TRIBHUVAN UNIVERSITY

FACULTY OF HUMANITIES AND SOCIAL SCIENCE

A Project Report

On

"Futsal Reservation"

Submitted to

Department of Computer Application

National College of Computer Studies

In partial fulfillment of the requirements for a Bachelor Degree in Computer Application

Submitted By:

Nischal Basnet

Sagun Ghimire

Under the Supervision of

Mr. Chetra Bahadur Chettri

Tribhuvan University

Faculty of Humanities and Social Science

National College of Computer Studies

SUPERVISOR'S RECOMMENDATION

I hereby recommend that this project be prepared under my supervision by **Sagun Ghimire** and **Nischal Basnet** entitled **Futsal Reservation** in partial fulfillment of the requirements for the degree of Bachelor of Computer Application is recommended for the final evaluation.

……

Signature

Chettra Bahadur Chettri

SUPERVISOR

Faculty Member

Department of Computer Application National College of Computer Studies

Tribhuvan University

Faculty of Humanities and Social Sciences

National College of Computer Studies

LETTER OF APPROVAL

This is to certify that this project prepared by **Nischal Basnet** and **Sagun Ghimire** entitled **Futsal Reservation** in partial fulfillment of the requirements for the degree of Bachelor in Computer Application has been evaluated. In our opinion, it is satisfactory in the scope and quality as a project for the required degree.

SIGNATURE of Supervisor	**SIGNATURE of HOD/ Coordinator**
Chhetra Bahadur Chhetri Faculty Member Department of Computer Application National College of Computer Studies Paknajol, Kathmandu	Rajan Poudel Faculty Member Department of Computer Application National College of Computer Studies Paknajol, Kathmandu
SIGNATURE of Internal Examiner	**SIGNATURE of External Examiner**

ABSTRACT

The Futsal Reservation System Website is a cutting-edge platform created to transform the method by which futsal enthusiasts schedule and oversee their gaming sessions. Futsal, a rapid-paced indoor soccer variant, has garnered widespread acclaim, drawing players from diverse age groups and skill sets. Yet, the conventional court booking process has been fraught with challenges, including complexity, time-wasting, and a tendency for mistakes.

Keywords: Futsal, Reservation System, Web-based Platform, User-friendly Interface, Real-time Availability, Player Profiles, Admin Dashboard, Futsal Attributes

ACKNOWLEDGEMENT

I would like to thank my supervisor **Mr. Chettra Bahadur Chettri** for his valuable guidancewho gave me great encouragement for this work and helpful suggestions.

I would also like to thank our Vice Principal, **Mr. Santosh Maskey** who monitored, guided, and motivated us throughout this project's phases. I appreciate the support from allthe supervisors, friends, and family to help make this project successful.

Nischal Basnet

Sagun Ghimire

TABLE OF CONTENTS

Contents

List of Tables

List of Figures

List of Abbreviation

Apache	Server
CSS	Cascading Style Sheet
Futsal Reservation	A web-based Futsal Booking
HTML	Hyper Text Markup Language
MySQL	Database Management System
PHP	Hypertext Preprocessor
SQL	Structured Query Language

Chapter 1: Introduction

1.1 Introduction

Futsal reservation is an online platform designed to make it easy for players to book and reserve futsal courts for their games and training sessions. With this project, players will be able to book for futsal courts from the comfort of their homes or offices without having to physically visit the courts or make calls to book a reservation. The platform will feature a user-friendly interface that allows players to search for available courts based on location, date, and time. The system will also provide detailed information on the courts, including pictures, rates, and amenities. Players will be able to select the courts that best fit their needs and preferences and make reservations for the desired date and time.

Overall, the futsal reservation project aims to simplify the process of booking futsal courts and provide players with a seamless and hassle-free experience. By providing a centralized platform for futsal court reservations, this project will save player's time, effort, and money while also helping to boost the growth of the futsal industry.

1.2 Problem Statement

The futsal reservation project is designed to address the challenges that players face when booking futsal courts for their games and training sessions. Presently, players must physically visit the courts or make reservations over the phone, which can be time-consuming and frustrating. Additionally, it can be challenging for players to locate available courts that meet their requirements, as there is no centralized platform for futsal court reservations. To solve these issues, the futsal reservation project aims to offer an online platform that simplifies the process of reserving futsal courts, making it easier for players to locate available courts that meet their needs and providing a secure and convenient way. By addressing these challenges, the project intends to improve the overall experience of futsal players and contribute to the development of the futsal industry.

1.3 Objectives

The main objective of Futsal Reservation is

- Simplify booking:

  To provide a simple online platform that reserve futsal courts.
- Promote Futsal:

  To contribute the growth and improve experience of futsal players by providing accessible and convenient booking.

1.4 Scope of Project

The scope of this project is to enable users to browse available futsal courts and view their schedules and rates. The motive of developing this project is to make it user-friendly so that the users can book futsal that they desire.

1.5 Limitations

This project has a few limitations which have been summarized in the points below:

- Search listings are complex.
- Data security problems.

1.6 Report Organization

1.6.1 Introduction

Chapter one introduces the concept of this project in brief. It describes how objectives can be tackled it and the problems that have been existing. It also presents the scope of the project.

1.6.2 Background study and literature review

This chapter focuses on the basic ideology of how this project will be built. It tracesthe study of different platforms and their workings.

1.6.3 System analysis and design

In this chapter, the requirements gathering, feasibility study, and designing of the project are described. It includes diagrams, functionality analysis, requirements gathering technique, and process model.

1.6.4 Implementation and testing

This chapter is designed to give information about how the project has been implemented, what kind of software and tools has been used, and the type of testingthat the project has gone through.

1.6.5 Conclusion and future recommendation

This chapter includes the possible outcome of the project, the conclusion, and future recommendation

Chapter 2: Background Study

2.1 Background study

It is the study futsal reservation system, you can gain a clear understanding of its functionalities, advantages, and potential challenges. This information can be valuable in designing, developing, or enhancing such a system to better meet the needs of futsal players and facility owners. The existing systems have been studied as the backgroundstudy for this project.

2.2 Study of the existing system

The existing system follows a procedure where a customer must be physically available at the futsal to reserve. The customer has to walk to the futsal and reserve the court. If the customer doesn't find the suitable ground or the court is all booked he/she is looking for or is not satisfied with the ground, he/she will have to roam to futsal and this can continue for a long time unless the customer meets what he/she desires. This can be both time and energy consuming.

2.3 Literature review

Futsal, a variant of soccer, has gained popularity globally as a sport that offers fast-paced and exciting gameplay. With the rise in popularity of futsal, the need for a centralized and convenient platform for reserving futsal courts has become increasingly evident. Several studies have investigated the potential benefits of implementing a futsal reservation system.as well. According to a study published in the Journal of Physical Education and Sport, a futsal reservation system can help promote the sport's growth by providing easier access to futsal courts. Additionally, it can improve the player experience, increase revenue for futsal courts, and promote transparency in the industry. Overall, a futsal reservation system can improve accessibility, provide revenue generation opportunities, promote transparency, and enhance player experience. These factors make it a motivating solution for both players and futsal court owners.

Chapter 3: System Analysis and Design

3.1 System Analysis

The Waterfall Model was the first Process Model to be introduced. It is also referred to as a linear-sequential life cycle model. It is very simple to understand and use. In a waterfall model, each phase must be completed before the next phase can begin and there is no overlapping in the phases.

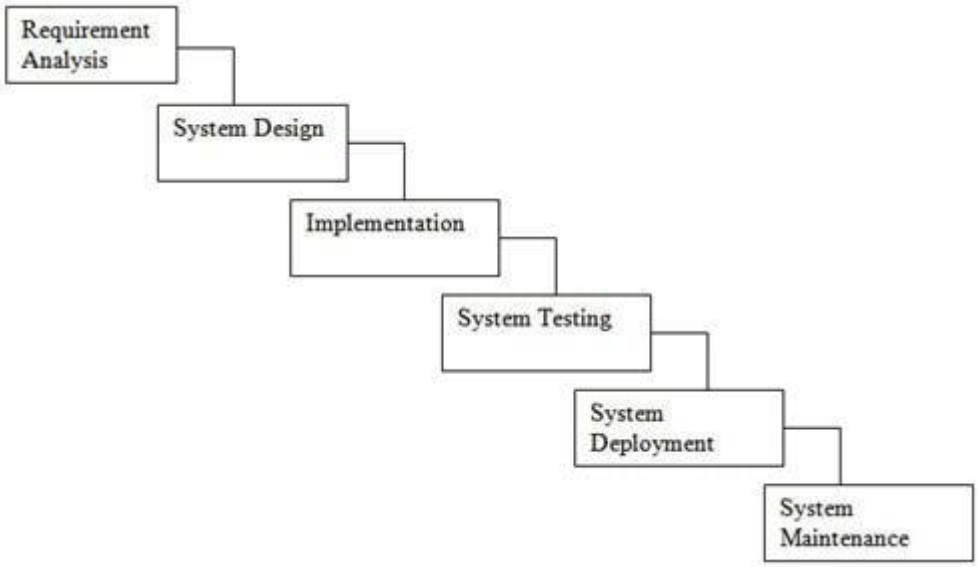

Figure 3.1: Waterfall Model

3.1.1 Requirement Identification

Requirement identification is the gathering of relevant requirement that will be used to develop a system. There are different methods to gather requirement which includes studying of existing system, interviews, questionnaires etc.

3.1.1.1 Functional Requirement

- This system should allow users to register and login
- The system should enable users to book a court by selecting a preferred court location, date, time, and duration.
- The system should provide an interface for court owners to manage their courts, update court information, and view reservation schedules.

3.1.1.2 Non-Functional Requirement

Availability:

The system will be available for all the users from any geographical location.

Reliability:

The system will be reliable as it uses encryption to protect user data.

User Interaction:

Users will get an attractive and easy interface to interact with the system.

3.1.2 Feasibility Study

It is the study of how well the system will function under the given constraints. It studies about how easy is it to build a system under given constraints. The constraints include operational feasibility, economic feasibility, and technical feasibility.

3.1.2.1 Technical Feasibility

This system meets the technical feasibility as it will be using existing technologies like HTML, CSS, JavaScript, PHP, MySQL, and etc. as well assimple hardware specifications.

3.1.2.2 Operational Feasibility

Since the proposed system can be accessed using a web browser which is available in both desktop computers as well as mobile devices, thus, it is operationally feasible.

3.1.2.3 Economic Feasibility

The system will be built using the tools that are freely available on the internet as well as royalty free images, so, this system is economically feasible.

3.1.3 Use Case Diagram

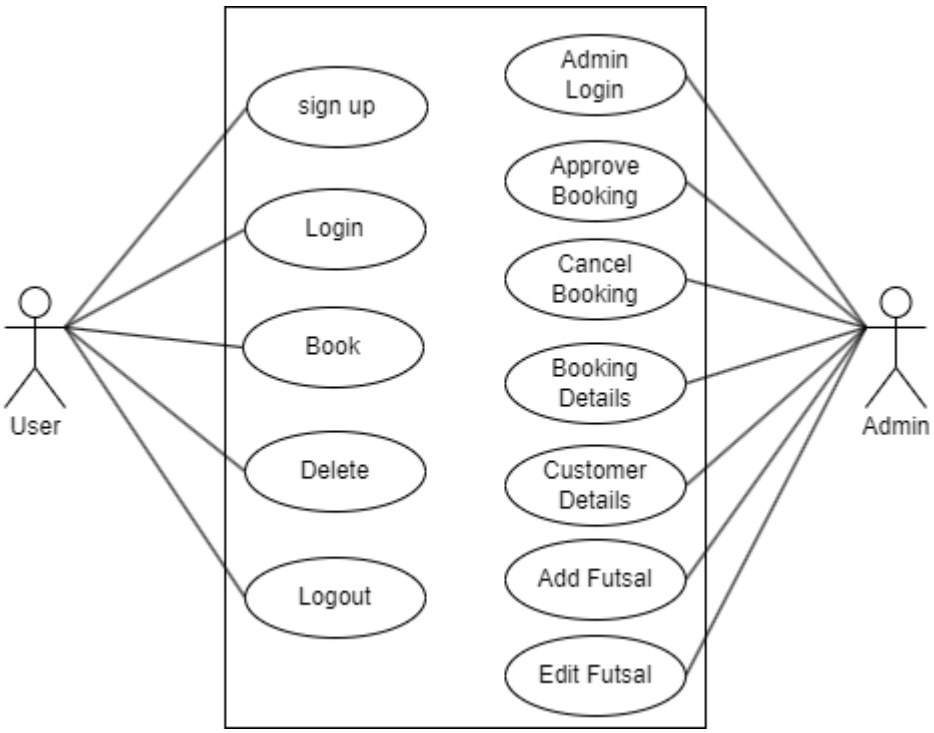

Figure 3.2: Use Case Diagram

Figure 3.2 shows the Use Case Diagram for Futsal Reservation. The users can search the Futsal, view Futsal details, and book the Futsal. Whereas, the admin can manage the Futsal, and view the contact details of users.

3.1.4 Data Flow Diagram

3.1.4.1 DFD level 0 (Context-free diagram)

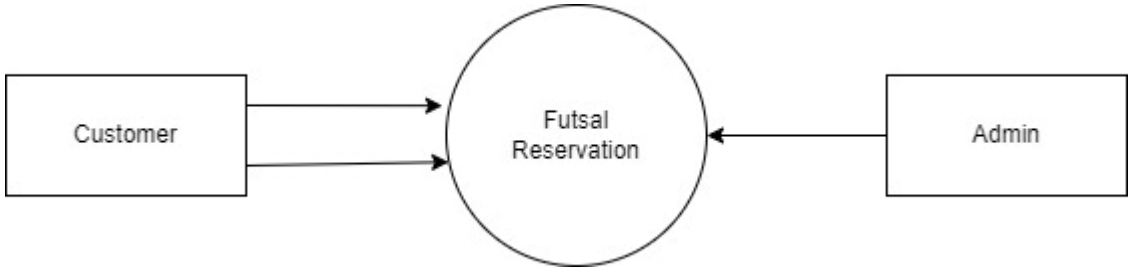

Figure 3.3: Context-free diagram (DFD level 0)

Context diagram shows the graphical representation of data for Futsal Reservation in which we can see the Users, and Admin. DFD clearly shows how the users have register and admin has to verify and control the data which are stored in the database.

3.1.4.2 DFD level 1

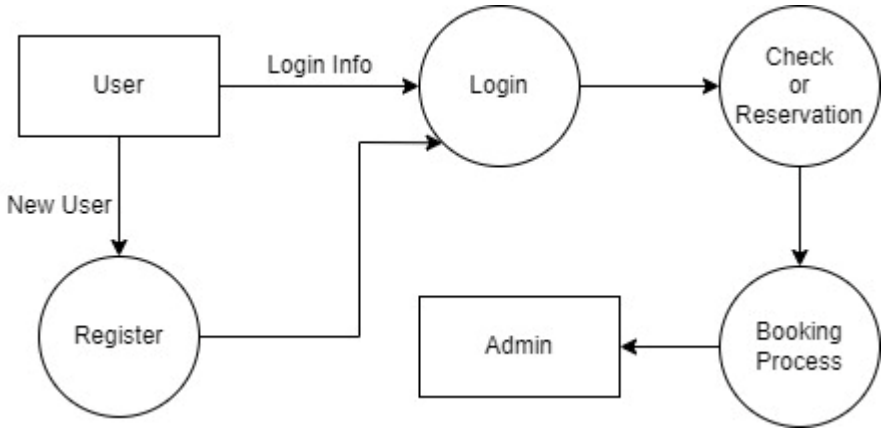

Figure 3.4: Data Flow Diagram Level 1

Data Flow Diagram (DFD) shows the graphical representation of data for Futsal Reservation in which we can see the data of Futsal, user details, admin, and users. DFD, clearly shows how data is flow between the entities and how data are stored in a database.

3.1.5 Flowchart Diagram

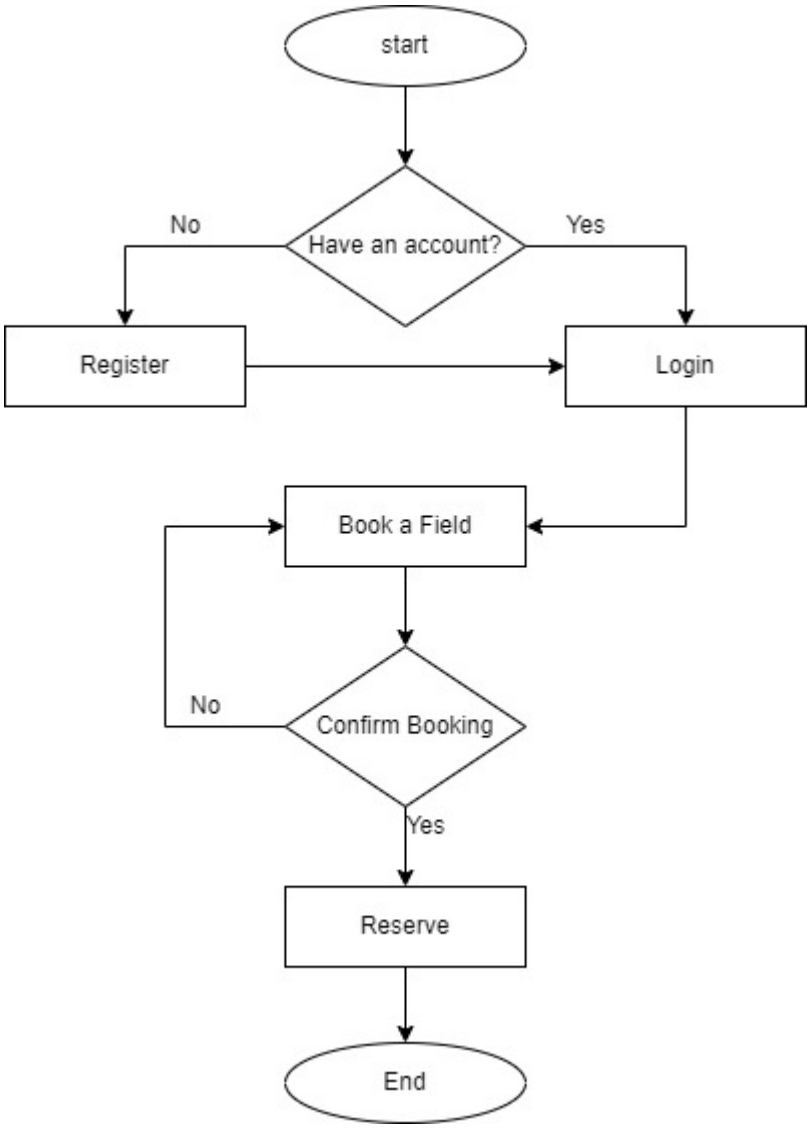

Figure 3.5: Flowchart Diagram

This diagram, it shows that the admin should log in to get access to the dashboard, and then the admin can manage the Futsal data. Also, the usershould register first, and then it gets access to login into the system. After the login is successful the users can add a Futsal to our website.

3.1.6 Process Modeling

The Entity-Relationship model of the database being displayed is shown below:

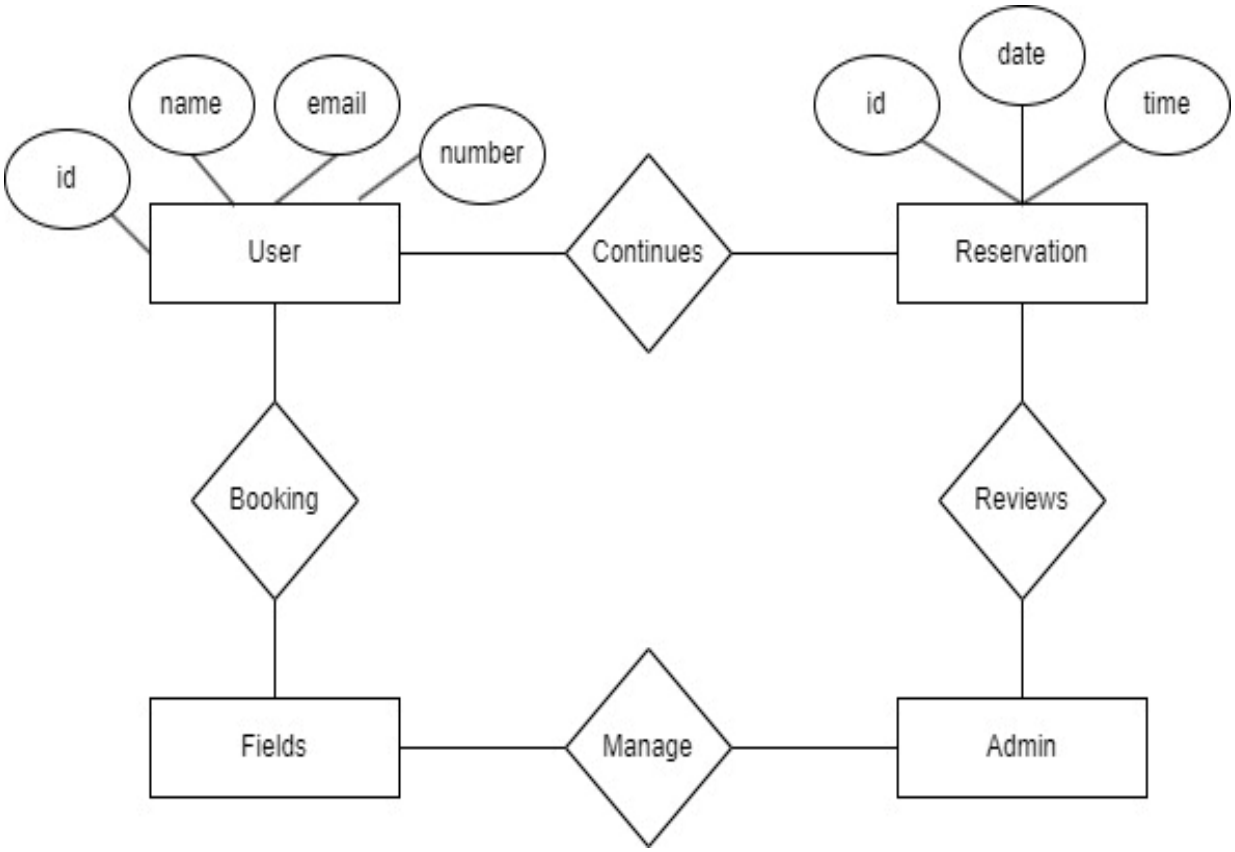

Figure 3.6: ER-Diagram

Figure 3.6 shows Entity-Relationship Diagram for Futsal Reservation. It helps to systematicallyanalyze data requirements to produce a well-designed database. It shows how the data are flow from the admin to the user.

3.1.7 Schema Diagram

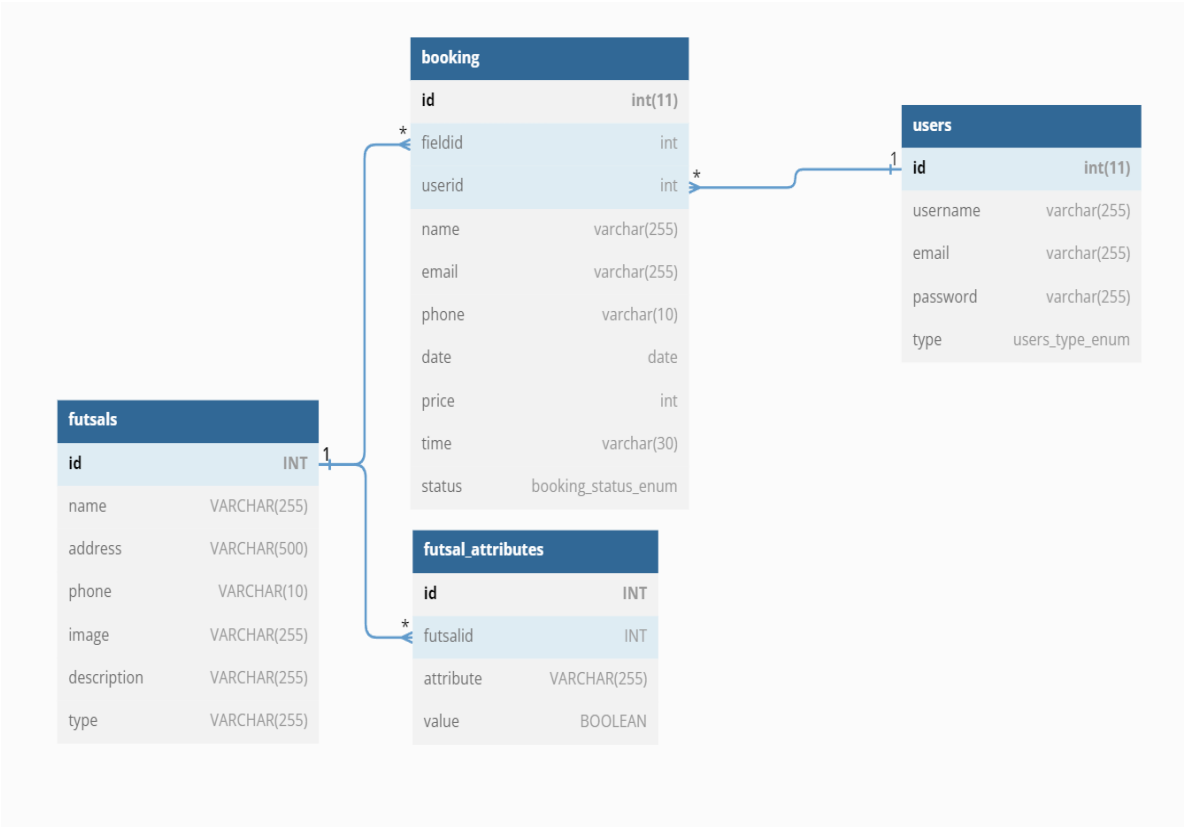

Figure 3.7: Schema Diagram

The above figure is the schema diagram for the Futsal Reservation, the associations between various database classes can be easily seen. The associations are also consistent with the class diagram's association presented above ER diagram.

3.2 System Design

3.2.1 Architectural Design

A three-tier architecture is a design pattern used in futsal reservation websites that divides the system into three distinct layers, each with specific responsibilities. These layers are known as the presentation layer, application layer, and data layer.

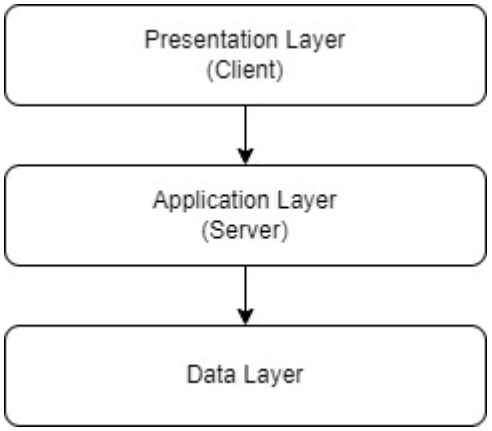

Figure 3.8: Three Tier Architecture

Here's an overview of how these layers are structured in a futsal reservation website:

1. Presentation Layer: In futsal reservation website, the presentation layer includes web pages, forms, and user interface components that enable users to view available futsal courts, select booking times, and make reservations. This layer interacts with the application layer to process user requests and retrieve data for display.

2. Application Layer: In a futsal reservation website, the application layer handles tasks such as validating user inputs, checking court availability, managing bookings, and processing payments. It encapsulates the business rules and processes essential for effectively managing the reservation system.

3. Data Layer: It includes the database and any other components necessary for interacting with it. In this architecture, the data layer stores information like futsal court details, user profiles, reservation records, and payment data. The application layer communicates with the data layer to retrieve or store data as required.

Overall, this three-tier architecture helps in separating concerns and maintaining a modular and scalable design. It simplifies maintenance, testing, and future enhancements by isolating the user interface, business logic, and data management aspects of the futsal reservation website.

3.3 Algorithm Details

The cosine similarity algorithm for futsal reservation is used to determine the similarity between two futsal reservations based on their attribute values. It helps in recommending similar futsal reservations to a given reservation. The cosine similarity between pairs of futsal's based on their attribute-value data. Here is a breakdown of the algorithm:

1. Retrieve the attribute-value data from the `futsal_attributes` table using a SQL query.
2. Create an associative array called `$attributeData` to store the attribute values for each futsal. The futsal IDs are used as keys in the array, and the attribute-value pairs are stored as nested arrays.
3. Define a function named `calculateCosineSimilarity` that takes two vectors (attribute-value arrays) as input and calculates the cosine similarity between them. The cosine similarity is a measure of similarity between two vectors and is calculated by taking the dot product of the vectors divided by the product of their magnitudes.
4. Create an empty array called `$similarityMatrix` to store the similarity scores between futsals. This matrix will be populated with the cosine similarity values calculated for each pair of futsals.
5. Iterate over the `$attributeData` array to calculate the cosine similarity between all pairs of futsals. For each futsal, compare its attribute values with the attribute values of all other futsals. Use the `calculateCosineSimilarity` function to calculate the similarity score and store it in the `$similarityMatrix`.
6. Choose a target futsal (in this case, futsal ID 1) and retrieve its similarity scores from the `$similarityMatrix`. Store the similarity scores in the `$targetSimilarities` array.
7. Sort the `$targetSimilarities` array in descending order based on the similarity scores.
8. Iterate over the sorted `$targetSimilarities` array and print the recommended futsals based on their similarity to the target futsal. The futsal IDs and their corresponding similarity scores are printed.

The algorithm provides a way to recommend similar futsals based on their attribute values using cosine similarity. It calculates the similarity between all pairs of futsals and ranks them based on their similarity scores.

Chapter 4: Implementation and Testing

4.2 Tools and Technology

4.1.1 Analysis and design tools

Various Microsoft office tools like MS word and power points are used. Thecoding is done using the compiler application VS Code.

4.1.2 Implementation tools

4.1.2.1 Front End

- **HTML**

  HTML (HyperText Markup Language) is the standard markup language for documents designed. HTML can embed programs written in a scripting language such as JavaScript, which affects the behavior and content of web pages.

- **CSS**

  Cascading Style Sheets (CSS) is a style sheet language used for describingthe presentation of a document written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript. CSS was used to add styles to our website. The simplest designon the user end of the website like button colors, boxes, and tabular designs wasdone using CSS.

- **JavaScript**

  JavaScript often abbreviated JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS. JavaScript was another front-end tool we used in our project. Features like formvalidation, color changing on order, etc. were made using JavaScript to make the website interactive from the client side.

4.1.2.2 Back End

- **PHP**

  PHP (recursive acronym for PHP: Hypertext Preprocessor) is a widely-used opensource general-purpose scripting language that is especially suited for web development and can be embedded into HTML.

4.1.2.3 Database

- **MySql**

  phpMyAdmin is a free software tool written in PHP, intended to handle the administration of MySQL over the web. phpMyAdmin supports a wide range of

operations on MySQL and MariaDB. Frequently used operations (managing databases, tables, columns, relations, indexes, users, permissions, etc.) can be performed via the user interface, while you still can directly execute any SQL statement.

4.1.2.4 Server

- **Apache**

  (Application Server) Apache, often referred to as Server, is an open-source Java Servlet Container developed by the Apache Software Foundation.

4.1.3 Implementation details of a module

The different modules provided are:

- **Module 1: Login and Register**

  This module is responsible for validating the type of user and displaying options according to the role of users.

- **Module 2: Booking**

  This module provides an interface that allows users to book fields for futsal.

- **Module 3: Register**

  This module allows the user to register the details according to the requirementto create an account.

4.2 Testing

4.2.1 Testing cases for unit testing

Unit testing focuses on the functioning of the smallest unit of the software design.Unit testing is applied to each of the smallest modules so that we are ensured that every module is producing the required result. It helps to ensure that even the highermodules dependent on the smallest module function properly. Every error in the smallest modules is properly examined and tested to produce the correct output.

Test 1: Registration and Login

S.N.	Steps	Expected results	Status
1.	Successful Registration	registration with valid information	Pass
2.	Registration with Existing Email	Verify that a user cannot register with an email that already exists in the system.	Pass
3.	Required Fields	Verify that all required fields (e.g., name, email, and password) must be filled in during registration.	Pass
4.	Email Validation	Verify that the system validates the email format during registration.	Pass
5.	Successful Login	User cannot log in with incorrect username or password and receives an error message.	Pass
6.	Incorrect Credentials	Verify that a user cannot register with a username that already exists in the system.	Pass

Table 4.1: Testing of Registration and Login

Test 2: Booking Process

S.N.	Steps	Expected results	Status
1.	Field Availability	Check that the system accurately displays the available date only.	Pass
2.	Required Fields	Verify that all required fields must be filled with valid information during booking.	Pass
3.	Time Selection	Ensuring that users cannot select a time that has already passed during the booking process.	Pass
4.	Booking Confirmation	Ensure that the system displays a booking confirmation message.	Pass

Table 4.2: Testing of Booking Process

Test 3: User Dashboard

S.N.	Steps	Expected results	Status
1.	Dashboard	Displays pending and approved bookings	Pass
2.	Display of User Details	Check that the user's profile information, such as name and email are displayed correctly.	Pass
3.	Change Details	Verify that user can change their details. Ensure with successful message	Pass
4.	Booking Status	Verify that each booking in the dashboard clearly indicates its status (e.g., confirmed, pending, rejected).	Pass
5.	Booking Details	Confirm that the booking details match the selected booking.	Pass
6.	Cancel Booking	For an upcoming booking, attempt to edit or cancel the booking from the dashboard.	Pass

7.	Booking History	Verify that the list displays the user's past bookings, including field details, date, and time.	Pass
8.	Navigation and Functionality	Verify that the dashboard should work smoothly without any errors.	Pass
9.	Logout	Ensures that clicking on logout button destroys the session and return to home.	Pass

Table 4.3: Testing of User Dashboard

Test 4: Admin Dashboard

S.N.	Steps	Expected results	Status
1.	Dashboard	Displays pending and approved bookings	Pass
2.	Display of Admin Details	Check that the Admin's profile information, such as name and email are displayed correctly.	Pass
3.	Update Profile	Verify that Admin can change their details. Ensure with successful message	Pass
4.	Booking Status	Verify that each booking in the dashboard clearly indicates its status (e.g., confirmed, pending, cancelled).	Pass
5.	Booking Details	Displays the booking detail of user.	Pass
6.	Confirm and Cancel Booking	Verify that admin can confirm or reject the booking.	Pass

7.	Booking History	Verify that the list displays the user's past bookings, including field details, date, and time.	Pass
8.	Futsal Court	Displays the futsal details. Also allows admin to add, edit and update the details including attributes and image of futsal.	Pass
9.	Navigation and Functionality	Verify that the dashboard should work smoothly without any errors.	Pass
10.	Logout	Ensures that clicking on logout button destroys the session and return to home.	Pass

Table 4.4: Testing of Admin Dashboard

Test 5: Futsal

S.N.	Steps	Expected results	Status
1.	Display of Futsal Details	Showcasing added futsal entries, along with their respective details such as name, contact information, images, map location, and descriptions. Each entry is featured with edit buttons for futsal information and modifying its attributes.	Pass
2.	Adding Futsal	Verify that all required fields (e.g. Name, Address, Contact, etc.) must be filled in during registration.	Pass
3.	Editing Futsal	Allows user to change details and attributes of added futsals	Pass

Table 4.5: Testing of Futsal

Chapter 5: Conclusion and Future Recommendation

5.1 Lesson learnt/ Outcome

This project will allow users to choose the futsal any time they want. It provides multiple categories provides booking for futsal. The users can also choose alternative futsal with similar attributes.

5.2 Conclusion

This project is expected to deliver a high-performance website with attractive and easy to use. This project will meet all of its objectives as well as address theshortcoming that has been served in most of the real estate's websites. This project is designed to provide user better experience to book a field for futsal.

References

[1] Futsal Nepal – futsal opponents or players in Nepal (futsal-nepal.com)

[2] QFX – Booking System -qfxcinemas.com

[3] Find Tournaments and updates of Futsal in Nepal | Goalnepal.com

Appendices

Screenshot 1: Register and Login Page

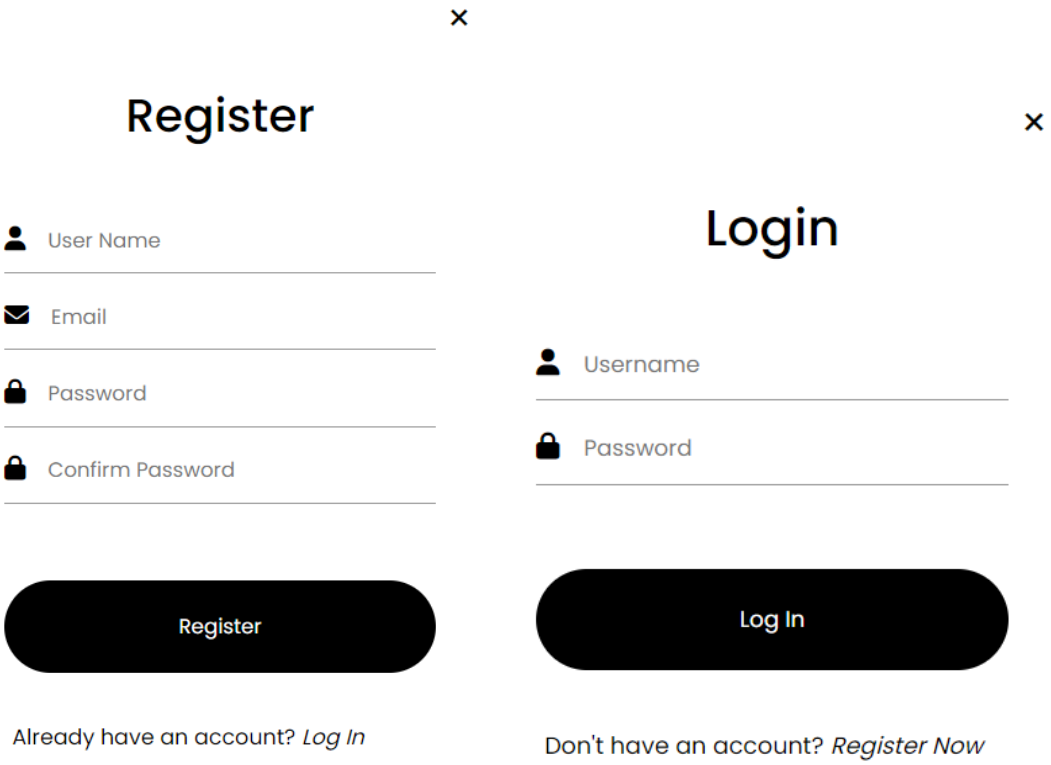

Figure 6.1: Register and Login Page

Screenshot 2: Home Page

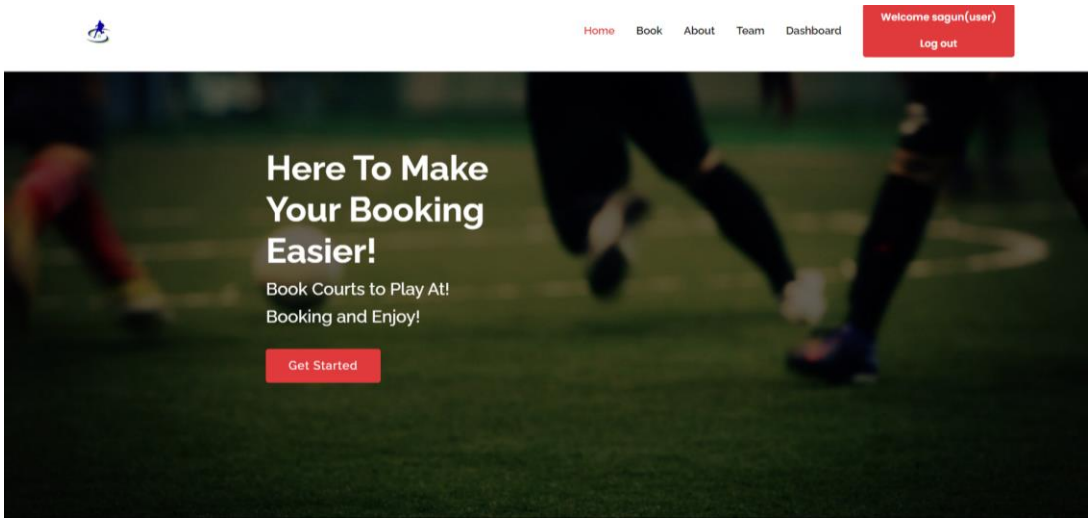

Figure 6.2: Home Page (User)

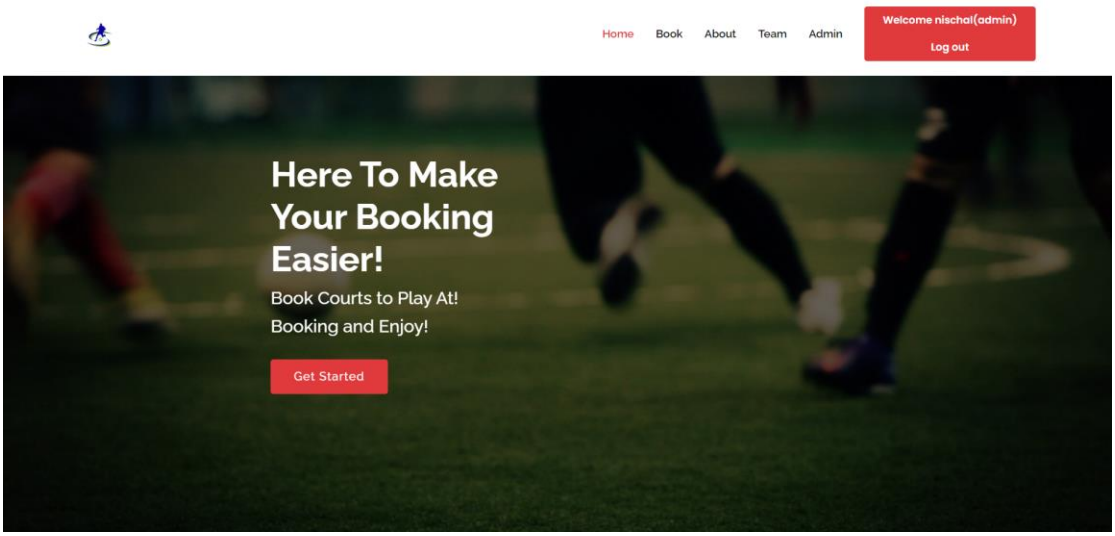

Figure 6.3: Home Page (Admin)

Screenshot 3: Booking Page

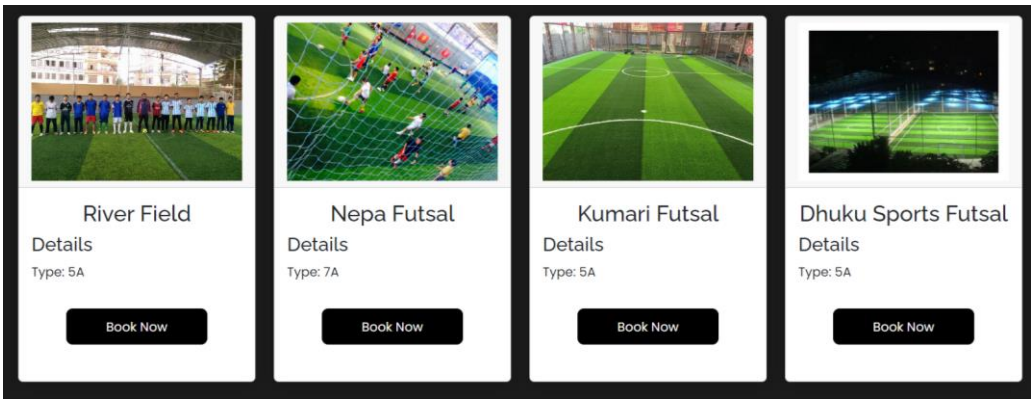

Figure 6.4: Book Page

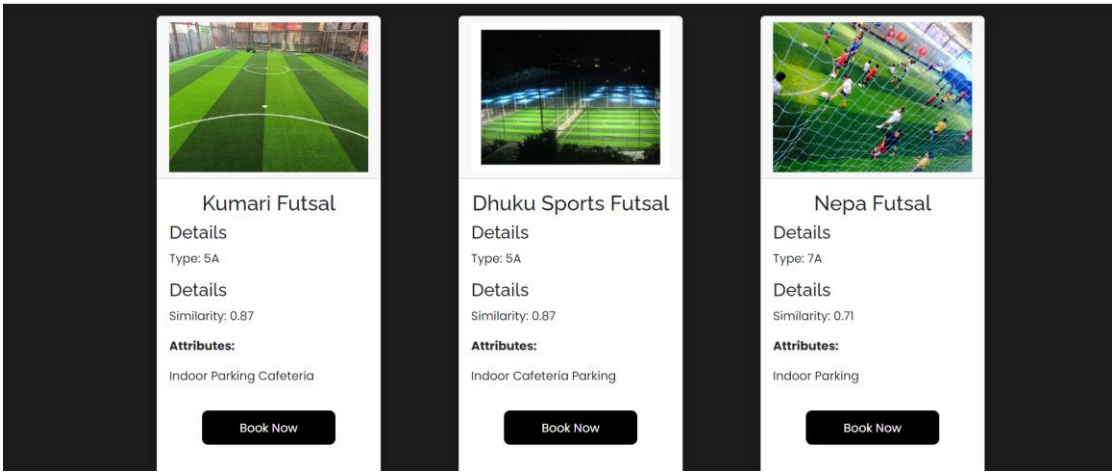

Figure 6.5: Similarity Page

Screenshot 4: About and Contact Page

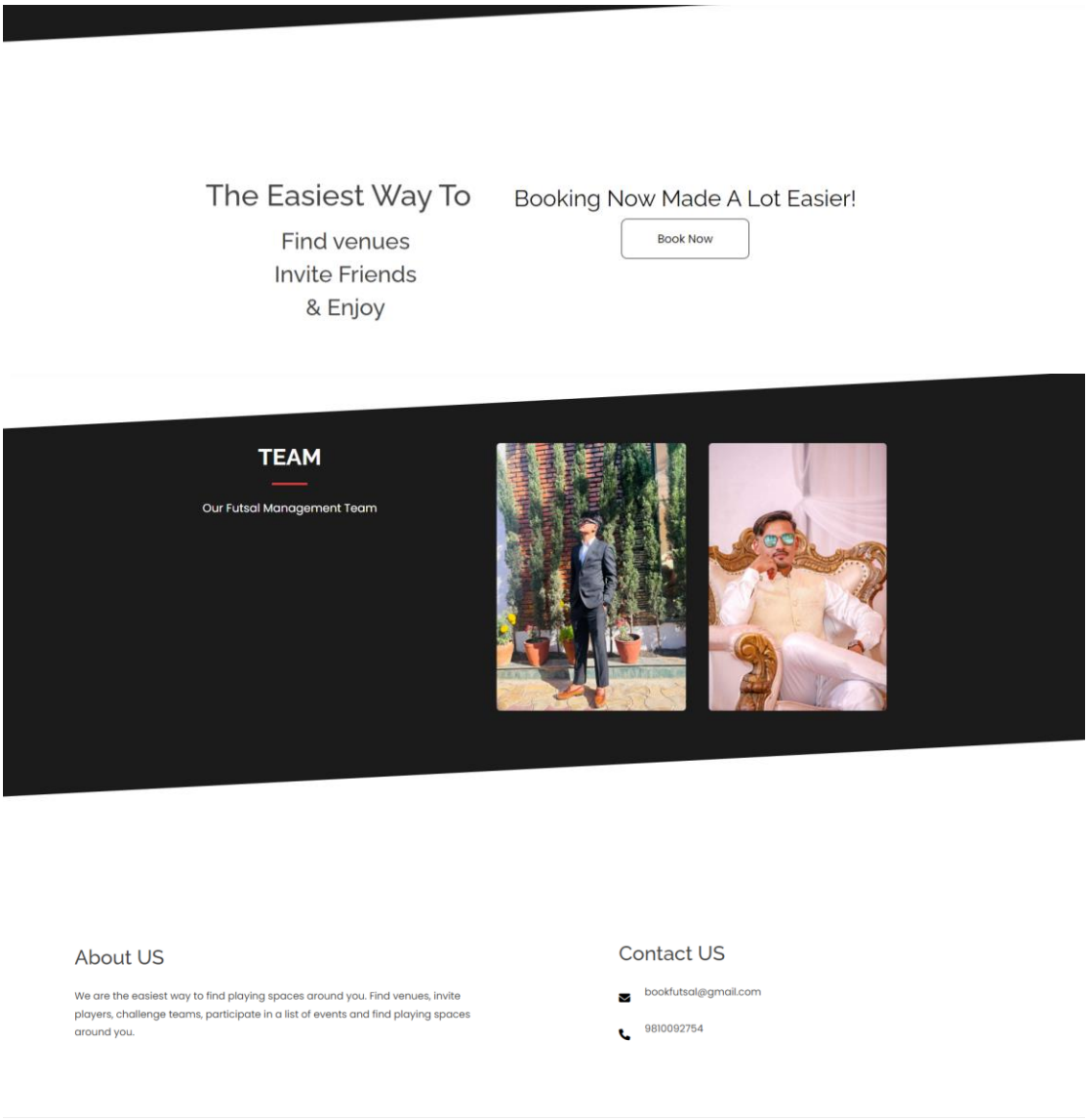

Figure 6.6: About and Contact Us Page

Screenshot 5: Booking Field

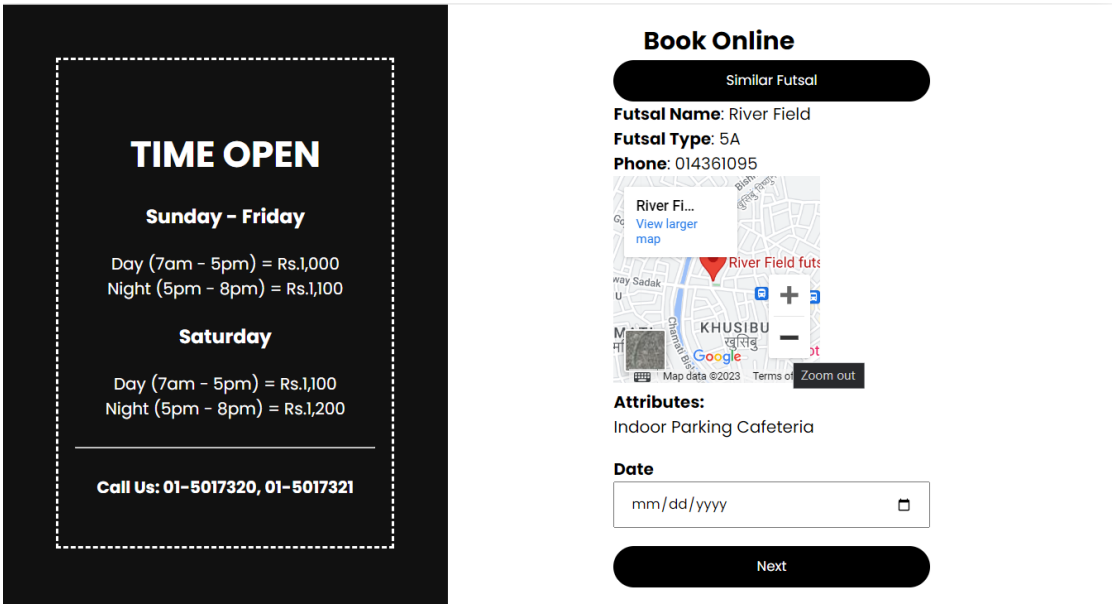

Figure 6.7: Booking field

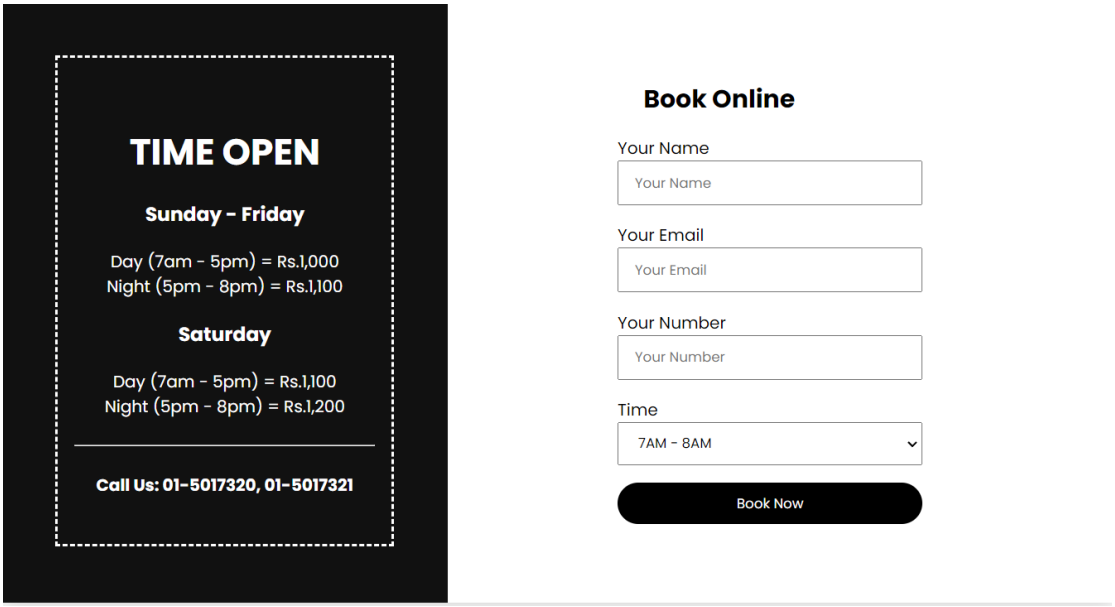

Figure 6.8: Booking field (ii)

Screenshot 6: User Dashboard

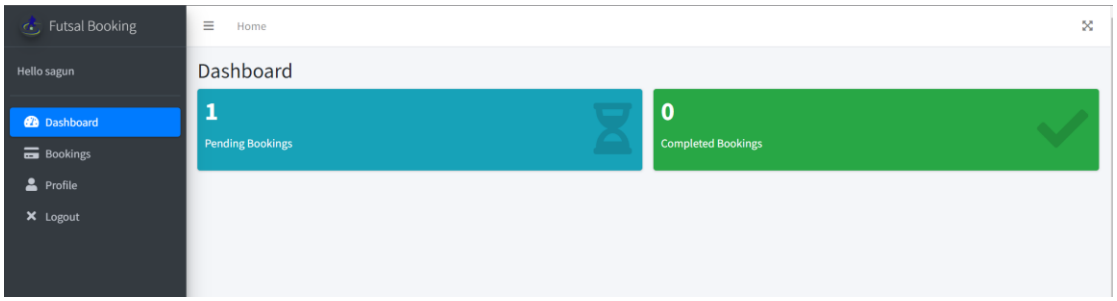

Figure 6.9: User dashboard

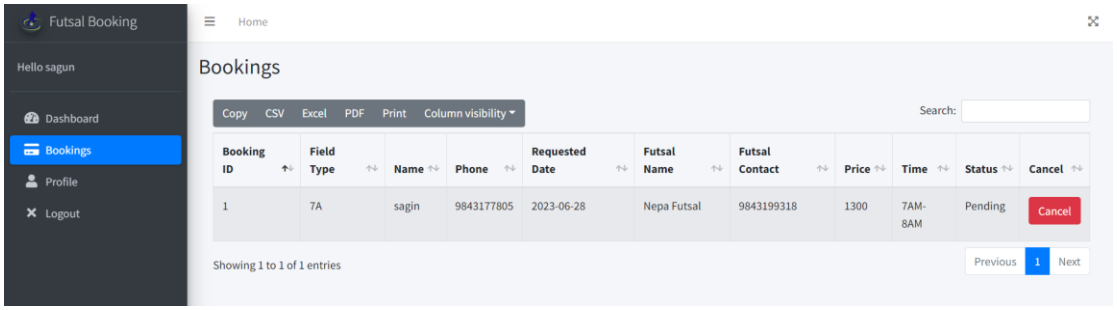

Figure 6.10: User Bookings

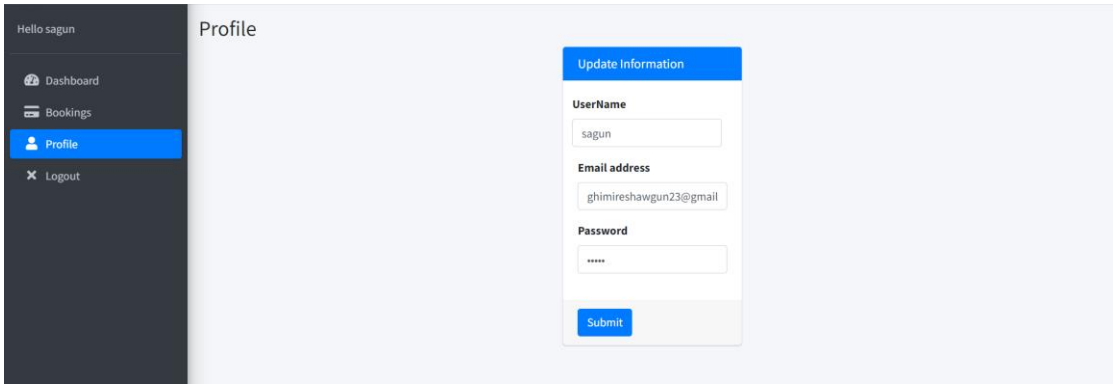

Figure 6.11: User Profile

Screenshot 3: Admin Dashboard

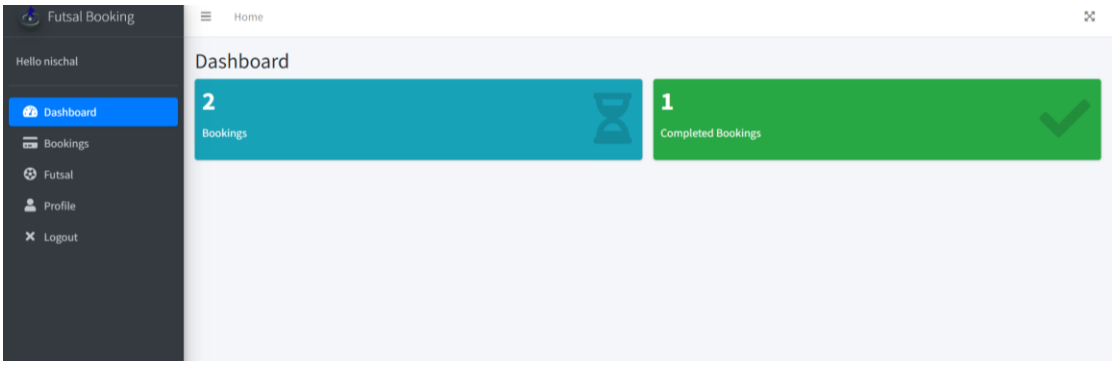

Figure 6.12: Admin dashboard

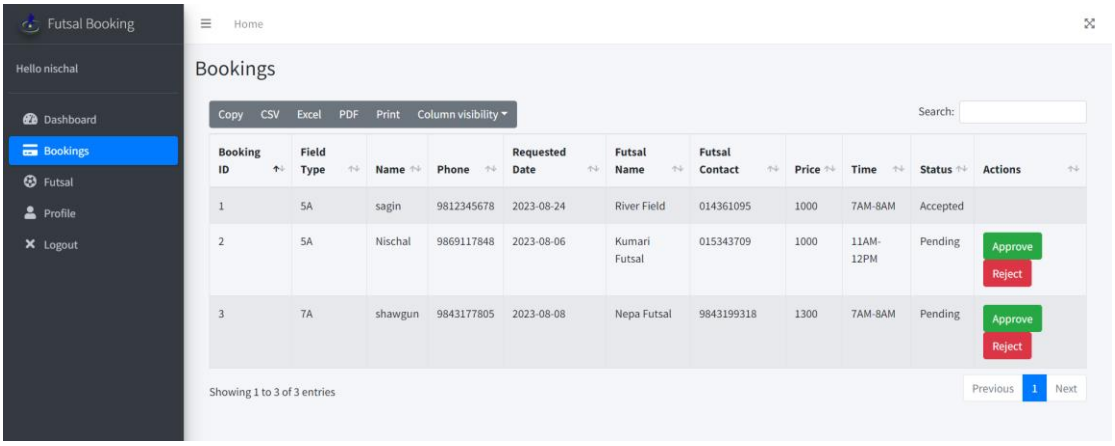

Figure 6.13: Admin Bookings

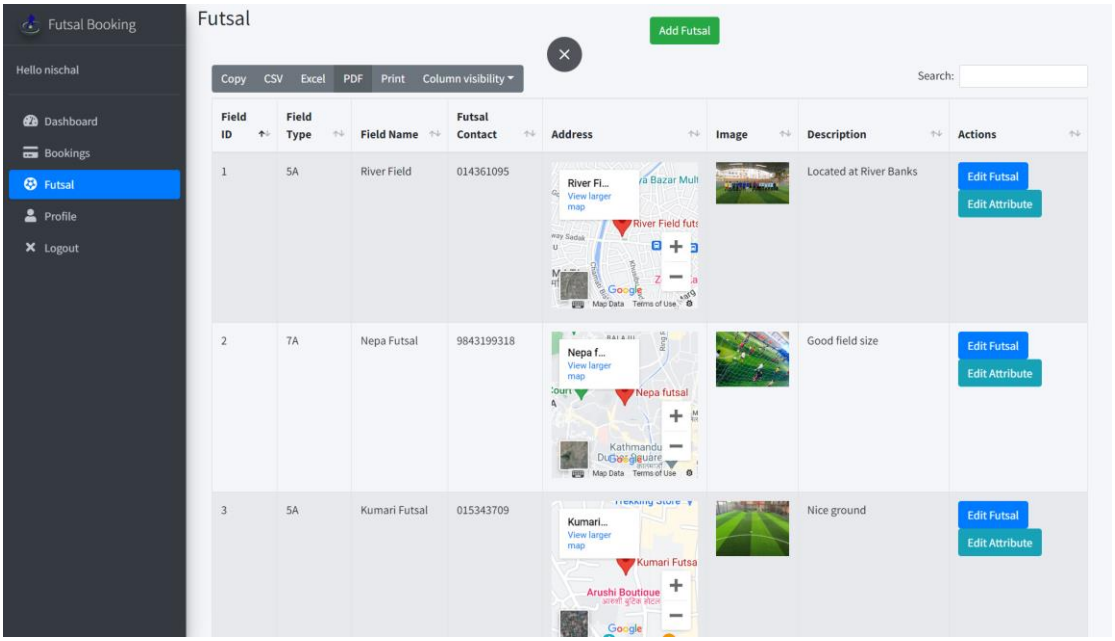

Figure 6.14: Admin Futsal

Figure 6.15: Add Futsal

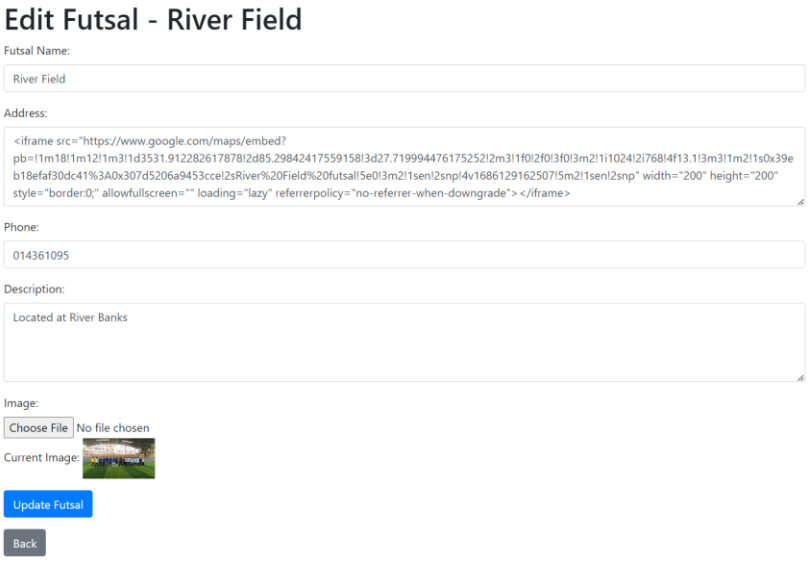

Figure 6.16: Edit Futsal

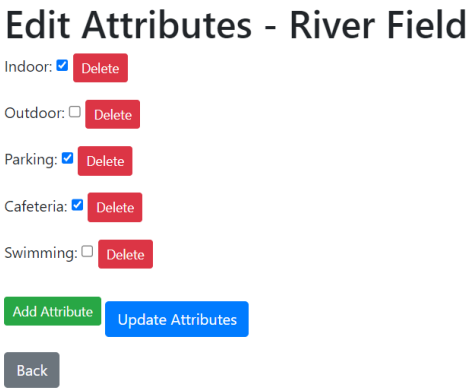

Figure 6.17: Edit Attributes

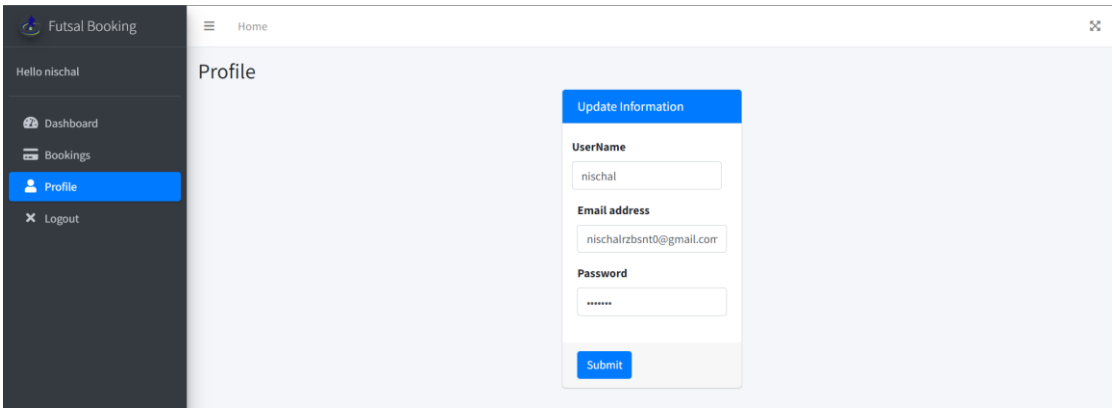

Figure 6.18: Admin Profile