**Mobile App**

Project Proposal

Nottingham Trent University

Final Year Project

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# Introduction

The chosen topic for the project is a mobile application aimed at individuals who have interest in Sports. The application will try help individuals who are not familiar with clubs by providing the all necessary information and help they may need to get started. The reason behind the chosen topic is related to physical health issues in the UK due to lack of exercise which will be discussed in more detail later. Thus, the application will aim to encourage more people to get involved and help them find opportunities in their area. Health issue is the main problem this project aims to tackle and provide a potential solution for. According to the NHS (July 2012) a lot of health issues in the UK are due to the lack of exercise which is “as deadly as smoking”. It has been estimated that “one in 10 cases of heart disease (10.5%) and just under one in five cases (18.7%) of colon cancer in the UK” often can be due to lack of exercise. In 2008, inactivity caused more than 5.3 million of the 57 million deaths estimated worldwide (NHS 2012). Lack of exercise can also cause your bones to become weak, risk of diabetes or hypertension (Kristin Davis, n.d).

The main focus of the project is to try creating an application which will encourage individuals to be active by joining their local clubs or sport facilities as a means to stay fit. The purpose of the application is to store data on variety of sport clubs/facilities, opportunities (includes GPS feature) and all there is to know about getting for the user all in one place. Often people want to join a local club etc but don’t have enough information about the clubs or their location which this project will help resolve. Currently, there are no solutions in the app market or online that offer same functionality or features to the proposed project. However, there are a few resources which help achieve similar results. For example, using Google maps to locate suitable local clubs or facilities and then receive directions. Facebook is another platform which helps achieve similar results. Facebook has a functionality which allows its users to create Facebook pages where they can post updates and events. After doing some research, there were few pages that can be found on Facebook who advertise sport clubs/tournaments providing opportunities to people; such as “Sunday League Football (West Midlands Only)” page. ‘Sunday League Football’ also advertises kits players can buy at a very reasonable price. Another online resource which provides information are sport associations such as the FA (Football Association) website; where you can find all there is to know about Sunday league football clubs. The user can find their city’s Sunday league (Men/Women and different ages), and all the teams currently registered; among other things, they also keep track of match results and player/club statistics. There is an app called “Match Report Pro” on Google Play/App Store which provides similar features and functionality compared to the proposed project; It is free to install. The application allows its user to create an account (usually the club manager) and register their team on the platform. The user will have the ability to manage their team from the app as they can add the player information, register match dates (when the match date approaches it will send them a notification); ‘Live Scoring’ system, Team statistics & individual player stats. The app has a built-in function which will automatically write match report for the user. The user can also communicate with the team sending them messages and chat using the app. There are also sport facilities who post leaflets to advertise around the local area and often provide indoor sports opportunities, such as ‘DW Fitness First’, ‘David Lloyd’ and ‘Moorways’ etc who offer indoor boxing and swimming lessons.

# Aims and Objectives

This project aims to create a sports application intended to encourage individuals to partake in sports of their choice. The projects aim to achieve this by the following:

1. Research/Learn to develop in Android Studio

Do research and learn how to implement the features needed for the application. Without doing research, it’ll prove to be difficult later and will likely be a big setback for the project. The research should take no more than 2-3 days maximum.

1. Provide people with all the information about local clubs

Try implementing features and functionality which will make people look into local clubs and all the information they may need to get into their chosen sport. This may take some trial and error to meet the user requirement. Majority of the time will be used achieve this.

1. Develop a user-friendly UI

Implement a very simple user interface which is easy to use. Will attract more people to use the application compared to an application which is very complicated to use, so after some time, users will get frustrated and not use it. This may take around a week.

1. Find a way to safely store user data

It will be important to have a secure way to store user data by implementing a database, so no one else has access to it. Also, this will make sure the user data is saved so they won’t have to keep making an account each time they use the app.

1. Provide map feature

Implement a GPS feature which shows the location of the clubs which will make it easier for the user to locate

1. Intergrade functionality for variety of sports

Have a variety of sport options for the user because everyone has different likes and dislikes, so instead of forcing a specific sport, it will be good to have a variety to choose from.

1. Add functionality for individuals to leave reviews

# Task and deliverables

There are a few tasks and deliverables which need to be completed in order to meet the aims and objectives set. The tasks and deliverables include:

1. Research

* Research how lack of exercise is affecting individuals and the main reason behind it
* Research existing solutions currently available to see what their strengths and weaknesses are and try to add the improved functionality in the app
* Research Android Studio using their documentation and online tutorials to help develop skills
* Research how to design GUI
* Research way to test the application to ensure the code has no errors and it runs fine
* Research how to set up database for mobile application using Android Studio

1. Create a repository for version control which will enable to backup all the data and keep it safe, so it is not lost
2. Develop prototype of the application by putting together all the knowledge gained from the research
3. Identify requirements

* Identify functional requirements for the application
* Identify Non-functional requirements
* Milestone: Requirements gathered

Dependant: Functional and Non-functional requirements

1. Analysis

* Create model use cases

Dependent: Requirements gathered

* Create class diagram which will show the structure of the system and classes it will need Dependent: Requirements gathered
* Create sequence diagram which will show the interaction between objects and classes
* Milestone: Analysis complete

Dependent: All Analysis tasks

1. Database Design

* Create ERDs (Entity relationship diagram) which will show the relationship between entities within the application

Dependent: Analysis

* Create DFDs (Data flow diagram) which will show the data flow within the application Dependent: Analysis
* Normalisation of the data which will allow to reduce dependencies

Dependent: DFDs & ERDs

* Milestone: Database Design completed

Dependant: Database Design tasks

1. Design

* Create a paper prototype of the application

Dependent: Analysis and Database Design

* Milestone: Design completed

Dependent: All design tasks completed

1. Implementation

* Create user login for Player user, Club user and Admin

Dependant: Design and Database Design

* Create Signup for 2 types of users

Dependent: Design & Database Design

* Create UI for the Player user – Dependant: Design
  + Home interface
  + Profile interface
  + Local sport facilities interface
  + Competitive clubs interface
  + Non-competitive clubs interface
  + Quick Match
* Create UI for Club user – Dependant: Design
  + Home interface
  + Profile interface
  + Add Club static interface
  + Add club league interface
  + Upload Club photo interface
* Create UI for Admin – Dependant: Design
  + Home interface
  + Manage player user interface
  + Manage club user interface
* Implement the backend for all 3 UIs - Dependent: Database, Analysis & Design
  + Backend for Player user
  + Backend for Club user
  + Backend for Admin
* GPS functionality which shows the location of the club- Dependent: Design
* Milestone/Deliverable: Player user part complete

Dependent: Creating UI and Backend completed

* Milestone/Deliverable: Club user part complete

Dependent: Creating UI and Backend completed

* Milestone/Deliverable: Admin part complete

Dependent: Creating UI and Backend completed

1. Testing

* Create test suites using Android Studio to make sure the application works fine and meets the project requirements

Dependent: Login/Sign up being completed

* Get colleagues to test it to make sure it meets the user requirements

Dependent: Implementation being completed

* + Milestone: Testing complete

1. Project Report
2. Deadline from other modules

Once the application is completed and tested, it would be uploaded to Google Play which is Android App store so users can freely access it. Also, have local clubs and individuals use the application and receive their feedback. However, this is out of scope for this project due to having deadlines for other modules.

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Date** | **Deliverables completed** |
| Review Point 2 | 6/11/19 | 1,3 |
| Tutorial 3 | 20/01/20 | 2,4,5,6,7 half of 8 |
| Tutorial 4 | 01/03/20 | 8,9 |

# Gantt Chart

* 1. Project milestones (including main deliverables)
  2. Project tasks and deliverables including start time and duration
  3. Other milestones including deliverables for other modules, exams etc.
* Artificial Intelligence Lab Task 1 - 05/11/2019
* FYP Tutorial 2 - 18/11/2019
* AAD 1st submission - 22/11/2019
* FYP Review point 2 - 06/12/2019
* Artificial Intelligence Lab Task 2- 10/12/2019
* Artificial Intelligence Report - 17/01/2020
* FYP Tutorial 3 - 20/01/2020
* Review point 3 and show case entry - 08/02/2020
* AAD Report + Code - 14/02/2020
* Artificial Intelligence Lab Task 3 - 25/02/2020
* Adv Soft Engineering Report + Code - 26/02/2020
* FYP Tutorial 4 - 02/03/2020
* AAD Phase Test - 06/03/2020
* Artificial Intelligence Lab Task 4- 27/03/2020
* Project submission - 24/04/2020
* Project demonstration - 30/04/2020
* FYP Tutorial 5 - 04/05/2020

# Resources

The main resource which will be used throughout for the project will be Android Studio which is an IDE for android development. It is Java integrated development environment which provides the user which drag-and-drop tools. This makes it easier for the developer to work on the interface for the application they are trying to create; it also gives the user a visual representation of how the application will look on a mobile phone. Android Studio is of the best android development IDE (Adam Sinicki, 2018), one of the reasons for this is because it provides the user with a virtual device so they can execute and run the code to see how the application would look along with how it works. The application will be implemented using ‘Android Java’ programming language which is very similar to Java because it is Java based and there are large Java libraries supported in Android (Java).

The project will aim to target Android platform instead of iPhone (IOS). The main reason for this is because according to the statistics, Android share 74.45% of the market while IOS shares only 22.85% (Martyn 2019). This shows that the project will be able to influence a large number of audiences, compared to IOS. For the storing data, the application will use a database called Firebase which is a cloud-based database. The application will also use ‘Flutter’ which is a Google Framework. The project will use Flutter to assist with implementation of the user interface as Flutter has its own UI system. The project will use version control to ensure the work is safe and has been backed up in case of any unforeseen incidents. To achieve this, the version control which will be used is called ‘GitHub’. GitHub is the most commonly used version control system amongst developers as it is very versatile and has many useful functionalities. Once the project has been finished, it will be then uploaded on ‘Google Play’ for users to access which is the platform where android users download apps from.

There are various online resources which will be used to assist with the completion of the project. Udemy and YouTube will be used to watch tutorials on how to implement features/functionality for the application and to increase the knowledge on mobile development. Udemy is an online platform for online courses, which teaches its users from the basics to the advanced techniques of the topic. YouTube is a media platform where the user can find any type of video they wish to see. There are also Mobile Application labs which provide information on many useful functionalities which could be used in the project. The lab tutor for the mobile application module along with my personal tutor are also available to assist with the project and give helpful advice when needed. Friends and colleagues who are familiar with android development can also be source of information if there are issues while working on the project. For designing the user interface paper prototype, ‘Fluid UI’ is a very helpful online platform which allows the person to drag and drop UI features such as buttons, text boxes etc, making it very easy to design a prototype. ‘Material Design’ is a website which will assist when designing GUI for the application as it contains different layout and design ideas for mobile applications, websites and desktop consoles etc. The only hardware required for the project would be a mobile phone with Android OS installed.

# Risks

|  |  |  |  |
| --- | --- | --- | --- |
| **Potential Risk** | **Probability**  **(Out of 5)** | **Cause of the Risk** | **Potential Solution** |
| Not meeting requirement | 1 | The functionality and features aren’t meeting the project requirement | Get in touch with local clubs/friends and colleagues and see if they are willing to give feedback |
| Project too complicated | 2 | Making the project way too complicated and unrealistic to complete in the given timeframe by adding too many/complicated features | Discuss with PT if the features are realistic or unrealistic to create. Start by working on the easier features and leave the complicated ones to last |
| Users do not use the application | 0 | There might be some features the application is lacking | Get some feedback from friends (who play sports), PT, colleagues and maybe even local clubs. |
| Interface is very confusing and complicated to use | 3 | Due to lack of experience making application, it could prove to be difficult to add all those features in a user-friendly way | Try to get advice from ‘Mobile Application’ module lecturer and PT. Don’t add too many features on a single interface, instead try to have a verity of interfaces for different features to make it simple to use for the user |
| The project doesn’t get finished on time | 2 | Due to having lots of work to do for other modules, there isn’t much time to work on the project | Manage time well by using free sessions/time efficiently and make a weekly timetable to divide the time appropriately between the modules. |
| Work gets deleted | 1 | Accidently delete the code file, or laptop/computer stops working | Make sure the worked is backed up and use source control (version control) such as ‘GitHub’ to keep work safe and backed up |
| Database isn’t set up properly | 3 | The database isn’t implemented properly so the app cannot store user information, such as login info when they register. This will result in the app not functioning properly plus them having to make a new account over and over. | Do some testing while implementing the app features. Do some research on how to set up the database properly in ‘Android Studio’. |
| Home computer breaks down | 2 | The computer at home stops working due to unforeseen circumstances | Come to university early so you can use their facilities i.e. computers |
| Error in the Code | 5 | Not implementing test suites to test the code for errors etc which could result in the application being full of bugs and ruin user experience | Research how to write test suites in android studio and what resources are available online to help achieve this |

# Legal, Social, Ethical and Professional Issues (LSEPIs)

There are many legal, social, ethical and professional issues which need to be taken into consideration while working on the project. One of the legal issues which may affect the project is General Data Protection Act (GDPR) 2018. Data Protection Act 2018 is the updated version of Data Protection Act 1998 where the personal information used by organisations or businesses need to be, “handled in a way that ensures appropriate security, including protection against unlawful or unauthorised processing, access, loss, destruction or damage” [1]. This act will affect the project as the application will store the users’ personal information such as, name and address etc, thus, while implementing the application, it is important to make sure the user’s data is safely protected. One way to achieve this is by making sure no one has access to user data except the user or the admin. Also, only the user can see their own personal information. Computer Misuse Act is another legal issue which will affect the project. This act ensures the personal data of individuals is safe and protected from “unauthorised access and modification” [2]. The solution to this is similar to he previous one, by making sure unauthorised users do not have access to other people’s details. In addition to this, the data can be stored in an online database instead of the phone. This will keep the personal information protected and away from unauthorised personal, so they won’t have any means to access it. One other legal issue which may need to be taken into consideration is Freedom of Information Act. However, this will not have an impact on the project because the Freedom of Information Act only covers public authorities [3].

There are a few social issues to be taken into consideration such as the impact on the society i.e. families, education, workplace etc while working on the project. The project may have a positive impact on families as they may download it as a means to get into sports/exercising and aim to improve their wellbeing together. It can also effect educational sector as schools may encourage student to download the application so they make take interest in sports and look after their health from a young age, as the lack of exercise because a habit as you get older and become more lazy which increases the chance of health problems. It may have an influence the youth and encourage them to get out of their houses instead of using their phones or computers at home all day. This will help decrease the risks of social isolation as they are going to meet new people and socialise by making new friends. Cyberbullying can be another issue which may affect the project as one of the potential features to improve the project could be to add social media side where people talk about their experiences with different clubs and give them a rating out of. However, this could result in cyberbullying, for example if someone give a poor rating or leaves a negative comment about a club, the staff or the members of the club could be offended which could result in cyberbullying.

One of the ethical issues which may affect the project is misuse of information such as identify theft and offensive material. There have been many cases of identity theft where people have had unauthorised access to someone’s detail or using social media. The application will store user’s personal information, thus if someone else other than the user had the access to it, their identity can be stolen; someone can stalk them as they will have their address details. Therefore, it is important to keep the user data safe as mentioned previously in the legal issues. Someone can make a club account as a prank and add offensive material or inappropriate location details instead of a sports club or facility. Thus, it is important the admin monitors the clubs being added, the potential solution to this can be that before the club/facility details are added to the club, the admin will have to approve it, if it is declined, then the data will not be added to the app. Ethical issues such as Safe Guarding (DBS) doesn’t impact the project as it doesn’t involve anything which may put anyone’s health in risk, neither does it involve working with kids.

There are professional issues which may also have an effect on the project, thus it is important to unsure the British Computer Society (BCS) Code of Conduct is taken into consideration which lists how to keep your work at the professional standards. Under the ‘Public Interest’ section, it is mentioned to ensure professionalism, your activities should not discriminate “on grounds of, sex, sexual orientation, martial status, nationality, colour, race, ethnic origin, religion, age or disability” [4]. This could have an impact on the project as there could be clubs listed in the application who discriminate against a certain type of people, or if the application for example, had the options where it specifically asked for their race and filter the sports they can do depending on what race they chose. Thus, it is important when creating the application, not to include any features which may discriminate, and also include an option for users to report any clubs they may feel are discriminating. In the code of conduct, it is also stated to keep professional competence and integrity in mind, meaning respect other people’s alternative news and accept criticism with an open mind. This can e applied to the project, so when a colleague/friend or PT gives some criticism, don’t take it to heart and be upset about. Instead use that criticism to improve the project further. When working on projects generally, sometimes unexpected issues can arise which could have a big impact on the project and effect it’s progress, therefore, it is important to react to any unexpected situation appropriately to show professionalism.

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