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## **Recording Thoughts for Mental Health Therapy**

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I hereby declare that this dissertation is all my own work, except as  
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# **Recording Thoughts for Mental Health Therapy**

**Umar Saghir**

## **Abstract**

Abstract

## **Acknowledgements**

Acknowledgements

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# **1 Introduction**

## **1.1 Background**

It is human nature to be constantly thinking and processing information and the world around us; we think about things like our past, our future, our environment and the people around us all of the time, and this can occur consciously and subconsciously. Many of the the things we think about come to us automatically (therefore these occur subconsciously), and the resulting actions we perform and emotions we experience are determined by these thoughts. As stated by (Ogilvie n.d.), the causes for these thoughts are due to our deeply rooted personal belief systems and opinions which have been formed from all of the experiences we have had, and these give us meaning to all of the things we think about, ultimately determining our reality.

If this is the case, a positive or negative automatic thought can cause a same respective reaction. A Negative Automatic Thought (or 'NAT') is a subconscious thought that occurs in response to everyday events. These thoughts are irrational, self-defeating (Cuncic 2019) and have a direct negative impact on us. The problem is that we do not do anything about these thoughts, and there are many reasons for this. One reason being that we find them too difficult to explain to anyone or even ourselves, so we choose to just dismiss them. Another reason may be that we get so accustomed to them that we begin to not pay attention to them instead of dealing with them; and this is where it can become problematic as the reoccurrence of NATs is where the mental health of an individual can be affected,

leading to low moods, irritability and conditions such as anxiety<sup>1</sup> and depression<sup>2</sup> (Dictionary n.d.).

In order to combat these thoughts an established technique used by therapists is *cognitive behavioural therapy (CBT)*, which is a talking therapy that can help you manage your problems by changing the way you think and behave. It very much focuses on your present problems rather than issues from your past (NHS 2016). The affected person is asked to write down their negative thoughts and the emotions and scenarios that were associated with them. This technique is further discussed in the report (see subsection 3.1).

As one can conclude, addressing NATs is paramount in achieving healthy living and a happy state of mind. We need to make the therapy process as efficient and convenient to help achieve this.

## **1.2 Motivation**

The supervisor for this project Julie Greensmith showcased a current written therapy process used by a psychologist which systematically asks questions to the affected person about their thoughts and emotions to help them focus on determining why they may be experiencing them.

We acknowledged that this method could be changed and improved by digitising it into a mobile application form, which would make the recording and tracking process more convenient as well as simplifying the management of their thoughts. It would also limit the potential to forget the thoughts a person experi-

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<sup>1</sup>An uncomfortable feeling of nervousness or worry about something that is happening or might happen in the future.

<sup>2</sup>A mental illness in which a person is very unhappy and anxious (= worried and nervous) for long periods and cannot have a normal life during these periods.

ences as they would be more inclined to record them as and when they occur.

After conducting initial research it became apparent that myself was very interested in this subject in regards to the psychology aspect, as well as how it could benefit a lot of people in their daily lives, not to mention diagnosed mental health sufferers.

## **1.3 Vision**

### **1.3.1 Aims and Objectives**

#### **Aims**

The aim of this project is to design and implement a prototype for a mobile application which would transform a current, written mental health therapy technique into a digital version.

#### **Objectives**

The *key objectives* are thus:

1. Research around the subject of cognitive mental health therapy
2. Research and compare alternative mental health therapy digital applications
3. Research high fidelity prototyping software/tools
4. Design low and high fidelity prototypes
5. Learn how to implement database within chosen prototyping tool
6. Implement a basic prototype of the application
7. Get real potential users to test the prototype and report the feedback
8. Implement necessary changes from feedback and evaluate overall project



### 1.3.2 Vision Statement

*Recording Thoughts for Mental Health Therapy* is a mobile application designed to be used by sufferers of mental health conditions (e.g. anxiety, depression, obsessive-compulsive disorder <sup>3</sup> (Dictionary n.d.)) whilst on the go, to make recording of Negative Automatic Thoughts (NATs) as convenient and efficient as possible. It will not target any specific age range and would significantly improve the conventional written method used for cognitive behavioural therapy. The application will also be beneficial to mental health therapists and psychologists who wish to either use it for their patients or conduct further research in digital therapy.

There are two functional parts to the thought recording process in this application:

- In-situation
- Retrospective

The ‘in-situation’ part is where the user is procedurally asked questions which they can answer as and when they are experiencing the negative thoughts and the scenario relating to it. This meets the requirement of efficiency and convenience. The ‘retrospective’ aspect to the process again procedurally asks the user questions but they have the choice of answering them when they want. This is to allow the user to go back to their thoughts and reflect/view them with better clarity.

The app<sup>4</sup> (techopedia n.d.) will store their thoughts in chronological order along with the user’s answers to the questions asked. This way, the thoughts are

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<sup>3</sup>A mental illness that causes a person to do something repeatedly for no reason.

<sup>4</sup>An app is computer software, or a program, most commonly a small, specific one used for mobile devices.

recorded and organised so that the user does not forget them and makes it simple to process, analyse, reflect on them as well as edit their initial answers if needed.

### **1.3.3 Success Metrics**

**SC-1:** Have 75% of users who currently use the app continue to use it after 6 months following initial release.

**SC-2:** Will show a 25% reduction in anxiety and depression related symptoms of diagnosed users.

**SC-3:** Consistent usage of app measured by 5 or more NATs recorded by user.

**SC-4:** Shown an average 10% increase in usage of the app by each user per month.

**SC-5:** A ratio of 75:25 preference of app users to conventional written therapy is achieved from a sample size of 20 users after the first month of release.

### **1.3.4 Risks**

This mobile application will not target a specific age range but the types of users it aims to be of benefit to are current sufferers of mental health illnesses, therapists and psychologists. Furthermore, it will be an innovative product which provides a new technique for therapy, and so will be appealing to those who are not satisfied with their current therapy, whether that be an alternative tool or the treatment they are receiving from their therapist.

There are some risks involved for the types of users mentioned. Firstly, from a sufferer's perspective using the app when experiencing a Negative Automatic Thought may invoke further stress or anxiety, or worsen their symptoms in general. This could be due to reasons such as being a new user of the app and not being familiar with how it works. Another reason could be that the person con-

cerned is elderly and may not be as familiar or competent with modern technology, making this digital form of therapy obsolete for them.

Continuing on from the previous point, sufferers and therapists may not accept this new digital therapy technique and reluctant to move away from tried and trusted methods. We must expect this to be the case and account for it by developing the necessary training or tutorials for using the application. There must also be thorough product and market research conducted so that potential issues can be resolved beforehand. The research should also prove the effectiveness of digital cognitive behavioural therapy to alleviate some of these risks.

### **1.3.5 Assumptions and Dependencies**

Assumptions for this project are things which we can assume that the user has or can do, but is not necessarily required to use the mobile application. Also, they could be things that are true to the purpose of the project.

On the other hand, dependencies are things which are mandatory for the app to run as expected.

#### **Assumptions**

**AS-1:** Current techniques used for cognitive behavioural therapy (i.e. written technique) could be improved.

**AS-2:** Users are able to control and navigate their mobile device, and perform general actions on them such as type text or select on-screen buttons.

**AS-3:** Users can read and understand information and answer questions as appropriate.

**AS-4:** Purpose of application use is related to cognitive behavioural/mental health therapy.

## **Dependencies**

**DE-1:** Hardware and memory capacity of user's mobile device is adequate to run the application.

**DE-2:** Necessary operating system running on device on which the app will be installed.

## **1.4 Scope and Limitations**

### **1.4.1 Major Features**

The mobile app prototype will have the following *fundamental features*:

1. An intuitive, simplistic and appealing user interface and experience to reduce complication and allow user to focus on recording their thoughts
2. Add responses by user to questions related to their NATs
3. Record thoughts in a variety of methods, including text, audio, visually (i.e. photo/video)
4. Save thoughts for accessing, analysing and editing at a later time
5. Save date and time of thought
6. Select appropriate emotion(s) related to their thoughts and rate the strength of them
7. Allow user to rate their own belief in the thoughts they record

### **1.4.2 Scope of Initial Release and Subsequent Releases**

*Table 1* on Page 8 showcases the scope of the project. Each row correlates to a numbered feature mentioned in subsection 1.4.1.

**Note:** The term ‘Thought Diary’ mentioned in the table is the name given to where all the user’s recorded thoughts will be located in the app.

Feature	Release 1	Release 2
1	Basic functions of app possible and UI matching initial design	Enhancements to all aspects of UI following feedback
2	Able to input text and save as user response	Edit/delete the response
3	Provide UI options for using device camera, inserting photo/video, audio recording but not fully implemented	Implement camera usage of device
4	Able to save one thought in a database which can then be viewed from Thought Diary	Save multiple thoughts and ability to edit some aspects of already saved thoughts
5	Enter date and time manually as initial step when adding a new thought, which is saved in thought diary	App saves date and time automatically when user saves the thought, initial step no longer required
6	Select emotion from options in drop down menu. Rate strength of emotion by selecting appropriate option button	Select multiple emotions
7	Select appropriate option button	Improve UI

Table 1: Project Scope

### **1.4.3 Exclusions**

The idea of this project is to provide an alternative and improved method for recording negative automatic thoughts. Exclusions would be that it should not be used as an alternative to medicinal treatments prescribed by a doctor. Furthermore, the mobile app will not cure mental health symptoms or conditions - its purpose is to improve the efficiency of *cognitive behavioural therapy* and make it more convenient. This may however in turn improve or even alleviate stress for example that may be occurring as a result of the current written method. There is potential for some symptoms or conditions of mental health sufferers to be made worse; not all symptoms will be reduced or improved.

## **1.5 Deployment Consideration**

The initial considerations for the utilities that will be used to make the project possible were the software, technologies and platforms that would be best suited to meet the requirements and standards set out. These considerations were composed of propositions by the project supervisor, Julie Greensmith and from the author's research and initiative. They are listed below:

- Adobe XD, InVision - for high fidelity prototype
- MIT App Inventor, BuildFire, Thunkable, Appery.io - for implementation of app prototype
- Git and GitHub - technology for version control of app and final report, remote repository for back up
- LaTeX - typesetting system for write up of final report

## **2 Requirements Specification**

### **2.1 Overview**

### **2.2 Functional Requirements**

### **2.3 Non-Functional Requirements**

## **3 Related Work**

In this section *cognitive behavioural therapy (CBT)* will be explained in more detail. This is the underlying method that this project aims to digitise into a mobile app form, and so it needs to be researched and understood. Additionally, this section will look into alternative mental health/cognitive behavioural therapy apps that are currently out there, analysing how they help the user and discussing inspiration that can be taken from these for this project.

### **3.1 Cognitive behavioural therapy**

According to (FNP 2018), CBT is a short-term therapy technique that can help people find new ways to behave by changing their thought patterns. It works on the basis that the way we think and interpret life's events affects how we behave and, ultimately, how we feel. As mentioned before, therapists and psychologists commonly use this method to work with their patients to change or improve their thought patterns get a better understanding of why they think the way they do. This technique can be used to address many psychological and in fact non-psychological symptoms too. One benefit of the app is that it will help make the user eventually less dependent on their therapist and use the app as a form of self-

therapy. (FNP 2018) says, ‘according to the American Psychological Association (APA), the person eventually learns to become their own therapist’.

Even though this project focuses on the recording of NATs which one aspect of the CBT procedure, there is a wide array of CBT techniques that are used which can address other mental or emotional challenges, namely coping with grief or loss, resolving relationship conflicts and overcoming trauma. There are also non-psychological issues, an example being managing chronic physical symptoms (Clinic 2019). Some researchers also reported in 2012 that an online self-help program for CBT was even beneficial for chronic back pain (FNP 2018). As one can interpret, cognitive behavioural therapy is an ‘umbrella term’ given to many different therapies which share common elements and follow similar protocol.

As discussed in subsection 1.1, what we think about determines our reality and actions. This is why analysing one’s thoughts and recording them makes the person is beneficial as it makes them more aware and self-reflective of their negative interpretations, and only then can they take steps to change their perceptions and behavior. The psychological distress that a person experiences can skew their interpretations of situations, and then the person’s behavioural patterns will further reinforce the distorted thinking (McLeod 2019), which is what CBT aims to confront; identifying the thoughts and when they occur can help to understand why these thoughts may be occurring and ensure that the sufferer does not get into a cycle of reoccurring negative automatic thoughts.

### **3.1.1 Rational Emotive Behaviour Therapy**

One way that causes the distortion in one’s mental representation of the world is through ‘irrational thinking’ as suggested by Albert Ellis in the 1950s. He



proposed that each of us hold a unique set of assumptions about ourselves and our world which determine our reactions to the various situations we encounter (McLeod 2019). Changing the irrational thoughts one holds to rational ones is the underlying concept of the original cognitive behaviour therapy called *Rational Emotive Behavior Therapy (REBT)*, which Ellis developed. The way that this therapy worked was defined by what Ellis called *the ABC model*.

### The ABC Model

The basic idea behind *the ABC model* is that ‘external events (A) do not cause emotions (C), but beliefs (B) and, in particular, irrational beliefs (IB) do’ (Sarracino et al. 2017). This model can also be referred to as *the ABCDE model* (Selva 2018), see below.

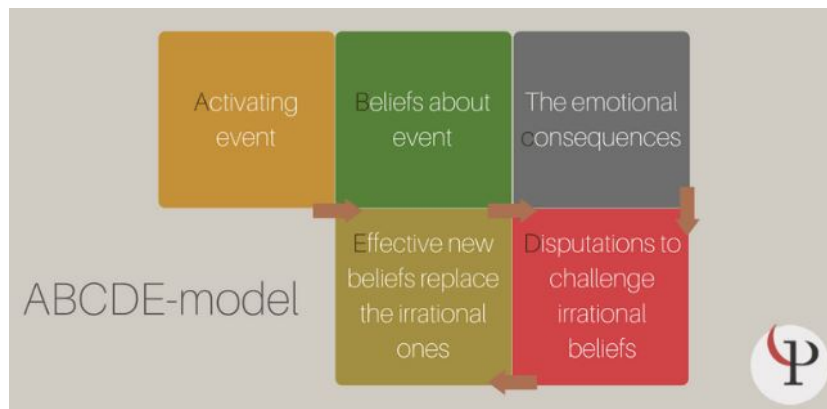


Figure 1: A flow chart for *the ABCDE model* (Selva 2018)

The visual above depicts a skeleton for the REBT process. (A) is the the event, scenario or stream of thoughts that led to the person feeling the unpleasant emotion; (B) is the rational or irrational belief that the person has as a result of (A); (C) is the emotional consequence as a result of the belief, which could be healthy or unhealthy respective to the rationality of the belief; (D) is the stage

where the person identifies their irrational thought; and (E) is where the person has changed their irrational thought into a rational one and therefore should experience a healthier emotional consequence (A) occurs again (Selva 2018).

This research is presented in this report as it is the underlying methodology to how cognitive behavioural therapy is done today, and the written method that this project aims to digitise uses this technique. As discussed in subsubsection 1.3.2, the ‘in-situation’ part of the app refers to A, B and C of *the ABCDE model*, and the ‘retrospective’ part referring to D and E. This will be shown in more detail in the design stage of the report (see section 4).

## **4 Design**

## **5 Implementation**

## **6 Evaluation**

## **7 Summary and Reflections**

## **8 Bibliography**

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## A Appendices