Development of a Web-Based Application for facilitating Connections Between Hockey Players and Clubs

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TM470 - TMA03

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A group of people playing field hockey

Description automatically generated with medium confidence

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**(4988/5000 words)**

Excluding References, Title Page, Contents, Appendices

# 1 Draft Project Report

## 1.1 Problem Description

Throughout my school life in South Africa I played hockey to an elite level, and even gained a full scholarship to university. In second year I decided to move to England to gain experience playing overseas.

This is where I bumped into my first problem. Finding a club in the area I was staying, that was a suitable level for me so that I could continue to push myself. I initially stayed in Eltham (Southeast England) and thus went to work googling and researching the clubs around me, which turned into a tedious process as I had to consider various factors such as travel time, membership fees, playing level, training times etc.

After narrowing down a few options I had to get the emails of the various captains of each club to find out more specific details, and then wait for responses before making my final decision. I found the entire process quite time consuming and intense, especially as I had just moved.

I now coach and play at Wimbledon Hockey Club. The club has fifteen adult hockey teams, with an average of sixteen players in each squad, that’s two-hundred and forty players. I coach the men’s 5s and ladies 4s, there are 7 players from the men’s team, and 8 from the woman’s who aren’t originally from London. I also play for the men’s 1s, and seven players had experienced the same problem I had (to varying degrees).

The problem I have identified, based largely off personal experience and from talking to members at Wimbledon, is the process of finding a club or connecting with other players when moving to a new area or country, is time-consuming and ineffective. Players often have to rely on word-of-mouth or search through various websites and directories to find clubs that match their interests and abilities. For clubs, it can be challenging to reach and attract new members, especially in areas with a high turnover rate (such as London).

The sole existing resource available to address the aforementioned problem is England Hockey's "Club Finder," (available at: https://www.englandhockey.co.uk/play/find-a-club) which utilizes the user's current location to suggest nearby clubs. However, this resource has its limitations, as it merely provides club names and addresses, thereby requiring the user to manually visit each site to acquire additional information.

I aim to address this problem developing a “Social media” type web application which connects hockey clubs and hockey players on one convenient central application.

### Business Case

HockeyHub, which is the proposed name for the application being developed, aims to provide a solution to the problem by connecting hockey players with each other and with clubs based on their profile information and preferences, all on one convenient central application.

The key advantages that HockeyHub aims to offer are detailed below:

Timesaving: Players should save time by having all the relevant information they need about a club available to them on HockeyHub, information such as training times and days, membership fees, location, preferred positions, contact details, playing experience and more.

Personalised: HockeyHub will only display clubs and information that is relevant to each individual player. This information will be determined by using a matchmaking algorithm which uses each player’s profile information and preferences.

Inclusive: HockeyHub will be suitable for players of all genders and abilities. Aiming to support both recreational and competitive players to ensure everyone is playing at the appropriate level.

Recruitment: HockeyHub aims to streamline recruitment process for clubs, providing them with a channel to reach and attract new members.

Overall, HockeyHub has the potential to improve the experience of clubs and players, making it easier for players to connect and participate in their favourite sport. There is also potential for HockeyHub to encourage further participation in the sport, as it provides a simple way for new players to get involved.

It is for these reasons that HockeyHub should provide a highly useful solution to a significant problem for people interested in recreational and competitive hockey. By offering a streamlined, personalized, and inclusive platform, it will simplify their journey into the sport, making it more enjoyable and accessible.

### Project Scope

The scope of this project involves the development of a web application that I, as a single, student developer, will not have the time complete fully. Therefore, I have decided to identify the business areas of most importance and intend to have them fully functional. These areas are key to the functionality of the web application, and key to addressing the problem.

**Player Profiles:**

Players will be able to create a profile that will include various personal information. They will also be able to set preferences in their profile. These preferences will be presented as a set of drop downs to ensure consistency and validity. These preferences will then be used by the matchmaking feature.

**Matchmaking Feature:**

HockeyHub will use a matchmaking feature to recommend clubs and players to each other based on profile information and preferences.

**Club Profiles:**

Clubs will be able to create a profile that includes relevant information about the club (such as name and location). Like players, clubs will be able to set preferences based on what particular players they are looking for.

### Software Architecture

The HockeyHub application will be developed using Bubble.io, a low-code app development platform that aligns with the three-tier architecture model. Bubbles key features include drag and drop programming, user-friendly visual interfaces, comprehensive customization, robust security measures, and integration with other services through the use of API’s.

Bubbles specific technical details are elaborated upon in [Appendix 5.3 – Bubble Technical Details.](#_Appendix_5.3_–)

In terms of software architecture, Bubble follows the three-tier architecture model.

**Presentation Layer:**

This layer constitutes the application's user interface and communication elements, featuring components such as forms, buttons, and input fields.

**Application Layer:**

This layer includes the logic that handles user input, data processing, and database communication. Within bubble, this is implemented through the use of workflows and plugins.

**Data Layer:**

This layer includes the database that stores the application data. Bubble uses a cloud-based database to store and handle data, hosted on Amazon’s Relational Database Service (RDS).

Figure 1: A simple Three-tier architecture diagram *(Amazon.com, 2023)*

Timeline

Description automatically generated with medium confidence

### Level 3 Module Extension

The module I have chosen to extend upon is TM354 (Software Engineering). The specific objective within this project for this extension-based investigation will be to "Identify the key features in the development and documenting of User Stories and use that approach within a User Story-based requirements process."

I have decided on this because one of the key components of agile development is “putting people first” *(Atlassian, 2023),* and user stories put users at the centre of the conversation and ensures communication between developers and users so that the end application fulfils the user’s needs.

User stories provide a simple and effective way to capture and communicate requirements from the perspective of the end user or customer. They help to ensure that the development team is focused on delivering features that provide value to the user, rather than getting bogged down in technical details. User stories are covered briefly in the module material in unit 2, but in reality, there is much more to them than what is shown. To illustrate this I have provided two figures, Figure 2 from the OU module material *(Open.ac.uk, 2014)* and Figure 3, a template provided by *(Justinmind.com, 2020)*, a prototyping website used by top companies such as Google and Adobe.

User stories' usefulness in capturing requirements comes from their non-technical language, which makes them easier for customers/users to understand. I will be using user stories to help capture the requirements of my application by communicating with various members of Wimbledon hockey club.

Text, letter

Description automatically generatedFigure 2: A simple user story template provided in the module material *(Open.ac.uk, 2014)*

Figure 3: A user story template provided by *(Justinmind.com, 2020)*

Graphical user interface

Description automatically generatedThe user story template employed in this project implements a grouping strategy that organizes user stories according to their relevance and priority. This priority-based classification is critical in ensuring the development efforts align with the most significant user needs first, maximizing the value provided to the users early in the project lifecycle.

Furthermore, the user stories are categorized according to their respective domain within the system. This includes domains such as Players, Clubs, Matchmaking, and Communication. This domain-centric breakdown allows for a more streamlined understanding and management of user stories, focusing on specific aspects of the system when needed.

## Project Planning

### 1.2.1 Lifecycle Model

In deciding the appropriate lifecycle model I have considered a set of questions; these questions are based on those suggested by Mohamed Sami (an enterprise architect with more than 10 years of professional experience) in the article “Choosing the right Software development life cycle model” Sami, M. (2012).

* **How stable is the project idea, scope and environment?**

Realistically, I would say relatively low. The matchmaking process is relatively complex that is likely to require ongoing adjustments. The environment may be subject to change if there are changes in user preferences and needs, thus the project will need to be able to respond to these changes.

* **How confident am I with my own experience needed to tackle the activities needed for the project?**

Fairly confident. My previous experience with the development environment and other resources used in the project bodes well, but this is the first time I am attempting a project of this extent.

* **Do I have good stakeholder visibility?**

Yes, fortunately I am able to have constant communication with stakeholders (players, coaches and admin at Wimbledon HC)

With the following in mind, I have decided to utilise a user-centred, iterative lifecycle, as well as aspects of agile methodology to guide development. I say aspects of agile because I recognise agile development encourages pair programming and teamwork, which is not applicable to this project.

Figure 4 depicts a user-centred design model, which is similar to the model I will be using in my project, although I will be using different terminology. The initial requirements gathering phase is represented by the term "research," categorization and prioritization is represented by "Define," the design and build phase is represented by "Design," the review phase is represented by "Evaluate," and the cycle repeats for the next sprint with the term "iterate."

Figure 4: User-centred design *(Reveall.co, 2023)*

Chart, funnel chart

Description automatically generated

This diagram sets out the project lifecycle plan (which is discussed in more detail in [section 1.1.6](#_Major_Tasks_and)).

### Major Tasks and Subtasks

The updated plan follows the following structure:

1. Requirements Identification
2. Categorization and Prioritization
3. Design and Build
4. Review

For further details, please refer to [Appendix 5.1](#_Appendix_5.1_–)

*TMA02:*

At this stage of the project, the relevant user stories have been successfully gathered and categorized, providing a clear understanding of the requirements for HockeyHub. To categorize and prioritize the user stories, the template illustrated in Figure 2 of the Extension section was used. The process involved selecting the stories with the highest importance, categorizing them by type, and defining a set of acceptance criteria for each story.

Finally, based on the categorised user stories, I have designed wireframes for the most essential features of the HockeyHub application. These wireframes provide a visual representation of the user interface and functionality of the application and serve as a blueprint for the development phase.

*TMA03:*

Using the wireframes produced in TMA02 I have built the application “skeleton” in Bubble. This progress is evidenced in the section [Project work completed](#_3.1_Project_Work). Admittedly I haven’t strictly adhered to the updated plan I laid out as part of TMA02, as I have created all the necessary forms and inputs. The reasoning being that this would allow me to visualise the “full picture” and focus only on developing the necessary functionality leading up to the final EMA submission.

With that being said, from this point I will be following the four sprints I had laid out as part of TMA02 giving myself approximately 100 hours to complete the project work (75 hours project work, and 25 EMA). These sprints are detailed fully in the section [Project Work to be completed](#_4.3_Project_Work).

### Resources

The following resources have been identified as necessary to successfully complete the project, with the task column indicating which phase of the project plan the resource is predominantly used for.

**Table 1: Resources**

|  |  |  |
| --- | --- | --- |
| **Resource** | **Details** | **Task** [**(See Section 1.1.6)**](#_Major_Tasks_and) |
| Bubble.io | [Bubble.io](https://bubble.io/?ref=7ab298zx) is a low-code app development framework that lets you design, develop, host and scale applications. I’ve chosen to use it because I have previous experience using it and will allow me to work more efficiently as I won’t have to build everything from scratch. | Design and Build.  All development will be done using the bubble platform. |
| WhatsApp & Gmail | I have grouped WhatsApp and Gmail together as I will be using both of them for communication purposes. | Initial Requirements Identification. Collecting user stories.  Review. At the end of each build phase a review will be conducted to gather feedback from users. |
| Members of Wimbledon HC | I am using my teammates and members of WHC to gather user stories. I have predominantly asked players who have moved over from other countries, who are therefore more familiar with the problem. | Initial Requirements Identification. Collecting user stories.  Review. At the end of each build phase a review will be conducted to gather feedback from users. |
| Pencil | The Pencil app is a free and open-source tool that you can use to create wireframes and diagrams | Design and Build.  All wireframes have been created using the pencil app. |

### Skill Development

For this project to be successful I am going to have to make use of the skills I have learnt throughout my OU degree. Specifically TM354 (Software Engineering) and TT284 (Web Technologies). I've furthered these foundational skills by engaging with the information sources detailed in [section 2.1.](#_2.1_Information_Sources)

One crucial area of skill development has been in mastering Bubble, a necessary competence to deliver the required functionality for the application. A significant challenge lies in the implementation of the matchmaking algorithm. In order to navigate this, I've utilized resources such as a specific tutorial on implementing a matching feature: NoCodeAcademy(2022)Createamatchingfeature(availableat:<https://www.youtube.com/watch?v=zJB5NuDaF4g&t=24s>).

Simultaneously, I've been enhancing my comprehension of user stories and agile development. The TM354 Module material served as the basis of my initial understanding, which I've sought to expand through additional information sources listed in section 2.1.

Finally, to deepen my understanding of Bubble, I've successfully completed the tutorial titled “Getting Started: Build Your First App” (Bubble, 2023). This tutorial equipped me with the know-how to configure features such as sign-up, login, and profile pages, which will be integral to the project.

On reviewing my progress thus far, it's evident that I have made significant strides in terms of developing my planning, resourcing, and development skills since the first TMA.

### Risks

*TMA02:*

After reviewing TMA01, it became apparent that my initial risk assessment was superficial in nature. I had not yet developed a plan to mitigate any of the identified risks and had only identified a generic risk along with its likelihood and impact on the project.

*TMA03:*

I have revaluated the project risks and adjusted the table accordingly. In addition to this, I have included an associated risk column in my updated project plan.

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk** | **Impact** | **Likelihood** | **Mitigation** |
| Finished product does not work as intended | H | M | To mitigate this risk, my skills development plan and identified information sources aim to equip me with the necessary capabilities to develop a functional and robust application. |
| Project becomes unmanageable | M | M | My mitigation strategy includes an interactive approach focusing on the highest priority features first. This ensures the delivery of a meaningful product even if the scope needs to be readjusted due to time constraints. |
| Unable to complete project in given timeframe | M | L | Similar to the previous risk, my approach includes prioritizing high-value features. |
| Other OU study | L | H | Proper planning and prioritization are key to managing concurrent study demands. If required, I will request deadline extensions. |
| Technical issues | H | L | Regular use of cloud-based auto-updating storage mitigates the risk of data loss due to technical issues. |
| Conflict between users over requirements | H | H | I plan to conduct user reviews and gather feedback, ensuring that the final product meets desired functionality and user expectations. |

# 2 Account of Related Literature

## 2.1 Information Sources

I have identified the following initial information sources to support my project, along with a brief explanation, and the project task the source will be used with.

|  |  |  |
| --- | --- | --- |
| **Information Source** | **Explanation** | **Task** |
| Official Bubble Channel(<https://www.youtube.com/@BubbleIO>) | Useful in the event I need to remind myself of certain features/functionality. | Design and Build (Build) |
| Bubble Academy(<https://bubble.io/academy?ref=7ab298zx>) | The official Bubble academy, which provides various tutorials tailored to learning specific features of the platform | Design and Build (Build) |
| Bubble Manual (<https://manual.bubble.io/>) | Technical manual covering all tools, tabs and key features of the Bubble interface. | Design and Build (Build) |
| Tutorial on matching Feature (<https://www.youtube.com/watch?v=zJB5NuDaF4g&t=24s>) | This video provides a look at how to implement a matchmaking feature similar to tinder (the dating app). Although HockeyHub will function slightly differently this video still provides good insight. | Design and Build (Build) |
| Bubble Course(<https://www.youtube.com/watch?v=CSMx0cTa6Ls&t=337s>) | Useful for guidance on setting up and managing a database in Bubble. | Design and Build (Build) |
| TM354 Module site(<https://learn2.open.ac.uk/course/view.php?name=TM354-22J>) | Used to form my initial understanding of agile development and user stories. Provides a point of reference for me to extend upon. | Requirements Identification. Categorization and Prioritization |
| Cohn, M. (2004) User stories applied : for agile software development. 1st edition. Boston: Addison-Wesley. | eBook available from the OU library, which goes into further detail on user stories and how to correctly use them for planning and agile development. | Requirements Identification.  Categorization and Prioritization |
| Shore, J. and Warden, S. (2008) The art of agile development. 1st edition. Sebastopol, California: O’Reilly. | eBook available from the OU library, which contains practical guidance for applying agile development methods. | Requirements Identification.  Categorization and Prioritization |
| Larman, C. (2004) Agile and iterative development : a manager’s guide. 1st edition. Boston: Addison-Wesley. | eBook available from the OU library, a guide to agile and iterative development methods, and why you should use them. | Requirements Identification.  Categorization and Prioritization |
| User Story Mapping(<https://www.youtube.com/watch?v=YumNf61xn5E>) | A practical example of user story mapping to help manage backlogs and prioritize. | Categorization and Prioritization |
| Why write user stories?  Harper, R. (2017) Writing User Stories. 1st edition. O’Reilly Media, Inc. | A book available through the OU library explaining why writing user stories is fundamental to product development. (Also available as a short video) | Requirements Identification. Categorization and Prioritization |
| How To Write User Stories, Epics, & Personas - Dev Life  https://www.youtube.com/watch?v=Fw98L-kcRpc | How to write effective user stories, including the importance of focusing on the user's needs and how to structure the story. | Requirements Identification. Categorization and Prioritization |

## 2.2 Review of Literature Sources

This literature review seeks to delve into Agile methodology, and one of its crucial components: User Stories. This review is conducted within the context of the project's extension objective that looks to "Identify the key features in the development and documenting of User Stories and use that approach within a User Story-based requirements process." It focuses on the User Stories' application within an Agile environment, specifically in conjunction with the Bubble development platform.

**The Importance of Agile and Iterative Development**

Agile and iterative methodologies have established themselves as quintessential frameworks guiding the design and implementation processes. Introduced in the TM354 Module, these methodologies emphasize a rapid response to change, customer satisfaction, and efficient team collaboration, all of which are integral to any software development project.

Agile development, as described by Larman (2004), is characterized by its adaptability, allowing for flexibility and adjustment as projects progress. This quality makes Agile particularly well-suited to manage the uncertainties and variable demands that typically accompany software development processes. This customer-centric approach ensures that the resulting product aligns closely with user requirements. By promoting constant feedback and communication, Agile methodologies make it possible to align the software development process with user expectations.

Increased project transparency is another key feature of Agile development, as Larman (2004) outlines. Agile methodologies promote a culture of open communication and visibility into the project status and development progress. This transparency provides stakeholders with a real-time view into the project, aiding decision-making and ensuring all parties are informed and engaged.

Iterative development, much like Agile, promotes flexibility and encourages regular revisions to improve the software based on accumulated knowledge and customer feedback. By dividing the development process into smaller, manageable cycles, iterative development allows teams to regularly reflect, learn, and improve their software with each iteration.

All these characteristics make Agile and iterative development methods the cornerstone of a User Story-based requirements process in this project. It's imperative to thoroughly understand the intricacies of these methodologies to fully leverage their potential in development efforts. These methods provide the necessary structure and flexibility for the development of projects like HockeyHub, where the need to cater to diverse user requirements and navigate changes quickly is paramount. To ensure the project's success, the practices and principles learned from Agile and Iterative methodologies will be continually referred to and applied throughout the development process. The books “Agile and iterative development : a manager’s guide”, and “The art of agile development” have proved to be valuable resources which have allowed me to deepen my understanding, and thus apply the principles in this project.

**The Role of User Stories in Agile Development**

In Agile methodologies, User Stories play a pivotal role as an essential tool in capturing, articulating, and prioritizing requirements. Cohn (2004) portrays User Stories as the vehicle for driving the development process with a user-centred perspective, focusing on delivering features that genuinely matter to the user. They act as a communication bridge between the developers and the users, fostering a better understanding of the user’s needs and perspectives, thereby preventing the project from straying into unnecessary technical complexities.

As outlined in the project's extension objective, User Stories have served as the primary tool for capturing the application's requirements, ensuring that the developed features align with the users' needs. User Stories articulate these requirements from the user's perspective. This has allowed me as a developer, to maintain a constant focus on the user's viewpoint, making the development process more empathetic and user oriented.

Harper (2017) emphasizes that the power of User Stories lies in their simplicity and accessibility. Written in everyday, non-technical language, they provide a clear, understandable representation of user needs, ensuring that every stakeholder, irrespective of their technical proficiency, can contribute to and understand them. This accessibility ensures that the software development process remains inclusive, transparent, and user-centric, adhering to the core principles of Agile methodology.

**The Process of Developing User Stories**

The process of developing User Stories is a comprehensive and thoughtful exercise. It requires an intimate understanding of the users, their roles, the tasks they want to accomplish, and the overall value they aim to derive from using the application. More than mere requirements, User Stories capture the user's context and perspective, embodying the human element in the realm of software development.

To build on the understanding gained from the TM354 module material, the video "How to Write User Stories, Epics, & Personas - Dev Life" provided insightful guidance on structuring effective User Stories, stressing the importance of maintaining a user-centric approach and encapsulating the user's needs clearly and concisely.

This user-centric approach will ensure that the development of the HockeyHub is a collaborative, inclusive, and user-centred process, where every feature and functionality is mapped to a real need, enhancing the overall value and usability of the application.

**Bubble Platform and Agile Development**

Bubble's versatility and wide array of tools significantly bolster the iterative, dynamic nature of Agile development. The platform offers capabilities like drag-and-drop visual programming and built-in database structures. These features not only reduce the need for extensive coding but also allow for quick testing and deployment of features, aligning with the Agile principle of rapid, iterative releases.

Importantly, Bubble offers comprehensive educational resources. The Bubble Academy, Bubble Manual, and the Official Bubble Channel provide detailed guides, tutorials, and video resources that aid in mastering the platform's functionalities. These resources have proven to be indispensable to me, especially in the early stages of the project, as they provided a solid foundation for understanding and leveraging the platform's capabilities.

Of particular relevance to this project is the Bubble tutorial on implementing matchmaking features. Since matchmaking is a crucial component of the HockeyHub application, this resource provided guidance on how to develop this complex feature, reducing both the time and the learning curve associated with its development.

**Conclusion**

In conclusion, the in-depth exploration conducted in this literature review substantiates the relevance of the identified sources. These resources have significantly enriched the development process of the project, extending and enhancing my initial grasp of agile and iterative development, as well as the application of user stories. Their invaluable contribution underscores the essential role of sound, well-chosen literature in effective project management and execution.

# 3 Account of Project Work

## 3.1 Project Work Completed

Subsequent to TMA02 the following tasks have been completed, summarised in the table below (refer to [Appendix 5.4 – TMA02 Project Work](#_Appendix_5.4_–) for a recap of the work completed up to TMA02 ):

|  |  |
| --- | --- |
| **Task** | **Challenges / Issues** |
| 1. In alignment with the initial wireframes, I have progressed to creating designs within the Bubble platform, during which I incorporated necessary modifications and made distinct design choices. | Adjusting and modifying design elements to fit the platform's parameters. |
| 1. I have configured the necessary database tables to store information pertaining to both players and clubs | Initial misunderstanding of how various data types are stored in Bubble (Referencing the Bubble manual and Academy helped to Clarify these issues.) |

I have been following a user-centred, iterative lifecycle, as well as utilising aspects of agile methodology to guide the development of this project. This lifecycle is broken down into four key stages:

1. Requirements Identification
2. Categorization and Prioritization
3. Design and Build
4. Review

At this point stage 1 and stage 2 are complete. The user stories which were prioritized and categorized have been used to identify the key functional requirements, and an initial set of wireframes were created to try and visualize the elements needed to fulfil the functionality. Figures 5 – 15 below provide evidence of the application in the bubble environment, as well as the initial set up of the database. These figures should provide an idea as to where the application is in terms of development (essentially a skeleton, as mentioned previously).

The focus moving forward will be on developing the actual functionality of each of the elements, gaining feedback from users, and making any necessary changes along the way.

Further detail on the next steps to be taken are identified in [section 4.4 – Project work to be completed](#_4.4_Project_Work). This includes an updated plan, along with time estimates for each task.

With reference to Task 1 in the table at the start of the section:

Figure 5: HockeyHub Welcome Page (Screenshot of the app running in web browser)

A screenshot of a computer

Description automatically generated with medium confidence

Figure 6 : HockeyHub Login Form (Wireframe: left VS app in browser: right)

A picture containing text, screenshot, font, design

Description automatically generatedA screen shot of a computer screen

Description automatically generated with medium confidence

A screenshot of a computer screen

Description automatically generated with medium confidenceFigure 7 : HockeyHub Create Account Form (Wireframe: left VS app in browser: right)

A picture containing text, screenshot, electric blue, font

Description automatically generated

A screenshot of a computer

Description automatically generated with low confidenceFigure 8: Player Profile (In browser)

A picture containing text, screenshot, number, font

Description automatically generatedFigure 9: Club Profile (In browser)

A screenshot of a computer

Description automatically generated with medium confidenceFigure 10: Player Preferences (In browser)

A screenshot of a computer

Description automatically generated with low confidenceFigure 11: Club Preferences (In browser)

A picture containing text, screenshot, software, display

Description automatically generatedFigure 12: Player Connections (In browser)

A picture containing text, screenshot, software, display

Description automatically generatedFigure 13: Club Conenctions (In browser)

With reference to Task 2 in the table at the start of the section:

A screenshot of a computer

Description automatically generatedFigure 14 : Initial Database set-up (Player)

A screenshot of a computer

Description automatically generatedFigure 15 : Initial Database set-up (Club)

# 4 Project Review

## 4.1 Progress Review

At this juncture, my project can be likened to a skeleton; I have established the fundamental elements essential to its progression. From this point onward, until the final project submission, I intend to follow the four identified sprints.

The initiation of a project skeleton resulted in an adjustment to my original plan. Initially, the strategy was to set up various databases during distinct sprints, subsequently completing the functionality for each section. However, with all necessary forms and sections now in place, my focus has pivoted to the implementation of actual functionality. This strategic shift simplifies the process, allowing me to concentrate on enhancing the project's practical elements instead of its structural components.

Throughout TMA03 I dedicated more time to report work, as apposed to actual development work, in the hopes that this will allow me to focus primarily on development from now until the final submission, as hopefully the majority of my report will be “the finished product”.

## 4.4 Project Work to be completed

This sub-section outlines the tasks to be completed before the final submission date (11/09/2023). As mentioned in the [Major Tasks & Subtasks](#_Major_Tasks_and) section, I will be following the four sprints I had previously identified.

Sprint 1: Player Profile Build (20 hours)

* Set up player profile database – (Complete)
* Create player registration page – (Complete)
* Develop Login functionality – (5 hours)
* Add profile information form – (Complete)
* Test and debug profile functionality – (5 hours)
* Contingency time (Buffer for any unforeseen issues or tasks) - (10 hours)

Sprint 2: Club Profile Build (20 hours)

* Set up club profile database – (Complete)
* Create club registration form – (Complete)
* Adjust login functionality – (5 hours)
* Add club information form – (Complete)
* Test and debug profile functionality – (5 hours)
* Contingency time (Buffer for any unforeseen issues or tasks) - (10 hours)

Sprint 3: Matchmaking Functionality (20 hours)

* Confirm matchmaking requirements – (Complete)
* Plan matchmaking database – (Complete)
* Integrate matchmaking feature – (6 hours)
* Add matchmaking preferences to profiles – (Complete)
* Test and debug matchmaking functionality – (4 hours)
* Conduct user testing and feedback – (5 hours)
* Contingency time (Buffer for any unforeseen issues or tasks) - (5 hours)

Sprint 4: Basic Communication and Interaction (15 hours)

* Set up basic messaging – (5 hours)
* Develop basic interaction features – (3 hours)
* Test and Debug – (2 hours)
* Conduct final testing and user feedback – (3 hours)
* Prepare for project submission – (2 hours)

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*Harvard style, in alphabetical order.*

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# 5 Appendices

## Appendix 5.1 – Revised Plan

* Write TMA01 (Complete)
* Write TMA02 (Complete)
* Write TMA03 (Complete)
* Write EMA (In progress)

The initial project plan had some major shortcomings that came to light after a review of TMA01. Specifically, it was overly detailed and unrealistic, attempting to plan every step of the project to occur on a specific date within a predetermined timeframe. Rather than holistically approaching the project from a user-centred perspective, the plan was broken down into individual TMAs and planned in relation to their respective due dates. As a result, the plan did not account for important project stages such as collecting user stories, categorizing them, and then designing and building the application.

Initial Requirements Identification

This stage involved gathering user stories from a diverse range of stakeholders, including players, coaches, and administrative staff from Wimbledon and Blackheath Hockey Club. See [**Appendix 4.2** for the full list of User Stories. These stories will then be categorized and prioritized based on their importance to the overall functionality and effectiveness of the application.](#_Toc133426536)

Categorization and Prioritization

This stage involved categorizing the stories into four main groups based on their common themes.

Table 1:User Profile

|  |  |  |  |
| --- | --- | --- | --- |
| **User Profile** | **Description** | **Acceptance Criteria** | **Risks** |
| (1)Create Profile | As a Field Hockey player, I want to be able to create a profile on HockeyHub with my personal information and contact details. | Player profile is created with required information. | Privacy concerns with sharing personal information. |
| (15)Set Preferences | As a Field Hockey player, I want to be able to set preferences in my profile, such as playing position and level, to help with matchmaking. | Players can set their preferences and get matched with suitable clubs or players. | Players may provide inaccurate information to try and access more opportunities (such as lying about the level they have played) |
| (6)Receive Alerts | As a Field Hockey player, I want to receive notifications on HockeyHub about upcoming matches and training sessions that I have been invited to attend. | Players are notified of relevant club or match updates. | Players may receive too many alerts, leading to annoyance or frustration |
| (14)Connect with Players | As a Field Hockey player, I want to be able to connect with other players and clubs who share similar interests and preferences. | Players can form connections and build teams based on shared interests and preferences. | Concerns with the quality and compatibility of potential connections. |

Table 2: Club Profile

|  |  |  |  |
| --- | --- | --- | --- |
| **Club Profile** | **Description** | **Acceptance Criteria** | **Risks** |
| (30)Create Profile | As a Field Hockey club, I want to create a profile on HockeyHub so that I can showcase information about our team, including our location, number of teams, and training schedules. | Club profile is created with required information. | Privacy concerns with sharing contact information. |
| (47)Set Preferences | As a Field Hockey club, I want to be able to set preferences in our profile, such as preferred player positions and level, to help with matchmaking. | Clubs can set their preferences and get matched with suitable players. | Clubs may have unrealistic preferences that limit their opportunities. |
| (32)View Player Profiles | As a Field Hockey club, I want to be able to view detailed player profiles on HockeyHub, including information on their playing experience, contact details, and preferred playing positions. | Clubs can review potential players' profiles and statistics before making connection decisions. | Concerns with the accuracy and reliability of player data. |
| (33)Receive Recommendations | As a Field Hockey club, I want to receive personalized recommendations from HockeyHub based on our team's preferences for players. | Clubs are recommended suitable players based on their preferences and requirements. | Recommendations may not always be accurate or relevant. |

Table 3: Matchmaking Algorithm

|  |  |  |  |
| --- | --- | --- | --- |
| **Matchmaking Algorithm** | **Description** | **Acceptance Criteria** | **Risks** |
| (15)Set Preferences | As a Field Hockey player, I want to be able to set preferences in my profile, such as playing position and level, to help with matchmaking. | Players can set their preferences and get matched with suitable clubs or players. | Players may have unrealistic preferences that limit their opportunities. |
| (46)Receive Player Recommendations | As a Field Hockey club, I want to receive recommendations for potential recruits based on their preferences and profiles. | Clubs are recommended suitable players based on their preferences and requirements. | Recommendations may not always be accurate or relevant. |
| (27)Receive Club Recommendations | As a Field Hockey player, I want to receive recommendations for clubs that match my preferences and interests. | Players are recommended suitable clubs based on their preferences and requirements. | Recommendations may not always be accurate or relevant. |
| (45)Set Club Preferences | As a Field Hockey club, I want to be able to set preferences in our profile, such as preferred player positions and level, to help with matchmaking. | Clubs can set their preferences and get matched with suitable players. | Clubs may have unrealistic preferences that limit their opportunities. |

Table 4: Communication and Interaction

|  |  |  |  |
| --- | --- | --- | --- |
| **Communication and Interaction** | **Description** | **Acceptance Criteria** | **Risks** |
| (8)Direct Communication | As a Field Hockey player, I want to be able to communicate directly with other players or clubs on HockeyHub to arrange matches and training sessions. | Players can connect and communicate with each other or clubs through the platform. | Concerns with inappropriate behaviour or language. |
| (20)Online Forums | As a Field Hockey player, I want to be able to participate in online forums and discussions on HockeyHub. | Players can participate in community discussions and share information and opinions. | Inappropriate or harmful content being shared. |
| (28)Provide Feedback | As a Field Hockey player, I want to be able to provide feedback and ratings on clubs or players on HockeyHub. | Players can provide feedback and ratings on clubs or players to improve the quality of the platform. | Inaccurate or unfair feedback |

Design and Build

Image 1: Login Page

Graphical user interface, application

Description automatically generated

Graphical user interface, application

Description automatically generatedImage 2: Sign-up page

Graphical user interface, application

Description automatically generatedImage 3: Player Profile

Graphical user interface

Description automatically generatedImage 4: Club Profile

Review

I plan to have 4 sprints, with 2 reviews, broken down as follows.

Sprint 1: Player Profile Build

* Set up player profile database
* Create player registration page
* Develop Login functionality
* Add profile information form
* Test and debug profile functionality

Sprint 2: Club Profile Build

* Set up club profile database
* Create club registration form
* Adjust login functionality
* Add club information form
* Test and debug profile functionality

Sprint 3: Matchmaking Functionality

* Confirm matchmaking requirements
* Plan matchmaking database
* Integrate matchmaking feature
* Add matchmaking preferences to profiles
* Test and debug matchmaking functionality
* Conduct user testing and feedback

Sprint 4: Basic Communication and Interaction

* Set up basic messaging
* Develop basic interaction features
* Test and Debug
* Conduct final testing and user feedback
* Prepare for project submission

## Appendix 5.2 – Full List of User Stories

Below, I have compiled all of the user stories that have been submitted to me. These were provided by players from the men's 1st, 2nd, and 5th teams, as well as from the ladies’ 4th and 5th teams. From a club perspective, I have received stories from the administrative staff and coaches of both Wimbledon and Blackheath Hockey Club.

User Stories:

1. As a Field Hockey player, I want to create a profile on HockeyHub so that I can showcase my playing experience and preferences to potential clubs.
2. As a Field Hockey player, I want to be able to search for clubs on HockeyHub based on my preferred location, playing level, and training times.
3. As a Field Hockey player, I want to be able to view detailed club profiles on HockeyHub, including information on the number of teams, training schedules, and preferred player positions.
4. As a Field Hockey player, I want to receive personalized recommendations from HockeyHub based on my player profile and preferences.
5. As a Field Hockey player, I want to be able to communicate directly with clubs on HockeyHub to inquire about membership and training opportunities.
6. As a Field Hockey player, I want to receive notifications on HockeyHub about upcoming matches and training sessions that I have been invited to attend.
7. As a Field Hockey player, I want to be able to RSVP to matches and training sessions on HockeyHub so that clubs can plan accordingly.
8. As a Field Hockey player, I want to be able to communicate directly with other players or clubs on HockeyHub to arrange matches and training sessions.
9. As a Field Hockey player, I want to be able to view my attendance and performance history on HockeyHub to track my progress and development as a player.
10. As a Field Hockey player, I want to be able to give feedback and ratings on HockeyHub about the clubs I have attended, to help other players in their decision-making process.
11. As a Field Hockey player, I want to be able to use HockeyHub to discover new teams and meet new players, to enhance my experience and enjoyment of the sport.
12. As a Field Hockey player, I want to be able to filter my search for clubs on HockeyHub based on my preferred playing position and gender.
13. As a Field Hockey player, I want to be able to view reviews and ratings of clubs on HockeyHub from other players to help me make informed decisions about where to play.
14. As a Field Hockey player, I want to be able to connect with other players and clubs on HockeyHub who share similar playing preferences and interests.
15. As a Field Hockey player, I want to be able to set preferences in my profile, such as playing position and level, to help with matchmaking.
16. As a Field Hockey player, I want to be able to receive alerts on HockeyHub when new clubs are added that match my preferences.
17. As a Field Hockey player, I want to be able to view my schedule of matches and training sessions on HockeyHub to plan my availability.
18. As a Field Hockey player, I want to be able to track my performance statistics on HockeyHub, such as goals scored and assists made, to monitor my progress as a player.
19. As a Field Hockey player, I want to be able to connect with coaches and other hockey experts on HockeyHub to receive advice and training tips.
20. As a Field Hockey player, I want to be able to participate in online forums and discussions on HockeyHub.
21. As a Field Hockey player, I want to be able to share my experience and knowledge of the sport with other players on HockeyHub to help them improve.
22. As a Field Hockey player, I want to be able to access news and updates on the sport, including scores and highlights from professional leagues, on HockeyHub.
23. As a Field Hockey player, I want to be able to use HockeyHub to connect with players and clubs from other countries to learn about different playing styles and cultures.
24. As a Field Hockey player, I want to be able to participate in online forums and discussions on HockeyHub to share my opinions and ideas about the sport.
25. As a Field Hockey player, I want to be able to connect with sponsors and other partners on HockeyHub who can help support my playing career.
26. As a Field Hockey player, I want to be able to provide feedback to HockeyHub developers about how to improve the user experience and functionality of the application.
27. As a Field Hockey player, I want to receive recommendations for clubs that match my preferences and interests.
28. As a Field Hockey player, I want to be able to provide feedback and ratings on clubs or players on HockeyHub.
29. As a Field Hockey player, I want to be able to connect with players and clubs who are passionate about the sport and who share my love of the game.
30. As a Field Hockey club, I want to create a profile on HockeyHub so that I can showcase information about our team, including our location, number of teams, and training schedules.
31. As a Field Hockey club, I want to be able to search for players on HockeyHub based on their preferred position, playing level, and gender.
32. As a Field Hockey club, I want to be able to view detailed player profiles on HockeyHub, including information on their playing experience, contact details, and preferred playing positions.
33. As a Field Hockey club, I want to receive personalized recommendations from HockeyHub based on our team's preferences for players.
34. As a Field Hockey club, I want to be able to communicate directly with players on HockeyHub to invite them to attend matches and training sessions.
35. As a Field Hockey club, I want to be able to receive RSVPs from players on HockeyHub to plan for upcoming matches and training sessions.
36. As a Field Hockey club, I want to be able to view attendance and performance history for players on HockeyHub to monitor their progress and development as athletes.
37. As a Field Hockey club, I want to be able to provide feedback and ratings on HockeyHub about the players we have recruited, to help other clubs make informed decisions.
38. As a Field Hockey club, I want to be able to post updates and news about our team on HockeyHub, to keep our existing members engaged and attract new members.
39. As a Field Hockey club, I want to be able to use HockeyHub to connect with sponsors and other partners who can help support our team financially and logistically.
40. As a Field Hockey club, I want to be able to track our team's finances and expenses on HockeyHub, including membership fees, equipment costs, and travel expenses.
41. As a Field Hockey club, I want to be able to set goals and objectives for our team on HockeyHub and track our progress towards achieving them over time.
42. As a Field Hockey club, I want to be able to use HockeyHub to create and distribute promotional materials, such as flyers and brochures, to attract new members and sponsors.
43. As a Field Hockey club, I want to be able to use HockeyHub to analyse player data and performance metrics to identify areas for improvement and optimization in our training and development programs.
44. As a Field Hockey club, I want to be able to use HockeyHub to create and manage our team's roster, including adding and removing players as needed, and updating player information and preferences.
45. As a Field Hockey club, I want to be able to set preferences in our profile, such as preferred player positions and level, to help with matchmaking.
46. As a Field Hockey club, I want to receive recommendations for potential recruits based on their preferences and profiles.
47. As a Field Hockey club, I want to be able to set preferences in our profile, such as preferred player positions and level, to help with matchmaking.

## Appendix 5.3 – Bubble Technical Details

The purpose of this appendix is to provide technical details regarding Bubble. This will provide further insight and understanding for readers when reading other sections of the project document. This information has been summarised from the Bubble docs (https://manual.bubble.io/).

**Server**

The Bubble database is hosted on Amazon’s Relational Database Service (RDS) which is a part of Amazon Web Services. The database is encrypted using the industry standard AES-256 encryption.

**Database technology**

Bubble uses PostgreSQL – an open source database management system. In other words, we have not invented a new kind of database system but use one that has been in development for decades and is thoroughly tested and audited for stability and security.

Bubble offers a visual editor where users can drag and drop elements to create their application interface, and a database editor for managing data. Bubble also includes a wide range of plugins and integrations with popular tools like Stripe, Google Maps, and Zapier. Other technical features of Bubble include its ability to create responsive design layouts, its ability to handle complex workflows through conditionals and actions, and its ability to deploy applications to different environments with a single click. Additionally, Bubble offers user management and security features, such as authentication and role-based access control.

## Appendix 5.4 – TMA02 Project Work Completed

* User stories have been collected, categorized and prioritised, refer to [Appendix 4.2 – Full List of User Stories](#_Toc133697961)
* Using these categorised user stories, the first set of wireframes has been produced, visualising the areas key to the applications functionality. Refer to “Review” in [Appendix 4.1 – Revised Plan](#_Toc133697960)
* 4 sprints have been identified, one for the development of each of the key application components. These have been broken down further to illustrate the tasks that need to be completed in each sprint. Refer to “Review” in [Appendix 4.1 – Revised Plan](#_Toc133697960)
* No development has happened, but the Bubble environment has been created and is ready for development.

## Appendix 5.5 – Personal Review

## Review of Project Management

My project management skills throughout this project have been one of my weakest areas. The initial plan I developed in TMA01 was far too detailed and unrealistic, the plan was improved upon in TMA02 making it more realistic, and more relevant to my project lifecycle. I went slightly off track during TMA03 as I believed having a full project skeleton was the best way to proceed and would allow me to follow the four sprints identified until the final project submission. On review I also underestimated just how much time my other EMA’s (TM352 and TM351) would take, which led to me neglecting this project for some time.

On a more positive note I feel I have been able to produce a decent standard of work, even when, at times I seem to go off track and fall behind.

## Review of Personal Development

In review of my personal development I am proud (for the most part) of how I have handled this project. This will be the first development project I’ve taken from inception to completion.

I have noted in the previous section on how my project management skills have left much to be desired, but with the final EMA), I have no distractions. All of my other studies are complete and there is no reason why I can’t use the time available to produce a satisfactory project.