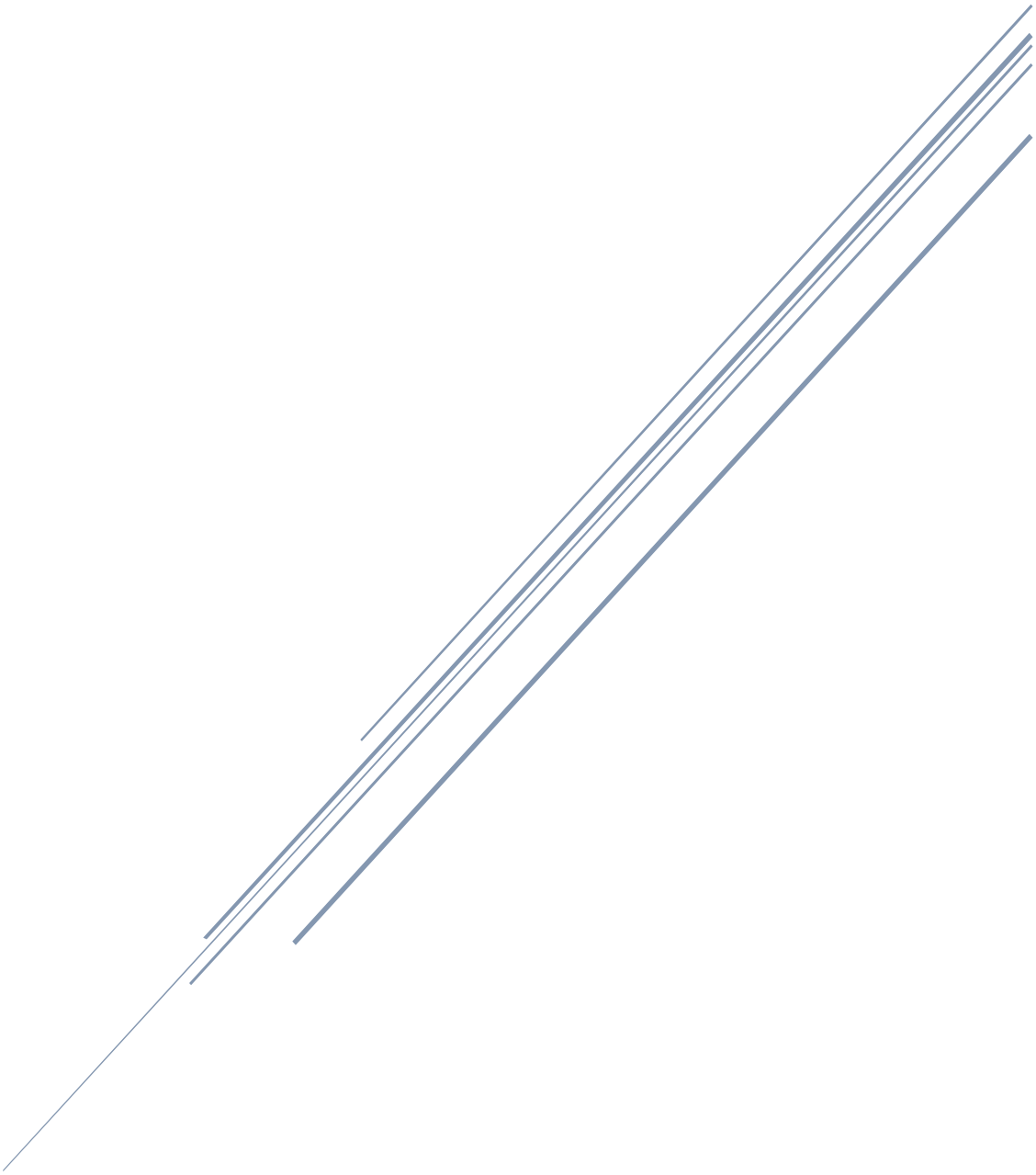
RIVALS WEB APP

An application to manage a football team and find opponents

Project Link - https://rivals-app.netlify.app/



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Software Project Report

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Introduction

Problem Statement

From being football fanatics ourselves, we found that there were not any intuitive ways to manage a amateur team or find opponents outside of word of mouth. Power league was the closest solution in allowing you to play random opponents however it was not done digitally.

Our Solution

This assignment will lay out the information and process of what it has taken to create the application for our proposal. We created a web application-based system for Sunday league matches so that customers can easily interact with this system through a tablet device, phone, or computer. The web app interface is very simple for customers to use, they would be able to book a football match game without any hassle. Also, this web application is very detailed, it will contain a league table with matchday stats, so users will be able to see their team progress after finishing a match. This will motivate users because they will be able to see their match stats after every game they play. This will help motivate them to play more with an incentive because they will want to improve their stats and compete with rival teams that are in the same league as them. Our project was to provide a web application-based system for Sunday league matches and competitive matches. The users would mainly interact with this system through a tablet device, phone, or computer. The web app interface is very simple for customers to use, they would be able to book a football match game without any hassle. And this is what we have aimed to create through this project and believe that we have reached our aims and objectives.

Our Methodology

We have used the agile method to help us complete this project because we believed it was the best methodology when the subject is about project management. The agile method is split into five parts of a cycle which are, individuals and interactions, working software, customer collaborations, and responding to changes. Each cycle part was followed by us as a group, and we worked together. This method has allowed us the time to make sure we finish off each of our tasks before moving on to the next stage of the cycle.

Project Scope

It was important that we set a scope for the project and set realistic objectives to fit both our time frame and limited resources. Basic functionality and design were extremely important, so we made sure that the final software would be able to do the following:

- Login & Log Out
- Be able to search for players and teams
- Create a Team
- Join a Team
- Find opponents (Swipe functionality)
- Have a dashboard with relevant data

We scoped out our project in a manner to maintain the things we needed to complete. This is because we didn't need to overdo ourselves with much work which can grow to be more time-consuming and permit us to fall behind on our project and finish this work. The tasks were split, and everyone was comfortable with the amount of work they were doing, and that's what helped us work together easily, also our group ethic was solely focused on the project the whole time.

Planning and Research

The planning and research for this project were carried out at an efficient level, there were loads of agreements and disagreements but in the end, we all agreed that the changes that we made were the right decisions and that's what made the project move forward. Our research and planning were strictly based on what we think the public use and to see which devices are being used more in this present day so that our application can be accessed effectively. What we found with research is that majority of the people use mobile phones, so what we did was we conducted some research on some local people playing football in groups, and we also made sure that we people we targeted played football frequently or even a handful of times in a year, we did that because we wanted to make sure we were targeting the right audience.

Development Technique/Methodology

The methodology that we carried out was accurate and was followed correctly allowing each stage to be taken in and operated correctly. The planning was 1 of the five stages, also we think the research that we carried out after doing the proposal, helped us see local football communities getting an idea of our app and having a physical interaction with the app as well.

The first set of research that our group carried out was making sure we target the right locations of football pitches that were easily accessible for players to play at and that both teams would have equal proximities. We also carried out market research in areas where the football pitches are located to see the age ranges are that play on those football pitches

so we can see if they fall into our target audience. We conclude that if the community of football players that played in the area of those football pitches is around the ages of (19 – 26) would fit into our target audience because people around those ages are most likely going to be playing football actively and regularly, which means they could use our application to book competitive football matches. We even spoke to a couple of people who regularly play on those pitches and explained what our app is going to provide, we said there was a list of available pitches and links to their websites to users once they input their location, they could pick an opposing team. We also listened to feedback because we find feedback very essential to the development and progress of our project therefore the importance of user feedback was huge in building our application.

Group Management

As a group, we all met up regularly so we could see how much progress we have done and it worked out smoothly, we also made sure we worked on the proposal and the primary idea. Also, for us to create an application that perfectly fits our wide range of user needs, we were required to do copious amounts of research. During the early planning stages of our application, we contacted 4 different Saturday league football teams about potentially becoming stakeholders for our web app. Thankfully they were all willing to be a part of our project which helped our application come to fruition.

Considering the types of technology to build product

To build our product we will use a number of coding languages, frameworks and database management systems. The languages we will most likely use are HTML, CSS, JavaScript, Java, SQL & PHP. Below we have shown the research behind deciding on what stack we will use for building our product.

Front-end frameworks + Stacks

Framework		Pros	Cons	Stack
React	80%	• Easy to Learn and Use • Creating Dynamic Web Applications Becomes Easier • SEO Friendly	• The high pace of development • Poor Documentation • View Part	• M - Mongo D • E - Express • R - React • N - Node.js
Angular	56%	• Great selection of third-party integrations	• Performance • Steep learning curve	• M - Mongo DB • E – Express • A – Angular • N - NodeJS

		• Framework is designed to be fully customizable	• Limited SEO options	
Vue.js	49%	• Performance • Easy to learn • Concise documentation	• Risk of over flexibility • Language barrier (Chinese)	• M - MongoDB • E - Express • V – Vue.js • N – Node.js

(Front-end frameworks, n.d.)

Database Management Systems

Database	Pros	Cons
MySQL	• Can be used in different OS (Windows, Linux, MacOS) • Data security- MySQL provides a very high-level of security. • High performance-MySQL provides very high performance	• Poor User Interfave • Lack of advanced features compared to PostgreSQL
PostreSql	• Highly expandable • Reliable, stable and secure system • Possible to process complex data types	• Performance degradation in the database environment
MariaDB	• SQL - Is well known and supports most types of usage cases for a database. • Open source - support and resources to develop on. • Multi-platform - runs on any operating system	• Poor performance on large data sets • Caching performance is lackluster
MongoDB	• Performance • Simplicity • Scalability	• Joining in MongoDB can be a tedious task • Duplicates • High Memory Usage
NoSQL (Firestore)	• Wide range of services/features • Quick and easy to setup • Authentication	• Platform dependence • Limited Query Capabilities

Technology to Build the Product Evaluation

We want our final product to have a sleek user experience and with high functionality. To achieve this, we believe that the combination of React, and Firebase be the best use of technology to build our product.

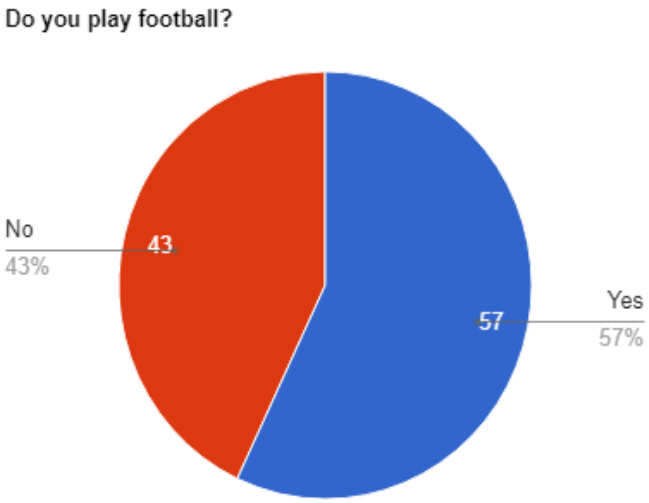
The decision behind using Firebase opposed to MySQL was because authentication for the user can be very straight forward and easy to use, In addition to this, a NoSQL database structure will allow us to easily add/change the database layout if we need to. Taking our

project scope into account we believed Firebase would allow us to achieve great functionality without having to sacrifice too much time with the backend development.

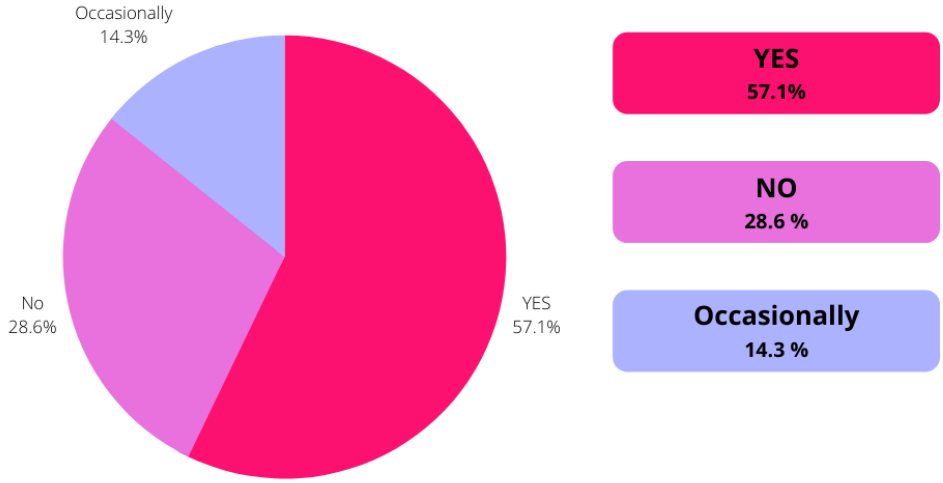
We went with React as it's easy to learn, as we must stay within a timeframe this was essential as we needed to use a framework we can pick up and use without falling behind. Also, creating dynamic web applications are easier with React as it is a JavaScript library for creating user interfaces that may be used to create single-webpage or mobile apps. SEO optimisation will play a big role towards the final deployment of the product, React is proven for better SEO performance as it is a library for building UI, It doesn't need additional tools for SEO such as PhantomJS to tackle SEO issues.

Market Analysis/Surveys

The image that is below is the 1st research that we carried out with the public because we wanted to find out how many people played football in that area because it was an area that had football pitches in close proximities which would very useful. Because we wanted to make sure we targeted the right locations of football pitches that were easily accessible for players to play at and that both teams would have equal proximities and that would mean it would be easy for both teams because they won't have to travel far to versus each other.

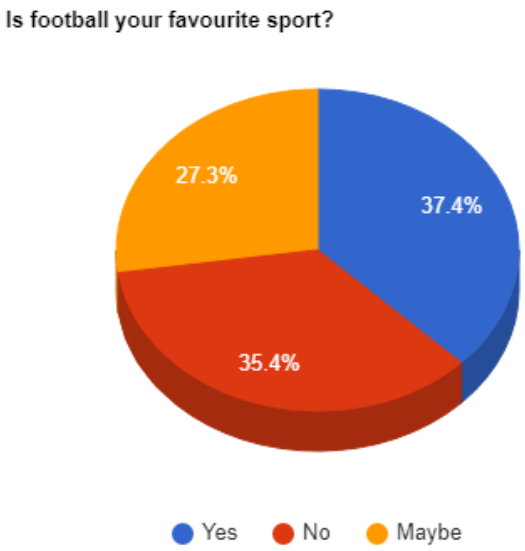


After taking some evaluations and conducting more research in the latter stages of our project, we thought asking the public 'if they'd played football' is a vague question because there could be many people that play football causally and would not be interested in playing against teams in a league division or even competitive matches at all. So, we decided to find out more context about the people that play football in the area were conducting our market research. The image below is the brand-new research data that we gathered.



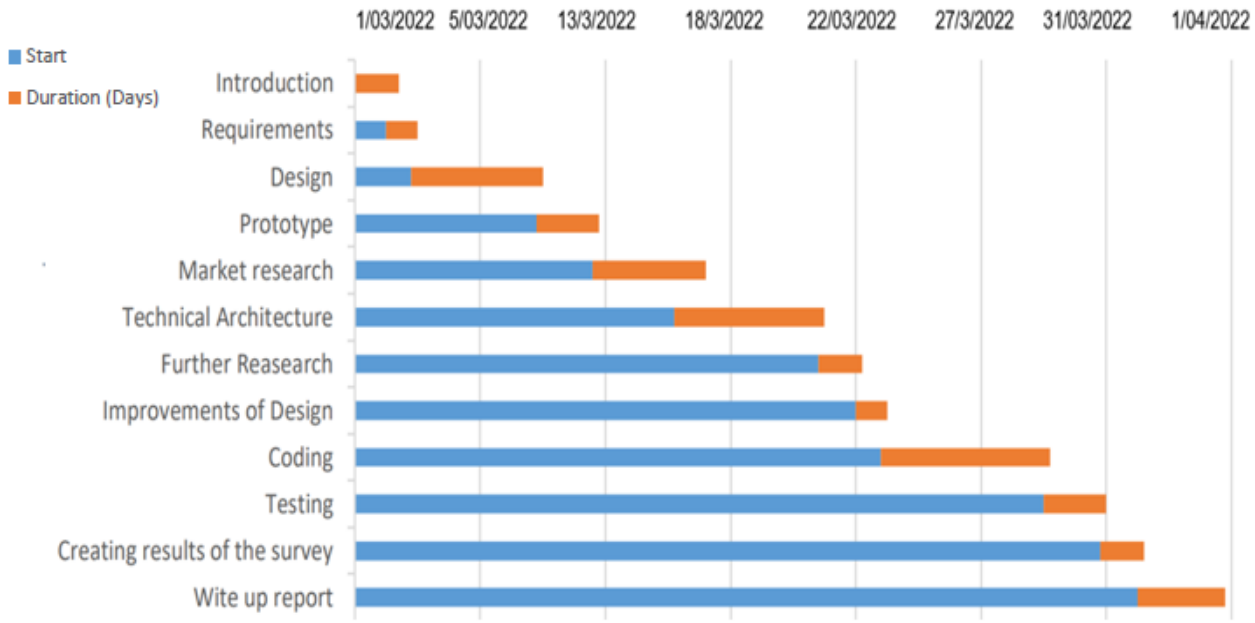
Do you play football competitviely?

The image that is below is the research that we carried out, we asked the public whether football is their favourite sport, because we wanted to find out the percentage of people in one area who find football as their favourite sport. This research was very useful because our application is based on football and the more people that say football is their favourite



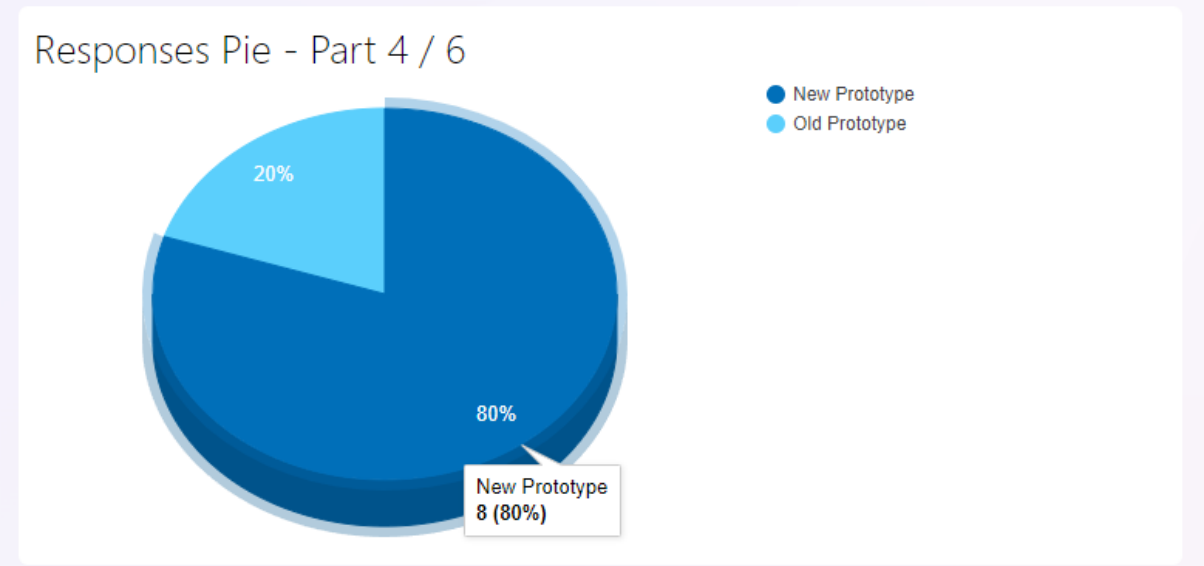
sport in the area that we did our survey in, it would be very useful because they could be potential users of our application because our app is centred around football.

Gantt Chart



Prototyping and Iteration

As a group we have improved our prototypes and and was given feedbacks in what design we shall implement in our final project, the feedback gave us ideas and reflection on the things that we have done wrong and the things we did good in. the poll has decided on what we should do and the fact that we used individuals in order to vote shows that the users should be in control in how the application will look like. The first design of our prototype was the original application that we were going to make however with the new design we have found out that it is more favourable. Our design was based on individuals to look for games this is because we felt that bringing a community through their favourite sport will create a lot of popularity and hopefully it will expand.



The proper arrangement of interface components improves the resource's usefulness and appeal to users. You may encourage visitors to do activities in some situations by using a well-designed website. You must know exactly what you want from the resource and what elements should appear on each page.
To that purpose, a prototype is built during the design stage – a black and white layout that represents a simpler site plan. It comprises all of the key parts in the form of blocks, allowing the client to assess the core notion.

Prototyping not only aids in identifying and formulating the design's core direction, but it also saves time. You don't have to spend a week constructing a new site layout after spending a
day establishing an idea. However, this isn't the only incentive to put effort on the prototype.

A Prototype is a model to demonstrate a concept, it is intended to be developed from a basic visualisation of an idea to a final product to be deployed. The Prototype can vary in complexity and completeness and does not always hold the exact logic used in the actual software application; however, the importance of prototyping cannot be stressed enough as it is arguably ‘the first step to success’ (Mishra, 2019). Prototyping allows the users to evaluate a concept and try it out before implementation and final deployment.

During our software development process, prototyping is the ideal way to test, evaluate, and validate our idea. It lets us confirm that we are building the desired product before we code it, in theory, prototyping reduces the risk of a failing project. We can make informed decisions based on an early and quick prototype (low-fidelity prototype) before spending

time and resources on the development of our final product. User feedback can also be given on more developed prototypes which is essential to the success of the project.

Stages of prototyping & how we will build a Prototype

1 – Assessing Requirements of the Software

Assessing the requirements of the software is the first stage in developing a prototyping model. During this phase, the targeted demographic of the product was asked what they would like to see implemented in the software and what needs they want the software to cater to. In this project we will conduct our requirement assessment through the use of surveys, we will use Google Surveys as they are quick, and Google makes the interface easy to use and user friendly which is important as we need quality market research for our project to be successful.

2 – Low Fidelity Design + Feedback

The second stage involves the creation of a low fidelity design or a quick design. Throughout this stage, the basic design for the system is formed. It provides the user with a quick overview of the system. This quick low-fidelity design assists in the development of the highfidelity design/prototype.

The reasoning behind using low-fidelity designs is that they are quick and inexpensive which is important to our group as we must stick to a timescale, and we have limited resources. Possible to make instant changes and test new iterations. They are also disposable which is convenient if you make a mistake or would like to alter the design. Also, regardless of ability and experience, stakeholders and users can get an understanding of the concept. Most importantly a low fidelity design enables us as a group to get an overall view of the project using minimal time and effort, instead of wasting time on minor details.

We will produce a low fidelity design by hand, and it will show the basic design of the website UI, the UML Diagram which will show an idea on how the database will work and the backend design such as communication between the website and database. This is an essential step for us in the development of our project as it ensures we work towards what the user wants. Once the low-fidelity design is created, we can get expanded feedback from the target demographic and get an insight into the reaction of the user to our vision.

3 - Medium Fidelity Design

A Medium-Fidelity Design focuses on the overall design and concepts for the proposed software without the pressure of making every page linked, clickable, and interactive, in other words, we can spend less time worrying less about the bugs of the project and focus on the ideation of the project.

We will also have a more developed UML diagram and a further developed database itself being used within the prototype. This will be the first time we thoroughly assess what languages and systems will be used to build the project, for example, the choice to use React over Angular or MySQL over Postgres. The prototype will be interactive which can improve the collaboration, as a group, this stage will help us to understand one another's ideas and work them into the project.

4 – High Fidelity Design (Functional Prototype)

During this stage, an actual prototype is developed intended to support the knowledge gained from the low-fidelity design. It is a simple low-level working model of the desired system. We will show this to potential stakeholders interested in the project as well as users to get continued feedback to implement in later prototypes.

It is important to find a balance of building something that shares an understanding of what the final product will be to the user and stakeholders without wasting time and resources by overcomplicating this original prototype. We will create a functional database that works alongside a website to demonstrate how the user will create an account and join a club among many other features. The main aim will be to have a tool to demonstrate our project to potential stakeholders and users rather than working on the final design of the software, therefore the UI will remain basic and will be addressed in a later stage of the prototyping. The languages and systems used to build the project will be finalised and the prototype will be developed using the finalised languages and systems.

5 - User Evaluation

The proposed software is demonstrated and tested by intended users, it is vital we investigate the prototypes strengths and weaknesses as these will be focussed areas of development. Detailed feedback from the intended user and potential stakeholders is gathered to be implemented. This process tends to run in a circle until we get overall satisfaction from the user where a final product can be deployed.

To carry out this stage we may consider getting a focus group of intended users and giving them a spreadsheet to give feedback on any issues they encounter (bugs) or any features they would like to see implemented. We can then use this spreadsheet as a checklist to work through while developing the prototype.

6 – Implementation of User Feedback on High Fidelity Design

If the user is dissatisfied with the current state of the product, then we will want to improve the model so that it responds to user feedback and suggestions.

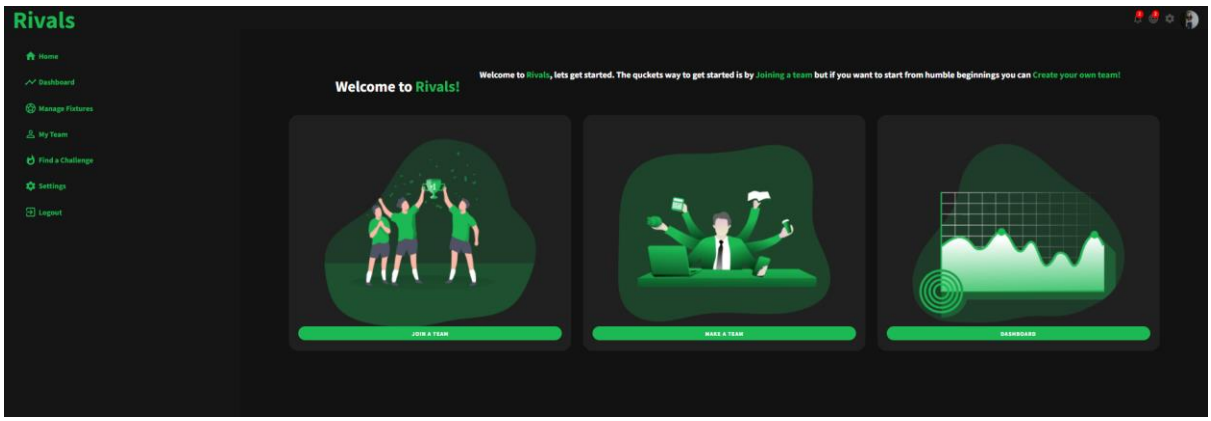
This is the final stage of our prototype; we will use the user feedback from the high-fidelity design and implement their feedback into our project. Once the user is happy with the product we can move on to the deployment of our software, the prototype stage of our project would now be complete.

Design

Design is an important part of the audience as it improves the user experience. As long as the design is right then the website will not fail as it will keep it in line with the target audience therefore allowing individuals to have good user experience and this will have good benefits for you and the audience.

Brand image

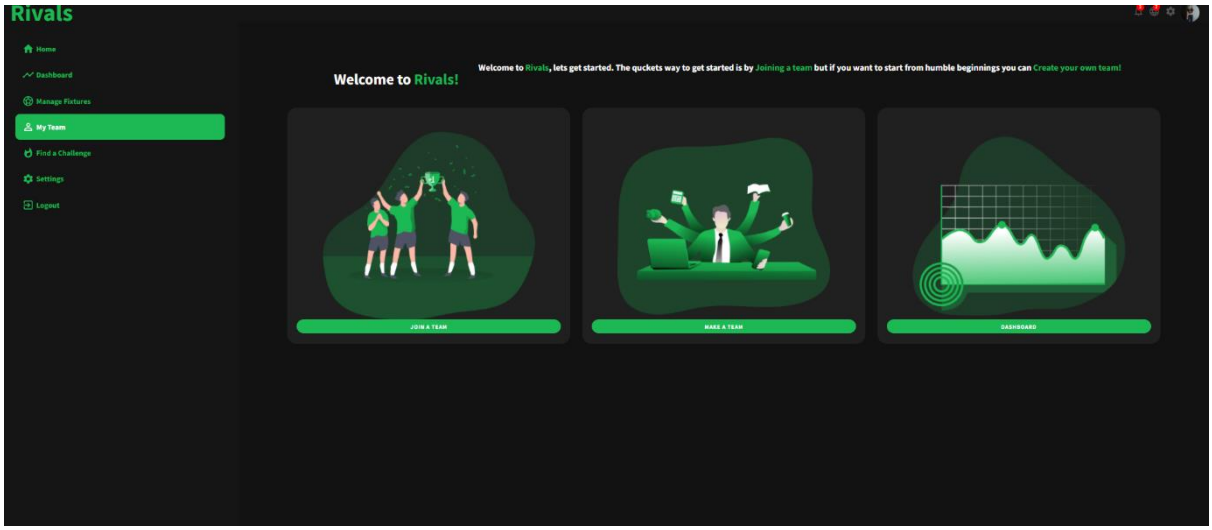
Your website is reflected of image and what it stands for, for our website rivals it was important to get people and view the image of our homepage in order to get their first impression on how the website looks and the feeling that they get from it. Therefore, we need to select the elements of our colours, design image and logo carefully whilst doing so.



See how we used the distinctive colour of black and green background while maintaining the same colour on our logo this keeps the consistency because these two colours represent the brand and the people that associate with it.

Colour

If you want your brand to be associated with trust, for example, you should choose the colour green. Furthermore, if you want customers to believe that your company produces high-quality service, the colour black might help you create that image. Similarly, you may choose your brand colours based on the brand connections you wish to create.
Then you may choose colours that elicit specific emotions or thoughts in individuals. Green, for example, is the colour most connected with trust, for example in our website



We maintain the same colour this allows it to keep the simplicity and neatness of the website and at the same times making it look neat therefore allow for a better user experience, the downside of having multiple colours is that it distracts the user and makes it look hideous, thus meaning that the correct use of colours allows it to be slicker.

Fonts and typography

The main rule for choosing a font is that it should be simple to read and stand out against the chosen backdrop colour. The real selection, on the other hand, should be based on your target demographic. Fonts that are livelier and trendier are generally preferred by younger people. Clean and basic ones that are simpler to read may be preferred by older persons. Your typeface should also represent the personality of your business, whether you want to appear professional or young.

Our Prototype

Low Fidelity Design

This is an overall screenshot of our low fidelity design that was created using (https://wireframepro.mockflow.com/, n.d.). For a more detailed view please refer to the Appendix (C-J).

Feedback on Low Fidelity Design

"Are we going in the right direction?" was the main question to be answered in this feedback session especially as we were at the early stages of the design process. To find an answer to this question, we created a low fidelity prototype.

Using a free software tool online we were able to create a basic sketch up a wireframe of what we thought our product would look like. The purpose of this prototype was to get an understanding of how we would lay out our product and whether it was a feasible design proposal. We understood that it wasn't aesthetically pleasing, however did showcase our vision to our intended users. Our goals and considerations when testing:

- Test the right people

  We tested seven people that we believe would fall into our target audience, the demographic of those tested was 19–24-year-olds that play football anywhere between frequently (weekly) to occasionally (handful of times a year).

- Be neutral when presenting your ideas

  We needed not to sway the opinion of the tester in any way, we made sure to present ideas without a biased opinion. This ensured our feedback was authentic and reliable, making it far more valuable to our future iterations.

- Remain Open-Minded

  On our testing feedback sheets we implanted an “I Like, I Wish, What If” method to allow participants to share their feedback in a critical but positive manner. Also, we made sure not to respond to negative feedback defensively but instead to ask useful questions to understand what exactly is wrong with our design, and how we can improve it.

- Communicate limitations to the user

  As this was only a low fidelity design, we made sure to inform the tester that the focus was design feasibility, “could you see it work or is there anything you would change?”, “anything you particularly dislike or like?”. As previously stated, we know the design needed to be more aesthetic however we told the tester this would come at a later stage.

- Ensure to Iterate

  Going back to our development model and methodology, we understood that we would have to use the feedback to produce an improved iteration of the original design. We decided to sort negative feedback and suggested improvements into an order of importance (logic and architecture before aesthetics).

Tester	Keep Doing +	Improve -	Flight
Jake	The calendar is a nice feature	Some pages have a lot going on	A to do list would be nice
John	I like the tables, they’re easy to read	The links at the top aren’t big enough or helpful	Seeing what players are ready to play should be included
Evan	The dashboard layout is quick to understand	The iPhone designs don’t seem easy to use	Work more on the iPhone design
Leo	Its neatly laid out which makes it easy to understand	Some pages come across repetitive	More stats could make it more interesting
Joe	I like the idea of making my own team	There’s not enough team information	Being able to select a squad would be a nice touch
Callum	It’s nice being able to say your position	The home page is too busy	Allowing the coach to message players could be useful
Will	I think it’s an interesting concept	Not enough player information	A way of seeing where the pitches are

Reflection and analysis on Low Fidelity Design

Although our design is basic, the test group seemed to grasp the concept and take a liking to the idea. They gave vital feedback, both positive and negative as well as potential features they'd like to see in the product. Upon reflection we can see that our designs were too busy and could make use of white space, in addition to this we feel the navbar layout is hindering the design of the dashboard.
In summary the key points from this feedback session have been:

Positives –

- The design was well interpreted
- The users were a fan of the concept itself
- Dashboard and stats were an element the users enjoyed

Negatives –

- Some pages were repetitive and too cluttered
- The navbar was not liked by the user
- Not enough stats on players and teams

Suggested improvements –

- A to-do list • Checking the availability of a player
- Squad selection for fixtures
- Solution for the coaches to message players
- Solution to seeing pitches (maps) This feedback will be used when continuing

with the development of our project using the iteration model, we will assess the feasibility of the test users suggested improvements and release multiple iterations with these requested features. We will also look at the negative feedback and develop solutions, this should improve customer satisfaction and experience with the product as the software will be more tailored to the user

High Fidelity Design (Functional Prototype)

Feedback on High Fidelity

Design Our main goal of this feedback session was to get a reaction from the user on the design and basic user experience of the product. A lot of time was spent on developing features suggested by the tester group and designing a marketable product with a unique brand.

Using a tool online (Framer, n.d.) we were able to create a high fidelity (somewhat functional) prototype that demonstrated our vision for the final product. The purpose of this prototype was to understand if our design was successful in being intuitive and satisfactory for the user. 'High-fidelity prototypes are assumed to be much more effective in collecting true human performance data (e.g., time to complete a task), and in demonstrating actual products to clients, management, and others.' (M. Walker, September 29–October 4, 2002) The goal of this prototype is to provide a proof of concept that demonstrates functionality to be tried and tested by customers and clients. To achieve our goal, we must consider the following when testing:

- Test the right people Again, we tested seven people that we believe would fall into our target audience, we thought this would be beneficial as we could get a reaction to the new design and features from a group that had seen previous iterations.

- Let test participants contribute ideas Feedback is essential to the development and progress of our project therefore the importance of user feedback cannot be stressed enough. We used the same form from the low fidelity feedback, users completed this throughout testing the high-fidelity design.

- Have a moderator as this prototype was more complex, we thought it was important to have a moderator to keep the session on-track and guides the test participants through the tasks.

- Remain Open-Minded On our testing feedback sheets we implanted a "I Like, I Wish, What If" method to allow participants to share their feedback in a critical but positive manner. Also, we made sure not to respond to negative feedback in a defensive manner but instead to ask useful questions to understand what exactly is wrong with our design, and how we can improve it.

- Communicate with the test user We made sure to inform the tester that the high-fidelity design was functional however would still lack many features expected of the final product, we wanted to see if we had catered to the wants of the user and whether we had been successful with our updated product

Tester	Keep Doing +	Improve -	Flight
Jake	The colour scheme is aesthetically pleasing	Some pages have a lot going on	
John	The new tool bar on the left of the screen makes navigation easier	There are no iPhone designs	iPhone compatibility
Evan	I think the find a challenge section is unique and intuitive	Would like to see teams addresses instead of distance	Comparing players stats would be a fun feature
Leo	There's a range of stats for both team and player which I like	Some pages come across repetitive	
Joe	Seeing what players are fit or unfit for a game is a great feature	The sign in/up form is abit buggy	A way of accessing the team sheet to see positions
Callum	Nice touch being able to see who says their available for a game	The home page is a bit messy	
Will	Interesting way to challenge teams to games	Not a clear way of picking a team for a match	A map that shows teams and pitches near you

Reflection and analysis on High Fidelity Design

Again, our test group seemed enjoyed the functional concept. They were pleased at the iterations we had made to the product and surprised at the overall quality of the prototype. Superb feedback was given by the group, also bringing some challenging suggestions to the table. Through reflection we can see that our designs have greatly improved however they were still elements of clutter/busy pages. The new features were well received indicating our feedback was authentic, leading to genuine development of the product.

In summary the key points from this feedback session have been:

Positives -

- The design was aesthetically pleasing
- The new tool bar on the left of the screen makes navigation easier
- New elements such as the challenge section were unique and intuitive
- Plethora of stats for both teams and players
- Implementation of a wanted feature (Match fit & Availability)

Negatives -

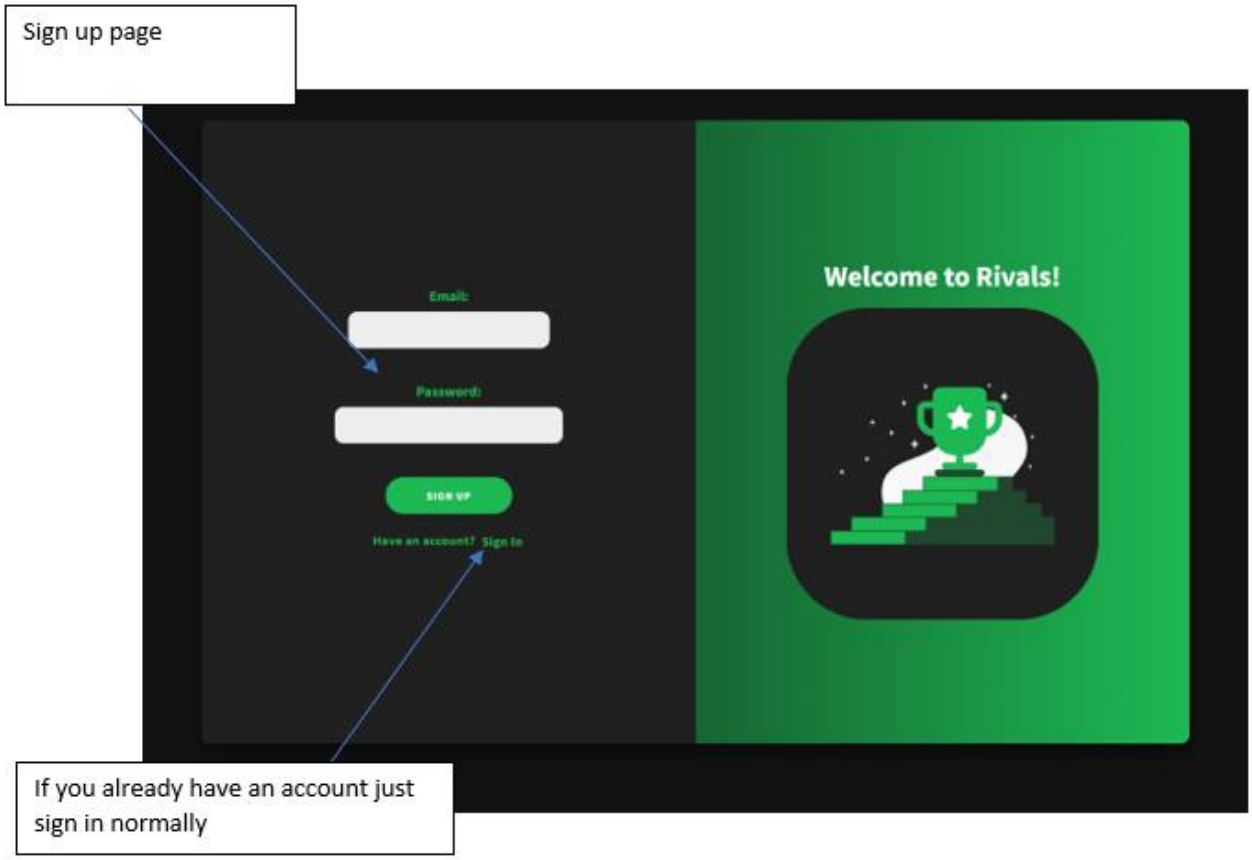
- Some pages are too cluttered
- Lack of iPhone designs

- Users want to see exact location of pitches rather than distance
- Bugs on Sign In/Up form
- No easy way of picking a team

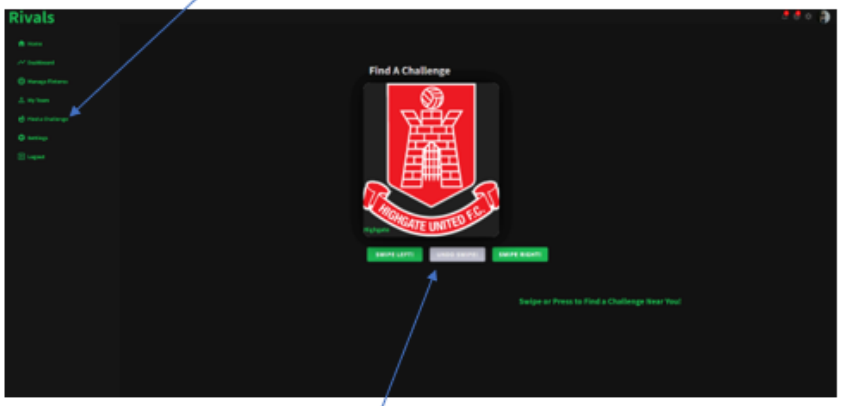
Suggested improvements –

- iPhone compatibility
- Ability to compare players stats would be a fun feature
- A map that shows teams and pitches near you Solution to seeing pitches (maps)
- Solution for accessing the team sheet to see position

User Guide:



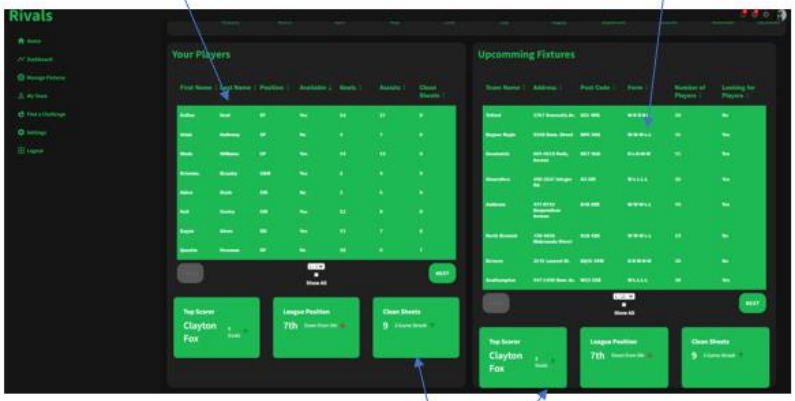
To find a team to challenge click on find a challenge button on the left of the screen



Use the buttons to swipe right to challenge, swipe left to not and middle is to undo the swipe

can see all the players that are playing and their statistics.

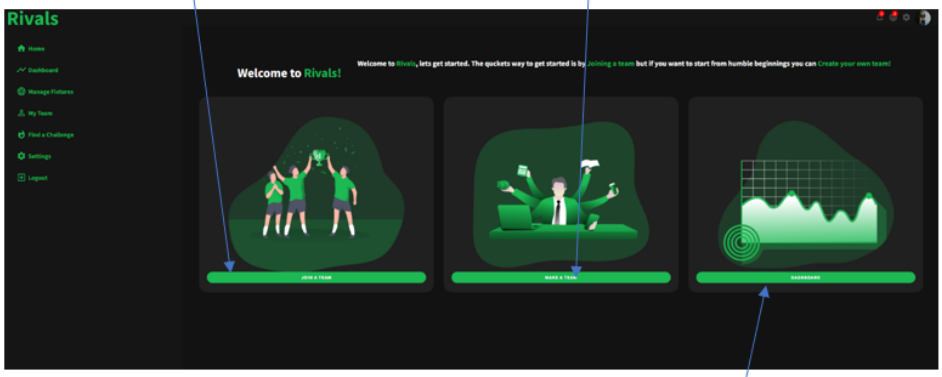
Can see upcoming matches and their stats.



More information about the season.

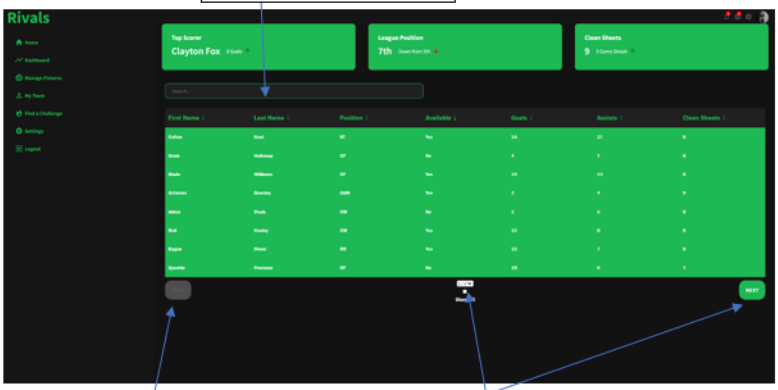
Join a team by clicking this button.

You can create a team by clicking on this button.



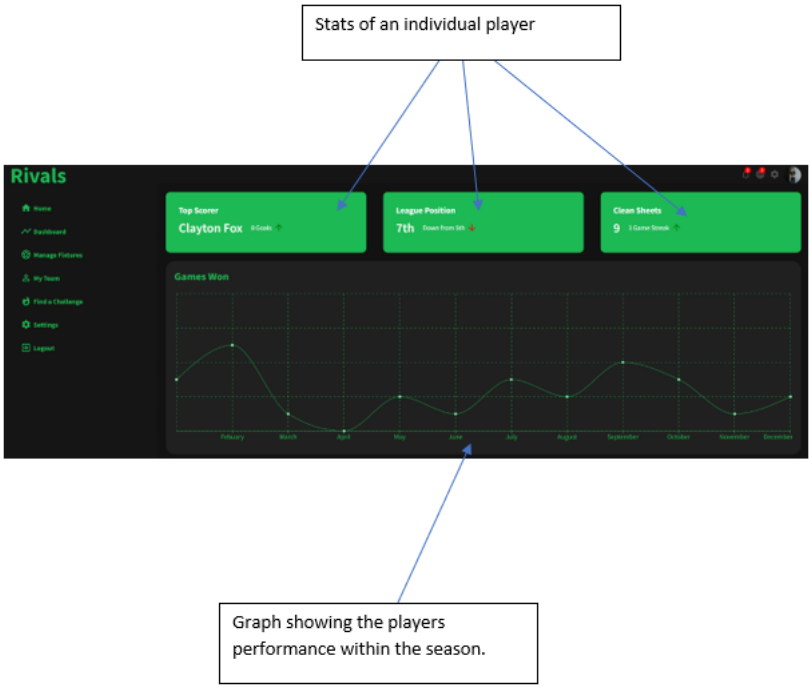
This button takes you to the dashboard.

Use this search bar in order to look for players.



Can use the button previous and next to change the pages to see the rankings of each player

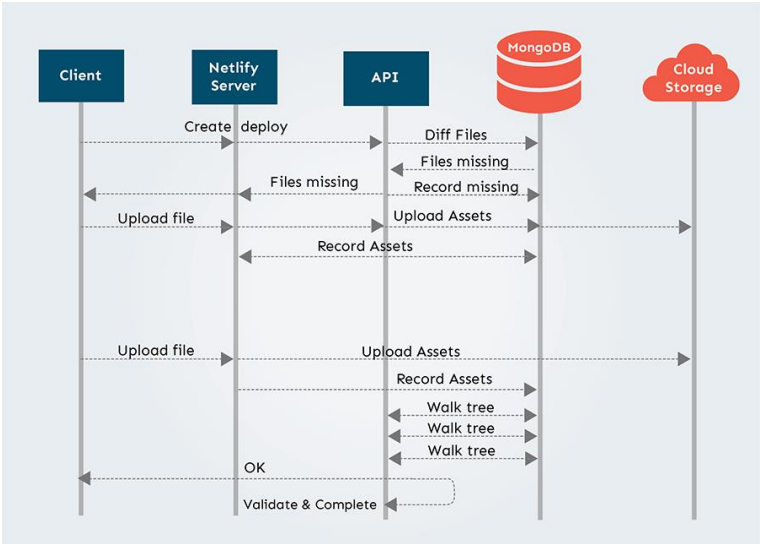
Can use the show all button or use the drop-down menu in order to show certain number of pages.



System Development

Deployment of Source Code

Using Netlify we were able to deploy our application with a minimum of fuss, all we had to do was run 'yarn run build' in the terminal of our project and upload the 'build' folder to Netlify. Netlify runs a build process to pre-render all your pages in static HTML. Netlify creates its own repository that pushes to its own microservices. It then executes and distributes content across a wide CDN to deliver pre-built static websites to visitors. Netlify enables a 10x faster path to much more performant, secure, and scalable websites, and apps. Also, it is quick and easy to push updates to the application, the site only goes down for less than a minute to apply any updates.



Source - https://www.netlify.com/blog/20 1

Front-End Development

The importance of the front-end development could not be understated as we knew users would only use the application if the front-end design was intuitive and slick. Using React made this task much easier to accomplish as it allows for custom components, fast rendering, high performance, flexibility and has a strong community support. We were able to use dependencies such as 'InteractiveTable' (react-interactive-table) and IntroJs to further our application without having to spend as much time developing the code.

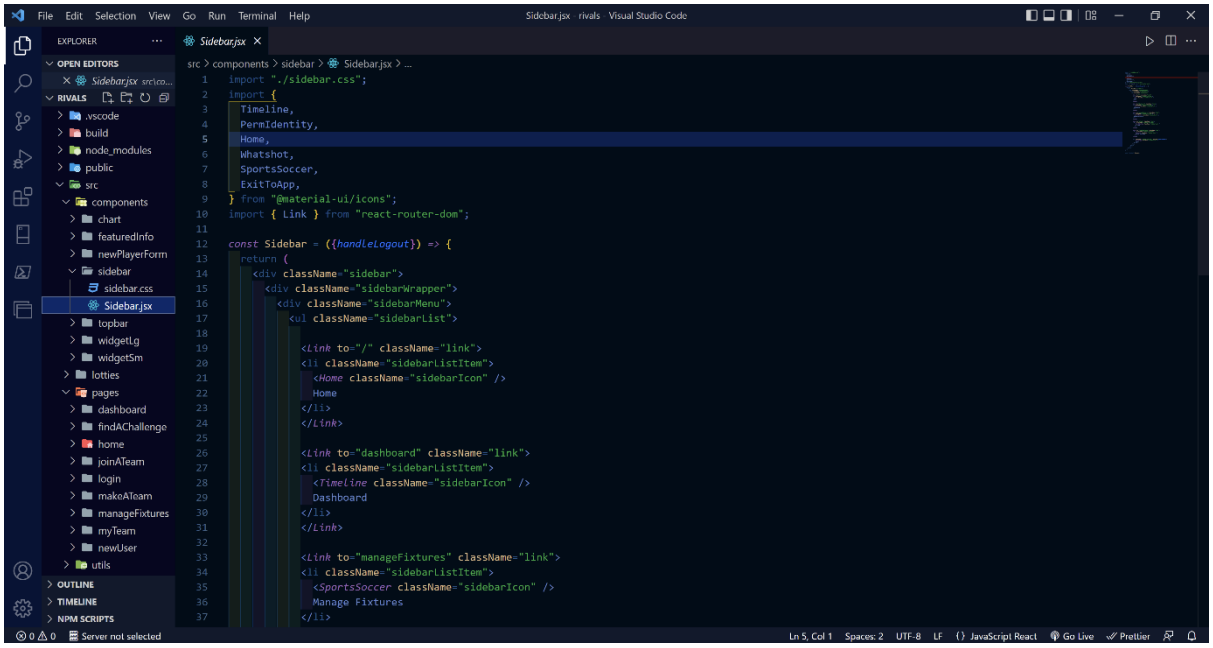


Figure 1: Sidebar Component

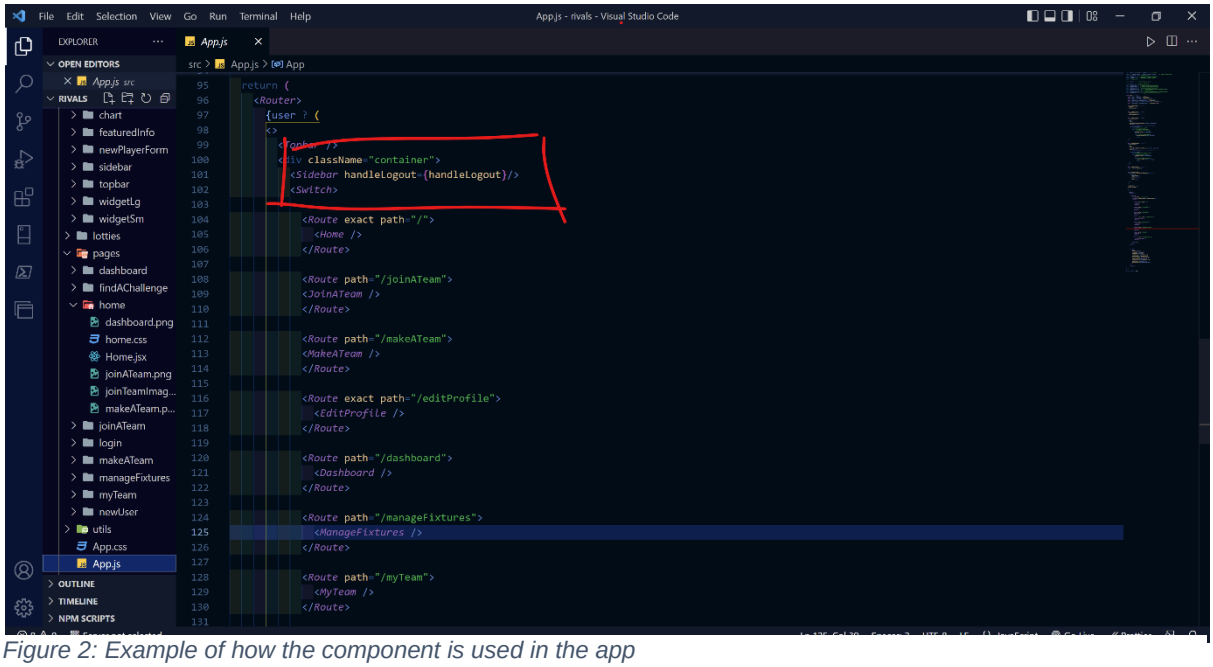


Figure 2: Example of how the component is used in the app

The figures above show how components made front-end envelopment easier, we only had to change the CSS or HTML for the sidebar once and it would change for every page. This sped development up and ensured the design stayed consistent across the application.

Middleware/Backend Development

Before we were able to add Firebase to our app, we needed to create a Firebase project and register our app with that project. After we registered the project, we get a Firebase configuration object that we used to connect our app to the Firebase project.

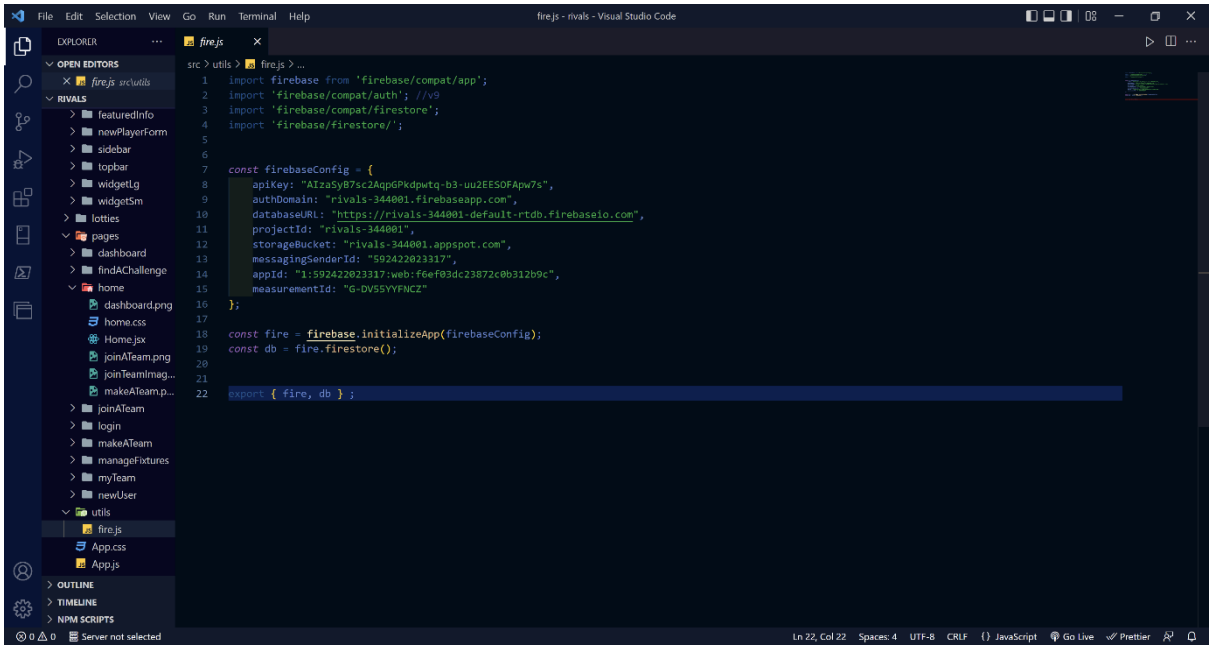


Figure 1: Shows how the application connects to the firebase API

In order to connect to firebase, we had to the firebase dependencies via 'yarn add firebase'. Once that had installed, we then had to initialize Firebase in our app and create a Firebase App object. Now that the app was connected with the firebase project all we had to do was import the object into the pages when we needed it. We were able to setup authentication, send data and receive data.

Consume Data from Firestore

In order to get data back from the Firestore database we must import db from the config file along with useState and useEffect to create state and fire the request to fetch data.

1. First we created a piece of state to store the data.

2. We then needed to create an async function to fetch data from Firestore and call it inside useEffect.

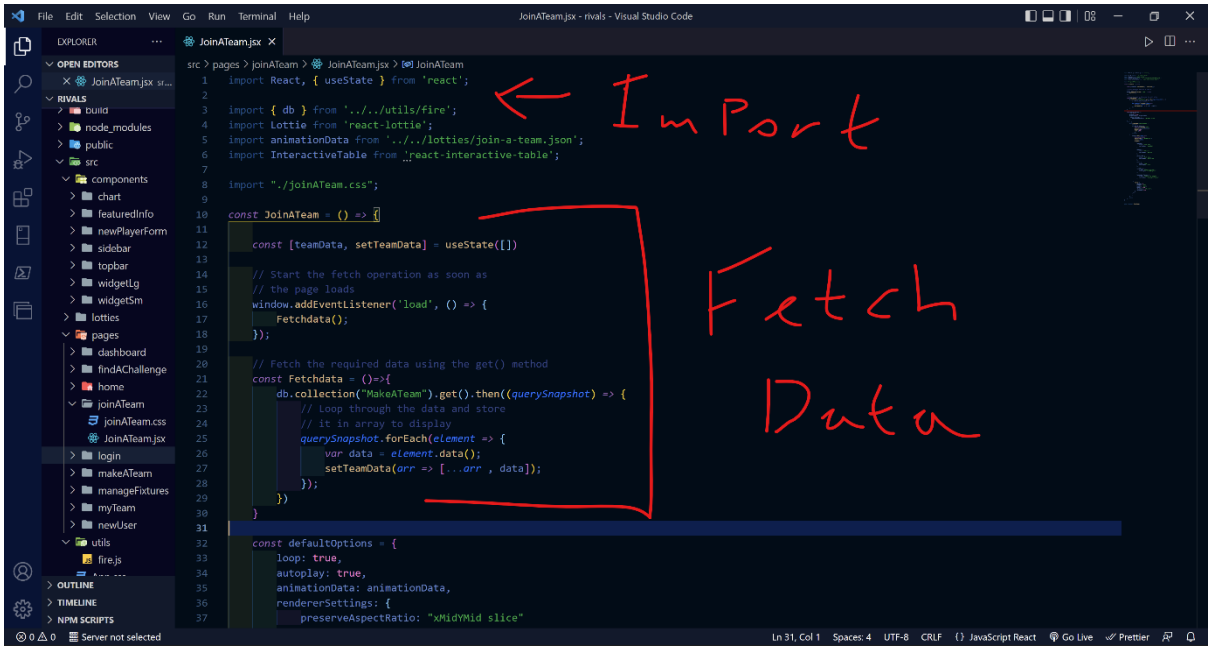
3. Within the fetchData() method, we called the collection() method on the db object and passed in the name of the collection (‘MakeATeam’) as a parameter.

4. In order to get the data from this response object, using the await keyword, we called the get() method on the response object and store it inside a variable data. The data object contains a property called docs that contains information about each individual document in the collection.

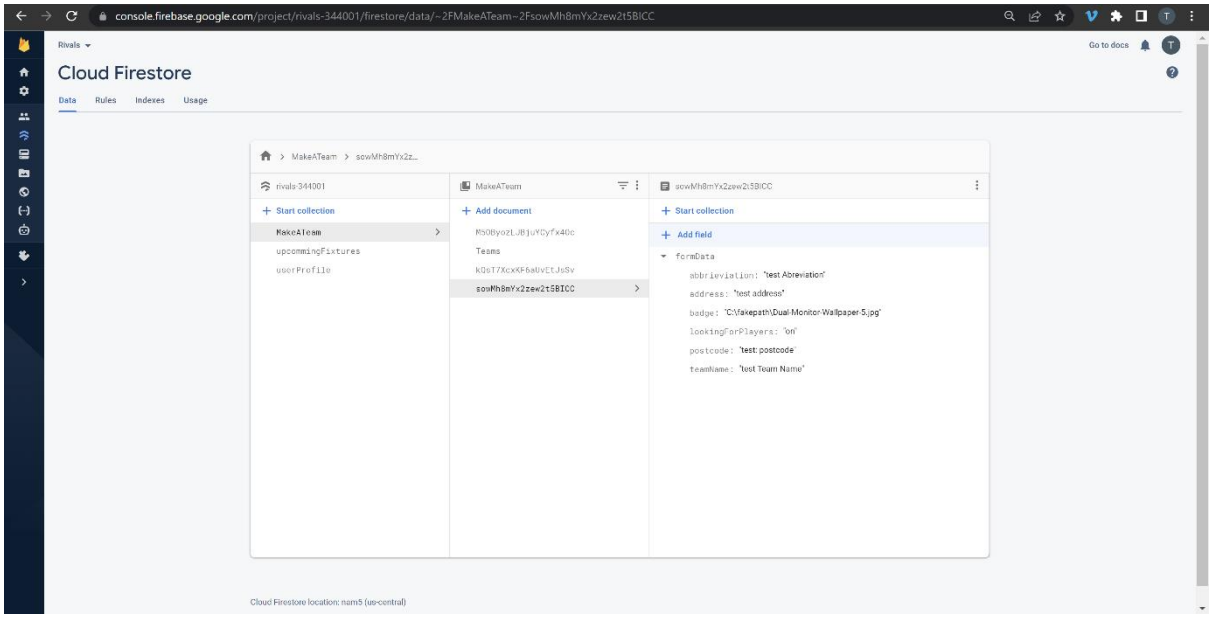
5. Next we had to Iterate over data.docs to get an individual item and call the data() method on each item to get the data inside it.

6. We then added the data to the state inside the loop.

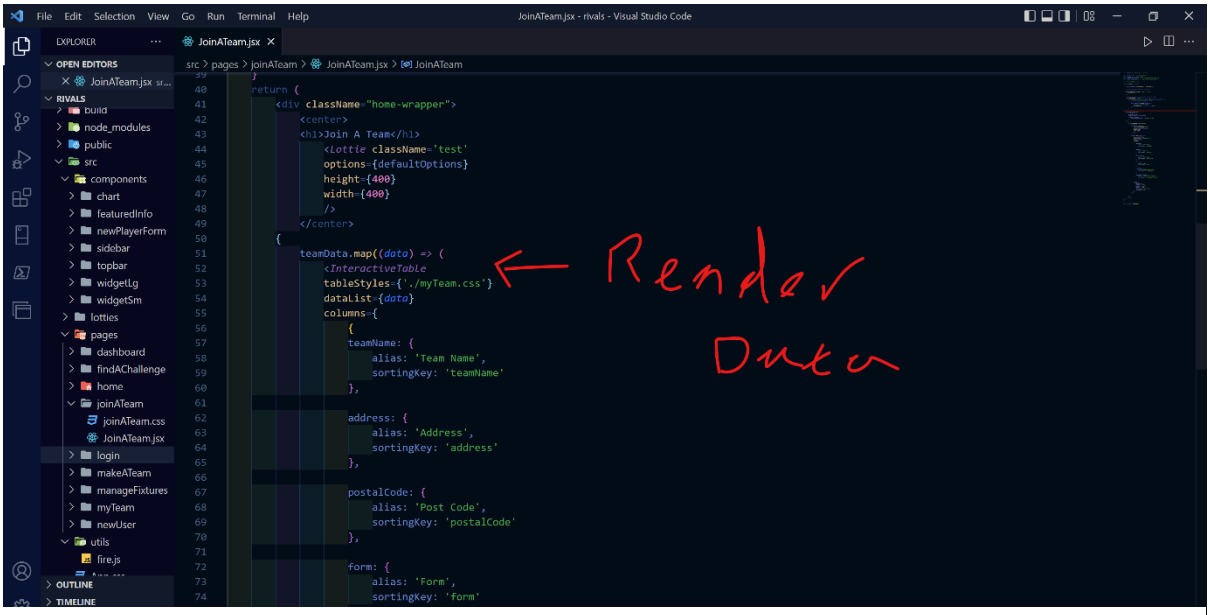
7. Finally, we checked the state and rendered the data on the DOM.



Backend for consuming data



Firestore Database for MakeATeam



Rendering the Data on fetch

Analysis

Our first design which as a group we agreed on was creating a web application that allowed users to select an opposing team within their area to play in an efficient and effortless way. We opened this idea to the public and they also felt this was a clever idea. We decided to stick with this design and moved on with testing and development. The design was simple

but took a lot longer than planned. During development, we changed and included new features for usability. Incorporating features required extensive research. We looked at incorporating features that included all types of people. This realization leads to us changing the development of the system. Development is a major part of the project as this is where your entire plan and ideas come to life.
This change in development was very crucial as it was the main point that had been brought up in the public testing phase.

Next time during the development process I will be focusing on my CSS and HTML skills to endure that I am able to improve and develop my ideas in a way that allows progress. During this project, there were features that I was unable to include due to my lack of knowledge and skill. To ensure that this does not occur in the future I will be focusing on broadening my coding skills and making sure we partake in some extracurricular courses to strengthen our knowledge in web development.

Overall, I believe that there are many things that we would do differently next time; although we were organised to some extent, it was not enough; therefore, we believe that next time we will work on our coding skills and knowledge, as well as our marketing skills; by this, I mean that we will ensure that we gather all information before moving on to the next stage, rather than conducting additional research later on, as this was time-consuming for us. We worked effectively together in general and accomplished the project to the best of our abilities.

Evaluation

The proposed software is demonstrated and assessed by intended users, it is vital we investigate the prototype's strengths and weaknesses as these will be focussed areas of development. Detailed feedback from the intended user and potential stakeholders is gathered to be implemented. This process tends to run in a circle until we get overall satisfaction from the user where a final product can be deployed. To conduct this stage, we may consider getting a focus group of intended users and giving them a spreadsheet to give feedback on any issues they encounter (bugs) or any features they would like to see implemented. We can then use this spreadsheet as a checklist to work through while developing the prototype.

Technical Novelty & Difficulty

One of the biggest challenges we faced as a group during the creation of our web application would be creating usability features that fit all different types of users. During our stakeholder's meeting, we came across a member that had visual impairments, so we

had to take into consideration people's disabilities. During this meeting, we also came across a wide variety of preferences when it came to the layout and design of the app.

To fix this issue we had to research different ways of creating a user-friendly application. To take the problem with users with disabilities we focused on optimizing the font and graphics size and keeping the colours of the page simple but eye-catching. Fonts were sized to be big enough for users to read without trouble but not too big that they distract from other parts of the page. Buttons have been made big enough so that users with lower manipulation skills and visually impaired users have no difficulty when accessing parts of the app. In addition, we also focused on the resolution of images being perfect as this affects user feedback greatly.

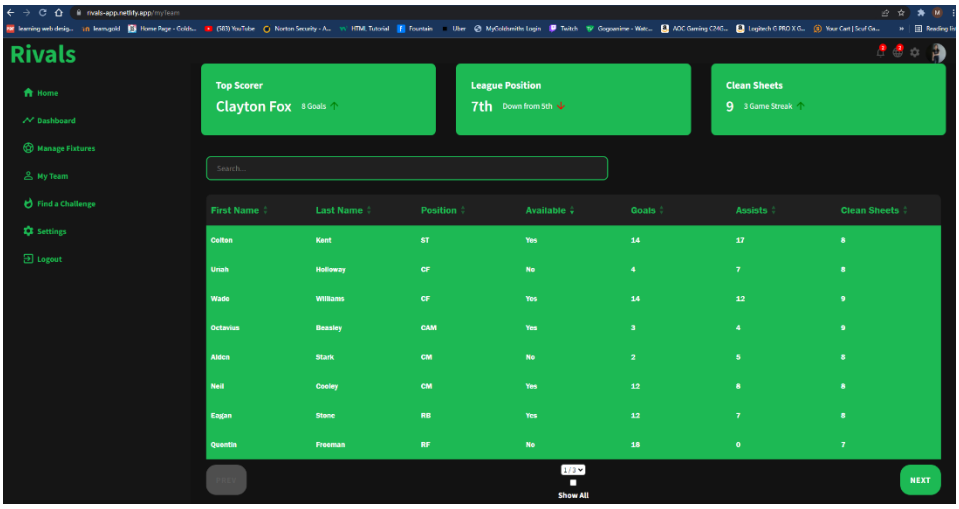
Something we used to help with the basic layout of the app was bootstrap. Bootstrap is a front-end framework used to create modern web applications. It is very practical as it is open-source and free to use.

During our initial interaction with our stakeholders, we spoke with many individuals as we wanted to make sure we made all parties happy with the final design of our app.
After we had presented our first prototype, some shareholders had concerns with our website not being able to be used as an app that users could download from their phones. They pointed out that this would eliminate the hassle of them having to search our website every time they need to use it. Our group took this point into consideration and attempted to create a web app that people could have on their phones and search on computers. Unfortunately, we eventually decided that with the time period given for this assignment and the little knowledge we had about mobile apps, this extension to our projects would be unachievable. We continued to develop our initial idea.

Our Final Design

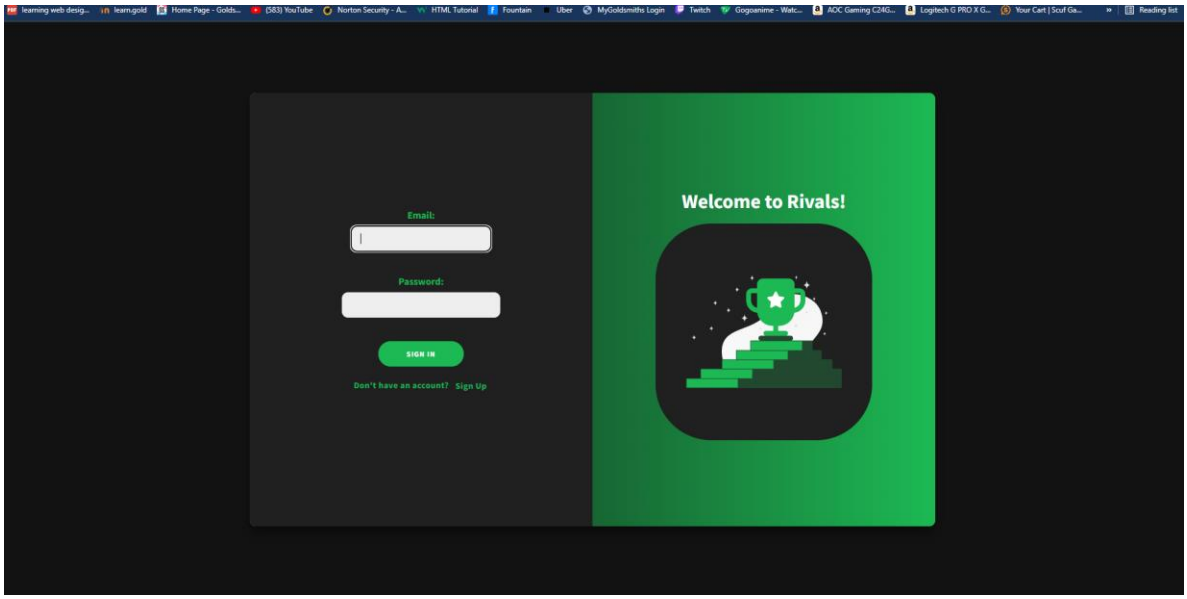
Before the major development of our app, we spoke with some shareholders and asked what they would like to see included in the app.
A shareholder by the name of Marcus Clarke pointed out that including a table with shows the win/loss/draw points of each team interacting with our app would allow users to have more control in picking teams to play that are more in their skill bracket. Users could see the team's game sheets and chose opponents based on similarities shared in their win/loss/draw ratios. This would eliminate the chance of unfair games from occurring. We as a group had concluded that adding this feature would be greatly beneficial to users and would also entice users to revisit and reuse our application in the future.

Dashboard of user's stats:

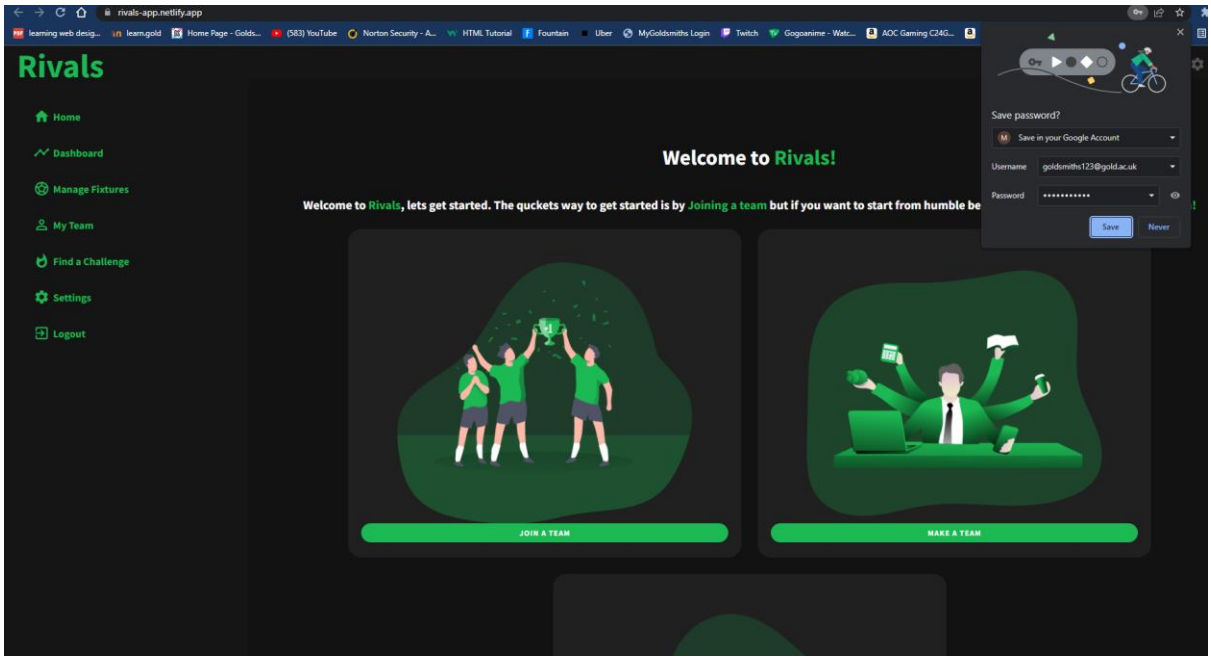


We also spoke with another stakeholder who pointed out that the security within the app was a major issue. They urged us to include a login/sign-in system that allowed users to create accounts and save information regarding their football teams. we as a group also felt as this was very crucial to keeping users' information safe and secure. We included a sign-in/signup and included the feature to save username and password within chrome.

Login/sign-up page:



Saving details feature:



We aimed to design an application that allows a vast variety of people within the football community to engage with one another and find opposing teams within a small radius to face off against. We also had strict goals to achieve such as making sure our application fit the needs of users in different conditions. We also wanted to make sure to take into consideration different individuals from the public and part of our stakeholder's team to make sure everyone was happy with the layout and design of our app.

Final Testing

We as a group feel as if we have done exactly what we had set out to do at the beginning of this project. In order to confirm this, we went back to our stakeholders and allowed them to test our application in its final state. We had received dome very pleasant feedback and constructive criticism for future projects.

Yonas Tesfay, the captain of the Balham over eighteens football team used our application to find an opposing team to play as friendlies pre-season. He was looking to find a team that was on a similar skill set to themselves. After his testing phase, Mr. Tesfay stated that our application was exactly what he was looking for. The stats board allowed him to find a suitable team. This particular stakeholder also suffers from a visual imparity. He stated that he could easily access all parts of the app and features like fonts and colours were perfect thought-out the application.

In addition to this review, we also had other stakeholders and members of the public present us with positive feedback such as:

“This application is perfectly thought-out and very user-friendly. I believe it can be used by all types of people and is programmed to cater to every user’s needs.”
Quoted by Jessica Johnson (Member of the public)

“I love using this website. It allows me to find opponents quickly and easily with similar skill sets to ours. It is a wonderful way to keep the team active during pre-seasons and off-seasons and easily accessible.” Rajesh Tanveer (Captain of the south end over twenty-one football team. (Stakeholder))

“This application was very well organized and extremely easy to use. It was very aesthetically pleasing. I liked the colour scheme used and the format of the page. It also was very secure as it allowed me to sign up and save my data for later use.”
Jad Mounmak (Member of the public)

These reviews have helped us feel more confident in our project. Although we may have not been able to include more features and ideas presented to us, we believe our application follows through very well with its initial purpose.

Conclusion

In conclusion, we believe we have completed our initial goal to the best of our abilities. Based on the time we were given and the amount of knowledge on the subject we feel that we delivered a state-of-the-art web application that could be used in the real world. We included multiple testing phases and ensured that we incorporated all the key features needed for the app to complete its desired task. We believe that a key to our success in development was user testing and feedback from the public and stakeholders. This phase of our development helped us target out the faults in our app and eliminate them before the final draft was created. We also believe this section of the project would be a key part to take onto future projects as it allows us to see how our work is looked at from other perspectives. It allows us to be criticised constructively and consider other people’s views and ideas. We believed we stuck to our scope, although we had more ideas and concepts to develop, our time was limited as were our resources prohibiting us to fully develop their potential. Given more time we would look to include better data visualisation on the dashboard to give users a stronger insight into the performance of their team and players. It would also be great to include some of the Google Authentication as we see this being used more and more by apps and makes the user experience that bit better.