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MENTAL HEALTH : TRACKER AND CHATBOT

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ABSTRACT

Mental health is a major concern in today's environment. The mental health condition has worsened as more people work from home and are separated from their loved ones. As a result, it's critical to keep track of and address any issues before they get too serious. Mental health chatbots can assist psychiatrists by replacing some of the expensive human-based engagement, providing a unique potential to increase the availability and quality of mental health intervention while also providing an alternate strategy to filling the much-needed self-care gap.

Using the Mental Health:Tracker and Chatbot, we attempt to do this. You'll have to build the app to be very nice and welcoming, keeping in mind that users may be suffering from mental illness and may not want to engage much with it. Chatbots may be a scalable solution for engaging consumers in AI-driven behavioral health interventions. 'Mental Health: Tracker & Chatbot' will assist you in diagnosing the type of mental health issue and tracking the degree of that issue, as well as suggesting solutions through a chatbot based on their current status.

Keywords: Research, Chatbot, Scalable, Artificial Intelligence, Mental health, Depression.

I. INTRODUCTION

Mental health is defined by the World Health Organization as "a condition of well-being in which an individual recognizes his or her own abilities, is able to cope with typical stressors of life, is able to work successfully and fruitfully, and is able to contribute to his or her community." Mental problems are estimated to afflict 29% of persons at some point during their lives.

Mental illnesses are one of the most common causes of disability worldwide. Mental, neurological, and drug use disorders caused 28.5 percent of global Years Lived with Disability (YLDs) in 2010, making them the leading cause of YLDs. Furthermore, they were responsible for almost 10% of global Disability-Adjusted Life Years (DALYs). Over the last 20 years, absolute DALYs for these illnesses have increased by 41%, from 182 million to 258 million (1990- 2010). Between 2011 and 2030, it is anticipated that missed labor and capital output due to mental diseases will cost the global economy $16 trillion. Mental health workers are in short supply around the world, with demand outstripping supply. While rich countries have around 9 psychiatrists per 100,000 people, low-income countries have as little as 0.1 psychiatrists per 1,000,000 inhabitants. Because of the scarcity of mental health services, providing one-on-one counseling is difficult.

Several studies have been carried out to evaluate various elements of using chatbots for mental health, including effectiveness, acceptability, usability, and adoption. Bringing this evidence together is critical for informing mental health practitioners and consumers about the fundamental aspects of chatbots and their potential applications, as well as informing future research about the major gaps in the existing literature. There have been two reviews. The first was a scoping study that solely looked at embodied conversational agents. The third evaluation looked at both embodied and non-embodied conversational agents (i.e. chatbots that engage with users solely through text on screens and do not display virtual human characters), but it concentrated on mental diseases. Because the search terms were restricted, only a small number of studies were found. As a result, an evaluation of all 6 types of chatbots (embodied and non-embodied) for mental health must be conducted using precise and comprehensive search phrases. As a result, the current review's goal was to offer an overview of the aspects of chatbots used by individuals for mental health that have been described in the empirical literature.

II. DESIGN

Tracker will use the Software Requirement Specification (SRS). It also explains the system's design and the requirements for external interfaces.

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Software Requirement Specifications

The project scope, operating environment, user characteristics, design, and limitations are all described in the Software Requirement Specification. The Mental Health Tracker and Chatbot's system architecture is also detailed.

Project Scope

The technology behind mobile app development is constantly improving. Mobile applications and the most recent app trends are currently benefiting both businesses and buyers. More than only trends and technologies are part of an effective and good app development technology. Until you're on the planet, it's practically impossible to envision a day without a cellphone. In today's economy, mobile devices are used to manage all aspects of life, from fundraising to running a business to purchasing movie tickets.However, as the need for mobile applications grows, so does the utilization of mobile application development services. Because of their widespread use, mobile devices are becoming increasingly crucial. In 2012, the number of mobile phone subscribers will reach 5 billion. Because of the rise of smartphones in industrialized countries and the expansion of mobile services in developing countries.

The scope of the Mental Health Tracker and Chatbot can be defined as a collection of reusable code, stylesheets, and include files that can be utilized by developers to create learning apps while also taking into account the following factors:

- Making learners mobile in order for them to broaden their horizons.
- Engaging learners on their own turf and speaking to them as people who are already learners and knowledge producers.
- Giving them full appreciation for their roles and accomplishments in life, as well as their roles as learners and knowledge creators. Learning in this environment entails being adaptable and mobile. Take a look at the present state of the App industry to learn more about this information. Mobile applications are habit-forming, which means that most users will stick with them for a long time.
- Take a look at the following statistics to see how mobile apps are growing in various categories:
- 49 percent are interested in social networking; 51 percent are interested in health and fitness.
- 79 percent prefer music • 16 percent - sports
- 22 percent - entertainment

Because mobile app development is not going away anytime soon, businesses must stay ahead of the curve in order to keep up with its speed and growth. In that case, you'll need to employ a knowledgeable and dependable supplier who can successfully guide you forward.

Operating Environment

We propose a Mental Health Tracker and Chatbot for developers to use in order to create learning applications with ease of use. This will save time because reusable code will be provided in our framework. Furthermore, the user can utilize this programme to learn anywhere and at any time, with interactivity and mobility.

User Classes and Characteristics

The user who will operate the system must have an Android tablet or phone as the base operating system..

Design and Implementation Constraints

Mobile devices, such as phones, tablets, and laptops (with touch screens), present a unique set of issues. The issue isn't whether you have a bigger screen; it's that they're fundamentally different. Battery life, screen size, form factor, keyboard availability, and dynamically changing orientation (user-controlled horizontal or vertical posture) are all concerns that must be addressed. Mobile devices, such as phones and tablets, account for the vast majority of users, with high future estimates. As a result, having appropriate tools for content development and dissemination is critical. Our primary focus is on small scale teams, thus they must have some.excellent tools for creating a platform for project management Opacity arose from this exact requirement. Opacity must be a highly portable, user-friendly, and secure app.

The following are the advantages of the design:

- **Portability:** The tracker may be utilized at any time and from any location.
- **User-friendly:** Because mobile devices such as tablets are used, it is user-friendly.

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System Architecture

As seen above, there are numerous hardware platforms available in the current circumstances. The Operating Systems are located above these. The application programming interfaces sit on top of the operating systems, allowing programmes to communicate with the underlying operating system and hardware platform. The Mental Health Tracker and Chatbot, which are suggested to be constructed on top of the API, occupy their layer above it. Each layer is described in detail after that.

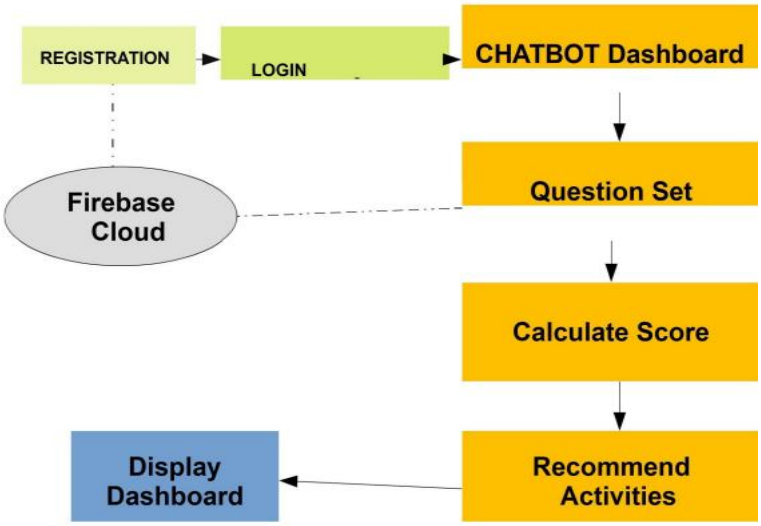

Figure 1: System Architecture

External Interface Requirement

User Interfaces:-

Application: The application will have a Graphical User Interface (GUI) with many screens from which the end user can navigate to information.

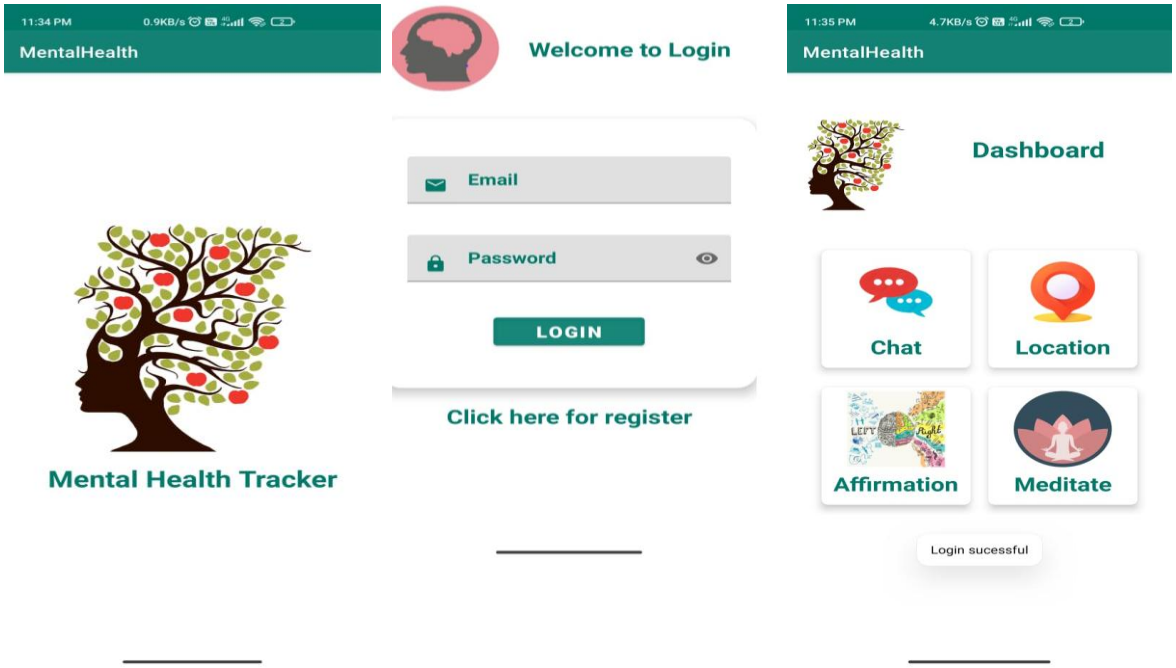

Figure 2: User Interfaces

Hardware Interfaces

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• **Mobile Devices:** This framework-based application will be deployed on mobile devices such as smartphones and tablets that run Android version 2.2 or above.

System Attribute in Software

• **Reliability:** Tracker is written in Java, which was once the most popular android development language. In the backend, the app will connect to the API and the API work database.

• **Availability:** The tracker must be available at all times and in a stable form.

• **Usability:** The Mental Health Tracker will allow users to manage their projects while also providing input to app developers.

• **Portability:** The app will be available globally via the Play Market store, and users will be able to use it on any Android platform.

Nonfunctional Requirement

In Software Engineering, improved models for capturing and analyzing NFRs are required.

• **Small screen size of mobile devices:**

Mobile gadgets are small, lightweight, and portable. Unlike laptop computers, which are expensive, heavy, and power hungry, mobile devices are comparatively inexpensive, lightweight, and some may operate for an extended period of time on a single charge or a couple of common batteries.

• **Input capabilities:**

Some of these gadgets' input capabilities raise concerns about students' capacity to enter vast volumes of text into a tablet to take notes or answer an essay-style question.

• **Extremely Adaptable:**

Many of these gadgets, on the other hand, are incredibly versatile and can be connected to a full-size folding keyboard for entering enormous amounts of data as quickly as a traditional computer.

Data Flow Diagram

The Data Flow Diagram depicts the flow of information across the project, indicating where information (data) is received (inputs) and where it is sent (outputs) (outputs).

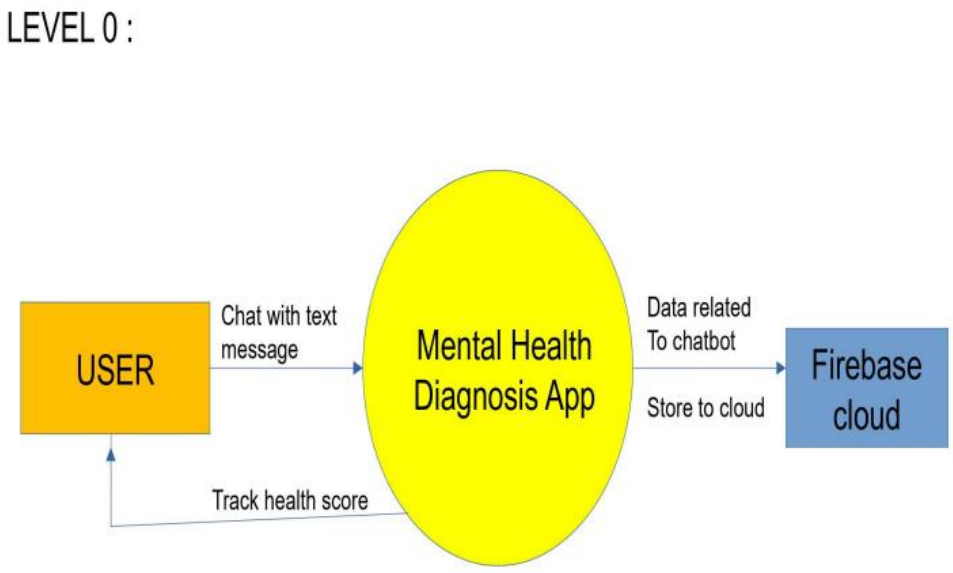

Figure 3: Level 0 - Data Flow Diagram

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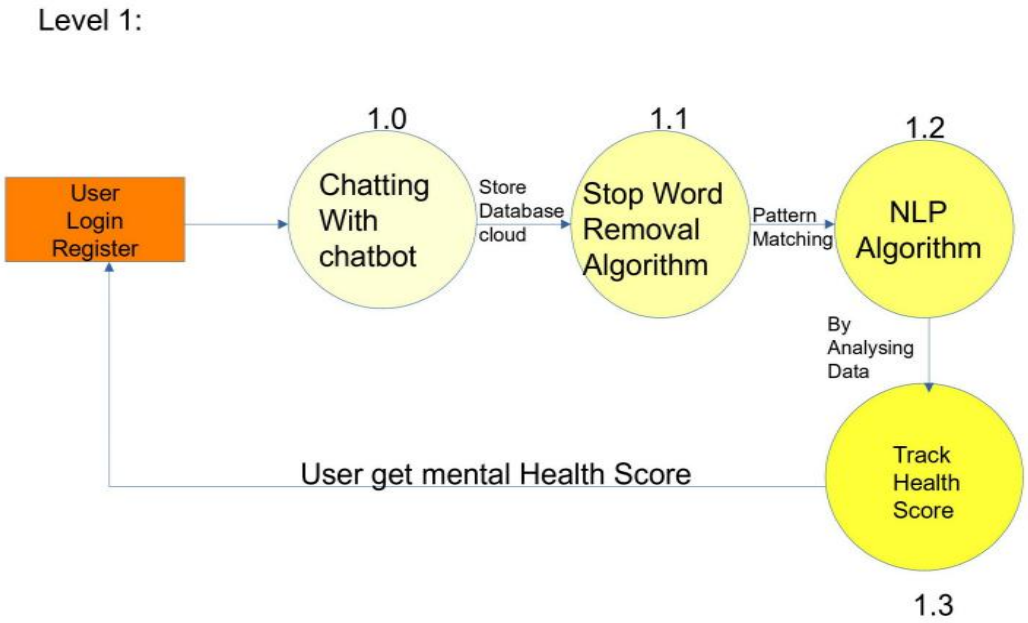

Figure 4: Level 1 - Data Flow Diagram

III. MODELING

We'll also go through the platform's applications and provide a quick review of the technical requirements.

Use Case Diagram

A formal use case diagram is a type of behavioral diagram derived from a use case analysis and described by the UML. Its goal is to offer a graphical representation of a system's functionality in terms of actors, their goals as use cases, and any dependencies between those use cases.

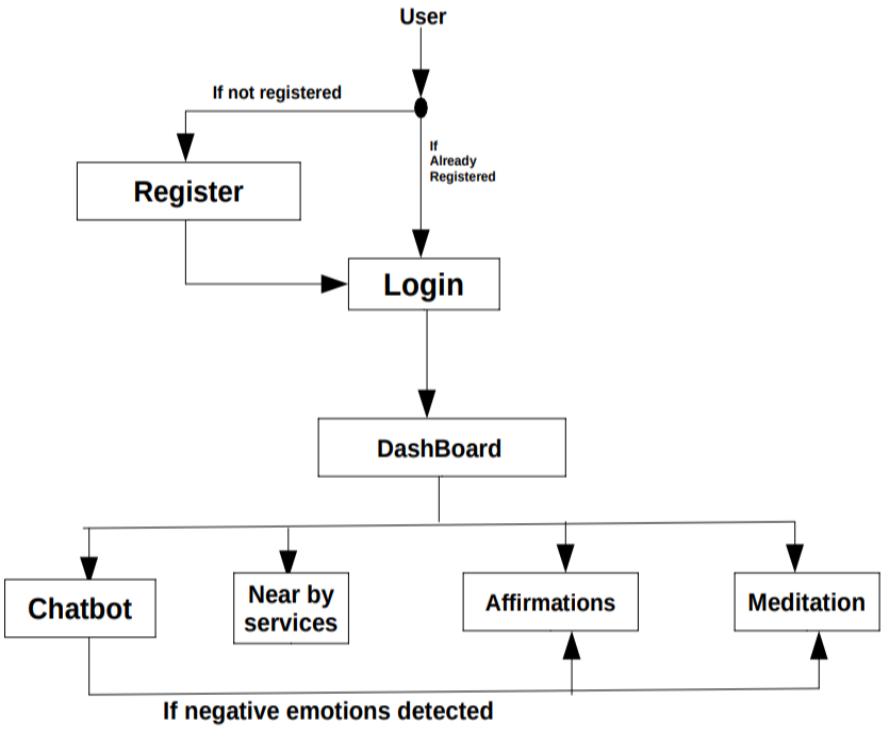

Figure 5: Level 1 -Use Case Diagram

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Activity Diagram

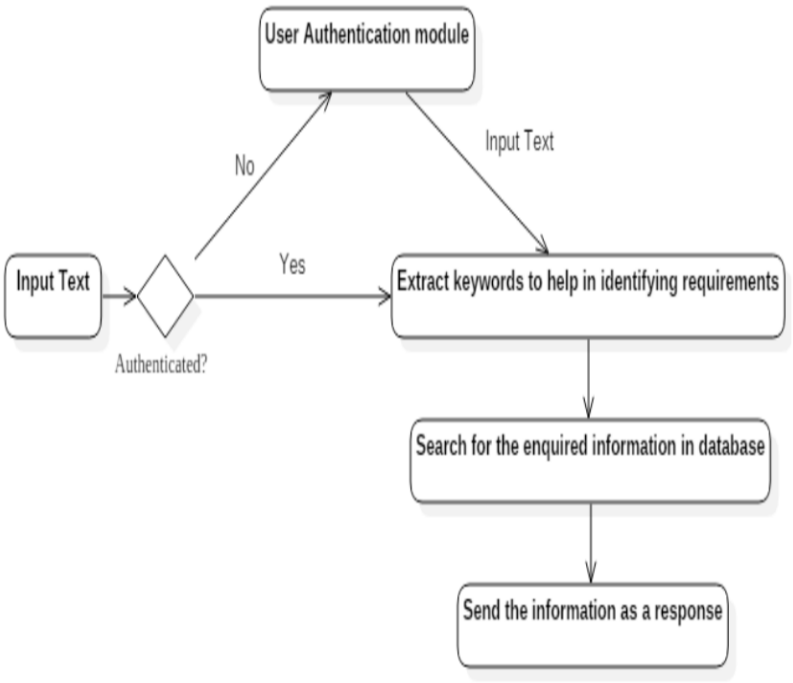

Figure 6: Activity Diagram

You can use activity diagrams to specify how your system will achieve its objectives. High-level actions are chained together to depict a process in your system in activity diagrams. An activity diagram is a flowchart that depicts the movement of control from one action to the next. An activity diagram, unlike a typical flowchart, depicts concurrency as well as control branches. The dynamic flow of a system is the focus of activity diagrams.

The process being modeled, such as utilizing the M-Learning programme, is called an activity. Select subject, select topic is an example of an action in a larger activity. The activity's flow is represented by arrowed lines known as edges or paths. The direction of flow from one action to the next is indicated by the arrowhead on an activity edge. An incoming edge is a line that enters a node, and an outgoing edge is a line that leaves a node. The Fork Node displays simultaneous or concurrent actions. There is just one incoming flow and many leaving flows in Fork. Before the flow can continue past the join, all incoming actions must be completed. Join has a single outgoing flow and numerous entering flows.

Sequence Diagram

The sequence diagram is generally used to depict the interactions between items in the order in which they occur. Developers frequently believe that sequence diagrams are only for them. Sequence diagrams, on the other hand, might be effective for communicating how a firm now operates by depicting how various business elements interact. Object interactions are depicted using sequence diagrams. They are interested in message sequences, or how messages are sent and received between multiple objects. A sequence diagram's principal aim is to represent the sequence of events between the pieces of the system that are involved in a certain interaction.

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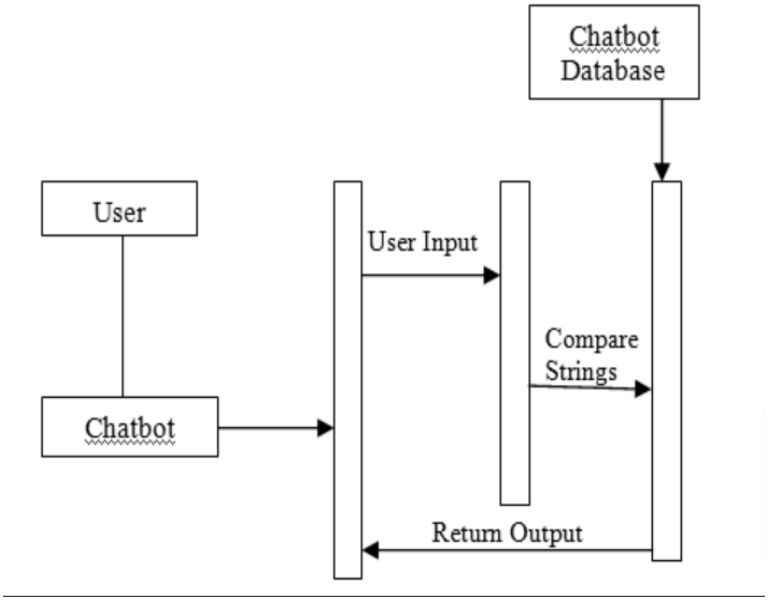

Figure 7: Sequence Diagram

IV. IMPLEMENTATION AND RESULTS

It contains the Mental Health Tracker and Chatbot's various implementation details.

Implementation Details

This section discusses the Tracker's numerous functionalities as well as the implementation methods. Some of the features and algorithms are described below, along with their implementation details:

:**• NATURAL LANGUAGE PROCESSING:**

Natural language processing (NLP) is an area of linguistics, computer science, and artificial intelligence concerned with computer-human interaction, specifically how to construct machines that can process and assess large amounts of natural language data. The goal is to develop a computer that can "understand" the contents of documents, including nuances in language in context.The system can then use the information and insights extracted from the articles to categorize and organize them.

– Stop Word removal Algorithm:

Stop words are a collection of words that appear regularly in a language. In English, stop words include "a," "the," "is," "are," and others. Stop words are commonly used in Text Mining and Natural Language Processing (NLP) to filter out keywords that are so widely used that they contain little useful information.

– Tokenization:

Tokenization is the breakdown of a phrase, sentence, paragraph, or even a whole text document into smaller components such as individual words or phrases.

– Pattern Matching:

Means that the interpretations are obtained by comparing word patterns to the input utterance.

• Bayesian Classifier Implementation:

The Bayes theorem estimates the probability P(c—x), where c is the class of probable outcomes and x is the supplied case to be identified, which represents some specific characteristics.

Supervised Machine Learning can be used:

Given: – document d – a collection of fixed classes C = c1, c2,..., cn

– a set of m papers that we've classified as belonging to a given class. We use the training set to train our classifier, which results in a trained classifier. The learnt classifier can then be used to classify new texts. To describe our classifier, we use the notation y(d) = C, where y () is the classifier, d is the document, and c is the class we assigned to the document.

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• **Naive Bayes Classifier:**

Based on the Bayes rule, this is a simple (naive) classification approach. It is based on a very basic document representation (called the bag of words representation). Consider the following scenario: we have two classes (positive and negative), and our input is a text that represents a movie review. We'd like to know whether the review was favorable or unfavorable. As a result, we can have a bag of good words (for example, love, fantastic, hilarious, and great) and a bag of bad words (e.g. hate, terrible).The number of times each of those words appears in the document can then be counted to determine if the document is positive or negative. This technique works well for topic classification; for example, suppose we have a collection of academic papers that we wish to organize into several categories (computer science, biology, mathematics).

• **Decision Tree Algorithm :**

The supervised learning methods include the Decision Tree algorithm. By learning simple decision rules inferred from prior data, the purpose of utilizing a Decision Tree is to develop a training model that can be used to predict.

– **Root Nodes:**

It is the node at the start of a decision tree from which the population begins to divide based on numerous characteristics.

– Decision Nodes:

Decision Nodes are the nodes that result from separating the root nodes.

– Leaf Nodes:

Leaf nodes or terminal nodes are nodes where further splitting is not possible.

– Subtree:

A subset of this decision tree is termed sub-tree, just as a small component of a graph is called subgraph.

• **THE INPUT AND OUTPUT ::**

This is the chatbot interface, and the image below depicts the user's discussion with the chatbot.

Figure 8: Enter message in Chatbot

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• **THE OUTPUT ::**

Our chatbot now converses with users, answers their inquiries, and creates a welcoming and user-friendly atmosphere. In addition, services such as Google Maps and others are available.

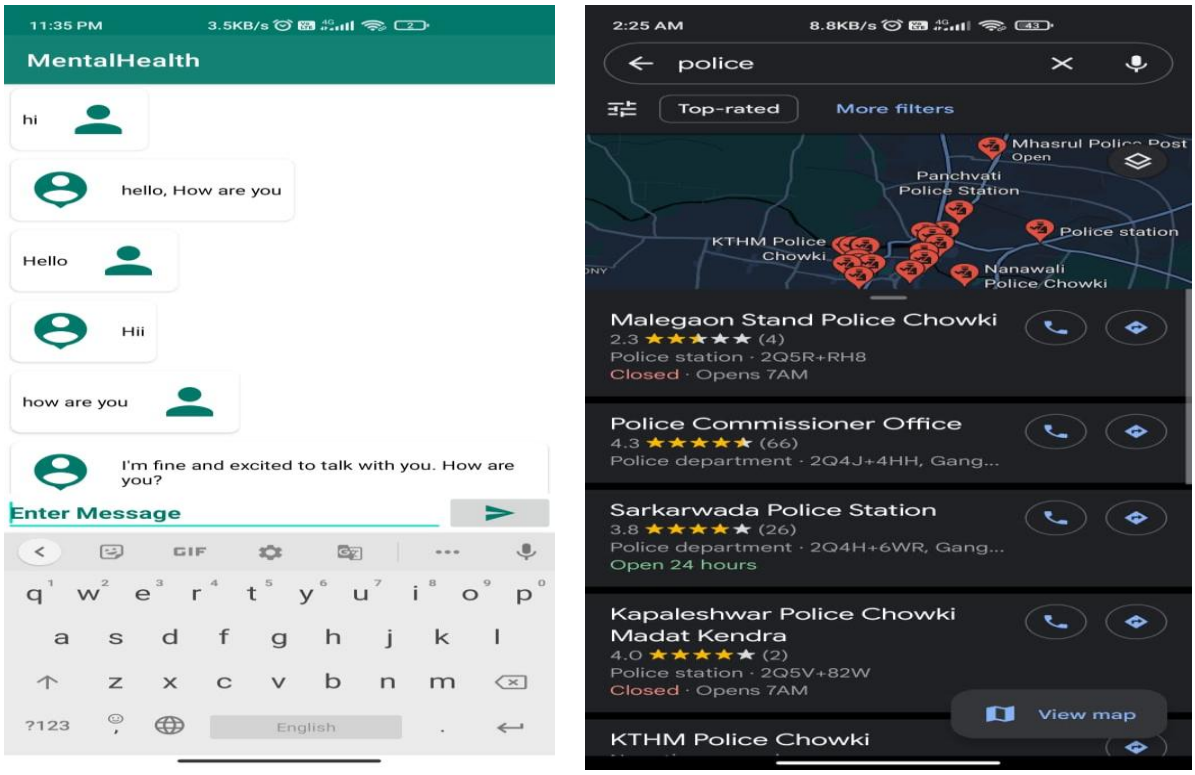

Figure 9: Response from chatbot

Chatbots respond to all questions from users, and users also benefit from the app's features such as Google Maps. Hospital locator, closest police station, as well as hotels and meditation centers.

V. RESULTS

The screenshots below show how Firebase is constantly changing in the backend. The background photos below have been properly authenticated.

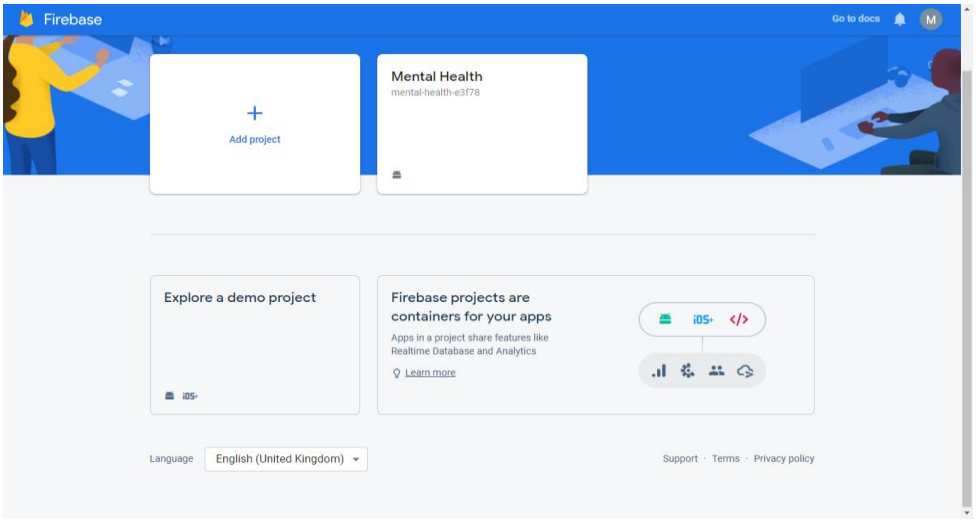

Figure 9: Updating Firebase In Backend

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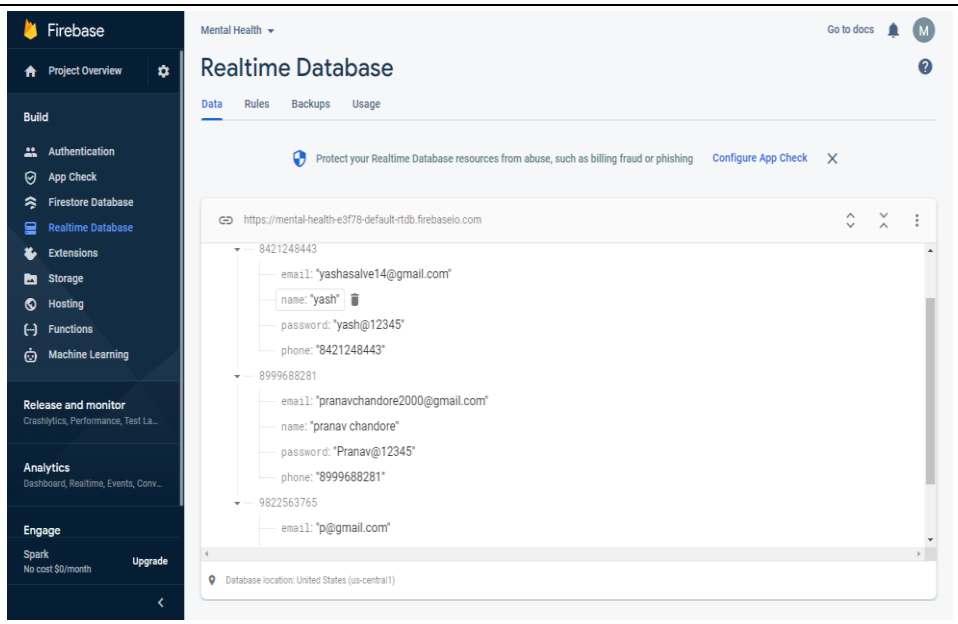

Figure 10: Authentication .

VI. CONCLUSION

Mental Health: Tracker & Chatbot' will assist you in diagnosing the type of mental health issue and tracking the degree of that issue, as well as suggesting solutions based on their ongoing condition using a chatbot. You'll need to design the app to be very nice and welcoming, keeping in mind that users may be suffering from mental illness and may not want to engage much with it. Chatbots could be a scalable solution for engaging consumers in artificial intelligence-driven behavioral health interventions.

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Without the great support of our guide and all other teachers, this report and the research underlying it would not have been feasible. Their enthusiasm, competence, and meticulous attention to detail have been an inspiration and have kept our work on track since my initial assessment.

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VII. REFERENCES

[1] Mental health: a state of well-being, World Health Organization, 2014.

[2] T. Chey, J.W. Jackson, V. Patel, D. Silove, Z. Steel, C. Marnane, C. Iranpour A thorough review and meta-analysis of the global prevalence of prevalent mental diseases Int J Epidemiol, 43(4), 476-493, 1980-2013.

[3] The global burden of disease: an update for 2004, World Health Organization, Geneva, 2008.

[4] The global burden of mental, neurological, and drug use disorders: an analysis from the Global Burden of Disease Study 2010, H.A. Whiteford, A.J. Ferrari, L. Degenhardt, V. Feigin, and T. Vos, PloS one, 10 (2015) e0116820.

[5] V. Patel, S. Saxena, N. Radcliffe, S. Ali Al-Marri, A. Darzi, S.P. Jones Health Affairs, 33 (2014) 1603-1611, How Google's "10 things we know to be true" could influence the creation of mental health mobile apps.

[6] "Study on Worker Behavior in the Construction Industry to Improve Production Efficiency," International Journal of Civil, Structural, Environmental, and Infrastructure Engineering Research and Development (IJCSEIERD), Vol. 3, Issue 1, Mar 2013, 59-66.