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Anti Anxiety Application

Bachelors of Science in Computer Science

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Bahria University
Islamabad Campus
(Department of Computer Science)

CERTIFICATE

We accept the work contained in the report titled "Anti Anxiety Application" as a confirmation to the required standard for the partial fulfillment the degree of BS(CS/IT)

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Acknowledgement

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Abstract

In this time and era, most people have started suffering from anxiety all over the world and a lot in Pakistan as well. Internationally , going to the psychiatrist is not considered as a taboo but in Pakistan going to a Psychiatrist is considered a taboo and people are straight out called or considered mental is even the mention of going to a psychiatrist is done. So to help people who are suffering with anxiety deal with this Taboo we have developed an application which will help the user lower their anxiety level through different means. The user wont have to go to the psychiatrist or a psychologist and just use our application to reduce their anxiety, we have added different methods through which the user can reduce his/her anxiety. The user can reduce their anxiety by listening to calm music which has been proven to help people with their anxiety or the user can also reduce their anxiety by reading motivational quotes and any one of these quote can by a mind changer or anxiety reducer for them, the user the can reduce their Anxiety by reciting the specific the surahs that help reduce anxiety or by reading the Duas that help with anxiety. We have also added a game which can help the user reduce their anxiety. The application that we have designed is targeting people of all ages so it will be able to help teenager, adults and even old people. The design of this application is user friendly making it easy for user of any age to use. Hence this application is beneficial for people of any age.

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1 Introduction

1.1 Introduction

Anxiety is the natural response of our body to stress, be it bursts of anxiety or permanent anxiety disorder. Lang PJ. Classified symptoms of anxiety into three-responses: worry (verbal subjective), avoidance (overt motor acts) and muscle tension (somato-visceral activity). Anxiety isn't necessarily a bad thing, it can help you stay focus and alarm and motivate you to solve your problems but if this worry and fear become constant or overwhelming then it crosses the normal line of anxiety and turns into an anxiety disorder. So that is why we made an application which helps people deal with their anxiety and also with their anxiety disorders.
There are different kinds of anxiety disorders but most of them become a group of mental illnesses as the distress you keep on carrying does not let you live a normal life. Around 50 million-plus people in Pakistan are dealing with anxiety and they don't have the proper means to help themselves, we aim to help these people. We have targeted the youth and the adults.This application contains calming music, games, motivating lectures and quotes; it has treatments from Sunnah and Quran section. Another thing that this application does is create a blog for the user automatically so that they can express themselves. There are different anti-anxiety applications in Google Playstore e.g. Happify, headspace, brain.fm etc.
Our application is different from them as it creates a blog and also has a "Shifa from Quran and Sunnah Section". This application has a series of questions at the start due to which we are able to define the anxiety level of the user and then treat them accordingly. We have developed this so that people dealing with mental health issues are not called psychotic or are not told they should be in mental hospitals or that they are attention seekers, just because they decided to open up about their anxiety. This application helps them deal with it silently.

1.2 Problem Description

We have developed an anti-anxiety application because around 50 million people suffer from depression in Pakistan and this number is increasing day-by-day. People in Pakistan believe that going to psychologists and physiatrist means you are psychotic. Mental health is not taken seriously in Pakistan, even though people are coming around it but they still have to come along away. If not treated on time, anxiety becomes one of the main causes of Mental illness. There are different types of anxiety disorders e.g. social anxiety, specific phobias, panic disorder, etc. Due to these reasons people especially the youth cannot be open about their anxiety and depression. Men in Pakistan don't accept their depression or anxiety as it will mean that they failed to cope with their responsibilities.Pakistan is a developing country so many of the things is going wrong, there isn't much social security, there is illiteracy, injustices and people are getting angrier and rational.

1.3 Existing Applications

Some applications exist for helping people lower their anxiety. The current problems are as follows:

1.3.1 Brain.fm

Brain.fm is also an application to relief stress and lower anxiety but this application's design is garish and is a bit buggy.

1.3.2 Headspace

This application charges cost for subscription if you want to access additional modules. This application needs discipline and commitment for regular practice.

1.3.3 Pacifica

This application is more expensive than any other application and requires subscription for full access.

1.4 Problem Statement

We have developed this application for people suffering from anxiety so that instead of going to psychologists and physiatrist they use this application because going to physiatrist is considered bad in Pakistan, people can easily download this application and reduce their anxiety by performing different kind of activities designed specially to reduce anxiety.

1.5 Objectives

- To reduce anxiety issues of people this can later result in major anxiety disorder and can be suicidal.
- To design such an app that can lower the anxiety level in people by listening to music, playing games, watching motivational videos, reading motivational quotes and also treat themselves using the Quran and Sunnah.
- To set up the relation between repeated peer exploitation and the start of self-described symptoms of anxiety or depression in people.

1.6 Scope

The scope of our project is that we have created an application that helps people who suffer from anxiety. Anxiety level of the user is determined using Beck Anxiety Inventory. This application has a feature where people can reduce their anxiety through Quran and Sunnah that can either be by listening to ayats or reading them, also this application creates a blog as soon as the user registers which is an exclusive from the applications that

have already been developed. This application also provides calming music, motivational speeches, quotes, and games to relieve stress. The users are asked to also review the methods every time they use them so that this information can be helpful for the current user in the future and for a new user to select the method for them.

2 Literature Review

Anxiety disorders are the most widespread mental disorder. There is a high probability of coexistence among anxiety disorders (especially generalized anxiety disorder or panic disorder), which makes treatment more difficult and complex. Current guidelines do not support benzodiazepines (also known as benzos, a class of psychoactive drugs that work in the central nervous system and are used for much more medical conditions) as a preferred treatment due to side effects.
Living with anxiety, panic disorder, or fear can make you feel as if you are not controlling your life. If you are ready to deal with the apprehensions that hold you back, then this application is going to guide you.
Smart phones and mobiles have become ubiquitous, and with rapid advances in technology, the number of health applications available to users is steadily increasing. In specific, concern has been the latest proliferation of applications. Nevertheless, little is known about the purpose of these concern applications, the features and functionalities that these applications have and support.
Currently, concern applications have the potential to increase access to mental health care. The ability to increase access to evidence-based mental health care gives these applications great assurance.

2.1 Research Papers

2.1.1 Generalized Anxiety Disorder (GAD) from Islamic and Western Perspectives

Although Generalized Anxiety Disorder (GAD) is different according to the Islamic perspective and the Western perspective, both of them are interrelated. Both Islamic and Western scholars agreed that GAD has the same effect even though both have different views in terms of its definition, causes and treatment. According to Islam, GAD is caused by spiritual interference while the anxiety and generalized anxiety disorder Western stated that GAD is derived from mental disorder. Most people who suffer from this disorder

will experience it again since the modern medical treatment is unable to cure the disease completely. A comparison has been done between western methods and Islamic methods to deal with anxiety. In this study the data of two patients has been studied, both patients had undergone Islamic psychotherapy intervention for one time only while the assessment for pre and post intervention was done by the psychiatrist at the same hospital. The instrument used was Hamilton Anxiety Rating Scale (HARS/HAM-A) and Parallel Analysis to measure the effectiveness of the Islamic psychotherapy intervention. It has been conducted from the study that both the patients had GAD and they had taken some medication to reduce it but there were very little positive implications however after they had gone under intervention using Islamic psychotherapy, there was a huge impact. Scores showed a significant decrease post and pre-intervention. Their levels of anxiety decreased from Stage 4 to stage 1 and 2 and moreover they had started to feel calmer even though they had undergone the intervention just done once by the researcher. Hence it is recommended to use spiritual treatment such as Islamic psychotherapy.

2.1.2 Can levels of a general anxiety-prone cognitive style distinguish between various anxiety disorders?

The question of whether some anxiety disorders are characterized by exaggerated perception of threat and future evaluation as particularly exaggerated for the future (general anxiety-prone cognitive style) is related to a cognitive style. The purpose of this study is to study generalized social anxiety disorder (SAD), generalized anxiety disorder (GAD), panic disorder with agoraphobia (PDA), and panic disorder without agoraphobia (PD) in the context of normal general anxiety-prone cognitive style levels. To do the severity of general distress and psychopathology is controlled for and to find out whether co-depressive disorder contributes significantly to levels of this cognitive style. The Anxiety Thought and Trend Scale, a measure of general anxiety-prone cognitive style, and symptom check 90 the revision was administered to 204 patients with various anxiety disorders who attended an outpatient anxiety disorder clinic and were diagnosed based on a semi structured diagnostic interview. Patients with major diagnoses of SAD and GAD had a more prominent anxiety-anxiety cognitive style than patients with major

diagnoses. PD and PDA when general distress and severity of psychotherapy were controlled. The presence or absence of co-occurring depressive disorder had no effect on this finding. The general cognitive component characterizes more PD and PDA than SAD and GAD, and a co-occurring depressive disorder does not affect this finding. These results have implications for distinguishing between different anxiety disorders.

2.1.3 Measuring Levels of Students' Anxiety in Information Seeking Tasks

This study measured anxiety information among postgraduate students of Punjab University, Lahore. A survey method that uses questionnaires was employed to conduct this investigation. The questionnaire contained an information-seeking anxiety scale and demographic variables administered to students, who were selected through a convenient sampling process for data collection. Results indicated that a large majority of respondents (n = 207, 82.4 percent) experienced more than less anxiety in the process of obtaining information. No significant relationship was found between age, gender, faculty, and information by looking at these students' anxiety scores. In contrast, there were significant differences in students' anxiety scores based on program of study, phase of study, and computer proficiency. The results provide useful insights to guide information professionals dealing with context and research services, particularly those engaged in designing information literacy curricula and managing information literacy instruction.

2.1.4 Comparison of Levels of Anxiety among Health Sciences Students

The efforts of medical and pharmacy students go through many challenges and difficulties to become medical doctors and pharmacists respectively. Some frustrations, fears, tensions, among others, were abused before they graduated. Whose anxiety level is high in these two sets of students? This study compares test anxiety levels among one-year medical and pharmacy students. A sample of 260 students from the Eastern University of the Republic of Turkey in Northern Cyprus was selected through simple random

sampling techniques in the 2015/2016 academic year. Correlation and regression were used to test the relationship between the variables and to review the best model. The Mann Whitney U non-parametric test was used to compare levels of anxiety among students because some assumptions about using the parameter test are violated. As a result, medical students and pharmacist students should not sign off on a significant difference between the anxiety levels, and the median anxiety scores of the medical students are higher than the mean anxiety scores of the pharmacy students.

2.1.5 Relations of the factors of the tripartite model of anxiety and depression to types of social anxiety

Our primary goal could be a many-sided model of hysteria and depression [Clark, L.A., Watson, D., et al. (1991) Examining the link of specific elements. many-sided models of hysteria and depression: psychological science proof and categorization implications. Journal of psychology, 100, 316–336], 2 styles of social anxiety (social communication anxiety and performance anxiety) and phobia in 148 people per previous analysis, overall social anxiety was a lot of closely associated with generalize have an effect on disorder emotional disturbance (AD) or physical hyper social issue than the low positive affect think about the many-sided model. However, as hypothesized, performance anxiety is a lot of closely related to physical health-related factors, whereas social intergenerational anxiety is a lot of closely related to AD, or a less positive have an effect on issue. We tend to expect correlations between covert mood and anxiety symptom questionnaires (mask; [Watson, D., Clark, L. A.), however not for social anxiety, insignificant anxiety, and depression for related to and sensory validity. The findings of this study offer an in depth description of the specificity of the many-sided model, that addresses the range of symptoms related to phobia.

2.1.6 Juvenile mental health histories of adults with anxiety disorders

Data on the mental histories of adults with anxiety disorder were investigated shape nosology and prevention efforts. Researcher created a psychiatrist

using data from a longitudinal study of birth cohorts aged 11 to 32 years (N = 1,037) Diagnosed according to DSM criteria. For adults aged 32 with anxiety disorders, follow the first diagnosis of anxiety and other childhood disorders. With adults for each type of anxiety disorder, approximately half were diagnosed with a mental disorder (One-third of anxiety disorder) by the age of 15 years. Histories of anxiety and depression are high general. For example, adults with panic disorder have no history of childhood disorders; whereas people with other anxiety disorders did. Was for adults with post-traumatic stress disorder a history of behavior disorder, people with other anxiety disorders do not. With adults specific fear had a history of childhood fear, but there were no other disorders. So it was he concluded that there is a strong affection between different anxiety disorders and those without specificity developmental histories of adults with anxiety disorders support a hierarchical approach typical, individual disorder is present within a wide range of anxiety disorders.

2.1.7 A longitudinal study of affective and anxiety disorders, depressive affect and diabetes distress in adults with Type 2 diabetes

The purpose of this study is to report the prevalence and correlates of vulnerability and anxiety disorders, prevalence of depression, and diabetes over time. In a non-intervention study, 506 patients with type 2 diabetes were evaluated 3 times in 18 months (9 - month intervals) for: major depressive disorder (MDD), generalized anxiety disorder (GAD), panic disorder (PANIC), Dysthymia (DYS) Depression Impact [Epidemiology Center studies-Depression (CES - D)]; Level of diabetes mellitus (TDS); HbA1c; And the population information. Diabetic patients showed greater prevalence and anxiety disorders over time, compared to social adults: 60 percent for MDD, 123 percent for GAD, 85 percent for PANIC, 7 percent DYS. The prevalence of depression and generalizability of distress was greater than 60–737 percent affect and anxiety disorders. The general nature of the affected individual patients and anxiety disorder over 18 months is more than twice the estimated rate in any single wave. The increase for CES - D and DDS is 60 percent. Stability of CES - D and DDS disorders, the prevalence of anxiety and anxiety disorders over time was significantly higher than this,

which was episodic. Associated with younger age, female sex, and the persistence of all conditions over time.HbA1c is positively associated with CES - D and DDS, But over time, vulnerability and anxiety disorders are not. High generality of complexity the prevalence of disorders and depression and over time diabetes distress are highlighted repeat mental health and diabetes testing is required for every patient, not just occasionally, but especially for younger adults, women and those with problems.

3 Requirement Specification

3.1 Purpose

We have built an application that help people control their anxiety level. Most of the people are suffering from some serious anxiety issues and they are not able to understand the reason for their anxiety and how they can prevent these issues. Our application aware them about anxiety, anxiety related issues and will provide them with several activities that will help them lower their anxiety.

3.2 Methodology

The user first register in our application so that an account is made also a blog is created for the user after they have verified themselves. The user then receives verification code that he/she have to enter to register to the application so that there is no authentication and authorization error. Moving on the user is asked to rate if they are feeling numbness, wobbliness in legs, etc. all these symptoms are measured using an anxiety scale called Beck Anxiety Inventory, which is verified by the psychologist. Then using this scale the application tells the user the level of their anxiety. After measuring anxiety our application shows them ways to lower their anxiety. Then the application shows the user a set of activities according to their level of anxiety, which are designed by the user to lower their anxiety. The set of activities includes listening to music, playing games, watching a motivational video, teachings from the Quran and Sunnah for Shifa. After using a method the user is asked to review that method telling how much this method has helped them with their anxiety, this data is saved which is used in the future in two ways. One, after using the application for 2 months this data is showed to them in a form of a chart, telling them what method helped them to some extent with their anxiety and it also shows them their previous record of anxiety. Secondly, this data helps new users by telling them the ratings of the methods so that they can choose accordingly. Anxiety level test of the user is done monthly. We have used the incremental development methodology for our project.

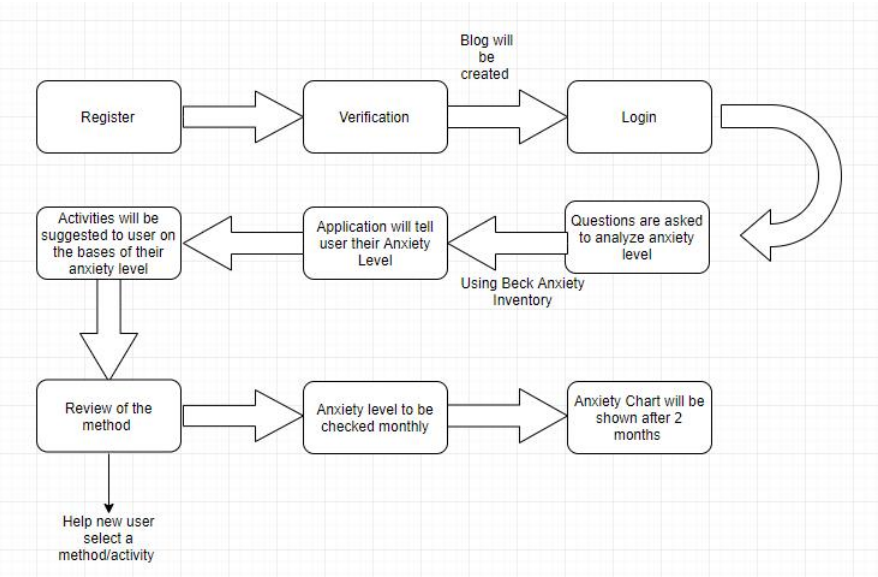

Figure 1: Methodology

3.2.1 Beck Anxiety Inventory

The scale we have used in our application Beck Anxiety Inventory (BAI). It is designed for individuals who are 17 years of age or older. Several studies stated that beck anxiety lists to be an accurate measure of anxiety symptoms in children and adults. This is a 21 multiple-choice self-report list that measures the severity of anxiety symptoms in children and adults. Questions are about common symptoms of anxiety such as numbness and tingling, sweating not due to heat etc. Each answer is scored on a scale of 0 (not at all) to 3 (severely).

	Not at all	Mildly, but it didn't bother me much	Moderately – it wasn't pleasant at times	Severely – it bothered me a lot
All questions	0	1	2	3

Figure 2: BAI Ratings

The score is calculated by finding sum of 21 items.

- 0-21= Low Anxiety
- 22-35= Medium Anxiety
- 36 and above= Certainlly concerning levels of anxiety

Below is the list of some questions. The users have to read them carefully and indicate how much they have been bothered about these symptoms during past month.

	Not at all	Mildly, but it didn't bother me much	Moderately – it wasn't pleasant at times	Severely – it bothered me a lot
Numbness or tingling	0	1	2	3
Feeling hot	0	1	2	3
Wobbliness in legs	0	1	2	3
Unable to relax	0	1	2	3
Fear of worst happening	0	1	2	3
Dizzy or lightheaded	0	1	2	3
Heart pounding / racing	0	1	2	3
Unsteady	0	1	2	3
Terrified or afraid	0	1	2	3
Nervous	0	1	2	3
Feeling of choking	0	1	2	3

Figure 3: BAI Questions

3.3 Overall Description

3.3.1 Product Functions

The main functionality that our product provides is:

- Measuring anxiety level using Beck anxiety Inventory.
- Recommend activities based on user's anxiety level.
- Ask user to rate the activity they performed.
- The user can view their record after every two months in the form charts.
- Every month user's anxiety level is recalculated.
- Recommend activities to new users based on ratings.

3.3.2 Operating Environment

Our application is an android application.

3.4 System Requirements

3.4.1 Functional Requirements

Following are the functional requirements:

- The user shall have internet access while opening the application.
- The user must be registered with our application in order to use it.
- As the user opens the application, he should login using his credentials.
- In order to measure Anxiety level the user must fill the questionnaire.

3.4.2 Non Functional Requirements

Following are the non functional requirements:

- Application is reliable.
- Accuracy rate is better than existing application.
- Interface of application is user friendly and simple.
- The application can shut down and restart due to any error.

3.5 Use Case

The Use cases of the project are following:

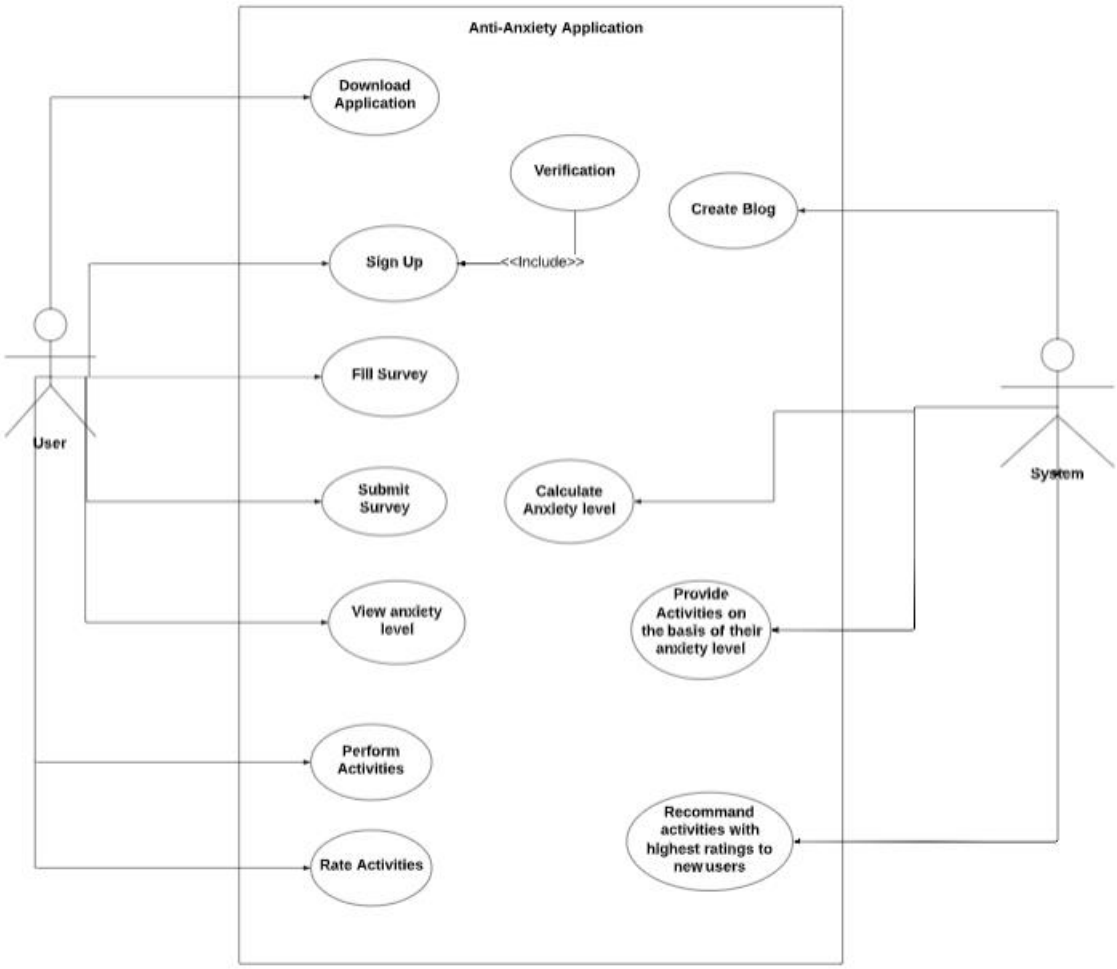

Figure 4: Use Case Diagram

Table 1: Download Application Use Case Description

Use Case ID	UC-01
Use Case Name	Download Application.
Actors	User.
Description	This use case allows the user to download the application.
Pre-Condition	Wifi connectivity.
Post-Condition	Application installed.

Table 2: Sign Up Use Case Description

Use Case ID	UC-02
Use Case Name	Sign Up.
Actors	User.
Description	This use case allows the user to make their own account in order to use the application and control their anxiety issues.
Pre-Condition	Application installation.
Post-Condition	Sign up successfully.

Table 3: Create Blog Use Case Description

Use Case ID	UC-03
Use Case Name	Create Blog.
Actors	System.
Description	This use case allows the system to create the blog for user so that the user can share their thoughts with others and can learn from other users as well.
Pre-Condition	Account Creation.
Post-Condition	Blog Created successfully.

Table 4: Fill Survey Use Case Description

Use Case ID	UC-04
Use Case Name	Fill Survey.
Actors	User.
Description	This use case allows the user to fill the survey provided by the application to know their anxiety level.
Pre-Condition	Login/Signup.
Post-Condition	System analyzes user anxiety level.

Table 5: Measure Anxiety Level Use Case Description

Use Case ID	UC-05
Use Case Name	Measure Anxiety Level.
Actors	System.
Description	This use case allows the system to calculate the anxiety level based on the survey. The application uses beck inventory scale for measuring anxiety level.
Pre-Condition	Fill survey.
Post-Condition	Anxiety level measured.

Table 6: View Anxiety Level Use Case Description

Use Case ID	UC-06
Use Case Name	View Anxiety Level.
Actors	User.
Description	This use case allows the user to know their anxiety level and work on lowering their anxiety level.
Pre-Condition	Anxiety level calculation.
Post-Condition	Anxiety level viewed.

Table 7: Suggests activities Use Case Description

Use Case ID	UC-07
Use Case Name	Suggests activities based on their Anxiety Level.
Actors	System.
Description	This use case allows the system to suggest the users some activities which will help user lower their anxiety level e.g. listening to music, playing games, Ayats from Quran and Sunnah , motivational videos etc.
Pre-Condition	Measuring anxiety level.
Post-Condition	Activities suggested on the basis of their anxiety level.

Table 8: perform activities Use Case Description

Use Case ID	UC-08
Use Case Name	perform activities.
Actors	User.
Description	This use case allows the users to perform activities either suggested by the system or activities of their own choice.
Pre-Condition	Anxiety level has been defined.
Post-Condition	Activities performed.

Table 9: Rate Use Case Description

Use Case ID	UC-09
Use Case Name	Rate activities.
Actors	User.
Description	This use case allows the users to rate the activities they performed so the system can save the rating in the database and can suggest new users to perform the activities with more ratings or the activities that gave more benefit to the users.
Pre-Condition	User performs activities.
Post-Condition	Activities reviwed.

3.6 Entity Relationship Diagram

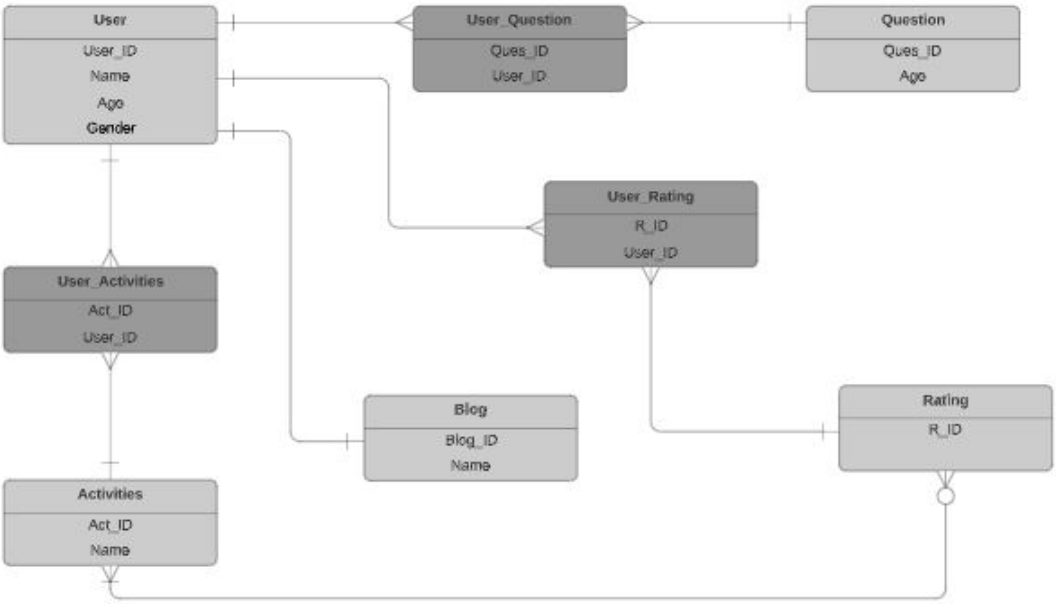

Figure 5: Entity Relationship Diagram

4 System Design

In this chapter we will discuss the further details of the functionality of the project and explain architecture of the project.

4.1 User Interface

The user interface of our application is software only. It has two modules one is mobile and other is web.
Our android application is made up of two parts like every other android application:

- The front end
- The back end

The front end is visual part of application that the user interacts with. The front end is written using XML.
The back end is where we implement functionalities. The back end is written using Java language.
The database we have used is the Firebase database. Firebase is a real-time and cloud-based database where you can store data JSON and is continuously synchronized for all connected clients. We can use offline Firebase; Data hosted on the cloud is also available locally on our system. Even if you are offline and there are some changes in the actual data or changes on the server, the user will get notified about the changes as soon as they come online and the changes will be updated on the local machine as well. There is no need for a specific application that can be directly accessed. As firebase is real-time database objects can be created at any time.

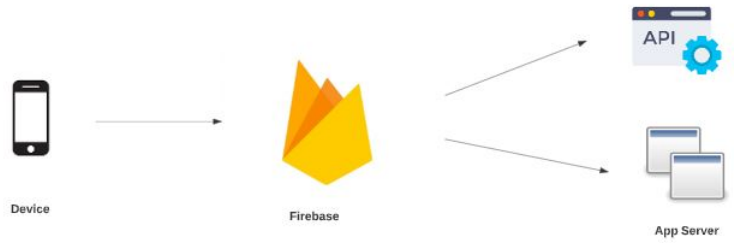

Figure 6: Back End Function

4.2 Low Level Design

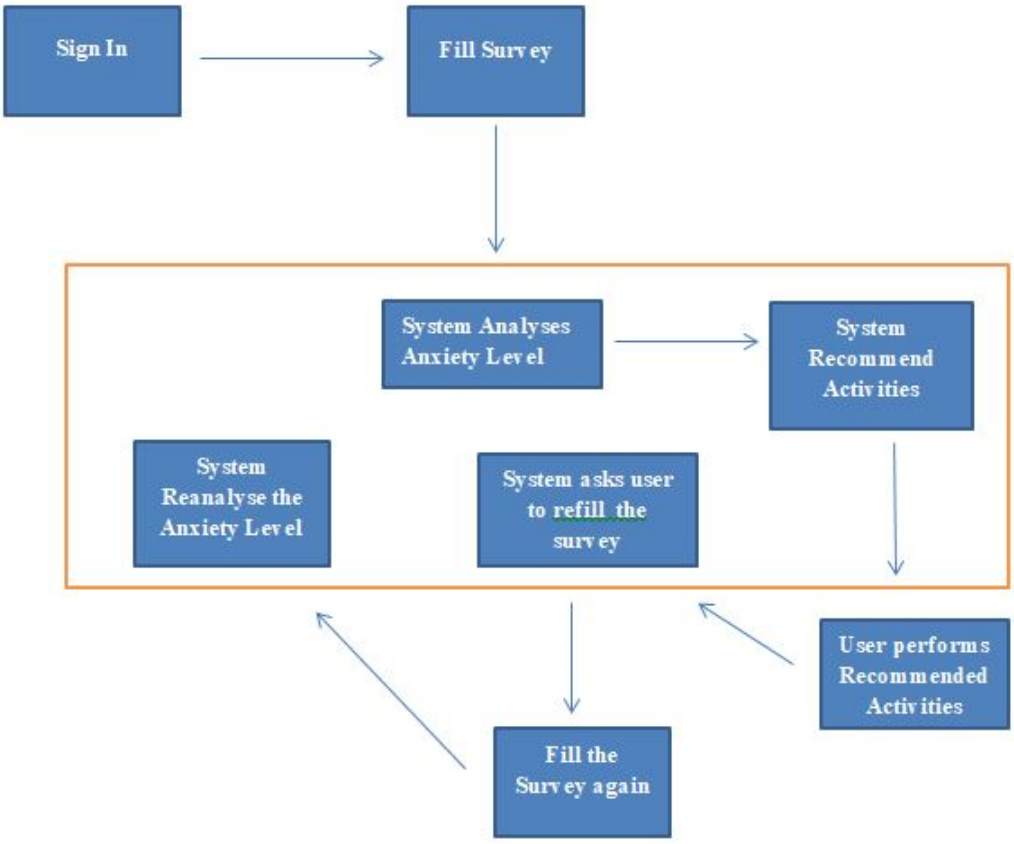

Figure 7: Low Level Design

4.3 High Level Design

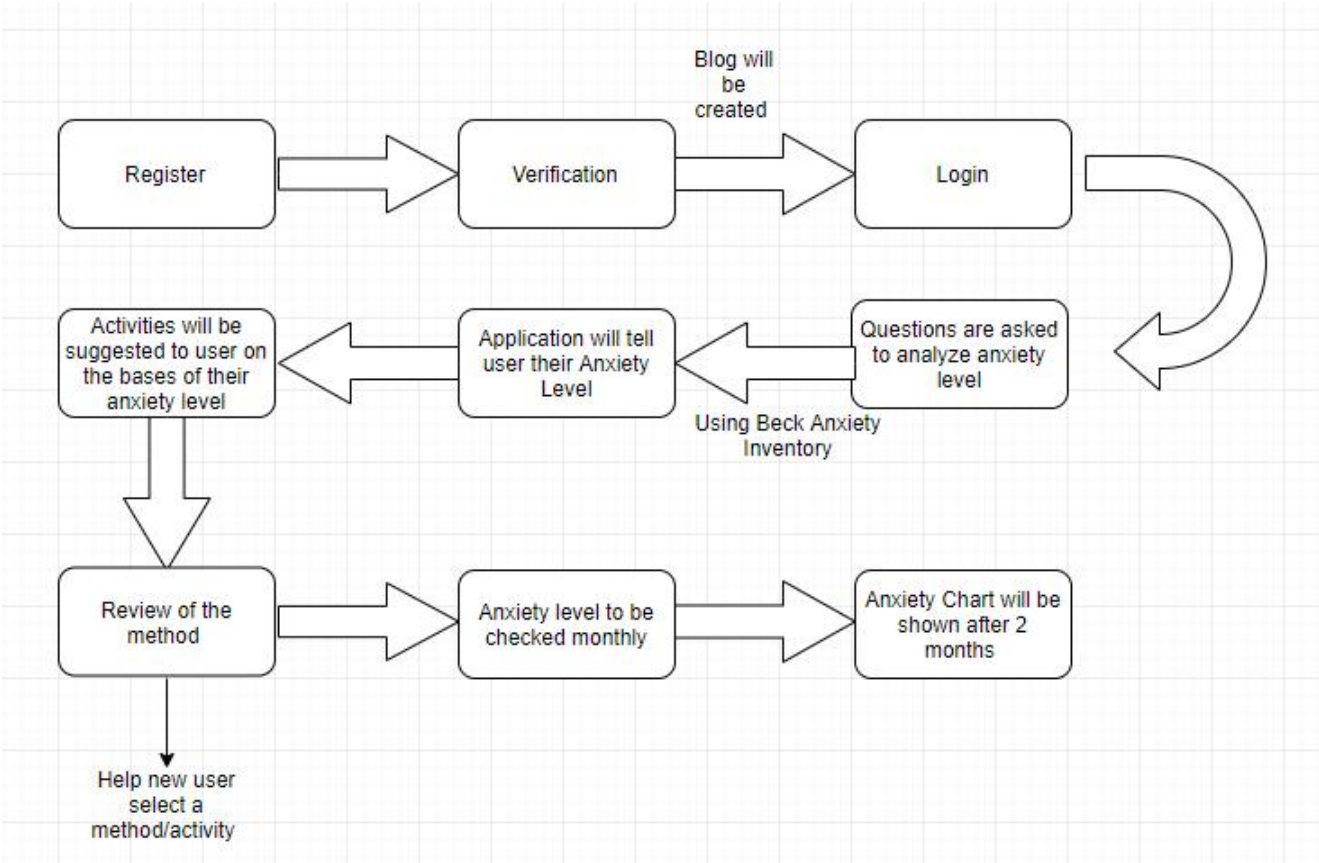

Figure 8: High Level Design

4.4 Activity Diagram

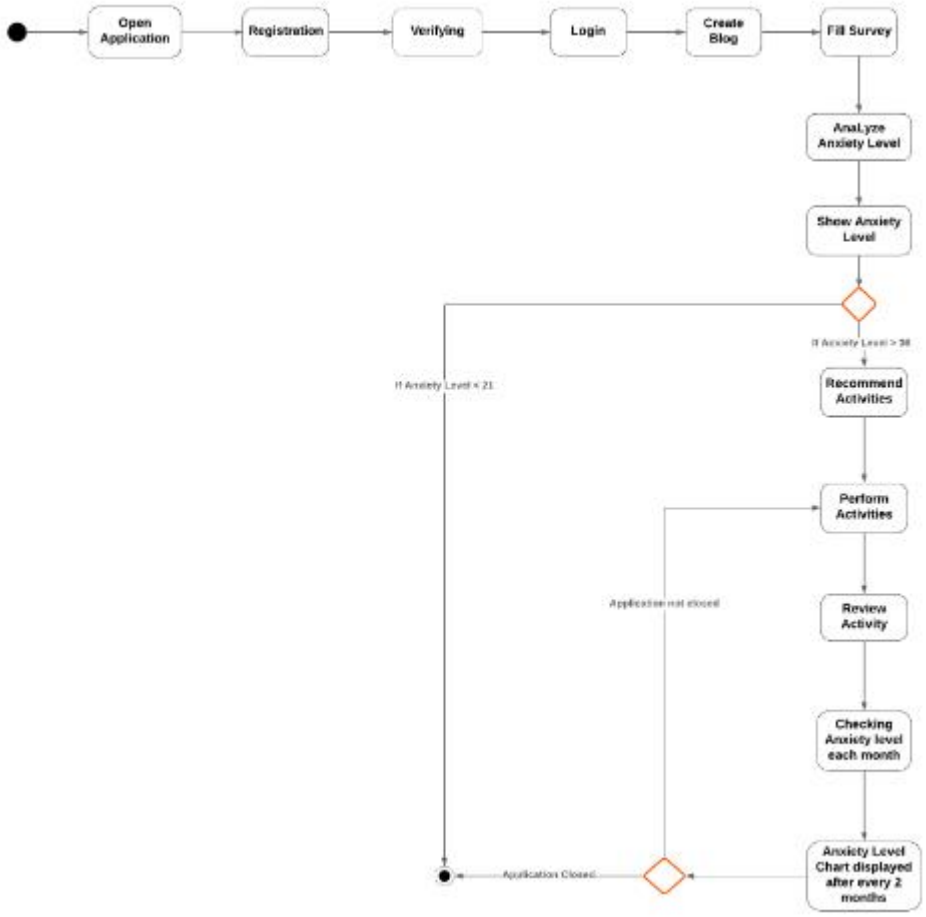

Figure 9: Activity Diagram

4.5 Sequence Diagram

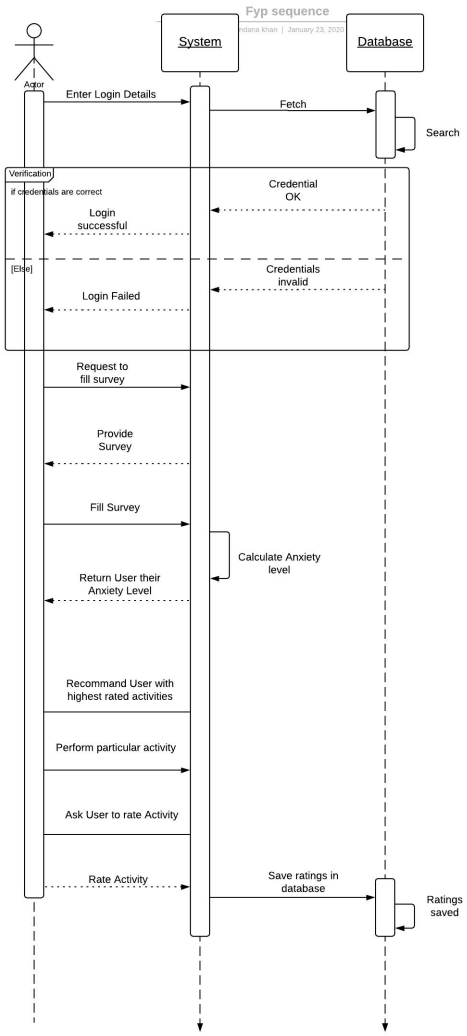

Figure 10: Sequence Diagram

5 System Implementation

In this chapter we have discussed languages, tools and technologies that are used to implement the application.

5.1 Working

Following is the basic working of our application.

- Our application is an android based application.
- First the user login, the user will fill the survey.
- The system will evaluate the anxiety level of the user based on the survey they filled.
- If the anxiety level of the user is greater than 36, the system will recommend user some activities. The users can perform these activities to lower their anxiety level.
- The system will also maintain the track record of the anxiety level of our users.
- After every two months the system will provide the statistics of their record.
- Through this statistics the user will be able to know their progress.

5.1.1 Application Interface

Sign Up :
Our Application has different interface screens. First screen contains user login and sign up button. New user must register first with the required details by clicking on Sign up button then he can login. No user can login if he is not registered.

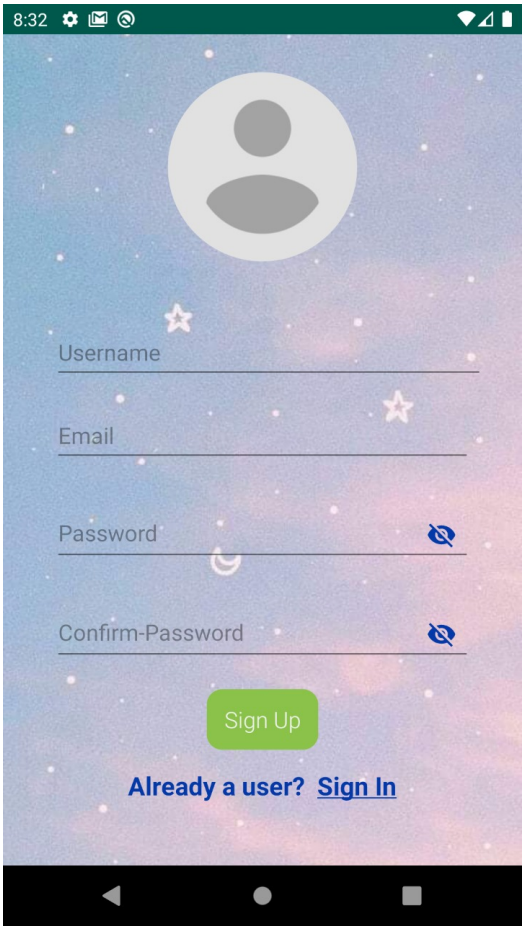

Figure 11: Sign Up

Survey Questions :
After sign up the user will be asked to answer some questions as we have used Beck Anxiety Inventory the user will have to answer 21 questions.On the basis of these questions user's anxiety level is determine.

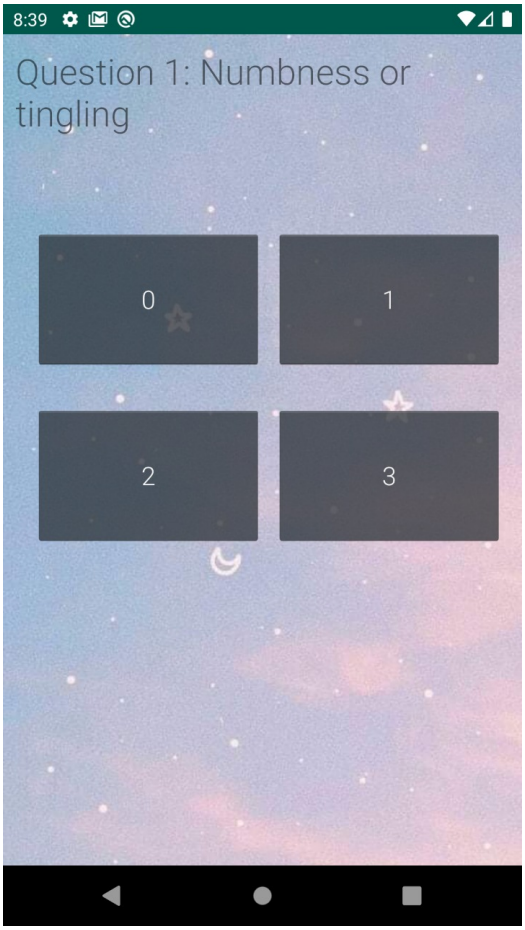

Figure 12: Questions that are asked to determine anxiety level

Remedies :
After anxiety level of user is determined the user will be showed some categories. The user can choose any category. We have the option of treating through quran, in which there are options like through recitation of quran, or reading duas or reading the ayate sakina which has some of the ayats of surah baqra.

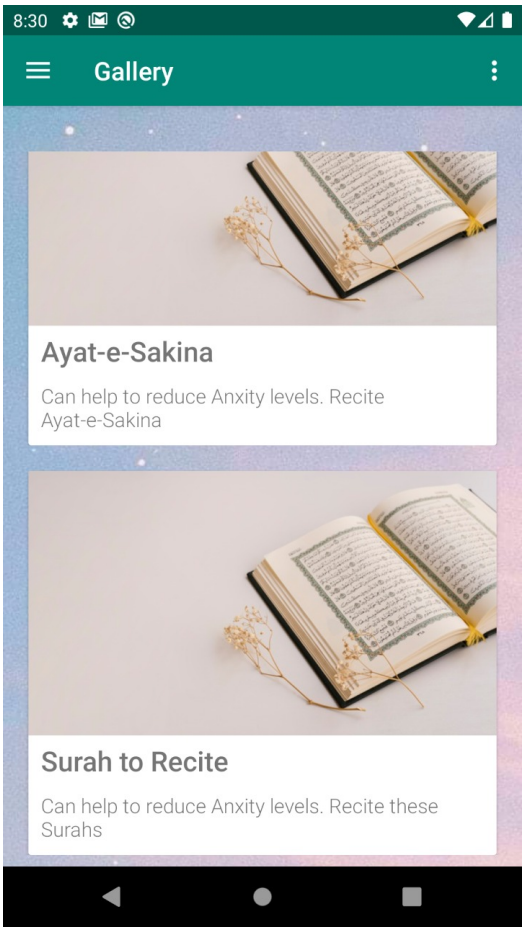

Figure 13: Surats to Recite

Figure 14: Ayat-e-Sakina

5.2 Tools and Technologies

The tools and technologies that are used in the development of Anti-Anxiety Application are as following:

- Android Studio
- Java
- XML

- Firebase Cloud Storage

5.2.1 Android Studio

Android Studio is the official IDE (Integrated Development Environment) for Google developing systems. It is used to develop applications for android devices. It supports two languages Java and Kotlin. We have used it for development and debugging purpose. It has an Android software development kit used for developing, debugging, evaluating, designing and running of the application. Moreover it has different plugins and graddle. As our application is for android devices so we have used android studio for development.

5.2.2 Firebase Cloud Storage

Firebase cloud storage is an object storage service that allows storing and managing media like images, videos and audio generated by mobile application user. It is simple, powerful, secure and reliable storage service by Google. In our application we have used the firebase cloud storage to store the data of the users having anxiety problems like their name, age, anxiety level and user's previous track record etc.

5.3 Languages

Following programming languages are used in our application:

- Java
- XML

5.3.1 Java

Java is a programming language used to create software and applications for multiple platforms. Java languages are similar to C and C ++, its syntax is

almost identical. As we know the android studio supports two languages Java and Kotlin. We have used Java language for developing our application. Java is widely used programming language for developing mobile applications. We have used java language, its libraries and functions to code our application.

5.3.2 XML

XML is a mark-up language just like HTML. It is used for interface layout design in android studio. We have used XML for designing the interface layout of our application. We have used XML inside Android Studio for rich Graphical User Interface. Android Studio used this language for front-end design to create the GUI. As designing GUI is an essential part of development as user is going to interact with application through GUI.

6 System Testing and Evaluation

6.1 Software Testing Techniques

In this chapter we discussed various software testing techniques. Testing is a very important part of software development phase. With these techniques we can evaluate the performance and working of software. To make sure that it will fulfil the functional requirements, mentioned before, of the software. Some of these techniques are:

- Functional Testing
- Performance Testing
- Acceptance Testing
- Graphical User Interface (GUI) Testing
- Compatibility Testing

6.1.1 Functional Testing

In this part system is checked with respect to its functional requirements:

- **Unit Testing**
  In this part we test each module of the product individually. Each module is tested one by one to check if it is working properly. It helps to find those modules that have some issues, so we can solve those issues easily. In our application we have different modules like login, anxiety measurement, activities the user perform to lower their anxiety level. We tested all of them individually.
- **Integration Testing**
  It is a process of testing where different modules are gathered or integrated then tested. It helps to find whether modules after integration

work correctly or not? In our application we tested modules after integration as they were completed. First, we performed unit testing on login and anxiety measurement module individually, now we performed integration testing to check do they work correctly together and same for other modules as they were completed. It also helps to check the performance of the application.

- **System Testing**
  In this testing we tested system as a whole. Once the whole system is complete then system testing is performed to check the performance and working of the system after integrating all the modules. We integrated all the modules like login, anxiety measurement, activities then tested system as a whole.

- **Black Box Testing**
  In black box testing output is checked with respect to the functional specifications by giving input. In this the internal implementation is not checked. In our system we checked the output by filling the survey for measuring anxiety level to see whether the results are accurate or not.

- **White Box Testing**
  In this part we check the internal architectures implementation of application whether it is performing fine. In our application for analysing anxiety level we have used Beck Anxiety Inventory scale. We also used firebase for data storage. We tested all of these; data storage is being saved and retrieved successfully.

6.1.2 Performance Testing

We checked performance of the application.

- **Stress Testing**
  We checked the application with specific load of it. The behaviour of the application is checked by installing this application to maximum devices.

- **Security Testing**
  In this part we check the security requirements of the application. In our application no unauthorized user can access the application. If our application the user having anxiety problems first will have to register themselves and then using that account only they can access the application.

6.1.3 Acceptance Testing

In this part we checked whether the main requirements of the application are fulfilled or not. We checked all the functional requirements which we defined which earlier in objective section are achieved or not.

6.1.4 Graphical User Interface Testing

In GUI testing we checked the application's interface behaviour with respect to user. We checked the screens with the controls like labels, buttons and icons. We checked that button size is constant; colour of label text is same.

6.1.5 Compatibility Testing

Compatibility testing is process in which the product is examined across different types of platforms that it supports. Since our application is Android based, it runs on different versions of Android successfully.

6.2 Test Cases

Table 10: Install Application Test Case Description (Positive)

Test Case ID	TC-01
Unit of Test	Test to verify application is installing.
Test Setup	Android device and Internet.
Expected Steps to be Executed	Open the application apk from where the file was saved.
Expected Result	Application should be installed.
Actual Result	Pass.

Table 11: Install Application Test Case Description (Negative)

Test Case ID	TC-02
Unit of Test	Test to verify application is not installing.
Test Setup	Android device and Internet.
Expected Steps to be Executed	Application apk cannot be opened.
Expected Result	Application should not be installed.
Actual Result	Pass.

Table 12: Open Application Test Case Description (Positive)

Test Case ID	TC-02
Unit of Test	Test to verify application is opening.
Test Setup	Android device.
Expected Steps to be Executed	Click on application icon on main screen.
Expected Result	Application should be opened.
Actual Result	Pass.

Table 13: Open Application Test Case Description (Negative)

Test Case ID	TC-04
Unit of Test	Test to verify application is not opening.
Test Setup	Android device.
Expected Steps to be Executed	Cannot click on application icon on main screen.
Expected Result	Application should not be opened.
Actual Result	Pass.

Table 14: Register User Test Case Description (Positive)

Test Case ID	TC-05
Unit of Test	Test to verify user is being registered.
Test Setup	Internet Availability.
Expected Steps to be Executed	Open application. Click on register. Fill all the form fields. Click sign up.
Expected Result	User should be registered.
Actual Result	Pass.

Table 15: Register User Test Case Description (Negative)

Test Case ID	TC-06
Unit of Test	Test to verify user is not being registered.
Test Setup	Internet Availability.
Expected Steps to be Executed	Cannot open application. Cannot click on register. Cannot fill all the form fields. Cannot click sign up.
Expected Result	User should not be registered.
Actual Result	Pass.

Table 16: User Login Test Case Description (Positive)

Test Case ID	TC-07
Unit of Test	Test to verify user is login successfully.
Test Setup	Internet Availability.
Expected Steps to be Executed	Open application. Fill all the required fields like email and password. Click login.
Expected Result	User should be login.
Actual Result	Pass.

Table 17: User Login Test Case Description (Negative)

Test Case ID	TC-08
Unit of Test	Test to verify user cannot login successfully.
Test Setup	Internet Availability.
Expected Steps to be Executed	Cannot open application. Cannot fill all the required fields like email and password. Cannot click login.
Expected Result	User should not be logged in.
Actual Result	Pass.

Table 18: Fetching Survey Test Case Description (Positive)

Test Case ID	TC-09
Unit of Test	Test to verify the system fetches the survey from database successfully.
Test Setup	Internet Availability, android device.
Expected Steps to be Executed	System fetches survey from database.
Expected Result	The user is able to fill the survey.
Actual Result	Pass.

Table 19: Fetching Survey Test Case Description (Negative)

Test Case ID	TC-10
Unit of Test	Test to verify the system fetches the survey from database not successfully.
Test Setup	Internet Availability, android device.
Expected Steps to be Executed	System cannot fetch survey from database.
Expected Result	The user is not able to fill the survey.
Actual Result	Pass.

Table 20: Measuring Anxiety Level Test Case Description (Positive)

Test Case ID	TC-11
Unit of Test	Test to verify the system is measuring anxiety level accurately.
Test Setup	Internet Availability, android device.
Expected Steps to be Executed	The user fills the survey. Clicks submit.
Expected Result	The users are able to know their anxiety level.
Actual Result	Pass.

Table 21: Measuring Anxiety Level Test Case Description (Negative)

Test Case ID	TC-12
Unit of Test	Test to verify the system is not measuring anxiety level accurately.
Test Setup	Internet Availability, android device.
Expected Steps to be Executed	The user cannot fill the survey. Cannot click submit.
Expected Result	The users are not able to know their anxiety level.
Actual Result	Pass.

Table 22: Fetching Quran and Sunnah Test Case Description (Positive)

Test Case ID	TC-13
Unit of Test	Test to verify the system fetches the Quran and Sunnah from database successfully.
Test Setup	Internet Availability, android device.
Expected Steps to be Executed	The user will be asked to select a category of activities such as Quran and Sunnah, music or games etc.
Expected Result	The content from Quran and Sunnah will be displayed to the user.
Actual Result	Pass.

Table 23: Fetching Quran and Sunnah Test Case Description (Negative)

Test Case ID	TC-14
Unit of Test	Test to verify the system fetches the Quran and Sunnah from database not successfully.
Test Setup	Internet Availability, android device.
Expected Steps to be Executed	The user will not be asked to select a category of activities such as Quran and Sunnah, music or games etc.
Expected Result	The content from Quran and Sunnah will not be displayed to the user.
Actual Result	Pass.

Table 24: Fetching Music Test Case Description (Positive)

Test Case ID	TC-15
Unit of Test	Test to verify the system fetches the music from database successfully.
Test Setup	Internet Availability, android device.
Expected Steps to be Executed	The user will be asked to select a category of activities such as Quran and Sunnah, music or games etc.
Expected Result	The content from music category will be displayed to the user.
Actual Result	Pass.

Table 25: Fetching Music Test Case Description (Negative)

Test Case ID	TC-16
Unit of Test	Test to verify the system fetches the music from database not successfully.
Test Setup	Internet Availability, android device.
Expected Steps to be Executed	The user will not be asked to select a category of activities such as Quran and Sunnah, music or games etc.
Expected Result	The content from music category will not be displayed to the user.
Actual Result	Pass.

Table 26: Fetching Motivational Videos/Quotes Test Case Description (Positive)

Test Case ID	TC-17
Unit of Test	Test to verify the system fetches the motivational Quotes from database successfully.
Test Setup	Internet Availability, android device.
Expected Steps to be Executed	The user will be asked to select a category of activities such as Quran and Sunnah, music or games etc.
Expected Result	The content from motivational category will be displayed to the user.
Actual Result	Pass.

Table 27: Fetching Motivational Videos/Quotes Test Case Description (Negative)

Test Case ID	TC-18
Unit of Test	Test to verify the system fetches the motivational Quotes from database not successfully.
Test Setup	Internet Availability, android device.
Expected Steps to be Executed	The user will not be asked to select a category of activities such as Quran and Sunnah, music or games etc.
Expected Result	The content from motivational category will not be displayed to the user.
Actual Result	Pass.

Table 28: Reviewing Activities Test Case Description (Positive)

Test Case ID	TC-19
Unit of Test	Test to verify the user review activities successfully.
Test Setup	Internet Availability, android device.
Expected Steps to be Executed	The user will be asked to review the activity they performed. User enters submit.
Expected Result	The activities will be reviewed.
Actual Result	Pass.

Table 29: Reviewing Activities Test Case Description (Negative)

Test Case ID	TC-20
Unit of Test	Test to verify the user review activities not successfully.
Test Setup	Internet Availability, android device.
Expected Steps to be Executed	The user will not be asked to review the activity they performed. User cannot enter submit.
Expected Result	The activities will not be reviewed.
Actual Result	Pass.

7 Conclusion

7.1 Conclusion

Our main objective was to build an android based application that reduces anxiety issues of people that can later result in major anxiety disorder and can be suicidal. We have designed this application that can lower the anxiety level in people by listening to music, playing games, watching motivational videos or reading motivational quotes and can also treat themselves using Quran and Sunnah. But before that anxiety level will be calculated. To calculate the anxiety level accurately we have used Beck Anxiety Inventory. BAI is a scale widely used for measuring anxiety level. We did not use any hardware or sensors; we have just used a mobile phone.

7.2 Future Work

In Pakistan 68 percent of people use android platform, it means that not only upper class but also the middle and lower-class people use android devices. We wanted to target the larger people, so we choose this platform. In near future we want to make application for other platforms also like IOS. More ever, we will add new modules that can give more accurate results.

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