

Student Mental Health Signposting App (My Mind)

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Abstract

The current mental health and wellbeing counselling service at Birmingham City University has experienced a 300% rise in referrals since 2011 causing a lot of strain on the currently ageing system that they currently use.

The condition and usability of the current system not only delays the process for a student to gain access to the counselling service, but it also discourages people who are looking to access the service due to the large unpopularity of the iASK system the university has implemented. The iASK system is unpopular due to the fact the system does not work most of the time and when it does, the information is not there or incomplete.

This has led to the counselling service to use a Microsoft SharePoint form to offer a referral service for student's meaning that the student is unable to access it due to the system requiring students to login, which is currently intermittent due to the university implementing a new single sign-on service, meaning that students tend to give up on trying to access the service.

In this report, I have designed and created a basic framework within an app which the university can implement into their current iASK system, diverting most of the traffic away from the unfinished support portal and streamlining and updating the systems the student affairs team currently use.

To allow me to create the app, I have asked several students from across the university to participate in the design and evaluation of any product I produce within this project. I have also timed these students accessing the current referral form for the student affairs team.

Acknowledgements

Dr. Yevgeniya Kovalchuk has been an incredibly supportive thesis supervisor. Her insightful criticisms and patient encouragement aided the progress within this project in innumerable ways.

Fathia Warren has also provided her insightful knowledge as a support tutor within this project giving me the needed advice and suggestions to make my project successful and meet the expectations required for this thesis.

Dedication

This thesis is dedicated to my father, who sadly passed away in July 2016. It is also dedicated to Peter Bell and James Edwards, friends who always questioned my processes and pushed me to do the very best within my field.

Declaration

I confirm that the work contained in this BSc project report has been composed solely by myself and has not been accepted in any previous application for a degree. All sources of information have been specifically acknowledged and all verbatim extracts are distinguished by quotation marks.

Signed: 
Alexander Edward Davis

Date: 19th May 2017

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Chapter 1

Introduction

1.1 Background

1.1.1 Project Background

“In recent years, health problems, particularly mental health of students is so interested. College is an important setting in which to evaluate and address mental health.”

(NAMI ET AL., 2014)

Today's society has recently begun speaking out on controversial and sensitive subjects become part of a regular conversation. This has started to include objects such as mental health and wellbeing including the diagnosis that many students who are at university having a mental health condition such as depression and anxiety disorders.

Many students starting at university are now facing the issue where they are unable to find support or unaware of any of the mental health support mechanisms available at their university.

1.1.2 Aim

The main aim of this project was to design, create and implement a mobile application that allows students at Birmingham City University can see the mental health support available from both the university and the students within the university.

The app also allows them to refer themselves to the Mental Health and Wellbeing student services team within the university and book and appointment with a mental health and wellbeing advisor.

1.1.3 Objectives

The mobile app follows the Apple iOS Human Interface Guidelines as I have primarily developed the app on the iOS mobile platform. Apple's software design guidelines state:

“Three primary themes differentiate iOS from other platforms:

Clarity. Throughout the system, text is legible at every size, icons are precise and lucid, adornments are subtle and appropriate, and a sharpened focus on functionality motivates the design...

Deference. Fluid motion and a crisp, beautiful interface help people understand and interact with content while never competing with it...

Depth. Distinct visual layers and realistic motion convey hierarchy, impart vitality, and facilitate understanding..."

(APPLE INC, 2016)

I originally designed the app so it will work on iPhones and iPods however in future I will include iPads into my designs with the possibility to expand the deployment of this application to work with Android devices.

The app must be able to work within file and data entry systems including the Microsoft SharePoint platform. These are used by the Student Mental Health and Wellbeing services within the university to allow students to refer themselves to the department. The implementation of this is not very good as many students must be referred to the actual form by a member of staff and to find this form on iCity, the university's information portal for staff and students, can be incredibly difficult which could potentially put off students from filling the referral form.

Figure one shows the current menu for the iCity information portal. As you can see, the ability to view the mental health and wellbeing page is not there however after several minutes of clicking you will be able to access the page by clicking several hyperlinks on many pages. Personally, as I have accessed this page previously, I am able to access it within a matter of minutes with only four clicks however some new students who are not used to the layout of iCity may not be able to do so in a similar fashion.

In the near future, the app will also allow members of staff to create, amend and cancel appointments for students. This will be done via an administrative website which will be linked to the same database as the student section. There is also the possibility to include the Doodle Online Appointment Management system into this as Doodle allows people to suggest times and view the availability of a specific person.

The app also includes a new, updated version of the referral form. The current design is not user friendly and some students may encounter difficulty when viewing and filling in the form. The form also includes unnecessary items, for instance, Figure 2 displays the sidebar (shown in the red box) at the top of the page that students do not need to access. Figure 3 also shows a question within the form that includes information that is now no longer valid. The question (shown in the blue box) in Figure 3 asks the user which faculty they belong to and includes faculties that now no longer exist (shown in a green box) and have merged to form other faculties. The design of this form has even includes a warning not to use these answers as they are not valid.

1.1.4 Product

Figure 4 shows the three different sections of the app that users can interact with. The app will communicate with an online database to allow the input of data such as appointments and allow access to the forum, this has been shown with the database section holding three tables for the appropriate app areas.

The main referral section of the app will contain a user creation page where users will be required to create their own account for the service. This account implementation is for the forum and so that the student can create appointments with Mental Health and Wellbeing Advisors. Although there is a possibility for me to use the university's single sign on service in future, I have decided that this is not a good idea for the current project as I would like to trial it on a select focus group and do not want to allow all students access to the app or the forum at this moment in time. There is the possibility in the future to implement the OpenAthens Single Sign-On service that most UK universities use. This would allow me to create a location specific, university specific experience for each user. Another reason for not requesting to the OpenAthens service is due to the time restriction within this project, there are several legal issues I would have to face and discuss with the service provider and this process would take longer than the allocated time I have for this project.

1.2 About this Thesis

This is the report of Alexander Edward Davis, submitted as part of the requirements for the degree of BSc in Computer Science at the School of Computing and Digital Technology, Birmingham City University, Birmingham, UK.

1.2.1 Reasons for Project

Higher Education Institutions are seeing a common trend within first year students where around 6% of all first year entrants do not continue with their studies according to data from the Higher Education Statistics Agency. The Times Newspaper states

“Six per cent of first degree entrants aged under 21 who enrolled in 2013-14 did not continue their studies beyond their first year, according to data from the Higher Education Statistics Agency.”

(HAVERGAL ET AL., 2016)

Many institutions have theorised that most non-continuation cases are caused by mental health issues such as anxiety and depression. To combat this ongoing issue, many universities have set-up counselling services for students suffering with mental health conditions. Although the number of

cases is not known, many counselling services are reporting an increase in referrals as stated by Ann Macaskill:

“There are increasing concerns globally about the mental health of students. In the UK, the actual incidence of mental disturbance is unknown, although university counselling services report increased referrals.”

(MACASKILL, 2013)

As these services are becoming available, I have noticed many issues with the referral system and knowledge of their existence within different university institutions. One common issue I have seen is that many students are aware how to get counselling support however the university's website makes it rather difficult for the student to refer themselves to the support services available.

1.2.2 Project Effects

This project will allow the ease of use for support services to be accessed and will also create the availability where many students who do not want staff intervention, via counselling etc., to be able to gain support from other students experiencing similar issues. There is the potential for any products created within this project to be used in a live environment where staff and students would actively use the system.

The forum section of the app can also ease the strain that most support services are experiencing. As the general public are becoming more confident talking about mental health issues, many people are coming forward with various mental health issues.

1.2.3 Comparison of other possible solutions

A possible solution for this issue is a web based application that utilises HTML, PHP and SQL Databases. I have decided that this is not an appropriate solution as the system needs to be available to those who are not near a computer and using their mobile devices to access the internet. This can create an issue where data usage is limited therefore a solution that uses little to no mobile data is optimum for this project.

1.3 Chapter List

Below are the chapters within the report overlooking the progress of the project.

Chapter 2 Literature Review. This chapter reviews the Effectiveness of Social Media within Mental Health Services.

Chapter 3 Background Research. This chapter looks at the research methods used within this project.

Chapter 4 Requirements. This chapter defines the attainment criteria to evaluate this project and any products produced.

Chapter 5 Design. This chapter examines the design of the project based on the requirements.

Chapter 6 Implementation. This chapter shows how the designs will be implemented in a production environment.

Chapter 7 Testing. This chapter includes the testing sequences and plans created to evaluate the final product.

Chapter 8 Evaluation of Product. This chapter details the feedback received from people who have used the previous system and/or may use the new system once implemented.

Chapter 9 Evaluation of Process. This chapter analyses the processes within the project and evaluates the effectiveness of these processes.

Chapter 10 Conclusion. The conclusions of the report are presented. This chapter summarises the main positive outcomes and conclusions resulting from this body of work.

Chapter 2

Literature Review

This chapter provides a comprehensive review of the Effectiveness of Social Media within Mental Health Services. Davis (2016) provides links to these and other resources.

2.1 Introduction

The growing use of Social Media within popular culture has shown that today's society is more willing to share with others on a public forum their personal and social activities such as shopping, eating out and watching films.

Unfortunately, Mental Health Issues are rarely brought up online on social media platforms however many awareness groups, education institutions and healthcare providers around the world are starting to create and utilise the social media platforms to provide support and advice for those who require it. For example, the Birmingham City University Student's Union (BCUSU) created and formed a mental health awareness society within the university. The Birmingham City University Mental Health Awareness (BCUMHA) Society's mission is stated on Facebook.

“Raising awareness, tackling stigma, and enhancing the student experience for those who suffer from a mental health illness at Birmingham City University”

(BIRMINGHAM CITY UNIVERSITY MENTAL HEALTH AWARENESS ET AL., 2016)

Since the formation of BCUMHA and similar societies at other universities, students have been discussing and raising issues within their university and provided feedback on the support they have been offered.

Table 1 (in Appendix A) contains all journal articles the author has selected surrounding the topic of the use of social media within mental health services.

2.2 The Deployment of Mental Health Services

Mental health services differ within each country; this critical literature review will focus mainly on the services provided within the United Kingdom and the United States of America.

2.2.1 Mental Health Services in the United States of America

Mental health services within the United States of America (USA) are provided by private companies who require payment from each recipient of their services.

The United States Military provides a service for personnel that assesses them for possible health issues created from working within the combat zones. This service begins with a form called the Post-Deployment Health Assessment form (PDHA). This allows the military to arrange and deliver specific healthcare treatments, including any mental health services to their staff. This service has a positive effect on the users of the service within the first year however statistics for after the first year of service are incomplete as stated in Hoge's paper,

"This study provides new data showing the strong relationship between combat duty and a variety of mental health outcomes and most importantly high mental health care utilization in the first year after deployment. ... Additional research is needed beyond a year after deployment to determine the long-term burden that this war will have on the mental health care system."

(HOGE ET AL., 2006)

2.2.2 Mental Health Services in the United Kingdom

Mental health services within the United Kingdom is generally funded by the National Health Service (NHS). The NHS is currently aiming to cut down operational costs for these services. In 1999, the then Secretary of State for Health Frank Dobson MP, announced

"The Government is committed to do whatever is necessary to deliver a modern and dependable health service ... Mental health services and the professionals who provide them will get the attention and resources they deserve"

(GREAT BRITAIN. DEPARTMENT OF HEALTH, 1999)

These commitments have not been fulfilled as the country has since experienced several recessions that have overshadowed the improvement to mental health services.

There are however stricter guidelines on providing efficient and quality mental health services. The Mental Health Act 1983 states all guidelines for the delivery and protection of mental health services.

“(1) It shall be an offence for any person who is an officer on the staff of or otherwise employed in...

to ill-treat or wilfully to neglect a patient for the time being receiving treatment for mental disorder as an in-patient ...

or

(b) to ill-treat or wilfully to neglect, ... a patient for the time being receiving such treatment there as an out-patient.

(2) It shall be an offence for any individual to ill-treat or wilfully to neglect a mentally disordered patient who is for the time being subject to his guardianship under this Act or otherwise in his custody or care.”

(CROWN COPYRIGHT, 1983)

2.3 The Concept of Social Media

Social media has become one of the human rights in some countries with many people who use the internet owning one or more social media accounts.

Social media platforms promote freedom of speech also as they are generally ungoverned and have in the past allowed those who are in oppressed countries to publicise the internal events going on.

2.3.1 Different Types of Social Media Platform

There are approximately 8 different social media platform categories; Social Networking, Video Sharing, Live-Streaming, Microblogging, Blogging, Social News, Photo Sharing and Content Curation. The most popular platforms for each category are Facebook, YouTube, Twitch, Twitter, WordPress, Reddit, Instagram and Pinterest respectively.

2.3.2 The Uses of Social Media

Many people well known within popular culture gain their popularity and ‘fame’ from using their social media accounts. The most famous case for this is Kim Kardashian who frequently publishes suggestive images of herself online to explicitly gain controversy.

Other users of social media platforms include tutorials, news articles, advertising, gameplay and general ideas for projects.

Many countries security services use these social networks to monitor possible security threats such as suspected terrorists. The United States of America's National Security Agency (NSA) utilises social media to monitor security targets as Joseph Verble states in his paper.

"The NSA became the management system for the ... researchers into new computer technology and communications infrastructure."

(VERBLE, 2014)

2.4 The Use of Social Media Within Mental Health Services

Recently, mental healthcare providers have been trialling the use of social media and online platforms for providing support and advice to their patients. Several journal articles suggest that online treatment would benefit however careful consideration on the design and use of the platforms should be observed. Orlowski states

"While the benefits of technology were seen in the ability to more closely track consumers' progress and level of risk, it was also associated with concerns around an implied level of clinician responsivity and possible increases to workload. These concerns included a perceived lack of processing around information communicated via these modes of communication and unclear guidelines around when and how clinicians should respond to potentially risky information, particularly outside of work hours."

(ORLOWSKI ET AL., 2016)

Social media can also be used by the general public to assess someone's mental health although the system is heavily reliant on each person's. This has already been implemented on Facebook where users can report those who are at risk of harming themselves or someone else. Figures 5, 6 and 7 show the advice and guidance Facebook provides its users who can either refer themselves or someone else to a mental health service.

Researchers have also found that the use of social media specifically the reduced contact between friends and family affected the odds of accessing mental health services. Maulik states

"The effect of social network and social support on general medical service use indicated that a reduced frequency of contact with either friends or relatives was associated with reduced odds of accessing services across different mental health conditions."

(MAULIK ET AL., 2009)

This demonstrates that mental healthcare providers should begin advertising and offering support on social media platforms as this would greatly increase the usage of their services and allow more

flexibility with appointments. It would also ensure that people suffering with anxiety disorders are able to attend their appointments regardless of being in the provider's facility or not.

The use of social media within healthcare can also be used within general healthcare also. The usage of services such as WebMD increase engagement and the awareness of other health conditions. Moorhead states

“Social media brings a new dimension to health care as it offers a medium to be used by the public, patients, and health professionals to communicate about health issues with the possibility of potentially improving health outcomes.”

(MOORHEAD ET AL., 2013)

2.4.1 Adoption within Education Institutions

Education institutions have been very hesitant to incorporate social media into their wellbeing programmes as there is evidence to suggest that students' conditions may worsen if services are accessed using social media platforms. Rosenbaum demonstrates this saying

“research shows that internet addiction may exacerbate ADHD symptoms in adolescents”

(ROSENBAUM ET AL., 2012)

Institutions may also be hesitant due to the cost of implementing such a service and developing procedures and training staff as demonstrated in Blanchard's article.

“Information communication technologies have great potential in improving young people’s mental health ... However, if this potential is realized, guidelines for their safe and effective use need to be developed. Furthermore, investment needs to be made in securing appropriate technology infrastructure ... and in training staff to better understand young people’s use of technology.”

(BLANCHARD, 2011)

2.5 Conclusion

The use of social media within mental healthcare allows more organisations to provide a more efficient service without affecting the quality at a lower cost compared to traditional methods such as face to face appointments.

The future of social media and mental health services is very unpredictable as many organisations are incredibly hesitant to start using social media platforms however as more digital devices including The Internet of Things devices become popular, the use of social media and mental health services may grow and become the main method for individuals to access these services.

Chapter 3

Background Research

3.1 Research Subjects

To ensure that my results are unbiased results, all participants for my research and evaluation were students at a university level. This included people with and without mental health issues and many students who may not seek emergency assistance may use the product to assist someone who does require assistance.

3.2 Research Methods

Throughout the project, I have employed various techniques which enables me to gain the relevant knowledge and ability to create a specification that will suit all the needs for most if not all users. Due to the nature of my project and the app, I decided to employ the PICO assessment process for researching the relevant fields. The PICO process has the following elements as stated within the New York University library website:

“Evidence-based models use a process for framing a question, locating, assessing, evaluating, and repeating as needed. PICO (T) elements include: Problem/Patient/Population, Intervention/Indicator, Comparison, Outcome, and (optional) Time element or Type of Study.”

(RESEARCH GUIDES: HEALTH (NURSING, MEDICINE, ALLIED HEALTH): SEARCH STRATEGIES: FRAMING THE QUESTION (PICO), 2017)

3.2.1 Interviews

As part of my research I interviewed many staff and students within Birmingham City University asking them of their experiences with the current system used within the university. I also asked each participant if they wanted to see the changes to the system if I were to only make modifications however there was a resounding request to rebuild the system from scratch due to the fact it was being integrated to a ‘semi-working’ system which did not suit the student’s needs.

3.2.1.1 Time Trials

Part of my interviewing process. I timed selected students to access the original Mental Health and Wellbeing Counselling referral form and gave them a maximum of five minutes to complete the

task. Out of the 8 students selected, 4 did not manage to complete the task within five minutes. The students who managed to complete the task within five minutes had a wide range of timings. For information about these timings please see Appendix D which contains the results of the student feedback sessions.

3.2.2 Analysis of Current System

I began my analysis of the current system by emailing members of staff who use the current system. Unfortunately, due to the nature of their work, they have been unable to respond to me however I have been able to check other aspects of the system by accessing it directly and researching the history of the university.

From the information I have seen shown in Figure 3, I have estimated the current system originate from 2008. This is information based on local history pages and knowledge from members of staff who have worked at the university for several years. The new university faculty structure, which consists of four main faculties, was brought into existence in 2014. This has made me conclude that the current referral system has been in place for almost 10 years however has been implemented into the controversial iASK system which was made available in September 2015 in line with the opening of the Curzon Building at the university's City Centre Campus.

Due to the issues gaining information about the current system, I am only able to make assumptions on its history and current state. From the research I have been able to gather successfully, I believe the system to have 3 revisions in its lifetime; one to accommodate the faculty restructure in 2014, the second to accommodate the launch of the iASK service and the third and most recent revision to accommodate the new single sign-on service the university launched in April 2017.

From feedback I have received from both staff and students, the consensus is even though there is an increasing number of people using the system every year, the system is unusable on mobile devices (see Figure 8 within Appendix A), and many of those who do use the system find it unintuitive and discouraging due to the requirement of emails to be sent to book an appointment.

3.3 Conclusion

To summarise my background research, I have discovered following issues:

- The current system is not user friendly,
- The system is dated and requires a refresh to bring it up to modern standards,
- The current system is not streamlined to provide a one stop hub for mental health counselling.

These points are the basis for a requirements specification and the changes are required as soon as possible due to the nature of the system's purpose.

Chapter 4

Requirements

4.1 App Design Requirements

The app should not require the user to leave the app for any of the following tasks:

- Referral for counselling
- Request, confirmation or cancellation of appointments
- Ability to access emergency help should it be required

I have also decided that the app should have a forum feature that will allow the user to get advice from people who have experienced similar issues.

4.2 Platform Requirements

I have decided that the app within this project should be designed using the Swift programming language for iOS mobile devices. This does not automatically rule out the possibility for the app to be made available to other platforms such as Android however I have chosen iOS due to the human interface guidelines written by Apple to ensure the app fulfils its needs for people with accessibility issues. I have selected to use the Swift language over the Objective C language as it is the easiest and most efficient language to write an iOS app in.

I will also be using several software frameworks within the app to speed up the development process. The main two frameworks I will be using are Firebase created by Google and Swift Forms created by Miguel Angel Ortuño. Firebase will create an easy to implement login system without the use for additional security features within the app. Swift Forms will allow me to easily create forms within the app for the user to fill in. These forms include the referral form and the appointment request form.

4.3 Accessibility Requirements

The accessibility requirements for my app fall in line with the Apple Human Interface Guidelines:

“Three primary themes differentiate iOS from other platforms:

Clarity. Throughout the system, text is legible at every size, icons are precise and lucid, adornments are subtle and appropriate, and a sharpened focus on functionality motivates the design...

Deference. Fluid motion and a crisp, beautiful interface help people understand and interact with content while never competing with it...

Depth. Distinct visual layers and realistic motion convey hierarchy, impart vitality, and facilitate understanding..."

(APPLE INC, 2016)

This will include the size and font of my text must be a predefined value, Apple generally encourages the use of the San Francisco typeface within iOS apps.

I will also ensure that my app will be easy for those with visual impairments to see without the need for changing settings. For this I used the online service Palletton to create my colour scheme which also includes calming colours such as purple and green.

4.4 Time Restraints

The whole app must be designed created to some working order within approximately 2 months. This will allow me to evaluate my app within the university with a wide student group using questionnaires and interviews.

4.5 Conclusions

The main requirements for the app are listed below:

- The user should not need to leave the app to complete the following tasks
 - Fill and submit the referral form
 - Request an appointment
 - Confirm or cancel appointments
 - Access an online forum
 - View and access emergency contacts
- The app must have a colour scheme that doesn't cause any usability issues
- The app must work on iOS devices such as the iPhone and the iPod and must be usable on all size ranges for these products
- The app's design must follow the Apple Human Interface Guidelines
- A connection to a database and forum must be available.

Chapter 5

Design

5.1 App Workflow

Figure 9 shows how the user would go through each section of the My Mind App; this includes the first-time setup of the app and forum. Figure 10 displays all the frameworks and databases the app utilises. This includes databases that haven't currently been implemented however will be soon.

5.2 Platform Decisions

Sections of My Mind will not be feature finished, this is due to issues meeting staff during my research meaning that I have been unable to get vital information regarding how the current system is used within their office. I have also decided due to the time constraint; the forum section will be an off the shelf system which will be integrated into the app. This is due to the framework that would be used to create the forum within the app does not fully work within the version of Xcode and Swift I have used.

The integration of the forum would involve the app to contain a web browser that accesses the forum via a website. The forum would be a separate website and hosted online. Thanks to the Major League Hacking 2017 season, I have received a free Domain.com domain name and have purchased www.mymindforum.com for this purpose.

The Firebase framework is easily integrated into iOS apps meaning I could utilise the framework with little to no effort or background reading into the framework. Firebase currently controls the user's logins and soon will include the ability to store appointment information for each student and staff member along with an easily updatable emergency contacts list.

5.2 Conclusion and Final Designs

Figures 11, 12, 13, 14, 15 and 16 are the final designs for the My Mind app. I have created these designs within Xcode, the development package I will be using to create the final mobile app. Figure 11 is the launch screen which is what will be displayed once the app is opened. Figure 12 shows the initial three screens that the user will see before logging into the app. The user will be able to switch between the screens by swiping right or left. Each screen will explain how the user can and should use the app. They also contain a button to login and sign up to the service.

Figure 13 displays the login area of the app which will allow the user to sign up, login and reset their password. Automatic login after sign up is not a feature within the app due to security concerns relating to the storage of the user's password temporarily before logging into the system.

Figure 14, 15 and 16 contain every screen the user can access after logging in. There are four sub-sections to the main area which allow the user to refer themselves to counselling, view, request and cancel appointments, access the online forum, sign up to the forum, log out of the app and access emergency contacts. The main design of this section is tab based where the user can tap the icons on the bar at the bottom of the screen to access each feature.

Chapter 6

Implementation

This chapter examines possible implementation methods I could use should Birmingham City University or any other organisation wanted to implement the system within their organisation.

6.1 Whole System Implementation

Whole system implementation is where the old system is removed completely from service and instantaneously replaced by the new system. This method has several major issues and challenges that would most likely conclude to the method not being used. A major concern with a whole system implementation is staff are unable to guarantee that the new system will be fully functioning and bug free from day one however a main advantage of this method is that it is the cheapest as it does not require a long-term implementation plan and doesn't require the need for both systems to be serviced simultaneously.

6.2 System Integration

System integration is similar to a whole system implementation however the old system is not removed from service completely but deactivated and used for a backup service should the new system not work at specific times. This method is much more reliable compared to whole system implementation as there will always be a working system standing by should one fail however I would not recommend this technique as it would require a much larger budget to keep both systems running for a set period.

6.3 Phasing Implementation

Phasing implementation is a compromise between whole system implementation and system integration. Both systems would run as one active service however each individual section of the system would be replaced one by one until the new system is the only system used. This is the most reliable technique as administrators would be able to easily switch between the two systems for a specific task. It would also mean there would be no downtime during the process. The main disadvantage with phasing the new system in is that the costs would be very high, close to the costs projected with a system integration as not only would the organisation have two systems running simultaneously but they would also have to hire designers and programmers to effectively build each section that is being replaced. Another major concern with phasing in a new system is that the

implementation project could be never-ending as programmers may find an unfixable bug within the system meaning that the old system is not taken out of service fully.

6.4 Final Implementation Decision

I have decided that should an organisation wish to implement the My Mind system, I would recommend the phasing implementation method. This would not only be the most reliable as sections from the old system would not be replaced until the new system was fully functioning without any bugs or issues, it would also be one of the most expensive options as both systems would have to be running alongside one another and the implementation would take the longest time compared to the other two options.

Chapter 7

Testing

7.1 Testing Techniques

The two testing techniques I will focus on before making a decision on which technique I shall use within the project are Black Box testing and White Box testing.

Black box testing is:

“Carried out using a test plan

No knowledge of the code or how it works

Simply looking at whether the input produces the output expected

Test every possible input to the system or every type of input possible”

(BULL, N.D.)

This testing strategy would allow me to quickly and easily test each section of my mobile app without having to manually acknowledge what each automatically generated line of code does within a specific task.

White box testing would be more intensive as it would involve the analysis of the algorithm and ensure that each part of the algorithm is not wasteful and is fully functioning even if it does not result in a value that is used within the app itself. White box testing however would require a longer testing process and may not be suitable for this project as some algorithmic code has been written by a third party which has already tested their code on a previous occasion.

7.1.1 Selected Testing Technique

Due to the major issues with white box testing, including the requirement for extra time for both the analysis of code but also to be able to understand what each line does, I have decided that this project should focus on using black box testing. This is mainly due to the large time constraint within the project and the fact that quite a lot of the code tested is only being tested for its implementation rather than erroneous written lines.

7.2 Test Plans

I tested each screen to ensure that the features within them were fully functioning with an expected output. To view the complete test plans, please go to Appendix E. Within the referral form test plan, I have not included any entry requirements to that plan due to the form not having any validation requirements within any of the fields.

Chapter 8

Evaluation and Conclusion

8.1 Evaluation of Product

8.1.1 App Questionnaires

I asked 8 students to use my app for 10 minutes then fill in the evaluation sheet shown in Appendix B. The general response from the students was mainly positive with feature requests that would be attainable and easy to implement within a small timescale.

The main section of the questionnaire, which included an opinions selection, received an overwhelmingly positive response with almost all participants within the survey said they found the app design to be intuitive and consistent across all sections of it.

Many users did not have an opinion regarding the help documentation but I have determined the cause of this to the fact that any help documentation wasn't created and wasn't presented to them. This would be something I would ensure would be presented with another group in the near future.

Results from the questionnaires can be found within Appendix F.

8.1.2 Comment Reviews

From the 8 evaluations, I received many suggestions and ideas regarding improvement to features already within the app and other requests for features not implemented yet. Many of the requests related to the lack of help documentation and the lack of quality control within the app as some users found several spelling mistakes in various screens. Many users thought the app screens were 'too busy' and that there needs to be less text on each screen as this tended to confuse the user; suggestions for less items on the screen suggests that there could be an issue with both users with accessibility issues and with iOS Human Interface Guidelines.

The many positive suggestions received from the questionnaires specifically praised the user interface of the app. While demonstrating the app to students, initial comments regarded the colour scheme of the screen and that it was 'easy on the eyes' and the 'name of the app doesn't create a stigma'. Many participants highlighted the availability of an emergency contacts list to allow not only students with mental health issues but friends and families of those students to be able to easily access help within the app.

There were several feature requests surrounding the security of the data within the app. Although all participants had the server-end security explained to them, many did not feel confident in the fact that data on the devices had not been secured with another system such as Apple's Touch ID or a pin number system. These concerns explained the issues with the device security could mean that people would be able to see when the student's next appointment was and could also possibly see information about the student's mental health condition.

Other feature requests included in addition to the building location on the map, the room location within that building. This would be incredibly helpful for students who have just started at the university and are unsure about where specific rooms are located within any given building. This feature was mentioned by a final year student who addressed the issue that many rooms in Birmingham City University's buildings with either be moved or removed in the new academic year due to a reorganisation of all the campuses to enhance the student learning environment. This feature would be incredibly easy to implement due to the fact that the university already has a similar system implemented within their library and learning resources department.

8.1.3 Overall Response

Overall, although the student data pool was much smaller than I had anticipated, the general response from these students was mainly positive with feature requests that would be easy to implement in a small amount of time. All participants stated that they would not only recommend this app to a friend but also recommend their university to implement the app into their current system. Should these results be projected, the university would heavily consider the use of this app within its current services if not completely replacing their current system with this app.

8.2 Evaluation of Process

8.2.1 Personal Evaluation

I feel that although this project did not meet its full requirements specification, the feedback received and the current progress is sound basis for the university to investigate the completion and implementation of the My Mind app into their systems. The time management of the project was a major issue as I had forgotten to account for other projects and assignments that ran alongside this project and due to this, there was a negative effect on both the quality control and the productivity within the project.

A main factor that affected this project was my personal health which required me to take several weeks off to recover. Should I return to this project for a second time, I would ensure that the above issues would be considered within my project timeline and planning.

These issues also caused several more further along into the project, due to my time off, I had been unable to contact key people within the university in order to understand their systems in depth

and create a fully functioning package that was ready to be delivered to the university should the want it implementing.

During the length of this project, I have learnt many important things regarding student mental health. Within Birmingham City University alone, the number of students being referred to the counselling service has increased by 300% since 2011 meaning the already dated system is now strained under the amount of users who go through the system every year. I have also learnt that most students who volunteered to participate within the project did not have mental health issues themselves however worked and live with people who do meaning that the knowledge of issues and specific aspects of the project required me to cater for both students with mental health issues and those who don't. This meant that my approach to any research topic had to be very sensitive as I personally did not receive any mental health first aid training nor am I a fully trained councillor.

8.2.2 Possible Future Changes

Should I return to the initial idea and redo this project, I would make several changes to the requirements specification, project management and timescale. For instance, I would allow myself a lot more time to research and develop the app as I feel this hindered the progress and design of the app as I was unable to contact any staff from the university to be able to understand the current system process.

I would also reconsider the frameworks I have used within this project as I had initially decided and designed my app to work with Amazon Web Services however due to the multitude of issues I experienced implementing AWS into my apps design, I decided to implement the Firebase API instead however this required me to completely rebuild and slightly redesign my app in a very short space of time.

In future I would consider using Microsoft SharePoint and Office 365 frameworks within my app as these systems are currently being implemented across the university and would also allow a much simpler integration should the university wish to bring My Mind to BCU.

Current feedback from students suggests that I should potentially look into creating the app on platforms other than iOS such as a web application and Android. I would strongly consider these possible options in the future as many students would buy an Android device over iOS due to the low cost and many students may also want to access the system using an internet browser on their laptop.

8.3 Conclusions

Overall, I believe this project was a success and has created a lot of groundwork for any organisation of a similar structure to Birmingham City University who wants to implement a system similar to My Mind. The feedback received from both staff and students has mostly been positive with realistic feature requests coming from both sides with only a few minor complaints regarding the

apps design and structure. My personal management of this project could have been improved due to the poor project time management and several communications issues leading to very little information being received regarding the current system and processes. These issues and recommendations however have not affected the overall impact of this project as towards the end of the project, many other students within the university were interested with the system and gave verbal feedback to both myself and the university. Many of these students were members of the Mental Health Awareness society within the university and were encouraged to recommend my app idea to members of staff within the university and the affiliated students union.

8.4 Future Work

Certain areas of this project do require urgent research such as how the current system is implemented within the university. This research could possibly lead into changes surrounding how data is stored and processed as the current design of My Mind does not have any connection whatsoever with the university's data centres and procedures.

Other aspects to focus on in the near future is the implementation of the feature requests from the feedback forms I have received more specifically the instant messaging feature and appointment notifications and reminders. One major feature I would implement in the near future is the Touch ID security on the device as many participants had concerns about their data being secure and compliant with the Data Protection Act of 1998.

To further the work of My Mind, I have made the app design, project and framework open source and available on GitHub. This would allow other organisations to use my work in the very near future to possibly create a fully functioning version of the mobile application I have created and possibly bring the application to other platforms such as Android, Windows, Mac OS and online as a web application.

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Appendix A – Tables and Charts

<i>Authors</i>	<i>Year</i>	<i>Paper Title</i>	<i>Paper Summary</i>
<i>Moorhead et al</i>	2013	A New Dimension of Health Care: Systematic Review of The Uses, Benefits, And Limitations of Social Media for Health Communication	This paper researches into the uses and effects of using social media platforms to communicate between healthcare provider and patient. The paper identifies recommendations to enable general health communication to become more effective.
<i>Hoge et al.</i>	2006	Mental Health Problems, Use Of Mental Health Services, And Attrition From Military Service After Returning From Deployment to Iraq Or Afghanistan	This paper considers the mental health care provided to military personnel coming back from combat areas and how the use of mental health screening has allowed the care provided to be of a higher standard.
<i>Maulik et al.</i>	2009	The Role of Social Network and Support in Mental Health Service Use: Findings from The Baltimore ECA Study	This paper examines the possibility and the effects of using social media to treat mental health issues.
<i>Orlowski et al.</i>	2016	The Promise and The Reality: A Mental Health Workforce Perspective on Technology-Enhanced Youth Mental Health Service Delivery	Like the previous article, this paper examines the effects of using social media to treat mental health issues however this paper focuses on mental health issues faced by younger people and how social media can be used.
<i>Rosenbaum et al.</i>	2012	The Effect of Instant Messaging Services on Society's Mental Health	This paper shows how instant messaging services affect societal mental health within this 18-30 age group. It also considers the issues of internet addiction within this age group and its effect on their mental health.

<i>Blanchard</i>	2011	Navigating the Digital Disconnect	Blanchard considers the strategies and their effectiveness of using new technologies to impact the mental health and wellbeing of young people aged 12 to 25.
<i>Crown copyright</i>	1983	The Mental Health Act 1983	This legislation defines all circumstances for admission for mental health issues and guidelines and policies for the care of patients with mental health issues.
<i>Great Britain. Department of Health</i>	1999	Mental Health: Modern Standards and Service Models: Executive Summary	This book issues the standards that all NHS trusts within the United Kingdom should follow and adhere to. It includes guidelines on treatment and care.

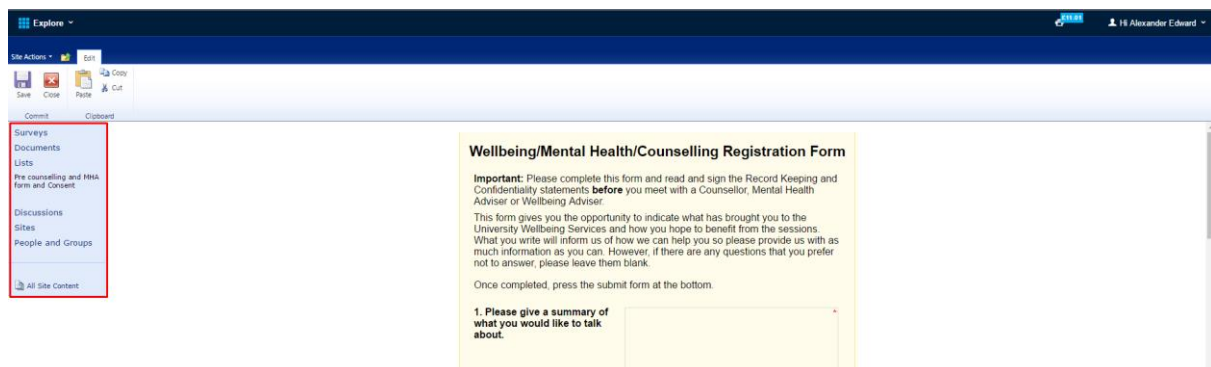
Table 1 - An Overview of the Academic Literature Surrounding the Effectiveness of Social Media within Mental Health Services

<ul style="list-style-type: none"> › Your BCU › ASK › Computing, Engineering and the Built Environment › Digital Print Services › Email - Office365 › Graduate+ › Hires and Loans Equipment Booking › My Documents › mySRS Portal › Research Community › Your Calendar 	<ul style="list-style-type: none"> › Learning Resources › Central Moodle › Centre for Academic Success › Digital Library › ExplOR › Library Catalogue › Mahara › Summon 	<ul style="list-style-type: none"> › General Links › Campus Developments › Careers and Employment › Complaints & Appeals › Environment › External speaker/meeting application form › Our Core Values › Strategic Plan › Student Essentials › Student Services › Upgrade Your Future 	<ul style="list-style-type: none"> › Health & Safety › Emergency › First Aiders › Health and Safety › Repairs & Maintenance Request › Report an Accident › Security 	<ul style="list-style-type: none"> › IT Services › IT Help › Students UniFLOW Printing
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[Modify](#)

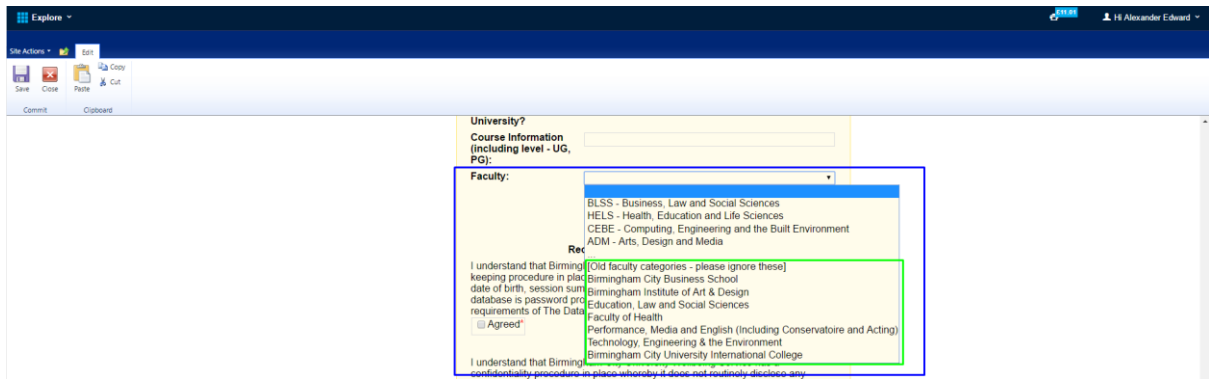
SOURCE: (BIRMINGHAM CITY UNIVERSITY, 2015)

Figure 1 - Current BCU iCity Menu System



SOURCE: (BIRMINGHAM CITY UNIVERSITY, NO DATE)

Figure 2 - Image showing sidebar not meant to be used by students



SOURCE: (BIRMINGHAM CITY UNIVERSITY, NO DATE)

Figure 3 - Image showing question with unusable answers

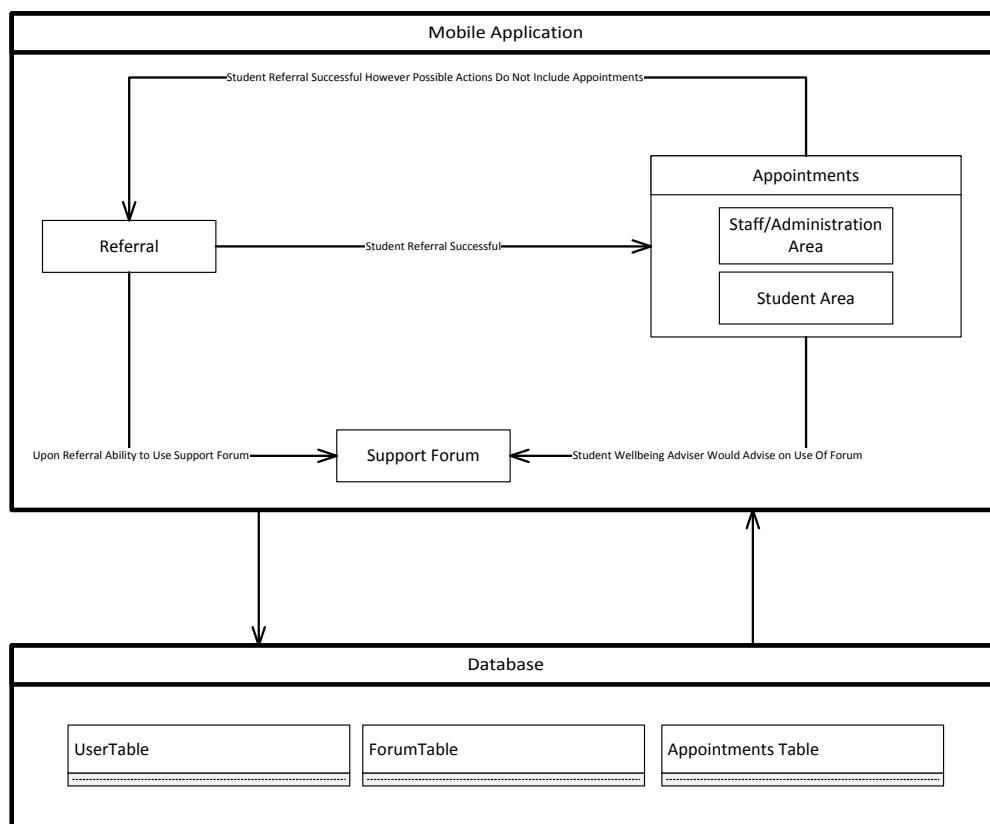


Figure 4 - Diagram of the three sections of the app and how a user could access the other sections of the app.

I'm having thoughts about suicide or self-injury

If you're in immediate physical danger, please contact local law enforcement or a suicide hotline for help.

If you're going through something difficult and the threat isn't immediate, we want you to know there are things you can do right now that may help you:

- Talk to someone at a helpline
- Reach out to someone you trust
- Give yourself a break and do something that makes you feel happy and good about yourself

Talk to someone at a helpline

Suicide Prevention

- Find your local suicide hotline by viewing our full list of prevention resources. Facebook partners with over 50 expert organizations around the world.

Self-Injury

- In the US, United Kingdom and Ireland, contact Reach Out: 1-800-448-3000; <http://us.reachout.com/facts/self-harm>
- In Australia, contact headspace: 1800 650 890; <http://headspace.org.au/get-info/self-harm>
- In other countries, contact Befrienders: 1-800-448-3000; <http://www.befrienders.org/about-self-harm>

Eating Disorders

- In the United Kingdom and Ireland, contact beat (beating eating disorders): 0845 634 1414; 0845 634 7650 (youthline); help@b-eat.co.uk; <https://www.b-eat.co.uk/>

Reach out to someone you trust

Contact someone you trust, like a family member, friend, counselor or teacher, and ask them to let you share what's on your mind. For example, you could say, "I'm going through something difficult and was hoping to talk to you about it. If that's OK with you, can you take some time to listen?"

Give yourself a break and do something that makes you feel happy and good about yourself

It can be difficult to focus when you're overwhelmed or can't find a solution to a problem right away. Stop for a moment, take a deep breath and give yourself a break from your feelings.

Try some of these tips from self-care experts at Forefront and the National Suicide Prevention Lifeline.

Get out for a while:

- Go for a walk, jog or bike ride
- Go to the movies
- Visit somewhere new, like a coffee shop or museum or park you've never been

Be creative:

- Draw something simple
- Make a nice meal
- Write a short story

Soothe your senses:

- Meditate or do yoga
- Take a hot shower
- Listen to your favorite songs

Relax:

- Look at the clouds
- Read a book, magazine or blog post
- Take a nap

If the tips above don't work for you, see more things you can do right now.

You can also learn more about dealing with suicidal thoughts and find local self-care experts.

If you have a friend who's having thoughts about suicide or self-injury, you can share these resources with them as well.

SOURCE: (FACEBOOK, 2017)

Figure 5 - Question giving advice regarding mental health issues

I need to find a suicide hotline for myself or a friend. ^

Suicide hotlines provide help to those in need. Contact a hotline if you need support yourself or need help supporting a friend. If you're concerned about a friend, please encourage the person to contact a hotline as well.

SOURCE: (FACEBOOK, 2017)

Figure 6 - Question giving advice regarding mental health issues

How do I help an LGBT person who has posted suicidal content on Facebook? ^

If you've encountered a direct threat of suicide on Facebook, please contact law enforcement or a [suicide hotline](#) immediately.

The Trevor Project specializes in suicide prevention for LGBT youth and offers a lifeline that people in the US can contact by calling 1-866-488-7386. The Trevor Project also offers resources for concerned friends and family members of LGBT youth. Learn more about The Trevor Project on their website: <http://www.thetrevorproject.org/>.

How helpful did you find this answer?



[View full article](#) - [Share article](#)

What is the Facebook Network of Support (NOS) and what NOS resources are available for LGBT people? v

How do I help a member of the US military community (ex: active soldier, veteran or family member) who has posted suicidal content? ^

If a friend or family member is planning suicide or you've seen a direct threat of suicide on Facebook, please contact your local emergency services or a [suicide hotline](#) immediately. We also ask that you [tell us](#) if you see something that suggests suicide or self-injury on Facebook.

The Veterans Crisis Line provides customized support to members of the military community, including veterans, active duty service members and their families. Support is available 24 hours a day, 7 days a week, 365 days a year.

You can contact them by:

- Calling their toll-free hotline at 1-800-273-8255 and press 1
- Visiting <http://www.veteranscrisisline.net/> to chat online
- Sending a text message to 838255

Additional resources available to the military community include:

- The Veterans Crisis Line
- The Wounded Warrior Project Restore Warriors (TM) provides support for veterans and families who are dealing with combat stress, PTSD or TBI
- TAPS: Tragedy Assistance Program for Survivors provides support for families and loved ones who have lost someone who was in the military service

SOURCE: (FACEBOOK, 2017)

Figure 7 - Question giving advice regarding mental health issues

TESCO 01:44 47%

hub.bcu.ac.uk

Explore £12.10 Hi Alexander Edward

Site Actions Edit

Save Close Paste Cut

Commit Clipboard

Surveys
Documents
Lists
Pre counselling and MHA form and Consent
Discussions
Sites
People and Groups
All Site Content

Wellbeing/Mental Health/Counselling Registration Form

Important: Please complete this form and read and sign the Record Keeping and Confidentiality statements **before** you meet with a Counsellor, Mental Health Adviser or Wellbeing Adviser.

This form gives you the opportunity to indicate what has brought you to the University Wellbeing Services and how you hope to benefit from the sessions. What you write will inform us of how we can help you so please provide us with as much information as you can. However, if there are any questions that you prefer not to answer, please leave them blank.

Once completed, press the submit form at the bottom.

1. Please give a summary of what you would like to talk about.

2. How long have you been concerned about this problem?

3. Have you met with a health professional to discuss these issues? Yes: ☐ No: ☐

4. Are you currently receiving support from a Counsellor, Mental Health Adviser or GP? No: ☐ Yes (tick all that apply):

- ☐ CBT Practitioner (e.g. Healthy Minds)
- ☐ Community Psychiatric Nurse (CPN)
- ☐ Counsellor/Psychotherapist
- ☐ GP
- ☐ Mental Health/Wellbeing Adviser
- ☐ Psychiatrist
- ☐ Psychologist
- ☐ Social Worker

5. Have you received support from a Counsellor, Mental Health Adviser or GP in the past? No: ☐ Yes (tick all that apply):

- ☐ CBT Practitioner (e.g. Healthy Minds)
- ☐ Community Psychiatric Nurse (CPN)
- ☐ Counsellor/Psychotherapist
- ☐ GP
- ☐ Mental Health/Wellbeing Adviser
- ☐ Psychiatrist
- ☐ Psychologist
- ☐ Social Worker

SOURCE: (BIRMINGHAM CITY UNIVERSITY, NO DATE)

Figure 8 - Screenshot of current system on a mobile device

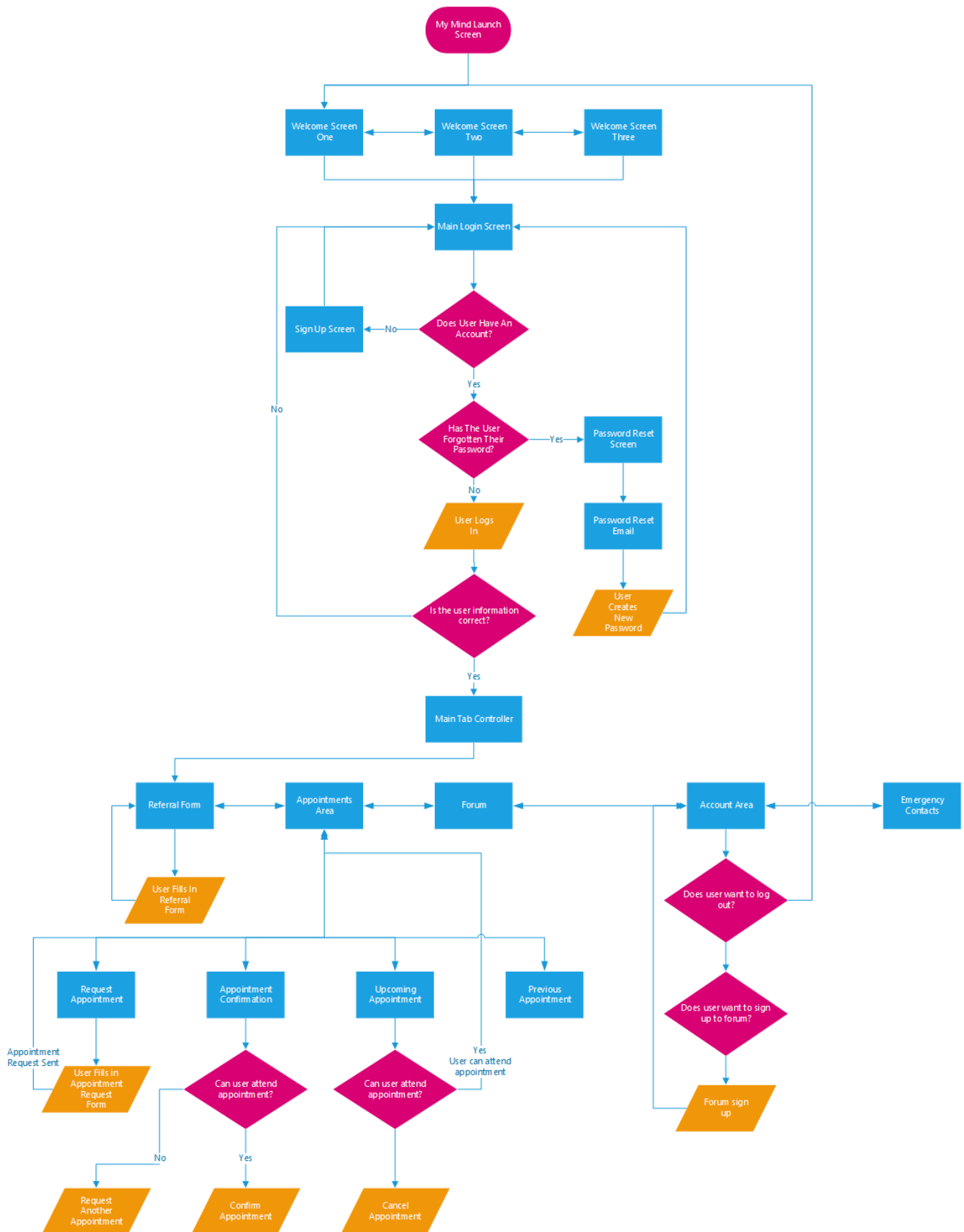


Figure 9 - Flowchart showing how the path a user would take within the My Mind app

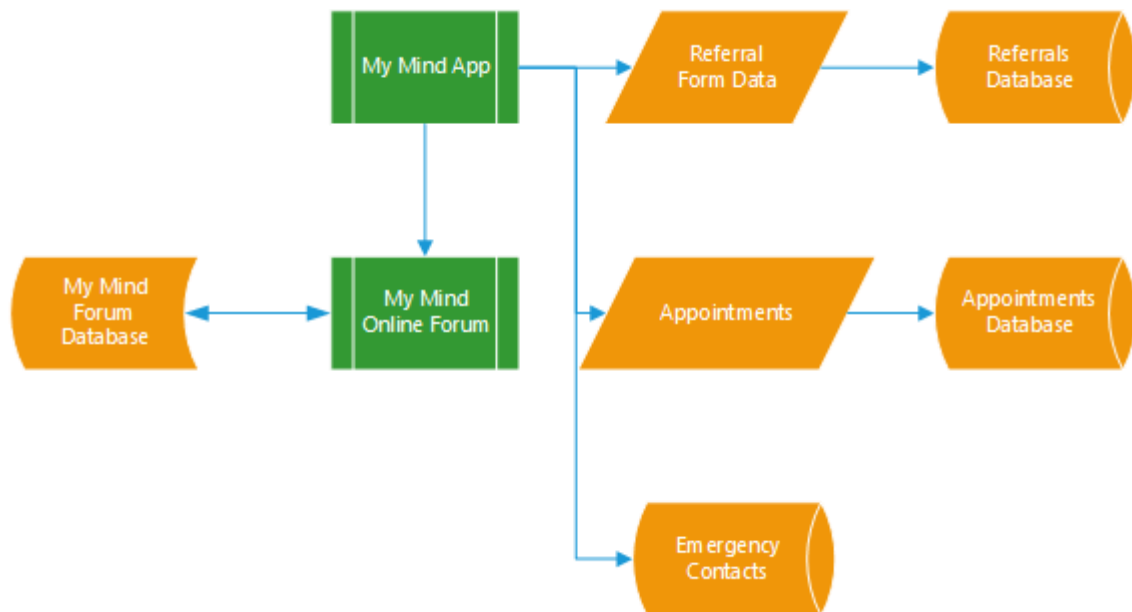


Figure 10 - Diagram showing structure of system

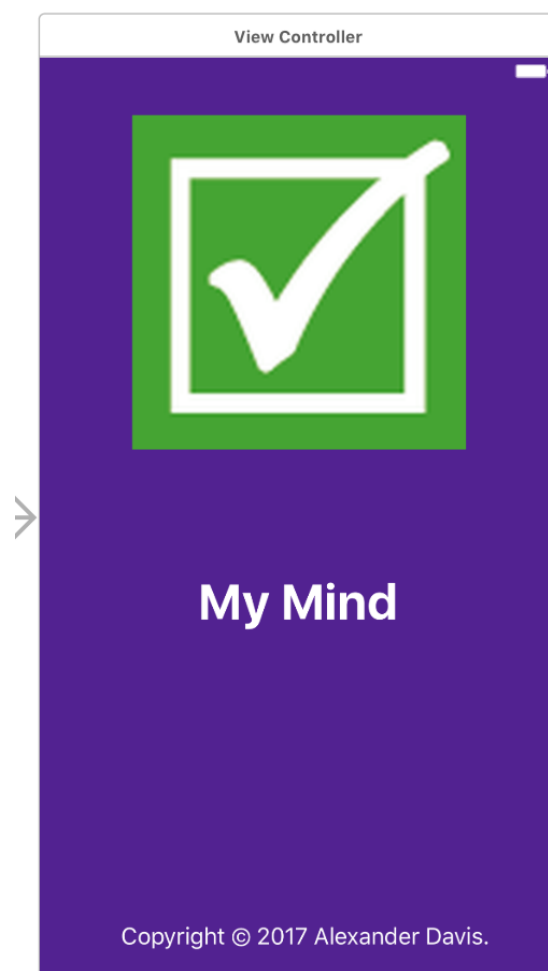


Figure 11 - Final Design of Launch Screen

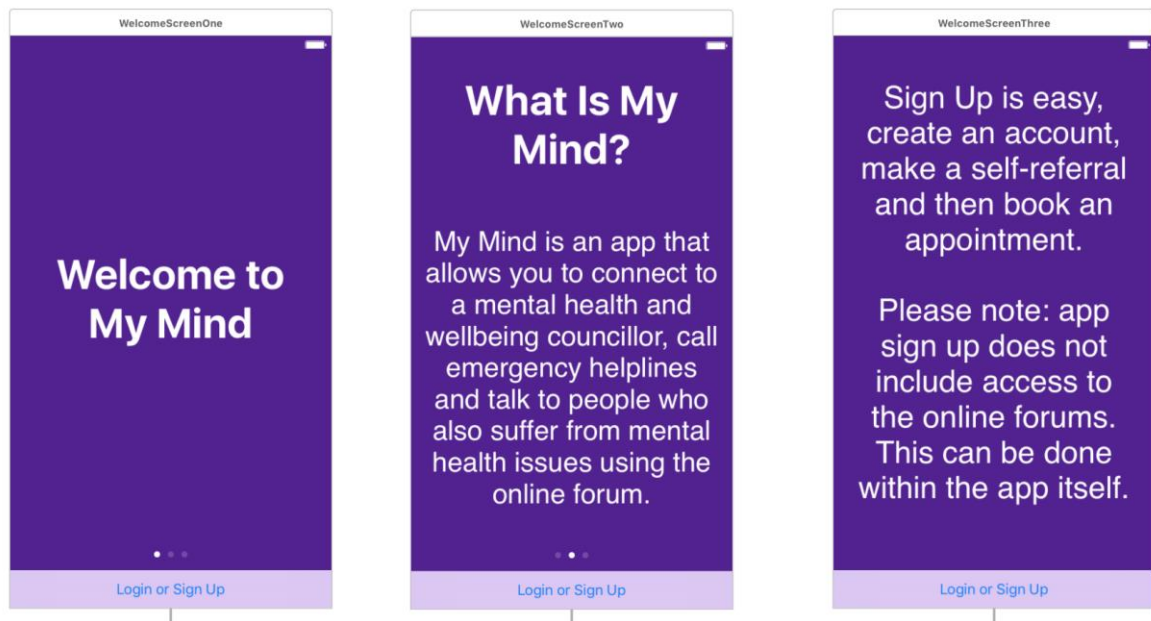


Figure 12 - Final Design of the Welcome Screens

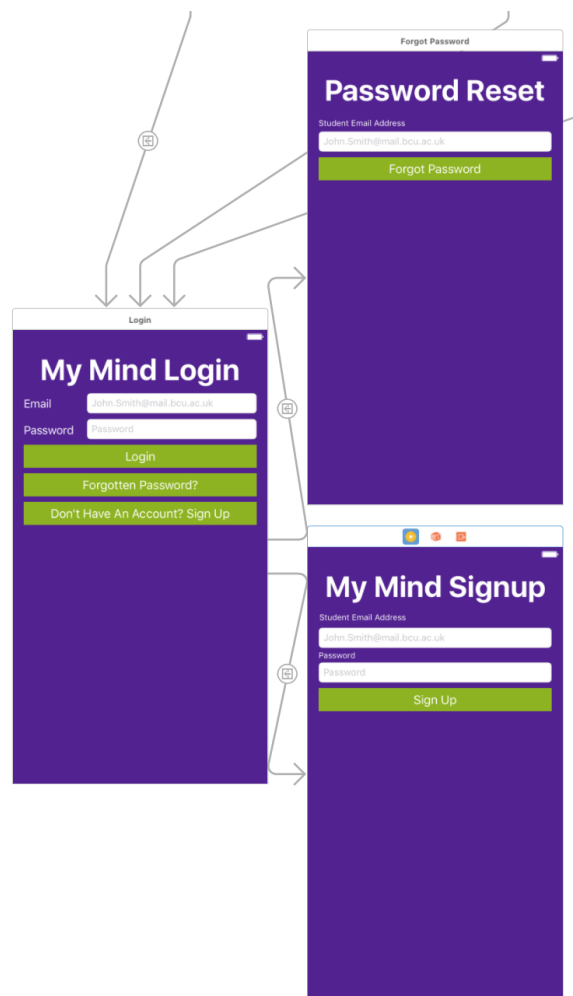


Figure 13 - Final Design for the Login Section



Figure 14 - Main Tab Controller

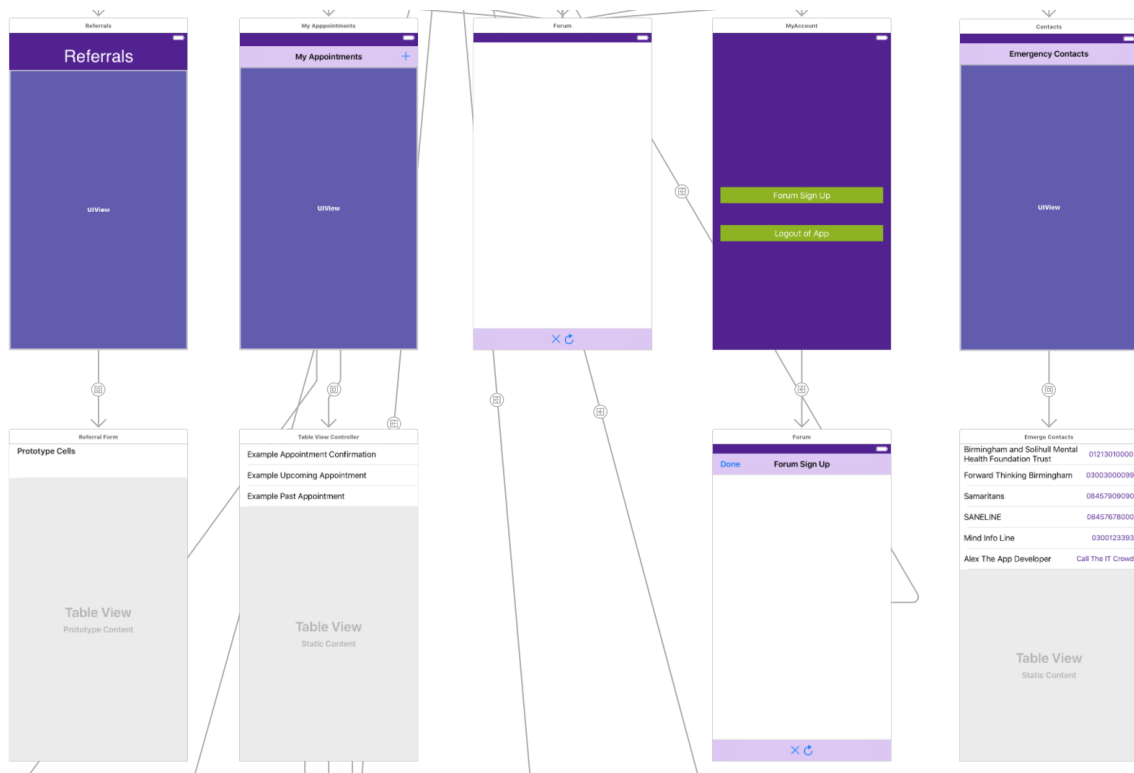


Figure 15 - Main App Designs (1)

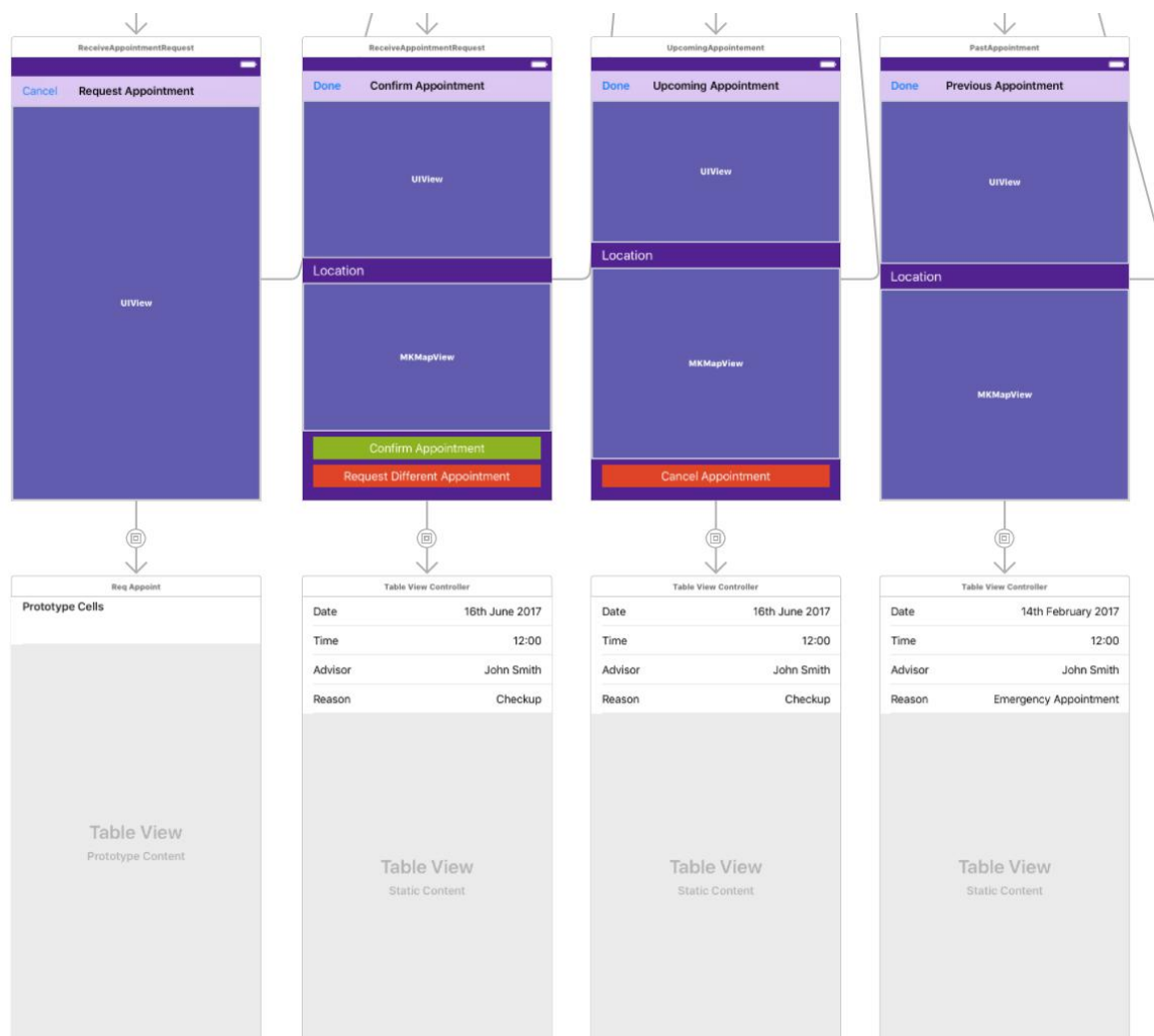


Figure 16 - Main App Designs (2)

Appendix B – Sample Questionnaire & Consent Form

Below is the content of the questionnaire to evaluate my app and the consent form for participation within the project.

Declaration of Participation & Acknowledgment of App Status

I _____ acknowledge the fact that 'My Mind' by Alexander Davis is not fully complete. Alex has shown and demonstrated all of the working sections to me and I give a true and honest evaluation of the final demonstrated product.

I give full consent to participating in this project and for my data to be used for the purposes of evaluating the final deliverable. I understand that I have the right to withdraw my content from the project, but I must do so by Friday 5th of May 2017 at 5PM.

Signed _____

Date _____

Evaluation of My Mind

For Alex's Use Only – Time Taken to Access Original Form: _____

1. Please state your gender
☐ Male ☐ Female ☐ Other
2. Please state your age group
☐ 0-12 ☐ 13-16 ☐ 16-21
☐ 21-30 ☐ 31-40 ☐ 41-50
☐ 51-60 ☐ 61-70 ☐ 71+
☐ Prefer not to say
3. How familiar are you with using apps?
☐ Use them all the time ☐ Often use them
☐ Sometimes use them ☐ Have a few and barely use them
☐ Don't have my own, but have used some friend's apps
☐ Never use them ☐ What's an app?
4. What is your current mobile device?
☐ iOS
☐ Android
☐ Windows
☐ Other Smartphone Platform
☐ Other Non-Smartphone Platform

Figure 17 - Page 1 of product evaluation

5. Please choose the answer that best represents your experience

	Strongly Agree	Agree	Some-what Agree	No Opinion	Some-what Disagree	Disagree	Strongly Disagree
I found this app easy to use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can use it without written instructions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can navigate through the app easily.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The language used in the app is easily understood.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The different sections/pages of the app are cohesive in look and feel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The app has adequate help documentation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The app has clearly marked way-finding buttons (exit, info, back, next page, etc.).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The prompts for input are clear.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The prompts for input are effective in making you want to contribute.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The app does everything I would expect it to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The app works the way I would want it to work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The app is designed for all levels of users.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using the app was an enjoyable experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I found the app unnecessarily complex.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I found the various functions in the app were well integrated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think that I would use this app frequently.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt very confident using this app.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Did anything about the app confuse you? (content, layout, design, the point of the app, etc.)

Figure 18 - Page 2 of product evaluation

7. List the most negative aspects of the app

8. List the most positive aspects of the app

9. What features should I add to improve the app?

10. I would recommend this app to a friend

☐ Yes

☐ No

11. I would recommend the university to integrate this app into their current system

☐ Yes

☐ No

12. Any additional comments, opinions, suggestions:

Figure 19 - Page 3 of product evaluation

Appendix C – Presentation

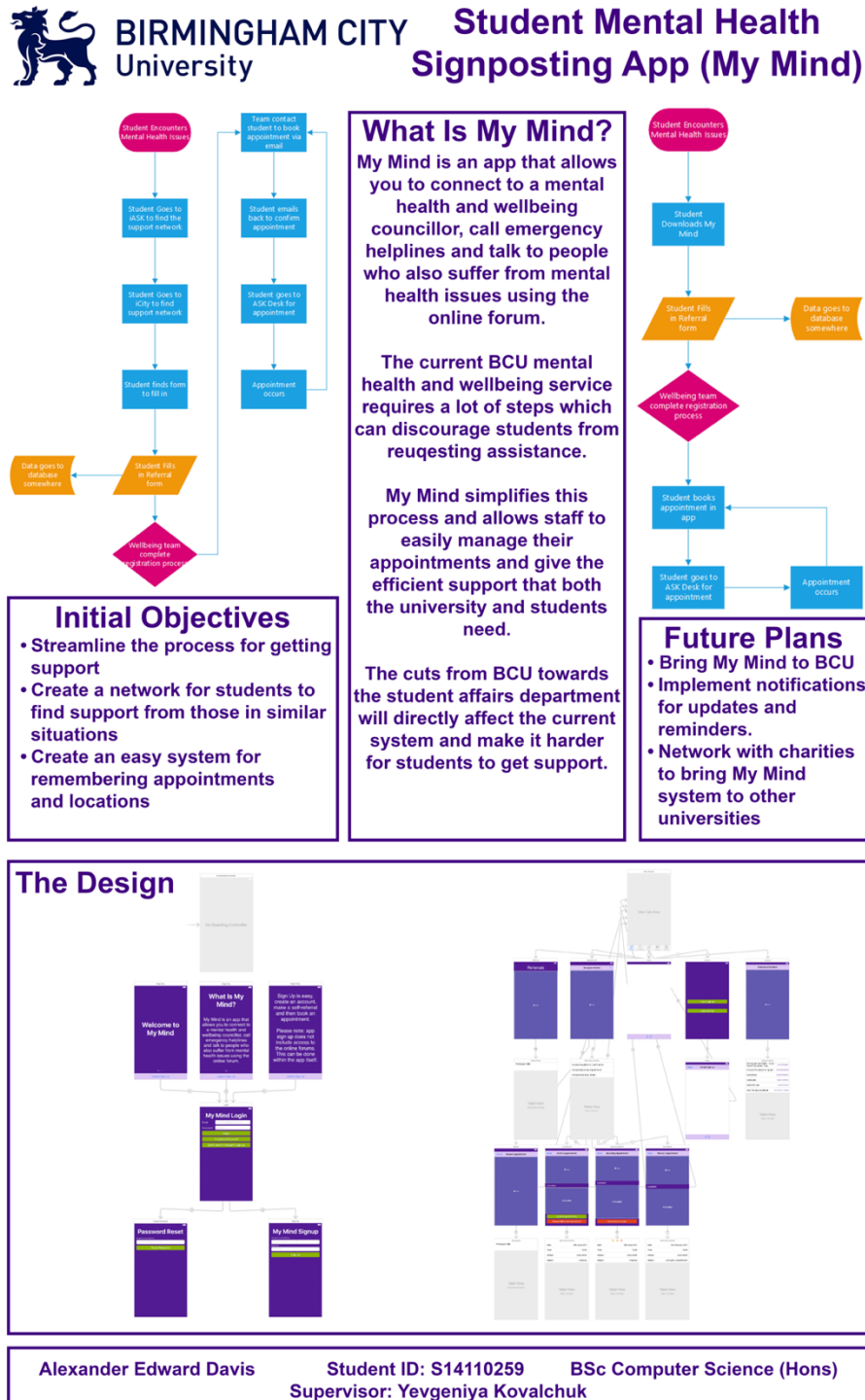


Figure 20 - Presentation Poster

Appendix D – Source Code

AppDelegate

```
//
// AppDelegate.swift
// My Mind
//
// Created by Alexander Davis on 09/04/2017.
// Copyright © 2017 Alexander Davis. All rights reserved.
//

import UIKit
import Firebase
import UserNotifications
import NotificationCenter
import FirebaseMessaging
import FirebaseDatabase

@UIApplicationMain
class AppDelegate: UIResponder, UIApplicationDelegate {

    var window: UIWindow?
    let gcmMessageIDKey = "gcm.message_id"

    func application(_ application: UIApplication, didFinishLaunchingWithOptions launchOptions:
[UIApplicationLaunchOptionsKey: Any]?) -> Bool {
        // Use Firebase library to configure APIs
        FIRApp.configure()
        FIRDatabase.database().persistenceEnabled = true

        //If User Is Signed In Direct to Main App Section
        let currentUser = FIRAuth.auth()?.currentUser
        let mainStoryboard = UIStoryboard(name: "Main", bundle: nil)
        if currentUser != nil
        {
            self.window?.rootViewController = mainStoryboard.instantiateViewController(withIdentifier: "MainController")
        }
        else
        {
            self.window?.rootViewController = mainStoryboard.instantiateViewController(withIdentifier: "OnBoard")
        }

        //Turn On Notifications for App
        if #available(iOS 10.0, *) {
            // For iOS 10 display notification (sent via APNS)
            UNUserNotificationCenter.current().delegate = self

            let authOptions: UNAuthorizationOptions = [.alert, .badge, .sound]
            UNUserNotificationCenter.current().requestAuthorization(
                options: authOptions,
                completionHandler: {_, _ in })

            // For iOS 10 data message (sent via FCM)
            FIRMessaging.messaging().remoteMessageDelegate = self as? FIRMessagingDelegate
        }
    }
}
```

```

    } else {
        let settings: UIUserNotificationSettings =
            UIUserNotificationSettings(types: [.alert, .badge, .sound], categories: nil)
        application.registerUserNotificationSettings(settings)
    }

    application.registerForRemoteNotifications()

    return true
}

func applicationWillResignActive(_ application: UIApplication) {
    // Sent when the application is about to move from active to inactive state. This can occur for certain types of
    // temporary interruptions (such as an incoming phone call or SMS message) or when the user quits the application and
    // it begins the transition to the background state.
    // Use this method to pause ongoing tasks, disable timers, and invalidate graphics rendering callbacks. Games
    // should use this method to pause the game.
}

func applicationDidEnterBackground(_ application: UIApplication) {
    // Use this method to release shared resources, save user data, invalidate timers, and store enough application
    // state information to restore your application to its current state in case it is terminated later.
    // If your application supports background execution, this method is called instead of applicationWillTerminate:
    // when the user quits.
}

func applicationWillEnterForeground(_ application: UIApplication) {
    // Called as part of the transition from the background to the active state; here you can undo many of the
    // changes made on entering the background.
}

func applicationDidBecomeActive(_ application: UIApplication) {
    // Restart any tasks that were paused (or not yet started) while the application was inactive. If the application
    // was previously in the background, optionally refresh the user interface.
}

func applicationWillTerminate(_ application: UIApplication) {
    // Called when the application is about to terminate. Save data if appropriate. See also
    applicationDidEnterBackground:.
}

func application(_ application: UIApplication, didReceiveRemoteNotification userInfo: [AnyHashable: Any]) {
    // If you are receiving a notification message while your app is in the background,
    // this callback will not be fired till the user taps on the notification launching the application.
    // TODO: Handle data of notification

    // Print message ID.
    if let messageId = userInfo[gcmMessageIDKey] {
        print("Message ID: \(messageID)")
    }

    // Print full message.
    print(userInfo)
}

func application(_ application: UIApplication, didReceiveRemoteNotification userInfo: [AnyHashable: Any],
    fetchCompletionHandler completionHandler: @escaping (UIBackgroundFetchResult) -> Void) {
    // If you are receiving a notification message while your app is in the background,
    // this callback will not be fired till the user taps on the notification launching the application.

```



```

// TODO: Handle data of notification

// Print message ID.
if let messageId = userInfo[gcmMessageIDKey] {
    print("Message ID: \(messageID)")
}

// Print full message.
print(userInfo)

completionHandler(UIBackgroundFetchResult.newData)
}
}

// [START ios_10_message_handling]
@available(iOS 10, *)
extension AppDelegate : UNUserNotificationCenterDelegate {

    // Receive displayed notifications for iOS 10 devices.
    func userNotificationCenter(_ center: UNUserNotificationCenter,
                               willPresent notification: UNNotification,
                               withCompletionHandler completionHandler: @escaping (UNNotificationPresentationOptions) ->
Void) {
        let userInfo = notification.request.content.userInfo
        // Print message ID.
        if let messageId = userInfo[gcmMessageIDKey] {
            print("Message ID: \(messageID)")
        }

        // Print full message.
        print(userInfo)

        // Change this to your preferred presentation option
        completionHandler([])
    }

    func userNotificationCenter(_ center: UNUserNotificationCenter,
                               didReceive response: UNNotificationResponse,
                               withCompletionHandler completionHandler: @escaping () -> Void) {
        let userInfo = response.notification.request.content.userInfo
        // Print message ID.
        if let messageId = userInfo[gcmMessageIDKey] {
            print("Message ID: \(messageID)")
        }

        // Print full message.
        print(userInfo)

        completionHandler()
    }
}

// [END ios_10_message_handling]
// [START ios_10_data_message_handling]
extension AppDelegate : FMessagingDelegate {
    // Receive data message on iOS 10 devices while app is in the foreground.
    func applicationReceivedRemoteMessage(_ remoteMessage: FMessagingRemoteMessage) {
        print(remoteMessage.appData)
    }
}
// [END ios_10_data_message_handling]

```


OnBoardingController

```
//
// OnBoardingController.swift
// My Mind
//
// Created by Alexander Davis on 30/03/2017.
// Copyright © 2017 Alexander Davis. All rights reserved.
//

import Foundation
import UIKit

class OnBoardingController : UIPageViewController {

    override var preferredStatusBarStyle: UIStatusBarStyle {
        return .lightContent
    }

    override func viewDidLoad() {
        // Set the dataSource and delegate in code.
        // I can't figure out how to do this in the Storyboard!
        dataSource = self
        delegate = self
        // This is the starting point. Start with step zero.
        setViewControllers([getPageOne()], direction: .forward, animated: false, completion: nil)
    }

    func getPageOne() -> PageOne {
        return storyboard!.instantiateViewController(withIdentifier: "WelcomeScreenOne") as! PageOne
    }

    func getPageTwo() -> PageTwo {
        return storyboard!.instantiateViewController(withIdentifier: "WelcomeScreenTwo") as! PageTwo
    }

    func getPageThree() -> PageThree {
        return storyboard!.instantiateViewController(withIdentifier: "WelcomeScreenThree") as! PageThree
    }
}

// MARK: - UIPageViewControllerDataSource methods

extension OnBoardingController : UIPageViewControllerDataSource {

    func pageViewController(_ pageViewController: UIPageViewController, viewControllerBefore viewController:
    UIViewController) -> UIViewController? {
        if viewController.isKind(of: PageTwo.self) {
            // 2 -> 1
            return getPageTwo()
        } else if viewController.isKind(of: PageTwo.self) {
            // 1 -> 0
            return getPageOne()
        } else {
            // 0 -> end of the road
            return nil
        }
    }
}
```

```

    }

    func pageViewController(_ pageViewController: UIPageViewController, viewControllerAfter viewController:
UIViewController) -> UIViewController? {
        if viewController.isKind(of: PageOne.self) {
            // 0 -> 1
            return getPageTwo()
        } else if viewController.isKind(of: PageTwo.self) {
            // 1 -> 2
            return getPageThree()
        } else {
            // 2 -> end of the road
            return nil
        }
    }
}

// This only gets called once, when setViewControllers is called
func presentationIndex(for pageViewController: UIPageViewController) -> Int {
    return 0
}

}

// MARK: - UIPageViewControllerDelegate methods

extension OnBoardingController : UIPageViewControllerDelegate {

}

```

Welcome Screens

WelcomeScreenOne

```
//  
// WelcomeScreenOne.swift  
// My Mind  
//  
// Created by Alexander Davis on 30/03/2017.  
// Copyright © 2017 Alexander Davis. All rights reserved.  
//
```

```
import Foundation  
import UIKit
```

```
class PageOne : UIViewController {  
  
    override var preferredStatusBarStyle: UIStatusBarStyle {  
        return .lightContent  
    }  
}
```

WelcomeScreenTwo

```
//  
// WelcomeScreenTwo.swift  
// My Mind  
//  
// Created by Alexander Davis on 30/03/2017.  
// Copyright © 2017 Alexander Davis. All rights reserved.  
//
```

```
import Foundation  
import UIKit
```

```
class PageTwo : UIViewController {  
  
    override var preferredStatusBarStyle: UIStatusBarStyle {  
        return .lightContent  
    }  
}
```

```
}
```

WelcomeScreenThree

```
//  
// WelcomeScreenThree.swift  
// My Mind  
//  
// Created by Alexander Davis on 30/03/2017.  
// Copyright © 2017 Alexander Davis. All rights reserved.  
//
```

```
import Foundation  
import UIKit
```

```
class PageThree : UIViewController {
```

```

override var preferredStatusBarStyle: UIStatusBarStyle {
    return .lightContent
}
}

```

Login Section and User Information

UserViews

```

//
// LoginView.swift
// My Mind
//
// Created by Alexander Davis on 31/03/2017.
// Copyright © 2017 Alexander Davis. All rights reserved.
//

import Foundation
import UIKit
import Firebase
import FirebaseAuth

class LoginView: UIViewController {

    @IBOutlet weak var Emailtbx: UITextField!
    @IBOutlet weak var Passwordtbx: UITextField!
    @IBAction func Loginbtn(_ sender: UIButton) {
        if self.Emailtbx.text == "" || self.Passwordtbx.text == "" {

            //Alert to tell the user that there was an error because they didn't fill anything in the textfields because they
            //didn't fill anything in

            let alertController = UIAlertController(title: "Error", message: "Please enter an email and password.",
            preferredStyle: .alert)

            let defaultAction = UIAlertAction(title: "OK", style: .cancel, handler: nil)
            alertController.addAction(defaultAction)

            self.present(alertController, animated: true, completion: nil)

        } else {

            FIRAuth.auth()?.signIn(withEmail: self.Emailtbx.text!, password: self.Passwordtbx.text!) { (user, error) in

                if error == nil {

                    //Print into the console if successfully logged in
                    print("You have successfully logged in")

                    //Go to the MainController if the login is successful
                    let alertController = UIAlertController(title: "Welcome", message: "You have successfully logged in",
                    preferredStyle: .alert)
                    let vc = self.storyboard?.instantiateViewController(withIdentifier: "MainController")
                    let defaultAction = UIAlertAction(title: "OK", style: .default, handler: { action in self.present(vc!, animated:
                    true, completion: nil);})
                    alertController.addAction(defaultAction)

```

```

        self.present(alertController, animated: true, completion: nil)

    } else {

        //Tells the user that there is an error and then gets firebase to tell them the error
        let alertController = UIAlertController(title: "Error", message: error?.localizedDescription, preferredStyle:
.alert)

        let defaultAction = UIAlertAction(title: "OK", style: .cancel, handler: nil)
        alertController.addAction(defaultAction)

        self.present(alertController, animated: true, completion: nil)
    }
}

}

}

}

override var preferredStatusBarStyle: UIStatusBarStyle {
    return .lightContent
}

}

class SignUp : UIViewController {

    @IBOutlet weak var Emailtbx: UITextField!
    @IBOutlet weak var Passwordtbx: UITextField!
    @IBAction func createAccountbtn(_ sender: UIButton) {
        if Emailtbx.text == "" {
            let alertController = UIAlertController(title: "Error", message: "Please enter your email and password",
preferredStyle: .alert)

            let defaultAction = UIAlertAction(title: "OK", style: .cancel, handler: nil)
            alertController.addAction(defaultAction)

            present(alertController, animated: true, completion: nil)

        } else {
            FIRAuth.auth()?.createUser(withEmail: Emailtbx.text!, password: Passwordtbx.text!) { (user, error) in

                if error == nil {
                    let alertController = UIAlertController(title: "Sign Up Complete", message: "You have Successfully Signed
Up", preferredStyle: .alert)
                    let vc = self.storyboard?.instantiateViewController(withIdentifier: "Login")
                    let defaultAction = UIAlertAction(title: "OK", style: .default, handler: { action in self.present(vc!, animated:
true, completion: nil);})
                    alertController.addAction(defaultAction)

                    self.present(alertController, animated: true, completion: nil)

                } else {
                    let alertController = UIAlertController(title: "Error", message: error?.localizedDescription, preferredStyle:
.alert)

                    let defaultAction = UIAlertAction(title: "OK", style: .cancel, handler: nil)
                    alertController.addAction(defaultAction)

                    self.present(alertController, animated: true, completion: nil)
                }
            }
        }
    }
}

```

```

    }
}

override var preferredStatusBarStyle: UIStatusBarStyle {
    return .lightContent
}
}

class ForgotPass : UIViewController {

    @IBOutlet weak var Emailtbx: UITextField!
    @IBAction func Resetbtn(_ sender: UIButton) {
        if self.Emailtbx.text == "" {
            let alertController = UIAlertController(title: "Oops!", message: "Please enter an email.", preferredStyle: .alert)

            let defaultAction = UIAlertAction(title: "OK", style: .cancel, handler: nil)
            alertController.addAction(defaultAction)

            present(alertController, animated: true, completion: nil)

        } else {
            FIRAuth.auth()?.sendPasswordReset(withEmail: self.Emailtbx.text!, completion: { (error) in

                var title = ""
                var message = ""

                if error != nil {
                    title = "Error!"
                    message = (error?.localizedDescription)!
                } else {
                    title = "Success!"
                    message = "Password reset email sent."
                    self.Emailtbx.text = ""
                }

                let alertController = UIAlertController(title: title, message: message, preferredStyle: .alert)

                let vc = self.storyboard?.instantiateViewController(withIdentifier: "Login")
                let defaultAction = UIAlertAction(title: "OK", style: .cancel, handler: { action in self.present(vc!, animated:
true, completion: nil);})
                alertController.addAction(defaultAction)

                self.present(alertController, animated: true, completion: nil)
            })
        }
    }
}

override var preferredStatusBarStyle: UIStatusBarStyle {
    return .lightContent
}
}

class Logout : UIViewController {

    @IBAction func Logoutbtn(_ sender: UIButton) {
        if FIRAuth.auth()?.currentUser != nil {
            do {
                try FIRAuth.auth()?.signOut()
                let vc = UIStoryboard(name: "Main", bundle: nil).instantiateViewController(withIdentifier: "OnBoard")
                present(vc, animated: true, completion: nil)
            }
        }
    }
}

```



```

        } catch let error as NSError {
            print(error.localizedDescription)
        }
    }
}

override var preferredStatusBarStyle: UIStatusBarStyle {
    return .lightContent
}
}

```

Main Tab Views

TabBarController

```

//
// TabBarController.swift
// My Mind
//
// Created by Alexander Davis on 05/04/2017.
// Copyright © 2017 Alexander Davis. All rights reserved.
//

import Foundation
import UIKit

class MainTabView: UITabBarController{
    override var preferredStatusBarStyle: UIStatusBarStyle {
        return .lightContent
    }
}

```

MainViews

```

//
// MainViews.swift
// My Mind
//
// Created by Alexander Davis on 09/04/2017.
// Copyright © 2017 Alexander Davis. All rights reserved.
//

import Foundation
import UIKit
import Firebase
import FirebaseDatabase

class Referrals: UIViewController{
    override var preferredStatusBarStyle: UIStatusBarStyle {
        return .lightContent
    }
}

class ReferralConf: UIViewController{

```

```

        override var preferredStatusBarStyle: UIStatusBarStyle {
            return .lightContent
        }
    }

class Appoint: UIViewController{
    override var preferredStatusBarStyle: UIStatusBarStyle {
        return .lightContent
    }
}

class Contact: UIViewController{
    override var preferredStatusBarStyle: UIStatusBarStyle {
        return .lightContent
    }
}

class EmergeContacts: UITableViewController{
    @IBAction func TrustCallBtn(_ sender: UIButton) {
        if let url = URL(string: "telprompt://01213010000") {
            {
                UIApplication.shared.open(url, options: [:], completionHandler: nil)
            }
        }
    }

    @IBAction func FwdThinkingbtn(_ sender: UIButton) {
        if let url = URL(string: "telprompt://03003000099") {
            {
                UIApplication.shared.open(url, options: [:], completionHandler: nil)
            }
        }
    }

    @IBAction func Samaritansbtn(_ sender: UIButton) {
        if let url = URL(string: "telprompt://08457909090") {
            {
                UIApplication.shared.open(url, options: [:], completionHandler: nil)
            }
        }
    }

    @IBAction func Sanebtn(_ sender: UIButton) {
        if let url = URL(string: "telprompt://08457678000") {
            {
                UIApplication.shared.open(url, options: [:], completionHandler: nil)
            }
        }
    }

    @IBAction func Mindbtn(_ sender: UIButton) {
        if let url = URL(string: "telprompt://0300123393") {
            {
                UIApplication.shared.open(url, options: [:], completionHandler: nil)
            }
        }
    }

    @IBAction func Alexsbtn(_ sender: UIButton) {
        if let url = URL(string: "telprompt://07871778000") {
            {
                UIApplication.shared.open(url, options: [:], completionHandler: nil)
            }
        }
    }
}

```


FormViews

```
//
// FormViews.swift
// My Mind
//
// Created by Alexander Davis on 11/04/2017.
// Copyright © 2017 Alexander Davis. All rights reserved.
//

import Foundation
import UIKit
import SwiftForms
import MessageUI
import MapKit

class ReferralForm: FormViewController, MFMailComposeViewControllerDelegate{
    override var preferredStatusBarStyle: UIStatusBarStyle {
        return .lightContent
    }

    struct Static {
        static let nameTag = "name"
        static let passwordTag = "password"
        static let lastNameTag = "lastName"
        static let addressTag = "address"
        static let IDTag = "idnumber"
        static let GenderTag = "gender"
        static let personalEmailTag = "personalemail"
        static let uniEmailTag = "universityemail"
        static let CourseTag = "course"
        static let phoneTag = "phone"
        static let Voicemail = "voicemail"
        static let DSATag = "disabledstudent"
        static let FacultyTag = "faculty"
        static let birthday = "birthday"
        static let PastSupportTag = "pastsupport"
        static let CurrentSupportTag = "currentsupport"
        static let subjectTag = "subject"
        static let timescaleTag = "timescale"
        static let button = "button"
    }

    required init(coder aDecoder: NSCoder) {
        super.init(coder: aDecoder)
        self.loadForm()
    }

    override func viewDidLoad() {
        super.viewDidLoad()
        //self.navigationItem.rightBarButtonItem = UIBarButtonItem(title: "Submit", style: .plain, target: self, action:
        #selector(ReferralForm.submit(_)))
    }

    // MARK: Actions

    func submit() {

        let data = self.form.formValues().description
    }
}
```

```

    let alertController = UIAlertController(title: "Form Completed", message: "This form has successfully been submitted", preferredStyle: .alert)

    let vc = self.storyboard?.instantiateViewController(withIdentifier: "MainController")
    let defaultAction = UIAlertAction(title: "OK", style: .default, handler: { action in SendRef(input: data);self.tabBarController!.tabBar.items?[0].isEnabled = false;self.present(vc!, animated: true, completion: nil);})
    alertController.addAction(defaultAction)
    self.present(alertController, animated: true, completion: nil)
}

// MARK: Private interface

fileprivate func loadForm() {

    let form = FormDescriptor(title: "Referral Form")

    let section1 = FormSectionDescriptor(headerTitle: nil, footerTitle: nil)

    var row = FormRowDescriptor(tag: Static.button, type: .button, title: "Send Form")
    row.configuration.button.didSelectClosure = { _ in
        self.view.endEditing(true)
        self.submit()
    }
    section1.rows.append(row)

    let section2 = FormSectionDescriptor(headerTitle: "About Yourself", footerTitle: nil)

    row = FormRowDescriptor(tag: Static.nameTag, type: .name, title: "First Name")
    row.configuration.cell.appearance = ["textField.placeholder" : "First Name" as AnyObject,
"textField.textAlignment" : NSTextAlignment.right.rawValue as AnyObject]
    section2.rows.append(row)

    row = FormRowDescriptor(tag: Static.lastNameTag, type: .name, title: "Last Name")
    row.configuration.cell.appearance = ["textField.placeholder" : "Last name" as AnyObject,
"textField.textAlignment" : NSTextAlignment.right.rawValue as AnyObject]
    section2.rows.append(row)

    row = FormRowDescriptor(tag: Static.IDTag, type: .number, title: "Student ID")
    row.configuration.cell.appearance = ["textField.placeholder" : "12345678" as AnyObject,
"textField.textAlignment" : NSTextAlignment.right.rawValue as AnyObject]
    section2.rows.append(row)

    row = FormRowDescriptor(tag: Static.birthday, type: .date, title: "Date of Birth")
    row.configuration.cell.showsInputToolbar = true
    section2.rows.append(row)

    row = FormRowDescriptor(tag: Static.uniEmailTag, type: .email, title: "University Email")
    row.configuration.cell.appearance = ["textField.placeholder" : "john.smith@mail.bcu.ac.uk" as AnyObject,
"textField.textAlignment" : NSTextAlignment.right.rawValue as AnyObject]
    section2.rows.append(row)

    row = FormRowDescriptor(tag: Static.personalEmailTag, type: .email, title: "Alternative Email")
    row.configuration.cell.appearance = ["textField.placeholder" : "john.smith@outlook.com" as AnyObject,
"textField.textAlignment" : NSTextAlignment.right.rawValue as AnyObject]
    section2.rows.append(row)

    row = FormRowDescriptor(tag: Static.phoneTag, type: .phone, title: "Phone")
    row.configuration.cell.appearance = ["textField.placeholder" : "Mobile Number" as AnyObject,
"textField.textAlignment" : NSTextAlignment.right.rawValue as AnyObject]

```

```

section2.rows.append(row)

row = FormRowDescriptor(tag: Static.Voicemail, type: .booleanSwitch, title: "Can we leave a voicemail
message?")
section2.rows.append(row)

row = FormRowDescriptor(tag: Static.GenderTag, type: .picker, title: "Gender")
row.configuration.cell.showsInputToolbar = true
row.configuration.selection.options = (["F", "M", "O", "U"] as [String]) as [AnyObject]
row.configuration.selection.optionTitleClosure = { value in
    guard let option = value as? String else { return "" }
    switch option {
    case "F":
        return "Female"
    case "M":
        return "Male"
    case "O":
        return "Other"
    case "U":
        return "I'd rather not to say"
    default:
        return ""
    }
}
section2.rows.append(row)

row = FormRowDescriptor(tag: Static.addressTag, type: .multilineText, title: "Address")
section2.rows.append(row)

row = FormRowDescriptor(tag: Static.DSATag, type: .booleanSwitch, title: "Are you a disabled student (eligible
for DSA)?")
section2.rows.append(row)

row = FormRowDescriptor(tag: Static.CourseTag, type: .text, title: "Course")
row.configuration.cell.appearance = ["textField.placeholder": "BSc Computer Science (Hons)" as AnyObject,
"textField.textAlignment": NSTextAlignment.right.rawValue as AnyObject]
section2.rows.append(row)

row = FormRowDescriptor(tag: Static.FacultyTag, type: .picker, title: "Faculty")
row.configuration.cell.showsInputToolbar = true
row.configuration.selection.options = (["CEBE", "HELS", "ADM", "BLSS"] as [String]) as [AnyObject]
row.configuration.selection.optionTitleClosure = { value in
    guard let option = value as? String else { return "" }
    switch option {
    case "CEBE":
        return "Computing, Engineering and The Built Environment"
    case "HELS":
        return "Health, Education and Life Sciences"
    case "ADM":
        return "Arts, Design and Media"
    case "BLSS":
        return "Business, Law and Social Sciences"
    default:
        return ""
    }
}
section2.rows.append(row)

let section3 = FormSectionDescriptor(headerTitle: "What you would like to talk about.", footerTitle: nil)

```

```

row = FormRowDescriptor(tag: Static.subjectTag, type: .multilineText, title: "")
section3.rows.append(row)

row = FormRowDescriptor(tag: Static.timescaleTag, type: .picker, title: "How long have you been concerned?")
row.configuration.cell.showsInputToolbar = true
row.configuration.selection.options = (["NL", "ST", "QL", "VL"] as [String]) as [AnyObject]
row.configuration.selection.optionTitleClosure = { value in
    guard let option = value as? String else { return "" }
    switch option {
    case "NL":
        return "Not Long (within 1 month)"
    case "ST":
        return "Some Time (1-3 months)"
    case "QL":
        return "Quite Some Time (3-6 months)"
    case "VL":
        return "A Long Time (6+ months)"
    default:
        return ""
    }
}
section3.rows.append(row)

row = FormRowDescriptor(tag: Static.CurrentSupportTag, type: .multipleSelector, title: "Are you currently receiving support?")
row.configuration.cell.showsInputToolbar = true
row.configuration.selection.options = (["No", "CBT", "CPN", "CP", "GP", "MHWA", "Psy", "Psy", "SW", "O"] as [String]) as [AnyObject]
row.configuration.selection.optionTitleClosure = { value in
    guard let option = value as? String else { return "" }
    switch option {
    case "No":
        return "No"
    case "CBT":
        return "CBT Practitioner (e.g. Healthy Minds)"
    case "CPN":
        return "Community Psychiatric Nurse (CPN)"
    case "CP":
        return "Counsellor/Psychotherapist"
    case "GP":
        return "GP"
    case "MHWA":
        return "Mental Health/Wellbeing Adviser"
    case "Psy":
        return "Psychiatrist"
    case "Psy":
        return "Psychologist"
    case "SW":
        return "Social Worker"
    case "O":
        return "Other"
    default:
        return ""
    }
}
section3.rows.append(row)

row = FormRowDescriptor(tag: Static.PastSupportTag, type: .multipleSelector, title: "Have you received support in the past?")

```

```

row.configuration.cell.showsInputToolbar = true
row.configuration.selection.options = (["No", "CBT", "CPN", "CP", "GP", "MHWA", "Psi", "Psy", "SW", "O"] as
[String]) as [AnyObject]
row.configuration.selection.optionTitleClosure = { value in
    guard let option = value as? String else { return "" }
    switch option {
    case "No":
        return "No"
    case "CBT":
        return "CBT Practitioner (e.g. Healthy Minds)"
    case "CPN":
        return "Community Psychiatric Nurse (CPN)"
    case "CP":
        return "Counsellor/Psychotherapist"
    case "GP":
        return "GP"
    case "MHWA":
        return "Mental Health/Wellbeing Adviser"
    case "Psi":
        return "Psychiatrist"
    case "Psy":
        return "Psychologist"
    case "SW":
        return "Social Worker"
    case "O":
        return "Other"
    default:
        return ""
    }
}

section3.rows.append(row)

form.sections = [section1, section2, section3]

self.form = form
}
}

class ReqAppoint: FormViewController, MFMailComposeViewControllerDelegate{
    override var preferredStatusBarStyle: UIStatusBarStyle {
        return .lightContent
    }

    struct Static {
        static let date = "date"
        static let time = "time"
        static let location = "location"
        static let phoneTag = "phone"
        static let advisor = "advisor"
        static let reason = "reason"
        static let button = "button"
    }

    required init(coder aDecoder: NSCoder) {
        super.init(coder: aDecoder)
        self.loadForm()
    }

    override func viewDidLoad() {

```



```

        super.viewDidLoad()
        //self.navigationItem.rightBarButtonItem = UIBarButtonItem(title: "Submit", style: .plain, target: self, action:
#selector(ReferralForm.submit(_)))
    }

    // MARK: Actions

    func submit() {

        let data = self.form.formValues().description

        let alertController = UIAlertController(title: "Request Sent", message: "Your Request Has Been Sent",
preferredStyle: .alert)

        let vc = self.storyboard?.instantiateViewController(withIdentifier: "MainController")
        let defaultAction = UIAlertAction(title: "OK", style: .default, handler: { action in SendRef(input:
data);self.tabBarController!.tabBar.items?[0].isEnabled = false;self.present(vc!, animated: true, completion: nil);})
        alertController.addAction(defaultAction)
        self.present(alertController, animated: true, completion: nil)
    }

    // MARK: Private interface

    fileprivate func loadForm() {

        let form = FormDescriptor(title: "Referral Form")

        let section1 = FormSectionDescriptor(headerTitle: nil, footerTitle: nil)

        var row = FormRowDescriptor(tag: Static.button, type: .button, title: "Send Form")
        row.configuration.button.didSelectClosure = { _ in
            self.view.endEditing(true)
            self.submit()
        }
        section1.rows.append(row)

        let section2 = FormSectionDescriptor(headerTitle: nil, footerTitle: nil)

        row = FormRowDescriptor(tag: Static.date, type: .date, title: "Date Requested")
        row.configuration.cell.showsInputToolbar = true
        section2.rows.append(row)

        row = FormRowDescriptor(tag: Static.time, type: .time, title: "Time Requested")
        row.configuration.cell.showsInputToolbar = true
        section2.rows.append(row)

        row = FormRowDescriptor(tag: Static.location, type: .picker, title: "Location")
        row.configuration.cell.showsInputToolbar = true
        row.configuration.selection.options = (["Centre", "North", "South", "Cons", "Margaret", "Jew", "Bour"] as [String])
as [AnyObject]
        row.configuration.selection.optionTitleClosure = { value in
            guard let option = value as? String else { return "" }
            switch option {
            case "Centre":
                return "City Centre (Curzon Building)"
            case "North":
                return "City North (Baker Building)"
            case "South":
                return "City South (Seacole Building)"
            case "Cons":

```

```

        return "The Birmingham Conservatoire"
    case "Margaret":
        return "Margaret Street"
    case "Jew":
        return "Victoria Street"
    case "Bour":
        return "Bournville Campus"
    default:
        return ""
    }
}

section2.rows.append(row)

row = FormRowDescriptor(tag: Static.phoneTag, type: .phone, title: "Phone")
row.configuration.cell.appearance = ["textField.placeholder" : "Mobile Number" as AnyObject,
"textField.textAlignment" : NSTextAlignment.right.rawValue as AnyObject]
section2.rows.append(row)

row = FormRowDescriptor(tag: Static.advisor, type: .picker, title: "Preferred Advisor")
row.configuration.cell.showsInputToolbar = true
row.configuration.selection.options = (["JS", "AD", "TM", "U"] as [String]) as [AnyObject]
row.configuration.selection.optionTitleClosure = { value in
    guard let option = value as? String else { return "" }
    switch option {
    case "JS":
        return "John Smith"
    case "AD":
        return "Alexander Davis"
    case "TM":
        return "Tim Minchin"
    case "U":
        return "I Don't Mind"
    default:
        return ""
    }
}
section2.rows.append(row)

row = FormRowDescriptor(tag: Static.reason, type: .multilineText, title: "Reason for Appointment")
section2.rows.append(row)

form.sections = [section1, section2]

self.form = form
}
}

class ConfAppoint: UIViewController{
    @IBOutlet var ConfirmMap: MKMapView!
    override func viewDidLoad() {
        let initialLocation = CLLocation(latitude: 52.483358, longitude: -1.883024)
        centerMapOnLocation(location: initialLocation)
    }
    override var preferredStatusBarStyle: UIStatusBarStyle {
        return .lightContent
    }
}

let regionRadius: CLLocationDistance = 1000
func centerMapOnLocation(location: CLLocation) {

```

```

        let coordinateRegion = MKCoordinateRegionMakeWithDistance(location.coordinate,
                                                                    regionRadius * 2.0, regionRadius * 2.0)
        ConfirmMap.setRegion(coordinateRegion, animated: true)
    }
    @IBAction func Confirm(_ sender: UIButton) {
        let alertController = UIAlertController(title: "Appointment Confirmed", message: "Your appointment has been confirmed.", preferredStyle: .alert)

        let vc = self.storyboard?.instantiateViewController(withIdentifier: "MainController")
        let defaultAction = UIAlertAction(title: "OK", style: .default, handler: { action in self.present(vc!, animated: true, completion: nil);})
        alertController.addAction(defaultAction)

        self.present(alertController, animated: true, completion: nil)
    }
    @IBAction func RequestAptbtn(_ sender: UIButton) {
        let alertController = UIAlertController(title: "New Request Made", message: "A new appointment request has been made for you.", preferredStyle: .alert)

        let vc = self.storyboard?.instantiateViewController(withIdentifier: "MainController")
        let defaultAction = UIAlertAction(title: "OK", style: .default, handler: { action in self.present(vc!, animated: true, completion: nil);})
        alertController.addAction(defaultAction)

        self.present(alertController, animated: true, completion: nil)
    }
}

class UpcomingAppoint: UIViewController{
    @IBOutlet var UpcomingMap: MKMapView!
    override func viewDidLoad() {
        let initialLocation = CLLocation(latitude: 52.483358, longitude: -1.883024)
        centerMapOnLocation(location: initialLocation)
    }
    override var preferredStatusBarStyle: UIStatusBarStyle {
        return .lightContent
    }

    let regionRadius: CLLocationDistance = 1000
    func centerMapOnLocation(location: CLLocation) {
        let coordinateRegion = MKCoordinateRegionMakeWithDistance(location.coordinate,
                                                                    regionRadius * 2.0, regionRadius * 2.0)
        UpcomingMap.setRegion(coordinateRegion, animated: true)
    }
    @IBAction func Cancelbtn(_ sender: UIButton) {
        let alertController = UIAlertController(title: "Appointment Cancelled", message: "Your appointment has been cancelled.", preferredStyle: .alert)

        let vc = self.storyboard?.instantiateViewController(withIdentifier: "MainController")
        let defaultAction = UIAlertAction(title: "OK", style: .default, handler: { action in self.present(vc!, animated: true, completion: nil);})
        alertController.addAction(defaultAction)

        self.present(alertController, animated: true, completion: nil)
    }
}

class PastAppoint: UIViewController{
    override func viewDidLoad() {
        let initialLocation = CLLocation(latitude: 52.483358, longitude: -1.883024)

```

```

        centerMapOnLocation(location: initialLocation)
    }
    override var preferredStatusBarStyle: UIStatusBarStyle {
        return .lightContent
    }

    @IBOutlet var PastMap: MKMapView!

    let regionRadius: CLLocationDistance = 1000
    func centerMapOnLocation(location: CLLocation) {
        let coordinateRegion = MKCoordinateRegionMakeWithDistance(location.coordinate,
                                                                    regionRadius * 2.0, regionRadius * 2.0)
        PastMap.setRegion(coordinateRegion, animated: true)
    }
}

```

ForumView

```
//
// ForumView.swift
// My Mind
//
// Created by Alexander Davis on 31/03/2017.
// Copyright © 2017 Alexander Davis. All rights reserved.
//

import Foundation
import UIKit

class ForumViewController: UIViewController {

    override var preferredStatusBarStyle: UIStatusBarStyle {
        return .lightContent
    }

    @IBOutlet var webView: UIWebView!

    override func viewDidLoad() {
        super.viewDidLoad()
        // Do any additional setup after loading the view, typically from a nib.
        let url = URL(string: "https://www.mymindforum.com");
        let requestObj = URLRequest(url: url!);
        webView.loadRequest(requestObj);
    }

    override func didReceiveMemoryWarning() {
        super.didReceiveMemoryWarning()
        // Dispose of any resources that can be recreated.
    }

}

class ForumSignUpViewController: UIViewController {

    override var preferredStatusBarStyle: UIStatusBarStyle {
        return .lightContent
    }

    @IBOutlet weak var ForumSignUp: UIWebView!

    override func viewDidLoad() {
        super.viewDidLoad()
        // Do any additional setup after loading the view, typically from a nib.
        let url = URL(string: "https://www.mymindforum.com/ucp.php?mode=register");
        let requestObj = URLRequest(url: url!);
        ForumSignUp.loadRequest(requestObj);
    }

    override func didReceiveMemoryWarning() {
        super.didReceiveMemoryWarning()
        // Dispose of any resources that can be recreated.
    }

}
```

}

Appendix E – Test Plans

Login System

Field Name(s)	Input	Required Output	Output
Email Address Password	test1@alexfyp.com Test1Passw0rd	Welcome You have successfully logged in	Welcome You have successfully logged in
Email Address Password	test1@alexfyp.com [empty]	Error Please enter an email and password.	Error Please enter an email and password.
Email Address Password	test1@alexfyp.com ajgrtbugohsneg	Error The password is invalid or the user does not have a password.	Error The password is invalid or the user does not have a password.
Email Address Password	ThisIsNotAnEmailAddress Test1Passw0rd	Error The email address is badly formatted	Error The email address is badly formatted
Email Address Password	fakeemail@alexfyp.com Test1Passw0rd	Error There is no user record corresponding to this identifier. The user may have been deleted.	Error There is no user record corresponding to this identifier. The user may have been deleted.
Email Address Password	[empty] Test1Passw0rd	Error Please enter an email and password	Error Please enter an email and password.
Email Address Password	[empty] [empty]	Error Please enter an email and password.	Error Please enter an email and password.

Table 2 - Test Plan for Login Screen

Field Name(s)	Input	Required Output	Output
Email Address Password	test1@alexfyp.com Test1Passw0rd	Sign Up Complete You have Successfully Signed Up	Sign Up Complete You have Successfully Signed Up
Email Address Password	test1@alexfyp.com [empty]	Error Please enter your email and password.	Error Please enter your email and password.
Email Address Password	ThisIsNotAnEmailAddress Test1Passw0rd	Error The email address is badly formatted	Error The email address is badly formatted

Email Address Password	[empty] Test1Passw0rd	Error Please enter your email and password.	Error Please enter your email and password.
Email Address Password	[empty] [empty]	Error Please enter your email and password.	Error Please enter your email and password.

Table 3 - Test Plan for Account Creation Screen

Field Name(s)	Input	Required Output	Output
Email Address	test1@alexfyp.com	Success! Password reset email sent.	Success! Password reset email sent.
Email Address	ThisIsNotAnEmailAddress	Error The email address is badly formatted	Error The email address is badly formatted
Email Address	fakeemail@alexfyp.com	Error There is no user record corresponding to this identifier. The user may have been deleted.	Error There is no user record corresponding to this identifier. The user may have been deleted.
Email Address	[empty]	Oops! Please enter an email	Oops! Please enter an email

Table 4 - Test Plan for Password Reset Screen

Referral Form

Input	Required Output	Output
Send Form Pressed	Form Completed This form has successfully been submitted	Form Completed This form has successfully been submitted

Table 5 - Test Plan for Referral Form

Appointments

Screen	Input	Required Output	Output
Appointments Home	Request Appointment Pressed	Screen Changes to Request Appointment Screen	Screen Changes to Request Appointment Screen
Appointments Home	Example Appointment Confirmation Pressed	Screen Changes to Example Appointment	Screen Changes to Example Appointment

		Confirmation Screen	Confirmation Screen
Appointments Home	Example Upcoming Appointment Pressed	Screen Changes to Example Upcoming Appointment Screen	Screen Changes to Example Upcoming Appointment Screen
Appointments Home	Past Appointment Pressed	Screen Changes to Past Appointment Screen	Screen Changes to Past Appointment Screen
Request Appointment	Send Form Pressed	Request Sent Your Request Has Been Sent	Request Sent Your Request Has Been Sent
Request Appointment	Cancel Pressed	Screen changes to Appointments Home	Screen changes to Referrals Form
Example Appointment Confirmation	Confirm Appointment Pressed	Appointment Confirmed Your appointment has been confirmed	Appointment Confirmed Your appointment has been confirmed
Example Appointment Confirmation	Request Different Appointment Pressed	New Request Made A new appointment request has been made for you	New Request Made A new appointment request has been made for you
Example Appointment Confirmation	Done Pressed	Screen changes to Appointments Home	Screen changes to Referrals Form
Example Upcoming Appointment	Cancel Appointment Pressed	Appointment Cancelled Your appointment has been cancelled	Appointment Cancelled Your appointment has been cancelled
Example Upcoming Appointment	Done Pressed	Screen changes to Appointments Home	Screen changes to Referrals Form
Example Past Appointment	Done Pressed	Screen changes to Appointments Home	Screen changes to Referrals Form

Table 6 - Test Plan for Appointment Section

Forum (Browser)

Screen	Input	Required Output	Output
Fully loaded page	Refresh pressed	Page refreshes	Page refreshes
Fully loaded page	Stop Loading pressed	Nothing	Nothing

Table 7 - Test Plan for Browser

Account Screen

Input	Required Output	Output
Forum Sign Up Pressed	Browser opens with sign up page	Browser opens with sign up page
Logout of App Pressed	Screen changes to welcome screen	Screen changes to welcome screen

Table 8 - Test Plan for Account Screen

Emergency Contacts

Input	Required Output	Output
Any contact pressed	Number appears with call option	Number appears with call option
Mind Info Line then Cancel the any other contact pressed	Number appears with call option Returns to contacts list New number appears with call option	Number appears with call option Returns to contacts list New number appears with call option

Table 9 - Test Plan for Emergency Contacts Screen

Appendix F – Student Feedback Results

Student Information and Groupings

	Age Group	Gender	Time Trial Exercise	Familiarity with Apps	Mobile Device Type
<i>Participant A</i>	16-21	Female	4:12	Use them all the time	iOS
<i>Participant B</i>	22-30	Male	0:25	Use them all the time	iOS
<i>Participant C</i>	16-21	Male	03:29	Use them all the time	Android
<i>Participant D</i>	22-30	Male	DNF	Use them all the time	iOS
<i>Participant E</i>	16-21	Male	DNF	Use them all the time	Other Non-Smartphone Device
<i>Participant F</i>	16-21	Female	DNF	Use them all the time	Android
<i>Participant G</i>	21-30	Female	DNF	Use them all the time	iOS

Table 10 - Participant Information

Participant Answers

	Strongly Agree	Agree	Some-what Agree	No Opinion	Some-what Disagree	Disagree	Strongly Disagree
<i>I found this app easy to use.</i>	5	2					
<i>I can use it without written instructions.</i>	5	1	1				
<i>I can navigate through the app easily.</i>	5	2					
<i>The language used in the app is easily understood.</i>	5	2					
<i>The different sections/pages of the app are cohesive in look and feel.</i>	6	1					
<i>The app has adequate help documentation.</i>	1	2	1	3			
<i>The app has clearly marked way-finding buttons (exit, info, back, next page, etc.).</i>	1	6					
<i>The prompts for input are clear.</i>	3	4					
<i>The prompts for input are effective in making you want to contribute.</i>	5		2				
<i>The app does everything I would expect it to.</i>	4	2	1				
<i>The app works the way I would want it to work.</i>	4	2		1			
<i>The app is designed for all levels of users.</i>	4	1	2				

<i>Using the app was an enjoyable experience.</i>	3	2		2			
<i>I found the app unnecessarily complex.</i>						5	2
<i>I found the various functions in the app were well integrated.</i>	3	3	1				
<i>I think that I would use this app frequently.</i>	1	1	3	1		1	
<i>I felt very confident using this app.</i>	4	3					

Table 11 - Closed Question Feedback

Open Ended Question Feedback

Did Anything in The App Confuse You

- Struggled to find the “What do you want to talk about” box – could be more obvious.
- How to add/request an appointment.
- Who sees what data. Data protection information.

Negative Aspects

- Too much text
- App seems to be a bit too busy
- Spelling Mistakes
- Constantly jumps back to initial page when selecting back button
- No help documentation

Positive Aspects

- Colour scheme
- Easy navigation
- Useful features overall
- Intuitive
- Emergency contacts
 - Feature highlighted twice by different participants

- Appointment creation/request tool
- Overall system easier to use in comparison to current system
- Name of app does not create a stigma

Feature Requests

- Instant messaging feature
- Instead of building location, have a room location map
- Touch ID Protection
- Reminders/notifications of appointments the day/hour before perhaps an option to set a reminder

Overall Feedback

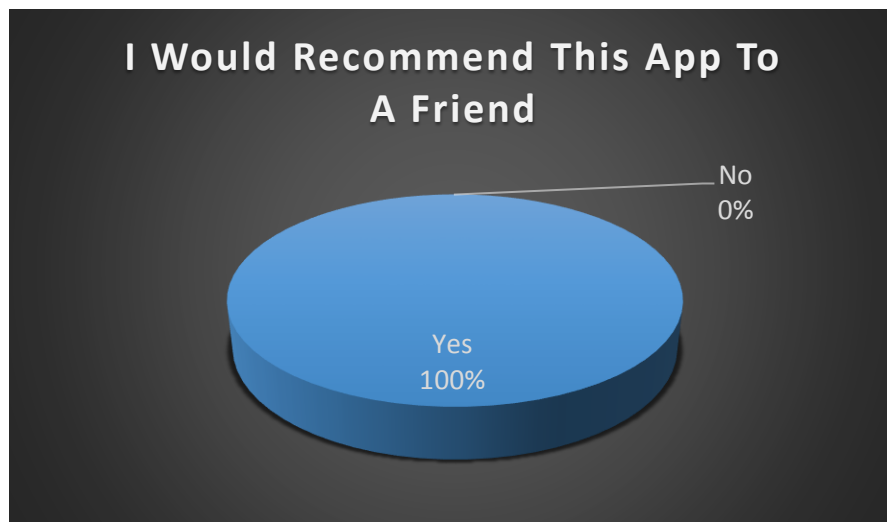


Figure 21 - Percentage of students who would recommend the app to a friend

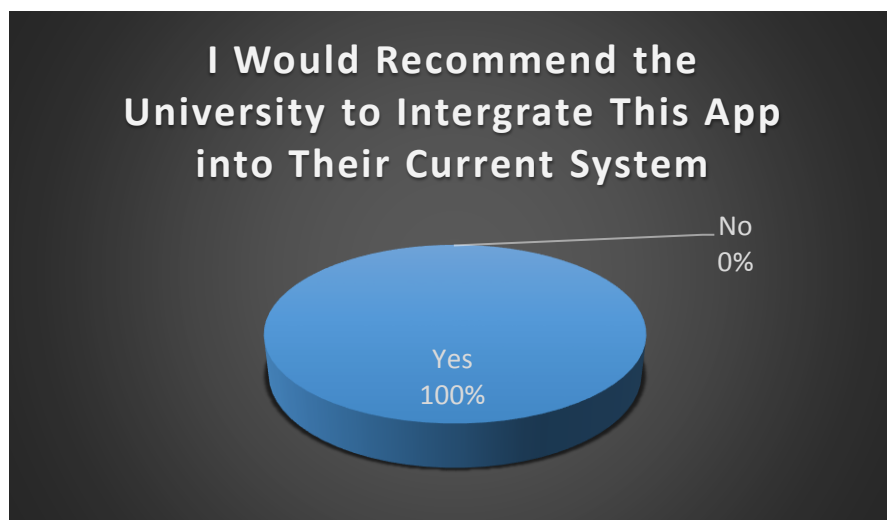


Figure 22 - Percentage of students who would like to see the app used within their university

Appendix G - UCEEL Copyright Waiver



Student Name: Alexander Edward Davis

Project/Thesis Title Student Mental Health Signposting App (My Mind)

Course: BSc Computer Science with Honours

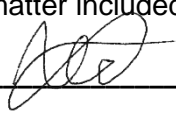
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