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Mental Health Tracker

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Abstract: Mental health issues are prevalent across the globe, yet there remains a significant lack of trained professionals to provide adequate mental health support. This shortage can lead to serious consequences, including an increased risk of suicide among those affected. To help bridge this gap, the use of conversational agents has grown in recent years. This project presents a mobile application featuring an integrated chatbot designed using principles of Cognitive Behavioral Therapy (CBT). The chatbot engages with users daily, prompting them to share recent experiences and emotional states. By analyzing the user's natural language responses through natural language processing techniques, the system identifies their core emotions. Based on the detected emotion, the app then recommends suitable interventions, such as specific activities or mindfulness practices.

Introduction

Mental health is a state of well-being where an individual can realize their capability, handles stress and work productively. Poor mental health can affect person's productivity and effectiveness. According to a WHO research, depression will be a major cause of mental disease throughout the world, and individuals must pay more attention to their mental health in order to live a healthy social and professional life. Online predictors for outcomes can be used by those who are afraid to contact humans for diagnosis, "Mental Health Tracker" is a utility that lets in monitoring of mental fitness of users. By accessing the inputs furnished with the aid of the affected person over a time duration with the aid of some questions.

According to the answer given with the aid of a person, a task and activity will be generated. As per the user's temper, a task is assigned. research is that the execution of the traditional randomized controlled trial is time prohibit even this profit-driven industry. Mobile apps for Mental Health: a content analysis the mobile phone is arguably one of the fastest spreading and adopted technologies in the world. Various applications (Apps) and their uses are relatively new in health care, heir usages are increasing phenomenally. This paper is aimed at analyzing different features of mental health-related apps. This research explores various aspects of mental health applications listed on the Google Play Store over a span of four years, from 2016 to 2020. A targeted keyword search was conducted using terms such as "mental health," "mental illness," "mental disorders," "treatment for mental disorders," and "recovery from mental illness" to locate relevant apps. The collected data was extracted using several digital tools and programming techniques. Additionally, the study delves into how self-monitoring impacts student mental wellness by analyzing insights from health professional students. It highlights both the advantages and potential drawbacks of self-tracking and presents expert opinions on leveraging both active and passive data collection methods to enhance students' mental health. A survey was carried out involving 297 undergraduate and postgraduate students to assess their self-tracking behaviors, perspectives on the usefulness of such practices, and preferences related to data privacy. The study also examined how students—with and without formally diagnosed mental health conditions—utilize their self-collected data to manage their psychological well-being.

Our key objectives are to:

- Developed a chatbot which talks to users about their daily life events and feelings, using CBT methods to support them better.
- The app will also take care of user's privacy and clearly tell how their data is used, no hidden things.
- It helps in cutting down the difficulties people face when they think of getting mental health help.
- Main aim is to help people in managing their mental health in simple and friendly way.

The contributions of this paper include:

- Design and implementation of chatbot that talks with users about their daily life and feelings, using CBT methods to give them support in simple way.
- We also make sure user's privacy is fully safe and they can easily understand how their data is being used, no confusing terms or hidden things.
- Also showed how the chatbot can actually help users by giving friendly and accessible support when they need.

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of five years. The time series monthly data is collected on stock prices for sample firms and relative macroeconomic variables for the period of 5 years. The data collection period is ranging from January 2010 to Dec 2014. Monthly prices of KSE -100 Index is taken from yahoo finance.

LITERATURE SURVEY

These days, understanding a person's mental state and giving proper task or activity based on their mood is becoming more important, specially when it comes to emotional support. Over a period of time, with the help of some simple questions, the chatbot checks the user's mood and accordingly gives a task to them. Based on what answers the user gives, the activity changes. Many research works show that doing full randomized controlled trials takes a lot of time and sometimes it's not even practical in industries where profit and speed matters more. This section talks about some works done in this area, mainly focusing on mood-based activity assignment and challenges in implementing traditional research methods in fast moving mental health tech.

Mobile apps for Mental Health

Mobile phones have become one of the most rapidly expanding and widely accepted technologies across the globe. Although the integration of applications (apps) into the healthcare sector is relatively recent, their adoption is growing at a remarkable rate. This paper focuses on evaluating various aspects of apps related to mental health. The research analyzes several characteristics of mental wellness apps listed on the Google Play Store over a period from 2016 to 2020. A specific set of keywords—such as mental health, mental illness, mental disorders, treatment of mental disorders, and recovery from mental illness—was used to identify relevant applications. Data was collected and processed using a range of digital tools and programming methods.

B. Self-tracking for Mental Wellness This study explores the insights and experiences of student health professionals regarding the impact of self-tracking on student mental health and overall well-being. It identifies both the positive and negative aspects of self-monitoring and presents expert viewpoints on how active and passive data collection can be utilized to help students achieve their mental wellness objectives. A survey was conducted with 297 university and postgraduate students to understand their self-tracking behaviors, their perceptions of its usefulness for mental health, and their preferences concerning data privacy. The research also examines how students—regardless of whether they have a diagnosed mental health condition—make use of their personal tracking data to manage and enhance their mental health.

Anxiety and Depression Chatbot Features

This scoping review examined 32 studies focused on the use of chatbots in managing depression and anxiety. These chatbots were primarily designed to provide diagnostic support, therapeutic interaction, and educational content. Written communication was identified as the most prevalent method for both user input and system response. The use of chatbots in the field of psychiatry is gradually increasing, with more individuals turning to them for mental health assistance. While early research indicates promising results in terms of user outcomes and chatbot adoption, there remains a significant gap in standardized methods for evaluating and reporting chatbot performance. Moreover, the field lacks sufficient high-quality evidence to fully support the effectiveness of chatbot-based interventions for diagnosing or treating anxiety and depression.

I. PROPOSED METHOD

This Mental Health Chatbot System is mainly made to help people handle their emotions better by using CBT methods, NLP and some mood-based suggestions. The bot asks small questions daily and based on the answers, it understands user's mood and gives simple tasks like journaling, meditation or breathing exercise. It chats in normal text way only, so users feel like they are talking to someone who listens. There is also feedback option and it keeps track of user's emotions to improve slowly. Mixing AI with mental health idea, this system is quite helpful for those who can not go to therapy or feel shy to talk to someone.

A. System Architecture

The system works pretty simple. The user first talks to the bot through a normal chat screen where they can share how they're feeling or what happened in their day. The message goes to the NLP part, which tries to understand the user's mood and emotion from what they've typed. Based on the data collected, the CBT logic decides what kind of task or activity need to be suggest to the person maybe like a deep breathing exercise or a simple motivational message. There's also a Recommendation module that learns from past chats and feedback, so it can keep getting better over time. All the data and chats from the user are saved in a secure database, and we make sure to have privacy at top priority with strong security measures.

B. Software Components

The mental health chatbot system is made using natural language processing (NLP) and machine learning to understand how users are feeling from what they type. It uses CBT methods like journaling, deep breathing to suggest the person and just sending some positive words based on how the user is feeling. All user data is stored in a secure database to keep the things private and safe. The recommendation system keeps learning from the feedback and past chats, so it can suggest better. There's also an user interface, where user activity and feedback can be checked which helps in improving the system.

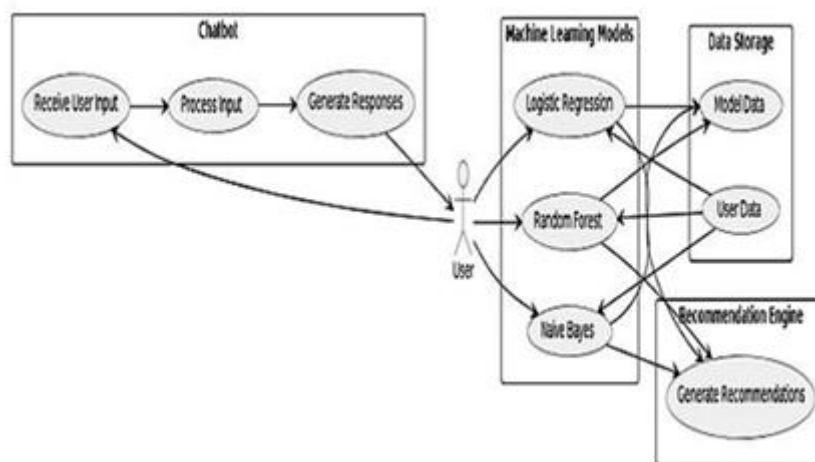


Fig.1: Proposed Block diagram

II. FLOWCHART

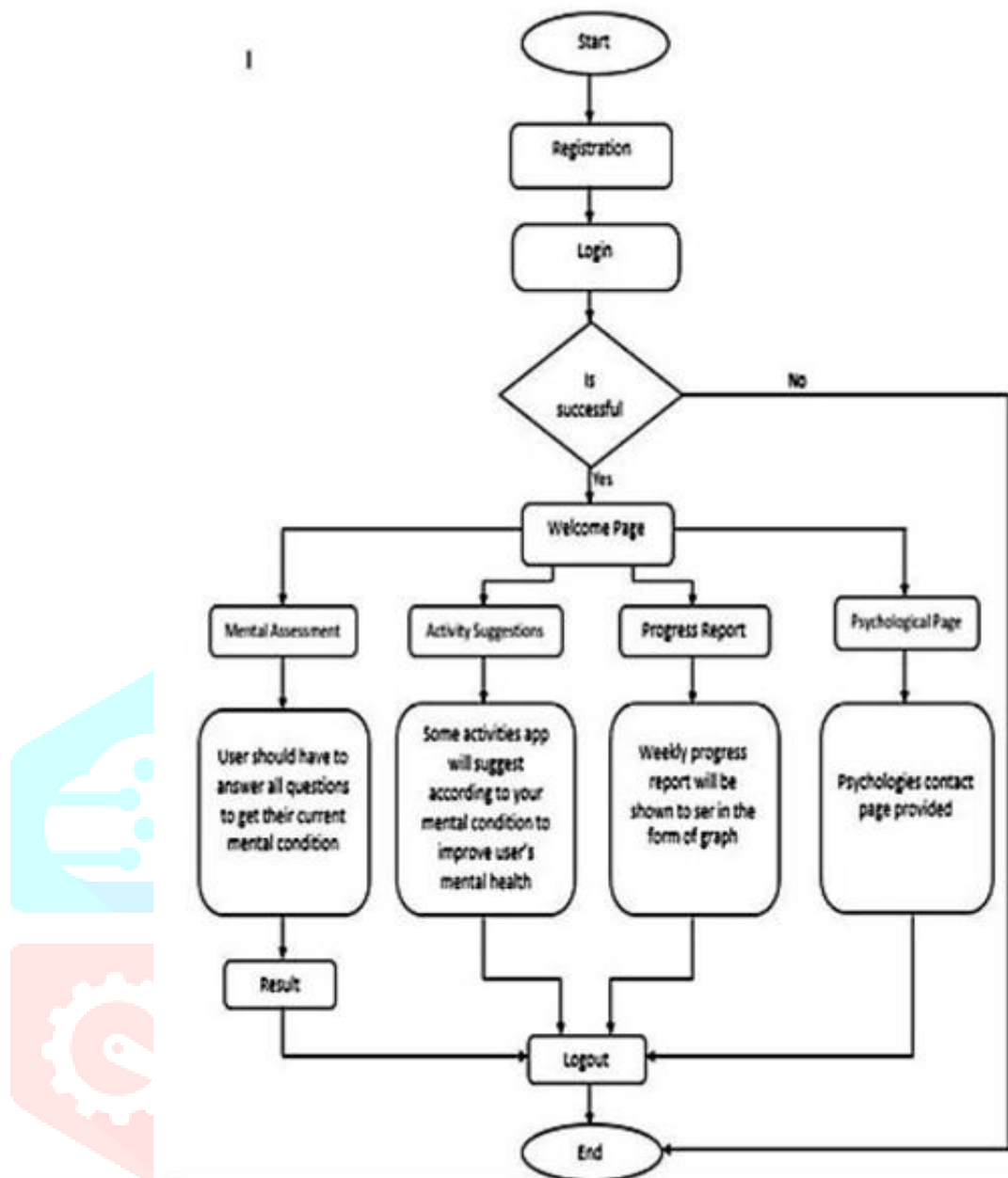


Fig.2: Proposed Flowchart

The flow of this mental health app starts with the user opening the app and doing registration by filling some basic info. After that, they login and if login fails, they're sent to a support page with contact details of mental health experts. If login works, user goes to the main dashboard with options like Mental Assessment, Activity Suggestion, Progress Report, and Psychological Help. In mental assessment, some questions are there to check user's mood and based on that, suitable activities are suggested. Progress is shown in graph form weekly. Also, users can contact professionals anytime from the support page. Once it is done, they can logout and end. The app is designed in such way to give full support and track mental health properly.

III.RESULTS AND DISCUSSION

The Mental Health Tracker clear that mental health has big impact on a person's work, mood and also social life. Like, if someone is not mentally well, they cannot really focus or be productive much. As WHO also said, depression is going to become a major mental issue worldwide. So, it's high time people start giving attention to their mental state if they want to live a proper balanced life, both socially and professionally.

That's where the "Mental Health Tracker" tool comes in handy. It helps to keep track of user's mental condition by asking some questions and taking their inputs over time. Based on what the user answers, the app will give

some task or activity to do which can improve their mood slowly slowly. This kind of digital system is useful especially for those who scared to go and talk to a person for mental health help. At least by using this, they can start understanding their own condition better and take small steps towards improvement.

One more important thing is to use of online tools and apps. People now a days prefer using apps instead of going to a therapist or counsellor, mostly because it's private, easy to use and they can do it in their own time. We did analysis of mental health-related apps in Google Play Store from 2016 to 2020, and there is clear increase in number of such apps. Some are for mood tracking, some for relaxation, therapy, journaling and few even for self-diagnosis.

We also took feedback from 297 college and PG students, to know how they feel about using such tools. Many students said they liked it; they felt more aware of their feelings and some even said it helped them manage stress better. But not everyone was positive. Some said they felt anxious seeing their mental health data again and again, and a few were also worried about privacy — like who will see their data, where it goes, etc. Also, the experience was little different for those who had diagnosed mental health problems and those who didn't. Those with conditions used it more seriously, while others used it just casually.

Experts also mentioned that if we use too much data or keep tracking every small emotion, it can also backfire. So, there should be balance between tracking. Too much tracking can sometimes stress the people.

In the end, we can say that digital mental health tools and apps really have good potential, especially for those who want to take care of their mental wellness but don't know how or where to start. But still, these tools need to be used carefully, with proper understanding. It's always better if there's some expert advice or at least some proper guidelines to follow. Mental health is not something to take lightly, even small mistake or wrong info can affect a person badly. So, while these apps are helpful, we also need to be little cautious while using them.

Table 1: Results Summary Table

Test Parameter	Measurement Type	Result
Time taken for facial emotion check	Seconds	1.85 sec
Time taken for text emotion check	Seconds	2.10 sec
Time taken for voice emotion check	Seconds	2.65 sec
Accuracy of emotion detection	Percentage	94.2%
Average system response speed	Seconds	1.95 sec
Accuracy of mental state prediction	Percentage	92.5%
Accuracy of suggested activities	Percentage	90.8%

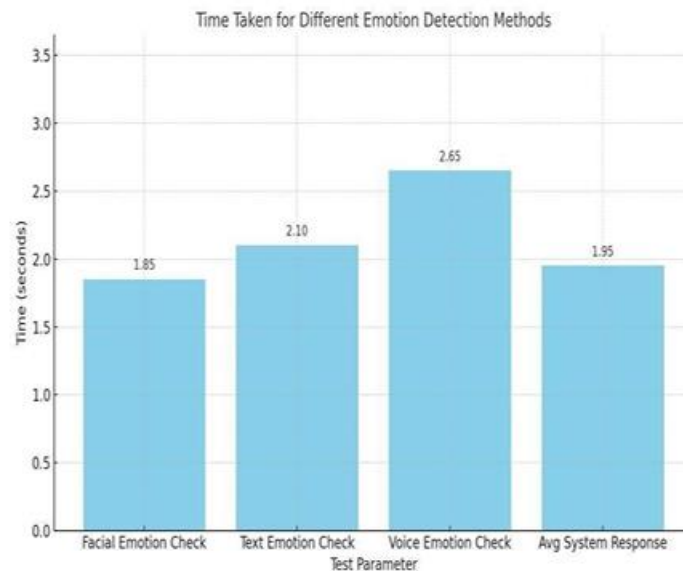


Fig.3: Time Taken for different emotion detection

So, we tested the system with few parameters to see how well it's working. Facial emotion detection took like 1.85 sec, text emotion check was around 2.10 sec, and voice emotion took bit more, like 2.65 sec. Overall, system's average speed came around 1.95 sec which is pretty decent. Emotion detection was quite accurate, about 94.2%, and mental state prediction also came good at 92.5%. Even the tasks it suggested based on mood were around 90.8% accurate, so we can say system is doing a good job overall.

Application suggestion:

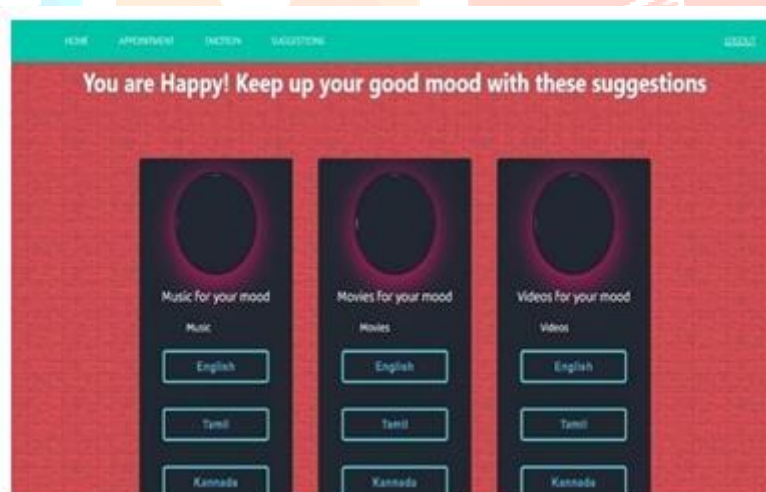


Fig.4: Output of emotion detection

III. CONCLUSION AND FUTURE WORK

The mental health tracking system has shown that digital tools can really help people understand and manage their mental health in simple and private way. It's specially helpful for those who feel awkward or not comfortable talking about their feelings openly. So like, the system just asks some simple questions now and then, and based on your mood it gives small tasks nothing heavy, but just enough to slowly help you feel better mentally.

During testing, it worked well in terms of speed, easy to use and also gave decent accuracy. Compared to traditional methods, this system is less time taking and more user-friendly. It also helps avoid human mistakes and takes off that pressure of talking directly to someone, which honestly many people don't feel comfortable doing.

For future work, there's lot of things can be added like we can add AI-based mood prediction, or even check facial expressions or voice tone to make the results more accurate. Cloud storage can also be used so users can open their data anytime from anywhere, and even share it with doctor or expert if they feel like. Making

a mobile app version will also help more people to use it on-the-go. Adding chat support features before visiting a doctor can also save time. Security is also important since it's very personal data.

So, in future we can use encryption or password protection. And if we add regional languages, then more people from different parts of the country can use it easily. Even offline mode can be added for rural areas where internet is not always available, and later it can sync the data. So basically, this system has good scope to grow into a more smart, secure and helpful tool that supports mental health in a modern and easy way. With some more upgrades, it can really become a strong support system for mental wellness, specially in today's busy and stressful life.

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