# Initial Plan: A personal diary app

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## Project Description

With recent increases in mental health problems in the UK, there is increasing demand for innovation within patients' treatments. Conditions such as depression, anxiety, PTSD and OCD are common, and potentially very serious, mental illnesses that can negatively affect both our thoughts, feelings and actions. (1) These can lead to having symptoms such as panic attacks, restlessness and anxiety, and can even include heart palpitations. (2) Treatment options can include various medications along with talking therapies such as Cognitive Behavioural Therapy (CBT). CBT is a form of therapy that focuses on using your thoughts, feelings, physical sensations and actions to help patients deal with overwhelming problems by breaking them down into smaller, more manageable problems. Each of these four aspects are interconnected – also referred to as the 'Hot Cross Bun', Figure 1, and by changing your physical actions or thoughts you can reduce severe anxiety.
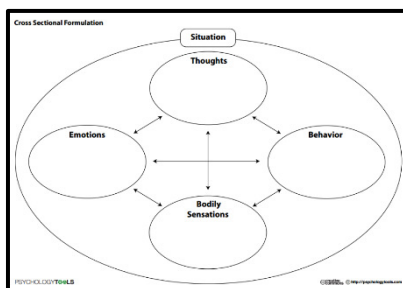


Figure 1. Hot Cross Bun diagram (3)

Diaries are a large part of CBT treatment. (4) Therapists will ask their patients to fill these out intermittently, depending on their treatment course, and talk about their thoughts or emotions during certain events in the day. This allows not only great self-reflection for the patient, but for the therapist to gather a wide array of data to attempt to find any patterns which may lead them to what they're feeling and how they cope with these emotions. (5) However, a barrier to patient compliance can lie with problems with having to keep on your person a physical diary is the lack of convenience and embarrassment it may cause the patient having to get it out to fill it in for that situation. (6) This leads to patients not filling out any information for days on end causing problems with recall of events and specific feelings associated. Therefore, therapist's information can be more limited and the time to reaching a solution is increased.

This project was instigated by a CBT therapist named Cheryl Jones. She has frequent issues with patients not filling in their diaries and thus not progressing with their therapy - thus the idea for a personal diary application came about.

The aim of this project is to supply patients with a solution to this problem by using a smart and convenient mobile application. This application will consist of everything a normal diary can do: Text entries, date of entry selection and adding photographs to an entry. Alongside these regular functions, the user will also be able to change how they want their entry to appear. This can be in the form of adding or removing columns on a table, changing the layout from normal text to bullet points. This is a convenient and discrete way to produce diary entries for the therapist, who will be able to access any diary entry containing the information patients wish to fill out and analyse it for their next appointment. By having easy and continuous access to a diary, it makes it so much easier to convey your emotions at the exact moment you are feeling them by just getting your phone or tablet out of your pocket and filling it in.

## Project Aims and Objectives

The aim of this project is to design and develop a mobile application that patients can use as a diary for their own self- reflection as well as the therapist using it for analysis. The user will be able to fill in a diary entry for a given event occurring on a day by using a table consisting of: The situation, thoughts, behaviour, physical sensations, emotions, the people involved and the location of the situation. These can be added either by a simple few sentences or even bullet pointed to mark out the main points at the time. Then, via the admin view which the therapist will have access to, this information is collected and assessed. All information can be grouped by different methods, such as the date of entry or reoccurring information from the table. For example, if the same situation is added more than once within, this shows that the patient feels something when that certain event has occurred and would be useful for the therapist to know and work on with the patient.

These patients will be experiencing extremely high levels of stress and anxiety, potentially whilst using the application. For this reason, the usability of the app is very important. It needs to be easy to follow and not contain features like small button's or arrows which may become difficult to press when experiencing these levels of stress.

## Objectives:

- **Research and planning:**
  a.  Study React Native java library
  b.  Most effective ways to treat patients using CBT to assess what features are needed within the app
  c.  How these features can be implemented within the app
  d.  Find any existing solutions, list its strengths and weaknesses and use that information to bolster my own design in the form of a literature review
  e.  This literature review will be used to guide my requirements, functional and non-functional

- **Identify and Define Requirements:**
  a.  By using the literature review in the previous objective, it will help guide my functional and non-functional requirements
  b.  Also using the information gained from the client meetings and video calls to make sure they have all the functionality they want

- **Design and Implementation:**
  a.  Design and create a suitable user interface using React Native
  b.  Create a wireframe to help visualise how different screens will interact with each other
  c.  How data will be stored and is able to be retrieved by the therapist
  d.  Implementation of requirements

- **Test and Evaluate:**
  a.  Test the application conforms to all functional and non-functional requirements
  b.  User testing

- **Documentation:**
  a.  This will be done as I proceed with the project to keep the memory of how I developed different sections fresh in my memory
  b.  Introduction, Background, Approach, Results and Evaluation, Future work, Conclusions and Reflection on Learning

## Challenges:

By working with sensitive data, you can run into problems with privacy and security. With this, you need to be able to protect patient data stored on both the patient's and therapist's system. This information will be stored locally on the user's phone so they can access without an internet connection, but once connected the patient will be given the option to uploaded that particular entry into an external storage server to be determined, which the therapist can then access. This is crucial because the therapist needs to access the patients completed diary entries for assessment before any appointments and will need to pull any data that's been inputted, onto their system to assess. Giving the patient the option to share particular entries is important as they may want to fill the diary out for self-reflection, but aren't comfortable showing the therapist.

By working with a client, I need to prepare for a potential delay of feedback or response of anything sent. To plan for this, make sure there is plenty of time for a response before I can proceed onto the next step.

Another challenge I will be facing is the fact I have no prior experience in the creation of a mobile application. I will need make sure I have sufficient planning of learning how to use my chosen method, which is the React Native JavaScript library, whilst developing my skeleton and further learning to start implementing my requirements.

## Ethics:

Although all data used will be anonymous when I test the system myself, once I get to the user evaluation section, I will be asking known users and the client to use my application and evaluate their response's – which requires an ethics form to be approved.

# Work Plan

I need to consider the needs of the client and so regular meetings and communication is needed to make sure I'm on the right track to meet her requirements.

**Week 1** (27/01 – 2/02)
Aims:

- Write initial plan and discuss with supervisor
- Research React Native JavaScript Library for cross platform mobile application development
- Submit ethical approval form

Milestone(s):

- Initial plan completed

Deliverables:

- Initial plan

**Week 2** (03/02 – 9/02)
Aims:

- Supervisor meeting to discuss plan for project
- Begin study of React Native
- Listen to recording of initial client meeting and note down important information
- Research similar applications and assess functionality and usability; write a literature review for final report using this and initial client meeting
- Documentation of the Final Report started: Introduction, Background and Approach
- Use literature review to start writing functional and non-functional requirements

Milestone(s):

- React Native course started
- Literature review of similar applications finished
- Requirements started
- Initial structure and introduction of Final Report finished

**Week 3** (10/02 – 16/02)
Aims:

- Continue React Native training
- Research and design the preliminary user interface, maintaining the usability for all age groups - what the screens are within the applications and descriptions for their use along with wireframes to see how screens will interact with other screens
- Finish requirements
- Gather anonymous patient data from the client and develop personas

- Meeting with client and supervisor regarding requirements and if anything is missing – revise any changes

Milestone(s):

- UI design finished
- Requirements finished
- Method found on how to store information and how it can be sent to therapist
- Ethics approval
- Personas finished

**Week 4** (17/02 – 23/02)
Aims:

- Finish React Native training
- Develop a method for how individual sensitive patient data will be stored and sent to the therapist
- Produce UML class diagram for design for how system backend will work

Milestone(s):

- Method found on how to store information and how it can be sent to therapist
- UML Class diagram finished
- React Native basic lessons complete

**Week 5** (24/02 – 01/03)
Aims:

- Write up Acceptance Criteria and Test Cases
- Write up Use Cases
- Develop a prototype to show client and supervisor

Milestone(s):

- Basic structure of application completed with simple functionalities
- Prototype produced

**Week 6** (02/03 – 08/03)
Aims:

- Meeting with client and supervisor to discuss the UI and any other functionalities added before implementation is started – basic prototype
- After meeting and any changes have been revised, begin implementation of more challenging functionalities

Milestone(s):

- UI and main requirements accepted
- Prototype approved
- Implementation started

**Week 7** (09/03 – 15/03)
Aims:

- Begin implementation of how the prototype will work with the storage method; must be able to get data, clean data and store data
- Start implementation of main requirements taken from client meeting in week 3

**Week 8** (16/03 – 22/03)
Aims:

- Continue main requirement implementation
- Start research on the other requirements to see if they are possible since not as important

Milestone(s):

- Core functionalities in place: Diary entry with as many or few columns with data storage and retrieval

**Week 9** (23/03 – 29/03)
Aims:

- Meeting with client and supervisor to discuss the functioning prototype with the core functionalities in place
- Discuss with client and supervisor any adjustments to make or functionality still needing to be added

Milestone(s):

- Final design and implementation approved

**Week 10** (30/03 – 05/04)
Aims:

- Continue with the implementation making sure it runs as a coherent system and the program works with the storage method
- If time permits, try and incorporate lesser functionalities

**Week 11** (06/04 – 12/04)
Aims:

- Complete the implementation of the system
- Ensure all of the requirements have been met to the highest standard

Milestone(s):

- System complete

**Easter Weeks 1-3** (13/04 – 03/05)
Aims:

- Test the system against test cases and evaluate results

- Use real user testing, getting participants to perform certain tasks and evaluate results
- Complete a draft of the final report

Milestone(s):

- All tests against system completed
- Draft of final report complete

**Week 12** (04/05 – 07/05)
Aims:

- Finish proofreading final report and adjust anything needed

Deliverables:

- Final Project
- Final Application

## Gantt Chart:

| Main Tasks | Start Date | End Date | W1 | W2 | W3 | W4 | W5 | W6 | W7 | W8 | W9 | W10 | W11 | EW1 | EW2 | EW3 | W12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Write initial plan | 27/01/2020 | 03/02/2020 | | | | | | | | | | | | | | | |
| Ethics form submittion | 27/01/2020 | 10/02/2020 | | | | | | | | | | | | | | | |
| Write a literature report | 03/02/2020 | 05/02/2020 | | | | | | | | | | | | | | | |
| Write functional requirements | 05/02/2020 | 10/02/2020 | | | | | | | | | | | | | | | |
| React Native JavaScript Library Basics | 03/02/2020 | 17/02/2020 | | | | | | | | | | | | | | | |
| Develop personas | 10/02/2020 | 12/02/2020 | | | | | | | | | | | | | | | |
| Design user interface | 10/02/2020 | 17/02/2020 | | | | | | | | | | | | | | | |
| Design storage method | 17/02/2020 | 22/02/2020 | | | | | | | | | | | | | | | |
| UML diagram for backend design | 22/02/2020 | 24/02/2020 | | | | | | | | | | | | | | | |
| Test cases and acceptence critera | 24/02/2020 | 26/02/2020 | | | | | | | | | | | | | | | |
| Prototype developed | 24/02/2020 | 01/03/2020 | | | | | | | | | | | | | | | |
| Implementation of main requirments | 02/03/2020 | 20/03/2020 | | | | | | | | | | | | | | | |
| Research other requirements | 18/03/2020 | 20/03/2020 | | | | | | | | | | | | | | | |
| Complete the implementation of system | 23/03/2020 | 06/04/2020 | | | | | | | | | | | | | | | |
| Self and User testing with evaluation | 13/04/2020 | 20/03/2020 | | | | | | | | | | | | | | | |
| Final report first draft | 20/04/2020 | 29/04/2020 | | | | | | | | | | | | | | | |
| Proofread and complete final report | 29/04/2020 | 06/05/2020 | | | | | | | | | | | | | | | |

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