



GP-1 REPORT



SAFE HAVEN

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Table of Contents

1. Introduction	1
1.1 Motivation and Justification.....	1
1.2 Problem Statement	1
1.3 Proposed Solution	1
2. Market Feasibility Study	2
2.1 Market Survey.....	2
2.1.1 Survey.....	2
2.1.2 Competitors	2
2.2 Feasibility Study	3
2.2.1 Market Analysis.....	3
3. Modules	6
3.1 AI Chat Bot	6
3.2 Suicide Ideation Detection.....	6
3.3 Support Groups.....	6
4. System Design and Architecture	7
4.1 System Architecture.....	7
4.2 Block Diagram	7
4.3 Modules Diagrams	8
4.3.1 Journal.....	8
4.3.2 Chat Bot	8
4.3.3 Support Groups.....	9
5. Time Plan.....	10
6. Task Division.....	11

1. Introduction

1.1 Motivation and Justification

Mental health is a taboo in Egypt. This notion made us think of a way in which we can raise awareness to seamlessly tackle such an issue. Psychotherapy is presented with various challenges which can be classified into 2 categories. The first one is concerned with logistics and the second one is concerned with the humanitarian aspect of psychotherapy.

Speaking of logistics, not only is psychological therapy extremely costly, but also the patient's inability to commit to his/her therapy sessions due to a myriad of reasons such as long commute times hinders their recovery. Moreover, a patient's medical file is prone to loss or corruption in case it was not handled properly which sabotages the treatment pipeline.

Speaking of the humanitarian aspect of psychotherapy, many cases are prone to sudden relapses, for instance addiction and suicidal patients, and it is usually too late to save them before their relapse. Furthermore, late diagnoses can pose their hazardous repercussions on both the therapist and the patient. Lastly, one of the multitudinous challenges ahead of the patient is the feeling that he/she is the only one suffering.

All of the aforementioned reasons made us consider tackling such an issue in our graduation project owing to the fact that mental health is directly related to the well-being of the person who is the fundamental building unit of the society.

1.2 Problem Statement

Helping depression and anxiety patients cope with their condition at more ease and flexibility.

1.3 Proposed Solution

Our application, 'Safe Haven', acts as a tool that helps the therapist to monitor the patient more closely and follow up regularly which enhances the whole healing process. Moreover, this application has 3 modules; our AI chat bot, our suicide ideation detection journal and finally our support groups service accompanied by extra features that further enhance our user's experience.

2. Market Feasibility Study

2.1 Market Survey

2.1.1 Survey

We need to properly distribute the survey among many segments with respect to their educational, financial, societal levels, age and gender. This is crucial to end up with a survey that represents the population accurately. This would need ample time and resources which requires us to hire a surveyor association for optimal results.

2.1.2 Competitors

In Egypt, one of the currently available solutions is 'Shezlong'. It is the first online platform in the Middle East and Africa that helps you book online therapy sessions from anywhere at any time. However, it does not integrate AI in the process and it only serves as a link between the therapist and the patient.

One of the solutions that we came across was emotional extraction through videos and pictures. However, this method is not accurate enough yet to be able to detect depression. It is limited to basic emotions such as happiness and sadness. There also exists types of depression such as masked depression where the patient could appear normal and happy despite their suffering.

'Youper' is a mobile application that provides a personalized emotional health assistant to help treat stress, anxiety, and depression. The app uses techniques from several therapies, including CBT and mindfulness, to monitor and improve mental health through a series of brief conversations.

2.2 Feasibility Study

2.2.1 Market Analysis

- Market Outline:

Our Market	Mobile applications for linking doctors with patients, booking online sessions and psychological diagnosis
Target Audience	People who need psychological assistance
Competitors	<ul style="list-style-type: none"> ▪ Shezlong ▪ Youper ▪ Vezeeta ▪ Bloom
Customer Wants	<ul style="list-style-type: none"> ▪ Stress and depression diagnosis ▪ Anonymity and privacy ▪ Easier way of communicating through online sessions ▪ Trusted diagnosis and treatment ▪ Communicating with people with similar concerns
Services Offered by Competitors	<ul style="list-style-type: none"> ▪ Appointment booking ▪ Doctor review ▪ Interactive exercises ▪ Chat Bot ▪ CBT
Services Offered to Customers	<ul style="list-style-type: none"> ▪ Anonymity. ▪ Booking online therapy sessions. ▪ AI chat bot. ▪ Suicide ideation journal. ▪ Counseling and support groups.

- Competitive Study

Feature \ App	Safe Haven	Youper	Shezlong	Vezeeta	Bloom
Appointment Booking	✓		✓	✓	
Doctor Review	✓		✓	✓	
AI Chat Bot	✓	✓			
Suicide Ideation Journal	✓				
Online Support Groups	✓				
In-App CBT*		✓			✓
Interactive Exercises					✓

*CBT: Cognitive Behavioral Therapy.

■ Market Research

In order to understand the market clearly, we must systematically gather and analyze the needed data. These are the general statistics describing the percentage of each psychological disorder with respect to the whole sample space of psychologically ill patients in Egypt. The online research conducted showed these findings:

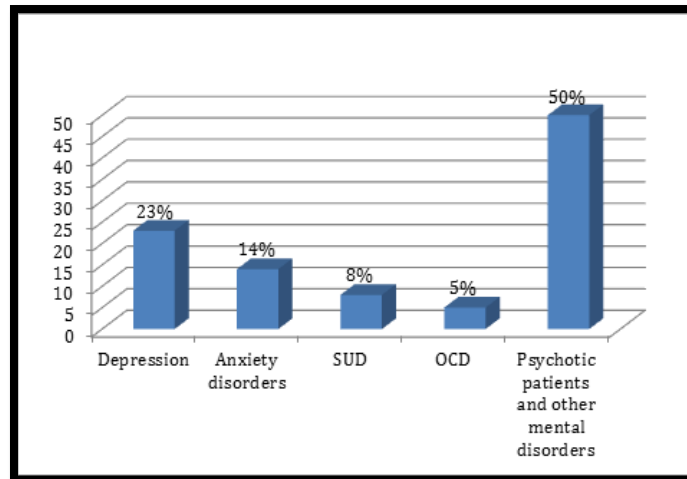


Figure 1 - General statistics about psychological disorders in Egypt

The figure shows that depression affects 23% of the sample space which is a significant percentage. 14% of the sample space has anxiety which are the two most common disorders that our application tackles.

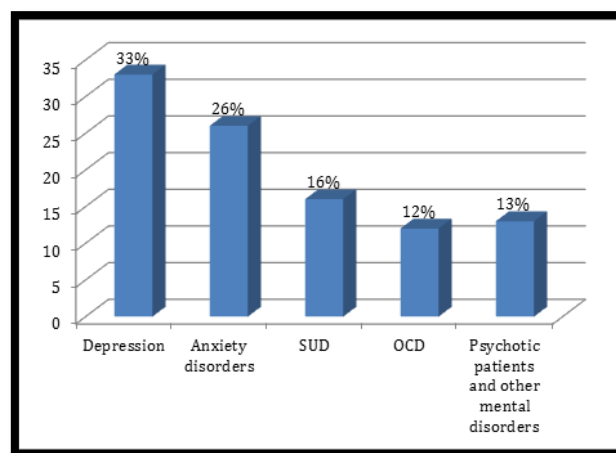


Figure 2 - Statistics about psychological disorders post covid-19 in Egypt

The figure shows that after covid-19, depression now affects 33% of the sample space which is a significant percentage and has increased by 10% than before covid-19. Also, 26% of the sample space has anxiety now which increased by 12%. Evidently, depression and anxiety are the most two common disorders nowadays; that is why our application tackles these two disorders specifically.

■ SWOT Analysis:

Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ AI chat bot ▪ Suicide ideation journal ▪ Support groups ▪ Online booking ▪ Online counselling ▪ 24/7 availability ▪ Privacy 	<ul style="list-style-type: none"> ▪ Internet dependent ▪ Lack of empathetic human care ▪ Expertise need
Opportunities	Threats
<ul style="list-style-type: none"> ▪ Anonymity ▪ Convenience ▪ Spreading awareness 	<ul style="list-style-type: none"> ▪ Risk of over depending on technology ▪ Data security ▪ Usability concerns

The SWOT analysis shows that we have great strengths that could contribute to great opportunities. However, we must be careful to avoid probable threats and overcome our weaknesses. The several technologies offered by our application like suicide ideation and AI chat bot will not only spread awareness but also it will compensate the empathetic human care. Also, offering privacy as a key feature in our application will contribute to anonymity and overcome data security concerns. Moreover, the idea of support groups fortifies the humanitarian aspect of the whole healing process which removes the risk of over depending on technology.

2.3.2 Technical Analysis

The technical analysis is one of the most important dimensions of the feasibility study. We will analyze the project in order to see if it is technically feasible or not and to make the best out of the available technology and human resources or decide on an alternative. There are a lot of factors that we will discuss.

2.2.1.1 Engineering and Technology

- Suicide Ideation Journal → NLP
- Chat Bot → NLP
- Web Interface → ReactJS

2.3.2.2. Human resources

Doctors are needed to:

- Guide us through the process of the chat bot machine learning model.
- Supervise the support groups.
- Diagnose patients in the online therapy sessions.
- Be available for patient counselling after their recovery.

3. Modules

3.1 AI Chat Bot

- It's a computerized chatting system to simulate interaction with the patient as if it's the doctor.
- It provides the patient with FAQ answers which are backed up by a therapist.
- It asks the patient some questions regularly and assesses his/her mental status and reports to the doctor.
- It reminds the patient of his/her medications.

3.2 Suicide Ideation Detection

- The patient is prompted to have a journal in which he/she inputs their feelings.
- The input text is then analyzed and if the patient has any suicidal thoughts, our trained model will detect suicide ideation.
- After that, our application will directly contact the therapist in case of having a suicidal patient.

3.3 Support Groups

- It's a chat room, with ability for video conference, for patients to meet and get to know each other more through sharing and interaction in the presence of a therapist who supervises the session.
- This is essential to defy the feeling of loneliness a patient might feel during the healing process.
- Patient anonymity is granted so that the patient feels safe to share his/her personal experiences without compromising their identity.

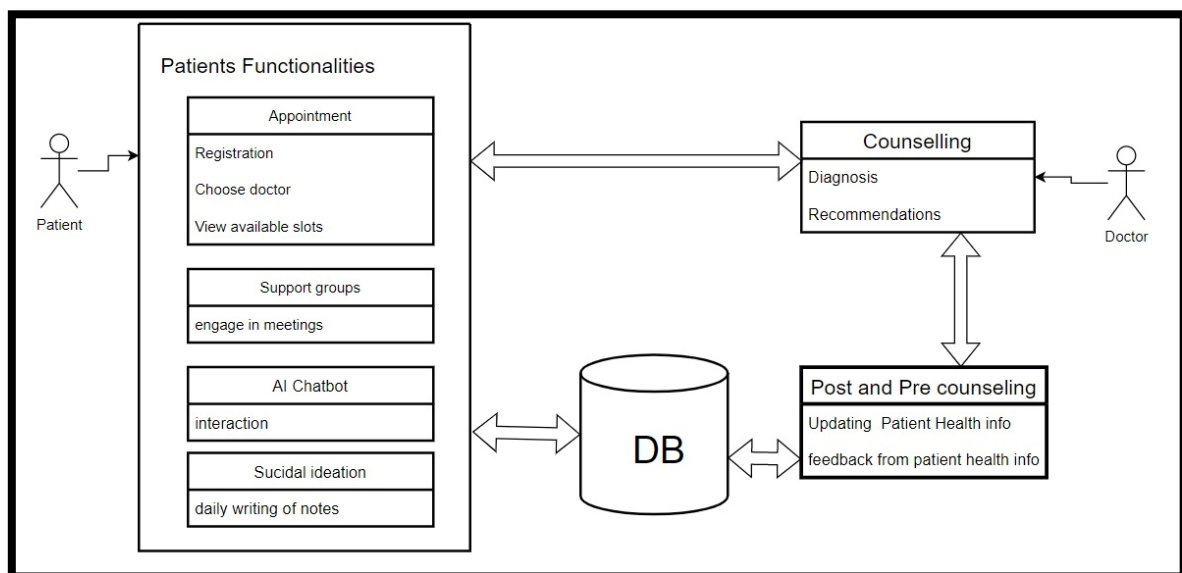
4. System Design and Architecture

4.1 System Architecture

For patient “X”, he first logs in to his account as a patient or creates a new one. “X” can either book an appointment with a doctor, or take part in a support group as prescribed by that doctor, or chat with our interactive chat bot, or writes in his journal how he feels today.

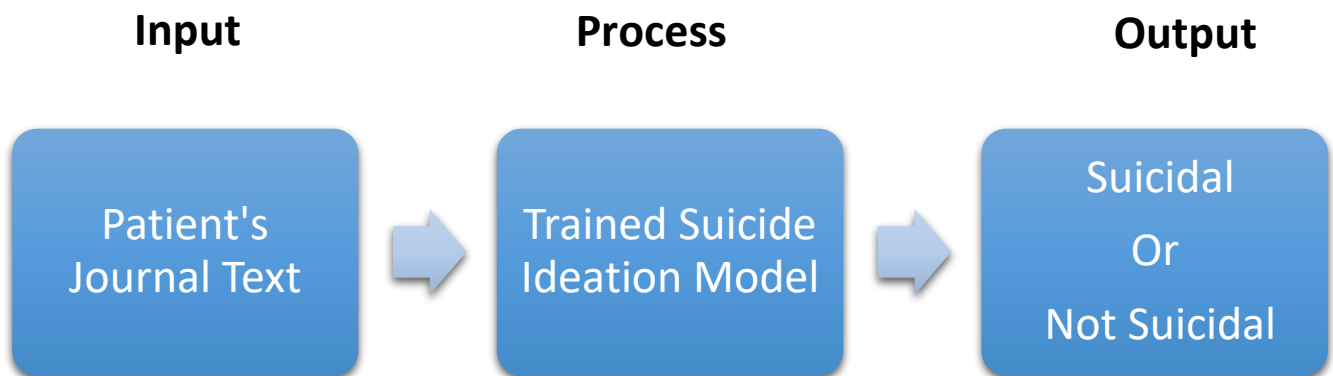
For doctor “Y”, he first logs in to his account as a doctor or creates a new one. “Y” can either input his empty time slots, or join the patient in an online session, or schedule a support group meeting, or monitor the patients’ well-being through keeping track of the feedback provided by all the patients’ journals and chat bots.

4.2 Block Diagram

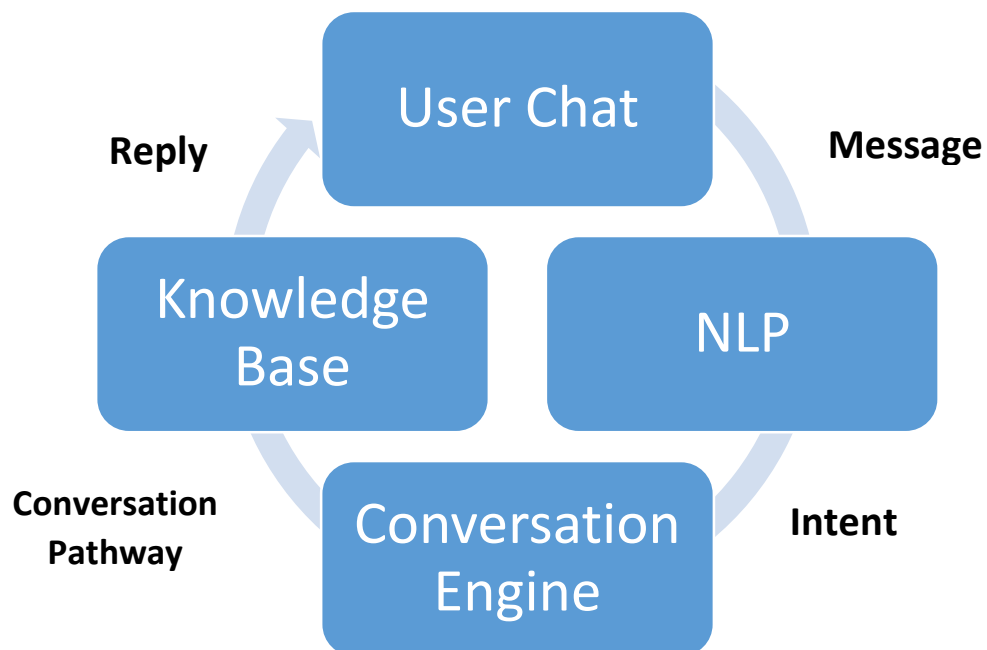


4.3 Modules Diagrams

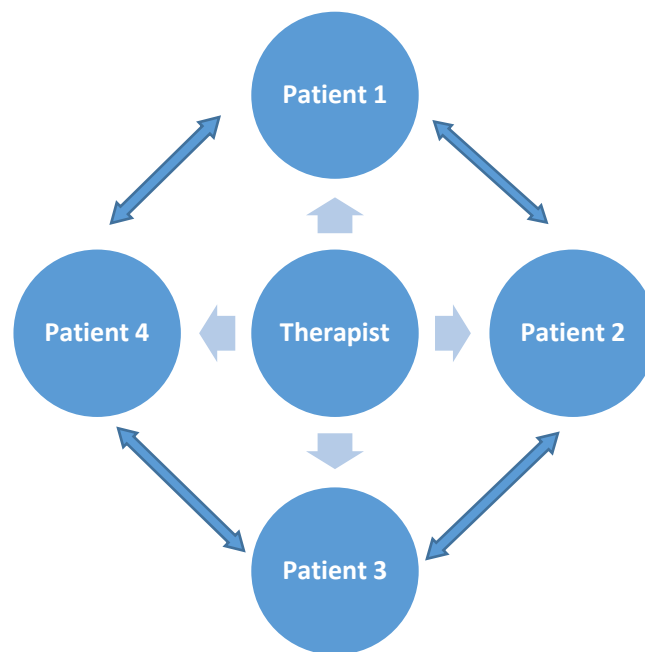
4.3.1 Journal



4.3.2 Chat Bot



4.3.3 Support Groups



5. Time Plan

Week #1 starts at 20/2/2022.

Week #	To-Do	
1	Data Collection	UI/UX Design
2	Data Preprocessing	Database Design
3	Model Training	Back/Frontend Implementation
4	Performance Analysis	Back/Frontend Implementation
5	Model Refining	Back/Frontend Implementation
6	Serve Model	Application Integration
7	Integrate Models with Application	
8	-	
9	Testing and Enhancement	
10		
11		
12		
13	Report Assembly	
14	Project Submission and Evaluation	

6. Task Division

Student	Tasks
Alaa	<ul style="list-style-type: none">▪ Frontend Implementation▪ Chat bot Model Training▪ Integrate Model with Application
Shaimaa	<ul style="list-style-type: none">▪ Database Design▪ Chat bot Model Training▪ Integrate Model with Application
Karim	<ul style="list-style-type: none">▪ Backend Implementation▪ Application Integration▪ Daily Journal Model Training▪ Integrate Model with Application
Menna	<ul style="list-style-type: none">▪ Backend Implementation▪ Application Integration▪ Daily Journal Model Training▪ Integrate Model with Application