INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.165

Web Application for Fantasy Gaming – Cricket

Saransh Shringi, Devang Vohra, Mohd Rehanuddin Malik, Shyamsundar Magar

Department of Information Technology, Terna Engineering College, Navi Mumbai, India

ABSTRACT: Fantasy sports has grown in importance as a social phenomenon in recent years. Its respondents are individuals who marketers find extremely appealing: young professionals with college degrees and higher-than-average household incomes. There is a plethora of fantasy gaming applications available on the internet. These applications cater to a wide range of sports fans, including cricket, football, basketball, etcetera. Fantasy sports and fantasy sport providers have frequently found themselves in the crosshairs of Indian gambling regulations, with the question of whether or not online fantasy sports playing is constituted gambling. It's critical to shine light on a questionable business that dresses up a formerly innocuous pastime, fantasy sports, and transforms it into a giant moneymaker for some of sports' greatest names. While there are many fans who desire to participate in these sports, many are unable to do so owing to the additional expenditures of entering events. Individuals between the ages of 18 to 60 are the target demographic for existing applications. These individuals make money and are able to spend it without any concern. There is a need for an application that incorporates youngsters under the age of 18 who do not earn money, as well as senior people who are retired but still want to play fantasy cricket with their friends and family.

We looked at a number of papers and case studies to see how the core of fantasy sports may be preserved for these fans while minimizing the perception of gambling. The results of this research provide an insight on how such an application can be built wherein the users can play fantasy cricket without any financial burden, along with providing a feasible earning to the creator of such an application. The features and functionalities of such an application are proposed in the result.

KEYWORDS: Fantasy gaming, cricket, gambling, betting, sports

I. INTRODUCTION

1.1 Introduction
Gaming tends to be defined by its engagement, skill-based play, and contextual/relative success or progress. Gambling tends to be viewed through fundamentals of betting or wagering, namely chance-based outcomes, intermittent reinforcement, and monetization including risk and compensation. Fantasy sports are not to be confused with gambling or betting. It is the freedom granted to its users to create their ideal squad based on their expertise and enthusiasm for the game. The potential to use one's own critical and creative thinking is provided to users.

1.2 Motivation of Project
Some online games are disguised as fantasy gaming, but they are essentially betting games with a significant element of chance. Fantasy gaming applications have amassed a significant degree of market trust and a high number of recurring clients. Dream11 has stood out as the market leader. It almost has a monopoly in the market. Dream11 increased its income from operations by 2.6 times to 2,070.4 crore in FY20 from 775.5 crore in FY19, owing to its heavy marketing and branding investment. According to our research, what makes Dream11 a solo runner is that they have focused on a certain niche and have a simple yet easy to use user interface, whilst their competitors are expanding into esports without establishing a fair market share and adding new games. This has made us realize the importance of an application that can be specifically dedicated to Cricket.

We were also stuck with the thought that the fantasy sports industry is even bigger than it appears to be now, and one of the key reasons for this might be its gradual absorption into the betting sector. The advertisements for such applications leverage the same psychological triggers as cigarette and alcohol advertisements, with a glamorous and successful personality at the heart of all of them. Also, fantasy gaming apps are outlawed by local government bodies in several Indian states, such as Karnataka, making it difficult for these apps to reach their full potential. The line between regulation and legal spin in online gambling has been razor-thin.

We were inspired to figure out how these problems could be tackled. We were curious to learn what functionalities and qualities a fantasy game app may have in order to avoid controversy while still surviving in the highly competitive real world.

II. LITERATURE SURVEY

2.1 Surveys and Comparison

Table 2.1: Summarized Literature Review

Sr No.	Title	Description	Research Gap
1	Machine Learning Applications in Fantasy Basketball	The application focuses on fantasy basketball on DraftKings platform. The goal is to predict the number of points each player will score using linear regression and then formulating a team of 8 best players according to the given constraints	While the paper focuses on demonstrating the power of machine learning, it is implemented on pre-existing applications such as DraftKings, FanDuel, etc. Also, it gives the authors unfair advantage over other competitors in the game. Basketball is not much followed in India. Cricket is the most popular sport in India.
2	A Fantasy Football Web Application with Active Server Pages and Access Database	The goal of the project is to create a fantasy football website with unique methods for playing as to demonstrate the author's knowledge of Windows XP based Internet Information Services along with Html, Css and Ole DB.	While the project focuses on football primarily, football isn't as popular as cricket in India. The author also has followed a different approach which includes pitting a particular player against another instead of the popular points based ranking system. The technologies used are Windows XP based IIS Server and OLE DB , support for which has been ended by Microsoft and thus is not recommended to be used today.
3	Sports Gambling: Software Design	The study explores how a sports gaming application development process can be created that can be used to develop legalized sports betting applications. This application is implemented using PoweBuilder and SQL.	The project presents a very well aid out framework for fantasy sports development but the authors have encouraged money management which is one of the promotors of betting/gambling. Development of such applications require flexible data models which can be implemented using NoSQL databases which are much more horizontally scalable and flexible.
4	Design and Development of an Android App Cricketer Fair	This paper focuses on creating an app called "Cricketer Fair" which updates a user about all the ongoing local cricket trophies in nearby towns and villages. It focuses on promoting local cricketers whose performances are recorded for skill display so that they can be invited to play bigger leagues. The project is developed using java, php and sql.	The application is available for mobile only. Also, the authors have used php to implement the backend. Use of nodejs would allow for faster performance due to its asynchronous architecture. Also, live score display would benefit from node's consistent server callback property. Also, player data can be optimally stored in object format in object oriented databases instead of relational databases such as sql. While the application shows scores of players, it does not allow users to create fantasy teams.
5	Dream11 IPL Team Recommendation using Machine Learning and Skill-Based Ranking of Players	Here they have implemented a team recommendation system where a players' performance is quantified on the basis of different player roles like batsman, bowler, wicket-keeper and all-rounder and skills like fielding, bowling type, etc. Other factors like pitch type, weather, etc, are also taken into account.	The study mainly focused on IPL which limits it's reach. There are plenty other leagues which are played for a longer period than IPL. Taking pitch report and weather into the calculation complicates the process .

6	An optimized model to create teams in fantasy cricket	The proposed system generates all possible teams or optimal teams based on given conditions and/or user-selected criteria. The system-generated teams are compared to teams made manually by users in a real context. In comparison to user-created teams, the outcome demonstrates a higher percentage of success.	While the system uses top notch model to make the team ,it limits the involvement and participation of the users and thus would lure them into some other application which allows the users themselves to make their team using their own thinking and expertise.
7	The central role of stress relief in video gaming motivations and preferences	The paper discusses how video games are a pervasive force in society, but despite decades of research there has been little consensus on their effects. We must first understand how and why people play video games before we can predict complex effects like extreme involvement.	As discussed in the paper, network analysis is a relatively new technique without established norms for sample size and network stability. Networks of even the largest of my samples, with 981 participants, showed some instability in measures of centrality.
8	Understanding the Fantasy Cricket Player: An Emerging market perspective	This study helps us understand the market of cricket fantasy application, The number of people involved in the existing applications, their interests, their complaints and hence helps us creating an application keeping their interests in mind.	The study is relatively old and the current market has grown exponentially. With the cricket leagues themselves expanding in terms of teams ,players and money . This has paved the way for a large open space in the cricket fantasy genre with many trying to explore and grab the opportunity.
9	Fantasy Football Playing and Internet Addiction Among Online Fantasy Football Participants	The purpose of this study was to identify the level of possible gaming addiction among fantasy football enthusiasts, as well as the peculiarities of this group.	The research is massively towards the addiction and gambling side of the fantasy app and not towards the trends of fantasy gaming. Feedback of the survey could have given additional light on users spending trends that if they are purposely using a small amount to play or they have been addictive or over-ambitious from their previous winning
10	Prediction of Live Cricket Score and Winning	This report targets concentrating the issue of anticipating the game outcomes before the game has begun dependent on the insights and information accessible from the informational collection The information mining calculations which can be applied on those properties.	Didn't implement an ensemble module with multiple learning algorithm which can be applicable for all type of cricket matches like 20-20, ODI and test cricket also

III. METHODOLOGY

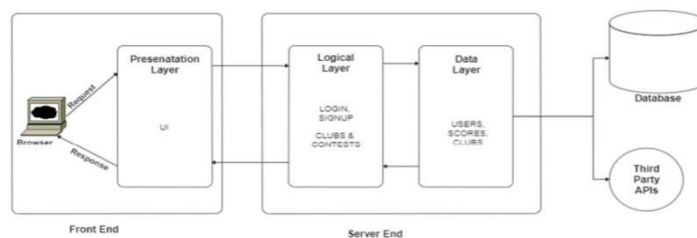**3.1 Overall System Architecture:**

Figure 3.1 Architecture Diagram of Application for Fantasy Gaming – Cricket

An overall architecture diagram of the system is a client-server-based architecture specifically server-side rendering architecture. Figure 5.1 shows the overall architecture of the system. The user triggers a http request to the web application server and in turn gets the response from the web server. The web server is connected to the database server to communicate

with the database, to retrieve user and club data. Based on the queries obtained from web server, the data is retrieved from the database and returned to the web server. Restful APIs are used to fetch dynamic data such as match details, player details amongst others.
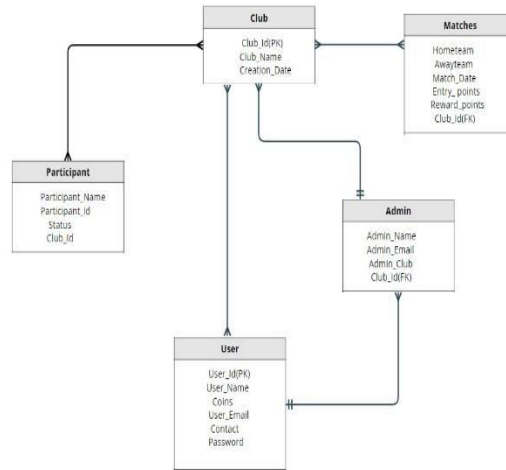
3.2 Data Modelling Diagram:

Figure 3.2 Data model diagram

Figure 5.5 represents a data model diagram.
There are five main relations, namely Club, Matches, Admin, User and Participant.
Each club enjoys a many-to-many relationship with the participants as each participant is allowed to join multiple clubs. Similarly, each club can have multiple participants. Club also enjoys many to many relationships with Matches and User. Club relation has a many to one relationship with the admin relation as Multiple clubs can have a common admin but a single club cannot have multiple admins. Similarly, admin enjoys many to one relationship with user as a user can be an admin for multiple clubs.

3.3 Methodology
The Spiral Model of System Development Lifecycle:
We came to the conclusion that the spiral model would be the greatest fit for creating such an application. The spiral model is a risk-based system development method. The spiral model guides a team to adopt components of more than one process models, such as incremental and waterfall based on the particular risk patterns of a given project. The spiral model was first described by Barry Boehm in1986 in his paper, "A Spiral Model of Software Development and Enhancement". Typically, the spiral model follows four phases. A software project goes through these phases again and again in iterations called spirals.
1.   Objective Determination and identifying alternate Solutions Phase
2.   Identify and Resolve Risks Phase
3.   Develop next Version of the Product Phase
4.   Review and Plan for the next Phase
We chose to follow the spiral model because of the risk analysis and risk management at each level, the Spiral Model is the ideal development model to follow for projects with numerous unknown problems that arise as the development progresses. Changes in the requirements at a later phase can be appropriately implemented by using this model.

3.4 Technology Used
Web Server-Express.js
Backend-Node.js
Database-MongoDB
Frontend-HTML, CSS, JavaScript

IV. RESULTS AND DISCUSSIONS

4.1 Output
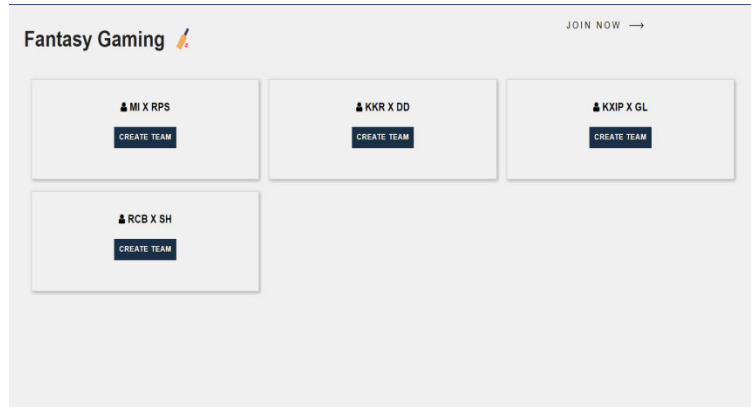The images presented below are the outputs of our system.

Figure 4.1.1 Homepage of Application

The image in figure 6.1 represents the homepage of fantasy gaming application. It consists of the match announcements and a Join Now button. Clicking on this button takes you to the Sign-in/Sign-up Screen.
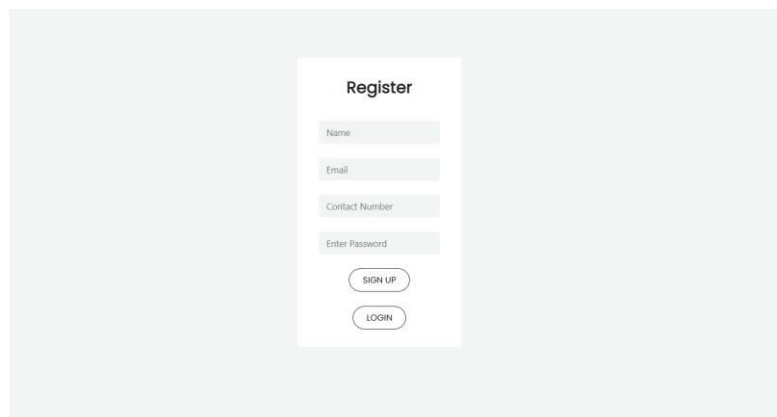

Figure 4.1.2 Sign-up page

As discussed for figure 6.1, figure 6.2 is the signup page for new users of the application.
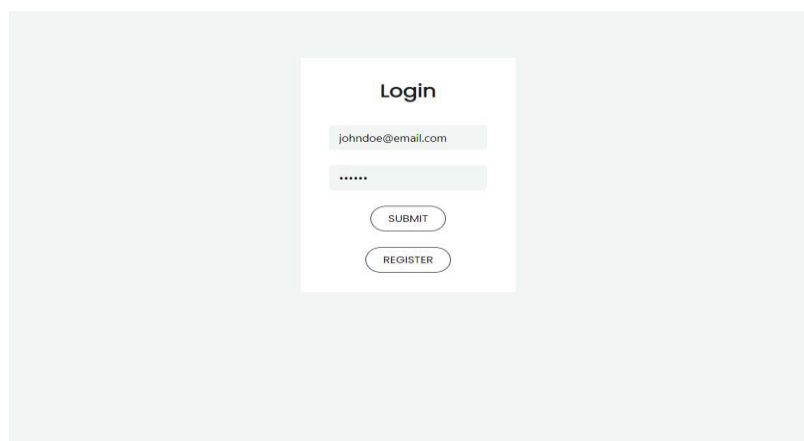

Figure 4.1.3 Login Page

The image in the figure 6.3 is the login page for the existing users where user can login using email id and password and then move on to create a club or join one.
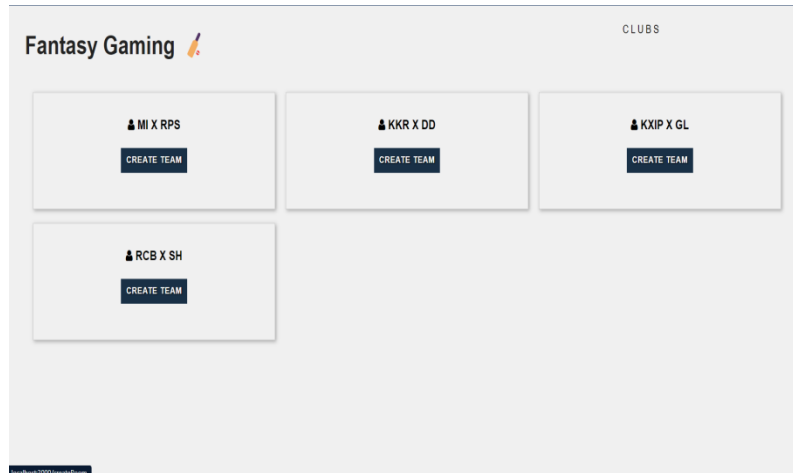

Figure 4.1.4 Dashboard

The image in figure 6.4 is the dashboard that is visible after successful login. The user can create clubs or join existing clubs by clicking at the Clubs icon or create team button.
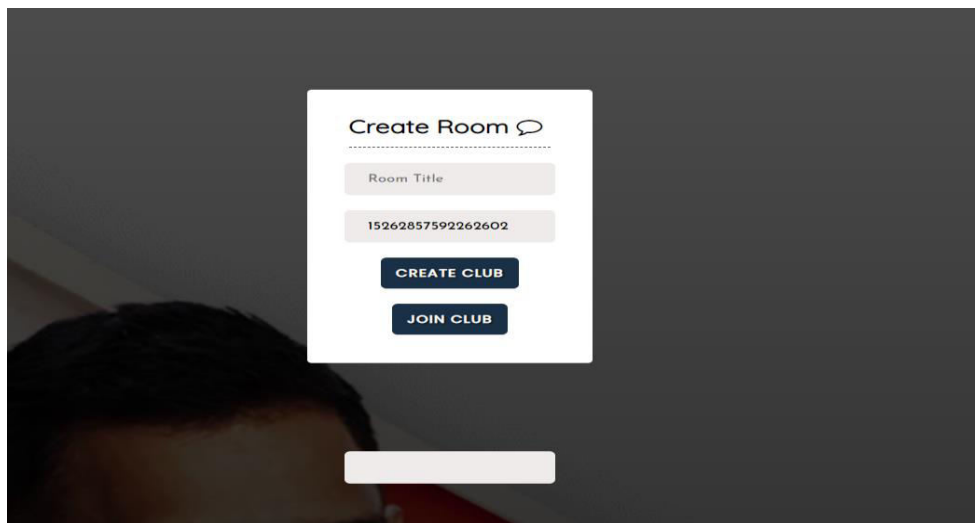

Figure 4.1.5 Clubs

The image in figure 6.5 is the clubs screen which consists of two options. Enter the Room title and click upon create club in order to create a club of your own. Click the join button and provide a unique club id and club name in order to join a club.
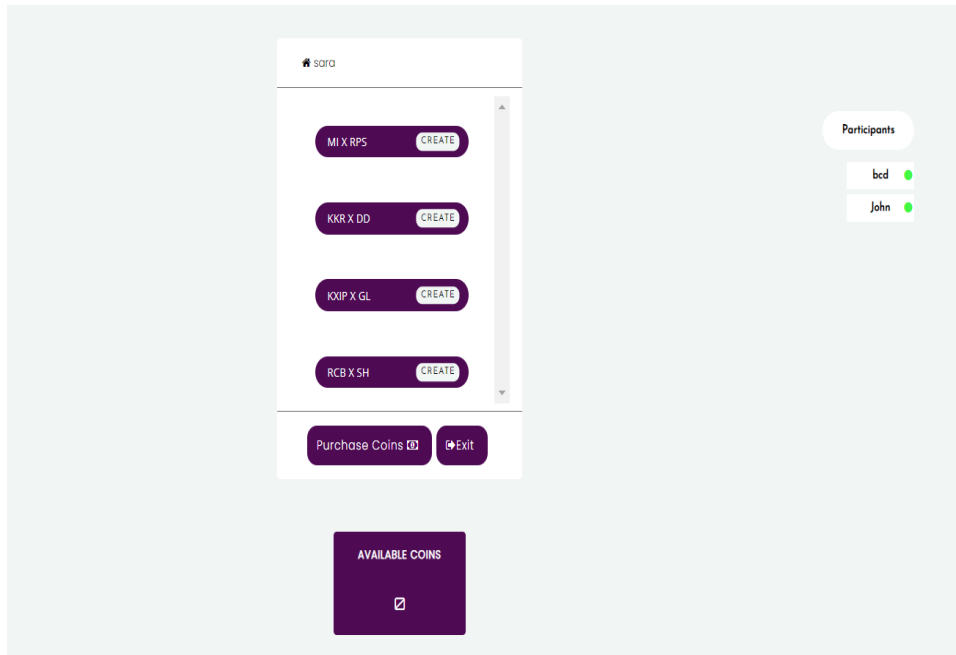
Figure 4.1.6 Club Dashboard-Admin's View

Figure 6.6 describes the club's dashboard when admin logs into it. All the matches to be played are listed. These matches are not visible at the participant end. Once the admin clicks create and creates a contest, the contest will be visible on the participant's dashboard. The admin can purchase additional coins using the purchase button
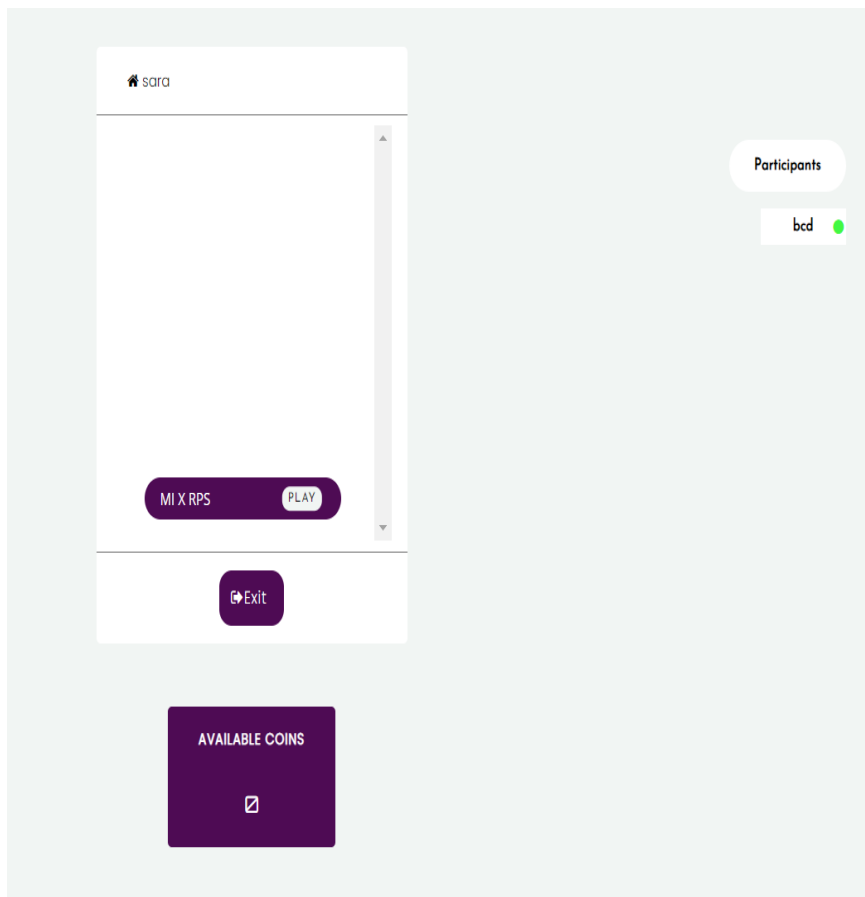

Figure 4.1.7 Club Dashboard- Participant's view

The figure shows how the club dashboard looks at the participant end. The participant can click play button to play a contest if he has enough coins. If not, he will have to request coins from user
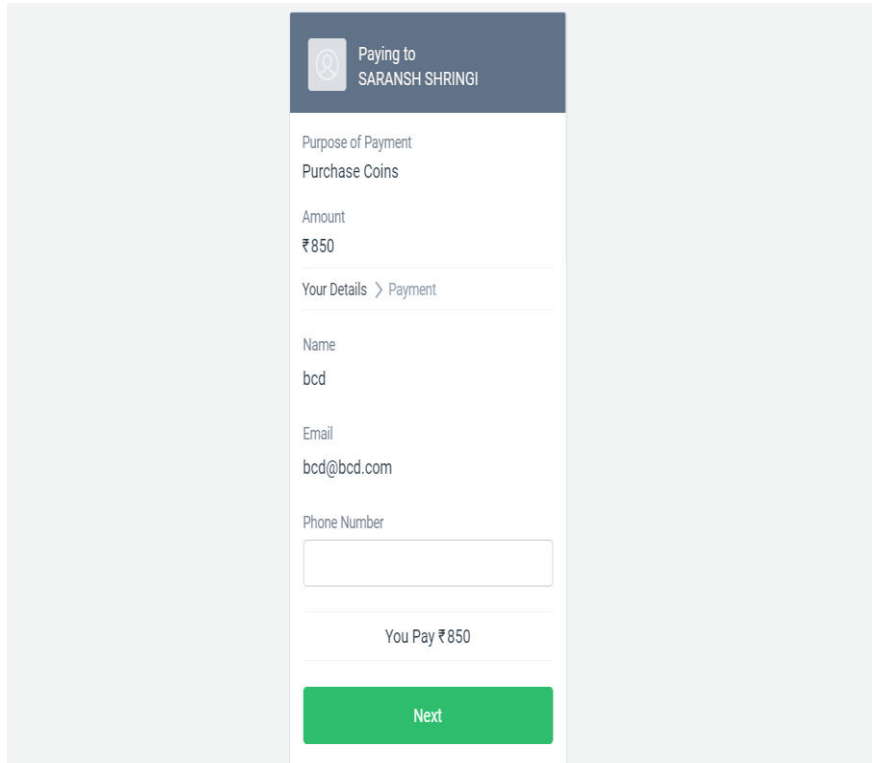

Figure 4.1.8 Payment gateway

The image in the figure 6.8 is the payment gateway that occurs when the admin wants to buy new coins and clicks the purchase coins button visible in figure 6.6

4.2 System Testing

In our case, since we were actually aware of the technology stack and the process flow of system, we prefer to go ahead with the white box testing wherein the section 6.2.8 enlists the various test cases that we have designed and tested.

4.2.8 Test Cases

Table 4.2.1 Test Cases

Test Case Id	Test Case	Expected Results	Actual Results (Pass/Fail)
1	Login with correct credentials.	Login Successful.	Pass
2	Login with incorrect credentials.	Login denied.	Pass
3	Unregistered user trying to login.	Login denied.	Pass
4	Password masked while entering.	Appears in the form of dots.	Pass
5	User tries to create a club by submitting the club's name	Club is created with the creator as admin and unique id for the club generated	Pass
6	User tries to join a club by entering the unique club ID as well as club name	User is now a club member	Pass
7	Admin tries to create a contest by entering the winning price and entry price when he doesn't have enough coins.	Deny action	Pass
8	Admin buys coins.	Update coins for the admin	Pass
9	The admin tries to create a contest with	Create the contest and make it visible	Pass

	enough coins available	to other club members	
10	A member tries to join a contest without having enough coins.	Deny action and ask him to request coins from the admin.	Pass
11	Admin tries to join a contest with enough coins.	Contest is joined.	Pass
12	Data validation for an incorrect data entry.	If the incorrect data or type mismatch happens or the required field is not filled, warning pop-ups.	Pass

V. CONCLUSIONS

5.1 Conclusion

The problems with gambling go beyond financial losses to social and personal problems.

We also learnt that most of the fantasy cricket apps introduced other segments, before they were successful in cricket. Fantasy cricket cannot grow to its full potential if this keeps happening in almost every other fantasy gaming application. We also found that this application could act as a solid entry point for new comers in the world of fantasy gaming. Users can utilize applications like these to play a contest without worrying about the monetary risks and thus gain confidence to play fantasy leagues.

There are, however, a lot of updates that can be worked upon. Advanced Predictive Modeling can be used to predict the match scores, player performances amongst others.

5.2 Future Scope

There are a lot of updates that can be worked upon. Advanced Predictive Modeling can be used to predict the match scores, player performances amongst others.

A much better, interactive frontend can be developed for the application so that the user feels that the application is at par with others.

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