'Edit Profile', 'Change Password', 'My Personal Workouts', 'My Fitnesses', 'My Classes', 'My Packages', and 'My Appointments'.	Pass

Table 5 6: Test Results for Member Registration

5.5. User Evaluation

User acceptance testing is the last phase of the software development process. User Acceptance Testing (UAT) is a type of testing performed by the end user or the client to verify/accept the software system before moving the software application to the production environment. UAT is done in the final phase of testing after functional, integration and system testing are done.

Following Figure 5.1 shows user evaluation form.

<u>User Evaluation Form – Everest Fitness</u>					
Employee Name:					
Designation:					
User role of the system:					
Evaluation item	Very good	Good	Average	Poor	Very poor
Ease of learning					
Response time					
User friendliness					
Color scheme					
System Navigation					
Responsiveness					
Easiness of data entry					
Ability to understand symbols					
Interface					
Overall reaction					
.....					
Signature	Date				

Figure 5 1: User Evaluation Form

Get feedback from above user evaluation form and after summarized feedback is given below using a chart.

Following Figure 5.2 shows feedback summary of the system.

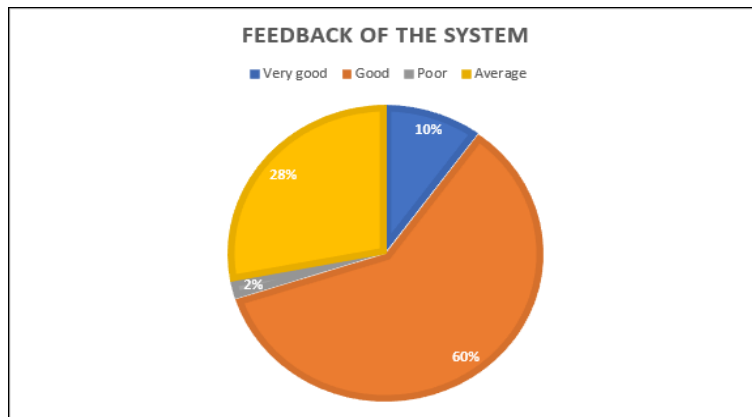


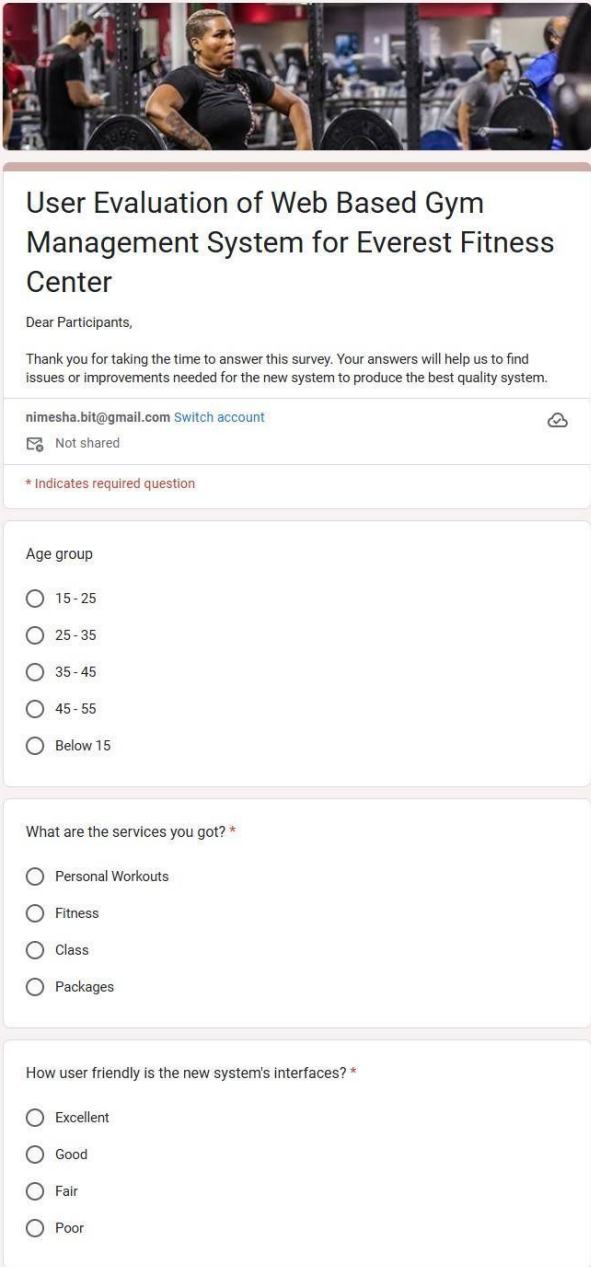
Figure 5 2: Feedback Summary of the System

5.6. Survey Feedback

The user evaluation google form is designed to gather feedback on the usability, functionality and overall experience of the gym management system. The following instructors and members of the Everest Fitness Center participated in the survey.

- ✓ Manager of Everest Fitness Center
- ✓ Administrator of Everest Fitness Center
- ✓ Five instructors
- ✓ Five members

Following Figure 5.3 shows google survey form.



The image shows a Google Survey form titled "User Evaluation of Web Based Gym Management System for Everest Fitness Center". At the top, there is a header image of a woman in a gym. Below the title, the form includes a greeting "Dear Participants," and a thank you message: "Thank you for taking the time to answer this survey. Your answers will help us to find issues or improvements needed for the new system to produce the best quality system." The form also displays the email "nimesha.bit@gmail.com" with a "Switch account" link and a "Not shared" status. A legend indicates that an asterisk (*) denotes a required question. The survey contains three questions, each with radio button options:

- Age group**
 - ☐ 15 - 25
 - ☐ 25 - 35
 - ☐ 35 - 45
 - ☐ 45 - 55
 - ☐ Below 15
- What are the services you got? ***
 - ☐ Personal Workouts
 - ☐ Fitness
 - ☐ Class
 - ☐ Packages
- How user friendly is the new system's interfaces? ***
 - ☐ Excellent
 - ☐ Good
 - ☐ Fair
 - ☐ Poor

How far the function of the system help you? *

☐ Excellent

☐ Good

☐ Fair

☐ Poor

Is application easy for a new user to accomplish tasks at the very first time? *

☐ Yes

☐ May be

☐ No

Does application provide functionalities as you expected? *

☐ Yes

☐ May be

☐ No

What is your overall satisfying about the performance the system? *

☐ Excellent

☐ Good

☐ Fair

☐ Poor

Would you recommend our web application to your friends? *

☐ Yes, I would recommend

☐ No, I wouldn't recommend

How can we improve our web application? Give your own Ideas and suggestions.

Your answer

Submit Clear form

Never submit passwords through Google Forms.

This content is neither created nor endorsed by Google. - [Terms of Service](#) - [Privacy Policy](#)

Does this form look suspicious? [Report](#)

Google Forms

Figure 5 3: Google Survey Form

The feedback highlights key strengths, areas for improvement, and user preferences, which will be used to enhance system functionality and user experience.

Following Figure 5.4 show responses of the survey form.

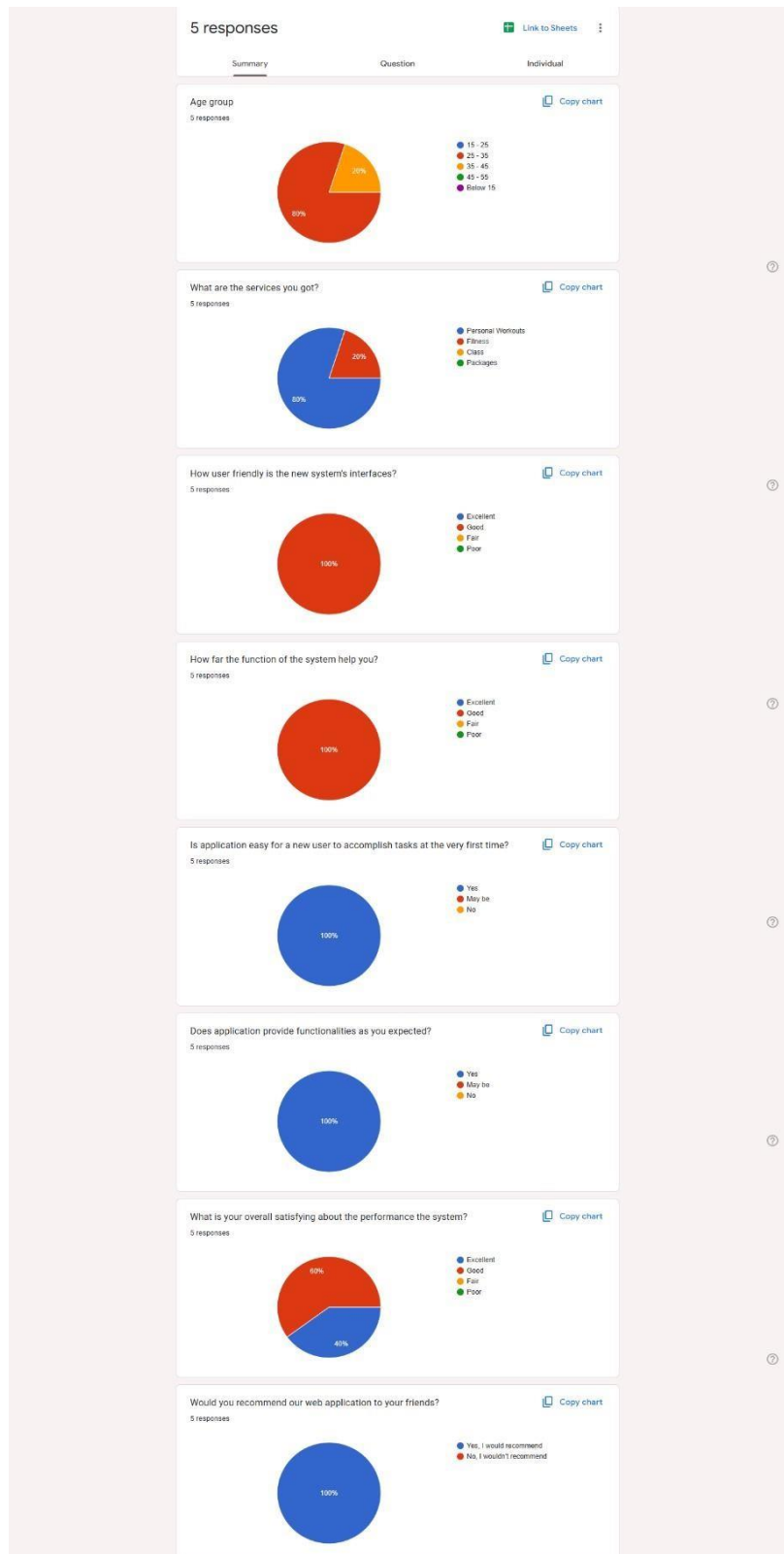


Figure 5 4: Responses of the Survey Form

Following Figure 5.5 shows the response of suggestions and ideas.

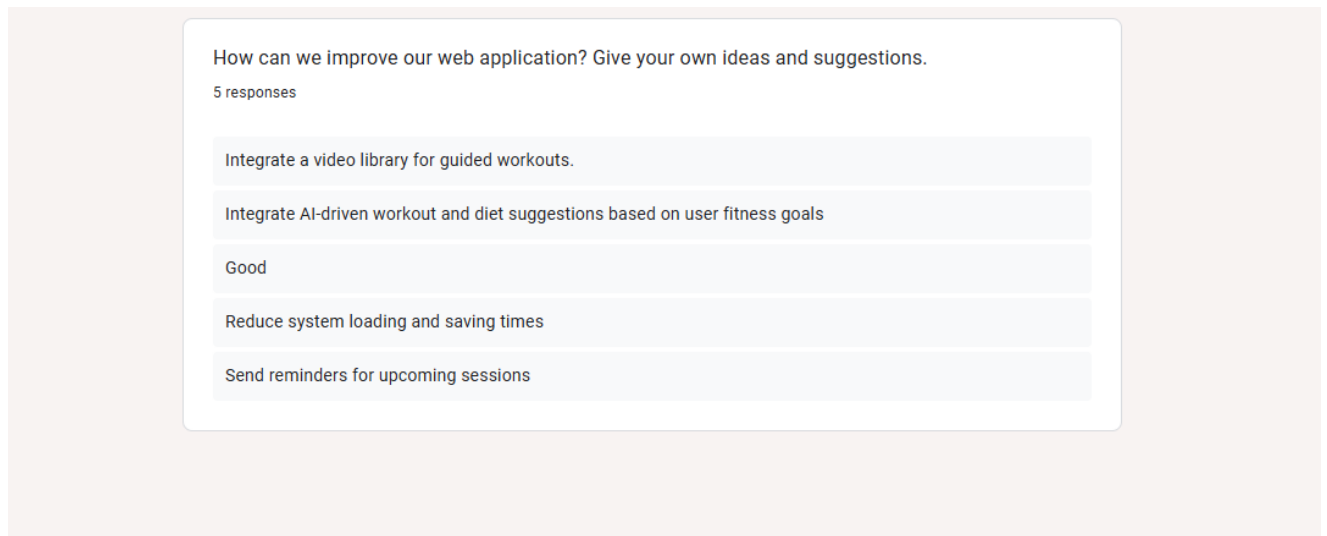


Figure 5 5: Suggestions and Ideas

5.7. Summary

This chapter is described the evaluation process of the entire development process. The evaluation process is a good measuring part to determine the development success according to the user request and efficient business process.

Moreover, the chapter is discussed the techniques used for the evaluation and the results of the evaluation according to user feedback.

Chapter 6 – Conclusion

6.1. Introduction

By now, gym training centers are available everywhere in the modern society. As a result of this, there is a fast growth in the health and fitness industry due to the heavy demand. It is important to provide a better service to the member. It will help to catch the market easily and exist for a long period. In this step, it is very necessary to do a review of the developed system and analyze what issues will be arise in future. Doing this review can touch to step by step for future development areas of the system. This chapter covers the overview of the developed system and lessons learnt during the development.

6.2. Overview of the Developed System

The management department of Everest Fitness Center plays a crucial role in supporting its core fitness services by handling member registrations, handling reservations of personal workouts, fitness scheduling, instructor assignments, job card creation and payment processing. However, the current manual process makes it difficult for gym employees to efficiently manage their workload, workout session scheduling, and payment tracking. The manual system also creates challenges in keeping track of instructor availability, managing member reservations, and maintaining fitness package records.

The project began with requirement gathering, where interviews and discussions were conducted with gym members, instructors, receptionist, and management staff with administrator to ensure that all key aspects of the gym's operations and functions were covered. The project followed the iterative waterfall model as its Software Development Life Cycle (SDLC) methodology.

The web-based gym management system was developed using PHP technologies and MySQL database services providing a robust and reliable platform for managing gym operations seamlessly. While coding on the system, had to learn on some PHP coding parts which is an advance programming language within limited time period. This is a heavy part of the implementation journey.

After the system was implemented and developer testing was completed, User Acceptance Testing (UAT) was conducted with gym staff and instructors. A survey was also conducted using a Google Form to gather feedback from gym employees and members who participated in the requirement gathering phase. The survey results highlighted several areas for enhancement, but overall, the system was rated highly satisfactory. The Everest Fitness Center management accepted the system with appreciation, recognizing its potential to improve efficiency, enhance member experience, and support future growth.

The web-based gym management system for Everest Fitness Center was developed to address the inefficiencies of the manual management process. The project aimed to streamline gym operations, enhance scheduling, improve payment tracking, and provide a better experience for both staff and members. Evaluating its success against the initial objectives provides insight into its effectiveness and areas for improvement.

- **Efficient Member Registration and Reservation Management**

One of the key objectives was to replace the manual registration process with a digital system to improve efficiency. The implemented system successfully automated member registrations and reservations for personal workouts. This reduced the workload of the receptionist and management staff while minimizing errors in manual record-keeping.

- **Workout Scheduling and Instructor Assignment**

Previously, scheduling workout sessions and managing instructor availability were challenging due to the lack of a centralized system. The new system introduced an automated scheduling feature, enabling instructors to manage their availability more efficiently and allowing members to book sessions seamlessly.

- **Payment Processing**

Handling membership fees and tracking payments was a manual, error-prone task. The new system introduced an integrated payment processing module, improving accuracy and efficiency. This significantly reduced discrepancies in financial records and enhanced the ability of management to track pending and completed payments.

6.3. Lessons Learnt

The most important lesson was time management. In this case, had to give prioritize to the deadline and implementation period. SDLC is very helpful to experience that case successfully. In addition to that, get real world development experience through SMS with software engineering disciplines. Following is the lessons list learned during the project cycle.

- ✓ Able to acquire knowledge on different areas.
- ✓ Able to deal on error fixing and surfing the better solution.
- ✓ Able to gain a practical training during development.
- ✓ Able to enhance communication skills, at frequent client meetups.

6.4. Future Improvements

Though the gym management system has fulfilled requirements requested by the members, some additional features added may be in future.

- ✓ SMS facility to notify alerts and new offers
SMS facility is more convenient specially members to remind their reservation schedules and gain attraction time to time discounts of packages.
- ✓ Develop the system as mobile application
By developing interactive mobile application, members can make a reservation easily in every time.
- ✓ Develop a live chat facility to inquire problems
Live chat improves bonds of the members. If member wants to know about more details of the packages, they can start live chat and ask it directly.

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Appendix A – System Manual

According to the chapter 4 in this thesis, implementation environment should arrange before setup the system for its usage. System manual is given detailed information how to install the system step by step. Both Hardware and software requirements should be met for run this GMS.

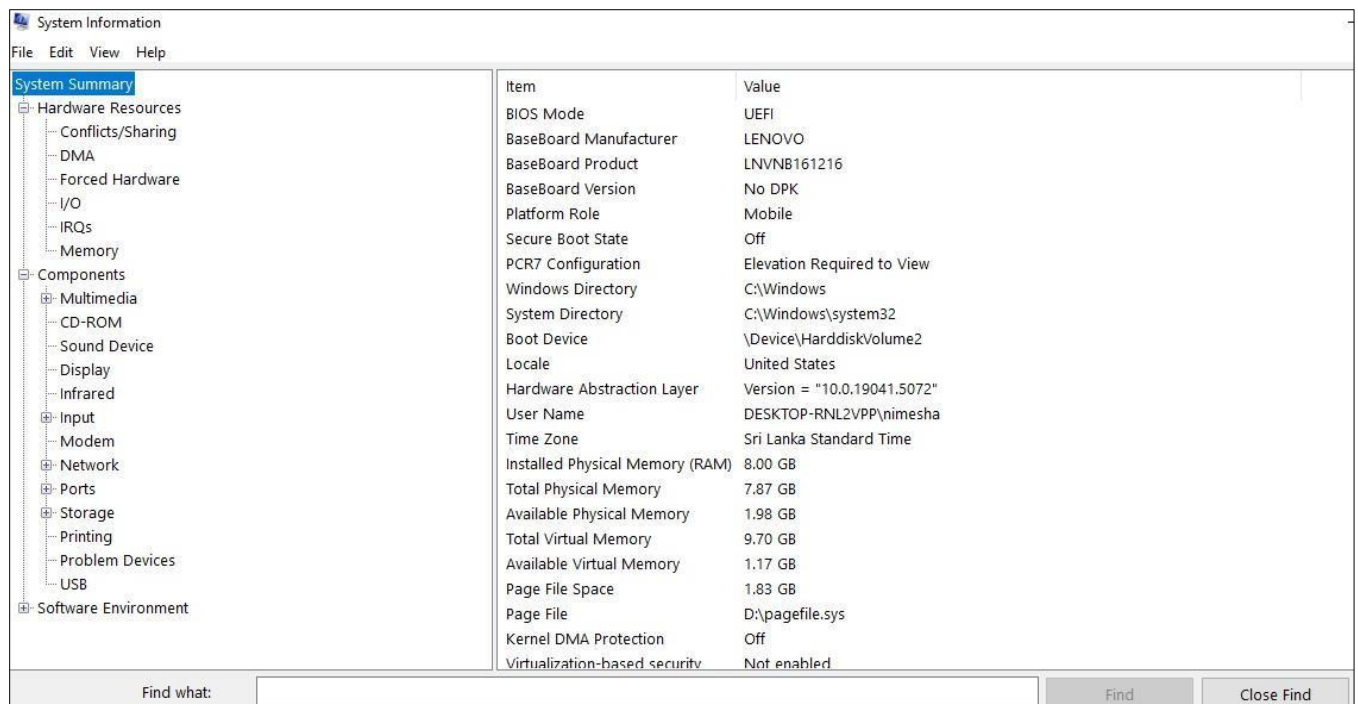
Hardware requirements

Following Table A.1 shows minimum hardware requirements of the system.

Hardware	Minimum Requirements
Processor	Intel(R) Core (TM) i3
Memory	2GB or above
Hard Disk	250GB or above
Display	1024 * 768 Resolution Monitor
Printer	Inkjet printer or Laser printer
Internet	ADSL connection (minimum speed 512kbps)

Table A 1: Minimum Hardware Requirements of the System

Following Figure A.1 shows system requirements of the system.



The screenshot shows the Windows System Information window. The left sidebar lists categories: System Summary, Hardware Resources, Components, and Software Environment. The main pane displays a table of system information.

Item	Value
BIOS Mode	UEFI
BaseBoard Manufacturer	LENOVO
BaseBoard Product	LNvNB161216
BaseBoard Version	No DPK
Platform Role	Mobile
Secure Boot State	Off
PCR7 Configuration	Elevation Required to View
Windows Directory	C:\Windows
System Directory	C:\Windows\system32
Boot Device	\Device\HarddiskVolume2
Locale	United States
Hardware Abstraction Layer	Version = "10.0.19041.5072"
User Name	DESKTOP-RNL2VPP\nimesha
Time Zone	Sri Lanka Standard Time
Installed Physical Memory (RAM)	8.00 GB
Total Physical Memory	7.87 GB
Available Physical Memory	1.98 GB
Total Virtual Memory	9.70 GB
Available Virtual Memory	1.17 GB
Page File Space	1.83 GB
Page File	D:\pagefile.sys
Kernel DMA Protection	Off
Virtualization-based security	Not enabled

Figure A 1: System Requirements

Software requirements

Following Table A.2 shows recommended software requirements.

Software	Recommended software requirements
Operating system	Microsoft windows 10 pro
Web server	XAMPP 8.0.9 XAMPP control panel v3.3.0 Apache 2.4 MariaDB 10.4.20 PHP 8.0.9
Database handling	phpMyAdmin 5.1.1
Coding	Apache NetBeans IDE 21.0
Design diagrams	Draw.io Dia diagram Canva
Web browsers	Google chrome
Documentation	MS Word Professional 2016 Adobe Acrobat Reader DC

Table A 2: Software Requirements

Installing XAMPP

- Installing XAMPP

Download XAMPP from <http://www.apachefriends.org> for windows and install.

Install the XAMPP into D:\xampp of the computer.

Following Figure A.2 shows XAMPP server download page.



Figure A 2: XAMPP Server Download Page

Open the CD and copy the SMS folder and paste it to the directory path “D:\xampp\htdocs”.

- Database installation

Open the web browser and type the URL <http://localhost/phpmyadmin/> in the address bar and enter username and the password (if you set username and password)

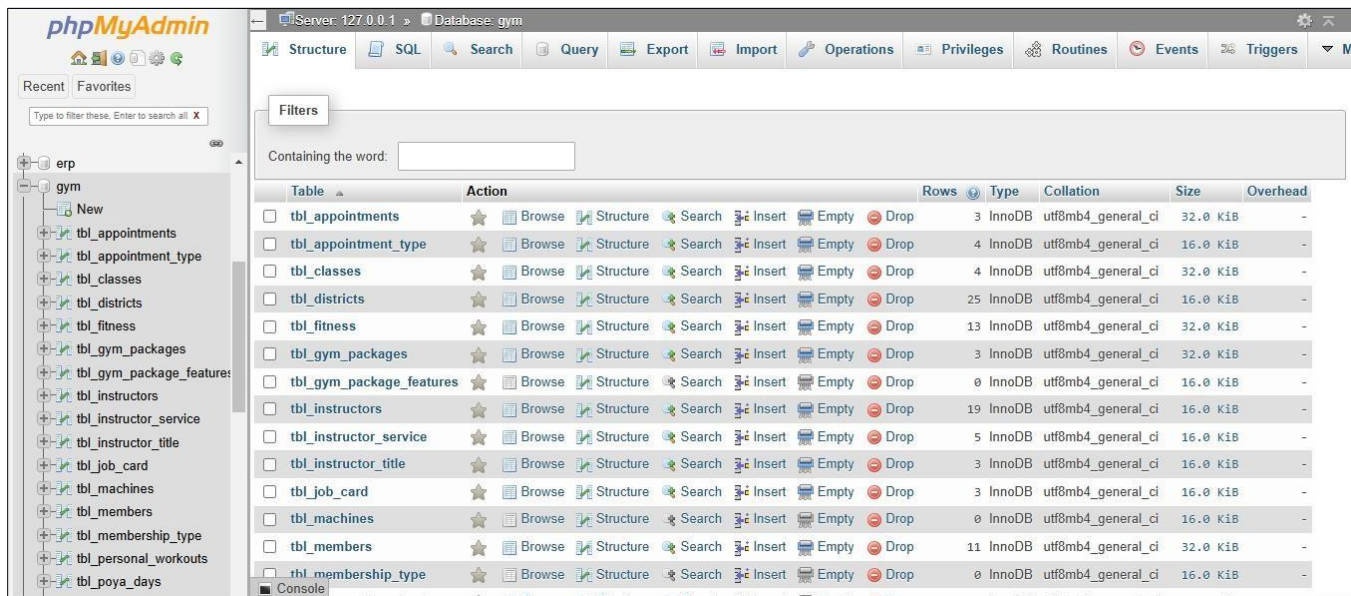
✓ Create new empty database named “gym”

✓ Navigate to the “Import” tab and click “Choose file” button to browse the database file.

✓ Select CD and open the Database folder from browse window. Select “gym.sql” file in the Database folder

✓ Press “GO” button which located in the bottom of the page.

Following Figure A.3 shows gym database.



The screenshot shows the phpMyAdmin interface for a database named 'gym'. The left sidebar shows a tree view of the database structure. The main area displays a list of tables with their respective actions (Browse, Structure, Search, Insert, Empty, Drop). The tables listed are:

Table	Action	Rows	Type	Collation	Size	Overhead
tbl_appointments	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	3	InnoDB	utf8mb4_general_ci	32.0 KiB	-
tbl_appointment_type	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	4	InnoDB	utf8mb4_general_ci	16.0 KiB	-
tbl_classes	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	4	InnoDB	utf8mb4_general_ci	32.0 KiB	-
tbl_districts	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	25	InnoDB	utf8mb4_general_ci	16.0 KiB	-
tbl_fitness	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	13	InnoDB	utf8mb4_general_ci	32.0 KiB	-
tbl_gym_packages	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	3	InnoDB	utf8mb4_general_ci	32.0 KiB	-
tbl_gym_package_features	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
tbl_instructors	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	19	InnoDB	utf8mb4_general_ci	16.0 KiB	-
tbl_instructor_service	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	5	InnoDB	utf8mb4_general_ci	16.0 KiB	-
tbl_instructor_title	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	3	InnoDB	utf8mb4_general_ci	16.0 KiB	-
tbl_job_card	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	3	InnoDB	utf8mb4_general_ci	16.0 KiB	-
tbl_machines	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
tbl_members	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	11	InnoDB	utf8mb4_general_ci	32.0 KiB	-
tbl_membership_type	[Browse] [Structure] [Search] [Insert] [Empty] [Drop]	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-

Figure A 3: GYM Database

- Launching the system

Open the XAMPP control panel (go to the “D:\xampp\”) and verify the XAMPP is running. If not click start buttons of Apache and MySql and Open the web browser and type the URL <http://localhost/gms> and press Enter key to launch the system.

Following Figure A.4 shows XAMPP control panel.

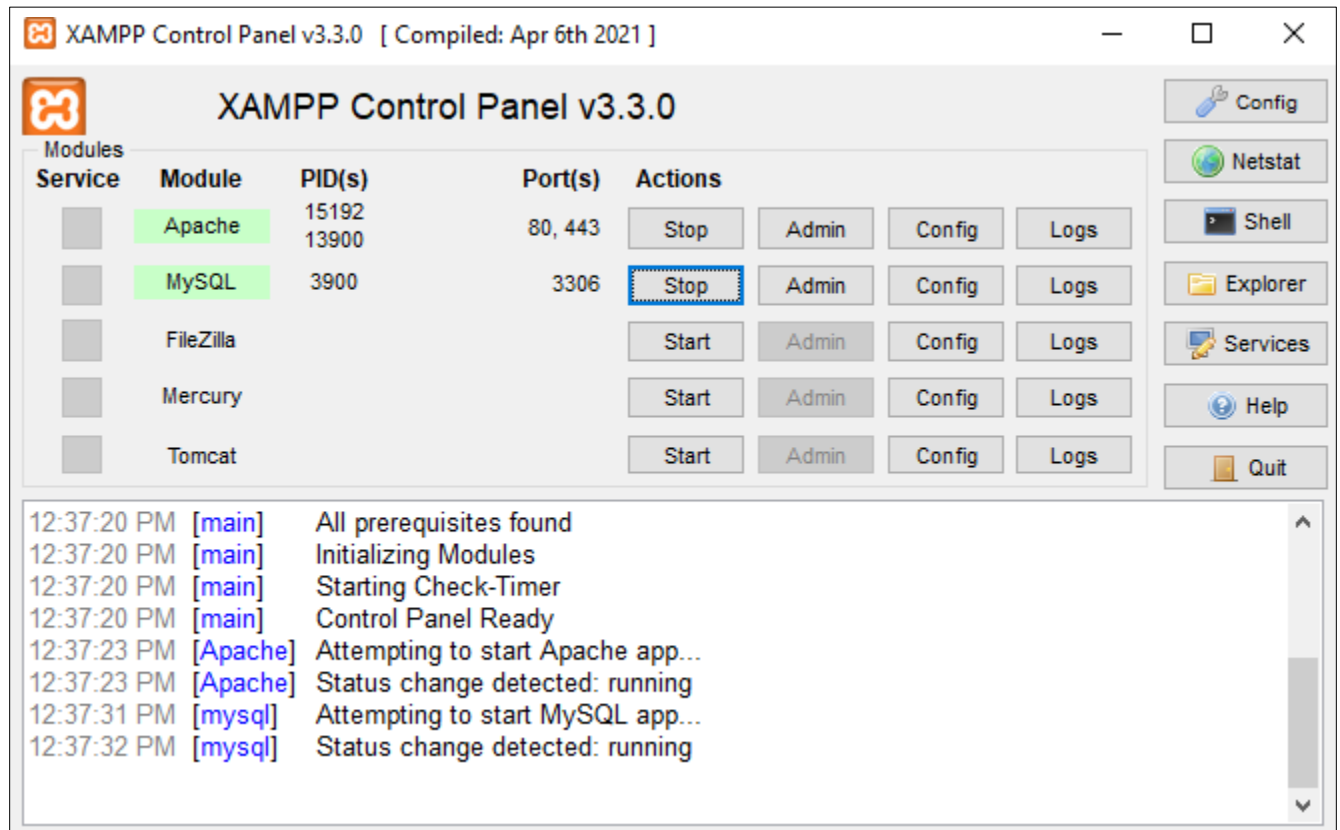


Figure A 4: XAMPP Control Panel

<http://localhost/gms> and press Enter key to launch the front-end of the system.

Following Figure A.5 shows front-end path.

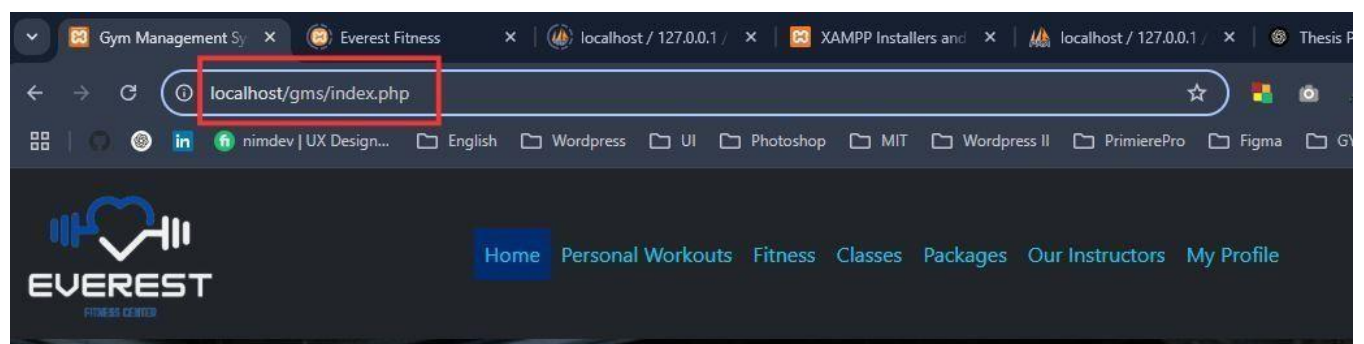


Figure A 5: Front End Path

http://localhost/gms/system and press Enter key to launch the back-end of the system.

Following Figure A.6 shows back-end path.

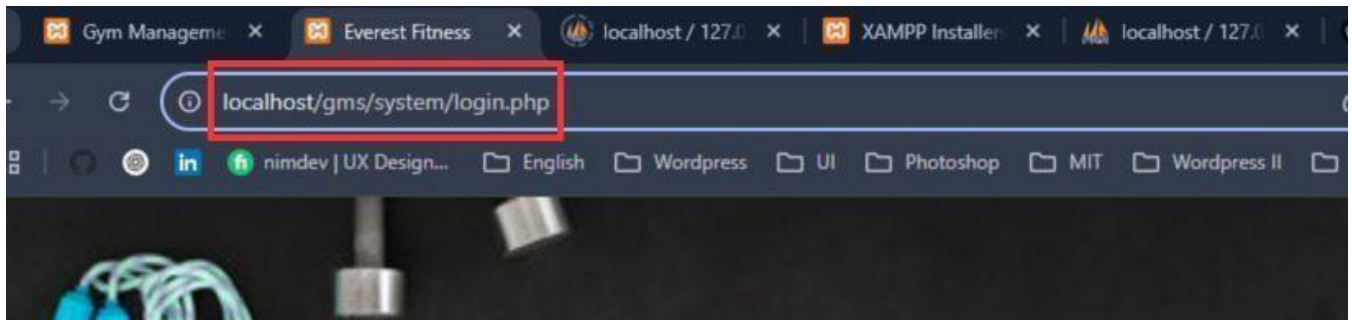


Figure A 6: Back End Path

Installing Apache NetBeans

Follow the below steps to install NetBeans to use as the development framework.

Download the NetBeans setup from <https://netbeans.apache.org/front/main/index.html> and run the downloaded .exe file.

Following Figure A.7 shows NetBeans Home Page.


[Apache NetBeans](#)

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Latest release

Apache NetBeans 25

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APACHE SOFTWARE FOUNDATION
<http://www.apache.org/>

COMMUNITY
CODE

ABOUT

- Who's Who
- Thanks
- Sponsorship
- Security

COMMUNITY

- Mailing lists
- Becoming a committer
- NetBeans Events
- Apache Events

PARTICIPATE

- Submitting Pull Requests
- Reporting Issues
- Improving the documentation

GET HELP

- Documentation
- Wiki
- Community Support
- Commercial Support

DOWNLOAD

- Releases
- Plugins
- Building from source
- Previous releases

Figure A 7: Netbeans Home Page

Open NetBeans and view the interface.

Following Figure A.8 shows NetBeans Interface.

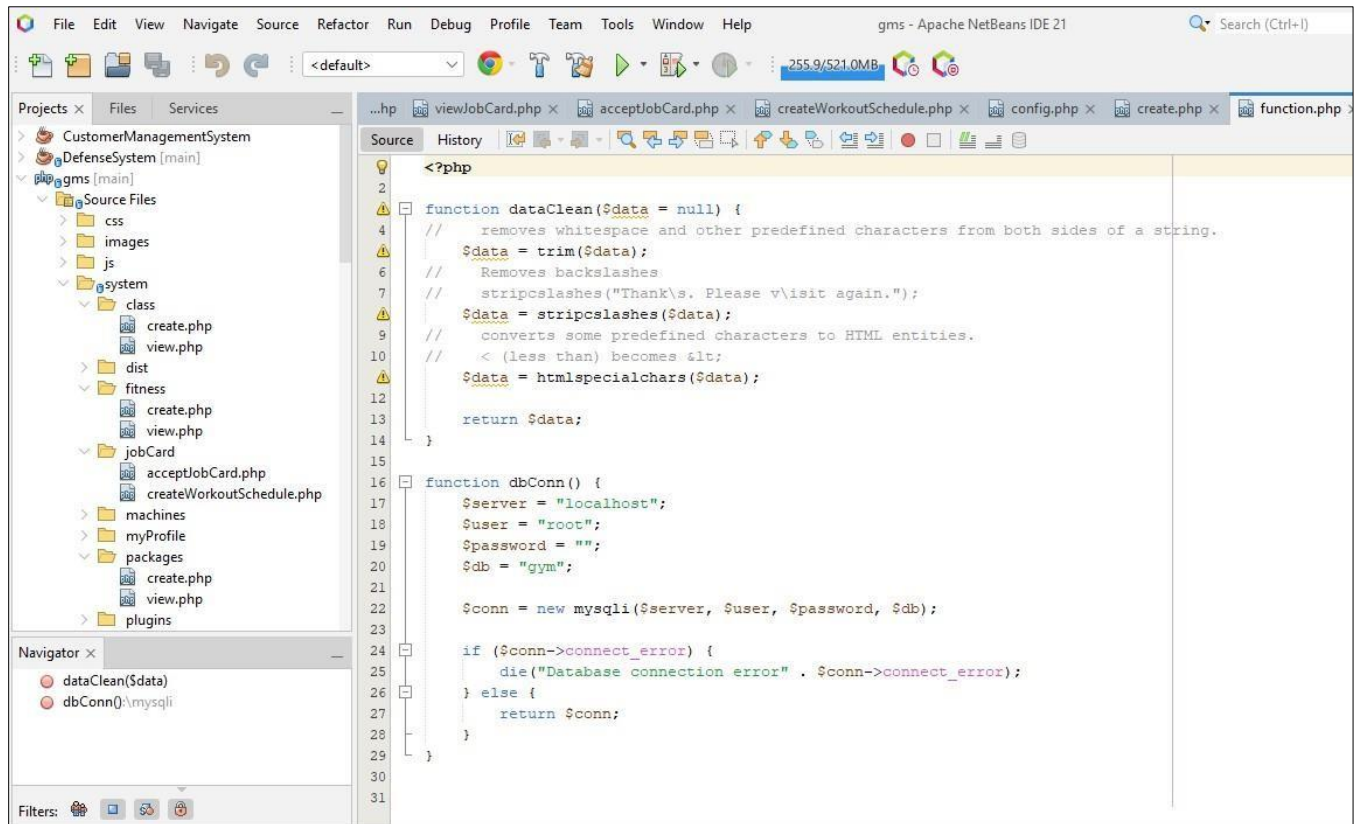


Figure A 8: Netbeans Interface

Appendix B - Design Documentation

Use case diagrams, descriptions and other diagrams in UML provide a better view of each module how those modules have been designed.

Use case diagram for personal workout reservation

Following Figure B.1 shows use case diagram for add personal workout reservation.

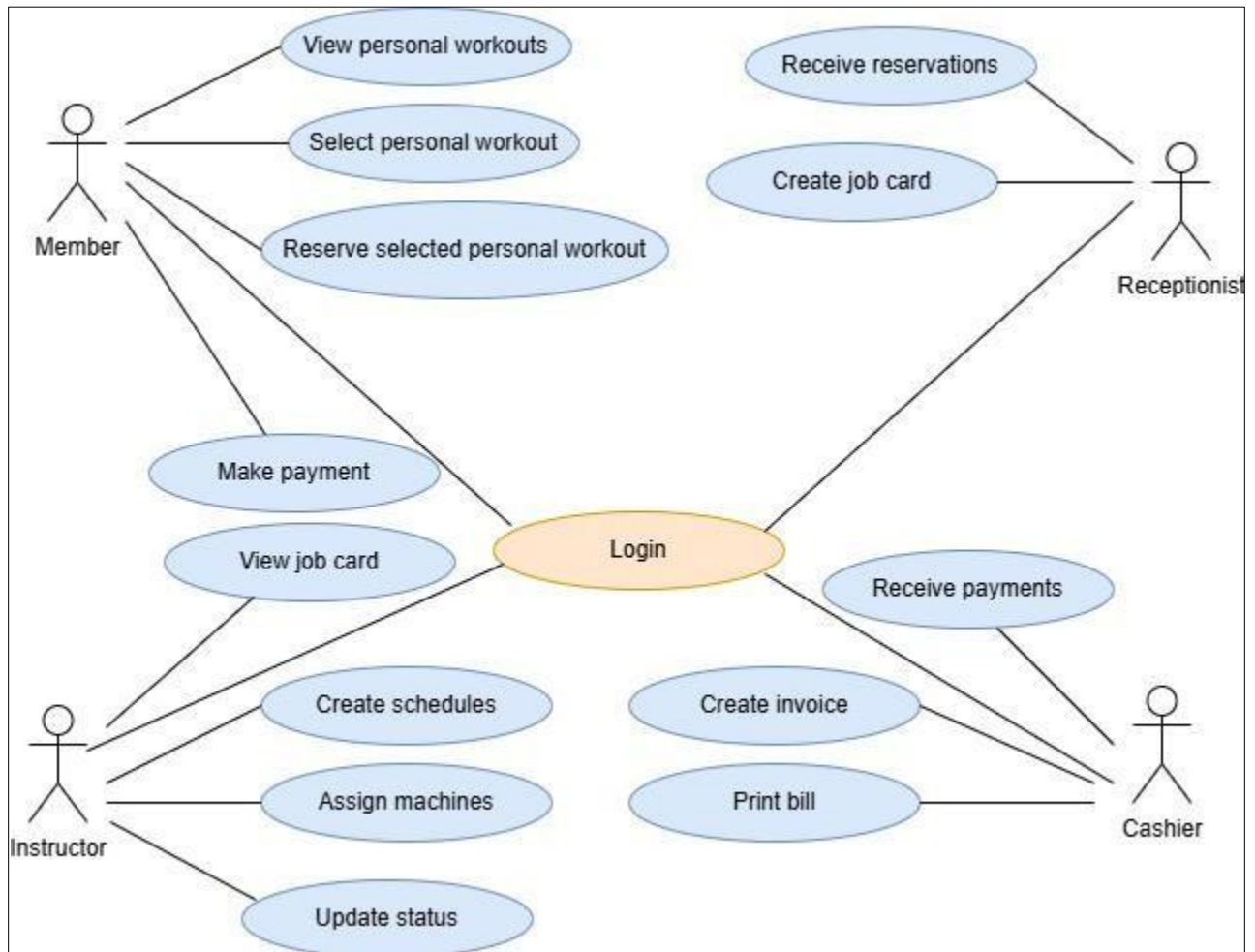


Figure B 1: Use Case Diagram for Personal Workout Reservation

Use case diagram for fitness reservation

Following Figure B.2 shows use case diagram for fitness reservation.

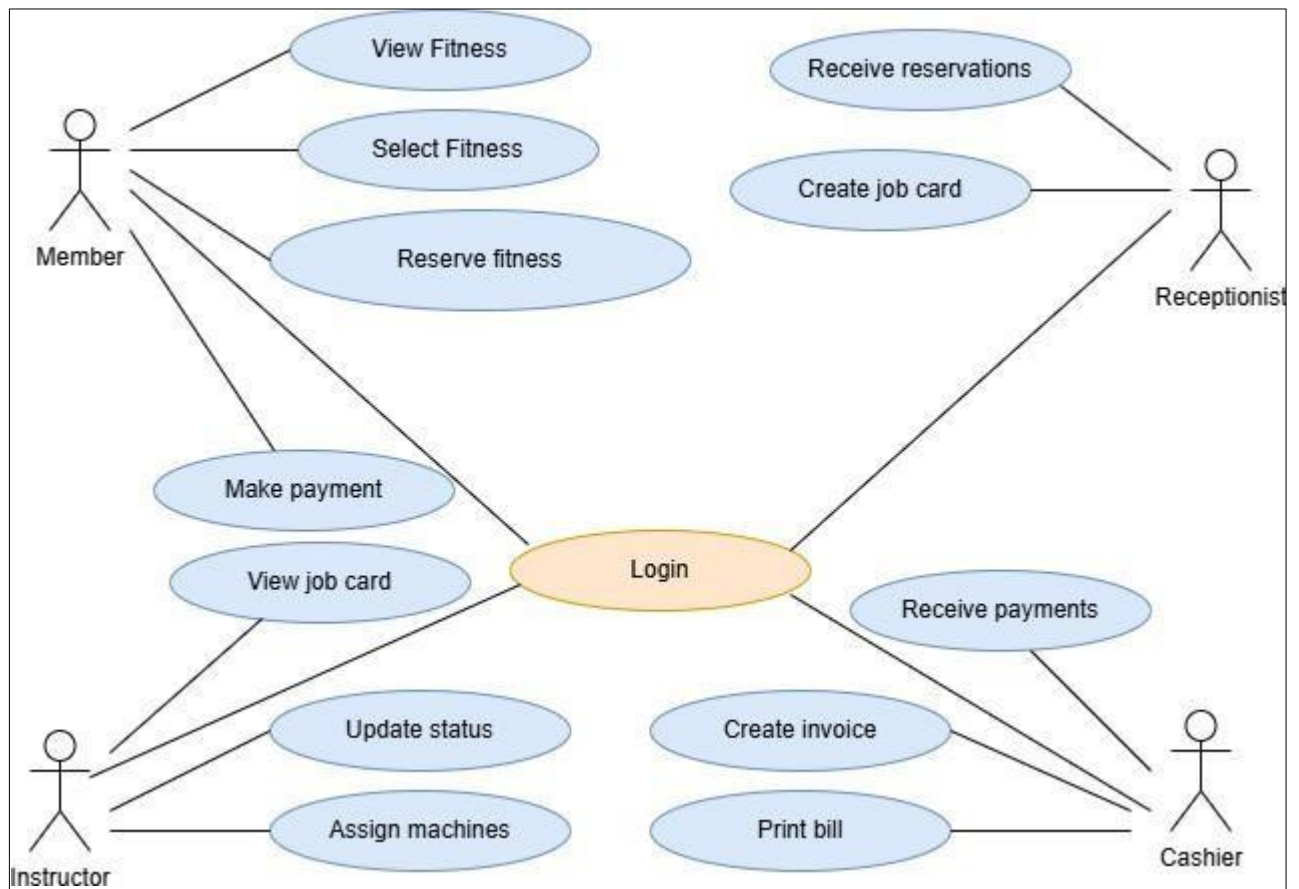


Figure B 2: Use Case Diagram for Fitness Reservation

Use case diagram for joining classes

Following Figure B.3 shows use case diagram for joining classes.

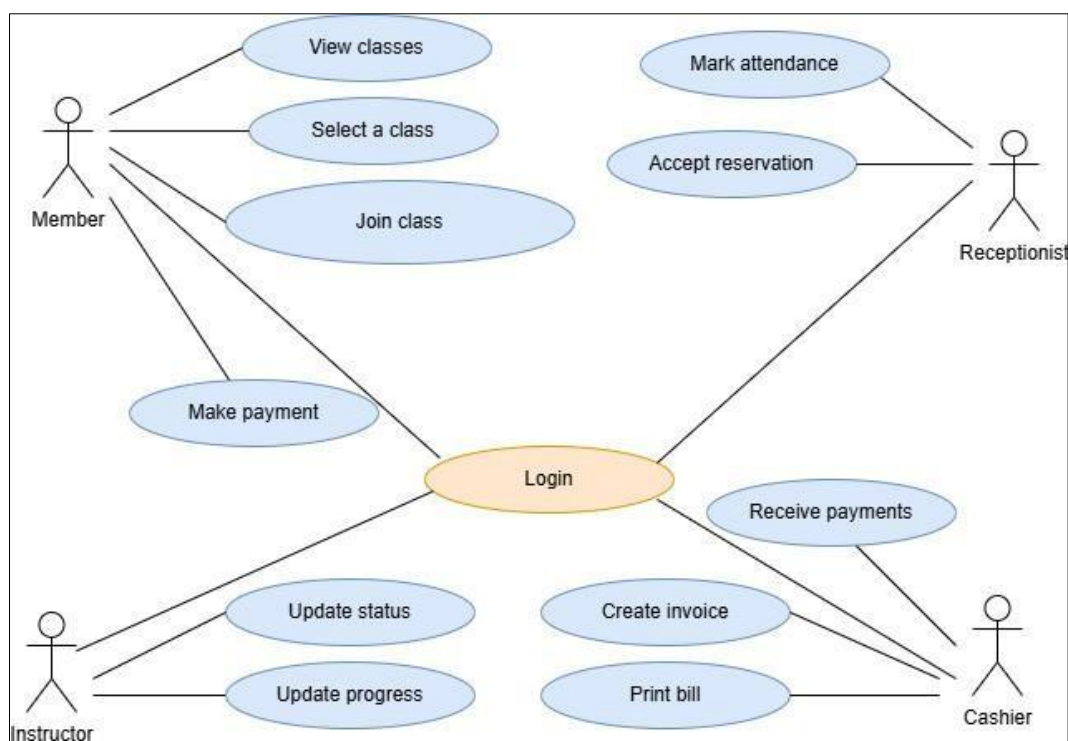


Figure B 3: Use Case Diagram for Joining Class

Use case diagram for applying gym packages

Following Figure B.4 shows use case diagram for applying gym packages.

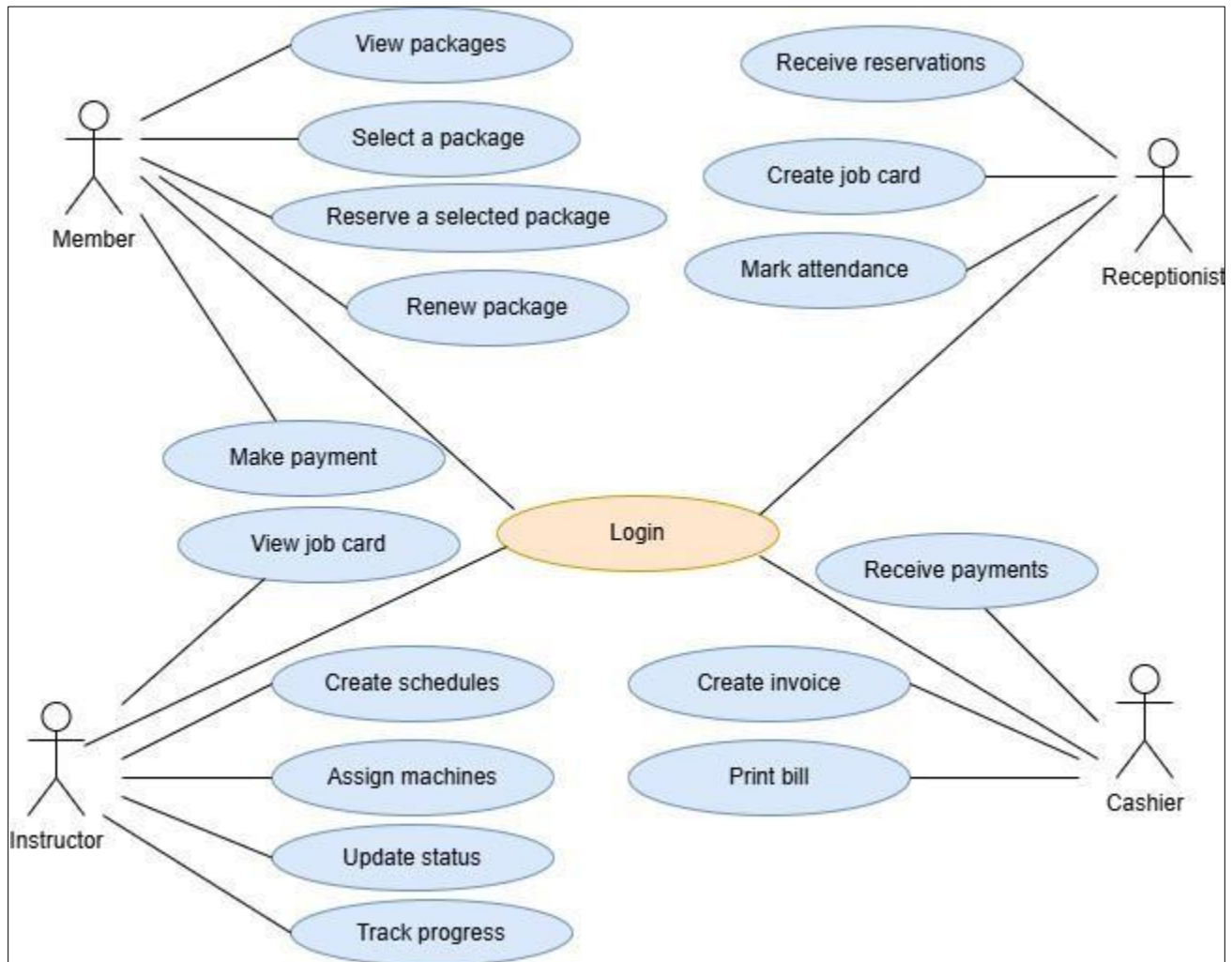


Figure B 4: Use Case Diagram for Applying Gym Packages

User interfaces ensure a seamless user experience by allowing members, instructors, and admin panel to efficiently interact with the gym management system. This design should focus on usability and accessibility to enhance overall gym operations. Members can quickly navigate and get an idea of the components. There are four main user interfaces which is provided by Everest Fitness Center.

User interfaces of personal workouts

Following Figure B.5 shows user interface for personal workouts.

Personal Training Workouts

Personal Training Session

Every day is another chance to get stronger



Strength Training

Focuses on building muscle strength and endurance.

- Bench Press
- Squats
- Push-ups
- Pull-ups
- Overhead press

[Login](#)
[Register](#)



Cardio Training

Improves heart health, stamina, and endurance.

- Treadmill Running
- Cycling

[Login](#)
[Register](#)



Muscle Building (Hypertrophy Training)

Targets muscle growth with controlled resistance exercises.

- Lat Pulldown
- Leg Press
- Triceps Dips
- Deadlifts
- Dumbbell Bicep Curls

[Login](#)
[Register](#)



Endurance Training

Improves cardiovascular and muscular endurance.

- Rowing

[Login](#)
[Register](#)

All Rights Reserved-Everest Fitness Center

Figure B 5: User Interface for Personal Workouts

User interfaces of fitness

Following Figure B.6 shows user interface for fitness 1.



[Home](#)
[Personal Workouts](#)
[Fitness](#)
[Classes](#)
[Packages](#)
[Our Instructors](#)
[My Profile](#)

[Register Now](#)
[Login](#)

Fitness

Unlock your potential with guided workouts tailored for all fitness levels!



Bench Press

Strength Training

A strength exercise that targets the chest, shoulders, and triceps by pressing a weighted barbell or dumbbells from a lying position.

[Login](#)
[Register](#)

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Figure B 6: User Interface for Fitness 1

86

Following Figure B.7 shows user interface for main fitness.

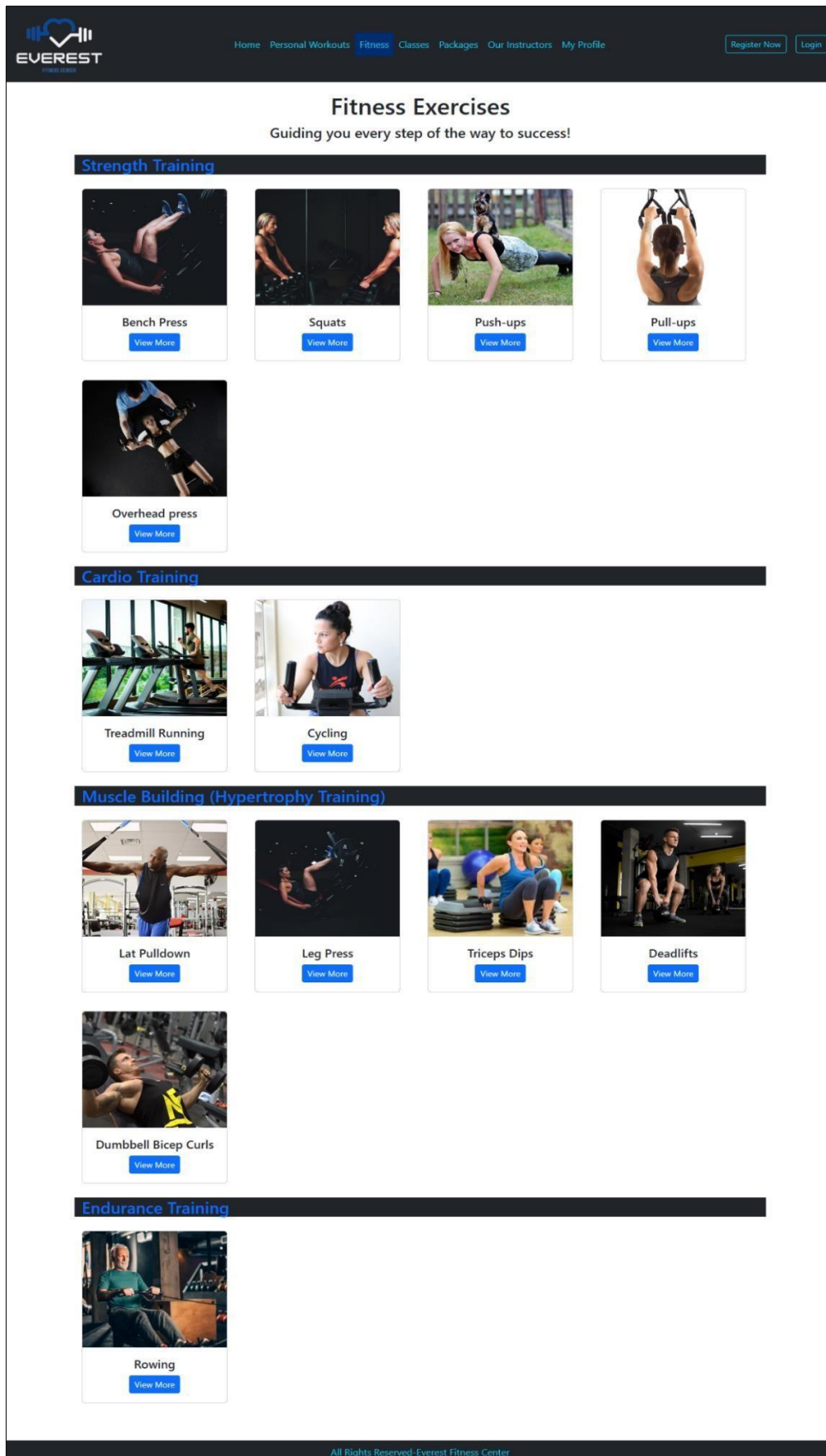


Figure B 7: User Interface for Main Fitness

User interfaces of Classes

Following Figure B.8 shows user interface for classes.

[Home](#) [Personal Workouts](#) [Fitness](#) [Classes](#) [Packages](#) [Our Instructors](#) [My Profile](#) [Register Now](#) [Login](#)

Fitness Class

General Group Class

Guiding you every step of the way to success!



Zumba Class
(Miss. Nimesha Gomas)

Zumba is a high-energy dance workout that combines Latin and international music with fun, easy-to-follow moves. It's a great way to burn calories, improve cardiovascular health, and boost mood.

- Wednesday
- 6:00 PM - 8:00 PM
- 02:00 hours

[Login](#) [Register](#)



Karate Class
(Mr. Saman Perera)

Karate is a disciplined martial art that focuses on self-defense, strength, and mental focus through precise strikes and movements. It helps improve coordination, confidence, and physical fitness.

- Saturday
- 9:00 AM - 12:00 PM
- 03:00 hours

[Login](#) [Register](#)



Yoga Class
(Miss. Kasthuri Silva)

Yoga is a mind-body practice that combines stretching, breathing exercises, and meditation to enhance flexibility, reduce stress, and promote overall well-being. It's perfect for relaxation and inner balance.

- Sunday
- 9:00 AM - 5:00 PM
- 08:00 hours

[Login](#) [Register](#)



Meditation Class
(Mr. Sunil Perera)

A meditation class focuses on mindfulness, relaxation, and stress relief through guided breathing techniques, mental clarity exercises, and deep relaxation methods. Suitable for all levels, it helps improve focus, emotional well-being, and overall mental peace.

- Friday
- 7:00 PM - 9:00 PM
- 02:00 hours

[Login](#) [Register](#)

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Figure B 8: User Interface for Classes

User interfaces of gym packages

Following Figure B.9 shows user interface of gym packages.

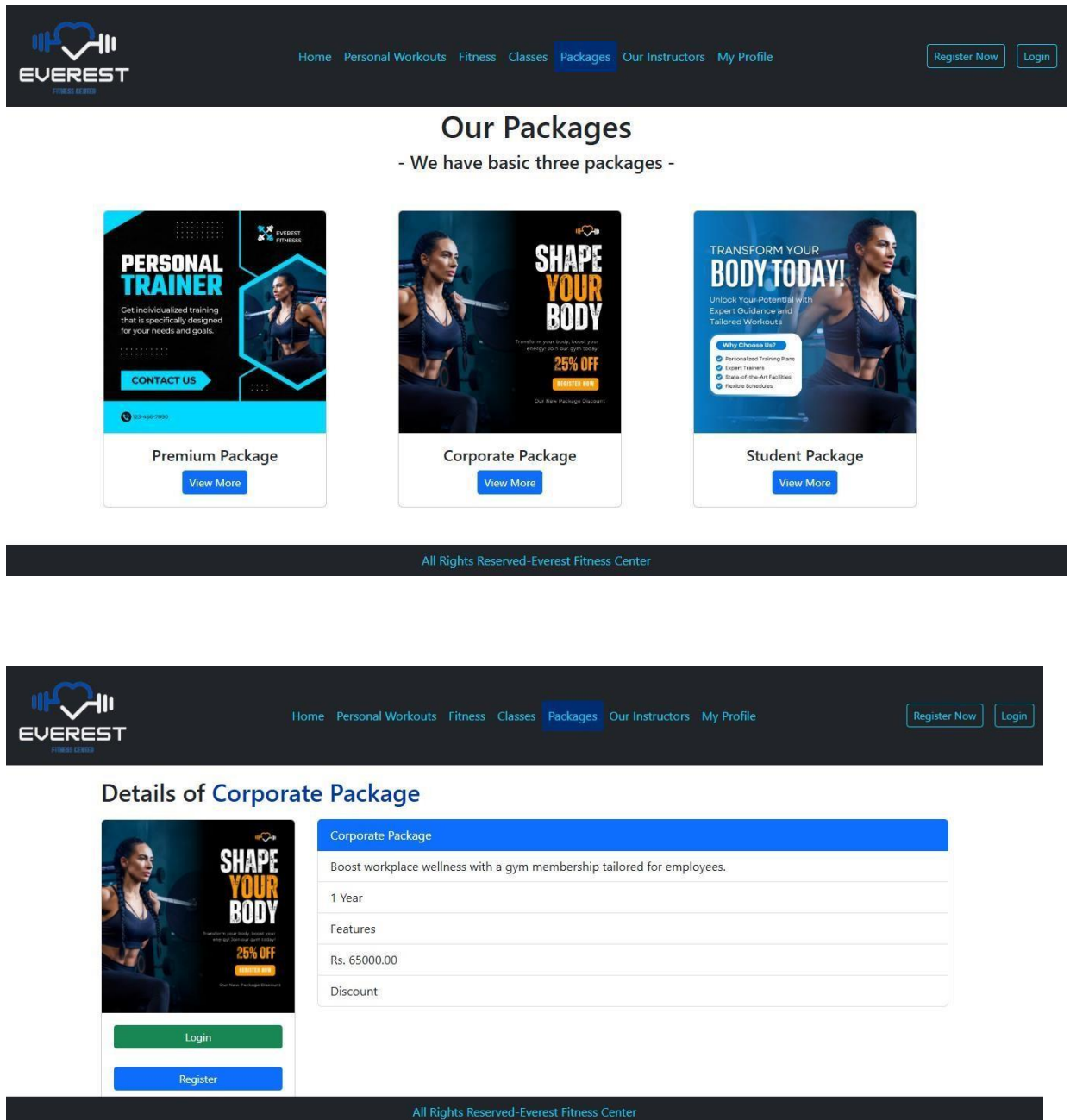


Figure B 9: User Interface for Gym Packages

Appendix C - User Manual

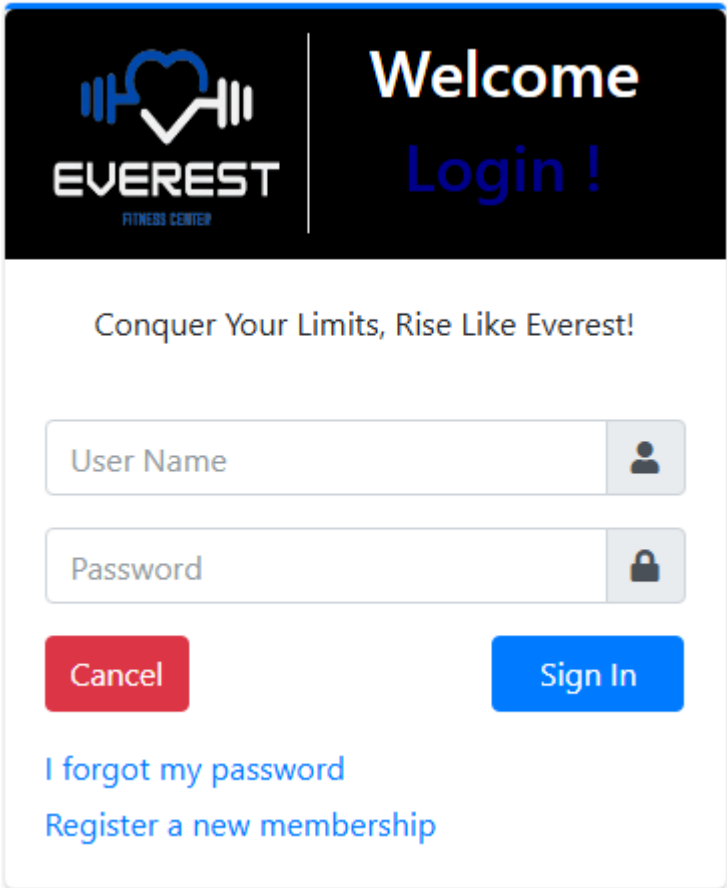
User Document of the application will be helping the gym members in their first time use to identify steps need to follow.

User Guide for all Everest Fitness users:

Login Step

1: Log in to the system by using the provided username and password.

Following Figure C.1 refers to the steps of the login process.



The screenshot displays the Everest Fitness Center login page. At the top, there is a dark header bar. On the left side of the header is the Everest Fitness Center logo, which includes a stylized heart and dumbbells above the text 'EVEREST FITNESS CENTER'. On the right side of the header, the text 'Welcome Login !' is displayed in white and blue. Below the header, the main content area has a light background. It starts with the tagline 'Conquer Your Limits, Rise Like Everest!'. Below this are two input fields: 'User Name' with a user icon on the right, and 'Password' with a lock icon on the right. Under the 'User Name' field is a red 'Cancel' button. Under the 'Password' field is a blue 'Sign In' button. At the bottom of the form, there are two links: 'I forgot my password' and 'Register a new membership', both in blue text.

Figure C 1: Login Process

Change password

Step 1: Go to the “My Profile” tab on navigation bar.

Step 2: Select “Change password” button.

Step 3: Provide necessary data and “Update”.

Following Figure C 2 refers to the steps of the change password procedure.

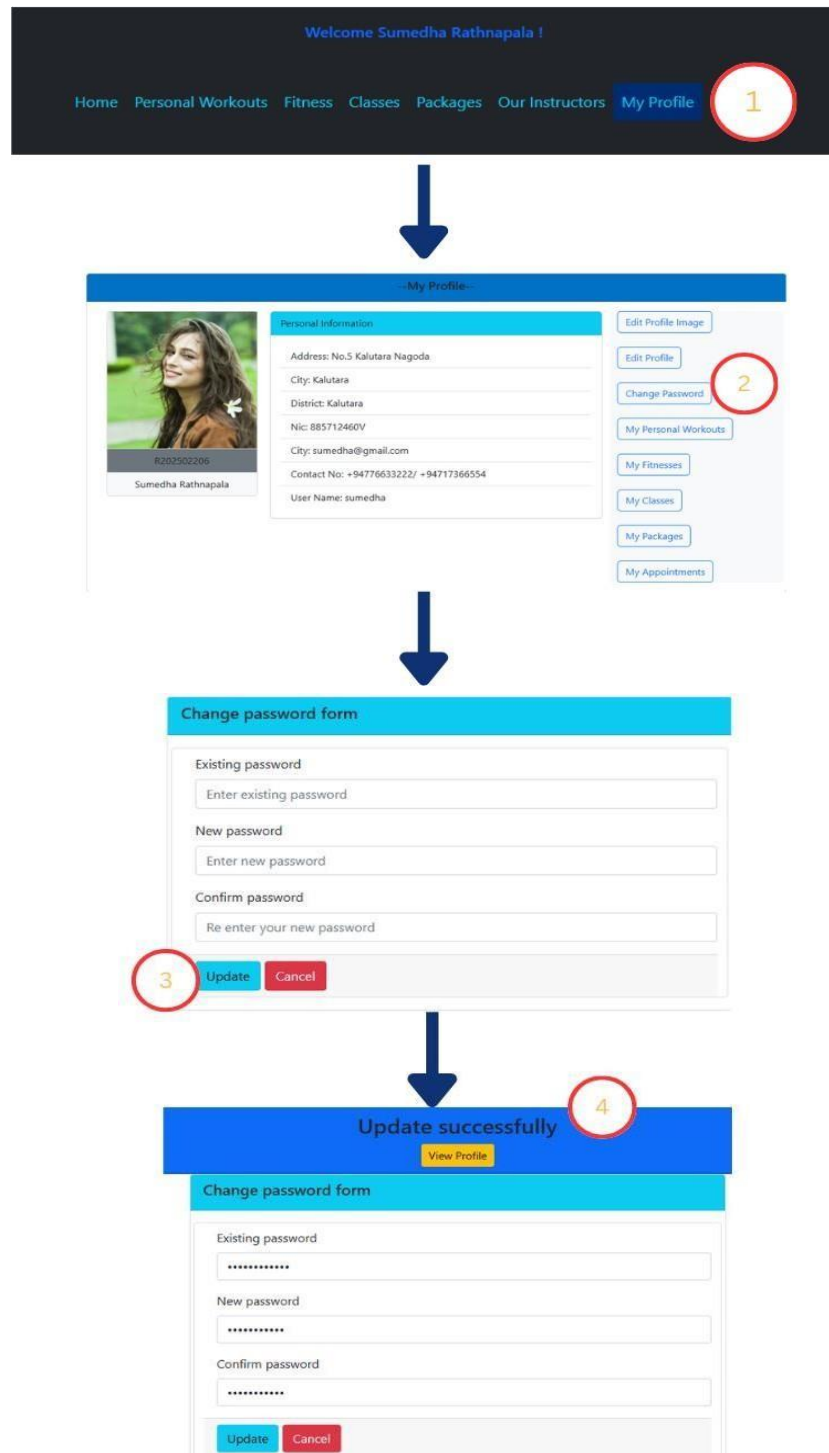


Figure C 2: Change Password

Member Registration step

Step 1: Go to the “Register Now” tab on navigation bar.

Step 2: Fill out the form fields and click “Save” button.

Step 3: System displays generated registration number with successfully message.

Following Figure C.3 refers to the steps of the change password procedure.

The figure illustrates the member registration process in three steps:

- Step 1:** The navigation bar at the top of the Everest Fitness Center website. The "Register Now" button is highlighted with a red circle and the number 1.
- Step 2:** The "Member Registration Form". The form is divided into two sections: "Personal Information" and "Account Information".
 - Personal Information:** Fields for First Name, Last Name, AddressLine1, AddressLine2, AddressLine3, AddressLine4, City, District, NIC Number, Email, Phone Number 1, and Phone Number 2.
 - Account Information:** Fields for Username, Password, and Confirm Password.The "Save" button is highlighted with a red circle and the number 2.
- Step 3:** The "Registered successfully" message. The message states: "Your registered details can be seen on My Profile Page." Below this, the registration number "R2025030611" is displayed, followed by "Welcome to Everest Fitness Center!!" and a "Login" button. The registration number is highlighted with a red circle and the number 3.

Figure C 3: Member Registration Step

Personal Workouts Reservation step

Step 1: Go to the “Personal Workouts” tab on navigation bar.

Following Figure C.4 refers personal workout reservation step1.

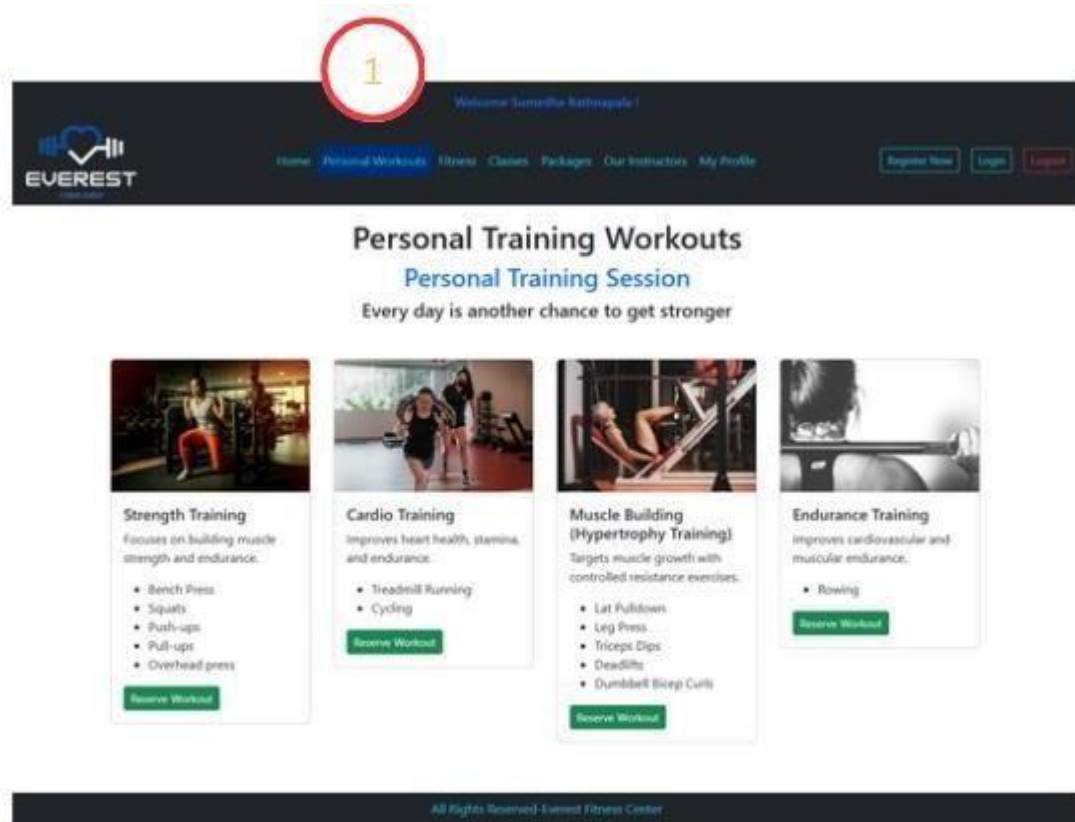


Figure C 4: Personal Workout Reservation Step1

Step 2: Click “Reserve Workout” button.

Following Figure C.5 refers personal workout reservation step2.

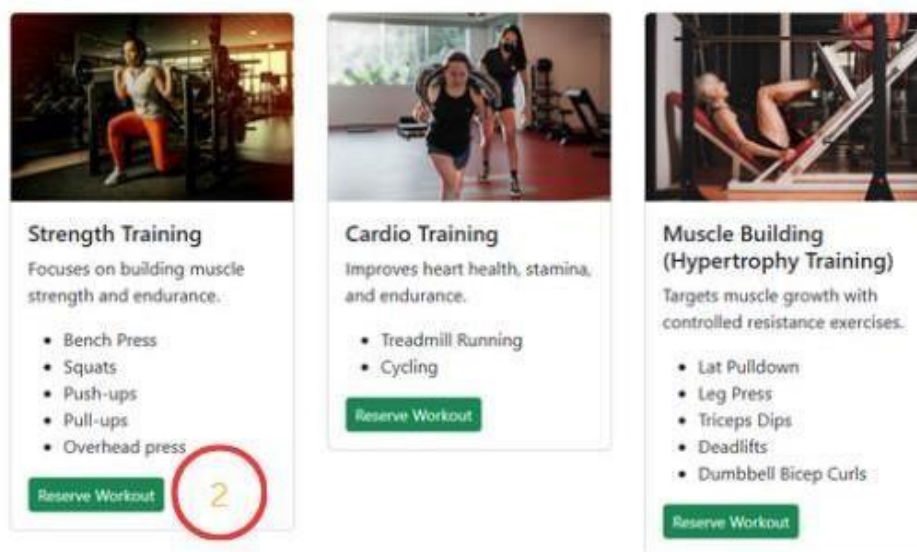


Figure C 5: Personal Workout Reservation Step2

Step 3: Fill out the select Data and Time section and Calculate BMI. Click the “Reserve Now” button.

Following Figure C.6 refers personal workout reservation step3.

Everest Personal Workout Reservation

Member Information

Member Registration No. KJ275123456

First Name: Sunil Kumar Last Name: Rautapala

Mobile: 9876543210

Workout Information

Workout Name: Strength Training

Workout Duration: 3000.00

Select Date and Time

Select Appointment Date: 2023-01-01

Select Available Time: 10:00:00

Calculate BMI

Enter Weight (Kg.): 48 Enter Height (M.): 5

Your BMI: 1.92

Reserve Now Cancel

Time Slots

Slot	Time
Slot 1	08:00:00 - 09:00:00
Slot 2	09:00:00 - 10:00:00
Slot 3	10:00:00 - 11:00:00
Slot 4	11:00:00 - 12:00:00
Slot 5	12:00:00 - 13:00:00
Slot 6	13:00:00 - 14:00:00
Slot 7	14:00:00 - 15:00:00
Slot 8	15:00:00 - 16:00:00
Slot 9	16:00:00 - 17:00:00
Slot 10	17:00:00 - 18:00:00
Slot 11	18:00:00 - 19:00:00
Slot 12	19:00:00 - 20:00:00
Slot 13	20:00:00 - 21:00:00
Slot 14	21:00:00 - 22:00:00
Slot 15	22:00:00 - 23:00:00

Figure C 6: Personal Workout Reservation Step3

Step 4: After filling weight and height under Calculate BMI, the system will auto generate the value of BMI.

Following Figure C.7 refers personal workout reservation step4.

Calculate BMI

Enter Weight (Kg.): 48 Enter Height (M.): 5

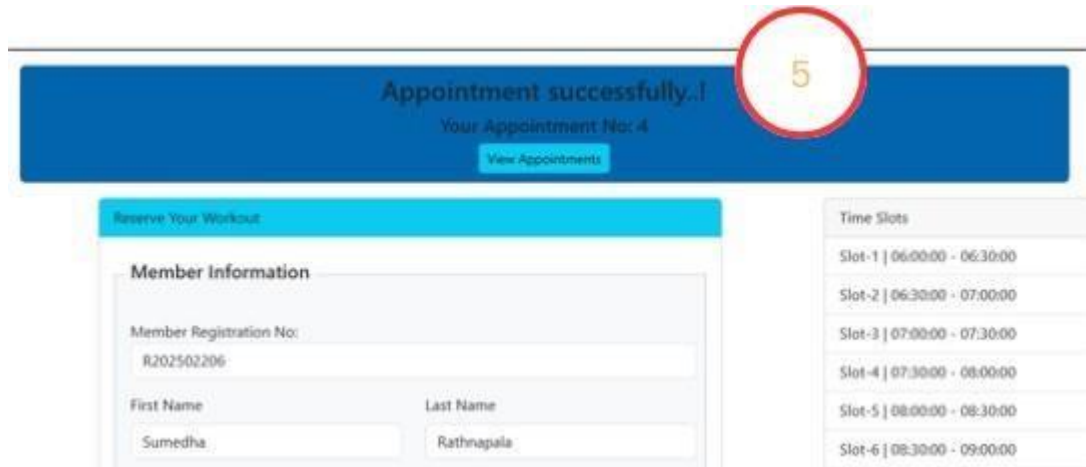
Your BMI: 1.92

Reserve Now Cancel

Figure C 7: Personal Workout Reservation Step4

Step 5: After successfully reservation process, the system will display successfully message with an appointment number.

Following Figure C.8 refers personal workout reservation step5.



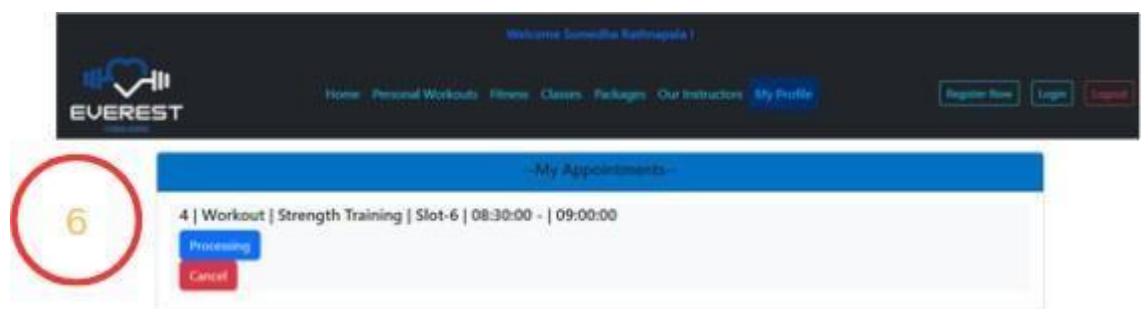
The screenshot shows a successful reservation confirmation. At the top, a blue banner displays "Appointment successfully.!" and "Your Appointment No: 4" with a "View Appointments" button. Below this, the "Reserve Your Workout" section shows member information: Member Registration No: R202502206, First Name: Sumedha, and Last Name: Rathnapala. To the right, a "Time Slots" table lists six available slots.

Time Slots	
Slot-1	06:00:00 - 06:30:00
Slot-2	06:30:00 - 07:00:00
Slot-3	07:00:00 - 07:30:00
Slot-4	07:30:00 - 08:00:00
Slot-5	08:00:00 - 08:30:00
Slot-6	08:30:00 - 09:00:00

Figure C 8: Personal Workout Reservation Step5

Step 6: Click “View Appointments” button to see the status of the reservation.

Following Figure C.9 refers personal workout reservation step6.



The screenshot shows the "My Appointments" page. The header includes the Everest logo and navigation links. The main content area shows a reservation for "4 | Workout | Strength Training | Slot-6 | 08:30:00 - | 09:00:00". The status is "Processing", and there are "Processing" and "Cancel" buttons. A red circle with the number 6 highlights the reservation details.

Figure C 9: Personal Workout Reservation Step6

Instructor Account Creation step

Step 1: System administrator login to the dashboard.

Following Figure C.10 refers instructor account create step1.



Figure C 10: Instructor Account Create Step1

Step 2: Go to the create instructor tab of side bar of the dashboard.

Following Figure C.11 refers instructor account create step2.

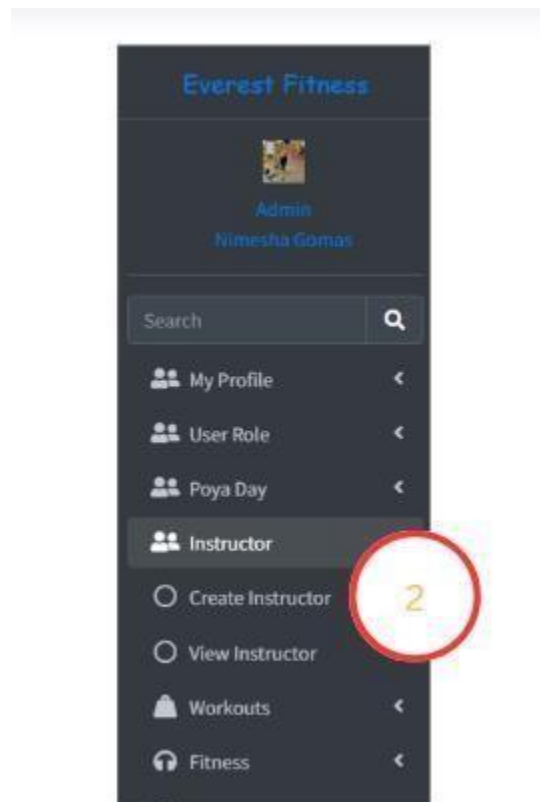


Figure C 11: Instructor Account Create Step2

Step 3: Click the create instructor tab and view the create instructor form. After filling the form fields and click “Save” button.

Following Figure C.12 refers instructor account create step3.

The screenshot shows the 'Create Instructor Account' form in the Everest Fitness Center dashboard. The form is titled 'Instructor' and contains the following fields: Select Title, First Name, Last Name, Address, Email address, Mobile, Telephone No., User Name, Password, Profile Image, Select Role, and Select Instructor Service. A red circle with the number '3' is drawn around the 'Save' button at the bottom left of the form.

Figure C 12: Instructor Account Create Step3

Step 4: When instructor details are inserted, the system will show successfully message.

Following Figure C.13 refers instructor account create step4.

The screenshot shows the 'Instructor' page in the Everest Fitness Center dashboard. The page displays a 'Create Instructor Account' form and a 'Table of Instructor Details'. A red circle with the number '4' is drawn around the 'Insert successfully..!' message at the top of the form. The table of instructor details shows the following data:

Name	Email	Profile Image	Change Status
Mrs. Kanthul Silva	kanthul@gmail.com		Change
Mrs. Nimesha Gomati	nimesha@gmail.com		Change

Figure C 13” Instructor Account Create Step4

Step 5: Successfully inserted instructor details are shown under “View Instructor” section of side bar.

Following Figure C.14 refers instructor account create step5.



Figure C 14: Instructor Account Create Step5

Appendix D – Management Reports

Management reports are very important to get predictions of the business. The system allows the administrators and Module Administrators to generate reports. Administrator can obtain list of members who registered to the system with their status.

Report on reservations by Personal Workouts

All the relevant data such as appointment no, workout id, customer registration no, appointment date, slot id and count results are displayed on the report.

Following Figure D. 1 shows report on reservation by personal workouts.

Report

Report / Reservation

Workout Name :

--

Enter Customer RegNo

mm/dd/yyyy

mm/dd/yyyy

Search

Found 4 records

AppointmentId	Workout Id	Customer Reg No	AppointmentDate	Slot ID
1	1	R202502191	2025-02-28	1
2	1	R202502191	2025-02-28	1
3	1	R202502191	2025-02-28	1
4	1	R202502206	2025-03-15	6

Export Table Data To Excel File

Convert HTML to PDF

Figure D 1: Report on Reservation by Personal Workouts

In this report section, admin can export table data to excel file and convert to pdf. For that, it is used to xlsx (SheetJS) library, jsPDF library and html2canvas library.

Following Figure D. 2 shows generated excel file of the reservation by personal workouts reports.

AppointmentId	Workout Id	Customer Reg No	AppointmentDate	Slot ID
1	1	R202502191	2/28/2025	1
2	2	R202502191	2/28/2025	1
3	3	R202502191	2/28/2025	1
4	4	R202502206	3/15/2025	6

Figure D 2: Generated Excel File

When click the “Convert HTML to PDF”, pop up the pdf file with settings to download.

Following Figure D. 3 shows generated pdf file of the reservation by personal workouts reports.

Print

1 sheet of paper

Destination: Microsoft Print to PDF

Pages: All

Layout: Portrait

Color: Color

Print Cancel

AppointmentId	Workout Id	Customer Reg No	AppointmentDate	Slot ID
1	1	R202502191	2025-02-28	1
2	1	R202502191	2025-02-28	1
3	1	R202502191	2025-02-28	1
4	1	R202502206	2025-03-15	6

Export Table Data To Excel File Convert HTML to PDF

Figure D 3: Generated PDF File View

Following Figure D. 4 shows generated pdf file.

3/7/25, 11:02 PM about:blank

Appointment Data

AppointmentId	Workout Id	Customer Reg No	AppointmentDate	Slot ID
1	1	R202502191	2025-02-28	1
2	1	R202502191	2025-02-28	1
3	1	R202502191	2025-02-28	1
4	1	R202502206	2025-03-15	6

Figure D 4: Generated PDF File

Report on reservations by monthly/ daily/ weekly/ yearly

This will show the appointments which related to provided time frame. In this report will show the graphical comparison. For that purpose, the system is used Chart.js. It is extracted values are stored in xValues (labels) and yValues (numeric data). jQuery is used for selecting HTML elements and extracting table data. Chart.js is a JavaScript library. It is used for creating interactive charts.

Following Figure D. 5 shows report on reservation by monthly/ daily/ weekly/ yearly.

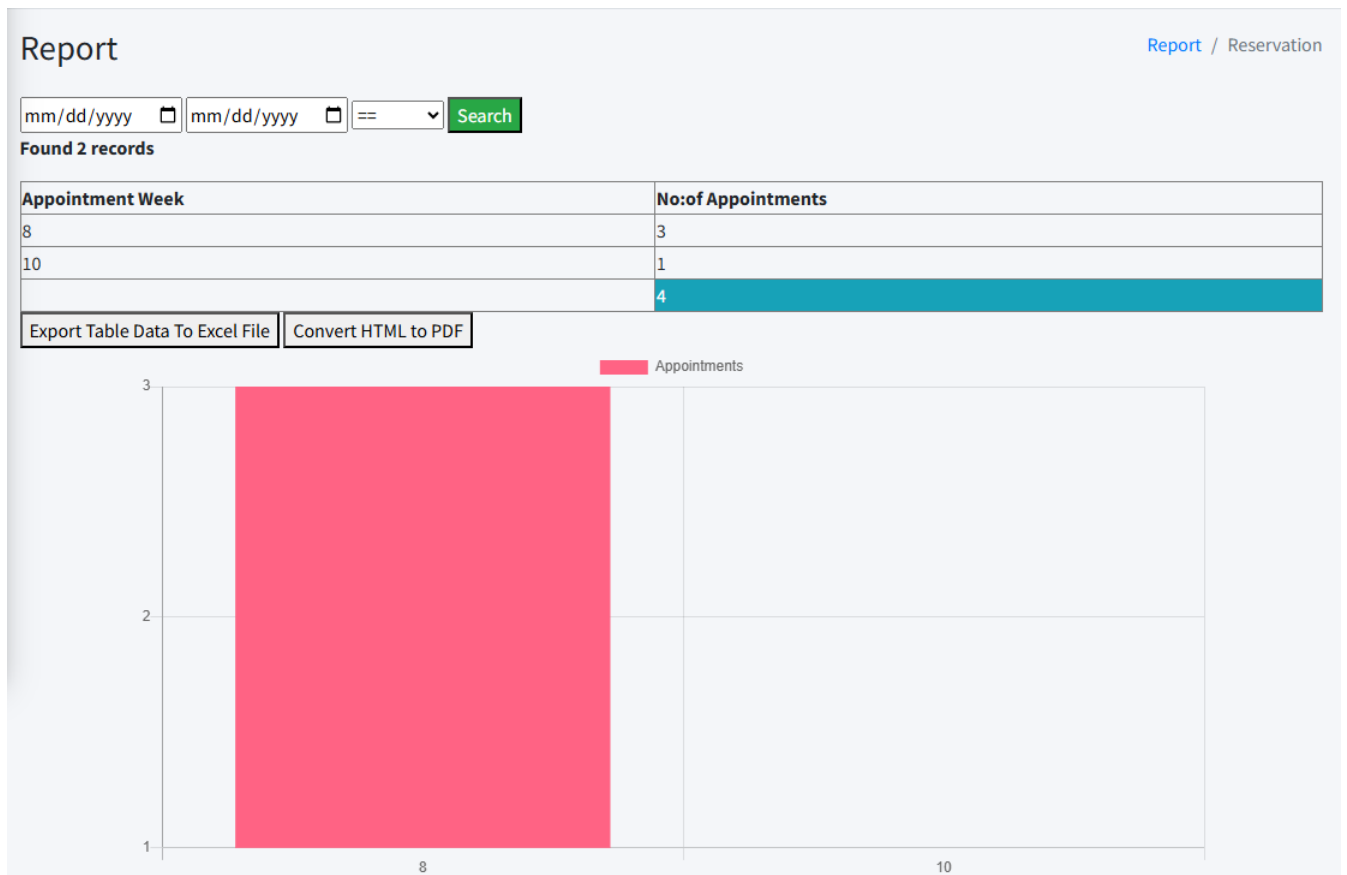


Figure D 5: Report on Reservation by Daily/Weekly/Monthly/Yearly

Report on reservations by Slots

All the relevant data such as appointment no, slot id and appointment date are displayed on the report.

Following Figure D. 6 shows report on reservation by slots.

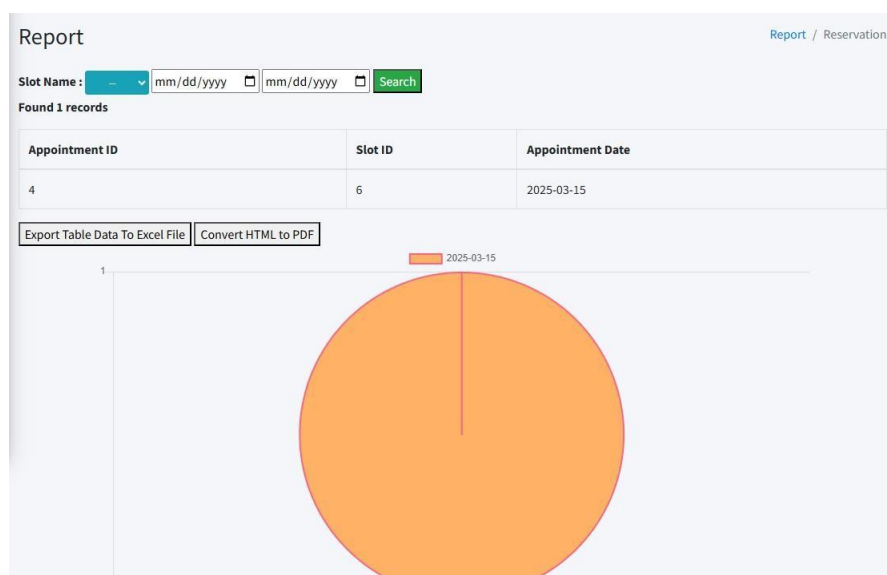


Figure D 6: Report on Reservation by Slots