FANS-DRIVEN (FOOTBALL) PLAYER RATING SYSTEM

By

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A REPORT

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ABSTRACT

Football is a team sport that relies on the collaboration of eleven individuals working together to make a solid squad. Two sides engage in an exciting battle on the sacred pitch, overseen by the referee's watchful eye. Within this competition, players demonstrate not just their inherent powers but also their perfected skills, all with the aim of triumph in mind. Undeniably, within the realm of football, exists an opportunity to establish a strong bond between the players and their eager fans. This proposal mainly focuses on developing a mobile application about fan-driven player rating system, an innovative platform allowing fans to evaluate players based on a multifaceted field of attributes, from the dribbling skills to the precision of shooting accuracy, from the artistry of assists to the bravery of defenders, midfielders, and strikers, and lastly, from the resilience of goalkeepers to the potential of keeping clean sheets. The application's goal is to regulate computer methods that anticipate match scores based on fan ratings and give a unique perspective on player performance. Moreover, the ratings provided by fans play a crucial role, as they have a direct impact on the daily rankings displayed on the leaderboards. Furthermore, the system envisions partnerships with football clubs for active player data administration. In the realm of players' data, an effective solution develops – the system will crowd-sourced data from the fans themselves. The data could be pulled from sources such as official website or Wikipedia, which contributed by fans. To protect the value of this origin, responsibility will be assigned to a group of trusted fans, preventing the unpredictable winds of constant change. Utilizing Flutter and programmed in Dart, this project's mobile application integrates Firebase and football APIs for its core functionalities. Providing features such as rankings, ratings, prediction, and the ability to choose favourite players, the app offers users an immersive platform to express their thoughts and insights. The team creation feature offers football enthusiasts a platform to construct their ideal squads. Fans can assemble teams based on player performances, and the system can generate an optimal starting eleven according to user preferences.

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LIST OF ABBREVIATIONS

RAM	Random Access Memory
SDK	Software Development Kit
VS Code	Visual Studio Code
OS	Operating System
ARIMA	Autoregressive Integrated Moving Average
LSTM	Long Short-term Memory Networks
API	Application Programming Interface

Chapter 1 Introduction

The interaction between fans and players has evolved as a critical component of the sport ecosystem. We cannot deny that a lot of loyal fans have spent numerous years absorbed in football matches and can provide unique perspectives from various vantage points. This presents an opportunity to enhance players' growth that might have eluded them otherwise. Traditional players' ratings often rely on experts' opinions which those experts normally form from retired players. Thus, this proposal mainly aims to increase the collective information of fans to create a more complete player rating system that considers fans' viewpoint.

1.1 Problem Statement

In the 21st century, the performance of a player has a direct impact on the collective team dynamics. This performance rating informs a coach's decision on a player's starting position or seat on the bench. Furthermore, a player's contractual obligations and the level of fan interaction emerge as critical factors. Unfortunately, the modern player rating environment tends to deviate from accurately representing fans' viewpoints. Instead, it mainly relies on expert judgements, such as the "weekly best 11" match-derived statistics, and awards like as "man of the match." This attitude downplays the importance of fan feelings, allowing them to play a less part in the rating system. This discrepancy generates unfairness and limits players' holistic understanding, robbing them of crucial information from their devoted followers. Lastly, the proposal would like to improve the involvement of fans by enhancing the rating system.

1.2 Motivation

There are a lot of mobile applications in recent years that provide the fans to see the scores of players based on their performance in the match such as Fantasy Football Manager, Premier League – Official App, FotMob – Soccer Live Scores, SofaScore, and others. These mobile applications have provided a platform for the fans to view the

team lineup, schedule of the match, statistics of player before and after the match and others. Nevertheless, fans do not have the chance to provide their opinions by giving the rating to the players while they only could discuss between each other in the chat. This will not affect the player statistics as it normally seeks opinion from the experts. Thus, these mobile applications can be improved by adding a section for fans to rate so that their opinion can be considered by the teams and make improvements. The system's computational algorithms for result prediction present an innovative way to blend fan sentiment with match outcome analysis. This project will culminate in several innovative features. Users will be able to evaluate players and offer them feedback. A daily leaderboard will showcase the top three players based on user ratings. Additionally, when selecting two teams, fans can opt to utilize the system's predictive capabilities. Lastly, users will have the opportunity to craft their ideal eleven on a daily basis, which they can then compare against an algorithmically generated best eleven derived from collective user data.

1.3 Project Scope

"Fan-Driven (Football) Player Rating System" is a straightforward and comprehensive project title that develops a mobile application for football fans to rate players based on their performance. Additionally, football fans can get involved and express their thoughts to achieve the desired goal of player rating.

The proposed solution is to create a fan-driven rating system to address the issue of football fans' ability to predict and rate the player. It will also give a more comprehensive view of the players' performance. The project will provide special insight into the outcome of matches according to fan ratings by utilizing machine learning and some models, leading to a more knowledgeable and exciting football experience.

The scope of the project includes the development and deployment of the fans-driven (football) player rating system mobile application. Furthermore, the project also powers the collective wisdom and opinion of the football fans to rate the performance of football players when they are on the pitch. It would be helpful for the players to know their limitations from the fans' side and make improvement. The system will be a

mobile app application, which targets both players and fans as mobile application users. The fans can login to view the player statistics and rate the players based on their occurrence, for example goal, assist, blocked and others. These statistics may affect the overall scores of the players and can make it as a consideration for man of the match. The player can use this mobile application to view the comment and rating scores given by the fans and reflect on their own. They can use the statistics in the mobile application to discuss with their training team to enhance their training skill by creating a complete training method. The mobile application will also contain the statistics from the official so that fans and players can take it as reference.

1.4 Project Objectives

The main objective of the project is to develop a mobile application that football fans can rate the players based on their performance on the pitch. Besides, the fans able to see the live score from time to time so that they manage to view the result and provide them a better view to rate the players. The sub objectives are to enhance the application performance to ensure smooth user experiences. Other than that, the mobile application also provides a platform for the users to choose their favourite player. They can compare whether their favourite player is the top 3 player of the days. Besides, the project also aims to develop a user-friendly design in mobile applications. The sub-objective is to build the infrastructure necessary for data collection and storage. For example, setting up the databases. The second sub-objective is ensuring the data provided is safe and secure. Furthermore, the project also focuses on developing a robust data collection mechanism so that fans can rate the players and provide comments. The sub-objective is implementing the algorithm and analytics to process user-generated data. Data will be cleaned, evaluated, and collected to create player ratings. Lastly, the objective of the project is to add more features to the mobile application so that the number of users that use the application will increase. The sub-objective is to make sure that the review given by the user is good. The second sub-objective is to increase the interaction and dependability between the user and the mobile application.

1.5 Contributions

The contribution of this project is to develop a new user-friendly mobile application for player rating system that allows football fans to rate the player based on their performance and predict the score before the match. The application enables fans to immerse themselves in the role of a team manager, actively influencing match outcomes by voting on the man of the match and first goal scorer. This allows users to express themselves and connect more intimately with the content of the game, enhancing their overall experience and participation in match processes. This mobile application also incorporates features enabling the users to select their favorite players from a football team. Besides, underrated players who may not receive the praise that they deserve from traditional media or official awards might benefit from fan-driven ratings. This can assist in promoting new talent and highlighting their contributions to their teams. Besides, the mobile application is also useful for the club manager as a consideration based on fans' rating and comment. These will provide extra information on how fans see players. Other than that, the mobile application also saves a lot of effort and time for the fans to search the match and view the players' statistics. Furthermore, these systems frequently have a worldwide reach, allowing fans from all over the world to take part. This global viewpoint can aid in breaking through regional prejudices and providing a more worldwide perspective on player performance. Apart from that, it has high potential to collaborate with football clubs to allow them to manage certain player statistics actively. The mobile application also implements a crowd-sourced data model, ensuring real-time updates and corrections. Users manage to create their own best starting 11 and compare with other fans all around the world. For example, there is a FIFA FIFPRO Men's World 11. There will be a leaderboard to show the top player based on fans' rating. This provide an overview to the users to know which player is the most preference. The project will motivate the players and make them become better and learn from mistakes due to the rating given by fans.

1.6 Report Organization

The report for Final Year Project 2 comprises five comprehensive chapters, each looking into different aspects of the project. Chapter 1, the Introduction, provides an

in-depth overview, covering elements such as problem statements, motivations, objectives, project scopes, contributions, and the organization of the report. Chapter 2, the Literature Review, focuses on an extensive examination of existing systems and applications, including renowned platforms like Premier League – Official League, SofaScore, Fantasy Football Manager (FPL), Manchester United Official App, and Flashscore. Moving forward, Chapter 3 is the system methodology/approach which include the overview of Agile SDLC Methodology, System Architecture Diagram, Use Case Diagram and the Use Case Description. Chapter 4 is the system design and will presents the System Block Diagram with the description. Chapter 5 will be the system implementation which will talk about hardware and software setup, setting configuration, system operation, implementation issues and challenges and the conclusion remarks. Chapter 6 is mainly about the System Evaluation and Discussion which need test the mobile application to decide whether is it functioning well. Besides, this chapter also included Objective Evaluation and a conclusion remark. The last chapter will be conclusion for the report and recommendation for further improvement to the mobile application.

CHAPTER 2 Literature Review

There are several mobile applications on the market that are related to the player rating system. To design a mobile application that performs effectively, such as providing more features than others, studies, and analysis of existing applications in the market are required. As a result, few literature reviews are being conducted on current applications after studies and reviews by other academics or creators of mobile applications. Furthermore, the strengths of the mobile application must be considered and utilized, while the weaknesses and limitations must be addressed to improve or add new features. There are a few mobile applications that have been reviewed in a similar manner.

2.1 Review of Existing Systems/Applications

2.1.1 Premier League – Official App

Figure 2.1.1.1: Premier League – Official App Mobile Application

Premier League – Official App is a mobile application that is available on Google Play Store and Apple App Store. This mobile app is useful for the fans to view the match highlight, players' statistics, fixture, and others. The user manages to receive notification based on their favorite teams. Besides, each teams' match stats also provided so that the fans could make a comparison. The mobile application is powered by oracle cloud which provides wide range of service such as storage and servers. Other than that, the mobile application allows the user to manage their own fantasy team and compete against others all around the world. This feature is useful for the fans to adjust

their team weekly according to the players' performance [1]. There are also score points included based on the players' performance, for example goals, assists, clean sheets and others. There will be bonus points for those players who scores hat trick or man of the match. The developer introduces this app mainly because the users manage to create their favorite teams and compete with other fans. Users also can increase their management skill such as they need to manage their team every week so that the points they gain can as much compared to others.

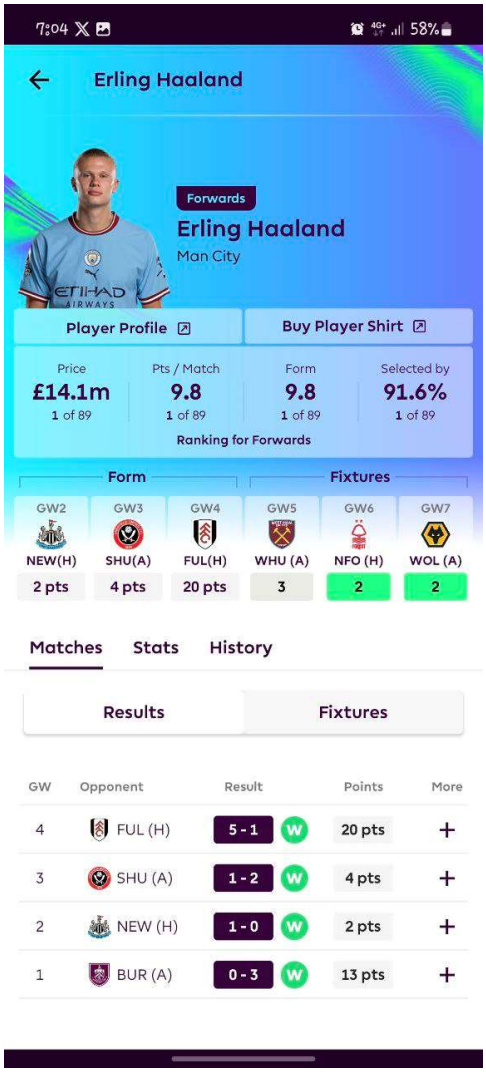


Figure 2.1.1.2

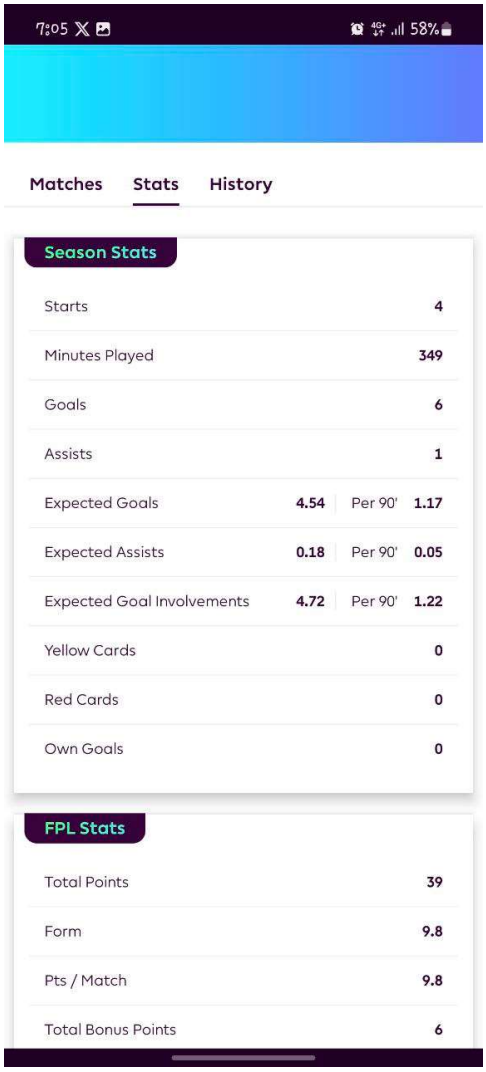


Figure 2.1.1.3

Figure 2.1.1.2 shows the overall statistics from a player while **Figure 2.1.1.3** shows more detailed statistics for a season such as starts, minutes played, goals scored and others.

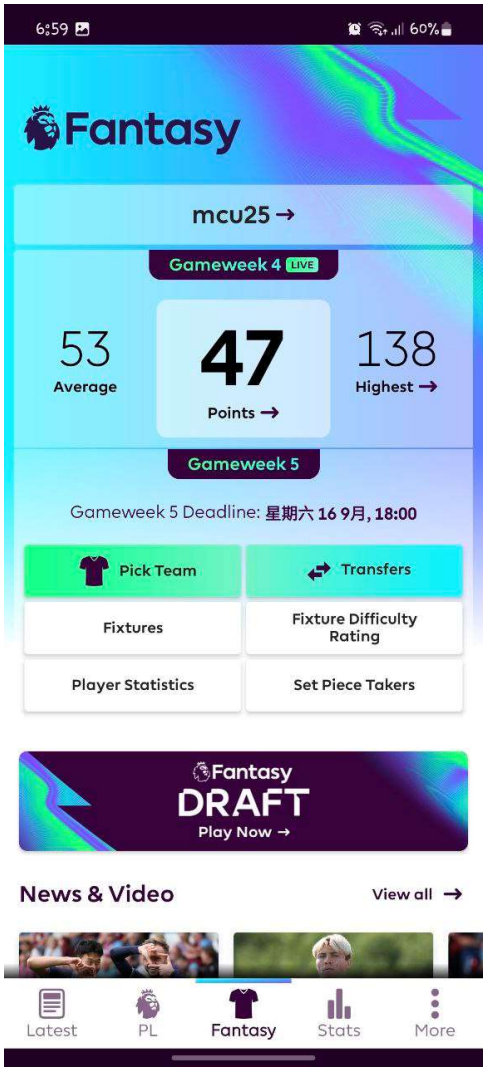


Figure 2.1.1.4

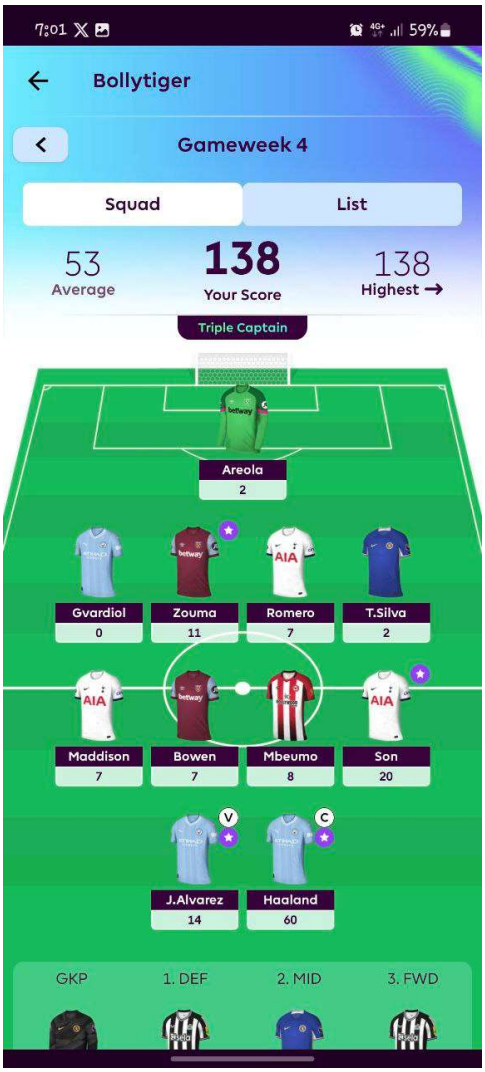


Figure 2.1.1.5

Figure 2.1.1.4 shows the fans' point based on the player selected while **Figure 2.1.1.5** shows the fan's squad that contain higher value and points. For example, the player selected has good performance so the point will also higher.

Strength of Premier League – Official App

The strength [5] is that the user manages to view the scores, latest news, video highlights, and manage their own team via Fantasy Premier League feature. They manage to compute with other fans around the world to show their ability to manage their team well through transfers. Besides, the mobile application could attract fans

due to the neat and tidy UI. It is easy for fans to search for certain features due to the features are listed well at each page.

Weakness of Premier League – Official App

The weakness of this mobile application is it may cause time-consuming problems due to users having to manage their team so that the points they earn will be higher compared to other fans. Next, the players' stats are difficult to view because the user needs to press in the player and the history button is small enough to find out. Furthermore, during high peak such as after some important match, the mobile application can be slow to load.

Ways to resolve the Weakness of Premier League – Official App

The mobile application may contain additional capabilities such as automated transfer to address time-consuming issues. The application can also have a notification function that users can access without needing to sign in. Users can pick whether they wish to modify their player or follow the statistics-based advice. The mobile application may then add a new tab to the homepage that displays player stats from the previous season. Fans must create comparisons to determine the overall performance. The tab might simply display goal scores, assists, clearance, and other information. Aside from that, the mobile application can save frequently used data using a capturing mechanism. It will help to alleviate the difficulty, especially during hectic periods.

2.1.2 SofaScore

Figure 2.1.2.1: SofaScore Mobile Application

SofaScore is a mobile application that is available on Google Play Store and Apple App Store. The application allows users to see the match around the world for example Malaysia, Germany, England, Spain, and others. The users can also change to their preferred language. Next, the SofaScore mobile application also provides real-time

updates and highlights after each match. The users can view the highlight if they miss the match from time to time. Besides, users can also view the lineup before the match. The mobile application also lists out the transfer player and enables the user to automatically click the notification button so that they won't miss any match. Other than personal statistics, the SofaScore mobile application also shows the overall statistics such as top player with the highest scoring rate, assists rate and others.

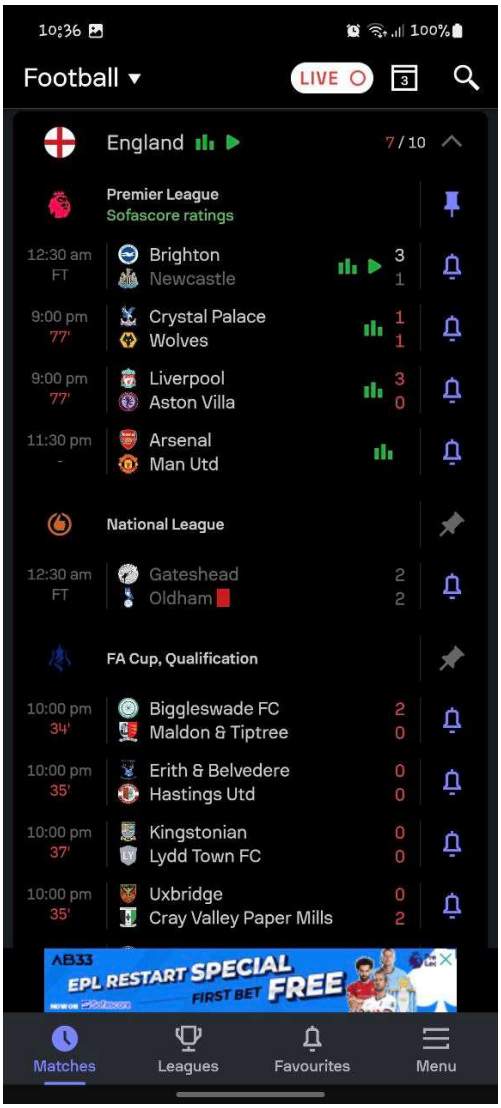


Figure 2.1.2.2

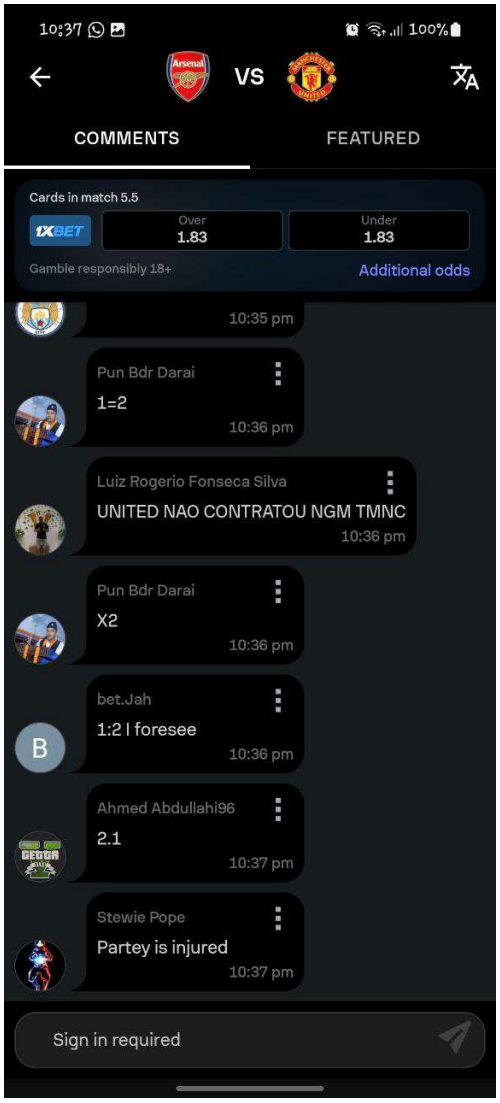


Figure 2.1.2.3

As Figure 2.1.2.2 showed, the main page of the mobile application is the match from different country and league. The mobile application provides live scores for all the matches and sports such as football, basketball and more. Users can also use the search features to search for the match that they wish to watch. If the user presses in the match, they can watch the stats from each team such as goal score, yellow and red card, substitute, and others. Next for **Figure 2.1.2.3**, users can talk with other fans around the world because SofaScore mobile application has chat features. Fans can exchange their comments and ideas before and during the match. This can increase the relationship between each other.

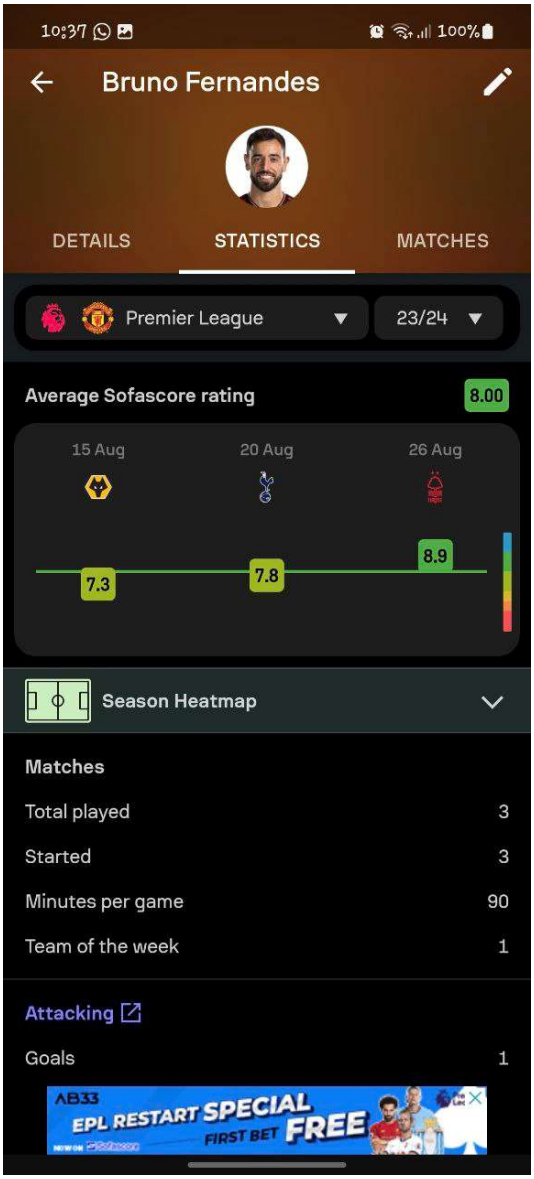


Figure 2.1.2.4

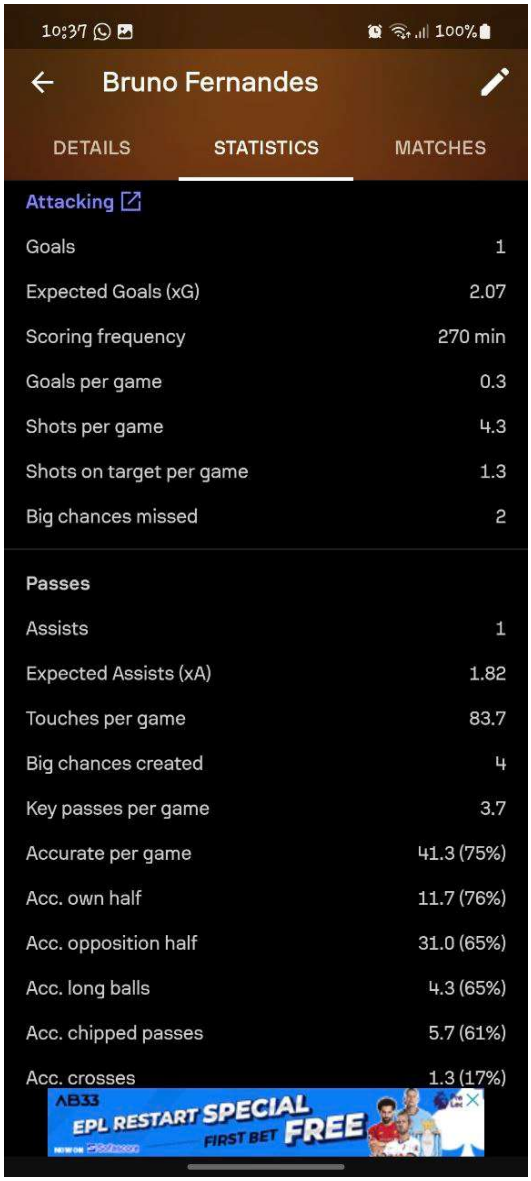


Figure 2.1.2.5

Based on **Figure 2.1.2.4 and 2.1.2.5**, if the user press on certain player, their statistics can be view such as match played, goals, passes, and others. Besides, user manage to see the player's strengths and weaknesses based on their position on the field. The SofaScore mobile application also rate the player based on their performance and the player has the opportunity to become one of the player of team of the week. Based on the statistics, user manage to know more about the ability of players.

Strength of SofaScore

The strength of SofaScore mobile applications is comprehensive coverage wide range of sports such as football, basketball, tennis, and others. The application also provides the statistics of the players. Besides, user may open the notification and choose to follow the match that they want to follow. The application also available in multiple language so that the user from different country able to use the application. Furthermore, the mobile application also allows users to follow their favourite team and player so that they can get the latest updates from time to time.

Weakness of SofaScore

The weakness of SofaScore mobile applications is data accuracy. There will be delay in updating the final scores especially important match. Besides, the user needs to automatically close the notification as the score may pop up earlier and affect the match experience of the user. The Chinese language is also the limitation for the mobile application as some of the team and player names does not contain Chinese language.

Ways to resolve the Weakness of SofaScore

To solve the data accuracy problems, is it a must to enhance the data validation and quality control processes. Next, developer may let the user choose when they first sign up or login to the mobile application whether enable or disable the notification. The developer may need to improve the user-friendly features such as focus on the side of language by hire translator to increase the efficiency.

2.1.3 Fantasy Football Manager (FPL)

Figure 2.1.3.1: Fantasy Football Manager (FPL) Mobile Application

Fantasy Football Manager (FPL) is a well-known and extensively played online fantasy football management game that has grown in popularity over time. FPL lets football fans take on the role of virtual manager, building and controlling their own football teams made up of actual Premier League players. The game is based on the actual performance of these players in Premier League matches, with FPL managers gaining points based on the real-life performance of their chosen players. The user needs to make decisions about the transfer and team selection as they need to decide who will be the starting 11.

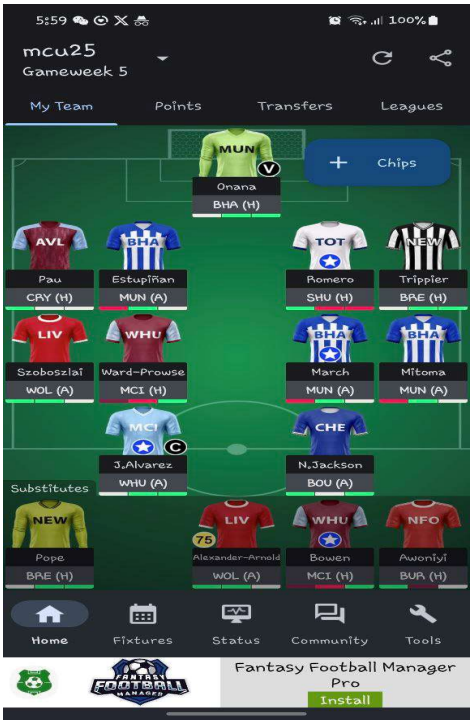
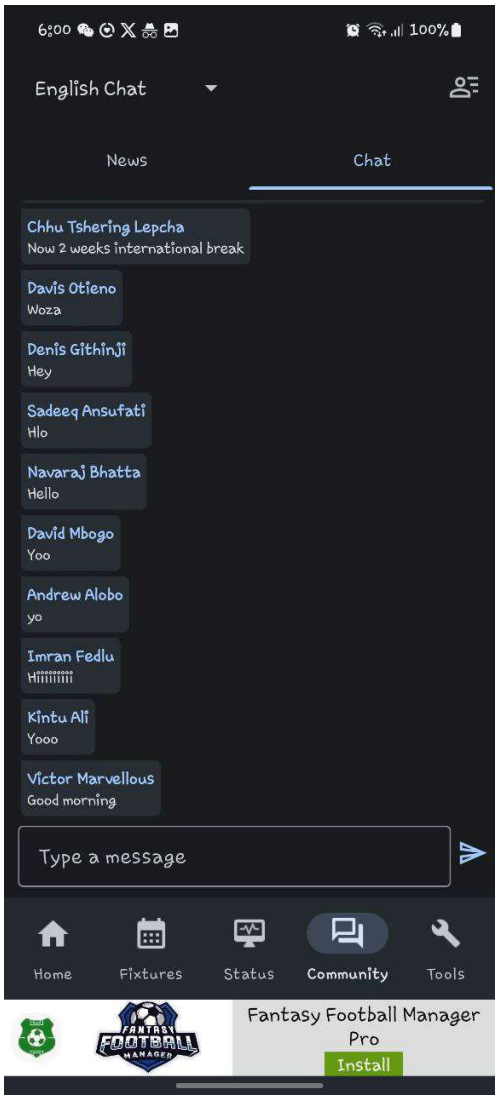


Figure 2.1.3.2

Figure 2.1.3.3

sed on **Figure 2.1.3.2** above, user manage to choose 15 players from the 18 premier league teams. Users need to choose the starting 11 players and captain. Users can transfer players who play well in live football matches to improve the teams. Besides, users could join the league or create their own to compete and chat with friends and other fans all around the world. For **Figure 2.1.3.3**, users manage to view the status of the game week such as points, transfers, and summary which contain the information of highest point of the week, most selected player of the week and others. This data is collected from users around the world.



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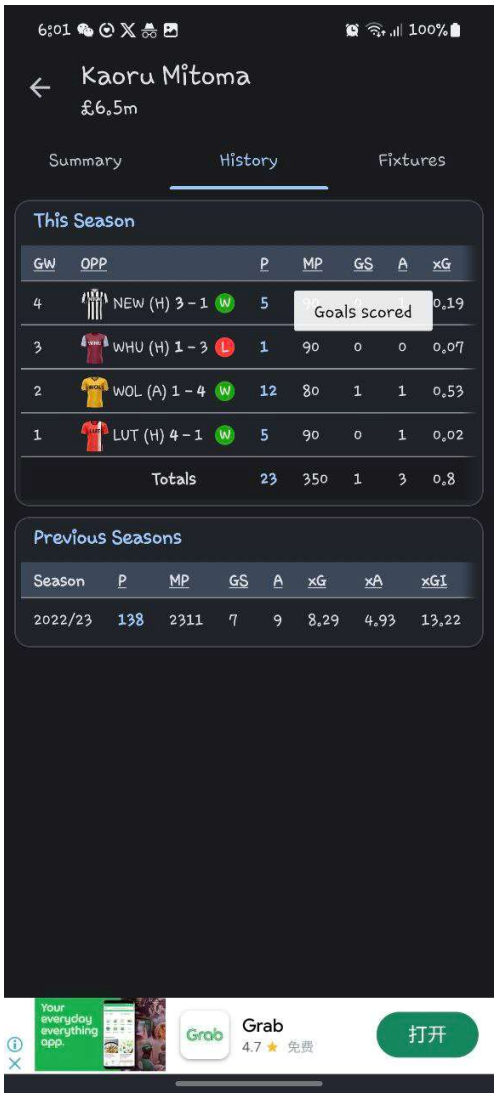


Figure 2.1.3.5

Figure 2.1.3.4 shows the community chat. When user click the chat button, the system allows them to choose whether to join English chat, global chat, or league invites. This

allows the user to communicate with others. Next, for **Figure 2.1.3.5**, it shows the player's statistics for the current season and previous season. For example, it will show the minutes played, goal scored, assists, expected goal and others. It will also show the value of players based on their performance so that the user manages to consider whether to make transfers.

Strength of Fantasy Football Manager (FPL)

One of the strengths of FPL is the wide variety of players available to choose from. It provides users with a variety of possibilities for squad composition. This enables players to form teams that represent their own interests and strategies. Another advantage of FPL is its real-time updates. Players may monitor their team's performance throughout the season and make improvements as needed. As a result, players must continuously adjust to the changing elevation of the EPL, which makes the game interesting and demanding. The competitive community is another strength of FPL. The app attracts millions of users from every corner of the world, creating a highly competitive environment. As users try to enhance their abilities and understanding of the EPL, this could serve as an outstanding motivation. Finally, FPL provides a range of game styles to accommodate the tastes of different participants. Players have the option of playing the most popular mode, and traditional mode. This helps players to discover which mode they prefer.

Weakness of Fantasy Football Manager (FPL)

Fantasy Football Manager's features and functionality are limited when it is using the free version as there are Fantasy Football Manager Pro which costs some money to purchase. The Fantasy Football Manager Pro users will be free from ads and unlimited transfers. Besides, the pro version allows the user to create their own private league rather than public league. Other than that, Fantasy Football Manager Pro (FMMP) gives access to advanced statistics that are not available in FMM. These statistics can help to

better understand player performance and make more informed decisions about the team. Furthermore, FMMP allows users to chat with other players in their league. This is a great way to get advice, discuss strategies, and build relationships with other players.

Ways to resolve the Weakness of Fantasy Football Manager (FPL)

We can think about implementing reasonable transfer limitations, fundamental player statistics, and an intuitive community forum to Fantasy Football Manager's (FMM) free version to make it better. Private leagues and complex statistics can remain Pro-only features. To encourage users to make the switch, we can highlight the benefits associated with becoming a Pro user and from time to time provide incentives or free trials. This approach will keep users intrigued by the free version while urging them to make the switch to the Pro version for more features.

2.1.4 Manchester United Official App

Figure 2.1.4.1: Manchester United Official App Mobile Application

This mobile application is available on Google Play Store and Apple App Store. The aim of the application is to bring closer the distance between the fan and the club. The mobile application allows fans of the English football club Manchester United to stay up to date with the latest news, scores, and videos. The users can view the live news updates about the club and players. For example, club statement on a player. The mobile application also shows the live scores and previous score for the fans to view include Premier League, FA Cup, UEFA Champions League, English League Cup, and others.

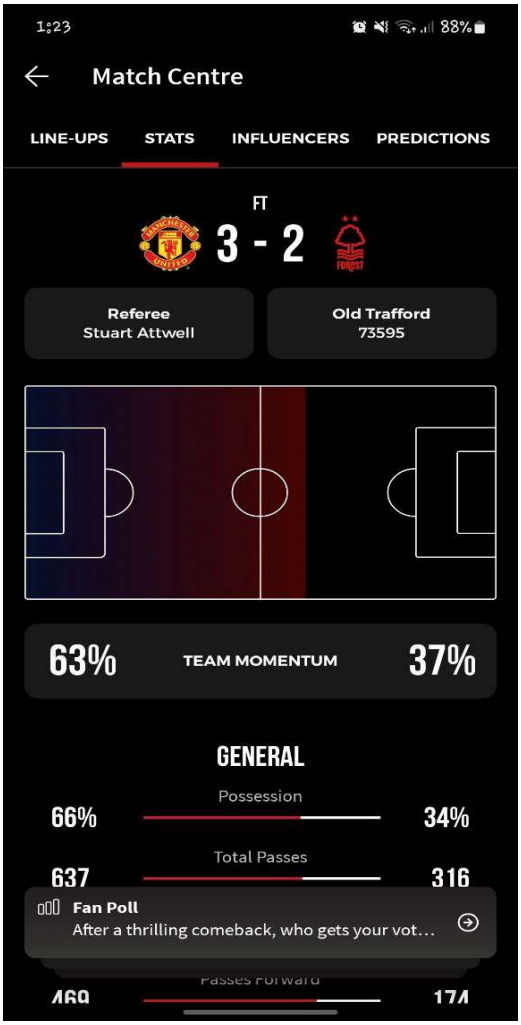
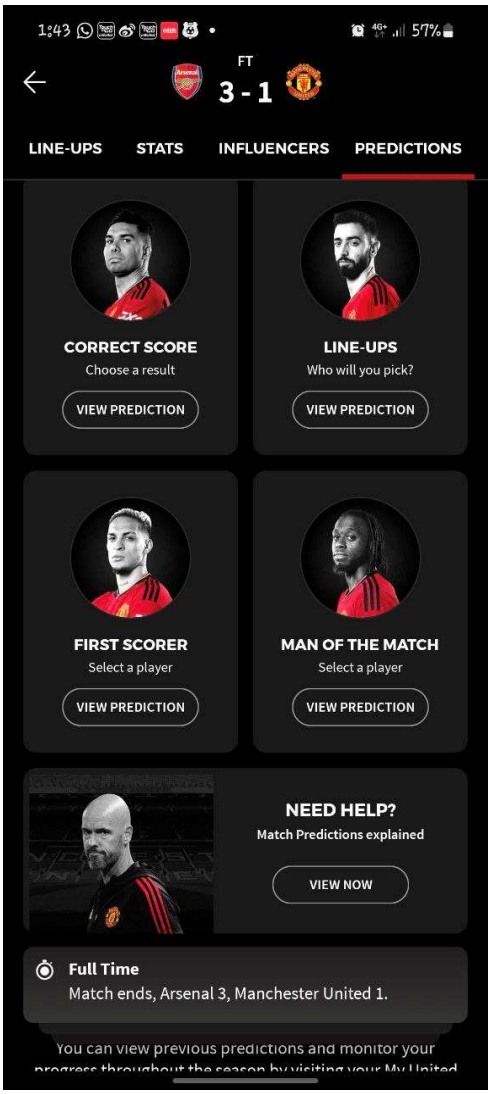


Figure 2.1.4.2

Figure 2.1.4.3

Figure 2.1.4.2 shows the Match Centre for all the club's matches. For example, the figure shows the stats between Manchester United and their opponent, Nottingham Forest. The mobile application showed the team momentum, general, attacking, and other statistics between two clubs. The statistics are provided by Opta, for example the chance created, crosses, forward passes, and others. Opta is a source that specializes in supplying data that is recorded in real time. For **Figure 2.1.4.3**, it shows that the fans able to vote the man of the match that created by the system. This shows that it is a user-friendly application that fans manage to provide their opinions and reviews.



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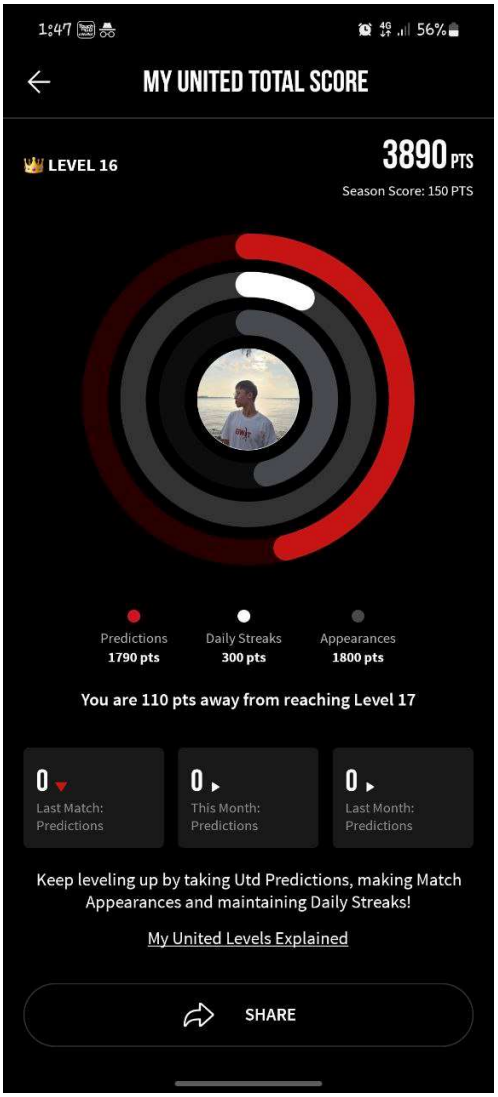


Figure 2.1.4.5

Figure 2.1.4.4 show that fans able to predict the score, line-ups, first scorer and man of the match before the match started. There will be prediction score after the match to show the accuracy of prediction. **Figure 2.1.4.5** shows the total score for a fan. For example, the total score shown is 3890 points while the season score is 150 points. These points gain from prediction, daily streaks, and appearances. The appearance gives the meaning of the fan had successfully open the app on 120 matchdays.

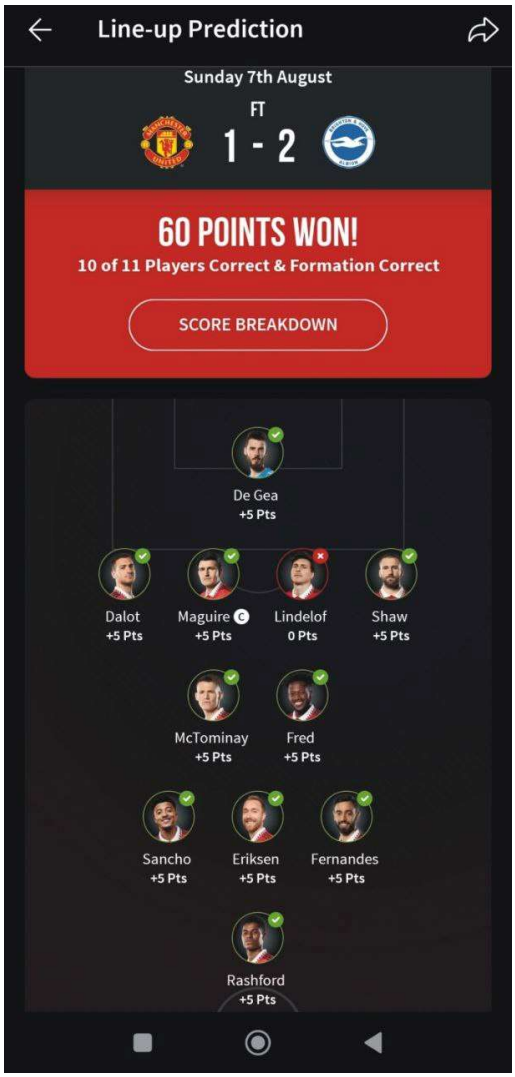


Figure 2.1.4.6

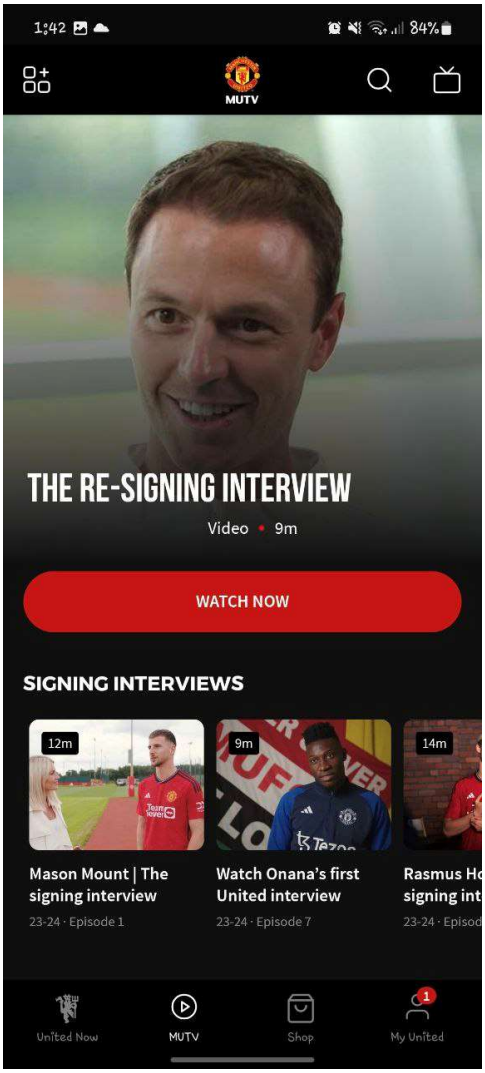


Figure 2.1.4.7

Figure 2.1.4.6 shows that the fan manages to predict the line-up before the match and a higher score will be gained if the prediction is like the real formation. It is an interesting interaction between fans and the official application as players need to think about the decision of the coach based on the players' performance when they are training. Next, **Figure 2.1.4.7** shows that the club provided video of interviews, classic matches, news, and others for the fans to watch through MUTV, which is a premium channel operated by the club. Other than that, the application also shows players' data from the first team until under-18 and legends. The application also has a shop which will link to the official website if the user wants to make any purchase.

Strength of Manchester United Official App

The strength of the Manchester United Official App is its capacity to provide supporters with real-time updates, ensuring that they are kept up to speed on the most recent news and game results. Additionally, the app includes unique content that isn't available anywhere else, such interviews and behind-the-scenes videos that give fans a fascinating look at the team. The matchday experience is improved by the live match broadcast and interactive elements, such as polls and quizzes, which help to build a feeling of community among fans. Other than that, the mobile application also provides a live match centre for all the club's matches with players' statistics. This allows the fans to make decisions about their vote toward the man of the match.

Weakness of Manchester United Official App

The weakness of the Manchester United Official App is the fans unable to watch the team's live match through the app while they need to use the third parties. The mobile application will experience crashes if many users use the application at the same time such as an important match. Besides, the Chinese version and English version of application are different from players to match preview. For example, the new signing may not appear on players list of Chinese versions. Furthermore, the playback of a match will not function sometime as it will only appear the sound. This may be due to the bug problem.

Ways to resolve the Weakness of Manchester United Official App

For live matches, the app should secure streaming rights or communicate with third-party streaming providers, enhance server capacity to prevent problems, synchronize material across language versions, and fix playback faults via regular updates and user input integration. These changes would considerably improve the Manchester United Official App's general operation and dependability.

2.1.5 Flashscore

Figure 2.1.5.1: Flashscore Mobile Application

This mobile application is available for download on both the Google Play Store and Apple App Store. It is a trusted source for live results, broad statistics, breaking news, and an abundance of information spanning numerous sports from all over the world, with a particular focus on football and basketball. Users may also personalize their experience by configuring notifications, which include features such as vibration and more. Aside from that, the app offers a handy dark mode feature which enables it to be used at night or in low-light circumstances. Language variation is additionally emphasized since the software supports different languages with the goal of reaching a global audience. A FAQ section is also accessible for user convenience, offering clear answers to frequently asked questions and supporting users in learning more about the application. Finally, the app encourages user involvement by allowing users to provide feedback, ensuring constant enhancement and rapid resolution of any problems encountered while using the app.

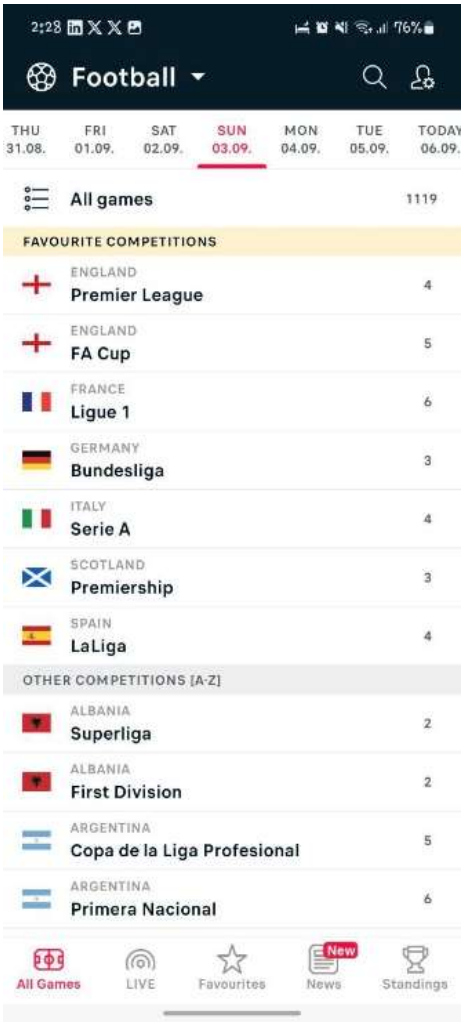


Figure 2.1.5.2

Figure 2.1.5.3

Figure 2.1.5.2 show the home page of the Flashscore mobile application. Users can choose their preferable sport by clicking the top left corner drop down menus such as football, basketball, and others. The user manages to search the matches all around the world and view the statistics as shown in **Figure 2.1.5.3**. besides, there will be a search bar to let the user to search for specific team, matches, and players' information.

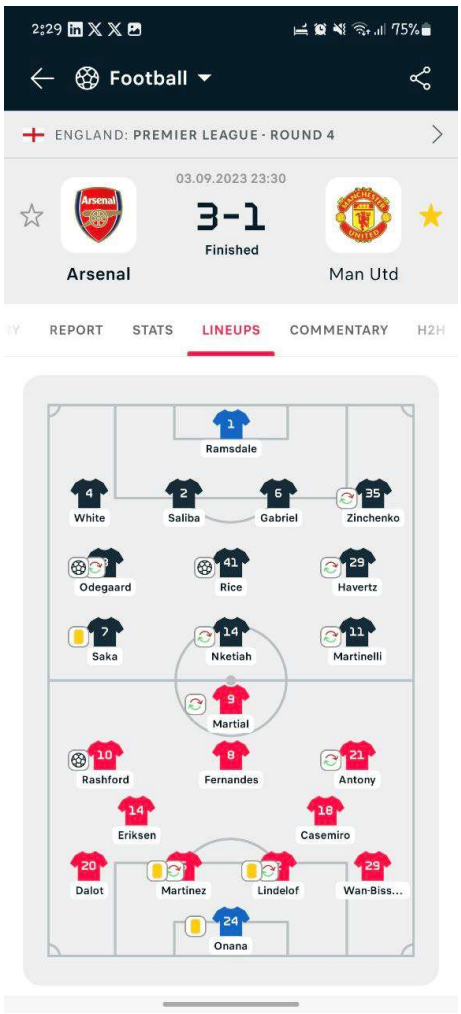


Figure 2.1.5.4

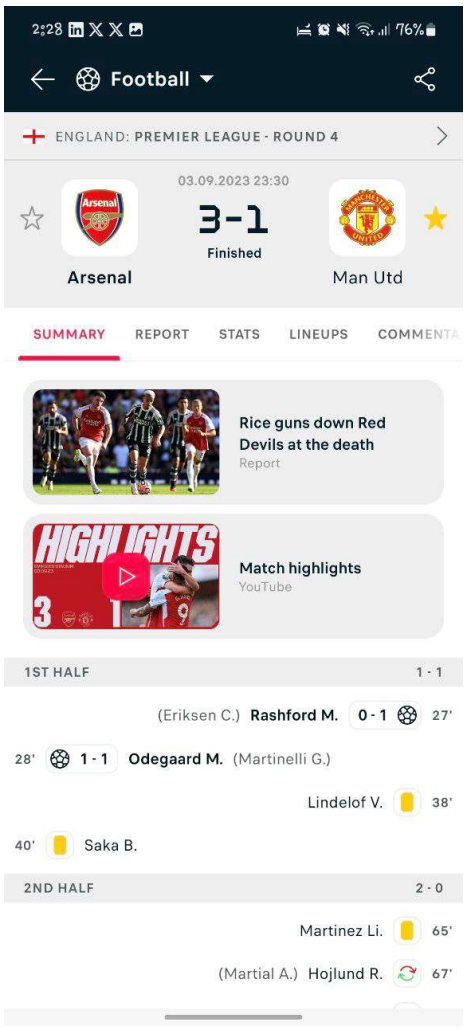


Figure 2.1.5.5

As shown in **Figure 2.1.5.4**, users acquire accessibility to several real-time match information, including a particular emphasis on player statistics such as yellow cards. In addition, the application enhances the user experience by offering comment filtering options, which allow users to limit their view to only the most significant updates. These brief overviews cover crucial occurrences such as player substitutions, goal scorers, and other significant situations, all given with a clear timeline for quick reference. This feature ensures users are not only kept up to date on the details of the line-up but also receive a detailed analysis of the critical moments as they occur. Moving on to **Figure 2.1.5.5**, it displays a detailed match report that improves the user's knowledge of the game. Users may view match highlights, full statistics for both the first and second halves, and relevant news updates in this section. Moreover, the gives

useful match statistics, such as attendance data, which provide context and depth to the entire match experience. **Figure 2.1.5.5** acts as a hub for important post-match observations, increasing the user's engagement with the sports event.

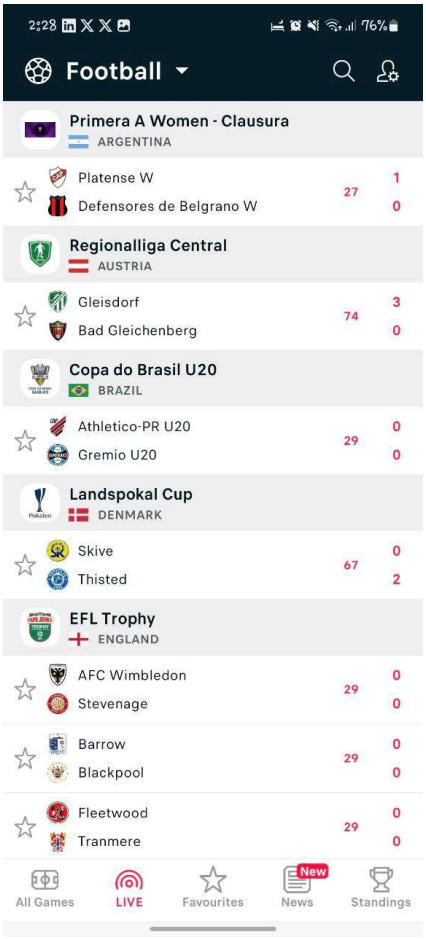


Figure 2.1.5.6

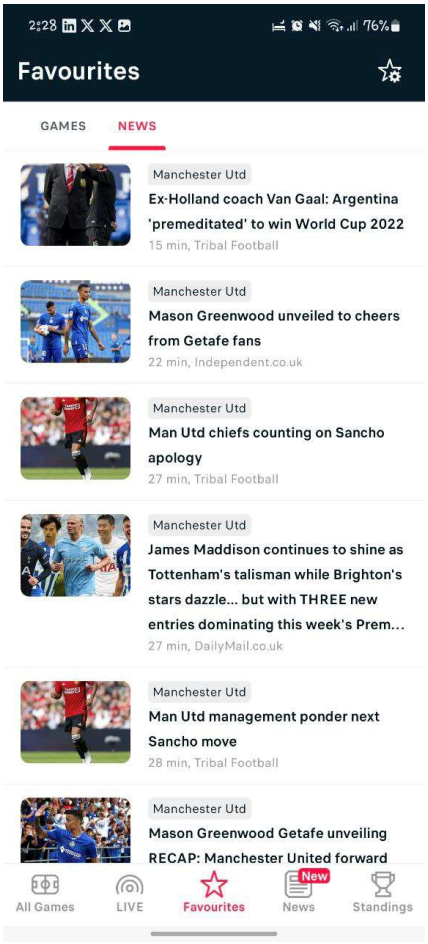


Figure 2.1.5.7

Figure 2.1.5.6 illustrates the outstanding characteristics of the Flashscore mobile application, which allows users to immerse themselves in the excitement of live sports contests. The application enables users to conduct searches for real-time scores, analyse entire player statistics, and receive instant notifications on critical game situations. The user-friendly system offers easy access, allowing fans to easily switch between events and obtain the information they want, making it a great resource for anybody seeking deep insights during live sports action. **Figure 2.1.5.7** on the other hand, shows the application's personalization feature, which allows users to modify their sports experience. By choosing one of their favourite sports teams within the app, users may

have access to a world of personalized data. The app collects and sends team-specific data such as match previews, analysis, transfer updates, and injury reports. This personalization improves the user experience by connecting fans to the teams and players they concern about.

Strength of Flashscore

Flashscore's ability to provide real-time sports updates across a wide range of sports is an outstanding strength. The program specializes in giving real-time scores along with comprehensive information for a wide range of sports, including football, basketball, tennis, and many more. This extensive coverage includes various leagues and tournaments from across the world, making it easy for those who love sports to obtain information on their favourite teams and events. The app's user-friendly interface enhances the user's experience significantly, making it accessible to both casual and die-hard sports fans. Furthermore, users may customize their experience by selecting their preferred teams or sports and receive personalized notifications and updates. Furthermore, its worldwide assistance makes it a global go-to source for sports news.

Weakness of Flashscore

Flashscore has numerous significant weaknesses. One of the primary concerns is the possibility of an excessive number of advertisements within the app. Excessive advertising may disturb the user experience, causing it to be difficult to navigate and take in real-time sports updates. A further limitation is the app's dependency on an internet connection, which makes it less helpful while not connected. When connectivity is unstable or absent, users may find it hard to access sports scores and updates. Furthermore, Flashscore may lack extensive history data and match records, limiting its significance for individuals seeking in-depth sports analysis or study.

Ways to resolve the Weakness of Flashscore

To overcome these weaknesses, Flashscore may optimize ad placement and frequency, as well as provide a premium ad-free edition. Next, an offline option should be offered, as well as a history data area for in-depth research. Encouragement of feedback from users and the implementation of premium memberships with additional functions can increase satisfaction and revenue. Optimizing data use is also essential to accessibility. Despite fixing problems, these steps will enhance the user experience and keep

Flashscore as the trusted source for real-time sports information and data.

Chapter 3 System Methodology / Approach

3.1 System Design Diagram/Equation

3.1.1 Overview of Agile SDLC Methodology

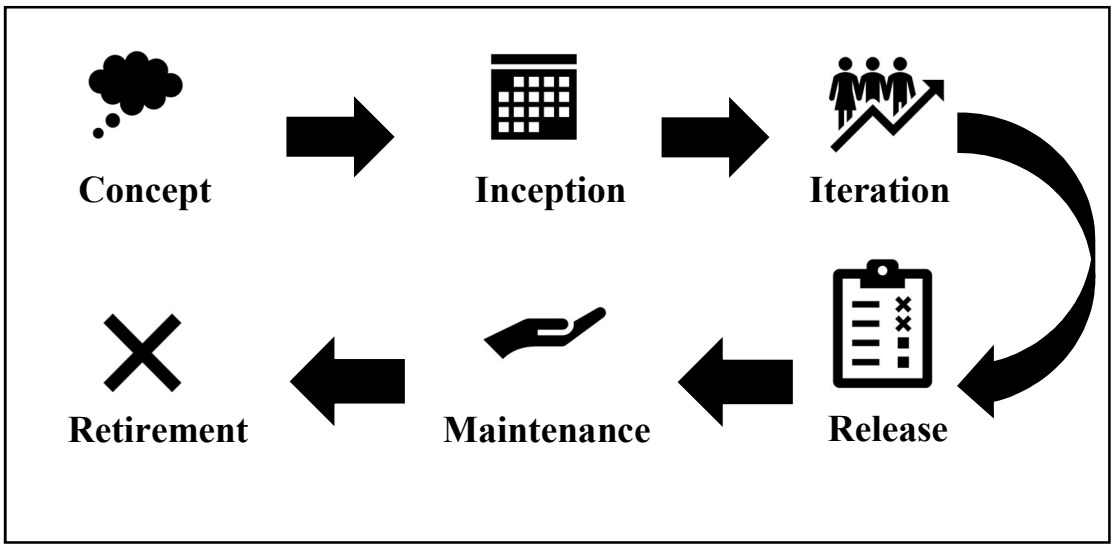


Figure 3.1.1.1: Agile Software Development Life Cycle (SDLC)

The Fans-Driven (Football) Player Rating System mobile application was developed using the Agile Software Development Methodology because of its built-in flexibility to adjust to frequent changes, such as user input, market developments, and other factors. Furthermore, the potential for users to switch to rival apps, making the existing one outdated even with continuous maintenance, underlines the importance for a flexible approach that can act quickly in response to changing conditions. The stage of Agile Software Development Life Cycle are concept, inception, iteration, release, maintenance, and retirement.

Agile Software Development

1. **Concept**

The initial stage of mobile application development, known as the Concept phase, focuses on creating a platform where fans can actively engage with their favorite players and immerse themselves in the excitement of matches by making score predictions and participating in various activities. Additionally, the app aims to foster stronger connections among fans through features like feedback and chat. Therefore, it

is crucial to develop a mobile application that effectively captivates fans, encourages ongoing usage, and consistently meets their expectations.

2. Inception

During the Inception phase, the focus lies on defining the comprehensive set of features to be incorporated into the Fans-Driven (Football) Player Rating System mobile application. The main purpose of the app is to make it possible for fans to rate players based to their performances on the pitch. Additionally, it's crucial to establish timelines that consider the workload and complexities associated with implementing various features. This strategic approach ensures that development efforts are efficiently managed, with adequate time allocated for more challenging features. Furthermore, identifying necessary hardware, software, and tools during this phase lays the foundation for a smooth development process. This precise planning sets the stage for effective execution and timely delivery of the mobile application.

3. Iteration

This stage is mainly the development stage as the timelines is being created. Developers need to follow the timelines to complete the development of mobile applications in time. Besides, the developers need some feedback from others during the development so that any new features can be immediately implemented into the code and run it so that it won’t affect the release time as promised. Developers need to always stand in the users view so that he or she manage to create a user-friendly mobile application and provide the user a comfortable platform to use the application. This stage will take longer duration due to coding part and debug time. Besides, any new features and idea will be implemented into the mobile application during this phase.

4. Release

Before releasing the mobile application to the public, internal developers conduct thorough testing to identify and resolve any bugs, ensuring the application is polished and fully functional. Additionally, feedback is gathered from selected app testers to promptly address any issues and ensure a smooth user experience. If new ideas surface during this phase, there's a possibility of revisiting the Agile Software Development Life Cycle to incorporate these innovations.

5. **Maintenance**

Maintaining an outstanding user interface requires frequently updating the current version of the application for mobile devices, which includes fixing any bugs. Maintaining the application's smooth and efficient operation requires this continuous approach. Through user input, developers may make the required adjustments to improve the usability and efficiency of the app over time.

6. **Retirement**

The Inception phase typically arises when a new software emerges in the market, offering enhanced features and greater user engagement. Subsequently, the existing application faces strong competition and may need to be replaced. Despite the developer's decision to shut down the software, it's crucial to carefully consider the process, as some users may still be around in using it. This takes a helpful approach to managing the transition and ensuring minimal disruption for remaining users.

3.1.2 System Architecture Diagram

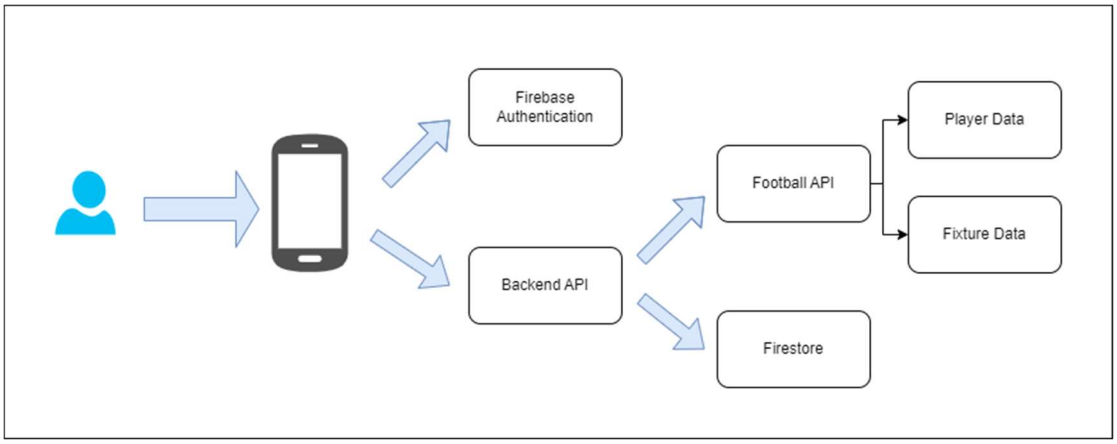


Figure 3.1.2.1: System Architecture Diagram for Fans-driven (football) Player Rating System

The architecture for fans-driven football player rating system mobile application is centred around a user interacting with a mobile device. The app utilizes Firebase Authentication for email and password-based user login, providing secure and

personalized access. The app integrates with a Backend API and Football API to process data and fetch current player and fixture information. Firestore serves as the primary database, storing user-generated content including player ratings, feedback, match predictions, users' best 11 team selections, and leaderboard data.

This architecture enables a rich, interactive experience where authenticated users can rate players, offer feedback, predict match outcomes, and create their ideal team lineups. The Backend API combines fresh football data from the external Football API with user-generated content from Firestore, presenting up-to-date and personalized information. The leaderboard feature, also stored in Firestore, adds a competitive element by ranking users based on their engagement and prediction accuracy, fostering increased user participation within the app.

3.1.3 Use Case Diagram

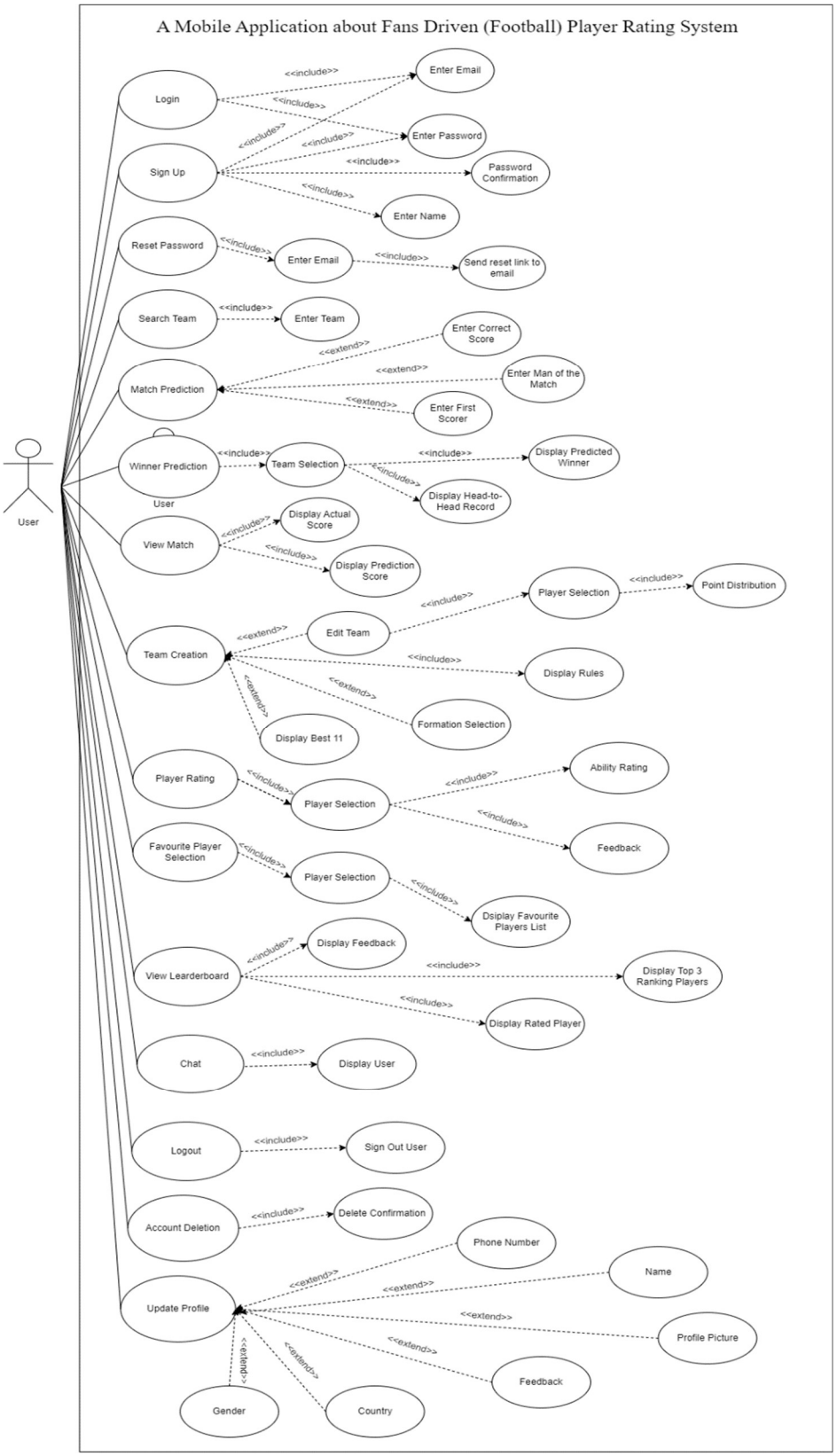


Figure 3.1.3.1: Use Case Diagram for Fans-driven (football) Player Rating System

3.1.4 Use Case Description

Table 3.1.4.1: Use Case of Login

Use Case ID	UC001	Version	1.0
Feature	F001 Login		
Purpose	To authenticate the user before login into the home page.		
Actor	User		
Trigger	User launch the Fans Driven (Football) Player Rating System.		
Precondition	Account exists in the system and not logged in.		
Scenario Name	**Step**	**Action**	
Main Flow	1	Users fills in the email and password.	
	2	Users click the “Remember Me” box.	
	3	Users clicks on the “Login” button.	
	4	System validates whether the account exists, which include the accuracy of the email and password.	
	5	System redirect user to the home page.	
Alternate Flow – Invalid Email	4.1.1	User inputs invalid email.	
	4.1.2	System validates user email and password.	
	4.1.3	System displays error message “Failed to sign in”.	
Alternate Flow – Invalid Password	4.2.1	User inputs invalid password.	
	4.2.2	System validates user email and password.	
	4.2.3	System displays error message “Failed to sign in”.	
Alternate Flow – Email is empty	4.3.1	User did not input the email.	
	4.3.2	System validates user email and password.	
	4.3.3	System displays error messages “Please enter your email”.	
Alternate Flow – Password is empty	4.4.1	User did not input the password.	
	4.4.2	System validates user email and password.	
	4.4.3	System displays error messages “Please enter your password”.	
	4.5.1	User did not click the “Remember Me”.	
	4.5.2	System validates user email and password.	

Alternate Flow – Miss of clicking "Remember Me"	4.5.3	System displays error messages "Please agree to remember me".
Rules	-	
Author	Lee Ming Wei	

Table 3.1.4.2: Use Case of Sign Up

Use Case ID	UC002	Version	1.0
Feature	F002 Sign Up		
Purpose	To allow new user to create account before using the mobile application.		
Actor	User		
Trigger	Users click the "Sign Up" button.		
Precondition	Account does not exist in the system.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User fill in the name.	
	2	User fill in the email.	
	3	User fill in the password.	
	4	User fill in the confirm password.	
	5	User click the "Sign Up" button.	
	6	System validates all the information that the user entered.	
	7	System redirect user to the home page.	
Alternate Flow – Username is empty	6.1.1	User did not enter the name.	
	6.1.2	System validates all the information that the user entered.	
	6.1.3	System displays error message "Please enter Name".	
Alternate Flow – Email is empty	6.2.1	User did not enter the email.	
	6.2.2	System validates all the information that the user entered.	
	6.2.3	System displays error message "Please enter Email".	

Alternate Flow – Password is empty	6.3.1	User did not enter the password.
	6.3.2	System validates all the information that the user entered.
	6.3.3	System displays error message “Please enter Password”.
Alternate Flow – Confirm Password is empty	6.4.1	User did not enter the Confirm password.
	6.4.2	System validates all the information that the user entered.
	6.4.3	System displays error message “Please enter Confirm Password”.
Alternate Flow – Email is invalid	6.5.1	User input invalid email.
	6.5.2	System validates all the information that the user entered.
	6.5.3	System displays error message “The email address is badly formatted”.
Alternate Flow – Password is invalid	6.6.1	User input invalid password.
	6.6.2	System validates all the information that the user entered.
	6.6.3	System displays error message “Password should be at least 6 characters”.
Alternate Flow – Confirm Password didn’t match with the password	6.7.1	User input different password for the confirmation password.
	6.7.2	System validates all the information that the user entered.
	6.7.3	System displays error message “Passwords do not match”.
Rules	-	
Author	Lee Ming Wei	

Table 3.1.4.3: Use Case of Reset Password

Use Case ID	UC003	Version	1.0
Feature	F003 Reset Password		
Purpose	To allow the user to reset password if they forgot the password.		
Actor	User		
Trigger	User click the “Forgot Password?” in the Sign in Page.		
Precondition	User successfully reset the password and redirect to home page.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User fill in the email address.	
	2	User click the reset password button.	
	3	System validates the email address input by the user.	
	4	System prompts a message “password reset email sent. Please check your inbox”.	
	5	System activate Google Firebase Authentication Service.	
	6	Google Firebase Authentication Service generate a link and send to user’s email account.	
	7	User press the link in their email account and redirect to a pop-up page.	
	8	Systems request user to enter new password.	
	9	User enter new password and press save button get the request to change password and approve.	
	10	User being notify “Password changed. You can now sign in with your new password”.	
	11	User enter the email and new password in sign in page.	
	12	System redirect user to the home page.	
Alternate Flow – Invalid email	3.1.1	User enter invalid email address.	
	3.1.2	System displays error message “Please enter a valid email address”.	

Alternate Flow – Invalid Password	7.1.1	Admin input the invalid password which the character is less than 6.
	7.1.2	System displays error message “The password must be at least 6 characters long”.
Rules	-	
Author	Lee Ming Wei	

Table 3.1.4.4: Use Case of Update Profile

Use Case ID	UC004	Version	1.0
Feature	F004 Update Profile		
Purpose	To update the user personal information.		
Actor	User		
Trigger	User click the update profile page and edit the information.		
Precondition	User successfully update the profile.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User update the profile picture.	
	2	User update the name.	
	3	User update the country.	
	4	User update the phone number.	
	5	User update the gender.	
	6	User provide the feedback.	
	7	User press the update profile button.	
	8	System validates all the information that the user entered.	
	9	System displays “Profile Updated Successfully !”.	
Alternate Flow – Invalid phone number	4.1.1	User input the invalid phone number,	
	4.1.2	System displays error message “Please enter a valid phone number”.	
Rules	-		
Author	Lee Ming Wei		

Table 3.1.4.5: Use Case of View Match

Use Case ID	UC005	Version	1.0
Feature	F005 View Match		
Purpose	To view the result of a match.		
Actor	User		
Trigger	User click the result to view the result of the match.		
Precondition	User successfully view the match result and compare with the predict result.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User can search the match based on the team.	
	2	User view the result of the match and compare with the predicted result.	
Rules	-		
Author	Lee Ming Wei		

Table 3.1.4.6: Use Case of Match Prediction

Use Case ID	UC006	Version	1.0
Feature	F006 Match Prediction		
Purpose	To predict the score, man of the match and first scorer.		
Actor	User		
Trigger	User click the predict match button to predict the match.		
Precondition	User successfully predict the result and wait the actual result to make comparison.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User press the predict button.	
	2	User edit the predicted correct score.	
	3	User edit the predicted first scorer.	
	4	User edit the predicted man of the match.	
	5	User press the submit prediction button.	
	9	System displays “Prediction submitted successfully !”.	

	10	System redirect user to the home page.
	11	System changes the unpredicted status to predicted status.
Rules	-	
Author	Lee Ming Wei	

Table 3.1.4.7: Use Case of Winner Prediction

Use Case ID	UC007	Version	1.0
Feature	F007		
Purpose	To predict the match winner based on head-to-head record.		
Actor	User		
Trigger	User click the two-team prediction button.		
Precondition	User successfully view the predicted winner by the system.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User click the two-team prediction button.	
	2	User select the team that want to be predicted.	
	3	User click the predict button.	
	4	System redirect user to the predicted winner page.	
	5	System shows the predicted winner.	
	6	System shows the head-to-head record of the two team that being selected.	
Alternate Flow – Failed to select team	2.1.1	User failed to select the team for winner prediction.	
	2.1.2	System displays error message “Please select both teams”.	
Rules	-		
Author	Lee Ming Wei		

Table 3.1.4.8: Use Case of Formation Selection

Use Case ID	UC008	Version	1.0
Feature	F008 Formation Selection		
Purpose	To select the formation to build the team.		

Actor	User	
Trigger	User click the drop-down list to choose the formation.	
Precondition	User successfully change the formation.	
Scenario Name	**Step**	**Action**
Main Flow	1	User click the drop-down list to choose the formation.
	2	System displays pop out message for formation changing confirmation.
	3	User confirm the changing of formation.
	4	System changes the formation and display message “formation changed. Please select your team again”.
Rules	-	
Author	Lee Ming Wei	

Table 3.1.4.9: Use Case of Starting 11 Page

Use Case ID	UC008	Version	1.0
Feature	F008 Starting 11 Page		
Purpose	To view the lineup of both team of a fixture.		
Actor	User		
Trigger	User click the view starting 11 buttons.		
Precondition	User successfully view the lineup for both teams.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User click the view starting 1 button.	
	2	System redirect user to show fixtures pages.	
	3	User select the fixtures.	
	4	System redirect user to match detail pages.	
Rules	-		
Author	Lee Ming Wei		

Table 3.1.4.10: Use Case of Team Creation Page

Use Case ID	UC009	Version	1.0

Feature	F001 Team Creation Page	
Purpose	To create the users' best starting 11.	
Actor	User	
Trigger	User click the team creation page and click on formation button.	
Precondition	User successfully create their best 11 players.	
Scenario Name	**Step**	**Action**
Main Flow	1	User click and change the formation.
	2	System request user to confirm the changes.
	3	User press the edit button.
	4	User choose the player by searching their name in the search bar.
	5	System verifies the point whether reach the maximum point.
	6	User press the done button.
	7	User press the save team button.
	8	System saved the user selection into the firebase.
Alternate Flow – Exceed point limit	5.1.1	User select the player from the player pool based on the position.
	5.1.2	System disallows the user to continue select the player if the point will exceed the limit.
Rules	-	
Author	Lee Ming Wei	

Table 3.1.4.11: Use Case of View Starting 11

Use Case ID	UC0010	Version	1.0
Feature	F010 View Starting 11		
Purpose	To view the starting 11 and the substitution.		
Actor	User		
Trigger	User click the team creation page and click on view starting 11 buttons.		

Precondition	User successfully view the lineups when they click on specific fixtures.	
Scenario Name	**Step**	**Action**
Main Flow	1	User enter the team creation page.
	2	User click on the view starting 11 buttons.
	3	System request user to search for the fixtures they want to view the lineup.
	4	User clicks on the fixtures.
	5	System displays the lineup for both teams,
Alternate Flow – Matches not yet started	4.1.1	User click the match that not yet started.
	4.1.2	System displays error message “Lineup Not Available” and request user to wait for the match to start.
Rules	-	
Author	Lee Ming Wei	

Table 3.1.4.12: Use Case of View Best 11

Use Case ID	UC011	Version	1.0
Feature	F011 View Best 11		
Purpose	To view the best 11 player chosen by the user.		
Actor	User		
Trigger	User click the team creation page and click on view best 11 buttons.		
Precondition	User successfully view the best 11 and other player that being chosen by the users.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User enter the team creation page.	
	2	User click on the view best 11 buttons.	
	3	System displays the best 11 of the day which include the top 11 and all players.	
Rules	-		

Author	Lee Ming Wei

Table 3.1.4.13: Use Case of View Leaderboard

Use Case ID	UC012	Version	1.0
Feature	F012 View Leaderboard		
Purpose	To view the top 3 players, list of players and the feedback that rate by users.		
Actor	User		
Trigger	User view the leaderboard to see the players that rate by other users.		
Precondition	User manage to view the leaderboard.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User click the ranking pages.	
	2	System redirect user to leaderboard tab.	
	3	System requests the admin to input his/her username.	
Rules	-		
Author	Lee Ming Wei		

Table 3.1.4.14: Use Case of Player Rating

Use Case ID	UC013	Version	1.0
Feature	F013 Player Rating		
Purpose	To rate the player based on their performance on the pitch.		
Actor	User		
Trigger	User click the player rating tab and select the player to rate.		
Precondition	User successfully rate the player and the rating being save to firebase.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User press the player rating tab in the ranking pages.	
	2	System requests user to select the players.	
	3	User select the player for rating purpose.	
	4	System redirect user to player rating pages.	

	5	System request user to rate the player based on dribbling, passing, teamwork, attitude, shooting and assists.
	6	User rate the player based on dribbling, passing, teamwork, attitude, shooting and assists.
	7	User enter the feedback.
	8	User press the submit rating button.
	9	Systems save the data into the firebase and show the result in the leaderboard.
	10	System displays “Login Successfully !”.
	11	System redirect user back to player selection page.
Rules	-	
Author	Lee Ming Wei	

Table 3.1.4.15: Use Case of Favourite Player Selection

Use Case ID	UC014	Version	1.0
Feature	F0014 Favourite Player Selection		
Purpose	To select the users’ favourite player.		
Actor	User		
Trigger	User press the select favourite player button.		
Precondition	User successfully select his/her favourite player.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User press the select favourite player button.	
	2	System requests user to choose the player.	
	3	User choose his/her favourite player.	
	4	System display message “player added to favourite!”.	
	5	Player chosen being save in the firebase.	
	6	System shows the favourite player in the list.	
Rules	-		
Author	Lee Ming Wei		

Table 3.1.4.16: Use Case of Chat Page

Use Case ID	UC015	Version	1.0
Feature	F015 Chat Page		
Purpose	To let the users manage to communicate to each other.		
Actor	User		
Trigger	User enter the chat page by select the user to start chatting.		
Precondition	Users successfully to chat with each other.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User select the other user that he/she wishes to chat.	
	2	System redirects the user to the chat page.	
Rules	-		
Author	Lee Ming Wei		

Table 3.1.4.17: Use Case of Account Deletion

Use Case ID	UC016	Version	1.0
Feature	F016 Account Deletion		
Purpose	To let the user to delete the account.		
Actor	User		
Trigger	User press the delete account button to delete the account.		
Precondition	User successfully delete the account.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User click the drop-down list of the account management.	
	2	User press the delete account button.	
	3	System shows the message “Are you sure you want to delete your account? This action cannot be undone.”.	
	4	User press the delete button.	
	5	System redirect user to sign in page.	
Rules	-		
Author	Lee Ming Wei		

Table 3.1.4.18: Use Case of Logout

Use Case ID	UC017	Version	1.0
Feature	F017 Logout		
Purpose	To let the user to logout the mobile application.		
Actor	User		
Trigger	User click the logout button.		
Precondition	User successfully logout the mobile application.		
Scenario Name	**Step**	**Action**	
Main Flow	1	User click the logout button in the setting pages.	
	2	System redirect user to the login page.	
Rules	-		
Author	Lee Ming Wei		

Chapter 4 System Design

4.1 System Block Diagram

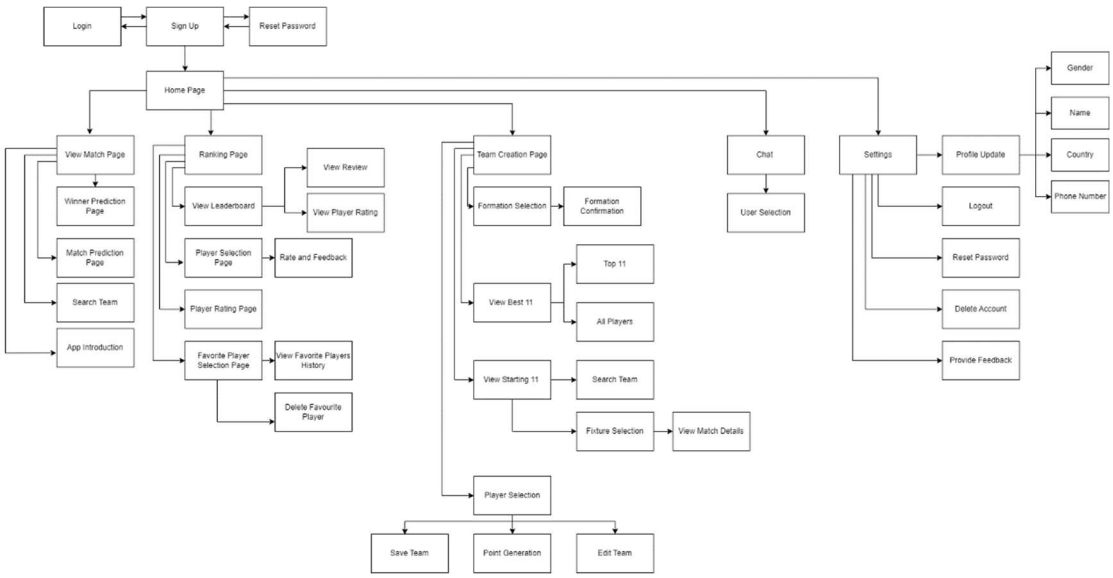


Figure 4.1.1 System Block Diagram

4.2 System Components Specifications

Before look into the primary pages of the system, it is critical to understand the user's journey from the initial launch of the mobile application. Upon opening the app, users are greeted with a login page, serving as the gateway to the fans-driven football player rating system. To access the wealth of features within, users must input their registered email and password. For newcomers, the system offers a streamlined account creation process, where they can easily set up their profile by entering their name, email address, and a secure password. Once the account is successfully created, the system seamlessly redirects the user to the home page, marking the beginning of their interactive football experience.

4.2.1 View Match Page

The View Match Page, serving as the home page of the application, immediately immerses users in the exciting world of the England Premier League 2024/2025 season. This dynamic page presents a comprehensive overview of the entire fixture list, allowing fans to stay up to date with all upcoming matches.

To enhance user experience, the page incorporates a search function, enabling supporters to quickly filter and locate fixtures for their favourite teams. This feature proves invaluable for those following specific clubs or planning their match-viewing schedule. One of the most engaging aspects of the View Match Page is its interactive prediction system. Users can tap into their football knowledge by selecting any two teams for a head-to-head comparison, using historical data to forecast potential outcomes. This feature not only adds an element of excitement but also encourages users to delve deeper into team statistics and performance trends.

For matches yet to kick off, the application offers an even more detailed prediction opportunity. Users can test their insight by predicting the correct score, first goal scorer, and man of the match. These predictions are securely stored in Firestore, allowing for easy retrieval and comparison once the actual results are in. To guide newcomers and ensure all users make the most of the prediction features, the page includes a helpful "How to Predict" button, offering clear instructions and tips. Once predictions are made, a prominent "Submit" button allows users to lock in their choices with confidence. The system provides immediate visual feedback, displaying a "Predicted" label within the fixture box, confirming that the user's predictions have been successfully recorded. This small but significant detail helps users keep track of the matches they've engaged with.

For completed matches, the View Match Page transforms into a reflection tool. Users can access the results by clicking a dedicated button, allowing them to compare their predictions against the actual outcomes. This feature not only satisfies curiosity but also helps users refine their prediction skills over time.

4.2.2 Ranking Page

The Ranking Page, accessible via the navigation bar, offers users a comprehensive platform to engage with player ratings and leaderboards. Upon entering this section, users are initially presented with an overview of the current leaderboard, providing a quick snapshot of top-performing players. For those eager to contribute their own assessments, the Player Rating tab allows users to select from a roster of current season players, dynamically fetched from a reliable football API. This ensures that ratings are always based on the most up-to-date player information.

The rating system is comprehensive, enabling users to evaluate players across several key performance areas: dribbling, passing, teamwork, attitude, shooting, and assists. This approach allows for a more comprehensive player assessment. Additionally, users have the option to provide written feedback, adding strength and context to their numerical ratings.

Once a user completes their evaluation and submits their rating, the data is securely stored in Firestore and seamlessly integrated into the leaderboard. This real-time update ensures that the rankings remain current and reflective of the community's collective opinion. The leaderboard tab showcases the top three rated players, highlighting those who have garnered the most positive assessments from the user base. Below the top 3 players, users can browse through an extended list of rated players, offering a broader perspective on community opinions.

To enhance user engagement, the system allows individuals to select their favourite players. This feature enables users to quickly track how their preferred athletes stack up against the community ratings, adding a personal touch to the leaderboard experience. Furthermore, the Ranking Page fosters a sense of community by allowing users to view feedback from other contributors.

4.2.3 Team Creation Page

The Team Creation page offers users an engaging and strategic experience in assembling their dream football squad. This feature allows fans to construct a team comprising their top 11 players from various positions, adding a layer of managerial simulation to the app. To begin, users select their preferred formation, setting the tactical foundation for their team. They are then presented with a diverse player pool from which to choose their lineup. Each player in this pool is assigned a point value, reflecting their perceived skill and importance.

Adding a strategic element to the selection process, users are given a budget of 150 points to allocate across their entire team. This constraint encourages thoughtful decision-making, as users must balance selecting star players with maintaining a well-rounded squad within the point limit. The team-building process is intuitive: users initiate player selection by tapping the "Edit Team" button, choose their desired players,

and finalize their selections with the "Done" button. To save their created team, users simply press the "Save Team" button, which securely stores their lineup in Firestore.

This feature goes beyond individual team creation by aggregating user choices to form a community driven "Best 11." By pressing the "Best 11" button, users can view the top 11 players most frequently selected across all user-created teams, as well as a comprehensive list of all chosen players. This collective data provides interesting insights into fan preferences and perceived player values. For a more personalized view, users can access their own lineup by tapping the "View Starting 11" button. This option also allows users to visualize how their team would look in specific fixtures, adding a layer of fantasy football excitement to real-world matches.

4.2.4 Chat Page

The Fan Chat feature offers users a dynamic platform for real-time communication within the football community. This interactive function enables fans to connect directly with one another, fostering engaging discussions and shared experiences. To initiate a conversation, users simply select their desired chat partner from a list of active community members. This user-friendly interface facilitates seamless connections, allowing football fans to engage in one-on-one dialogues about their favourite teams, players, and matches. The chat system provides a space for users to exchange thoughts, debate tactics, share match predictions, or simply enjoy casual banter with fellow football fans. This direct line of communication enhances the overall user experience, creating a more interactive and community-driven environment within the application.

4.2.5 Setting Page

The Settings page offers users comprehensive control over their personal information and account preferences. Within this section, users can customize their profile by uploading a profile picture, updating their name, specifying their country of residence, adding or modifying their phone number, and indicating their gender. This level of personalization allows users to create a more authentic representation of themselves within the football community. In addition to profile management, the Settings page serves as a conduit for user feedback. Recognizing the importance of user input in refining the application, there's a dedicated feature allowing users to share their

thoughts, suggestions, or report any issues they encounter. This feedback mechanism is crucial for continuous improvement of the app's functionality and user experience.

The page also houses critical account management options. Users can reset their password, enhancing account security. For those wishing to depart from the platform, an account deletion option is available. Additionally, a straightforward logout function is provided for users who wish to end their current session. To ensure all modifications are securely saved, the page features an "Update Profile" button. Upon pressing this, all changes made to the user's profile and settings are immediately synchronized with Firestore, the application's backend database. This real-time update ensures that user preferences and information remain current across all instances of the app.

Chapter 5 System Implementation

5.1 Hardware Setup

The hardware involved in this project is laptop and android mobile device. The laptop is used to search for information and do the coding work because it will be more efficient and effectiveness to develop a mobile application. The mobile phone is use for testing and installation of the player rating system mobile application. The specification of the phone allows me to test whether the mobile application is user friendly. The operating system of the phone is update to the latest version to make sure the application able to run smoothly without any bug or crash. The RAM and storage also need to exceed the minimum requirements to ensure the application can run smoothly without any error.

Table 5.1.1: Specifications of laptop

Description	Specifications
Model	Acer Aspire A315-57G
Processor	Intel(R) Core (TM) i5-1035G1 CPU @ 1.00GHz 1.19 GHz
Operating System (OS)	Windows 11
Graphic	NVIDIA GeForce MX330
Memory	8GB RAM
Storage	475 GB

Table 5.1.2: Specifications of Mobile Phone

Description	**Specifications**
Model	Samsung Galaxy S23+ SM-S916B/DS
Chipset	Qualcomm SM8550-AC

Operating System	Android 14 One UI 6.1
RAM	8GB
Storage	256GB
Resolution	1080 x 2340 pixels, 19.5:9 ratio (~393 ppi density)

Table 5.1.3: Specifications of Emulator

Description	**Specification**
Model	Samsung Galaxy Note20 SM-N980F/DS
Processor	Exynos 990
Operating System	Android 13
RAM	8GB
Storage	256GB
Resolution	1080 x 2400 pixels 20:9 ratio

5.2 Software Setup

The software involved in this project specific at the table below. Further research will be done to find a most suitable language, software, and database for the mobile application for fan-driven (football) Player Rating System.

Table 5.1.4: Other tools to use.

Description	**Requirement**
Language	Dart Programming Language
Software	Android Studio / Flutter / Android Software Development Kits (SDK)
Database	Firebase

Android Studio

Android Studio is an integrated development environment (IDE) developed by Google for building Android applications. It helps developers design, write, and test their apps all in one place. Android Studio has everything developers need to build great apps, like tools for writing code, checking for errors, and designing how the app looks. It's easy to use and helps developers create apps that work well on Android devices.

Flutter

Flutter, developed by Google, is a flexible framework for creating mobile, web, and desktop apps with a single codebase. It uses the Dart programming language to create visually appealing user interfaces quickly. Real-time previews help to speed up the development process. Its extensive popularity is due to its quickness, versatility, and active community.

Dart

Dart is a programming language developed by Google to build applications and services. It's simple to use and focuses on increasing developer productivity. Dart is well-suited for developing a variety of applications, including websites and mobile apps. It has current features that make coding faster and more efficient. Dart is particularly popular for developing apps with Flutter, a framework for creating user interfaces.

5.3 Setting and Configuration

Setting up developer mode on android device

1. Open the device settings on my Android device.
2. Scroll to the bottom and tap on “Developer options”.
3. In the developer option, under debugging, turn on Wireless debugging. This allows your device to communicate with the Android SDK over a USB connection.
4. A warning message will appear. Read it and tap "Allow" if you understand and wish to proceed.

5. After that, the user will be able to build and run the application in the mobile device via a USB connection for implementation and testing purpose.

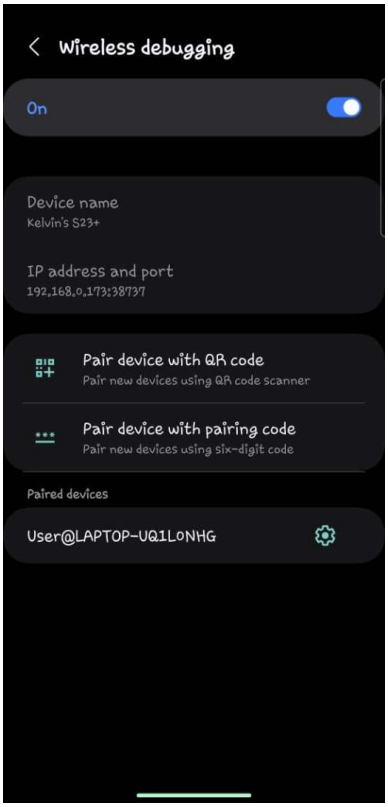


Figure 5.3.1 Screenshot of the Wireless Debugging

Setting up Firebase Cloud Firestore and Authentication

1. Create a Firebase project.
   a. Go to the Firebase Console.
   b. Click on "Add project" or select an existing project.
   c. Follow the instructions to create a project in the Firebase Console.
2. Add Firebase to Flutter app.
   a. In firebase Console, click on the project.
   b. Click the android icon to add android app to the project.
   c. Enter Android package name which can be found in android/app/build.gradle file.
   d. Download the google-services.json file and move it inyo Flutter project;s android/app/ directory.

3. Configure Flutter project.
4. Install Firebase packages. Open the pubspec.yaml file and add the dependencies into it. Run the flutter pub get in the terminal.

```
firebase_core: ^3.2.0
cloud_firestore: ^5.1.0
firebase_auth: ^5.1.2
firebase_storage: ^12.1.1
```

Figure 5.3.2 Screenshot of the dependencies

5. Initialize the Firebase in the Flutter app.

```dart
import 'package:flutter/material.dart';
import 'package:firebase_core/firebase_core.dart';
import 'splashscreen.dart';

void main() {
  runApp(MyApp());
  initializeFirebase();
}

Future<void> initializeFirebase() async {
  WidgetsFlutterBinding.ensureInitialized();
  try {
    await Firebase.initializeApp();
  } catch (e) {
    if (e.toString().contains('already exists')) {
    } else {
      print(e.toString());
    }
```

Figure 5.3.3 Screenshot of the Firebase Setup

6. Set up Firebase Authentication.
   a. In the Firebase Console, go to "Authentication".
   b. Click "Get started".
   c. Choose the sign-in methods that want to enable (e.g., Email/Password).

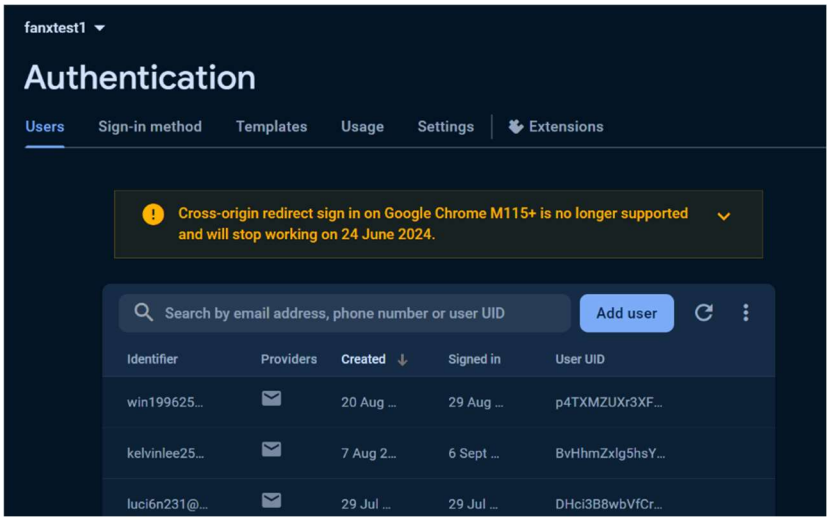


Figure 5.3.4 Screenshot of the Authentication in Firebase

7. Set up Firebase Cloud Firestore.
    a. In the Firebase Console, go to "Firestore Database".
    b. Click "Create database".
    c. Choose "Start in test mode".

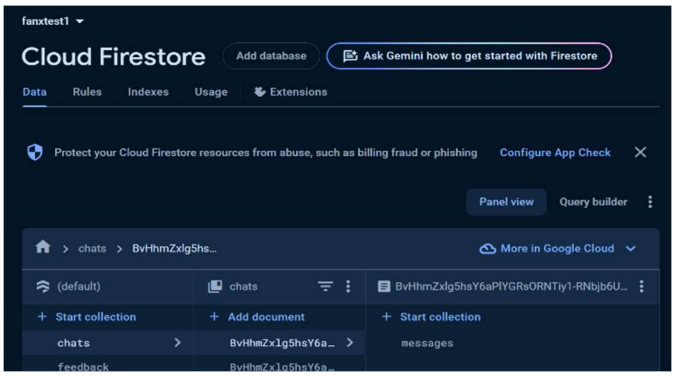


Figure 5.3.5 Screenshot of the Cloud Firestore in Firebase

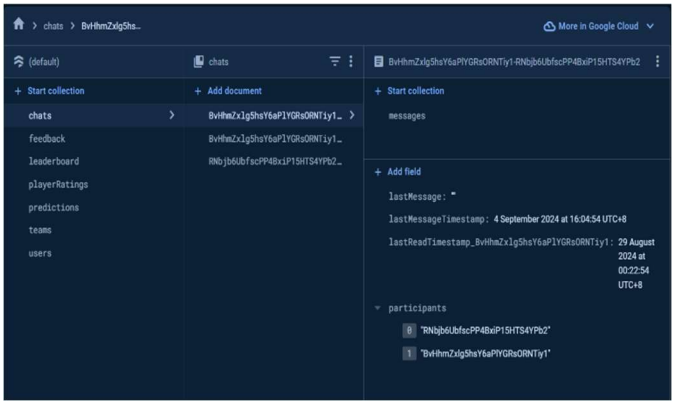


Figure 5.3.6 Screenshot of the Cloud Firestore in Firebase

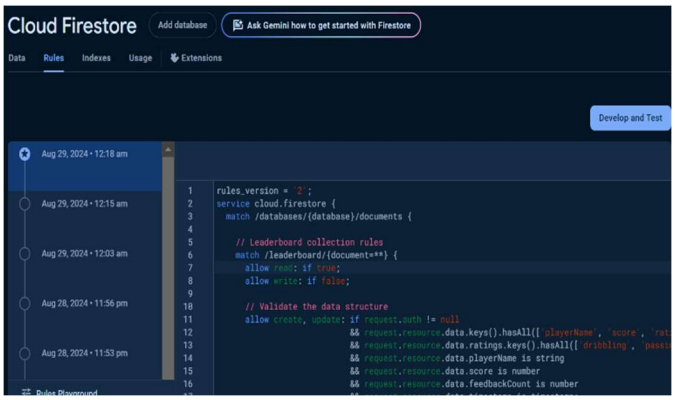


Figure 5.3.7 Screenshot of the Cloud Firestore in Firebase

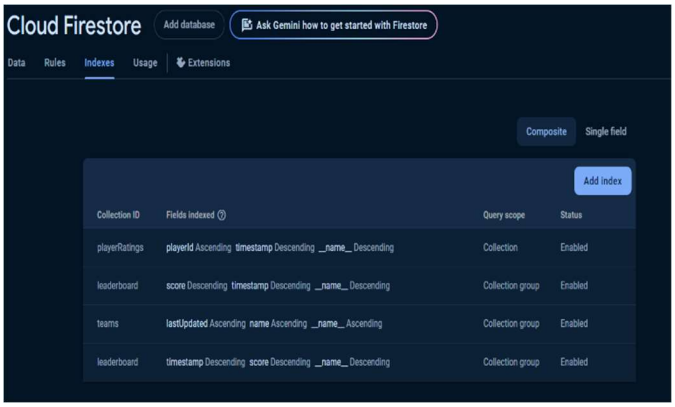


Figure 5.3.8 Screenshot of the Cloud Firestore in Firebase

Setting Up the Sportmonks API

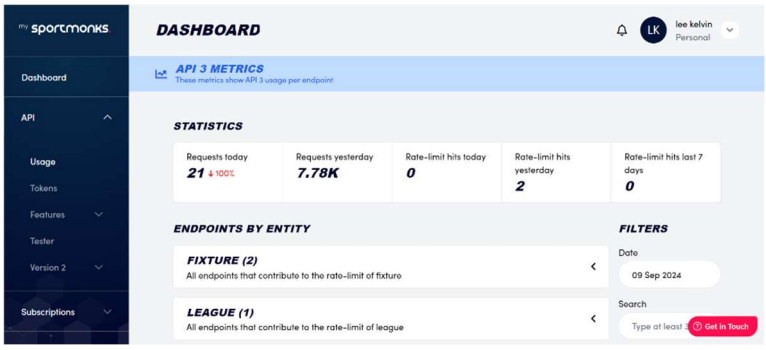


Figure 5.3.9 Statistics of the request to fetch the data

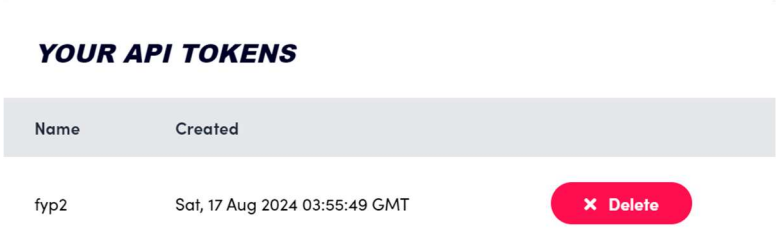


Figure 5.3.10 Api Token to use the features

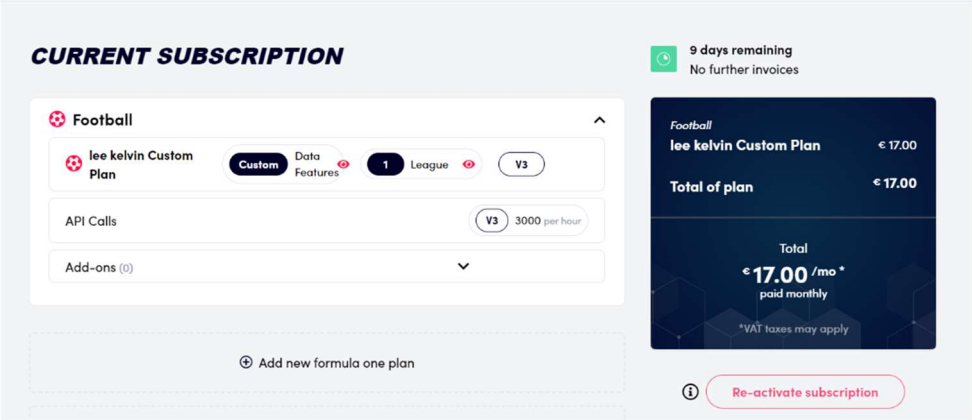


Figure 5.3.11 Current Subscription

As shown in figure 5.3.9, figure 5.3.10 and figure 5.3.11, I am currently using sportmonks football API to fetch the player and match data from 2024/2025 season England Premier League. Due to money constraints, I able to contact with the teams to discuss subscription of custom plan which only choose the features I need to implement into the mobile application. After subscription successfully, I manage to get the token and use the function provide by them.

5.4 System Operation

The application is name “FANX”, and the logo as shown in figure 5.4.1 is represented a football player who is kicking a ball. The name “FANX” is mainly due to the engagement of fans and the player. This mobile application mainly let the user to rate the player and let them view the result while also communication with each other.

Figure 5.4.1 Logo of “FANX” mobile application

5.4.1 Login Functionality

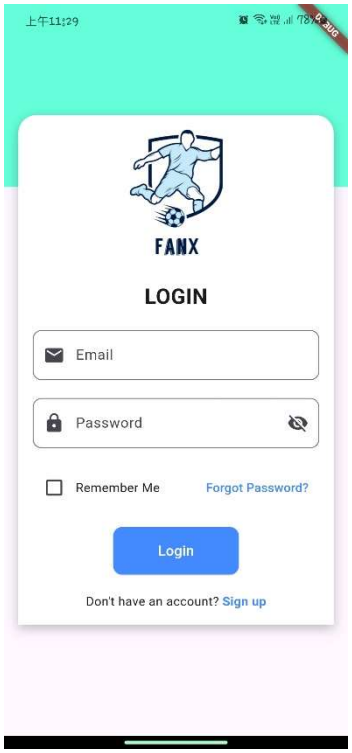


Figure 5.4.2 Login Page

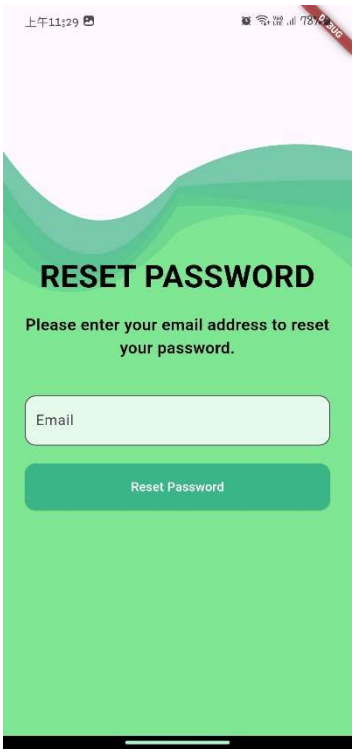


Figure 5.4.3 Reset Password Page

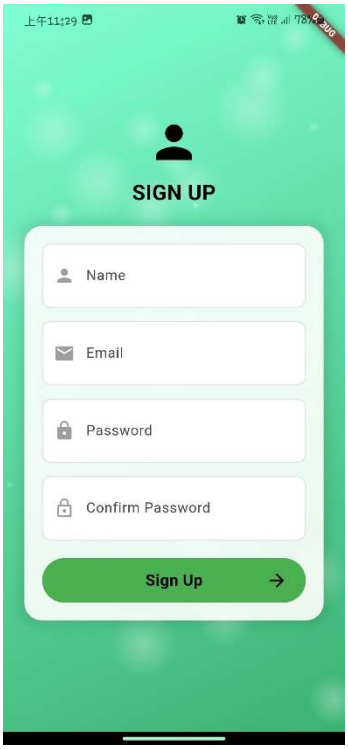


Figure 5.4.4 Sign Up Page

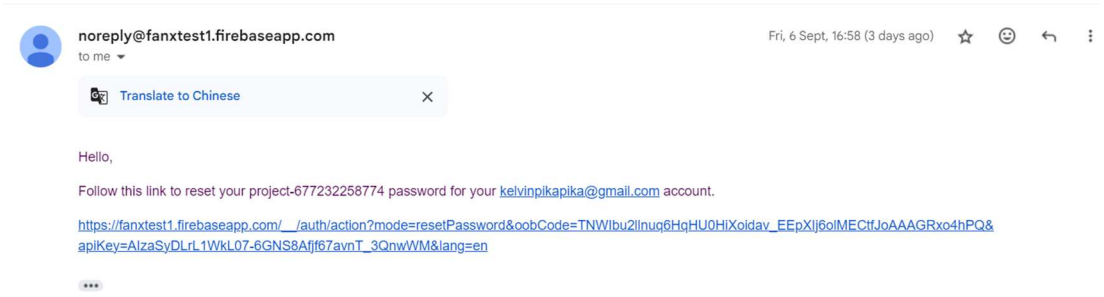


Figure 5.4.5 Email with Reset Password Link

Before login into the mobile application, user needs to first login with their email and password. User required to press the remember me box before press the login button as shown in **Figure 5.4.2**. If the user forgot password, he or she able to click the forgot password and enter their email address to reset the password as shown in **Figure 5.4.3**. User will be directed to the Gmail as shown in **Figure 5.4.5**. User needs to reset the password with at least 6 character and he or she will need to enter their email and password in the login page again. If the user is new, he or she can press the sign-up

button and fill in their name, email, password and confirmation of password. He or she then able to press the sign-up button and redirect by system to the home page of the mobile application. The updated password will be change in the Firebase Authentication to make sure that the user able to login again with the latest password.

5.4.2 Match Page/Home Page

Figure 5.4.6
Match Page

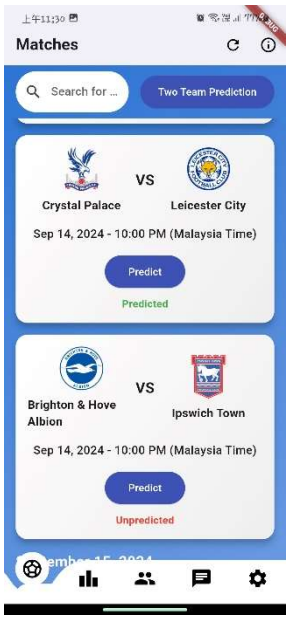


Figure 5.4.7
Match Page

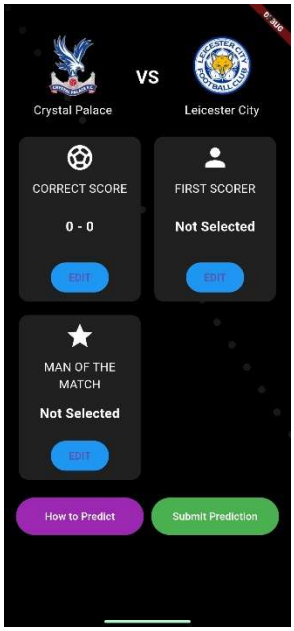


Figure 5.4.8 Prediction Page

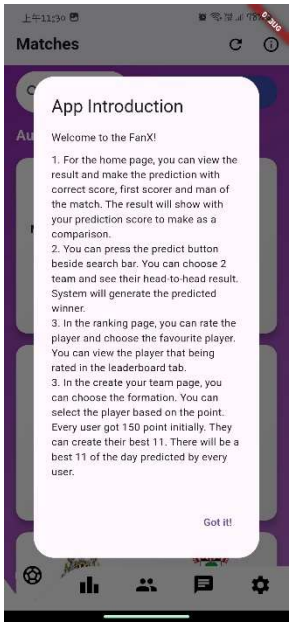


Figure 5.4.9 App Introduction

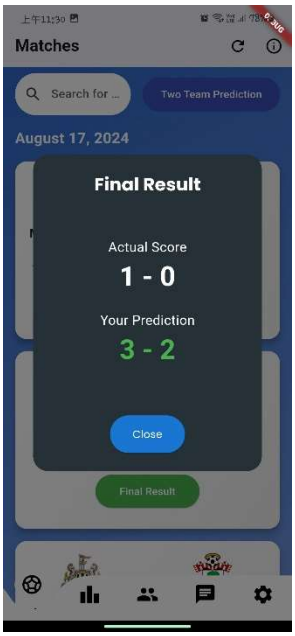
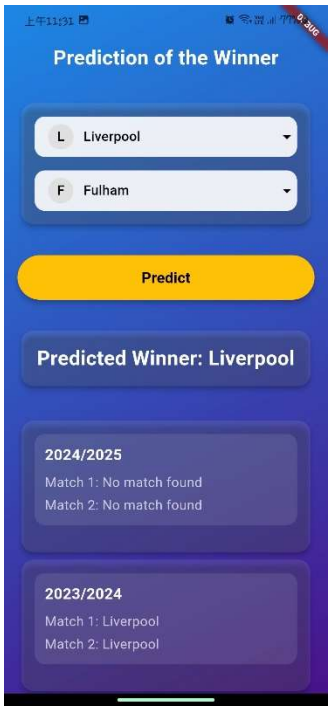


Figure 5.4.10 View Final Result



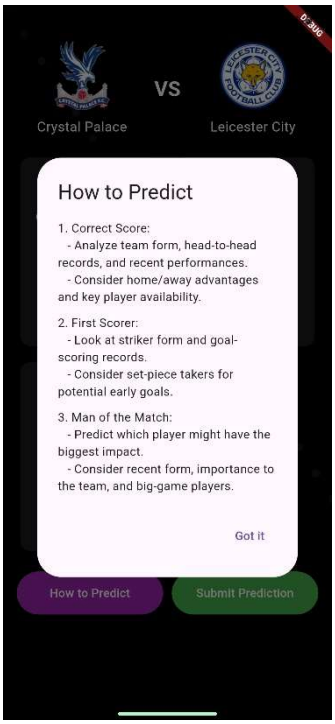


Figure 5.4.11 Predict Winner Page *Figure 5.4.12 Predict Winner Page* *Figure 5.4.13 How to Predict*

When a user successfully logs into the home page, they are able to see a search bar, two team prediction buttons, and all 38 Premier League fixtures, as shown in **Figure 5.4.6**. If a match has already been predicted, the word below the prediction button will change from "unpredicted" to "predicted", as seen in **Figure 5.4.7**. The user can also predict the match score, first scorer, and man of the match, as depicted in Figure 5.4.8. However, due to some constraints, the mobile application is currently unable to fetch the data for the actual first scorer and man of the match, but this feature will be updated and improved in the future. **Figure 5.4.9** shows the app's introduction, while **Figure 5.4.10** displays the view of the final result, allowing users to compare their predicted results with the actual results. The user can select two teams and press the "predict" button, as shown in **Figure 5.4.11**, and the system then generates a predicted winner based on the head-to-head record between the two teams. Lastly, **Figure 5.4.13** demonstrates how users can view the instructions for predicting matches.

5.4.3 Ranking Page

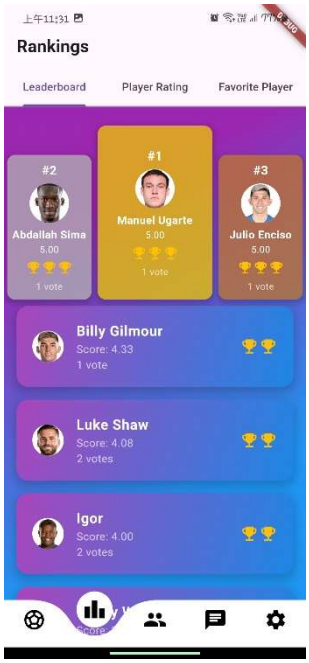


Figure 5.4.14 Leaderboard Page

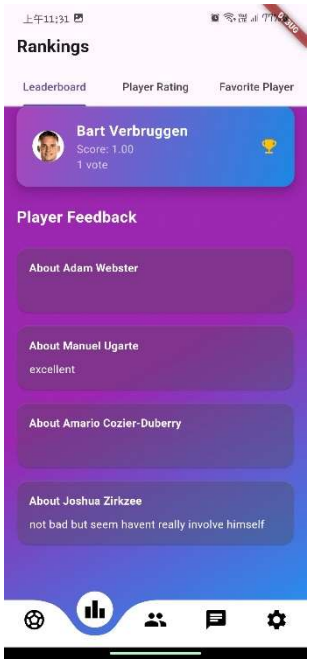


Figure 5.4.15 Leaderboard Page

Figure 5.4.16 Player Rating Page

Figure 5.4.17 Player Rating Page

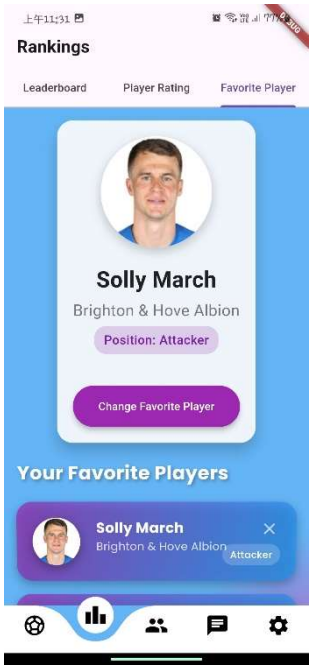


Figure 5.4.18 Favourite Player Page

When the user wants to rank the players, they can navigate to the ranking page. First, they will see the leaderboard tab, which displays the top 3 players and the other players on the list. The user can also see the feedback provided by other users for specific players. When the user clicks a player's name, they are able to view the overall rating given by all the users. The user can press the "player rating" tab to rate a player. From **Figure 5.4.16**, the user needs to select a player to rate, and they will be redirected to another page where they can rate the player in detail, such as dribbling, passing, teamwork, attitude, shooting, and assists, as shown in **Figure 5.4.17**. The user can also provide feedback for the player. The system fully trusts that the user can rate the player based on their actual performance on the pitch. This feature allows the application to gather valuable user feedback and insights, which can be used to improve the accuracy of the player rankings and provide a more engaging experience for the users. Finally, the user can select their favourited player, and they can compare their favourite player's ranking and feedback with the leaderboard to see how they fare compared to other users' assessments, potentially discovering new players to support or gaining a deeper appreciation for their chosen favourite.

5.4.4 Team Creation Page

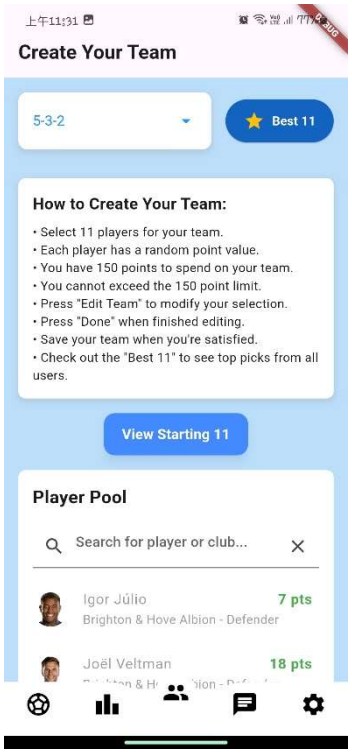


Figure 5.4.19 Team Creation Page

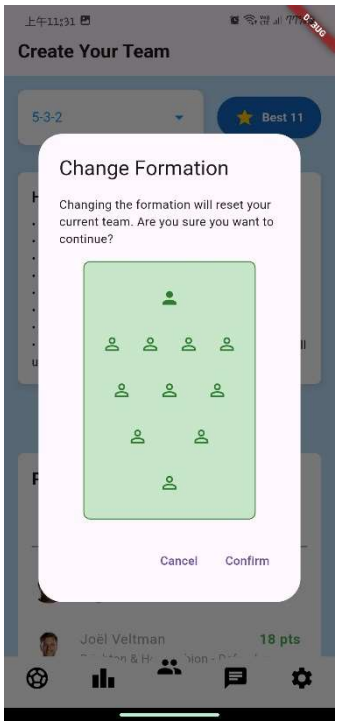


Figure 5.4.20 Change Formation

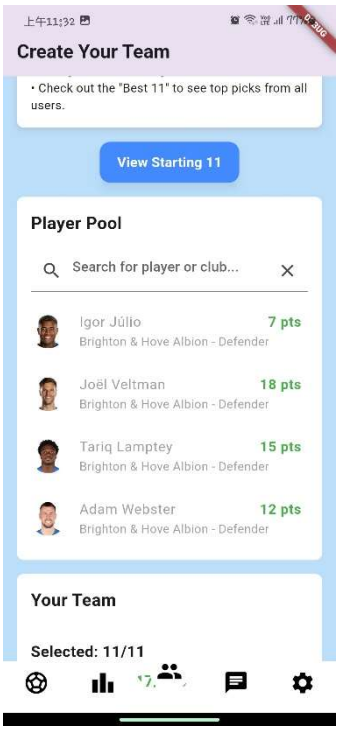


Figure 5.4.21 Player Pool

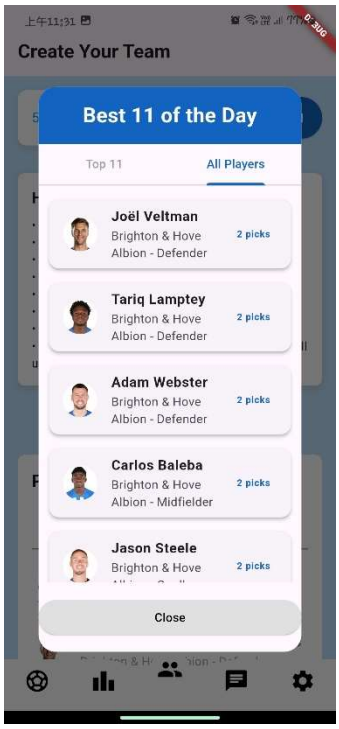


Figure 5.4.22 Best 11 of the Day

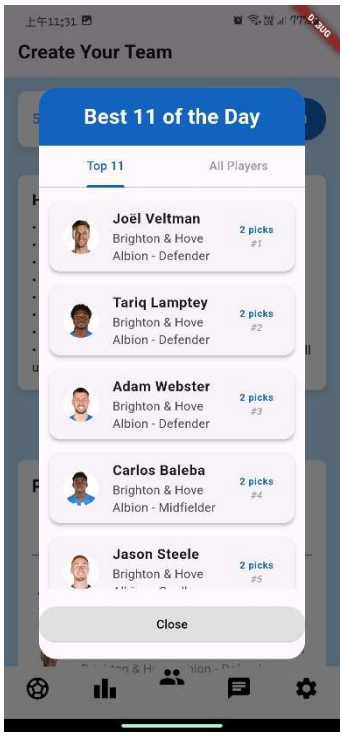


Figure 5.4.23 Best 11 of the Day

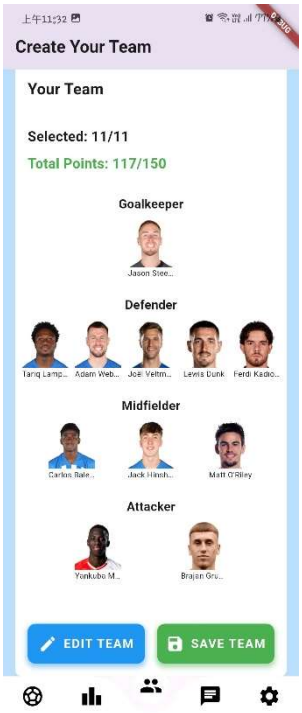


Figure 5.4.24 Create Your Team

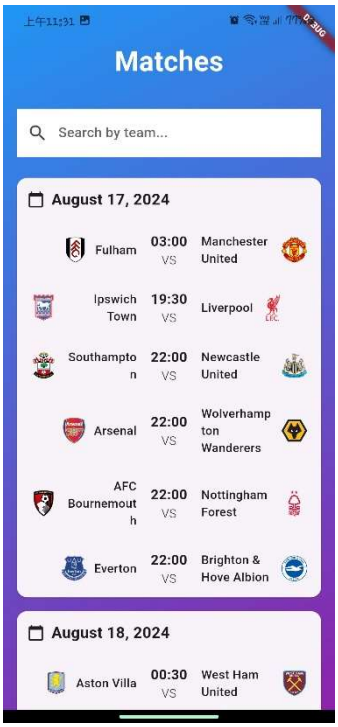


Figure 5.4.25 View Starting 11 Page

Figure 5.4.26 View Starting 11 Page

The user is able to navigate to the team creation page, as shown in **Figure 5.4.19**. On this page, the user can change the formation, such as 4-2-3-1 or 4-3-3, using the

dropdown list. When the user selects a new formation, a pop-up will appear to notify them that the change in formation will clear the current team, as shown in **Figure 5.4.20**. Next, as seen in **Figure 5.4.21**, the user can choose players from a pool of available players. They can search for players by name or club, and each player has a point value that is randomly assigned. The user can only select players whose total point value does not exceed 150 points.

The user can press the "Best 11" button to view the top 11 players of the day, as shown in **Figures 5.4.22 and 5.4.23**. This feature allows the user to see the current top-performing players and potentially incorporate them into their own team. Finally, the user can create their own team, as shown in **Figure 5.4.24**. To do this, the user must press the "Edit" button to make changes to the player lineup. Once the user is satisfied with their team, they can press "Done" to save it. The saved team will be updated to Firebase and displayed in the "Best 11" section. The user can also view the fixture by searching for a team name, as shown in **Figures 5.4.25 and 5.4.26**. By pressing on a specific match, the user can view the lineup for both teams.

5.4.5 Chat Page

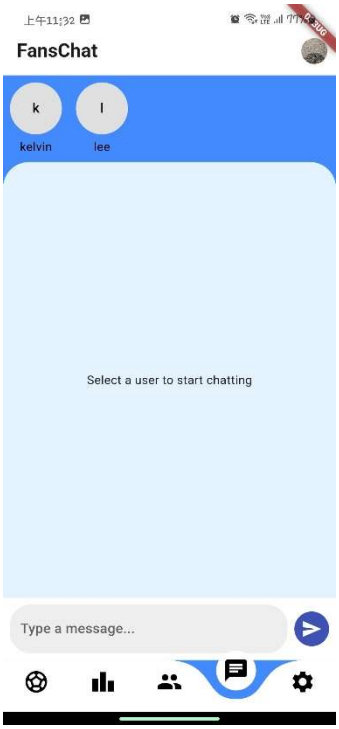


Figure 5.4.27 Chat Page

Figure 5.4.28 Chat Page

If the user wishes to chat with other users, they can press the "Chat" page in the navigation bar. As shown in **Figure 5.4.27**, the user will first be directed to the chat page, where they will be required to choose a user with whom they wish to continue the chat. After selecting the specific user, the user can enter the chat page and start a conversation about players, teams, fixtures, and other topics of mutual interest as shown in **Figure 5.4.28**. This chat functionality allows users to keep in touch and update each other on the latest information and developments within the application.

The chat feature provides an engaging social element, enabling users to connect, share insights, and foster a sense of community around their shared passion for the Premier League. By allowing direct communication, the application facilitates the exchange of valuable information, opinions, and strategies, enhancing the overall user experience. This user interaction and engagement can significantly improve the app's stickiness and user retention.

5.4.6 Setting Page

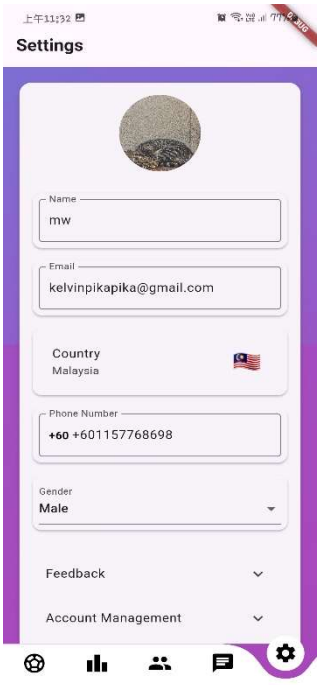


Figure 5.4.29 Setting Page

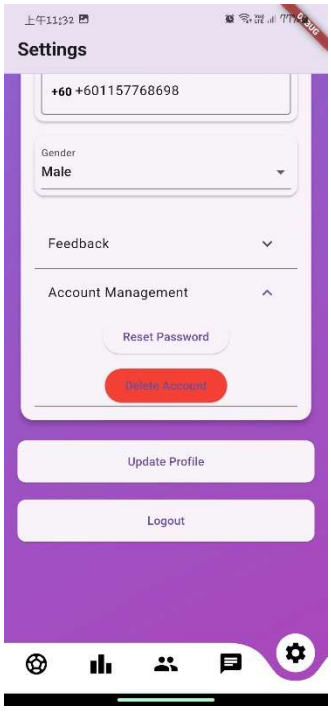


Figure 5.4.30 Setting Page

If the user wishes to change their information, they can navigate to the settings page by pressing the corresponding option in the navigation bar. As shown in **Figure 5.4.29**, when the user enters this page, they can change their profile picture, which will then be stored in the Firestore database. Additionally, the user can update their name, country, phone number, gender, and provide feedback. The email field is fixed, as it has already been registered in the Firebase authentication system. After filling in all the necessary information, the user can press the "Update Profile" button, and the changes will be saved to the Firebase database. It's important to note that the application has implemented validation for the phone number field, and if the format is incorrect, the user will be prompted with an error message. This feature ensures that the user provides accurate contact information. Furthermore, as shown in **Figure 5.4.30**, the user can choose to reset their password, delete their account, or log out of the application. These options provide the user with the ability to manage their account settings and security preferences, enhancing the overall user experience and control over their personal information.

5.5 Implementation Issues and Challenges

1. Learning Curve with Flutter and Dart

As Flutter is entirely new to me, I'll face a significant learning curve. Flutter uses the Dart programming language, which may have unfamiliar syntax and concepts compared to languages I've used before such as Java and Python. I'll need to invest time in understanding Flutter's widget-based architecture, state management solutions, and how to structure a Flutter project. This lack of experience might slow down my development process initially, as I'll need to learn and implement Flutter-specific best practices, deal with common pitfalls, and become proficient with Flutter's extensive widget library. I may find myself frequently consulting documentation, tutorials, and community forums to overcome challenges and implement features correctly.

2. Real-time Data Synchronization

Implementing real-time updates for player ratings across multiple devices will be challenging. I'll need to design a system that can handle concurrent ratings from multiple users while maintaining data consistency. This involves setting up a robust

backend infrastructure that can process and distribute updates quickly. I might consider using technologies like Firebase Real-time Database to push updates to connected clients. However, I'll need to carefully manage potential race conditions, ensure that all clients receive updates in the correct order, and handle scenarios where users are temporarily offline. Implementing an efficient conflict resolution mechanism will be crucial to maintain the integrity of my rating system.

3. User Authentication and Security

Developing a secure user authentication system is critical for my application. I'll need to implement features like user registration, login, password recovery, and possibly social media authentication. Ensuring the security of user data is paramount, which includes securely storing passwords, implementing token-based authentication for API requests, and protecting against common vulnerabilities like SQL injection and cross-site scripting (XSS) attacks. This challenge requires a deep understanding of security best practices and careful implementation to protect my users' data and maintain trust in my system.

4. Custom Plan for API

The development of the mobile application faced significant hurdles due to limitations in the custom plan subscription for the football API. This restricted access to crucial features, most notably the ability to fetch specific player data for team lineups. As a workaround, the team creation function had to rely on a random point system rather than implementing points based on actual player appearances and match results. This limitation not only made the development process more difficult but also impacted the accuracy and depth of certain app features, highlighting the need for a more comprehensive API solution in future iterations.

5. Algorithm Development for Fair Ratings

Creating a fair and accurate rating system that considers various factors will be a complex task. I'll need to design an algorithm that takes into account multiple aspects of a player's performance, potentially including statistics from matches, historical data, and the credibility of the users' providing ratings. The algorithm should be robust enough to prevent manipulation or bias, such as preventing a group of fans from

artificially inflating or deflating a player's rating. I might consider implementing weighted averages, confidence intervals, or even machine learning techniques to improve the accuracy of my ratings over time. Balancing the algorithm to be fair, accurate, and resistant to manipulation will require careful design and extensive testing.

6. Data Visualization and User Interface Design

Creating an engaging and informative user interface for my football player rating system will be crucial. I'll need to design intuitive ways to display player statistics, rating trends, and comparative data that are both visually appealing and easy to understand. This involves selecting appropriate charts, graphs, and other visual elements to represent complex data. I'll also need to ensure that the interface is responsive and works well on various screen sizes, from small smartphones to larger tablets. Implementing interactive elements like draggable sliders for ratings or tap-to-expand player cards can enhance user engagement but adds complexity to my UI code. Balancing aesthetics with functionality while maintaining performance on different devices will be an ongoing challenge throughout my development process.

5.6 Conclusion Remark

Throughout this chapter, I've explored the essential aspects of bringing our conceptual design into a functional reality. From setting up the necessary hardware and software environments to configuring the system and addressing various operational intricacies, each step has been crucial in shaping the final product. The system operation screenshots provided offer a visual testament to the user interface and functionality we've successfully implemented.

While the path to implementation has not been without its hurdles, as detailed in the issues and challenges section, these obstacles have ultimately contributed to a more robust and refined application. The learning curve associated with Flutter, the complexities of real-time data synchronization, and the intricacies of creating a fair rating algorithm have all pushed us to innovate and grow as developers. The insights gained from this implementation phase will absolutely prove invaluable in the continued evolution and improvement of the football player rating system.

Chapter 6 System Evaluation and Discussion

6.1 System Testing and Performance Metrics

System testing and performance metrics are crucial processes in verifying and validating the functionality and reliability of the developed fan-driven football player rating mobile application. The primary objective of this testing phase was to ensure that the application not only meets the specified requirements but also operates faultlessly across various user scenarios. The focus was on validating the interaction between multiple system components, as issues often arise from these interconnections.

The application was designed to offer users a comprehensive platform for engaging with football, including features such as viewing fixtures and results, predicting match outcomes, rating players, and creating personalized "best 11" lineups. Given the complexity of these features, rigorous testing was essential to identify and resolve any defects or inconsistencies. Unit testing was the primary methodology employed, utilizing a detailed checklist that encompassed all key components and functions of the application.

This checklist included specific test cases designed to verify each feature's functionality, from the accuracy of the rating system to the responsiveness of the user interface. Throughout the testing process, results were meticulously documented, and any identified issues were promptly communicated to the development team for resolution. This systematic approach to testing ensured that the application was thoroughly vetted and optimized before being released to end users, thereby guaranteeing a high-quality, reliable user experience that aligns with the project's goals of enhancing fan engagement in football.

6.2 Testing Setup and Result

Table 6.2.1 Login Page Testing

No	Test Item	Data	Expected Result	Actual Result	Pass/Fail
1	Email and Password	Email: kelvinlee25@1utar.my Password: 000000	User redirect to home page.	User redirect to home page.	Pass

	are both valid				
2	Email valid, password invalid	Email: kelvinlee25@1utar.my Password: 0000 (should be 6 character)	Show error message	Show error message	Pass
3	Email invalid, password valid	Email: kelvinlee25@q.we Password: 000000	Show error message	Show error message	Pass
4	Email invalid, password invalid	Email: kelvinlee25@q.we Password: 00010 (should be 6 character)	Show error message	Show error message	Pass

Table 6.2.2 Sign Up Page Testing

No	Test Item	Data	Expected Result	Actual Result	Pass/Fail
1	Information is correct except email address	Name: Kelvin Email: kelvin@11.le (email address format is invalid) Password: 000000 Confirm Password: 000000	Show error message	Show error message	Pass
2	Information is correct except password	Name: Kelvin Email: kelvinlee@1utar.my Password: 1234 (should be 6 character) Confirm Password: 000000	Show error message	Show error message	Pass
3	Password is different with confirmation password	Name: Kelvin Email: kelvinlee@1utar.my Password: 000000 Confirm Password: 0000 (should be 6 character)	Show error message	Show error message	Pass
4	All the information is correct and sign-up button is pressed.	Name: Kelvin Email: kelvinlee@1utar.my Password: 000000 Confirm Password: 000000	User redirect to home page.	User redirect to home page.	Pass

Table 6.2.3 Reset Password Page Testing

No	Test Item	Data	Expected Result	Actual Result	Pass/Fail
1	Email address is invalid	Email: kelvinlee25@12.le	Show error message	Show error message	Pass
2	Failed to fill in the email address	Email:	Show error message	Show error message	Pass
3	Email is valid but not yet been registered into firebase	Email: kelvinlee25@1utar.my	Show password reset email sent but the link will only send to the email address provided	Show password reset email sent but the link will only send to the email address provided	Pass
4	Email address is valid	Email: kelvinlee25@1utar.my	Redirect to login page and required to reset email through the link being send to email address.	Redirect to login page and required to reset email through the link being send to email address.	Pass

Table 6.2.4 Update Profile Page Testing

No	Test Item	Data	Expected Result	Actual Result	Pass/Fail
1	Press the profile picture and select picture in gallery.	Picture to be picked in mobile phone	Profile picture update successfully.	Profile picture update successfully.	Pass

2	Phone Number is invalid	If the country set is Malaysia, the phone number format is invalid. Phone Number: +601188499 (Invalid format)	Show error message	Show error message	Pass
3	Name, country, phone number and gender are valid	Name: Kelvin Country: Malaysia Phone Number: +6011-57768699 Gender: Male	Update Profile Successfully	Update Profile Successfully	Pass
4	Press the reset password button.	Show message "Password reset link send to the Gmail".	Reset password link found in the Gmail and request user to reset the password.	Reset password link found in the Gmail and request user to reset the password.	Pass
5	Press the delete account button.	Show message to confirm the deletion of account	Successfully delete the account.	Successfully delete the account.	Pass
6	Press the logout button.	-	Successfully logout the account and redirect to login page.	Successfully logout the account and redirect to login page.	Pass

Table 6.2.5 Match Page Testing

No	Test Item	Data	Expected Result	Actual Result	Pass/Fail
1	Search for the team to show the fixtures.	Teams: Manchester United	Only the fixtures with the team search will be shown.	Only the fixtures with the team search will be shown.	Pass
2	Two team prediction buttons have been pressed and select the 2 teams that	Select Team 1: Liverpool Select Team 2: Arsenal	Predict button can be pressed and predicted winner and head-to-	Predict button can be pressed and predicted winner and head-to-	Pass

	want to be predict.		head record will be shown.	head record will be shown.	
3	Two team prediction buttons have been pressed but the team selection is empty.	Select Team 1: Select Team 2:	Predict button cannot be pressed.	Predict button cannot be pressed.	Pass
4	Press the final result button for the match that passed.	Actual Result:1-1 Your Prediction:0-0	Result shown successfully.	Result shown successfully.	Pass
5	Press the predict button for matches that haven't pass.	Correct score:1 – 0 First Scorer: Luke Shaw Man of the Match: Marcus Rashford	Successfully save the data to the firebase and correct score will be shown with the actual score after the match.	Successfully save the data to the firebase and correct score will be shown with the actual score after the match.	Pass
6	View the status of prediction if successfully make prediction.	-	The match will show predicted.	The match will show predicted.	Pass
7	View the status of prediction if haven't make the prediction.	-	The match will show unpredicted.	The match will show unpredicted.	Pass

Table 6.2.6 Ranking Page Testing

No	Test Item	Data	Expected Result	Actual Result	Pass/Fail
1	Select Favourite Player	Adam Webster	Favourite Player	Favourite Player	Pass

	button have been pressed.		successfully updated.	successfully updated.	
2	Delete the favourite player by pressing the cross icon.	-	Favourite Player successfully deleted.	Favourite Player successfully deleted.	Pass
3	Select Player Rating button have been pressed.	Luke Shaw	Prompt to the page which able to rate the player.	Prompt to the page which able to rate the player.	Pass
4	Submit rating button have been pressed.	Press the submit rating button.	Data successfully updated to firebase and leaderboard.	Data successfully updated to firebase and leaderboard.	Pass
5	Player name have been pressed in the leaderboard tab.	Billy Gilmour with the average score and number of votes being pressed.	Successfully show the average rating details.	Successfully show the average rating details.	Pass

Table 6.2.7 Team Creation Page Testing

No	Test Item	Data	Expected Result	Actual Result	Pass/Fail
1	Formation drops down list is pressed on.	Change the formation from 4-3-3 to 4-2-3-1.	Successfully change the formation.	Successfully change the formation.	Pass
2	Point is exceeding the limit.	The point for 11 players is more than 150 points.	The players in player pool are unable to select.	The players in player pool are unable to select.	Pass
3	Point is in the range of limit.	The point for 11 players is less than or equal to 150 points.	The players in player pool can be selected and	The players in player pool can be selected and	Pass

			update to the team.	update to the team.	
4	Player name is valid when searching their name in search bar.	Name: Luke Shaw	Specific player with club name, position and point successfully being shown.	Specific player with club name, position and point successfully being shown.	Pass
5	Player name is invalid when searching their name in search bar.	Name: Luke AAL	No player will be shown in the player pool.	No player will be shown in the player pool.	Pass
6	Press the edit button to edit the players.	Press the minus icon on the player and update with latest player if point no exceed limit.	Team updated successfully.	Team updated successfully.	Pass
7	Press the done button to confirm the editing of players.	Done button is pressed on.	Team updated successfully.	Team updated successfully.	Pass
8	Press the save team button to save the team.	Save button is pressed on.	Team updated successfully and save to the firebase. Player will be updated to the best 11 page.	Team updated successfully and save to the firebase. Player will be updated to the best 11 page.	Pass

Table 6.2.8 View Starting 11 Page Testing

No	Test Item	Data	Expected Result	Actual Result	Pass/Fail

1	Team name is valid when search the specific team in search bar.	Team: Manchester United (a team in England Premier League)	All the team fixture being shown.	All the team fixture being shown.	Pass
2	Team name is invalid when search the specific team in search bar.	Team: Manches Town (Invalid team name as no such team in England Premier League)	No fixture being shown.	No fixture being shown.	Pass
3	Fixture to show the lineup is pressed on.	Match have started and passed.	Show the lineup for both teams.	Show the lineup for both teams.	Pass
4	Fixture to show the lineup is pressed on.	The match hasn't started yet. Current date is 10-9-2024 and the match will only start at 5-10-2024.	Show error message	Show error message	Pass

Table 6.2.9 Best 11 Page Testing

No	Test Item	Data	Expected Result	Actual Result	Pass/Fail
1	Best 11 button is pressed on.	-	Top 11 with list of players and all the players that being selected being shown.	Top 11 with list of players and all the players that being selected	Pass

				being shown.	

Table 6.2.10 Chat Page Testing

No	Test Item	Data	Expected Result	Actual Result	Pass/Fail
1	User profile that wants to chat with is pressed on.	User Profile: Kelvin	User redirect to chat page.	User redirect to chat page.	Pass
2	User profile that wants to chat with haven't pressed on.	User Profile: -	User unable to send the message.	User unable to send the message.	Pass
3	Message is valid.	Number: 1,2,3 Character: a, b, c Emoji: -	Message successfully sent.	Message successfully sent.	Pass
4	Send icon is pressed on.	-	Message successfully sent.	Message successfully sent.	Pass
5	Status of both users.	Each user is online.	Message can be sent and received.	Message can be sent and received.	Pass

Table 6.2.11 Account Management Testing

No	Test Item	Data	Expected Result	Actual Result	Pass/Fail
1	Reset Password button has been pressed.	-	A link will be sent to the email address.	A link will be sent to the email address.	Pass

2	Delete Account button has been pressed.	-	Show message to confirm the account deletion.	Show message to confirm the account deletion.	Pass

6.3 Objective Evaluation

The primary objective of this project was to **develop a mobile application enabling football fans to rate players**, which was successfully accomplished. The resulting app offers a range of features designed to boost fan engagement. Users can view actual match results, predict outcomes, and compare their predictions with real results. The app also includes a winner prediction feature based on head-to-head records, allows users to rate players and select favourites, and provides a leaderboard displaying player ratings and feedback. Additionally, users can create custom teams, view the best 11 players, access actual match lineups for reference, and communicate with each other to discuss fixtures, lineups, and other football-related topics.

To inform the development process, I conducted a thorough analysis of existing football-related mobile applications. This research, detailed in Chapter 2, involved reviewing five frequently used apps. By comparing these applications, I identified their advantages and disadvantages, focusing on which features provided the most value and best user experience. This analysis was crucial in guiding the design and functionality decisions for my own application.

In conclusion, the project successfully met all its objectives. The resulting mobile application not only allows football fans to rate players but also provides a comprehensive platform for engagement with the sport. By incorporating features like match prediction, player ratings, custom team creation, and user communication, the app offers a rich and interactive experience for football fans. The research conducted on existing applications ensured that the product was informed by current market offerings and user preferences, resulting in a well-rounded and user-friendly football app.

Chapter 7 Conclusion

7.1 Conclusion

The development of this mobile application stems from a desire to bridge the gap between passionate football fans and the players they admire. In an era where fan engagement is increasingly important, this app provides a unique platform for supporters to actively participate in player evaluation and team dynamics. By allowing fans to rate players, predict match outcomes, and create their ideal lineups, the application fosters a deeper connection between fans and the sport they love.

The primary aim of this project was to create a comprehensive, user-friendly mobile application that empowers football enthusiasts to engage with the sport in new and meaningful ways. This goal has been successfully achieved through the implementation of various features, including fixture viewing, result prediction, player rating, and personalized team creation. The application not only serves as an information hub for match details and results but also as an interactive platform where fans can express their opinions and showcase their football knowledge.

Football has a unique ability to unite people across cultures and continents. Its global appeal lies not just in the skill and athleticism displayed on the pitch, but also in the passion and dedication of its fans. Traditional player rating systems, typically managed by sports journalists or statistical analysts, often fail to capture the accurate perspectives of the fan. This mobile application aims to fill that gap by providing a platform where the voice of every supporter can be heard and valued.

The creation of this fan-driven rating system is also a response to the evolving landscape of football fandom in the digital age. With the rise of social media and online communities, fans are no longer passive spectators but active participants in the football narrative. They analyse matches, debate tactics, and form strong opinions about players' performances. However, these discussions are often fragmented across various platforms. This mobile application centralizes these fan insights, creating a structured and easily accessible format for fan opinions. By doing so, it not only enhances the fan

experience but also potentially provides clubs and players with valuable, crowd-sourced insights into performance evaluation.

In conclusion, this mobile application represents a significant step forward in fan engagement within the football community. By successfully developing and implementing all the planned functions, the project has created a powerful tool that enhances the fan experience and potentially provides valuable insights for clubs and players. The application's ability to aggregate fan opinions through ratings and feedback systems could offer a unique perspective on player performance, while features like custom team creation add an element of fun and strategy for users. As the sport continues to evolve, this application stands as a testament to the growing importance of fan participation.

7.2 Recommendation

Despite the successful development of the fan-driven football player rating system mobile application, there are several areas for improvement and expansion that could enhance its functionality and user experience. One primary area for development is the **integration of a more comprehensive football API**. Due to budget constraints, the current custom plan limits certain features. In future iterations, upgrading to a more robust API would unlock additional functionalities, providing users with a more complete and seamless experience. Additionally, implementing a **notification system** would greatly improve user engagement. For instance, sending alerts when matches end would prompt users to input their ratings and feedback promptly, ensuring more accurate and timely data collection.

Another significant enhancement would be the **implementation of advanced algorithms to improve prediction accuracy**. By incorporating machine learning techniques and analysing historical data, the app could offer more accurate match outcome predictions, enhancing its value to users. Furthermore, the **addition of interactive elements** such as quizzes or mini games related to football knowledge would increase user engagement and provide a more entertaining experience. These features could also serve as educational tools, deepening users' understanding of the sport and its players.

Lastly, focusing on **user convenience and interface improvements** would greatly benefit the application. Implementing social media login options, such as Google or Facebook authentication, would streamline the user onboarding process and potentially increase user acquisition. The ability to upload pictures in the chat feature would enrich user interactions, allowing for more dynamic discussions about players and matches. Finally, a comprehensive UI overhaul, taking into account user feedback and current design trends, would enhance the app's visual appeal and usability. These improvements would not only make the app more attractive to new users but also increase retention rates among existing users, solidifying its position as a go-to platform for football fans.

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Poster

UNIVERSITY TUNKU ABDUL RAHMAN (KAMPAR CAMPUS)
FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

FANS DRIVEN (FOOTBALL)PLAYER RATING SYSTEM

INTRODUCTION

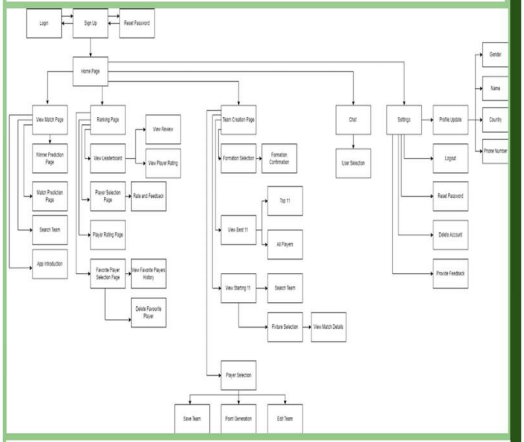
Traditional players' ratings often rely on experts' opinions which those experts normally form from retired players. Thus, this proposal mainly aims to increase the collective information of fans to create a more complete player rating system that considers fans' viewpoint.

OBJECTIVES

- Develop a mobile application that football fans can rate the player based on their performance.
- Develop a user-friendly design in mobile application.
- Develop a mobile application for user to create their best 11 player and communicate with each other in chat.

CONTRIBUTION

- Develop a new user-friendly application for player rating system.
- Incorporates features enabling the users to select their favourite players from a football team.
- Create their own best starting 11 and compare with other fans all around the world.



SYSTEM BLOCK DIAGRAM

CONCLUSION AND RECOMMENDATION

The mobile application successfully bridges the gap between football fans and players by providing an interactive platform for fans to rate players, predict matches, and create custom lineups. This enhances fan engagement and potentially offers valuable crowd-sourced insights to clubs and players.

NAME: LEE MING WEI 20ACB04860

SUPERVISED BY: MR TAN CHIANG KANG @ THANG CHIANG KANG

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	**Study week no.: 2**
Student Name & ID: Lee Ming Wei 20ACB04860	
Supervisor: Mr Tan Chiang Kang @ Thang Chiang Kang	
Project Title: Fans-Driven (Football) Player Rating System	

1. WORK DONE

No

2. WORK TO BE DONE

Redesign the Setting Page, Login and Sign-Up Page

3. PROBLEMS ENCOUNTERED

None

4. SELF EVALUATION OF THE PROGRESS

On Pace

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	**Study week no.: 4**
Student Name & ID: Lee Ming Wei 20ACB04860	
Supervisor: Mr Tan Chiang Kang @ Thang Chiang Kang	
Project Title: Fans-Driven (Football) Player Rating System	

1. WORK DONE

Done redesign the Setting Page, Login and Sign-Up Page.

2. WORK TO BE DONE

Work on Ranking Page and Team Creation Page.

3. PROBLEMS ENCOUNTERED

Firebase Setup Problem. Solved in a day.

4. SELF EVALUATION OF THE PROGRESS

On Pace

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	**Study week no.: 6**
Student Name & ID: Lee Ming Wei 20ACB04860	
Supervisor: Mr Tan Chiang Kang @ Thang Chiang Kang	
Project Title: Fans-Driven (Football) Player Rating System	

1. WORK DONE

Ranking Page and Team Creation Page.

2. WORK TO BE DONE

- Fix the bug and error of the Ranking Page and Team Creation Page.
- Investigate the way to implement API into the mobile application.
- Subscription of Sportmonks API.

3. PROBLEMS ENCOUNTERED

Financial Problem. Solved due to discussion with the team for custom plan.

4. SELF EVALUATION OF THE PROGRESS

On Pace

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	**Study week no.: 8**
Student Name & ID: Lee Ming Wei 20ACB04860	
Supervisor: Mr Tan Chiang Kang @ Thang Chiang Kang	
Project Title: Fans-Driven (Football) Player Rating System	

1. WORK DONE

- Bug for Ranking Page and Team Creation Page have been fixed.
- Successfully implement the API into mobile application.

2. WORK TO BE DONE

- Home Page, which is the Match Page include prediction page.
- First discussion with supervisor for the latest progress.

3. PROBLEMS ENCOUNTERED

No

4. SELF EVALUATION OF THE PROGRESS

On Pace

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	**Study week no.: 10**
Student Name & ID: Lee Ming Wei 20ACB04860	
Supervisor: Mr Tan Chiang Kang @ Thang Chiang Kang	
Project Title: Fans-Driven (Football) Player Rating System	

1. WORK DONE

- Home Page.
- Discuss with supervisor and had some advice for improvement of the mobile application.

2. WORK TO BE DONE

- Chat Page.
- Cleaning of the code and fix the bug and error.
- Run the mobile application and do the testing.
- Work on report include block diagram, use case diagram and others.

3. PROBLEMS ENCOUNTERED

None

4. SELF EVALUATION OF THE PROGRESS

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Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	**Study week no.: 12**
Student Name & ID: Lee Ming Wei 20ACB04860	
Supervisor: Mr Tan Chiang Kang @ Thang Chiang Kang	
Project Title: Fans-Driven (Football) Player Rating System	

1. WORK DONE

- Chat Page.
- Error fixing.

2. WORK TO BE DONE

- Completing the report.
- Poster.

3. PROBLEMS ENCOUNTERED

- None

4. SELF EVALUATION OF THE PROGRESS

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Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S3	**Study week no.: 13**
Student Name & ID: Lee Ming Wei 20ACB04860	
Supervisor: Mr Tan Chiang Kang @ Thang Chiang Kang	
Project Title: Fans-Driven (Football) Player Rating System	

1. WORK DONE

- Finalize all the functionalities in the mobile application.
- Report completion.
- Poster.

2. WORK TO BE DONE

- Prepare for presentation.

3. PROBLEMS ENCOUNTERED

- None

4. SELF EVALUATION OF THE PROGRESS

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Student's signature

PLAGIARISM CHECK RESULT

FYP2

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FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

Full Name(s) of Candidate(s)	LEE MING WEI
ID Number(s)	20ACB04860
Programme / Course	BACHELOR OF COMPUTER SCIENCE(HONOURS)
Title of Final Year Project	FANS-DRIVEN (FOOTBALL) PLAYER RATING SYSTEM

Similarity	**Supervisor's Comments (Compulsory if parameters of originality exceed the limits approved by UTAR)**
Overall similarity index: 14 **%** **Similarity by source** Internet Sources: 11 % Publications: 1 % Student Papers: 9 %	
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Based on the above results, I hereby declare that I am satisfied with the originality of the Final Year Project Report submitted by my student(s) as named above.

Signature of Supervisor

Name: Tan Chiang Kang

Date: 12/09/2024

Signature of Co-Supervisor

Name:

Date:

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF INFORMATION & COMMUNICATION TECHNOLOGY (KAMPAR CAMPUS)

CHECKLIST FOR FYP2 THESIS SUBMISSION

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Student Name	LEE MING WEI
Supervisor Name	Mr Tan Chiang Kang @ Thang Chiang Kang

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√	All references in bibliography are cited in the thesis, especially in the chapter of literature review
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I, the author, have checked and confirmed all the items listed in the table are included in my report.

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_____

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