

KRONOS FITNESS FIELD

A PROJECT REPORT

Submitted By

Mohd Kasif Khan

(202410116100122)

Harshit Sharma

(202410116100088)

Harsh Solanki

(202410116100087)

**Submitted in partial fulfilment of the
Requirements for the Degree of**

MASTER OF COMPUTER APPLICATIONS

Under the Supervision of

Mr. Arpit Dogra

Assistant Professor



Submitted to

**DEPARTMENT OF COMPUTER APPLICATIONS
KIET Group of Institutions, Ghaziabad
Uttar Pradesh-201206**

(December 2024)

CERTIFICATE

Certified **MOHD KASIF KHAN 202410116100122, Harshit Sharma 202410116100088, Harsh Solanki 202410116100087** has/ have carried out the project work having “Personal gym website ” for Master of Computer Applications from Dr. A.P.J. Abdul Kalam Technical University (AKTU) (formerly UPTU), Technical University, Lucknow under my supervision. The project report embodies original work, and studies are carried out by the student himself / herself and the contents of the project report do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University/Institution.

Date:

Mohd Kasif Khan
(202410116100122)
Harshit Sharma
(202410116100088)
Harsh Solanki
(202410116100087)

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Date:

Mr. Arpit Dogra
Assistant Professor
Department of Computer Applications
KIET Group of Institutions, Ghaziabad

Dr. Arun Tripathi
Head, Department of Computer
Applications KIET Group of
Institutions, Ghaziabad

ABSTRACT

This project, "**Kronos Fitness Field**," aims to provide a comprehensive online platform for gym enthusiasts and potential members to explore fitness services. Users can register, book sessions, browse fitness plans, and track progress. The project promotes a seamless and engaging digital experience while ensuring scalability and security. Abstraction plays a critical role in designing this project by simplifying complex functionalities into manageable modules. By focusing on key features such as user registration, session booking, and activity tracking, the project abstracts underlying technical details, making the interface intuitive for end-users. For example, users interact with simple forms and dashboards while backend processes handle data management, authentication, and analytics efficiently. This separation of concerns ensures a smoother user experience and facilitates system scalability and maintenance. Additionally, abstraction is applied in the system's modular architecture, where independent components like the user module, booking module, and admin panel can be updated or extended without disrupting overall functionality. This modularity underscores the project's robustness and adaptability.

Objectives:

- Allow gym members to register and manage their profiles.
- Facilitate online booking for sessions and fitness plans.
- Showcase available trainers and fitness packages.
- Track user activity and provide progress reports.

Key Features:

1. **User Registration and Login:** Secure authentication to access personalized dashboards.
2. **Session Booking:** Book gym or trainer sessions through a dynamic scheduling system.
3. **Admin Panel:** Manage user activities, bookings, and fitness plans.
4. **Analytics:** Provide insights on user engagement and fitness trend

ACKNOWLEDGEMENTS

Success in life is never attained single handedly. My deepest gratitude goes to my thesis supervisor **Mr. Arpit Dogra**, Assistant Professor, for his guidance, help and encouragement throughout my research work. Their enlightening ideas, comments, and suggestions encouraged me to complete this project.

Words are not enough to express my gratitude to **Dr. Arun Tripathi**, Professor and Head, Department of Computer Applications, for his insightful comments and administrative help at various occasions. Fortunately, I have many understanding friends and team members, who have helped me a lot on many critical conditions.

Finally, my sincere thanks go to my family members and all those who have directly and indirectly provided me moral support and other kind of help. Without their support, completion of this work would not have been possible in time. They keep my life filled with enjoyment and happiness.

Mohd Kasif Khan

Harshit Sharma

Harsh Solanki

TABLE OF CONTENTS

Certificate	ii
Abstract	iii
Acknowledgements	iv
Table of Contents	v – vi
List of Abbreviations	vii
List of Tables	viii
List of Figures	ix – x
1 Introduction	1- 3
1.1 Project description	1
1.2 Project Scope	1
1.3 Hardware / Software used in Project	2 - 3
1.4 Functional Requirements	3
1.5 Non - Functional Requirements	3 - 4
2 Feasibility Study	5 - 7
2.1 Technical feasibility	5
2.2 Operational Feasibility	6
2.3 Behavioral Feasibility	6 - 7
2.4 Economic Feasibility	7

3	Database Design	8 – 15
3.1	Flow Chart Diagram	8– 9
3.2	Database Tables	9 – 11
3.3	Entity Relationship Diagram	12 – 13
3.4	Use Case Diagram	13 – 14
3.5	Sequence Diagram	14 – 15
4	Form Design	16 – 17
4.1	Landing Page	16
4.2	Login Page	16 -17
4.3	Add Request Page	17
4.4	View request Status	18
5	Testing	20 - 30
5.1	Testing Case 1 (Login)	
5.2	Testing Case 2 (Add Products)	
5.3	Testing Case 5 (Logout)	
6	Literature Review	31
7	Bibliography	33

List of Abbreviations

S No.	Name of Abbreviations	Details of Abbreviations	Page
1	CS	Computer Science	1
2	OS	Operating System	1 - 2
3	Database Tables	Database Tables	9 -11
4	ER	Entity Relationship	12
5	UCD	Use Case Diagram	13
6	SD	Sequence Diagram	14

LIST OF TABLES

Table No.	Name of Table	Page
2.1	Admin Table	7
2.2	Contact us	8
5.1	Coupons	8
5.2	Request	9
5.3	Users	9

LIST OF FIGURES

Figure No.	Name of Figure	Page No.
3.1	Flow Chart Symbols	8
3.2	Flow Chart Diagram	9
3.3	Database Tables	9
3.4	Entity Relationship Diagram	12
3.5	Use Case Diagram	13
3.6	Sequence Diagram	14
4.1	Landing Page	16
4.2	Login Page	16
4.3	Add Request	17
4.4	View Request	18
6.1	Test Case 1 (Login)	43
6.2	Test Case 2(Add Request)	44
6.3	Test Case 3(Login)	45

Chapter 1

Introduction

1.1 Project description

The **Kronos Fitness Field** project introduces a comprehensive digital platform to revolutionize gym services. Traditional gym management often faces challenges such as manual booking processes, inefficient scheduling, and limited user engagement. This project addresses these issues by providing a centralized and interactive solution for both gym members and administrators.

Key Objectives:

1. **Simplify Gym Management:** By automating routine tasks like membership registration, session bookings, and payment processing.
2. **Enhance User Experience:** Offering users a seamless way to track fitness goals, interact with trainers, and access personalized schedules.
3. **Expand Accessibility:** Ensuring the platform is responsive across devices, allowing users to connect anytime, anywhere.

The website's intuitive design empowers users to explore fitness programs, manage bookings, and monitor progress, while gym administrators gain access to tools for efficient resource management. By leveraging modern web technologies and secure data handling practices, the project sets a new benchmark for fitness service delivery.

Project Scope

The project focuses on transforming traditional gym services into a digital experience, addressing user needs for convenience and accessibility. It aims to reduce administrative overhead while improving user engagement.

Benefits:

Enhanced user satisfaction with real-time booking.

Data-driven insights for fitness trends.

Automated management for operational efficiency.

Hardware / Software used in Project

Software Requirement for development

System Software –

Operating System (Windows XP or above)

Server (TOMCAT Server)Application Software –

Database (MySQL)

Web Technologies-

HTML5 & CSS3

Bootstrap

JavaScript

Frameworks

Spring

Software Requirement for User

OS –

Windows XP or above

Web Browser-

Microsoft Edge or above

Hardware Requirement for development

Input Devices - All basic input devices like keyboard, mouse, etc.

Output Devices - All basic output devices like printer, monitor, etc.

Secondary storage devices -

HDD - 60GB or above.

Back-up - Flash Drive, CD/DVD, cloud storage etc.

Internal components -

RAM - 512 MB (Minimum)

Processor - Intel Pentium 4 Processor or above

Hardware Requirement for User

Input Devices - All basic input devices like keyboard, mouse, etc.

Output Devices - All basic output devices like printer, monitor, etc.

Stable and secure Internet connection

FUNCTIONAL REQUIREMENTS

Request System-

Create an Account

Login to the Website

Navigate to the Dashboard.

Fill the Request Form

Customized the Request

Request Management System-

Add a new/update/delete request

See the status of the request

View the coupons

Update the status of the request

NON- FUNCTIONAL REQUIREMENTS-

Portability System running on one platform can easily be converted to run on another platform.

Reliability The ability of the system to behave consistently in a user- acceptable manner when operating within the environment for which the system was intended.

Availability The system should be available at all times, meaning the user can access it using a web browser, only restricted by the down time of the server on which the system runs.

Maintainability A commercial database is used for maintaining the database and the application server takes care of the site.

Security Secure access of confidential data.

Chapter 2

Feasibility Study

2.1 Technical feasibility-

It is the complete study of the project in terms of input, processors, output, fields, programs and procedure. It is a very effective tool for long term planning and troubleshooting. Technical feasibility is a process of validating the technology assumptions, architecture and design of a product. The following are common types of technical feasibility.

- **Concepts**
Conducting a proof of concept to test an idea or approach.
- **Infrastructure**
The capacity, performance characteristics and functionality of infrastructure. For example, a project may validate an assumption that a new system can use an organization's existing network infrastructure.
- **Facilities**
Confirming that facilities such as data centre will support project requirements.
- **Architecture & Design**
Validating the architecture and design of a project against functional and non-functional requirements. This can include a peer review process.
- **Data**
Checking that data supports requirements. For example, evaluating the data quality of required information.
- **Compliance**
Compliance to technology standards and regulations.
- **Platforms & APIs**
Evaluating platforms and APIs in areas such as functionality and reliability.
- **Components**
Tests and prototypes of component parts and materials.

- **Tools**

Validating technologies such as systems and applications. For example, confirming that an application can be customized to meet user interface requirements.

- **Integration**

Looking at how processes, systems, applications, and data will work together.

2.2 Operational Feasibility-

- Operational feasibility refers to the measure of solving problems with the help of a new proposed system. It helps in taking advantage of the opportunities and full fill the requirements as identified during the development of the project. It takes care that the management and the users support the project.
- Operational feasibility assesses the extent to which the required software performs a series of steps to solve business problems and user requirements. This feasibility is dependent on human resources (software development team) and involves visualizing whether the software will operate after it is developed and be operative once it is installed. Operational feasibility also performs the following tasks.
- Determines whether the problems anticipated in user requirements are of high priority.
- Determines whether the solution suggested by the software development team is acceptable.
- Analyze whether users will adapt to a new software.
- Determines whether the organization is satisfied by the alternative solutions proposed by the software development team.
- **Operational Feasibility of our project-**
 - This project is designed keeping in mind that when the users work on this platform then user can easily identify construction related items with in a no time. And buyer can have more option other than local seller and seller can easily expand their business at a large scale.

2.3 Behavioral Feasibility-

- No doubt the proposed system is fully GUI based very user-friendly and all inputs to be taken all self-explanatory even to a layman. Besides, proper training has been conducted to let them know the essence of the system to the users so that they feel comfortable with the new system. As far as our study is concerned the clients are comfortable and happy as the system has cut down their loads and doing.

2.4 Economic Feasibility-








- This assessment typically involves a cost/ benefits analysis of the project, helping organizations determine the viability, cost, and benefits associated with a project before financial resources are allocated. It also serves as an independent project assessment and enhances project credibility—helping decision-makers determine the positive economic benefits to the organization that the proposed project will provide.

Chapter 3

Database Design

3.1 Flow Chart Diagram-

Flowchart is a diagrammatic representation of sequence of logical steps of a program. Flowcharts use simple geometric shapes to depict processes and arrows to show relationships and process/data flow.

Symbol	Symbol Name	Purpose
	Start/Stop	Used at the beginning and end of the algorithm to show start and end of the program.
	Process	Indicates processes like mathematical operations.
	Input/ Output	Used for denoting program inputs and outputs.
	Decision	Stands for decision statements in a program, where answer is usually Yes or No.
	Arrow	Shows relationships between different shapes.
	On-page Connector	Connects two or more parts of a flowchart, which are on the same page.
	Off-page Connector	Connects two parts of a flowchart which are spread over different pages.

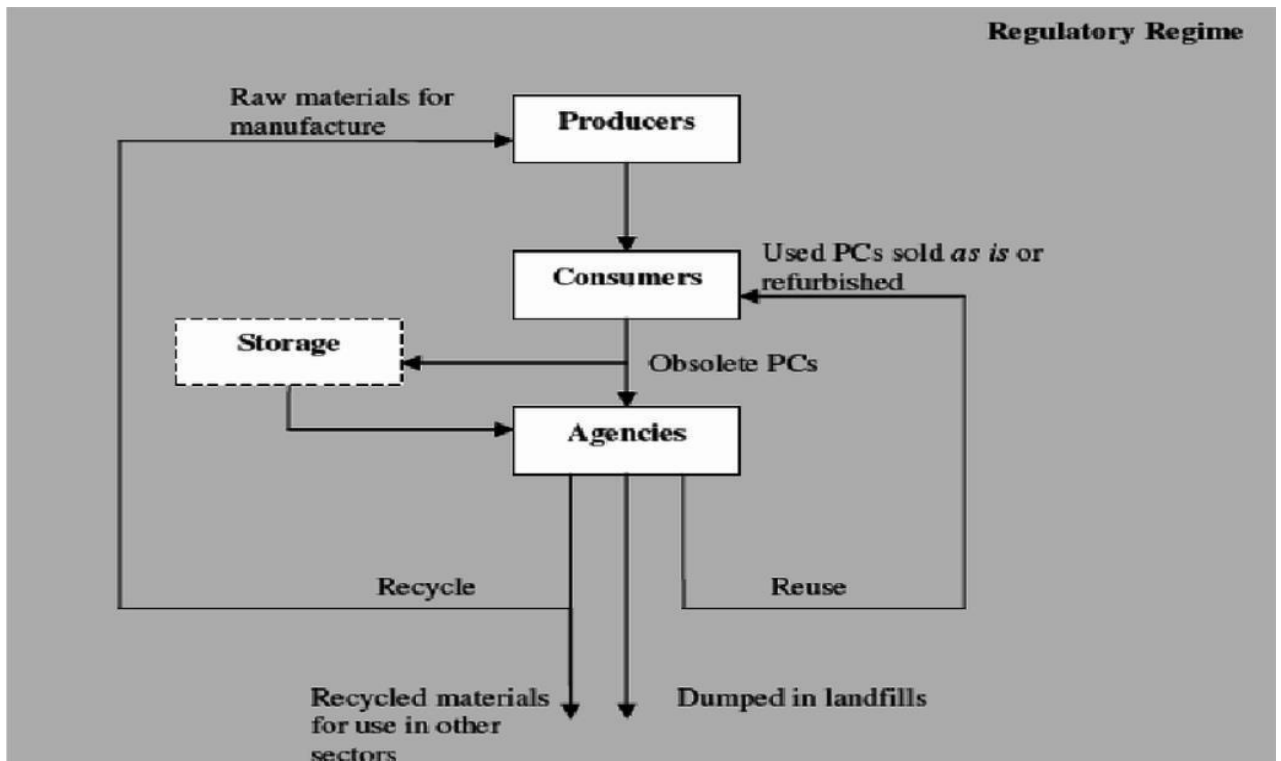


Fig No 3.1

3.2 Database Tables

3.2.1 ADMIN

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	int(11)			No	None		AUTO_INCREMENT	Change Drop More
<input type="checkbox"/> 2	fname	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 3	lname	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 4	email	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/> 5	password	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More

Fig No 3.2.1

3.2.2 Contact-Us











































#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id 	int(11)			No	None		AUTO_INCREMENT	 Change  Drop  More
<input type="checkbox"/> 2	name	varchar(255)	utf8mb4_general_ci		No	None			 Change  Drop  More
<input type="checkbox"/> 3	email	varchar(25)	utf8mb4_general_ci		No	None			 Change  Drop  More
<input type="checkbox"/> 4	address	varchar(255)	utf8mb4_general_ci		No	None			 Change  Drop  More
<input type="checkbox"/> 5	phone	varchar(10)	utf8mb4_general_ci		No	None			 Change  Drop  More
<input type="checkbox"/> 6	message	text	utf8mb4_general_ci		No	None			 Change  Drop  More
<input type="checkbox"/> 7	seen	varchar(1)	utf8mb4_general_ci		No	r			 Change  Drop  More

Fig No 3.2.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id 	int(11)			No	None		AUTO_INCREMENT	 Change  Drop  More
<input type="checkbox"/> 2	fname	varchar(100)	utf8mb4_general_ci		No	None			 Change  Drop  More
<input type="checkbox"/> 3	lname	varchar(100)	utf8mb4_general_ci		No	None			 Change  Drop  More
<input type="checkbox"/> 4	email 	varchar(150)	utf8mb4_general_ci		No	None			 Change  Drop  More
<input type="checkbox"/> 5	password	varchar(255)	utf8mb4_general_ci		No	None			 Change  Drop  More
<input type="checkbox"/> 6	deleted_at	date			Yes	NULL			 Change  Drop  More


☐ Check all
 With selected:
  Browse
  Change
  Drop
  Primary
  Unique
  Index
  Spatial
 

3.3 Entity Relationship Diagram

- ER model stands for an Entity-Relationship model. It is a high-level data model. This model is used to define the data elements and relationship for a specified system.
- It develops a conceptual design for the database. It also develops a very simple and easy to design view of data.
- In ER modelling, the database structure is portrayed as a diagram called an entity-relationship diagram.

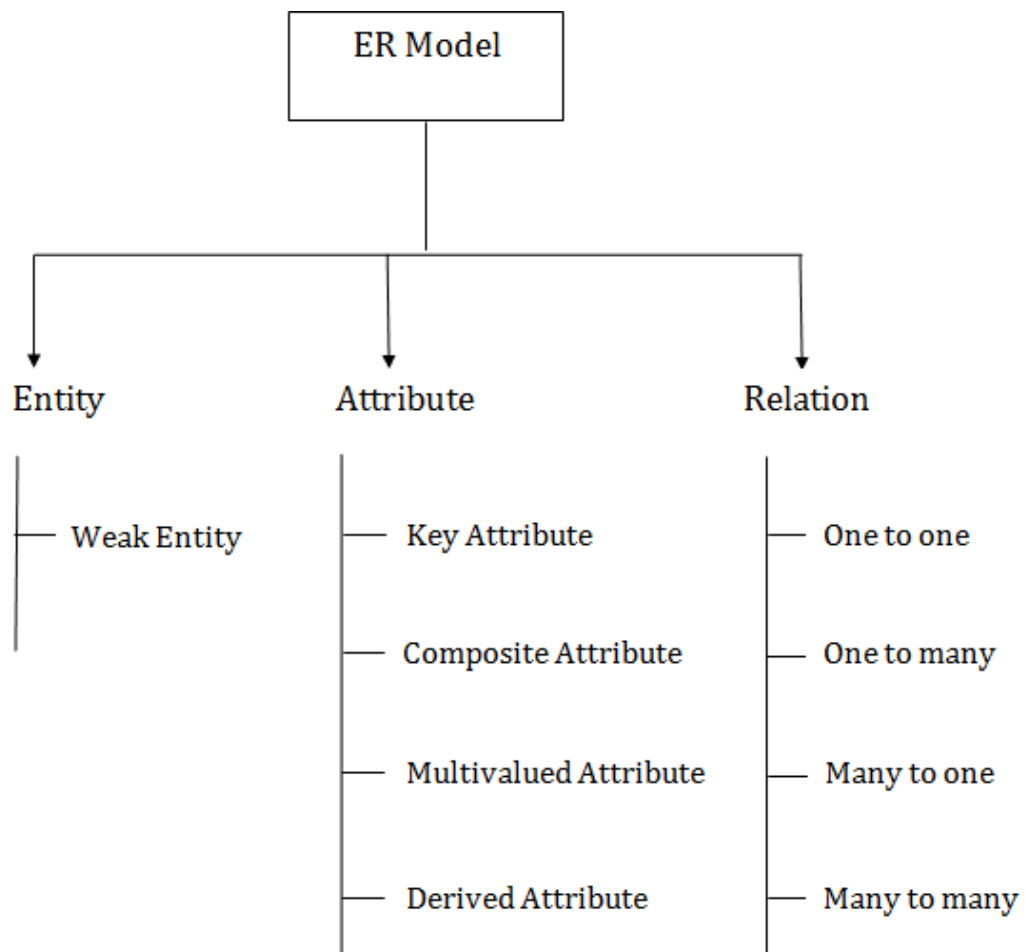


Fig No 3.3.1

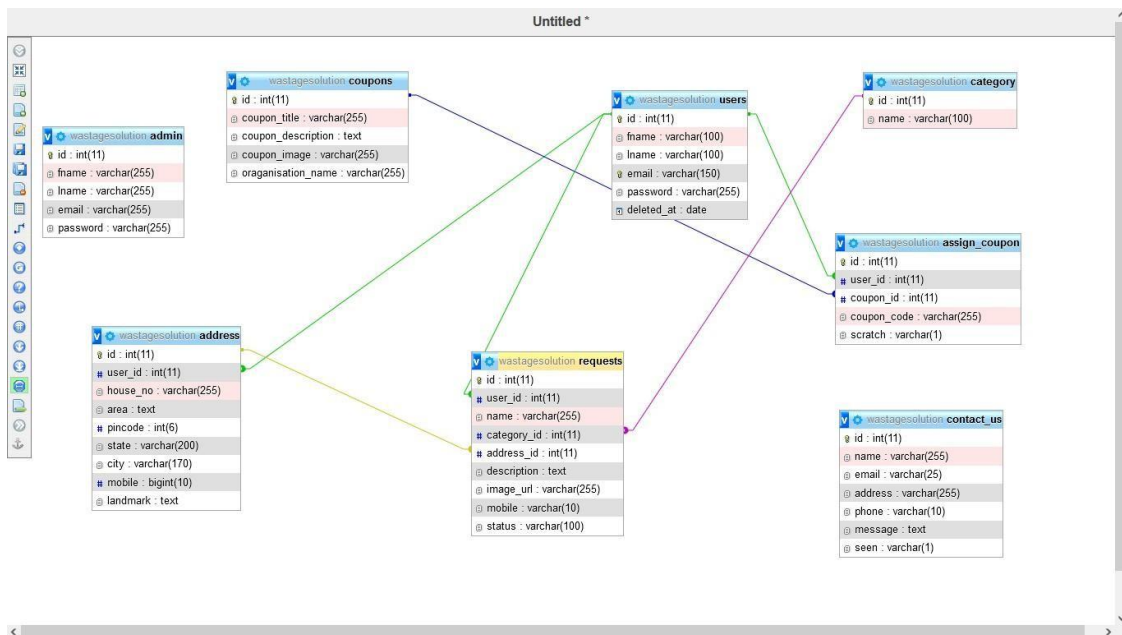


Fig No 3.3.2

3.4 Use Case Diagram

A use case diagram is used to represent the dynamic behavior of a system. It encapsulates the system's functionality by incorporating use cases, actors, and their relationships. It models the tasks, services, and functions required by a system/subsystem of an application. It depicts the high-level functionality of a system and also tells how the user handles a system.

Following are the purposes of a use case diagram given below:

- It gathers the system's needs.
- It depicts the external view of the system.
- It recognizes the internal as well as external factors that influence the system.
- It represents the interaction between the actors.

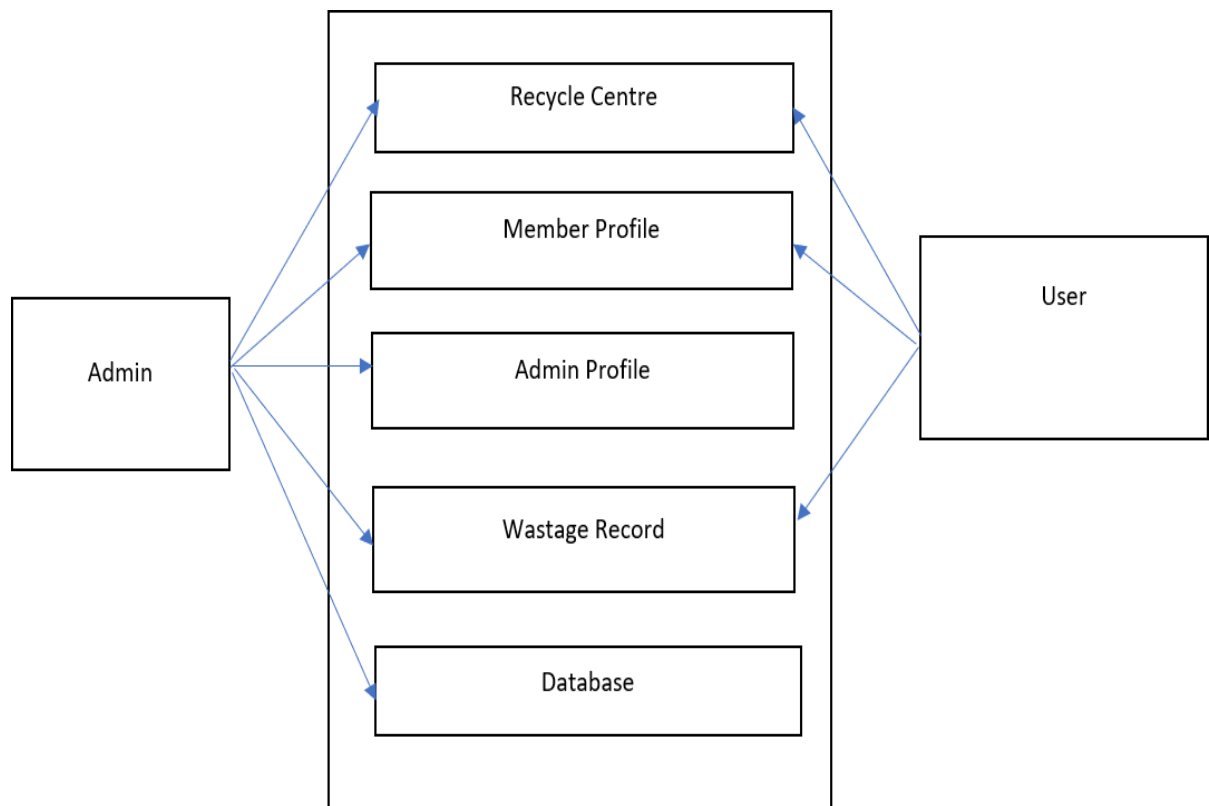


Fig No 3.4

3.5 Sequence Diagram

The sequence diagram represents the flow of messages in the system and is also termed as an event diagram. It helps in envisioning several dynamic scenarios. It portrays the communication between any two lifelines as a time-ordered sequence of events, such that these lifelines took part at the run time. In UML, the lifeline is represented by a vertical bar, whereas the message flow is represented by a vertical dotted line that extends across the bottom of the page. It incorporates the iterations as well as branching.

Purpose of a Sequence Diagram

To model high-level interaction among active objects within a system.

To model interaction among objects inside a collaboration realizing a use case.

It either models' generic interactions or some certain instances of interaction.

	SEPTEMBER				OCTOBER			
	1	2	3	4	5	6	7	8
Maintainance								
Deployment								
Testing								
Coding								
Design								
Requirement and Planning								

Fig No 3.5

Chapter 4

Form Design

4.1 Landing Page-

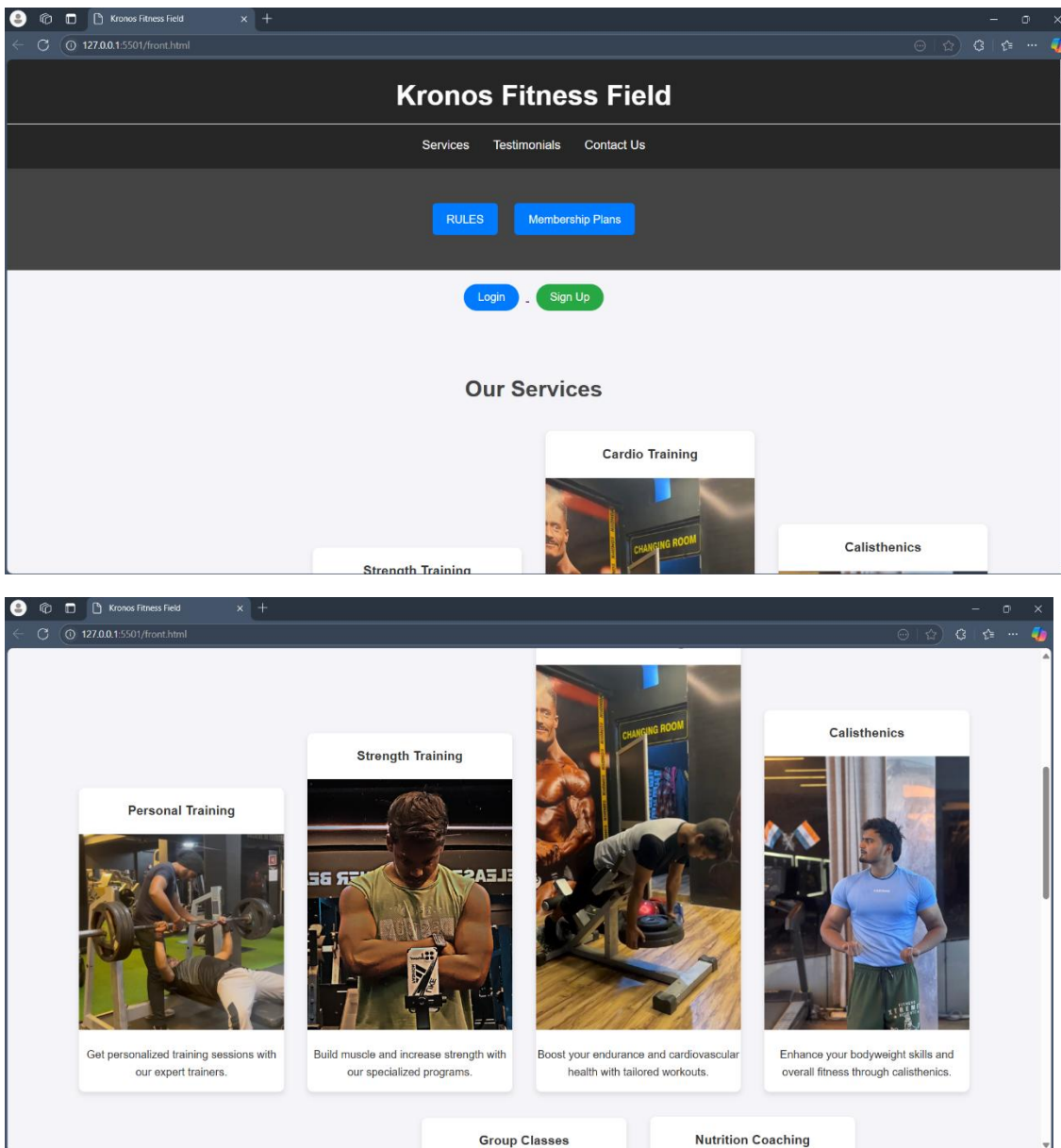


Fig No 4.1

4.2 Login Page –

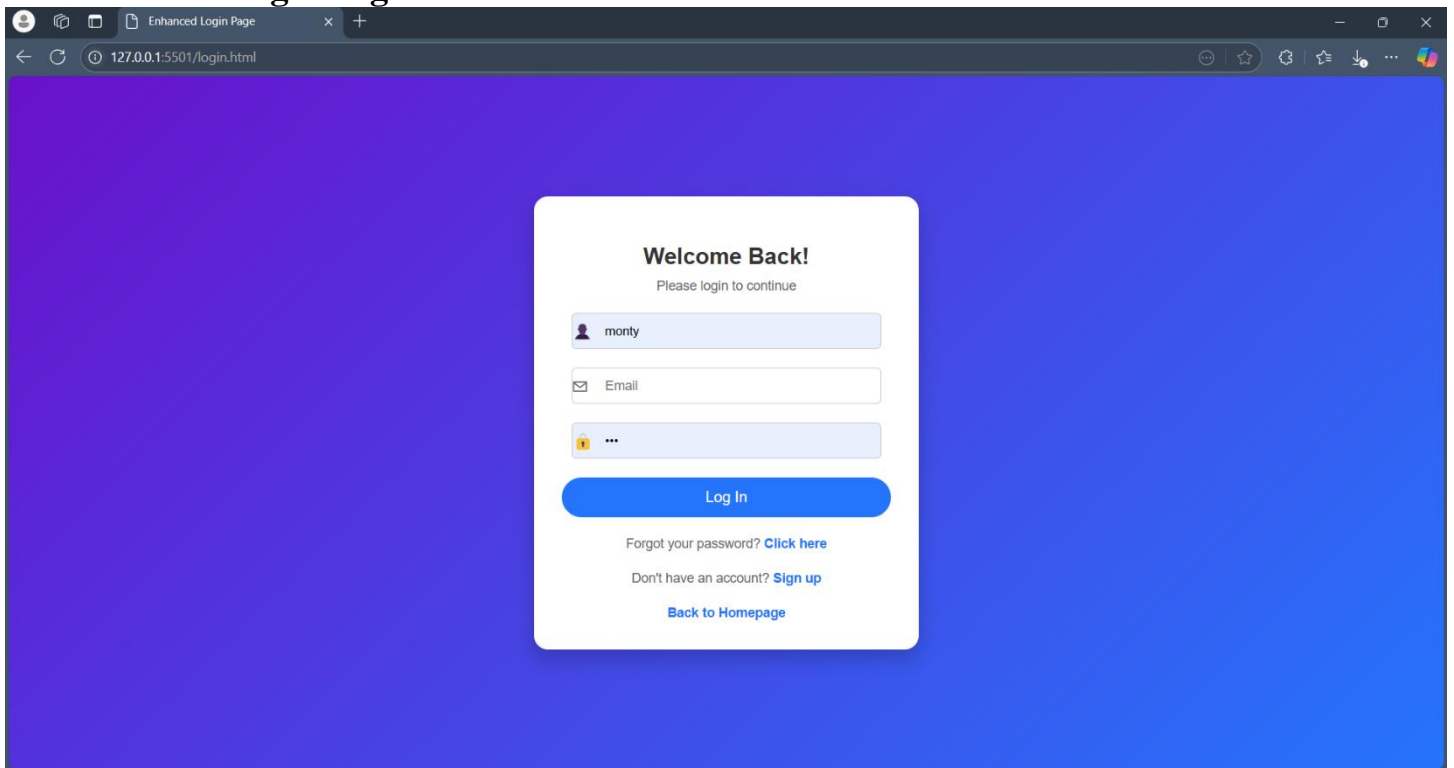


Fig No 4.2.1

4.3 Contact us Page-

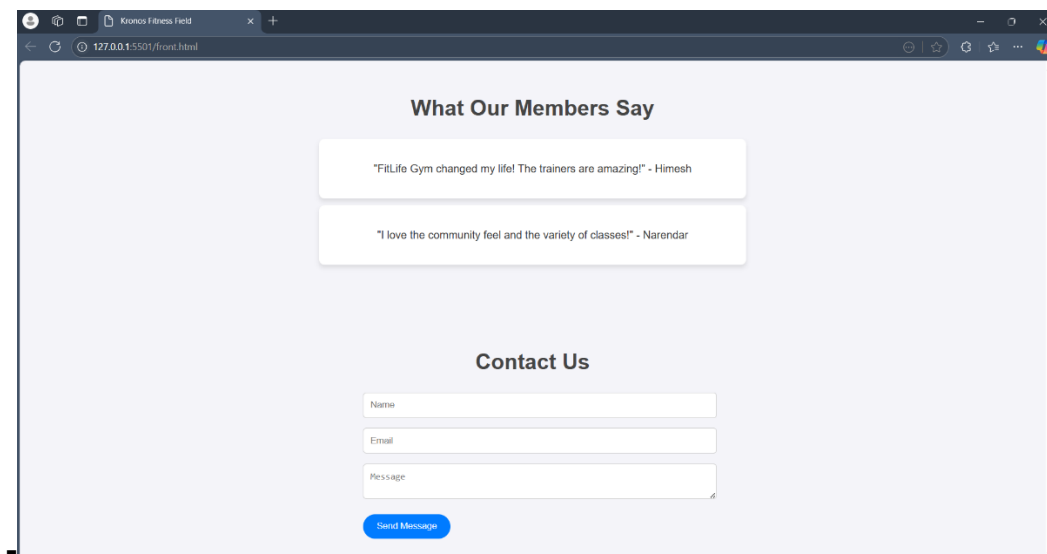


Fig No 4.3

4.4. Dashboard-

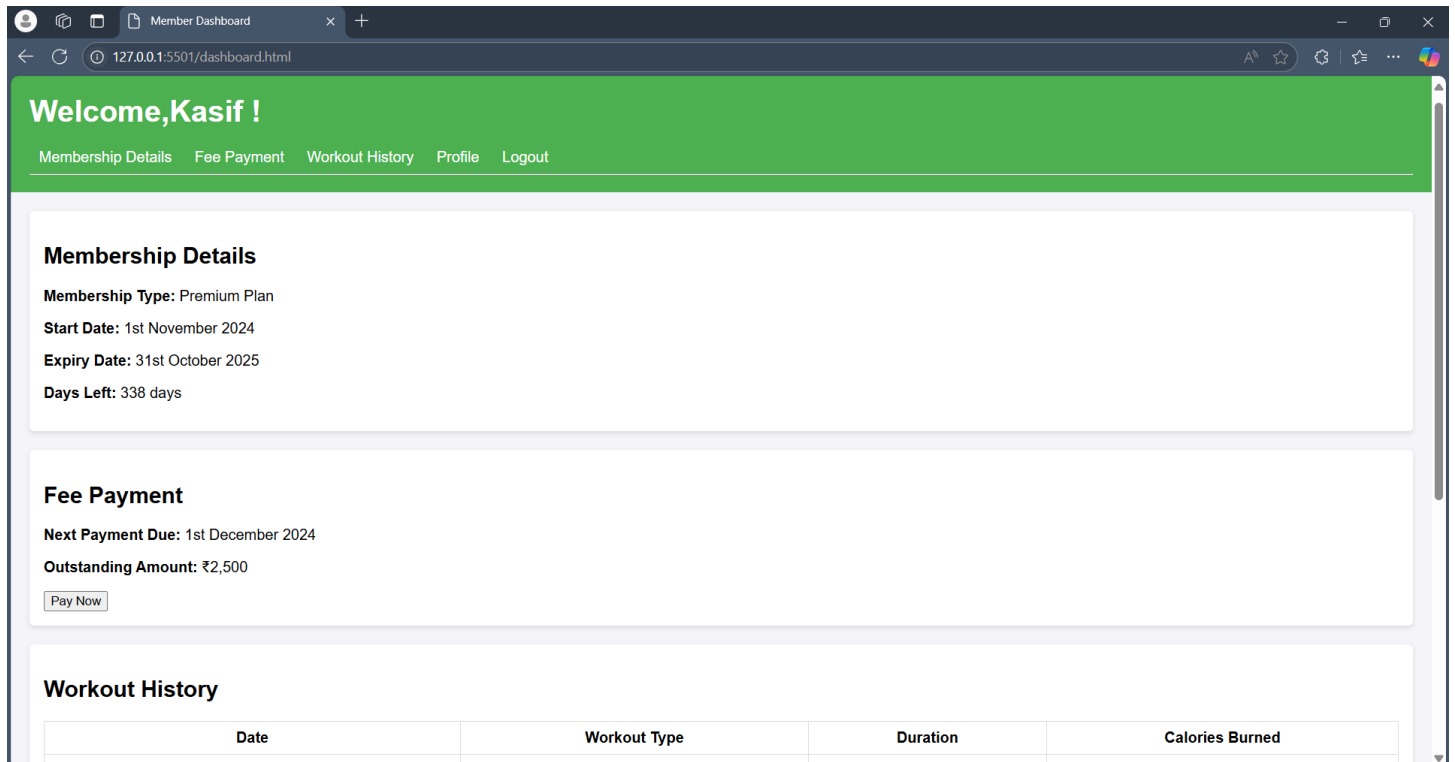


Fig No 4.4

Chapter 5

Testing

5.1 Testing Case 1 (Login)-

5.1.1 Functional Test Cases-

- 5.1.1.1 Verify if a user will be able to login with a valid username and validpassword.
- 5.1.1.2 Verify if a user cannot login with a valid username and an invalid password.
- 5.1.1.3 Verify the login page for both, when the field is blank and Submit button isclicked.
- 5.1.1.4 Verify the 'Forgot Password' functionality.
- 5.1.1.5 Verify the messages for invalid login.

5.1.2 Non-functional Security Test Cases-

- 5.1.2.1 Verify the timeout functionality of the login session.
- 5.1.2.2 Verify the login page by pressing 'Back button' of the browser. It should not allow you to enter the system once you log out.
- 5.1.2.3 Verify the Login page against SQL injection attack.
- 5.1.2.4 Verify the implementation of SSL certificate.
- 5.1.2.5 Verify if a user should not be allowed to log in with different credentials fromthe same browser at the same time.

5.2 Testing Case 2 (contact us)-

5.2.1 Functional Test Cases-

5.2.1.1 Users should be able to select the desired attributes of the product-on- product page, such as size, color, etc.

5.2.1.2 Adding a product to the cart should be possible.

5.2.1.3 Checking whether users can add a product to the wish list.

5.2.1.4 Users should be able to buy the product added to the cart once the user is signed in.

5.2.1.5 Customers shouldn't be able to add products to the cart when it is out of inventory.

5.2.2 Non-functional Test Cases-

5.2.2.1 All the products added to the cart should be purchasable by the user.

5.2.2.2 Verify error message is displayed on the UI when there is a limit on the products which can be purchased.

5.2.2.3 The error message should be displayed on the UI when shipping is unavailable to the delivery location.

5.2.2.4 All the payment methods should be displayed, and all of the methods should be working correctly.

5.2.2.5 Ensure email gets triggered to the email address or mobile number when the customer buys a product.

5.3 Testing Case 3 (Logout)-

5.3.1 Functional Test Cases-

- 5.3.1.1 Verify After successful login in Gmail click on the profile icon to check logout button is visible or not.
- 5.3.1.2 Verify by Clicking on the sign-out button without an internet connection and reconnecting to the internet to check if it's properly logout or not.
- 5.3.1.3 Verify by clicking on the logout button, after successful logout on the login screen press the back button.
- 5.3.1.4 Verify, login into more than two browser or mobiles and log out from any of them and check all other accounts are properly working or all get logout.
- 5.3.1.5 Verify After logout tries to re-login with the same or different account it's allowing or not.

5.3.2 Non-functional Security Test Cases-

- 5.3.2.1 Verify the logs for the login and logout sessions.
- 5.3.2.2 Verify if the logs contain multiple IPs for a single ID at the same time.
- 5.3.2.3 Verify if the logs contain a denial-of-service attack for the login or logout.
- 5.3.2.4 Verify if the unauthorized IP makes a request for the logout.
- 5.3.2.5 Verify if the log has suspicious activity.

Chapter 6

Literature Review

Digitizing Fitness Services: A Synopsis

The fitness industry has undergone significant digital transformation, driven by mobile apps, cloud computing, and the demand for convenience and personalization. Literature highlights the evolution of digital solutions, user engagement impact, and challenges in gym management systems.

Digital Transformation

Digital platforms and fitness apps have reshaped user interaction, offering personalized programs, real-time tracking, and streamlined operations. Studies by Catterson (2021) and Mistry & Patel (2020) emphasize how features like online booking and automation enhance efficiency and customer satisfaction.

Web-Based Solutions

Web-based gym management systems automate tasks like payments and bookings, reducing errors and improving workflows. Security protocols such as SSL and PCI-DSS, as discussed by Smith & Jones (2022), are critical for protecting user data and ensuring trust.

User Engagement

Personalized programs and data-driven recommendations boost user retention, as noted by Lee et al. (2020). Features like social sharing and trainer feedback foster community, enhancing satisfaction (Zhang & Lee, 2018).

Challenges

Scalability and user-friendliness remain key hurdles. Studies highlight the need for cloud infrastructure (Singh & Gupta, 2021) and intuitive designs catering to diverse user demographics (Zhang & Liu, 2022).

Summary

Digital solutions enhance gym efficiency, personalization, and user satisfaction while presenting challenges in scalability and accessibility. The Kronos Fitness Field project addresses these by integrating automation, personalization, and secure features into a unified platform.

Chapter 7

Bibliography

- Catterson, A. (2021). The Digital Transformation of the Fitness Industry: Trends, Challenges, and Opportunities. *Journal of Fitness Technology*, 5(2), 34-47.
- Mistry, P., & Patel, R. (2020). Web-based Gym Management Systems: Enhancing Operational Efficiency and User Engagement. *International Journal of Sports Science and Fitness*, 8(1), 10-18.
- Williams, S., Lee, J., & Anderson, M. (2019). Automation in Gym Management: A Case Study on Web-Based Solutions for Fitness Centers. *Journal of Web Development and Applications*, 11(3), 123-135.
- Smith, H., & Jones, D. (2022). Security in Online Payment Systems: Best Practices for Gym Management Platforms. *Journal of Cybersecurity and Payment Technologies*, 3(4), 211-220.
- Lee, K., Kim, J., & Park, H. (2020). Personalization in Fitness Applications: Leveraging User Data for Better Engagement. *Journal of Personalized Fitness and Wellness*, 7(2), 45-56.
- Zhang, Y., & Lee, H. (2018). The Role of Community Features in Fitness Platforms: Enhancing User Retention and Engagement. *International Journal of Health and Fitness Technology*, 4(1), 66-75.
- Singh, R., & Gupta, S. (2021). Scalability Challenges in Gym Management Systems: A Technical Perspective. *Journal of Software Engineering in Fitness Solutions*, 6(1), 92-104.
- Zhang, L., & Liu, J. (2022). User-Centered Design in Fitness Apps: Meeting the Needs of Diverse User Groups. *International Journal of Human-Computer Interaction*, 16(2), 109-120.
- Date, C.J. (2004). *An Introduction to Database Systems*. 8th Edition, Pearson Education.
- Pressman, R.S. (2014). *Software Engineering: A Practitioner's Approach*. 9th Edition, McGraw-Hill.
- W3Schools. (n.d.). Web Development Tutorials. Retrieved from <https://www.w3schools.com>.
- Stack Overflow. (n.d.). Developer Community. Retrieved from <https://stackoverflow.com>.