



slington college
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CS6P05NI Final Year Project

Interim Report
Futsal Booking App

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Abstract

Futsal grounds are still being booked through traditional means like phone calls. An android application uses a booking system for multiple futsal grounds in the valley along with providing information and location. Customers and merchants use the app get information about booking to make it easier and faster. New technologies mean payment can be done through digital wallet. Flutter and Laravel is used for development of the app. The development is being carried out using agile methodology. Comparisons can be made with other booking systems like Airbnb and BHOJ. All the planning has been done and development will be started.

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1 Introduction

Futsal Booking App is a mobile application which lets the user book a futsal ground in the Kathmandu valley. This app also gives information about various futsal grounds in the Kathmandu valley.

There are many futsal grounds in the Kathmandu valley. Futsal is mainly popular among the youths and matches are played on a regular basis. The futsal grounds are still being booked through phone calls or through face to face interaction. Futsal Booking App allows the user to book a futsal ground through an app which makes it easier for the player as well as the merchant who works at the ground.

1.1 Aims and Objectives

The project aims to develop a mobile application which gives information about futsal grounds available for booking along with map.

- Give information about futsal grounds around KTM valley
- Make booking a futsal ground easier and faster
- Give location using map integration

1.2 Report Structure

This report gives information on the project being done.

Background section shows how the project was conceived and how the research was done for the project to be carried out. All the physical and software tools needed for the project is listed here as well. Mobile applications which are similar to the projected app is compared along with screenshots. Features which may be used for futsal booking app are identified and explained.

Development section shows the development done for the project so far. Here, the architecture of the system and the methodology used is explained in detail. Initial wireframes of the UI are also shown. The use case diagram shows who can use which feature of the app. This is also explained in detail in the expanded use case diagram. The initial ERD made before normalisation to get a grasp of concept of the

working of the system is presented. Each step of the normalisation process is shown as well as the final ERD conceived after normalisation is presented.

Analysis of report section analyses the development work done during the first phase. The work done is compared to the Gantt chart to see if the development process is being carried out on time or not. If not, a plan on how the development process can be brought on time is given.

Future work section shows how much work is left to be done and how it will be undertaken. This can include development, documentation as well as testing.

2 Background

2.1 Project Elaboration

Futsal booking system is an android application. This app lets a user get information about various futsal grounds in the Kathmandu valley. The user can book a ground for a date and time. Events like tournaments, training is also listed. Ratings can also be given based on the service provided, behaviour of staff and the quality of play. This may affect other customers before booking the ground. Photos of the place is also shown in the app to let the customer see the ground before booking. Location of the place is also shown using maps to get the exact place.

2.2 Function and Features

The merchant needs to register in the app to make their ground available in the app to the players. They can provide information like opening time, closing time, price, photos and other necessary info. The player also needs to register firstly to make any booking. Once they are registered with all their information and logged in, a list of all the futsal grounds available near them are listed out. They can search and choose a futsal ground of their liking. After choosing a ground, they are led to make a booking where available timing is listed in green and booked timing are listed in red. After choosing an available timing, the payment page is displayed through which the futsal ground can be booked. This app also gives out a notification reminder 1 hour before the booking time to remind the player of their booking or they can set a reminder of their own in the reminder page during their own time. The booking page lists out all the booking made by the player using the app for their statements.

2.3 System Architecture

For the back-end programming the app, Laravel framework is used. The Laravel works on the basis of the MVC system architecture.

MVC Framework

MVC stand for Model View Controller. It is a software architecture pattern which separates the functionality, logic and interface of an application.

The model is responsible for interacting with the database like MySQL. Model does the querying part like select, insert, update and delete. Controller can also request data through the model.

The view takes care of the UI of the application. This is what the user sees and interacts with.

The controller performs the actions requested by the user, like visiting a page or submitting a form. It tells the model to fetch data from the database and the controller takes that data to load a view.

2.4 Tools Used

- Balsamiq Mockups was used for designing the wireframes of the app.
- Lucidchart was used for making the ER-Diagrams and the Use Case diagram.
- For the IDE, Android Studio is used as it is an IDE made specifically for the development of android apps.
- Visual Studio Code is used as a code editor for editing code as for debugging.
- Flutter is used as the front-end framework with Dart as the programming language since it is an up and coming language for cross platform programming for Android and iOS.
- For the back-end programming, Laravel framework is used.
- MySQL is the database used for storing data about futsal, customer, merchants, bookings and payments.
- An android phone to run and test the app.

2.5 Similar System Comparison

2.5.1 Airbnb

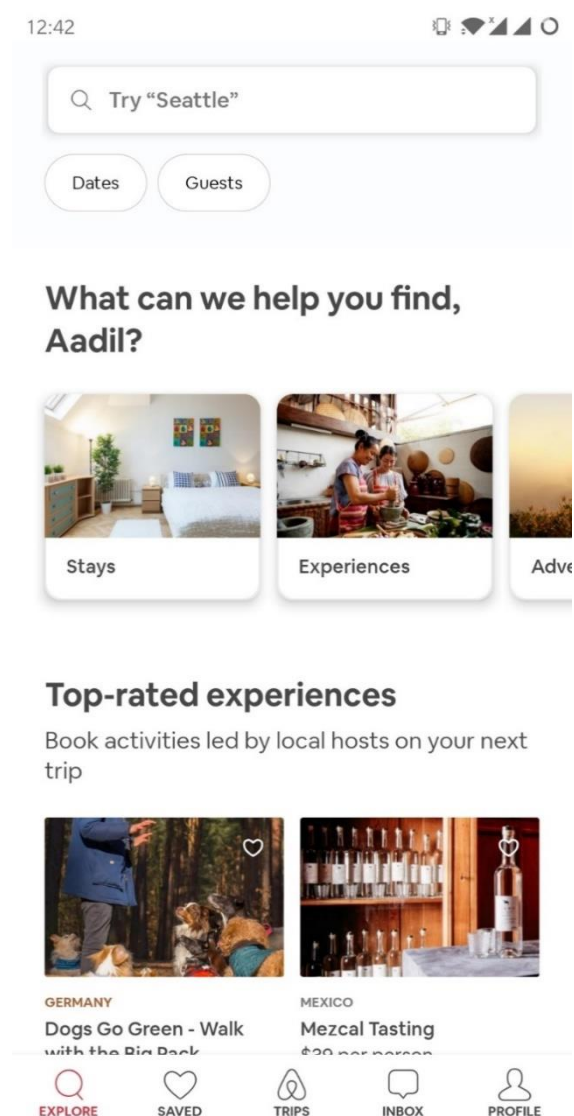


Figure 1: Airbnb

On the side is a screenshot of a popular hotel booking app known as Airbnb. In this app, the UI is similar as to what was planned. The front page where all the hotels are listed is to be replaced by futsal grounds. When the hotel card is pressed, information about the place (check in time, check out time, location, reviews) is listed. When check availability button is clicked, the calendar is popped up with green marking for the dates available. The futsal app will also have similar features as this app.

2.5.2 Kathmandu Futsal

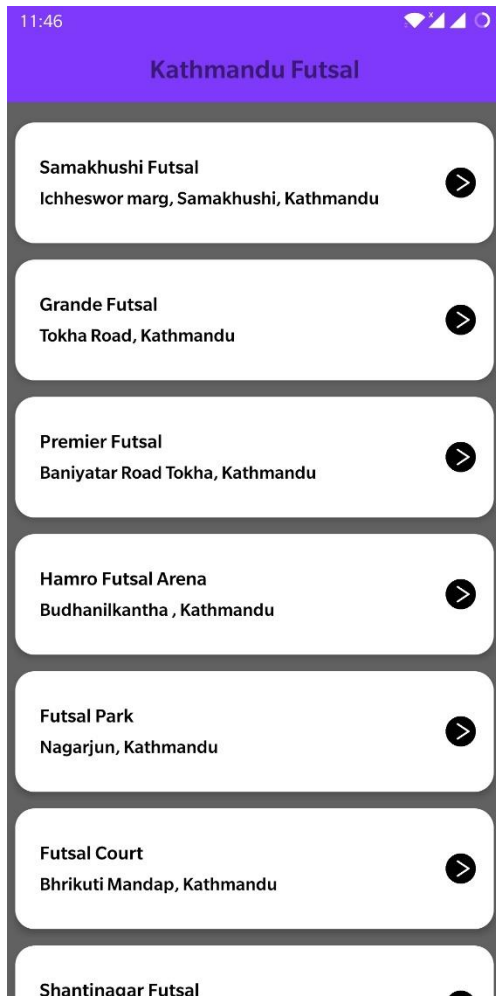
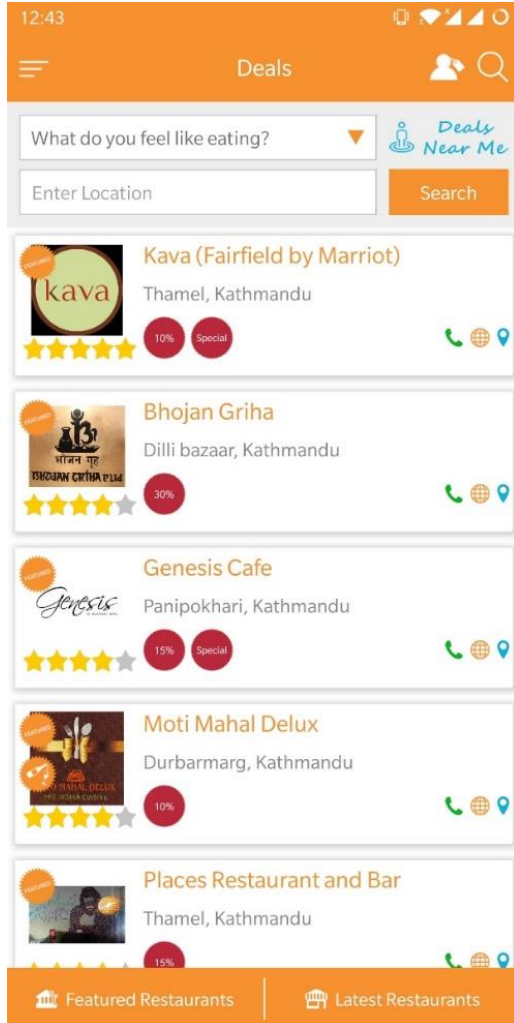


Figure 2: Kathmandu Futsal App

There are a few futsal apps in the play store. These apps do not provide a system for booking any futsal ground in the Kathmandu valley. Only information about the futsal grounds and phone numbers are provided. The futsal app going to be developed will have a better UI than the one in the screenshot. Also, a booking system is going to be developed which will make it a better app.

2.5.3 BHOJ



BHOJ is another similar app which has very nice features of food places available in the country. Restaurants, Cafes and bars are listed in the home page. All the necessary information about the place like location, open times, reviews and offers available are also given out.

3 Development to date

Initial research on the topic is done and open to change accordingly. Wireframes of all the pages of the app has been made to get a grasp of how the app will look. ERD was made to see all the entities needed for the app to function. Use Case diagram has also been completed to see who gets to use which functionality of the app. Normalisation was done to remove any anomalies in the system and the final ERD was prepared accordingly.

3.1 Methodology

Agile Methodology

Agile is a process that allows companies design and build the right product as per the demand of the client. This process helps the company to analyse and improve the product throughout its development.

Scrum is an agile process that is mostly used while managing complex software and product development, using iterative and incremental practices. Scrum process allows companies to adjust smoothly to rapidly changing requirements. This agile process provides better estimation taking less time creating them and also let us be in more control of the project schedule.

The agile process allows for the face to face interactions of customer, software development team, product owner which makes it easier for ideas to be circulated.

3.2 Wireframes

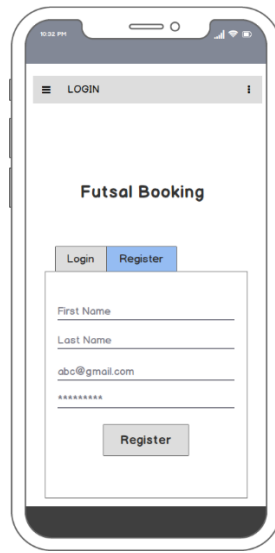


Figure 3: Wireframe Register

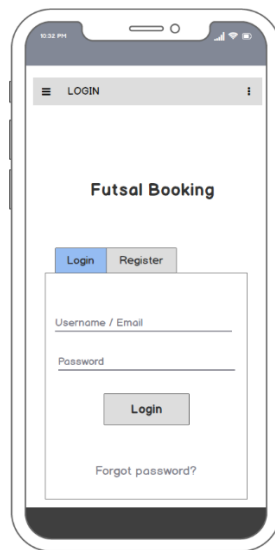


Figure 4: Wireframe Login

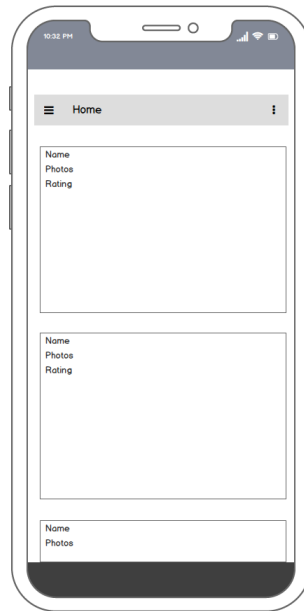


Figure 5: Wireframe Home Page

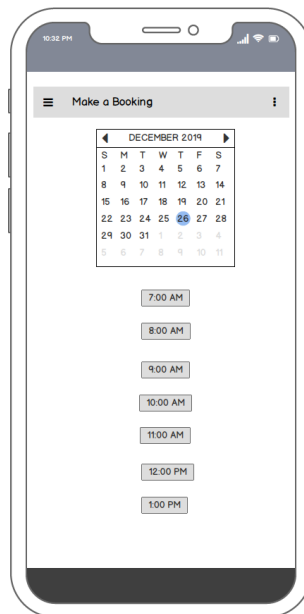


Figure 6: Wireframe Check Availability

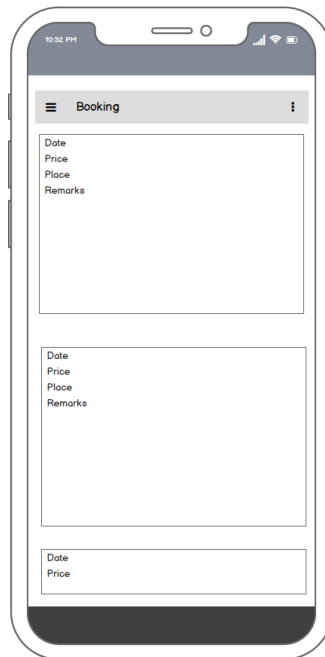


Figure 7: Wireframe Bookings

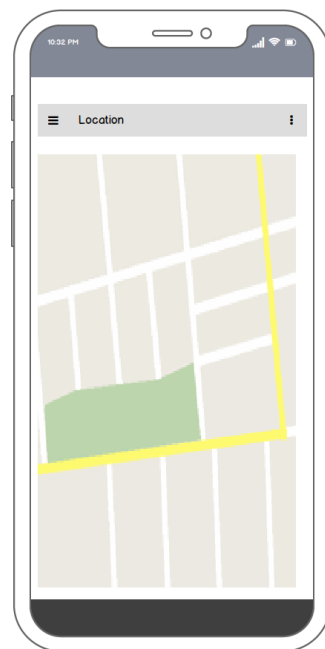


Figure 8: Wireframe Location

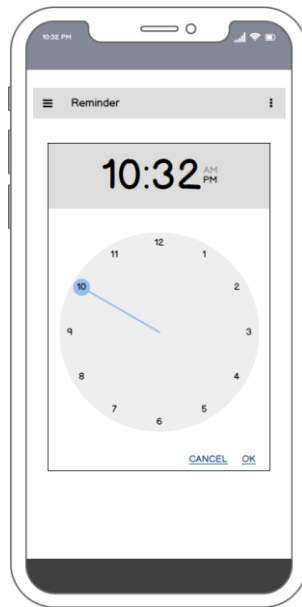


Figure 9: Wireframe Reminder

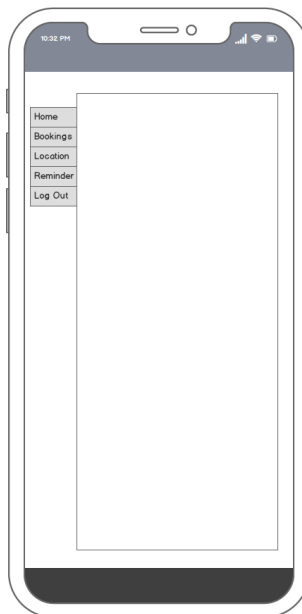


Figure 10: Wireframe Sidebar

The wireframe shows a mobile application interface for a merchant. At the top, there is a status bar with the time 10:32 PM and signal indicators. Below the status bar is a header bar with a hamburger menu icon on the left, the word "Merchant" in the center, and a vertical ellipsis icon on the right. The main content area contains four text input fields labeled "Futsal ground", "Timing", "Price on weekdays", and "Price on weekends". Below these fields is a small image icon and an "Upload" button. The bottom of the screen features a dark navigation bar.

Figure 11: Wireframe Add/Update Futsal Ground

3.3 Use-Case Diagram

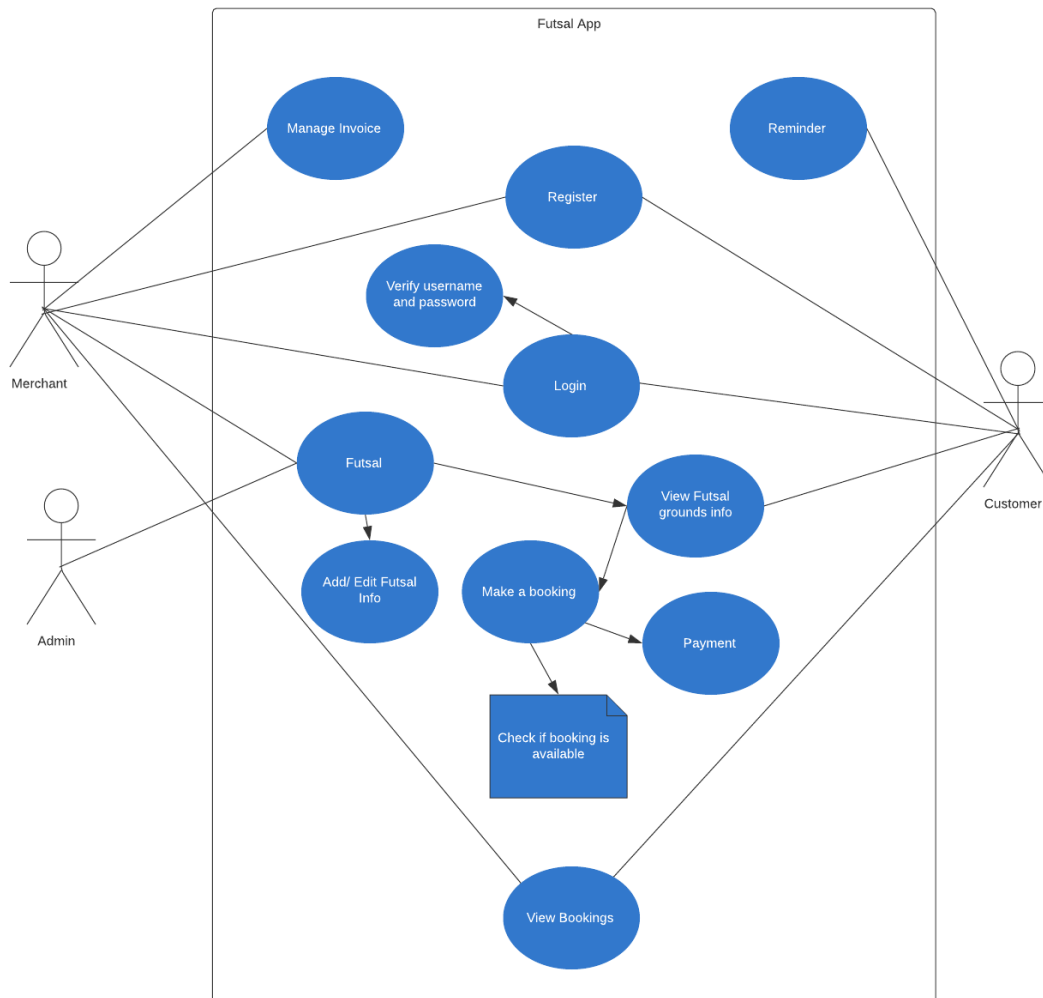


Figure 12: Use Case Diagram

3.3.1 Extended Use Case Diagram

3.3.1.1 Login/Register

Customer/Merchant	System
1. Enter user details.	
	2. Record details/ Verify username and password.
	3. Registration/ Login successful.
	4. Redirect to front page.

Table 1: Login/Register Extended Use Case

3.3.1.2 Make Booking

Customer	System
1. View futsal ground page.	
2. Press check availability button.	
	3. Bring up calendar page with available time.
4. Pick available time.	
	5. Redirect to payment page.

Table 2: Make Booking Extended Use Case

3.3.1.3 Add Futsal Info

Merchant/Admin	System
1. Add/Update Futsal ground.	
	2. Bring up futsal ground form.
3. Enter updated information.	
	4. Update in database.

*Table 3: Add Futsal Info Extended Use Case***3.3.1.4 View Bookings**

Customer/Merchant	System
1. View bookings page.	
	2. Retrieve information about customer booking.
	3. Show all bookings made by customer.

Table 4: View Bookings Extended Use Case

3.4 Initial ER-Diagram

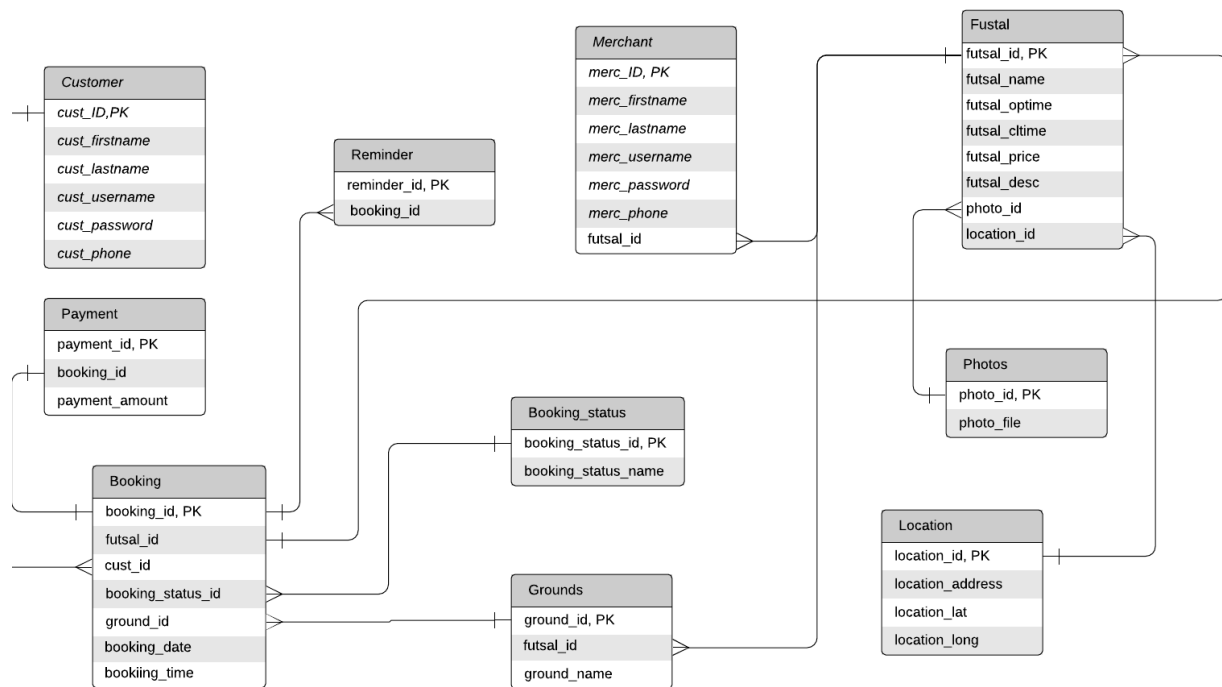


Figure 13: Initial ER-Diagram

3.5 Normalisation

UNF

Futsal (futsal_id, futsal_name, futsal_optime, futsal_cltime, futsal_price, futsal_desc, photo_id, photo_file, location_id, location_address, location_lat, location_long, merc_id, merc_firstname, merc_lastname, merc_username, merc_password, merc_phone, {cust_id, cust_firstname, cust_lastname, cust_username, cust_password, cust_phone, booking_id, booking_date, booking_time, booking_status_id, booking_statis_name, payment_id, payment_amount, ground_id, ground_name, reminder_id})

1NF

Futsal-1 (futsal_id, futsal_name, futsal_optime, futsal_cltime, futsal_price, futsal_desc, photo_id, photo_file, location_id, location_address, location_lat, location_long, merc_id, merc_firstname, merc_lastname, merc_username, merc_password, merc_phone)

Cust-1 (futsal_id*, cust_id, cust_firstname, cust_lastname, cust_username, cust_password, cust_phone, booking_id, booking_date, booking_time, booking_status_id, booking_statis_name, payment_id, payment_amount, ground_id, ground_name, reminder_id)

2NF

Futsal-2 (futsal_id, futsal_name, futsal_optime, futsal_cltime, futsal_price, futsal_desc, photo_id, photo_file, location_id, location_address, location_lat, location_long)

Merc-2 (futsal_id, merc_id, merc_firstname, merc_lastname, merc_username, merc_password, merc_phone)

BookCust-2 (futsal_id*, cust_id, booking_id, booking_date, booking_time, booking_status_id, booking_statis_name, payment_id, payment_amount, ground_id, ground_name, reminder_id)

Cust-2 (cust_id, cust_firstname, cust_lastname, cust_username, cust_password, cust_phone)

3NF

Futsal-3 (futsal_id, futsal_name, futsal_optime, futsal_cltime, futsal_price, futsal_desc, photo_id*, location_id*, merc_id*)

Photos-3 (photo_id, photo_file)

Location-3 (location_id, location_address, location_lat, location_long)

Merc-3 (merc_id, merc_firstname, merc_lastname, merc_username, merc_password, merc_phone)

Cust-3 (cust_id, cust_firstname, cust_lastname, cust_username, cust_password, cust_phone)

BookCust-3 (futsal_id*, cust_id, booking_id, payment_id)

Booking-3 (booking_id, booking_date, booking_time, booking_status_id, ground_id)

Booking_status-3 (booking_status_id, booking_status_name)

Payment-3 (payment_id, payment_amount)

Ground-3 (futsal_id, ground_id, ground_name)

3.6 Final ER-Diagram

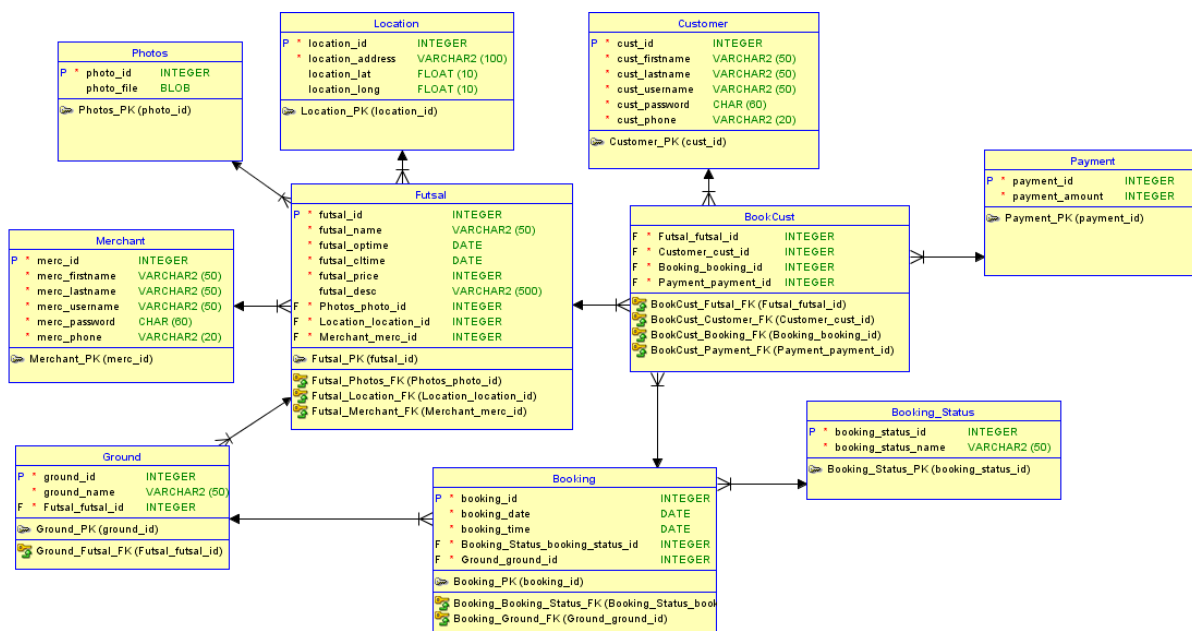


Figure 14: Final ER-Diagram

4 Analysis of progress

The project title has been finalized as Futsal Booking. The required research has been done and the software tools needed has been installed.

The wireframes to get an idea of the UI design of all the pages of the app has been made. All the entities needed for storing data in the database has been identified. The database has been normalised and the final ER-Diagram has been prepared. Use Case Diagram has also been made along with the Extended Use Case to know who can use which features of the app.

Survey was carried out as well and some responses were recorded. The project will be adjusted as per the responses received.

According to the proposed plan, the project is not moving on time. Since the learning time of Flutter as well as Laravel took far longer than expected, the development of the project could not move forward. After spending time getting familiar with Flutter and Laravel, the development process can move forward with some changes to the proposed plan.

So, to bring the project on time, the length of testing phase is decreased to 14 days and the deployment phase is decreased to 4 days. In the 19 extra days, the project is to be brought on time. The project can then be carried out accordingly. (Reference Appendix-A).

5 Future work

The most important work to be done is getting familiar with Flutter and Laravel through tutorial videos and researching on the subject.

The development will start according to the new plan which has 19 extra days for the development to recover the lost time. The UI of the app will be made as well as the back end of the app will be made. The front page, payment page, booking page will be made.

The database will also be made where the information about the customers, futsal grounds and bookings will be stored. White box testing and black box testing will be done to find any errors in the working or in the code of the app, which will make the app for refined. Finally, the app will be deployed in the play store.

All the works done will then be well documented to be reviewed.

6 References

Cprime. (2019) *WHAT IS AGILE? WHAT IS SCRUM?* [Online]. Available from: <https://www.cprime.com/resources/what-is-agile-what-is-scrum/> [Accessed 11 November 2019].

Flutter-Examples.com. (2019) *Flutter Online User Registration using PHP MySQL Server Tutorial Android iOS Example* [Online]. Available from: <https://flutter-examples.com/flutter-online-user-registration-using-php-mysql-server/> [Accessed 29 December 2019].

Gridsada, P. & Worathon, P. (2014) *Futsal Field Management System*. Attawit Commercial Technology College.

Majeed, A. & Rauf, I. (2018) MVC Architecture: A Detailed Insight to the Modern Web Applications Development. *Peer Review Journal of Solar & Photoenergy Systems*, 1(1).

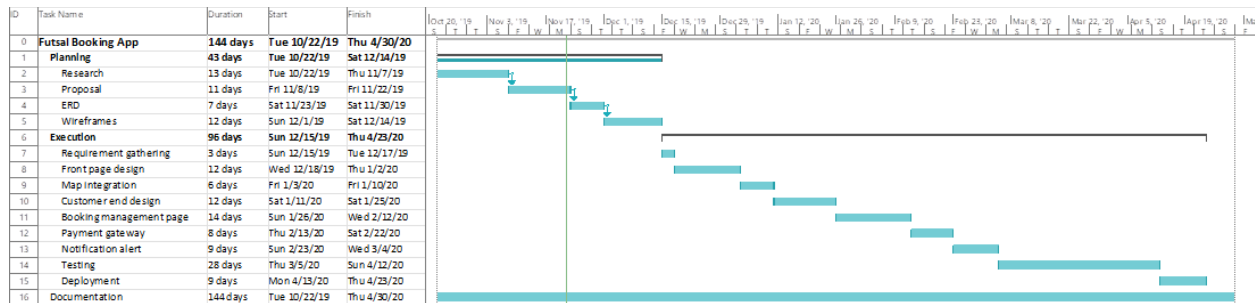
Mayank. (2018) *Step by Step Guide for Developing an Online Booking App from Scratch* [Online]. Available from: <https://engineerbabu.com/blog/online-booking-app/> [Accessed 17 November 2019].

Patel, D. (2019) *An Introduction to MVC Architecture: A Web Developer's Point of View* [Online]. Available from: <https://dzone.com/articles/introduction-to-mvc-architecture-web-developer-poi> [Accessed 3 January 2020].

7 Appendix

7.1 Appendix-A

Gantt Chart

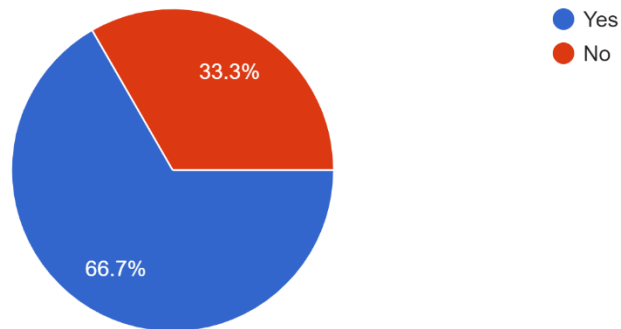


7.2 Appendix-B

Survey Responses

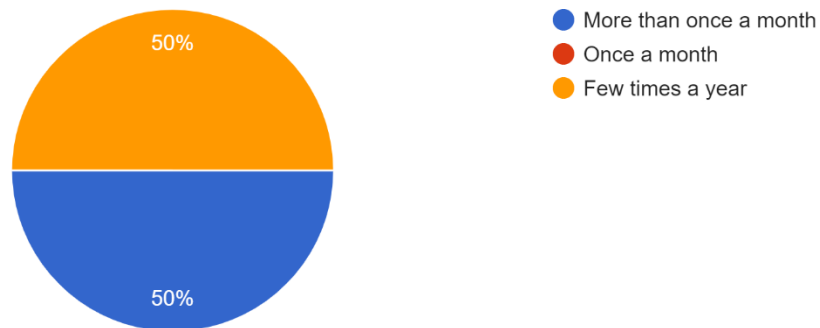
Have you heard of Futsal Booking System in Nepal?

6 responses



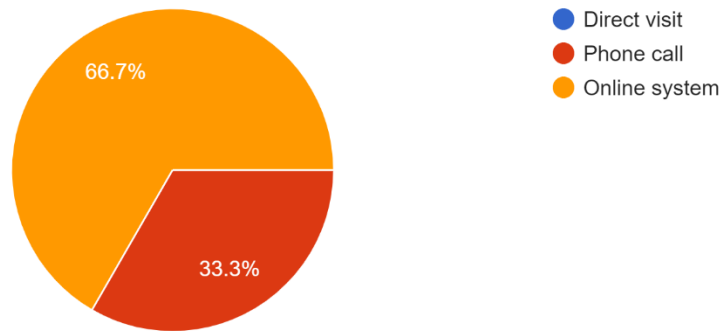
How often do you play futsal?

6 responses



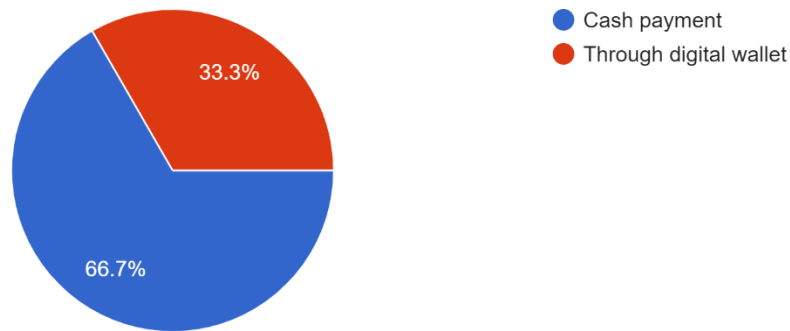
What method would you prefer to book a venue?

6 responses



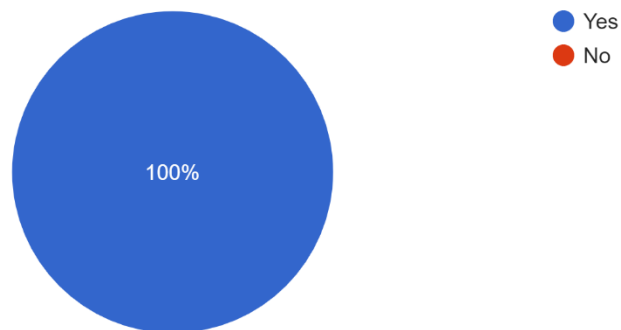
What mode of payment would you like for online booking?

6 responses



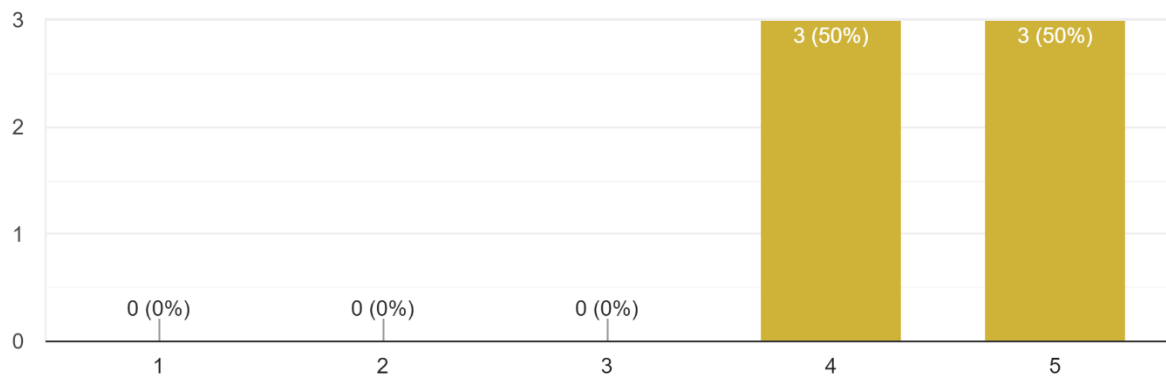
Are you likely to book a futsal ground using a booking app?

6 responses



How often do you think you will use the futsal booking system?

6 responses



7.3 Appendix-C

Extra screenshots of comparison

