# E-Medic Champ: Mental Health Analysis Application

**[1]Bhavya Parmar, [2]Rabee Shaikh, [3]Nitin Singh, [4]Dr Divya Y. Chirayil**

[1,2,3]Student, [4]Professor

[1,2,3,4]Pillai HOCL College of Engineering and Technology, Khalapur, HOCColony Rd, Taluka, Rasayani, Maharashtra, India

**Abstract: Mental health is a crucial issue that affects people of all ages, including young adults. Many teenagers suffer from mental health problems, but due to the lack of awareness and stigma surrounding mental health, these issues often go undetected and untreated. Depression, anxiety, ADHD, and behavioral disorders are some of the mental health problems that teen may experience, and if left untreated, these problems can have a detrimental impact on their development and well-being. Therefore, early detection and treatment of mental health problems in teen are critical. This paper presents an innovative e-mental health system, E-Medic Champ, that aims to detect mental health problems in teens and provide appropriate support and interventions.**

**Keywords: mental health, e-mental health system, depression, anxiety, ADHD.**

## INTRODUCTION

Mental health is a growing concern worldwide, and many people suffer from mental health problems without seeking help due to lack of awareness or stigma. Early detection of mental health issues is crucial for successful treatment, and technology can play a vital role in making mental health support more accessible and reducing barriers to getting help. With this in mind, we have developed the E-Medic Champ system, an innovative solution designed to detect and support adolescences with mental health problems. The system uses interactive questions to analyze the user's mental health status and provide suggestions to improve their condition. It also recommends psychologists and psychiatrists in severe cases. Our goal is to identify mental health issues early and provide appropriate support to prevent the condition from becoming severe. In this project, we have included various features such as mood and habit trackers, audio meditations, calming sounds, self-assessment tests, and emergency contacts, which provide a comprehensive approach to monitoring and improving user's mental health.

## I. LITERATURE SURVEY

[1] This project offers a website where users can interact with a system for diagnosing and analyzing mental health issues. The system predicts the user's mental health with 92% accuracy using a dataset and questions using the Logistic Regression technique. In order to collect user input and display system output, the website is developed utilizing the Flask API.

[2] In this paper the system for face emotion identification and sentiment analysis is suggested in this paper. Deep convolutional neural networks and OpenCV are used in the facial emotion recognition module to classify emotions into seven groups. The sentiment analysis module includes a questionnaire and chatbot to predict the user's mental state based on their responses. These tools can assist in determining the user's present mental and emotional condition.

[3] This paper proposes a model to forecast someone's mental health based on their social media usage. The model uses unsupervised machine learning techniques to classify social media data based on content, language, photos, and hashtags, and it achieves 91% accuracy for multi-class categorization. Social media monitoring can help identify mental health problems early, allowing for prompt intervention and treatment.

[4] In this study, a machine learning classifier-based approach for mental health detection is proposed. To determine the relevance of terms to mental health issues, the model consults the Related terms Site. A scale of polarity is developed for each disease based on the mapping of the occurrence of words that are pertinent. The best outcomes were achieved by logistic regression, which had an overall accuracy of 0.900174529.

## II. PROBLEM STATEMENT

The increasing number of people suffering from mental health issues is a significant concern worldwide. Many people are not aware of the different mental health problems, leading to neglect of this crucial issue. Depression, anxiety, PTSD are examples of problems that can become fatal if not treated promptly. Early detection of mental health issues is critical for successful treatment. However, people often hesitate to seek professional help due to stigma and lack of accessibility. Therefore, there is a need for an application that can promote early detection and accessibility to mental health support. Furthermore, traditional mental health care services such as therapy and counseling may not always be easily accessible or affordable for the person and their families. In addition, teens may not always be comfortable talking to a professional or seeking help from their parents or guardians, which can further delay the detection and treatment of mental health issues. This highlights the urgent need for digital mental health solutions that are easily accessible, interactive, and provide early detection and intervention.

## III. EXISTING SYSTEM

It seems that the current system lacks many of the functionalities mentioned in the documentation. The current system only includes one component, which is not specified. Some mental health applications focus on mood tracking, meditation, and relaxation techniques, while others provide access to professional help and connect users with licensed therapists for online counseling. Some apps offer self-help resources such as coping strategies for specific mental health conditions without any testing or detection of mental health issues. Additionally, the current system lacks security components, and users may not feel secure disclosing their private information due to the lack of high integrity.

## IV. IMPLEMENTATION

### FRAMEWORK

**Android Framework:** We utilized the Android framework as the primary development platform for our application. It provided us with a comprehensive set of tools and features for developing the user interface (UI) and integrating the system with the application UI. This allowed us to design a user interface that is intuitive and easy to navigate, ensuring that the user has a seamless experience.

**Java Programming Language:** Java played a crucial role in building the application logic and functionality. It allowed us to write the code necessary for the app to perform various operations, such as data processing and user input handling.

**Firebase:** Firebase served as the backend for the application, allowing us to store the user's mental health data securely in the cloud. Firebase also provided a robust set of features for real-time database management, including user authentication, data storage, and cloud messaging. It provides services to Android, IOS, Web, and unity. It provides cloud storage. It uses No-SQL for the database.

**Pacman:** PacMan is a package manager utility for Windows Subsystem for Android. Created by XDA Senior Member alesimula, the open-source tool aims to streamline the app sideloading job by providing an easy-to-use GUI installer for APK files. It also displays the full package name of the APK, its version number, the permissions, and the icon -almost like the standard package manager app does on an actual Android device. Pacman is package manager of Arch Linux can download, install, update, and uninstall compiled binary software packages on an Arch Linux system. It ensures that any necessary dependencies are also installed, updated, or uninstalled as necessary. Pacman packages use the extension .pkg.tar.gz, and the client command is pacman.

### METHODOLOGY

The proposed methodology involves in the development of a system that analyses the mental state of an individual through the means of their mobile phone.

When the user launches the application, he/she has to first create a profile in which all the data that the user generates is stored under that profile. All this data is stored in the firebase and is accessed by the application.

The user must first sign in or register in the app using their credentials as the first task. The user will view the app's home page after logging in, from where he can access the menu of the programme The menu tab consists of various modules.

Detailed explanation of these modules is given below.

1. To-do: In this tab the user can enter task that are to be completed in a certain time. This enables a sense of accountability in the user and the dopamine released when the task is completed helps to improve the mental state of the user.
2. Mood tracker: This feature enables the user to keep track of their moods, such as how they are feeling today compared to how they were feeling yesterday. They can also add their mood to this feature along with a description of how they feel today compared to how they felt yesterday, as well as what they feel has improved.
3. Habit Tracker: This function assists the user in adapting a new habit & helps him in maintaining them by keeping a log of this habits, such as reading books or jogging every day, by keeping track of it.
4. Breathe: By allowing for meditation, this feature will assist the user in maintaining mental calmness. This module comes with the timer which guides user with proper technique for meditation.
5. Self-Assessment: This element of the programme, which consists of six different types of tests (including those for bipolar disorder, depression, anxiety, and BSTD), is its centerpiece. The user must respond to questions on a questionnaire that is connected to the test. The answers to the questions asked from the questionnaire for each test is taken as input and using conditional statements the input is processed into a score of that particular mental health disorder. On the basis of this score machine learning algorithms are used to predict the state of the mental health and the severity of the respective disorder. The user's response will be saved in our application's firebase, and the system that collects all the responses will review it, rate it on a scale of 1 to 10, & add the total scores for each question, and notify the user for the results, including any symptoms of the above test that may apply to him. For instance, if the score is between 0 and 3, the patient has severe disease symptoms; if it is between 4 and 6, the patient has mild symptoms; and if the score is above 6, the patient has no symptoms.
6. Ambient: This feature provides the user with soothing music or tunes that can assist the user relax, keep calm, and feel better if they are stressed.

7. Quote wallpaper: This feature enables the user to alter the background image for his profile on a daily basis in accordance with the quote of the day so that he can read a fresh quotation each day to brighten his day.

8. Doctors contact: This feature contains all of the contact numbers of certified doctors & mental health experts, which user can connect to them & consult with them about their well-being.
9. Profile: This feature contains all of the user's credentials and allows him to edit or update them anytime he sees fit.
10. Helpline: This function enables users to get in touch with non-profit organizations that provide remedies & assistance to user for emergency healthcare services. Because these organizations contact information is integrated into this app, using this feature will enable users to request remedies.
11. Emergency contact (SOS): This feature contains all of the emergency contact numbers, including those for the police, hospitals, and other government emergency helplines.

So, this is how the E-Champ application functions generally

**FLOWCHART**

To provide a seamless user experience, we utilized two flowcharts to develop the mental health assessment and support application: One for the App itself and One for the App Menu.

1. App Flowchart
2. App Menu Flowchart

**1] App Flowchart**

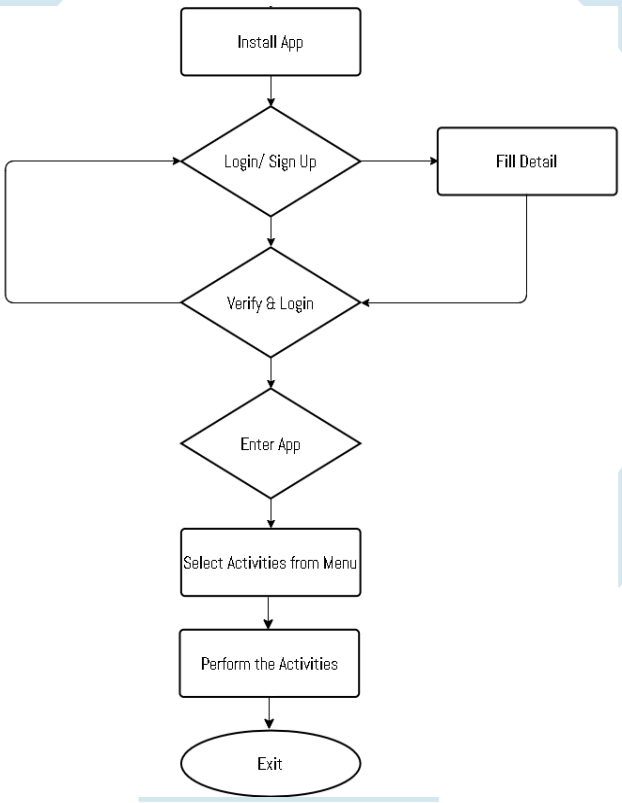


Fig 1: APP FLOWCHART

**2] App Menu Flowchart**

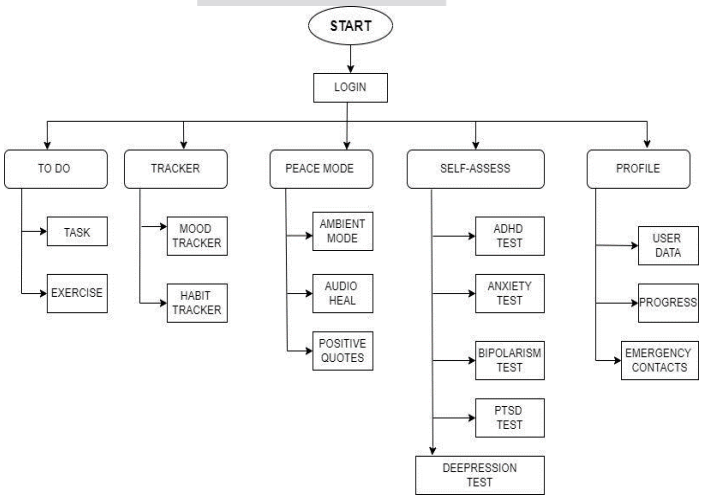


Fig 2: APP MENU FLOWCHART

The flowchart starts with the "Start" symbol, which leads to the "Login" symbol. Upon successful authentication, the user is directed to the main interface of the application, which is composed of five distinct modules**: "To Do," "Tracker," "Peace Mode," "Self-Assess,"** and **"Profile."**

Under the **"To Do"** category, the user can access two subcategories: **"Task" and "Exercise."** The "Task" module allows the user to set specific goals and objectives, while the "Exercise" module provides physical activities to promote physical health and reduce stress levels.

Under the **"Tracker"** category, the user can access two subcategories: **"Mood Tracker"** and **"Habit Tracker."** The "Mood Tracker" module enables the user to track their emotional states over time, while the "Habit Tracker" module helps users monitor their daily routines, including sleep, exercise, and diet, to gain valuable insights into their mental health and well-being.

Under the **"Peace Mode"** category, the user can access three subcategories: **"Ambient Mode," "Audio Heal,"** and **"Positive Quote."** The "Ambient Mode" module features calming soundscapes to promote relaxation, while the "Audio Heal" module provides guided meditations and mindfulness exercises. The "Positive Quote" module displays uplifting quotes to foster a positive mindset.

Under the **"Self-Assess"** category, the user can access five subcategories**: "ADHD Test," "Anxiety Test," "Bipolarism Test," "PTSD Test,"** and **"Depression Test."** The "Self-Assess" module includes standardized assessments for common mental health disorders, enabling users to self-evaluate and seek appropriate support and intervention.

Under the **"Profile"** category, the user can access three subcategories: **"User Data," "Progress," and "Emergency Contact."** The "User Data" module displays user information and preferences, while the "Progress" module tracks progress and performance across different modules. The "Emergency Contact" module enables users to add emergency contact information for quick access in case of an emergency.

Overall, the flowchart provides a detailed and technical representation of the primary features and functionalities of the mental health application, enabling users to navigate the application more efficiently and effectively.

## V. RESULT & DISCUSSION

One of the key strengths of the E-Medic Champ system is its ability to accurately identify potential mental health disorders at an early stage, allowing for timely treatment before the underlying issues escalate. The user-friendly interface offers a comfortable and non-intimidating way for individuals to answer questions, enabling the system to analyze their mental health status and securely store the collected data. This data is then used to provide personalized remedies and support to help individuals better manage their situation.


Fig 1) Menu Bar

After logging in you are able to navigate through the various modules/features of the app by clicking the three bars icon on the top left of the screen. By clicking this, the navigation menu pops up, allowing you to navigate to the feature you like.


Fig 2) Mood Tracker

Something our users find useful is the Mood Tracker. This easy-to-use feature helps users keep a log of their past moods, which helps track progress or point out when the user requires assistance.


Fig 3) Breathing Exercise

A unique feature for E-Champ is the Breathing module. This module is a special one since it helps the user meditate and relax. The user can specify the breathing pattern they wish to follow, and the module will animate that particular exercise for the user. Along with the Breath module, there is an Ambient Noises feature which plays soothing meditation music, further allowing the user to relax and rejuvenate.


Fig 4) Self-Assessment Quiz

E-Champ understands that Mental health issues are serious, so it provides a series of questionnaires for various mental health conditions in the Self-Assess module. This is very useful since the user is able to get an idea of their well-being by simply answering a few questions.

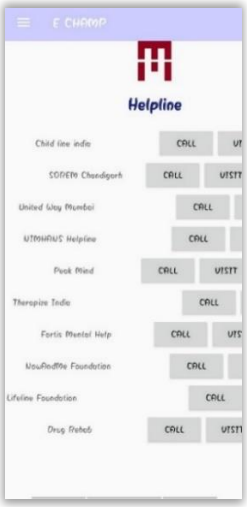


Fig 5) Helpline

In the case that the user is in a state of stress and/or panic, there are several quick-to-access helplines given to the user. The user has an option to visit their website or call a particular helpline for a more private conversation.

## VI. FUTURE SCOPE

In terms of future plans for E-Medic Champ, we aim to provide even more accurate and personalized mental health support. We plan to integrate a chatbot feature for real-time conversations and tailored recommendations. Additionally, we will explore voice call technology to analyze changes in the user's voice, providing accurate predictions of their mental health status. We will also provide timely recommendations to seek professional support, connecting users with licensed psychiatrists. Our team is committed to continuous improvement, leveraging the latest technologies to empower individuals to take control of their mental health with an accuracy of around 90%.

## VII. CONCLUSION

E-Medic Champ is a mental health app for young adults that provides early detection and treatment of mental health problems. It uses interactive questions to assess the user's mental health and suggests ways to improve it. The app includes mood and habit trackers, audio meditations, calming sounds, self-assessment tests, and emergency contacts. The app's methodology involves user-friendly design, reliable software and hardware, and accuracy of about 85%. The app aims to reduce the stigma around mental health, encourage help-seeking, and improve user's mental health.

## REFERENCE

1. Mrs. G. Parimala, Dr. R. Kayalvizhi, Dr. S. Nithiya. Mental Health: Detection and Diagnosis (2022) International Conference on Computer Communication and Informatics (ICCCI). https://ieeexplore.ieee.org/document/9740834
2. Manav Jain, Soumyaprakash Dasmohapatra. Mental Health State Detection using Open CV and Sentimental Analysis (2020). 2020 3rd International Conference on Intelligent Sustainable Systems (ICISS) https://ieeexplore.ieee.org/document/9315984
3. Vaishali M Deshmukh, Dr. Rajalakshmi B, Sarthak Dash, Pavan Kulkarni and Sai Kiran Gupta (2022). Analysis and Characterization of Mental Health Conditions based on User Content on social media. https://doi.org/10.1109/ICCCI54379.2022.9740834
4. Saleh Afzoon, Nabi Rezwani, Farshad Khunjush. Enabling the Analysis of Mental Health Patterns using an Effective Machine Learning Approach (2021). 2021 IEEE 25th International Enterprise Distributed Object Computing Workshop(EDOCW) https://ieeexplore.ieee.org/document/9626311,
5. Erly Krisnanik; Ika Nurlaili Isnainiyah; Az Zahra Aininda Resdiansyah(2020) 2020 International Conference on Informatics, Multimedia, Cyber and Information System (ICIMCIS). https://ieeexplore.ieee.org/document/9354299
6. Firth J., Torous, J., Nicholas, J., Carney, R., Pratap, A., Rosenbaum, S., & Sarris, J. (2017). The efficacy of smartphone-based mental health interventions for depressive symptoms: A meta-analysis of randomized controlled trials. World Psychiatry, 16(3), 287–298. https://doi.org/10.1002/wps.20472.
7. Wei, W., Zhao, Q., Chen, C., Zhang, Y., Deng, Z., Zhang, M., & Bao, Y. (2016). The Use of Mobile Apps and SMS Messaging as Physical and Mental Health Interventions for Children and Adolescents: A Systematic Review. Journal of Medical Systems, 40(10), 210. doi: 10.1007/s10916-016-0561-4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6928184/
8. Sander L, Rausch L, Baumeister H, in journal of JMIR mHealth and uHealth (2018). Mobile apps for promoting children's mental health: Systematic Review. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6069644/