21 OCTOBER 2018

Final Year Project
Documentation

PROJECT PROPOSAL

Proposal, High Level Design, Environment Set-up & Project Plan for the FYP

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Introduction

The evolution of technology, over the past couple of decades in particular, has played an integral role in shaping sport as we know it today. Sport has been invigorated enormously by the impact of a developing IT landscape and has been quick to adopt technological advancements.

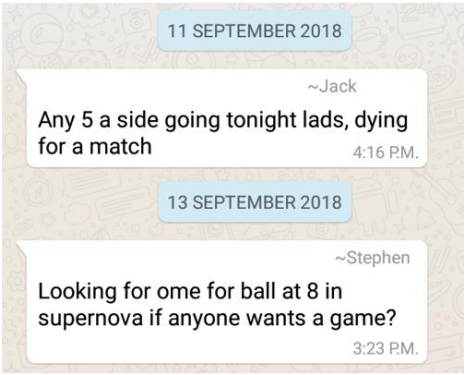
Take the audience for example, customers now have unlimited access to watch live events in 4K resolution through TV providers or online streaming. They can book tickets, flights and accommodation within minutes to attend events in person and even communicate with their heroes online via Snapchat, Instagram or YouTube. Athletes and clubs have also embraced the growth of technology and have access to advanced data analytics, innovative training and recovery equipment and cutting-edge medical devices. Sporting bodies have also been quick to adopt technology, making it part and parcel of the sport itself such as goal-line technology in soccer and Hawkeye in GAA and tennis. Timing equipment has been implemented in swimming, athletics and horse racing and a Video Assistant Referee is now a major part of the spectacle in rugby.

Technology has permeated elite sport and brought it to another level for both the competitors and audience. However, at a more grassroots level, technology is yet to be adopted and applied in the same way, which is concerning given that 4 out of 5 children in Ireland aren't meeting their physical activity requirements and around half of all adults are obese (Safefood.eu, 2018). These figures are continuing to increase and I believe that technology could play a fundamental role in creating a healthier and more active Ireland.

What's the problem?

Soccer is a core staple of my life and ever since I could walk I've been kicking a ball. Towards the end of my time in primary school, every Friday the students in our class would try to organise a 6-a-side game in the local sports complex's artificial pitch after school. If we managed to get 10 or more players, we could play, otherwise we didn't have enough bodies to cover the space on the pitch and didn't have enough money collectively to rent it in the first place. We'd all go home disappointed and crucially, having not exercised enough that day. This was my first taste of how fragile recreational games of soccer could be.

In the 15 years that followed, I couldn't possibly count the number of times that a game I've been involved in has been cancelled due to needing one or two extra players. This results in a lack of exercise for the eight or nine who were available to play and the sports complex renting the pitch lose out on valuable revenue. Equally, I couldn't possibly count the number of times I've been bored on the couch at home with €5 in my pocket, wishing there was an opening in a game to play that evening, or even the amount of texts I've received from others asking if I know of any games with spaces available.



As mentioned, the games used to be organised through word of mouth by asking your friends in school or at work. This was problematic because it relied on having a large enough group interested

within a small geographical location like a school or office. This process evolved to a system of texting, whereby the organiser would send out a text to a list of contacts and manually count the yes and no responses. This offered no transparency to other players and relied too heavily on the organiser. With the introduction of WhatsApp and Facebook Messenger, the process evolved towards creating group chats. A specific purpose group chat would be created where people could more easily organise games and add new players who might be interested in playing. This created larger groups (30 to 40 people) and thus, it was a little more likely that the needs of the players would be satisfied.

However, while there have been improvements in the typical organisation processes, there is still massive room to improve further. I believe there needs to be a way to get the people who are lying on their couches at home, who want to be out playing, in contact with those who desperately need one or two more players to get the game going.

Why's a solution required?

According to the English Football Association's website (as of May 2014): *Small Sided Football is the most popular and fastest growing area of adult football. With over 1.5m adults playing Small Sided Football every week and with 30,000 teams playing in organised and competitive small sided leagues, this format of football has increasingly become an integral part of the football family.*

The above relates to adult players in England who the FA were able to record. Add to the above those who flew under the radar and the children who also play, as well as every other football playing country in the world and you start to get a picture of how big the problem is. As I mentioned earlier, it would be impossible for me to count how many games I've missed due to a lack of numbers but I will offer a very conservative estimate. I play 2 – 5 times per week with different groups and have done for the past 15 years. If one game every fortnight is cancelled, then that's 26 games cancelled each year. This would mean that since I began playing, 390 games have been cancelled. Each successful game brings in between €35 – €65 for the provider of the pitch. Taking an average price of €50 and multiplying it by the number of games cancelled in the past 15 years equals €19,500. This is a potential loss of revenue for the pitch providers, just from the groups in which I've been involved.

Considering the scale of the small sided football industry, there are huge opportunities for increased revenue currently going astray for these providers. There are also hours of exercise slipping through players' fingers each week, not to mention the hours practising technical skills with the ball, teamwork and leadership skills and perhaps most importantly in this day and age, hours of human contact, comradery and fresh air.

Key Partners

Pitch Providers

- Integration of Online Booking and Online Payment functionality

PayPal

- Facilitating the Online Payments

Key Activities

Maintain the Website

Establish partnerships with Pitch Providers

Raise awareness and attract attention to the service

Manage customer queries

Key Resources

Skills

- Webmaster or Web development
- Relationship Building (Pitches, Clubs)
- Marketing (Social Media, site visits etc.)
- Customer Service

Website

Value Propositions

Increase revenue for Pitch Providers

- Higher percentage of bookings fulfilled
- Increase in overall bookings

Facilitate communication between Players

- Groups of Players can advertise vacancies in their games
- Single Players can search for vacancies in their area

Provide a Central Hub tailored towards organising games

- Players can check in to games
- Pitches can be booked online

Enable Online Payment

- Players can pay easily without the need for cash
- Groups can ensure every player has paid

Customer Relationships

Players

- FAQ section provided to answer common players' queries
- Contact us details provided to answer any further issues

Providers

- Site visits to advertise product
- Correspondence via e-mail

Channels

Web/Mobile via the Website

- The service is provided online through the website

Social Media

- Social Media platforms are used to attract attention

Customer Segments

Small Sided Soccer Players

- Single Players

  Individual player looking to play a game but doesn't know any groups

- Groups of Players

  An established group of players who are in need of an extra player in order to meet the required number of participants for a game

Artificial Pitch Providers

- Sports complexes, Leisure Centres, Clubs and Colleges which rent out Artificial Soccer Pitches

Cost Structure

Website

- Domain Name
- Web Hosting

People

- Time to complete the Key Activities

Revenue Streams

Players

- Charging a percentage on all Online Payments made through the website

Providers

- Requiring payments from Pitch Providers in order to be available on the website

Business Model Canvas

I propose to create a web application that serves as a central hub for the organisation of small sided soccer games. The service is called 'One More', two words that reverberate around group chats and workplaces every evening of the week. It refers to the dilemma of needing one more player in order to play the game, and that's exactly what this project aims to resolve.

As above, there are three key value propositions (VP) aimed at the players customer segment (CS). Firstly, the aim is to facilitate communication between players. A major issue with how games are organised at the moment is aligning supply and demand. Across the county or smaller geographical areas, there may be a very high demand amongst single players to join in a game (e.g. a mild evening during the summer). However, there is a very high probability that there are established groups of players who have a regular booking at a venue that for one reason or another, don't have adequate demand in their group on that evening to make up the 10 or 12 players required. Thus, the booking is cancelled and none of the CS get to play. I aim to provide a platform whereby groups can advertise any vacant positions in order to fulfil their booking and single players can search for any vacancies in their area.

Secondly, One More will provide a central hub tailored towards the organisation of small sided soccer games. As discussed, the majority of groups currently organise games via group chats. However, one of the most impressive methods I have seen is through a forum post on Boards.ie. 12 places are available and players enter their name in one of the places to book their spot for the upcoming game. Spots are therefore reserved like choosing seats on a plane or in a cinema. It negates the need for a dedicated organiser to send out a message and take on the responsibility for the whole group. Inspired by the above, I aim to decentralise responsibility and allow players to check in and out of games as they please. Once a game has been set up, whether a once off or a weekly booking, players can access the private group by entering a unique group code, like the method used on Fantasy Football applications. Furthermore, pitches can be rented through the web application, making it a one stop shop for game organisation.

Thirdly and finally, the service will provide users with the ability to pay online. This is crucial and a key selling point of the service. Small sided soccer doesn't keep up to date with the financial or technological environment in which it operates. It has been left behind as we move toward a less cash society in that, the only acceptable form of payment is cash. It can be difficult for players to find the coins or notes required or sometimes even forget the need for them at all, given they likely haven't used cash that day. This results in players turning up with less than the required amount or no money at all, leaving others to shoulder the cost. Another issue is that often players only have large notes such as €50, which can result in €45 worth of coins as change! Online payment gives players the opportunity to pay their share easily, prepay if desired and importantly, handle less cash.

As the project has a multi-sided market, players and providers, there are also important VPs for the providers CS. The chief VP is that as a result of the above, a higher percentage of bookings will be fulfilled resulting in increased revenue for the provider of the artificial pitch. The web application should also drive an increase in overall bookings and ensure sports complexes are at capacity more frequently. Take Leisureworld Bishopstown for example, the popular operating hours for the pitches are between 18:00 – 22:00 each day of the week. In order for Leisureworld to maximise revenue, it is important that each of the 4 pitches has a booking fulfilled for each hour interval. From my observations over the past few years, I conclude that this isn't currently the case and thus, Leisureworld could benefit enormously from the use of One More.

Additionally, providers would also benefit from the implementation of online payment. This would allow providers to introduce cancellation fees, encourage prepayments, avoid being faced with the scenario of

players retrospectively realising they don't have enough money collected and again, importantly, handle less cash. Furthermore, by enabling online payment and allowing bookings through One More, providers have less overhead around the provision of their services (e.g. receptionist taking calls about pitches, POS clerk processing payments).

Another critical element to consider is how the above VPs will be reached, enhanced and maintained. In order to deliver the VPs to the players, One More will first create a concentrated social media presence to advertise the service. Take Facebook for example, there are large groups of avid 6-a-side players to whom the service would appeal and thus, it's possible to target the CS directly online. Another method that will be used to garner interest is approaching groups of players before or after games to explain the service and the benefits it can provide groups. I aim to target the CS by advertising through channels in which small sided soccer is played or organised.

From a player's perspective, interaction with the service will occur solely through the web application which can be accessed via desktop or mobile. Besides the occasional pitch visit to promote One More as mentioned, there will be no person to person interaction. Players will be provided with a FAQ resource in order to answer any common queries. Furthermore, contact details will be provided in order to resolve any other issues.

From a provider's perspective, site visits will be initiated in order to meet with the suppliers and promote the service. Relationships will be forged through the visits or via email and thereafter, interaction will occur through the web application. Again, contact details will be provided in order to resolve any issues that providers may have.

As displayed on the Business Model Canvas, Key Partners (KP) include the pitch providers and PayPal. Firstly, it's paramount that One More works closely with providers in order to provide the most efficient and streamlined service as possible to the user. This includes the integration of online payment through PayPal, the integration of online booking and the implementation of special offers or loyalty deals. Key Activities (KA) such as maintaining and updating the website and establishing partnerships with providers are central to this. It's also crucial to work with PayPal in order to facilitate online payments in the easiest way possible. However, as of yet I'm unsure whether a partnership will be required or whether a PayPal API will suffice in order to provide payment functionality. Other KAs include managing customer queries to maintain good customer relationships and keep the customers that are attracted through another very important KA, marketing.

The revenue model focuses primarily on charging a small fee on top of the payment made to the provider. More market research will be needed, but from my experience, the price elasticity of demand for pitches is quite elastic. Groups are willing to pay large amounts because as long as the price doesn't exceed €60, it's €5 per player in order to successfully pay for the booking. Thus, adding a small fee shouldn't deter many groups because the cost is shared. Additionally, providers will be charged a subscription fee to feature on One More. Once subscribed, providers can use the service and charge their usual rental fees with the One More service fee on top.

E.g. 1 hour pitch rental = €45 One More service fee = €5 Total price = €45 + €5 = €50

An alternative to this model is to charge a percentage of the pitch rental fee for payments made using One More. This would require no subscription fee and would only affect booking made through the website.

E.g. 1 hour pitch rental = €45 One More percentage charge = 10% Total price = €45 (€40.50 to the provider and €4.50 to One More

The cost model is quite basic because the project consists of nothing more than a web application and labour. According to whoishostingthis.com, the average cost of an e-commerce website based on 1472 companies in the UK is £1660, or €1843. However, because I am creating the website myself, there will be no monetary cost. Furthermore, in order to fulfil Key Activities long term, employees or assistants will be needed. As for the scope of the current proposal, employees will not yet be needed and thus there is no associated cost.

Logo

Having paid close attention to the way that large social media and sports brands advertise, I decided to create a logo, carrying the brand name. The logo is small enough to be used as an icon, such as an application icon on a smartphone, while it can also be placed on larger designs. Logos should be able to work across a plethora of different media platforms and their importance cannot be underestimated. Revered designer Saul Bass stated that “Logos are a graphic extension of the internal realities of a company” while celebrated logo designer Paul Rand suggests that “Design is the silent ambassador of your brand”.

The logo is based on a soccer team crest. The design aims to be simple and clear. The two green strands in the design represent the group of players in need of a game, while the white strand in the middle represents the single player who joins the game, completing the crest. The font used resembles that which may have been seen on old scoreboards during World Cup games or European Cup finals and plays on the emotion and history of the full sized game.

Product Backlog List

I compiled a product backlog list as part of the high level design in order to generate a list of features that were necessary to fulfil the wishes and expectations of the potential users. It also served as an opportunity to rank the features according to their importance and thus allow the prioritisation of their development.

The accompanying table is a list of all of the necessary features. The list is based off the user stories below and encompasses the needs of the General User, Single User and Group User. The feature list does not include any features for Pitch Providers at this point but could be subject to change. The reason for this is that at the moment, the website is going to be aimed at Players rather than Providers and the majority of the work with the Providers will be done in the background via e-mail, telephone etc.

The top 3 were selected as such because if that is all the website is able to achieve, then it would go a long way towards solving the problem documented in the Project Proposal. They are the essential, core features of the system and will be prioritised as such. The features thereafter will also give the user more functionality and improve many of the processes around 6-a-side soccer.

Feature	Priority
Organise Games	**1**
Search & Join Game	**2**
Advertise Vacant Spot	**3**
Central Hub for 6-a-side	**4**
Set up new Single Player Game	**5**
Pay Online	**6**
Submit a Team of 6 Players	**7**
Book Pitch Online	**8**
Invite Players to Game	**9**
Search for Players	**10**
Create an Account	**11**
Customise Account	**12**
Rating System	**13**
Set up a League	**14**
Set up a Stats Zone	**15**

User Stories

The users of the system are broken down into 3 different categories:

General Player 

Generic User who seeks features applicable to both Group and Single Players

Single Player 

A player who doesn't have a group to play with and is looking to join a game

Group Player 

A player who is part of a group that play regularly

As a…	I want…	So that…	Priority
General Player	to be able to create an account	I can use the account without having to enter my information every time	**11**
General Player	to be able to customise the information on my account	I can share my interests, the club I support, the frequency I play and my skill level with others	**12**
General Player	a rating system like in Uber or Airbnb	I can see who are the reliable players and who are the unreliable players	**13**
General Player	to be able to pay online	I don't have to find cash in order to pay my share at the game	**6**
Single Player	to be able to search for games with vacancies in my area	I can join a game and play soccer	**2**
Single Player	to be able to go to a single, central resource where games are organised	I can have a better chance of being needed in a vacant game	**4**
Single Player	to be able to set up a new game	I can get a game going without relying on a group vacancy	**5**
Single Player	to be able to invite players to join the game I have set up	I can increase the amount of players playing the game and make friends	**9**
Single Player	to be able to search for players names	I can find my friends or other players that I have played with and possibly invite them to games	**10**
Group Player	to be able to organise my weekly game online	I can stop using the outdated methods of group chats	**1**
Group Player	to be able to book my pitch online	I don't have to ring the provider every week	**8**
Group Player	to be able to advertise a vacancy in my group's game	I can get a single player to fill it and get the game to go ahead	**3**
Group Player	to be able to enter a squad of 6 players and search for another squad of 6 players	I can play our team against another team	**7**
Group Player	to be able to enter the stats of the players (i.e. goals scored, wins, minutes late)	I can analyse who are the best players and use it to joke with my friends	**15**
Group Player	to be able to set up a league	I can play competitively against other teams of 6 and track the points and scores	**14**

User Personas & Empathy Maps

As part of the High Level Design I created two User Personas with Empathy Maps that portray the characters typically found in small sided soccer circles. The first is a user called Rob, represented by the player on the far right of the image, cooling down after another gruelling Tuesday evening duel. Rob is pictured alongside his friends, with whom he plays each Tuesday and Friday. He embodies the considerable amount of players over 40 who play 6-a-side soccer and use it as both exercise and recreational time.

Quote: "
Play the easy passes lads!

Age: 53
Work: Carpenter
Family: Wife and 3 children
Location: Cork City
Character: Humorous, hard-working, honest

Personality

Introvert	Extrovert
Thinking	Feeling
Sensing	Intuition
Judging	Perceiving

Goals

-Enjoy playing soccer

Get some exercise

Have comradery with their friends

Frustrations

-Not getting the players and therefore missing their weekly or bi-weekly game

People turning up late

Bio

Loves watching football and is a big Manchester United fan

Takes his son to football at the weekend and his daughters to handball

Heads to the pub every weekend to meet up with friends and have a few drinks

Motivation

Incentive
Fear
Growth
Power
Social

Brands & Influencers

Premier League
UEFA CHAMPIONS LEAGUE
NIKE

Preferred Channels

Traditional Ads
Online & Social Media
Referral
Guerrilla Efforts & PR

SAY
"Looking forward to tonight's game now"

"Is Jerry back playing at all after the hamstring injury?"

"Split up the young fellows now tonight, they'll run riot otherwise!"

STAKEHOLDER

Rob

THINK
This is becoming hard work!

I better look after myself to try and stay fit.

Glad we managed to get a game going!

FEEL
Belonging

Fun/enjoyment

Accomplishment

Confidence

DO
Put in a lot of effort, both playing and organising.

Laugh and joke with all of the other players.

Problem statement

Stakeholder		Need		Insight
Small sided soccer player	NEEDS A WAY TO	Ensure that games go ahead and aren't cancelled	BECAUSE	Playing them to stay fit and happy is crucial

Insights

Rob plays twice a week and really enjoys the games.

He plays a part in organising them and uses them to try and stay fit and healthy.

Below, Glen is also represented by the player trying to evade the efforts of the team in red bibs. He depicts a different subset of the small sided soccer community. Glen is a young, budding athlete who plays organised sport but uses 6-a-sides to sharpen his skills and enhance his fitness. He epitomises a group of players under the age of 30 who are typically less reliable and don't have set groups like Rob. Like many young people, there are a plethora of things vying for the focus of Glen's Tuesday evening such as study, friends and part-time work. Thus, Glen drops in and out of groups frequently to satisfy his own needs.

Quote:
Come on! Track back!

Age: 25
Work: Student
Family: Parents, 2 brothers, girlfriend
Location: Blanchardstown, Dublin
Character: Driven, Open-minded, Brave

Personality

Introvert	Extrovert
Thinking	Feeling
Sensing	Intuition
Judging	Perceiving

Goals

- Get out of the house
- Extra practice on top of his college team's training
- Banter with his friends

Frustrations

- Boredom in his house in the evenings
- Players who aren't at his level
- Pent up energy

Bio

Promising athlete who excels across soccer, GAA and swimming

Fan of Celtic in soccer and Ireland in all sports

Studious in college and has high hopes to graduate Law

Motivation

- Incentive
- Fear
- Growth
- Power
- Social

Brands & Influencers

FAI, IRFU, O'Neills THE CHOICE OF CHAMPIONS

Preferred Channels

- Traditional Ads
- Online & Social Media
- Referral
- Guerrilla Efforts & PR

SAY
"Is there any game going tonight lads?"
"Season is over so I'll be around for a few months now"
"Sick of studying I need to get out and do something!"

THINK
Wish I could play more, these summer evenings are a bit boring.
I'm going to really put in the work over the next year or two.

STAKEHOLDER
Glen

DO
Actively looks for games when it suits him.
Works hard at his fitness and his technique.

FEEL
Fulfilment
Pride
Confidence
Enjoyment

Problem statement

Stakeholder		Need		Insight
Small sided soccer player	NEEDS A WAY TO	Find games that need a player	BECAUSE	He loves to play them to stay fit and get out of the house

Insights

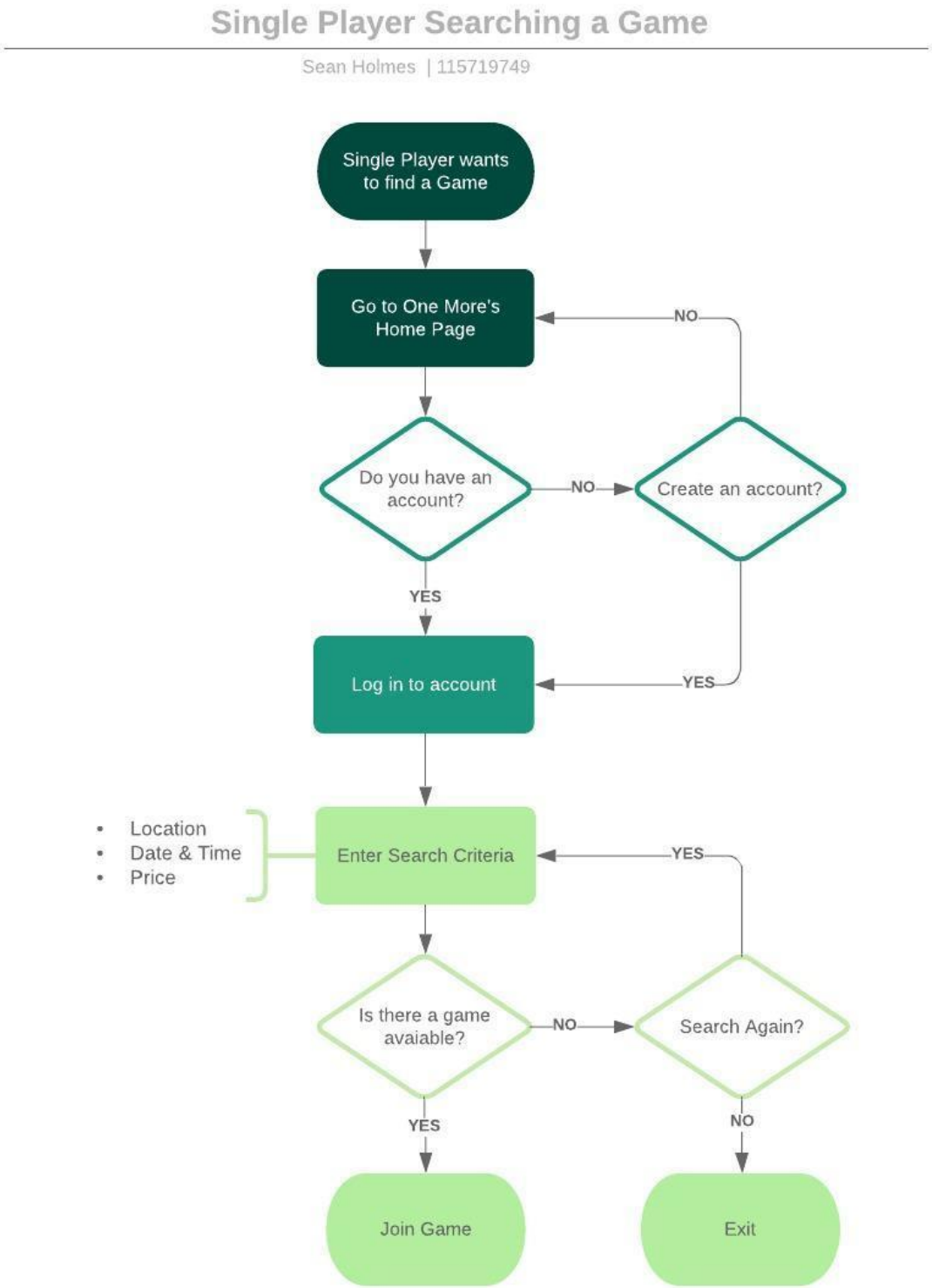
Glen plays whenever he can find time to squeeze in an extra game or two.

While he doesn't play a part in organising them, he's really keen to play and will be a small part of a lot of groups

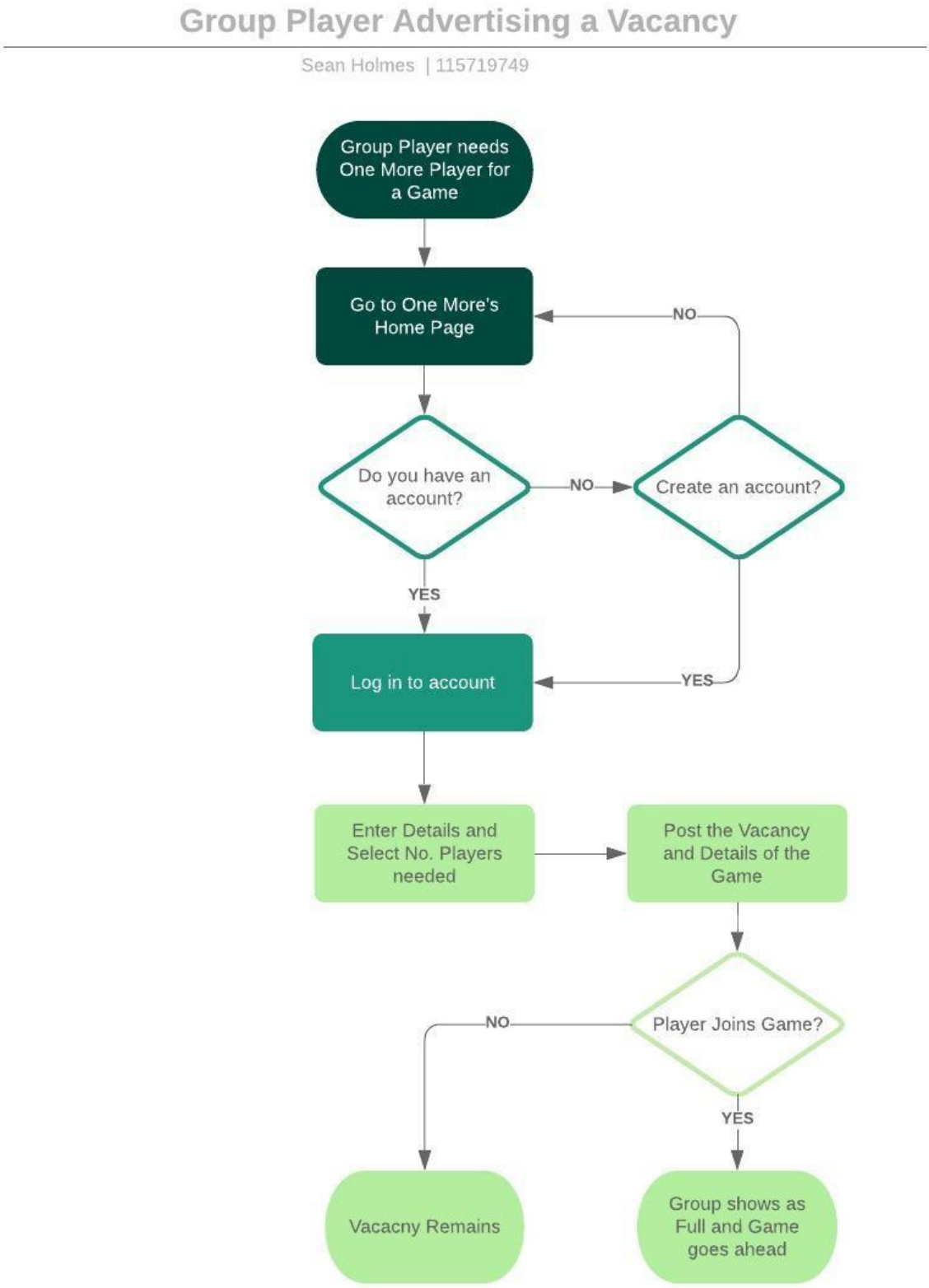
UML Diagrams

Flowcharts

The below flowchart shows the process a Single Player would take in order to search for and join a game using the One More website. As represented by the three colour shifts, the process can be broken into three key elements; visiting the One More website, logging in to a user account, searching for the game.

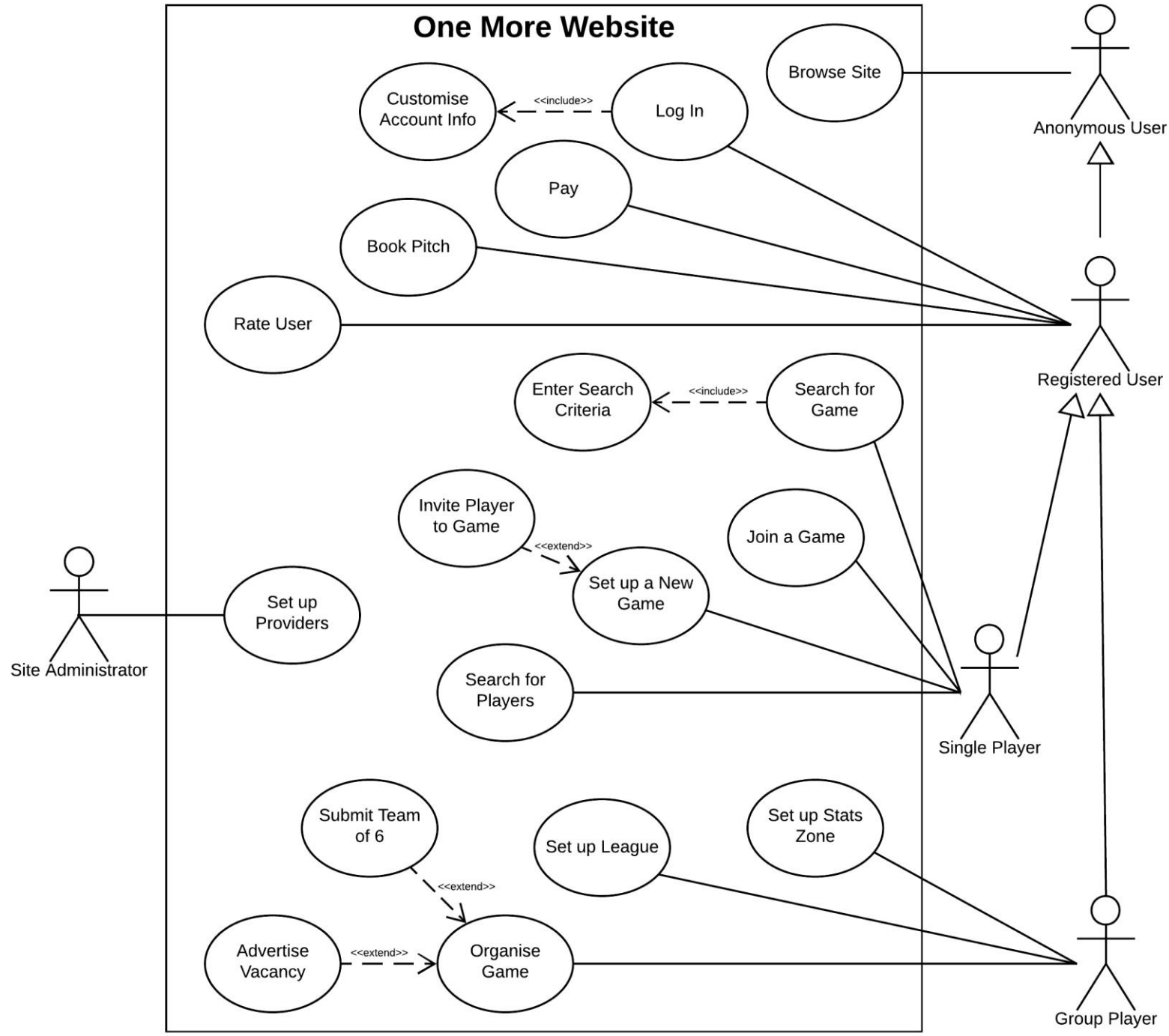


Another key process of the service is portrayed below. A Group can advertise a vacant position within their Game which the Single Player can then join, as above. It is similar in nature to the former, as it can be broken down into the following elements; visiting the One More website, logging in to a user account, posting the details of the Group's requirements.



Use Case Diagram & Descriptions

Below is the Use Case Diagram which gives an overview of the functionality of the system. It includes the use cases for Single and Group Players, who inherit from a registered user and an anonymous user. It also includes the site administrator's use case. The diagram intends to show all proposed functionality. The use case descriptions below the diagram are more specific and walk through certain scenarios etc.



Use Case Name	Player Organises a Game Online
Use Case ID	1
Description	A player organises his weekly 6-a-side soccer game on the website. He sets up his game and books a pitch online. Only 11 players sign up for the game so he posts the vacancy to the website where another player sees it and joins the game. The game goes ahead with 12 players and each player pays online.
Actors	Group Player, Single Player
Pre-conditions	Must have access to the internet and a URL or link to the website. Player must have an account and be signed in. There must be interest from other players within the group to get to a total of 11 players. There must be demand amongst Single Players to play a game in the specified location that day. There must be a pitch available.
Basic Flow	• The Group Player logs in and organises his weekly game via the website. The game is on Friday at 6pm in Leisureworld, Bishopstown. Players within the group can check in to the game from 8:00am on Wednesday morning. • The Group Player has a weekly booking with Leisureworld, once he checks in for the game on Wednesday, Leisureworld are notified that the booking will be availed of and thus, keep the pitch reserved. • 11 Players in total check in to the game. • The Group Player posts the vacancy to the Single Players section with the details of the game and the required number of players. • A Single Player who is logged on to the website sees the vacancy and decides to join the game. The group are notified that a player has joined, taking the total to 12 players. The vacancy is automatically removed from the Single Players section once it has been filled. • Each player pays their share using PayPal.
Alternative Flow	• The Group Player realises that many of the regulars are on holiday and either cancels the booking manually, or automatically by not checking in to the game by 23:59pm on Wednesday. Alternatively, the Group Player submits a team of 6 players, under the usual weekly booking, encouraging another group of 6 players to play against them. • The Group Player doesn't require a Single Player because he notices there is actually a very high demand within his group this week and the game fills up to 12 players very quickly with a few substitutions on standby on a first come first serve basis. • The Group Player posts the vacancy to the Single Players section but no Single Player chooses to join the game. • Player(s) doesn't have sufficient funds to transfer money via PayPal.
Post-conditions	The game of soccer took place. The Pitch Provider was paid in full. The game register has been reset and will open again at 8:00am on Wednesday.

Use Case Name	Create an Account
Use Case ID	2
Description	A user visits the website and creates an account which they log in to and customise.
Actors	Anonymous User, Registered User
Pre-conditions	Must have access to the internet and a URL or link to the website.
Basic Flow	• The Anonymous User enters the URL or clicks a link to navigate to the website. • They click the create account button and fill in their details to create the account. They now become a Registered User. • They log in to their account using the password they specified in registration. • The Registered User can access more of the sites functionality, including the ability to customise their account. • The Registered User updates their details and enters some information about their favourite team, their skills level etc.
Alternative Flow	• The webpage cannot be found due to an error. • The Anonymous User decides against creating an account. • The Anonymous User doesn't complete the fields with the required information in order to successfully create an account. • The Registered User creates the account but doesn't log back in to it. • The Registered User forgets the password of their account. • The Registered User doesn't want to customise their account.
Post-conditions	An account will be created for the Registered User. The account information will be updated.

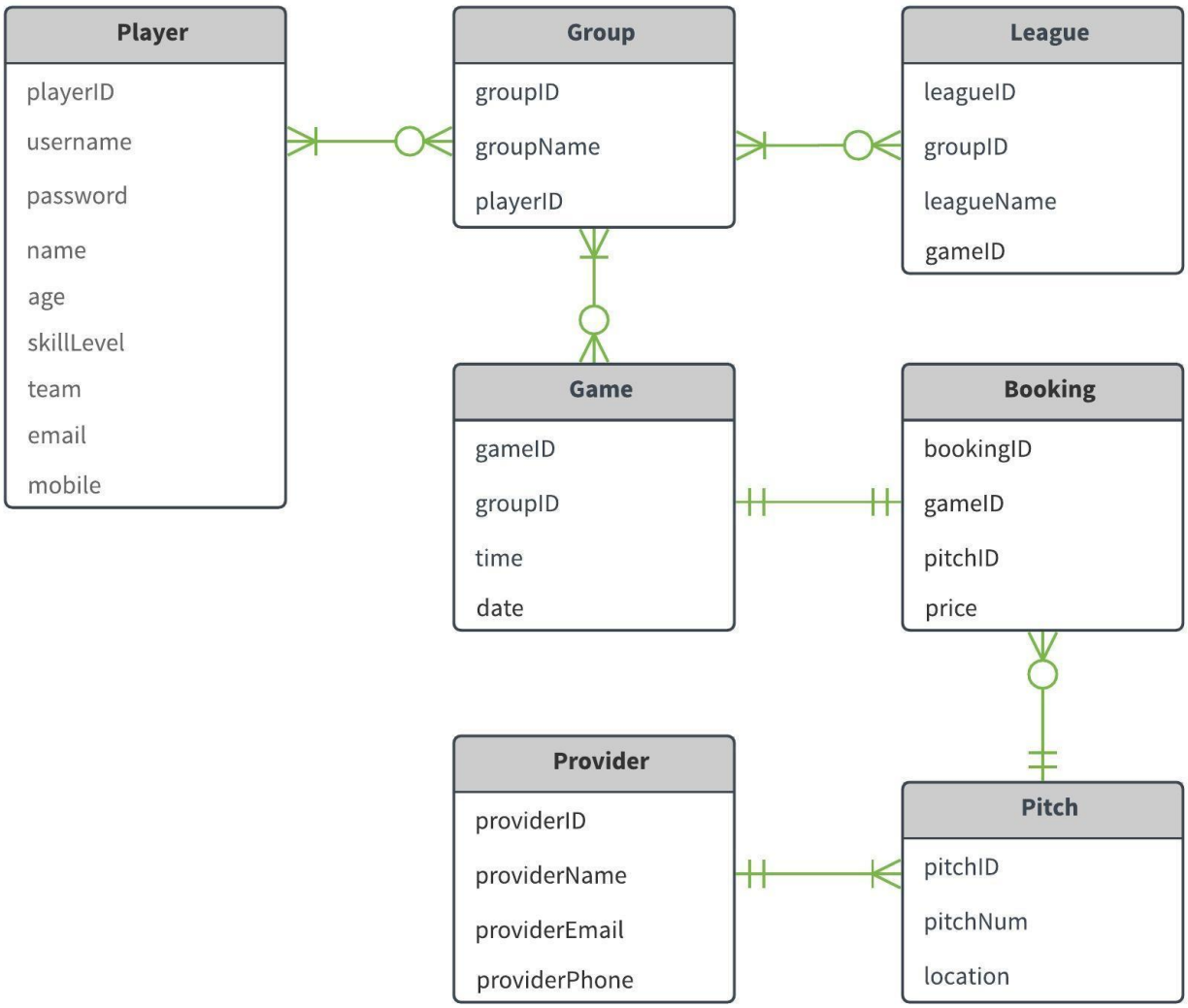
Use Case Name	Set up a League
Use Case ID	3
Description	A player sets up a league to compete against other teams
Actors	Group Player
Pre-conditions	Must have access to the internet and a URL or link to the website. Must be registered and logged into the account. Must have at least 5 team mates to make up a group of 6. Must be enough interest amongst other groups to join the league.
Basic Flow	• The Group Player logs in and goes to the Create League section of the website. • They submit their team by creating a team name and inviting other players to join. There is a minimum requirement of 6 players in order to make up the 6 players required for each game. There is a maximum requirement of 12 players to allow for a large enough pool of players in order to ensure the 6 players required is consistently met. • Once the league has been set up, the league creator posts it to the League section of the website where other teams can join. • Once enough teams have joined, the league fixtures are auto-generated and it is the responsibility of each team to contact their opponent in order to organise a time, date and venue for the game. • Once complete, the score and points will be manually inputted by the captains of the teams and the table will automatically update.
Alternative Flow	• The Group Player may not have enough players to consistently put out enough players. • A group of Single Players may form in order to play in the league. • There may not be enough demand amongst other groups to join the league.
Post-conditions	A league will be created with the Group Player’s team registered.

Entity Relationship Diagram (ERD)

An intrinsic element of the High Level Design is the ERD. It shapes the foundation of the web application and allows myself, the reader and the user better understand how each strand of the system interact. While creating the ERD, I made a number of key assumptions.

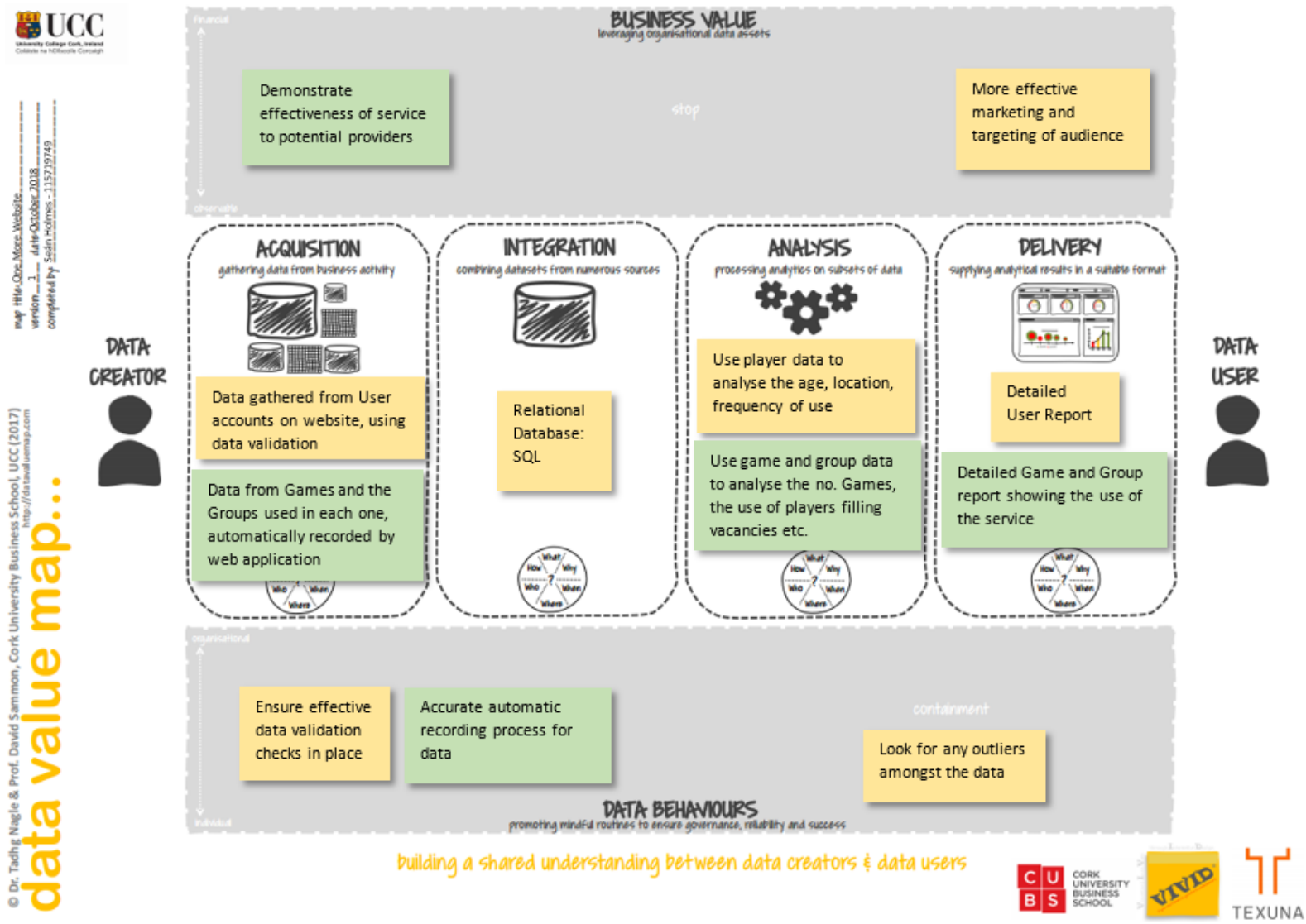
Assumptions:

- A Player will have many more variables than those initially listed. This is to cover the Stats Zone which will include things like number of goals, number of wins, win percentage, minutes late etc. A rating variable will also be assigned to the player in order to provide the rating functionality.
- In order to play a Game, a Player must be part of a Group. This includes Single Players who join in to a larger group in order to play the game.
- A Game is an instance whereby a full group agree on a time and date. The Booking will then consist of the Game, as well as other things like the pitch etc.
- Groups can play in many different Leagues simultaneously.
- A Game must have 1 or 2 Groups. This is because a Game cannot exist without a Group and also to accommodate allowing 2 Groups of 6 to play against each other.
- The variables are subject to change but give a representation of what the classes will look like.



Data Value Map

I created a Data Value Map to show some of the techniques and processes I plan to use in order to ensure my data is accurate, usable and helpful. The yellow notes represent the steps taken in order to produce a report that will aid marketing. The report aims to show the different subsets of customers and thus, target them accordingly. The green notes portray the report which will detail the number of games organised through the website, the use of the Single Players to fill vacancies, the number of Single Players who are able to find games etc. This data can then be used to market the service to potential Providers as well as Players themselves. There will be other uses for the data and Acquisition, Integration, Analysis and Delivery methods used as the project grows.



STRENGTHS

- Great knowledge & experience as a player (potential user)
- Passion to solve the issue for myself, not just others
- Access to Facebook groups, WhatsApp groups, texting lists etc.
- Software development education & experience

WEAKNESSES

- No current partnerships with providers
- Dependence on BIS education and lack of start-up experience
- One man team

OPPORTUNITIES

- Need for a solution to the problem
- Social Media popularity allows further reach
- Expanding the service to other countries
- Look into a partnership with large sports brands

THREATS

- Low barriers to entry
- Other sports are becoming more and more popular

Environment Set-up

While thrashing out the details of the One More service, I spent a considerable amount of time debating between using a web application and a mobile application. I considered other means of achieving the service but quickly zeroed in on the aforementioned because they were the two that stood out and stuck with me as being the most feasible, appropriate and optimal. I decided to choose the former, a web application, over the

latter for one crucial reason, accessibility. This may seem paradoxical because a mobile application provides incredibly easy access to products and services.

Take mytaxi for example. On a night out in Cork city on any given weekend, when all the pubs and clubs start closing around 2:00am, there's always a massive scramble for taxis and usually the demand outweighs the supply. Thus, it can take a considerable amount of time to hail a cab the traditional way and get home. mytaxi are rapidly becoming Cork's leading taxi service provider through enabling a quick and easy booking system via their mobile application. This is of course if you actually have the mobile application. For regular users, the mobile version of the application is great, but as I've noticed to my detriment on a few occasions, it's very tricky to use the service without the app. Therefore, having the mobile application is a pre-requisite to using the service, unlike a traditional taxi company that you can call.

I want users of One More to be able to dip in and out of the service at will, without having to download anything in order to gain access. Users from the Single Player group may use the service very sparingly and should be able to access a website within a few seconds, whether on mobile or desktop, to look for vacancies in games etc. Of course, further down the line, a mobile application would be absolutely ideal for Group Players and Single Players who use the service regularly, but for the purpose of the Final Year Project the most critical element of the service is to be universally accessible.

Tools & Techniques

To achieve this, I'll create a web application using a three-tier architecture. The Presentation tier will be developed using mainly HTML/CSS in NetBeans IDE 8.2 (Enterprise Edition). Crucially, the Presentation tier will make use of a responsive design, abiding by the principles set out by Ethan Marcotte (2014), including:

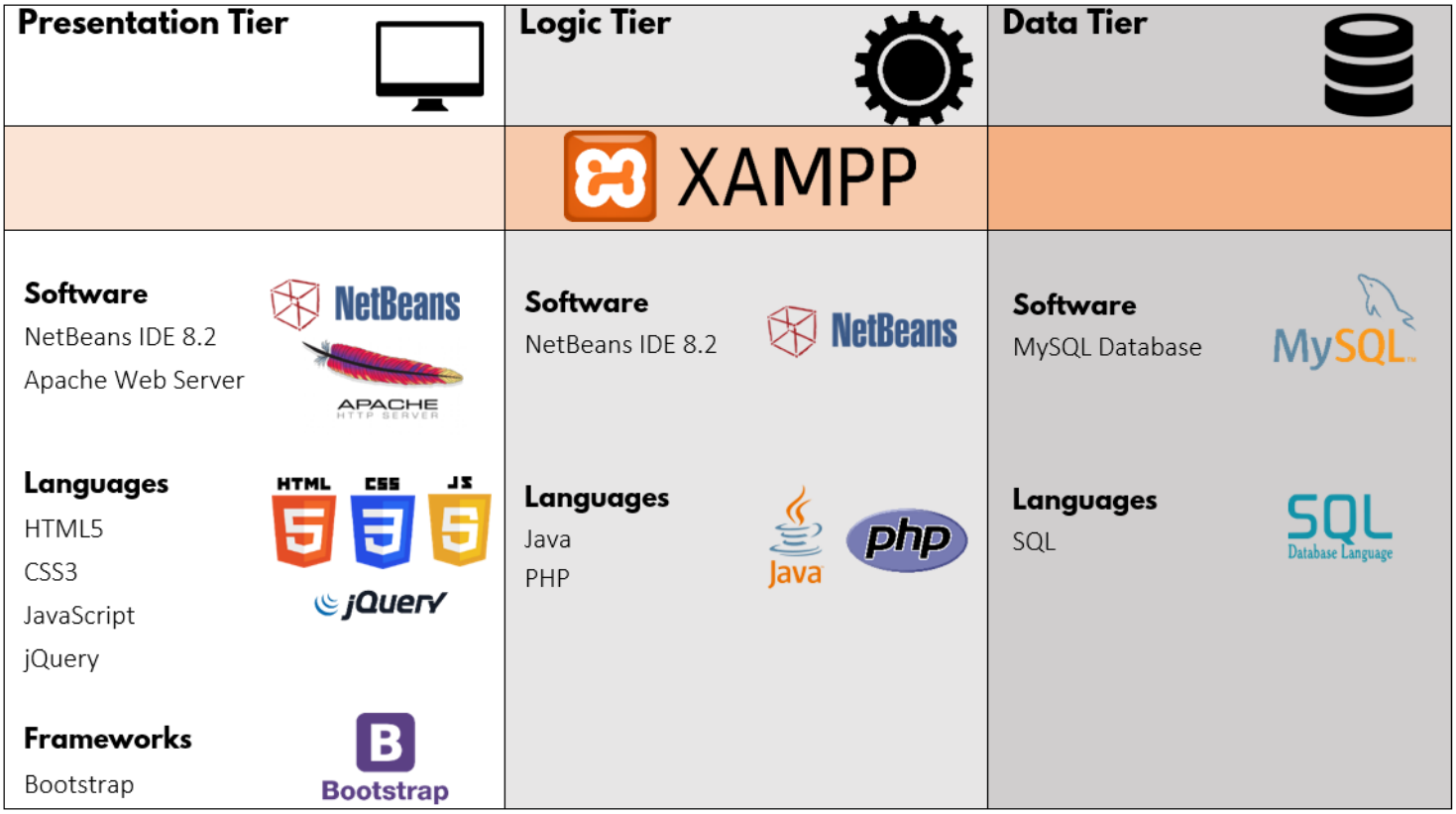
1. A flexible, grid-based layout
2. Flexible images and media
3. Media queries, a module from the CSS3 specification

This will be accomplished by using Bootstrap as well as Javascript and jQuery snippets from Bootsnipp.com. I've chosen these particular languages, tools and software because it's what I've been taught throughout my time studying Business Information Systems (BIS). I'm familiar with their use and have completed web application projects using this software in the past.

I'll use Java and PHP to develop the Logic tier of the application, once again in NetBeans IDE 8.2. I'll connect the Java application to the HTML webpages using Java servlets, which act as an intermediary between the client and server. Furthermore, I'll use various API's throughout the project to provide functionality such as Calendars, Maps etc.

The Data tier of the web application will be developed using a MySQL database. I chose this particular option because I have some experience using MySQL databases during my time studying BIS and have a very good understanding of SQL. I'll set up a connection between the database and the rest of the application using a connector in Java. Importantly, to facilitate all the above, I'm going to use XAMPP. I chose XAMPP because it includes Apache Web Server to host the web application and MySQL, used for the Data tier. It consolidates the software and makes it easier to enable communication between all three tiers of the application.

Below is a high-level diagram of what software and programming languages will be used in each tier of the application.



Project Plan (Gantt Chart)

To try a give a structure to the development, I created a Gantt chart which breaks the work out into 5 broad work packets which span across the 6 iterations. Each work packet consists of tasks and each task has a deliverable (i.e. the working version of what the task set out to achieve). As seen below, the iterations aren't all the same length and the work packets aren't necessary of equal size. These considerations have been taken into account when creating the chart and also reflect the difficulty I anticipate each work packet will cause.

The work packets are as follows:

- Database Connectivity
- Completing the Skeleton
- Implementing Basic Functionality
- Implementing Adv Functionality
- Finishing Touches

While the FYP guide suggests that the first piece of work that should be completed should be the most important piece to the user, or the first user story, none of the user functionality can be successfully implemented without having a sturdy skeleton in place (i.e. the database set up and connected, having a webpage off which to work, having the webpage connected to the Java application and further to the DB). Thus, the first two work packets aim to create the foundations on which to layer the functionality and GUI.

Product Backlog	User Stories	Iteration 1	2	3	4	5	6
Database Connectivity 1.0							
	1.1 Create DB schema in MySQL & populate table						
	1.2 Implement a portion of the Data Model in Java						
	1.3 Create a connection between Java & DB						
	1.4 Test the DB Connection						
Completing the Skeleton 2.0							
	2.1 Create/populate the remaining schema/tables in DB						
	2.2 Implement the rest of the data model in Java						
	2.3 Create the website Home Page in HTML						
	2.4 Create Servlet to connect webpage to DB						
	2.5 Test connectivity from webpage to DB						
Implementing Basic Functionality 3.0							
	3.1 Create User Account						
	3.2 Organise Game						
	3.3 Search Games						
	3.4 Advertise Games						
Implementing Adv Functionality 4.0							
	4.1 Single Player Game						
	4.2 Online Payment						
	4.3 Online Pitch Booking						
	4.4 Invite Players to Game						
	4.5 Search for Players						
	4.6 Set up a League						
	4.7 Set up a Stats Zone						
Finishing Touches 5.0							
	5.1 Create Login screen & verification						
	5.2 Create About, Contact Us webpages						
	5.3 Clean up the GUI on the website						
	5.4 Generate and use QR code to access website						
	5.5 Add Google Maps to show the pitches						
	5.6 Integrate Facebook API						

WP-1 Title	Database Connectivity		
Start Date	22-10-2018	**Due Date**	04-11-2018
Description	Create and Test connectivity between basic Java program and the MySQL DB		
	Tasks 1.1 Create DB Schema in MySQL and populate table 1.2 Implement a portion of the Data Model in Java 1.3 Create a connection between Java & DB 1.4 Test the DB Connection		
Deliverable(s) including due date	Deliverable — Date due D1.1 — 04-11-2018 D1.2 — 04-11-2018 D1.3 — 04-11-2018 D1.4 — 04-11-2018		

WP-2 Title	Completing the Skeleton		
Start Date	05-11-2018	**Due Date**	18-11-2018
Description	Complete the remaining structural and connectivity requirements in order to begin adding user functionality		
	Tasks 2.1 Create/Populate the remaining Schema/Tables in the DB 2.2 Implement the rest of the Data Model in Java 2.3 Create the website Home Page in HTML 2.4 Create Servlet to connect webpage to DB 2.5 Test connectivity from webpage to DB		
Deliverable(s) including due date	Deliverable no. — Date due D2.1 — 18-11-2018 D2.2 — 18-11-2018 D2.3 — 18-11-2018 D2.4 — 18-11-2018 D2.5 — 18-11-2018		

WP-3 Title	Implementing Basic Functionality		
Start Date	19-11-2018	**Due Date**	20-01-2019
Description	Create and implement the most fundamental user functionality		
	Tasks 3.1 Create User Account 3.2 Organise Games 3.3 Search Games 3.4 Advertise Games		
Deliverable(s) including due date	Deliverable no. / Date due D3.1 20-01-2019 D3.2 20-01-2019 D3.3 20-01-2019 D3.4 20-01-2019		

WP-4 Title	Implementing Adv Functionality		
Start Date	21-01-2019	**Due Date**	17-02-2019
Description	Complete the remaining user functionality (Across two Iterations)		
	Tasks 4.1 Single Player Game 4.2 Online Payment 4.3 Online Pitch Booking 4.4 Invite Players to Game 4.5 Search for Players 4.6 Set up a League 4.7 Set up a Stats Zone		
Deliverable(s) including due date	Deliverable no. / Date due D4.1 03-02-2019 D4.2 03-02-2019 D4.3 03-02-2019 D4.4 03-02-2019 D4.5 17-02-2019 D4.6 17-02-2019 D4.7 17-02-2019		

WP-5 Title	Finishing Touches		
Start Date	18-02-2019	**Due Date**	03-03-2019
Description	Add non-critical features and functionality to the web application		
	Tasks 5.1 Create Login screen and verification 5.2 Create ‘About Us’, ‘Contact Us’ webpages 5.3 Clean up the website’s GUI 5.4 Generate and use QR code to access website 5.5 Add Google Maps to show pitch locations 5.6 Integrate Facebook API		
Deliverable(s) including due date	Deliverable no. / Date due D5.1 03-03-2019 D5.2 03-03-2019 D5.3 03-03-2019 D5.4 03-03-2019 D5.5 03-03-2019 D5.6 03-03-2019		

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