

Mental Health Therapy Chatbot for Students and Working Professionals

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Abstract— The COVID-19 pandemic has brought to light the significant mental health challenges that individuals face, posing a great challenge for mental health therapists. Unfortunately, many people still find it challenging to open up about their mental health struggles due to the fear of being stigmatized. Consequently, stress builds up, impeding productive work, and leading to conditions like stress and depression. To address this critical mental health issue, we present a chat bot therapy solution based on the Cognitive Behavioral Therapy (CBT) approach. This chat bot can communicate and interact with users through various modes such as spoken, written, and virtual communication. With its potential to address mental health issues effectively, the chat bot therapy aims to reduce the mortality rate due to depression. By offering a safe and confidential space for people to seek support, we believe that the CBT chat bot therapy will help alleviate the burden on mental health therapists and bring positive change to people's lives.

Keywords—Chat bot, AI & ML, CBT, Natural Language Processing

1. INTRODUCTION

According to recent research by the World Health Organization, a staggering 264 million people suffer from depression, which can lead to the worst-case scenario of suicide. The number of cases of stress and anxiety is particularly high among those aged between 15 and 29 years, and the causes of depression are varied within this age group. However, many individuals suffering from mental illness fail to recognize the severity of their condition and continue to experience stress without realizing the impact it has on their brain cells.

Moreover, in low-middle income countries, 76-85% of people lack the necessary resources or access to trained healthcare providers. Even in developed countries, the ratio of mental health providers to the population is still relatively low, with as few as 0.1 mental health providers per 100,000 people in low-income countries, compared to 9 in developed countries.

To address this problem, chat bots can serve as a real-time savior for individuals suffering from mental health issues. All that is required is network connectivity, and a bot therapist is at their fingertips. Chat bots can help bridge the gap in mental healthcare provision in areas where resources are limited.

Additionally, chat bots are available 24/7, allowing users to access support whenever they need it.

It's important to note that chat bots are not designed to replace human healthcare practitioners, but rather to assist them in their work. These tools are user-friendly, interactive, and can be utilized for stress reduction and motivation. The therapist chat bot is an advanced method of therapy, comprising different modules that work together to provide constructive thoughts and offer self-help techniques tailored to the user's stress level. The program uses natural language processing to detect the user's mood and provide content accordingly.

The design and development of our Cognitive Behavioral Therapy (CBT)-based AI chat bot includes both virtual and physical interaction with therapists. A pilot study confirmed the effectiveness of our chat bot in providing support for individuals with mental health issues. With these self-mental healthcare techniques, individuals can benefit from chat bot therapy, which is easily accessible, user-friendly, and effective in addressing their mental health concerns.

2. LITERATURE REVIEW

Pranav Kapoor, et.al in [1] [2021] developed a Chat bot: A Relief from Mental Stress and Problems and suggested that as the pandemic develops, our mental health has become an increasingly essential element in our everyday routines. People still don't feel more suitable revealing mental health problems with others, therefore they choose to keep their problems to themselves. This causes a building of tension in their minds, which hinders their job efficiency. As these cases proceed, we anticipate the use of a Therapy Chat bot to assist and monitor the individual's mental health. Despite the worry about being judged, the user can express his emotions. As a result, the number of individuals dying from depression is on the decline [1].

Ali Abdallah Alalwan, et.al in [2] [2019] are published a research paper: In this literature there are using Seven bibliographic databases (Medline, Embase, PsycINFO, Cochrane Central Register of Controlled Trials, IEEE Xplore, ACM Digital Library, and Google Scholar) were used in our search. This chat bot interacts with the patient and provides

better solutions. Chat bots have the potential to be useful tools for individuals with mental disorders, especially those who are reluctant to seek mental health problems [2].

Dr. Manisha Mhetre, et.al in [3] [2015] developed AI Chat bot: This paper based on insomniac and in this paper the researcher use artificial intelligence and deep learning and made a chat bot the main goal of this chat bot is increase the number of encounters with these individuals as they get more sad and anxious. And this friendly chat bot is very helpful for reducing insomnia. Insomniacs are a big problem in human life. This creates mental stress and depression and people don't observe better in his life [3].

Menal Dahiya, et in [4] [2017] are published international generals: Chat bot is widely popular now-a-days and catching speed as an application of computer communication. Some programs respond intelligently like humans. This type of program is called a Chat bot. This paper addresses the design and implementation of a Chat bot system. We will also study another application where Chat bots could be useful and techniques used while designing a Chat bot [4].

K. K. Fitzpatrick et.al in [9] [2017] develop chatbot: A chatbot used in therapy has many advantages, more people can benefit from treatment because it's cheap and you don't have to go anywhere, you can just stay in your bed and have therapy whenever you feel sad, stressed, angry, etc. In addition, it is easy to use a chatbot, you don't need special training for that, and it can also be used for simple entertainment. Another point is that some people may be afraid to trust someone for fear of being betrayed or ridiculed; for example the therapist. When it comes to talking to a conversational agent, these fears are absent [5]

3. METHODOLOGY AND TOOLS

The basic Sequence to Sequence architecture is used for building conversation Mental Health Therapy Chat bot using DialogFlow framework.



Figure 1. Dialogflow Framework

There are different type of intents are created where entities are focused on reacting for the different situations.

Our Mental Health Therapy Chat bot is focuses the many entities like:

- Personal loss
- Career / Job problems
- Academics / Education related problems and etc.

Initial comments and its responses are arranged in a

Nested way so as to preserve sequence of “conversation” among the people.

This chat bot is used in the form of web app, where supervised learning is used to generate responses based on a person text. In which the bot detects the keywords and reacts according to it.

After training the data, the dialogflow intent is connected with the communicate website and that website uses this intents to create a chat bot.

3.1 Software requirements

3.1.1 Visual Studio

Visual Studio is a powerful developer tool that enables you to complete the entire development cycle in one place. It is a comprehensive integrated development environment (IDE) that you can use to write, edit, debug, and build code, and then publish your app. Beyond code editing and debugging, Visual Studio includes graphical designers, compilers, code completion tools, source control, extensions, and many more features to enhance every stage of the software development process.

3.1.2 Django

Django is a high-level, open-source Python web framework that makes it easy to build robust, scalable, and secure web applications quickly. It includes features such as an ORM for database interactions, URL routing and views, templating engine, authentication and authorization, admin interface, internationalization and localization, security features, and middleware support. Django follows the MVC architectural pattern and has a large community of developers and users.

3.3.3 DialogFlow

Dialogflow is a natural language processing (NLP) platform that can be used to build conversational applications and experiences for a company's customers in various languages and on multiple platforms.

Dialogflow can be used for a variety of applications, including :

- Customer service artificial intelligence (AI) agents- Interfaces can be programmed to answer questions, access orders, make appointments and take requests.
- Conversational commerce- Bots can help customers make self-service purchases or schedule deliveries.

- Internet of things (IoT)- Dialogflow can be applied to IoT devices to make them better at understanding context and responding with precision

4. ARCHITECTURE/BLOCK DIAGRAM

The customer inputs the inquiry in the UI as the content. The UI gets the client questions and after that send It to the chat bot web application.

In the chat bot application, the abstract encounters pre-handling steps consolidate tokenization where the words are tokenized, by then the stops words are taken out and highlighting.

The inquiry answers are put away in the information data set to recuperate the recover the answer.

4.1 Tokenization

Tokenization is the process of breaking text into smaller units called tokens, such as words or phrases. It helps with text normalization, segmentation, feature extraction, text processing efficiency, and text understanding in natural language processing (NLP) tasks.

4.2 Stop word expulsion

The process of converting data to something a computer can understand is referred to as **pre-processing**. One of the major forms of pre-processing is to filter out useless data. In natural language processing, useless words (data), are referred to as stop words.

4.3 Recover the coordinated with the sentence

The responses for the question is acquired from the above interaction are recovered and shown in the UI.

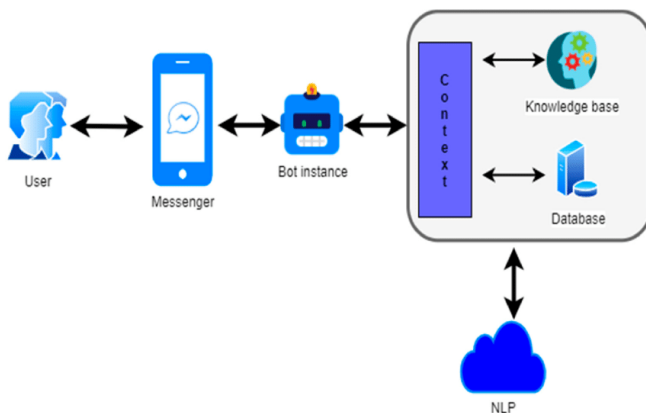


Figure 2. AI chat bot functionality

5. FLOW CHART

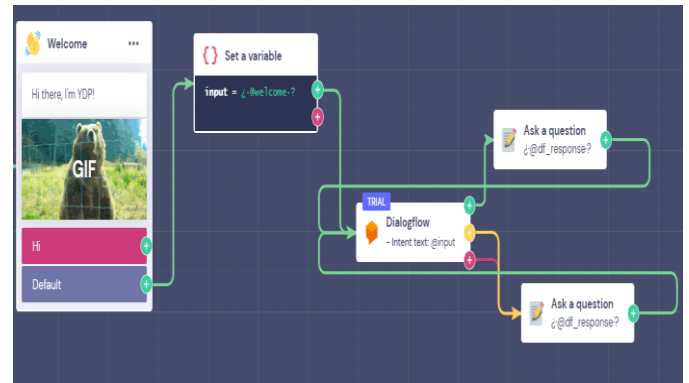


Figure 3. Designed workflow of chat bot

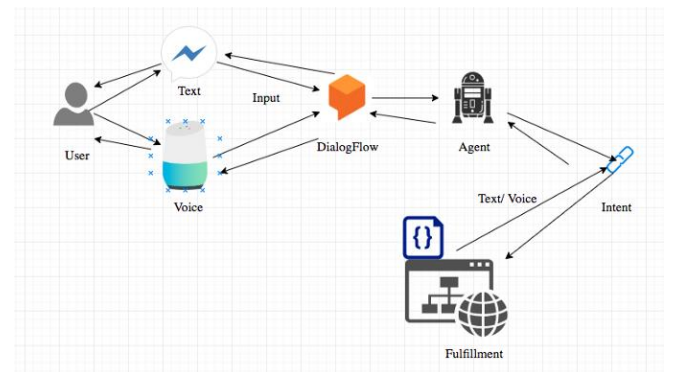


Figure 4. Flowchart of chat bot

- The users first enters the web-app and create an account then they can directly login's inside the web-app.
- After login, the user enters the homepage and get a button named "Tap to Chat with the bot".
- After taping the button the user can chat with bot and discuss upon his problem and the bot on the basis of tokenization method detects keywords and acts accordingly.
- The bot suggest some ways to cope up better.

6. RESULTS AND OUTPUT

The bot has been trained on more than 5 user cases and needs to be constantly updated to keep up with the new emerging problems.

Thus after extensive training of the data, our bot will very effective and be more open to a wider range of situations.

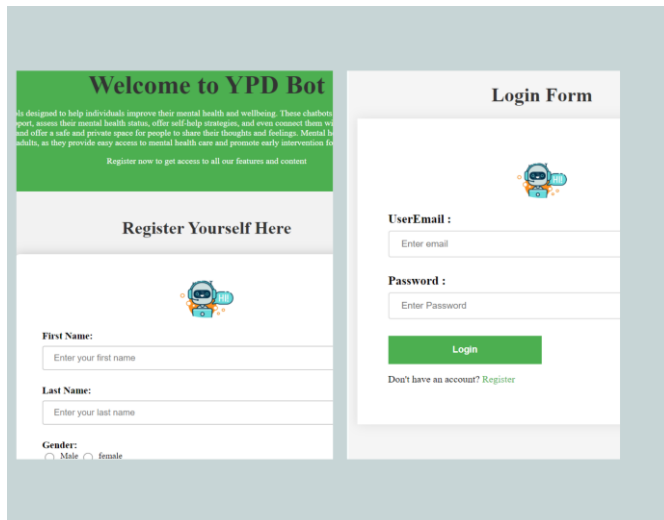


Figure 5. Image showing UI/UX of the web app



Figure 7. Image showing UI/UX of chatbot page on telegram

The bot is successful in detecting a user's problem and in responding with some ways in which how the user can feel better and get out of the depression.

The bot is able to detect all the 5 cases taken into account which are:

- Depression
- Anxiety
- Personal loss
- Education related problems
- Career problems/Stress

7. CONCLUSION

Our Mental Health Therapy Chatbot functions well and is able to work effective.

mental health therapy chatbots have the potential to revolutionize the field of mental health by providing accessible and affordable support to individuals in need. While chatbots cannot replace the expertise and empathy of a human therapist, they can serve as a valuable complement to traditional therapy or as a first-line resource for those who may not have access to in-person care. Chatbots can also provide a safe and confidential space for individuals to discuss their mental health concerns without the fear of judgment or stigma. As technology continues to advance, we can expect to see further development and refinement of mental health

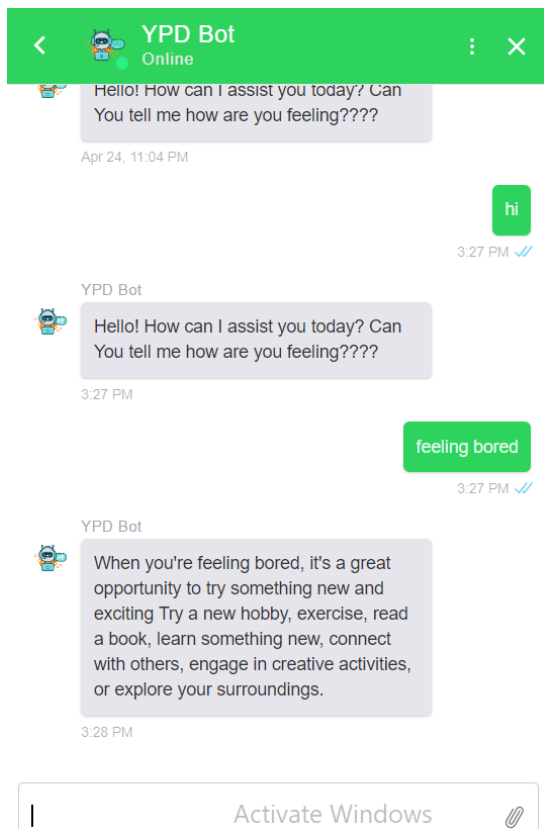


Figure 6. Image showing UI/UX of the chatbot page

therapy chatbots, making them an even more effective and valuable tool for supporting mental health and well-being.

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