Moodshift: An App for Depression

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Abstract - **Chatbots were introduced to mimic human behavior. This concept can be applied to mental healthcare apps wherein the users anticipate they are talking to a mental health professional. Instead of being a static web app, chatbots are becoming more prevalent in mental healthcare apps. They mimic the human behavior by asking users to provide a mental health diagnosis. There are many vulnerable groups who will suffer from psychological distress, anxiety, depression, substance abuse, suicide and suicidal behavior due to economic recession, insecure job situation, unemployment, lower socio-economic status. The effects on mental health will last several years after the pandemic ends. Delay in seeking professional help because of stigma surrounding mental health will cause more issues,". Voice-based chatbot makes it casual, intuitive, and direct. Interaction with the chatbot happens through natural language whereas its evaluation happens through natural language processing and natural language generation. A machine learning algorithm is used to classify depression detection results according to the severity.**

Index Terms - **Chatbot, depression detection, machine learning algorithm, mental healthcare, natural language generation, natural language processing, voice-based chatbot.**

I.INTRODUCTION

According to the international Journal of Psychiatry, 13.5% of children between 0-14 years suffer from some sort of clinical depression. 45% of people in developed countries have access to maintain healthcare and while only 15% in developing nations. The idea is to propose a system that will provide constant companionship and make people feel cared about. Since therapy is not always available or affordable, the goal is usually to provide an alternative. Since professional therapy may not be accessible or affordable, the goal is to provide an alternative. Chatbot is often described as a conversational agent by interacting between users and machines. The purpose of a chatbot is simple, to intake the input from the user, interpret and send a response appropriately. To create a personal virtual therapist and understand factors affecting online therapy. It offers guarantee of privacy, as a depressed human does not believe in sharing because of the risk of being mocked. Chatbot would also be able to detect Depression level which is divided into 5 levels ranging from Level 0 to Level 4. Level 0: Completely healthy; Level 4: Immediate Help.

It offers privacy as a depressed human would not want to share their thoughts with anyone. It also has the ability to identify Depression level which is divided among 5 levels. Another means of being a bridge between humans and machine is a speech-to-speech system. It provides a humanly touch by analyzing sentiments based on the conversation. To predict the severity of depression, the questionnaire helps by analyzing the answers and gives a suitable output. The system uses the sentiments of the participants to predict the severity of depression. It also helps in identifying the triggers that cause depression. Additionally, the system also provides calming methods to deal with anxiety.

II. LITERATURE SURVEY

[1] It uses AI to identify and respond to the user's emotions. Author also talks about an application Woebot after which the students, after using, show the symptoms of depression overtime. Author also proposes a system for developing a CBT bot not only for depression but for anxiety, panic disorders, bipolar disorders. In this paper, author states, "How can emotion be detected to support a user in regulating their emotions?" focuses on finding sentiment diffusion pattern from different sentiment polarities rather than just analyzing the text which gives an improvement of about 5.06% to 8.38%. In this method all retweets and positive tweets were assigned a polarity value. This method was used to analyze how statements lead to a reversal of a sentiment. For a neutral tweet, the value was zero. This was further

used to analyze what kind of statements lead to a sentiment reversal.

[5] talks about a system, that provides a questionnaire and also gathers data from a social networking site and converts the textual data into input data which is analyzed using machine learning SVM approach. Deep Neural Network is used for feature extraction and a deep integrated support vector machine (DISVM) classifies the input data and realizes the recognition of depression which makes the system better by making the algorithm more stable and also increases accuracy.

[6] proposes a system that is about developing and understanding virtual therapy. Building an application for which every user will have its own personal therapist. It attempts to offer extreme privacy between the bot and the user. The bot would also be able to detect the depression level which is divided into five levels ranging from 0-4. Depending upon these levels, therapy level is suggested. It talks about features of the chatbot for it to become more human-like, displaying jokes, searching the web, storing data and carrying data analysis, suggesting appropriate solution to patients. This chatbot will have its own personal therapist, who will be able to provide suggestions and comfort to the user. It will also store and analyze data collected by the user.

[7] says that this system converts textual data into input data which was analyzed using convolutional neural network (CNN). Apart from this, it also analyzes other features like community in social network based on what pages you follow, the posts you like, etc.

III. USER CLASSES AND CHARACTERISTICS

Register and Login: To maintain user's data and keep a log of everything. The user can log in using their valid email id and password.

Chatbot: Chatbot is an artificial intelligence chatbot that enables users to interact with the bot by providing a physical interaction.

Depression Detection: Depending upon the results obtained from the questionnaire, the model predicts the probability of depression.

Calming methods: To calm a person down, meditation techniques are introduced.

IV. SYSTEM ARCHITECTURE

The input is given to the chatbot using text or speech. Automatic speech recognition converts speech to text. The NLP components Natural Language Understanding which helps the machine to understand and analyze human language through keywords, emotions transforms the speech, and Natural Language Generation (NLG) that acts as a translator and converts the computerized data into natural language representation. The output can be given through speech or text based on users' preference.

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Rasa is a chatbot platform that enables developers to create text-based and voice-based assistants. Its flexible AI framework is built on top of K-Means clustering algorithm. The input is taken from the user when they answer the questionnaire. This is given to the K-Means clustering algorithm which is primarily used for Classification of data. The goal of the K-Means clustering algorithm is to divide the data in the correct clusters and according to these clusters, the severity of depression is predicted.
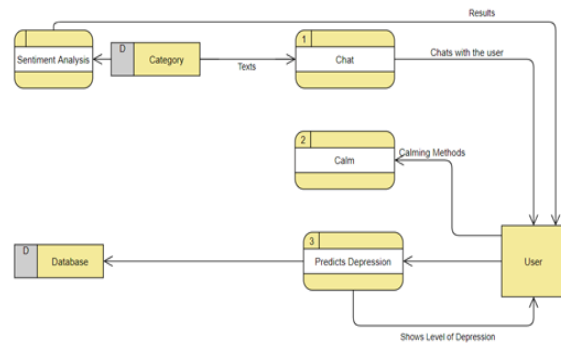

Fig. 1 Data Flow Diagram

V. CONCLUSIONS

In colleges, many students suffering from depression are also suffering from other mental health conditions. The concept of this system was to combine various aspects of mental health to help those suffering from this condition. Furthermore, the system has been

enhanced by including various features from different applications into one unit. This system has been designed to help people identify the various benefits of mental fitness help. It is also designed to make them feel comfortable approaching a professional for help.

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