# MindPeace

## An Engineering Project in Community Service

**Final Report**

***Submitted by***


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***in partial fulfillment of the requirements for the degree of***

***Bachelor of Engineering and Technology***


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**Bonafide Certificate**

Certified that this project report titled **"MindPeace"** is the bonafide work of 19BCE10141 Smriti Panda, 19BCE10273 Anushka Khare, 19BCG10011 Supantha Paul, 19BCG10012 Aadira Anil Ramakrishnan, 19BCG10024 Deepargh Chatterjee, 19BCY10116 Ayushi Chaudhuri, 19BEE10021 Sanjyot Sanjay Khardekar, and 19BEE10029 Deepshikha Sen who carried out the project work under my supervision.

This project report (Phase II Final Review) is submitted for the Project Viva-Voce examination held on 22nd April 2022

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**Comments & Signature ( Reviewer 2)**

# 1. INTRODUCTION

This report summarizes the second phase of the project titled “Mind Peace”. MindPeace is an online platform that is focused on mental health, its awareness, and building a community that supports one another in times of need. MindPeace not only has dedicated spaces for each age group but also has branched out to address many mental health issues other than depression-like burnout, anxiety, PTSD, and eating disorders. One of the objectives of the project is to create a safe space and easy access to genuine resources.

## 1.1 Motivation

The stigma of mental health is prevalent in every nook and corner of our country and is apparent throughout all ages. Mostly, they are left undiagnosed and untreated and thus lead to adverse situations such as tension in family relationships and even death. The pandemic triggered anxiety, depression, and other mental illnesses in many individuals with little to no help that could address these issues.

Due to the reduction in physical consultations, many online forums and platforms were developed with the motive to help these problems and encourage people to not neglect mental health issues. However, these measures lacked a few features that promoted ease of use and availability and the results were dissatisfactory.

## 1.2 Objective

The objectives of this project are multi-faceted. One of the major objectives of MindPeace is to provide good and effective mental health care, accessible for all regardless of age and status, and to eliminate any social stigma by normalizing it. Also, a big motivation was to integrate some of the most useful features from different applications into one space.

We aim to connect some of the best professionals working in the field to every person in need and get them timely help. Also, an assessment plan through which an individual can evaluate their condition and get help accordingly.

Here, with the consideration of every concerned person, we have provided reliable and tested resources and ways through which one can treat themselves or someone close to them.

## 2. Existing Work / Literature Review

There are a few applications that have similar functions, such as:

Mindspace App[1] is an application that provides guided meditations, relaxing music, and breathing techniques.

Moodfit[4] is another app that offers journals, tips on mindfulness and breathing work, etc. The app has features like:

- Adaptable based on your goals
- Ability to track daily progress
- Visual insights with actionable exercises
- Daily reminders to keep one on track
- Customizable based on one's needs and goals

But also has issues like:

- lack of access to professional help
- May lead to self-diagnose
- Some advanced features have additional costs
- Tracking moods can be time-consuming
- Lack of progress may cause feelings of frustration

Some other applications available in the market are Inner Hour, DayLio, etc. These applications have only a few features that MindPeace offers.

## 3. The topic of the work

(a) System Design / Architecture

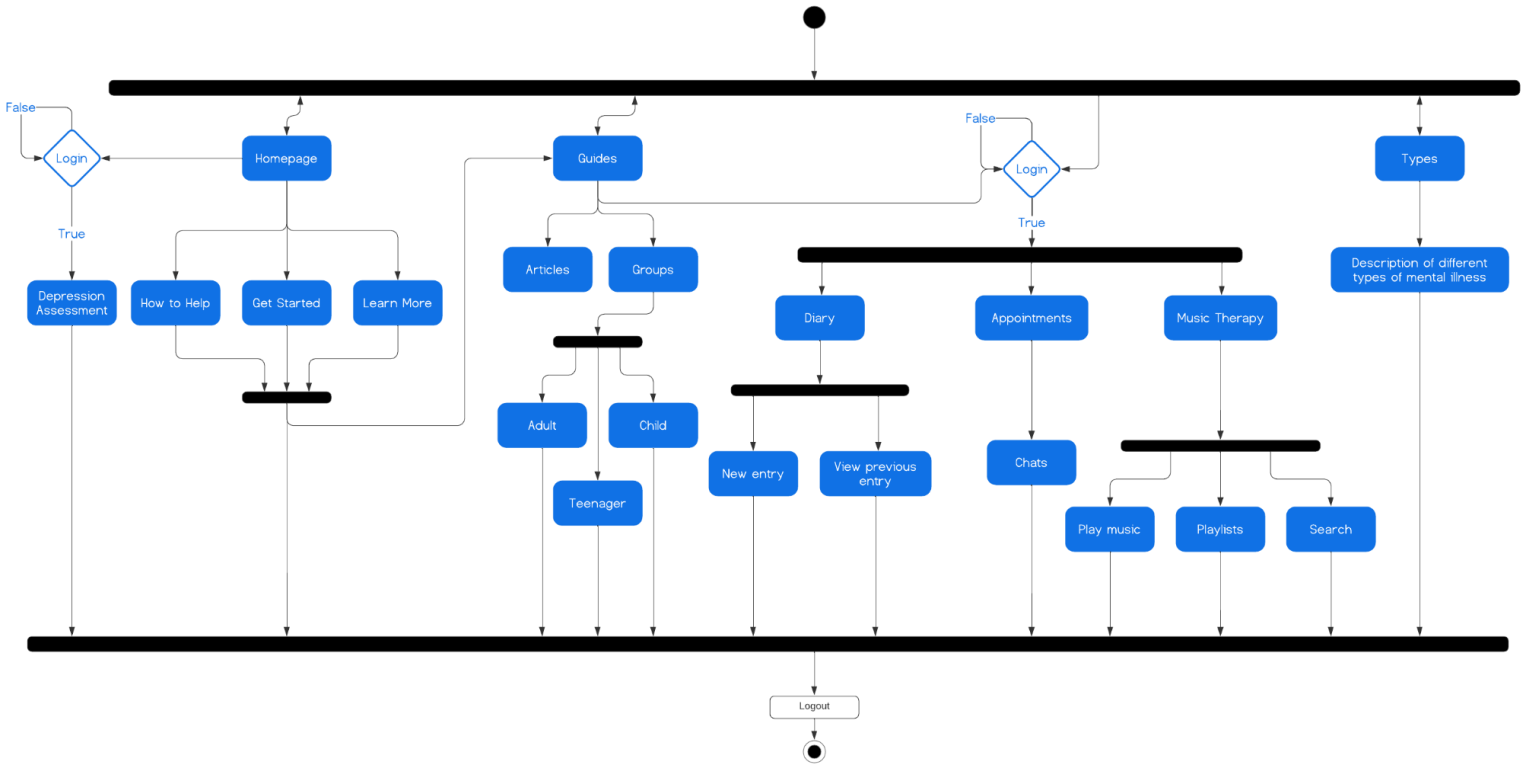


*figure (1): UML Activity Diagram*

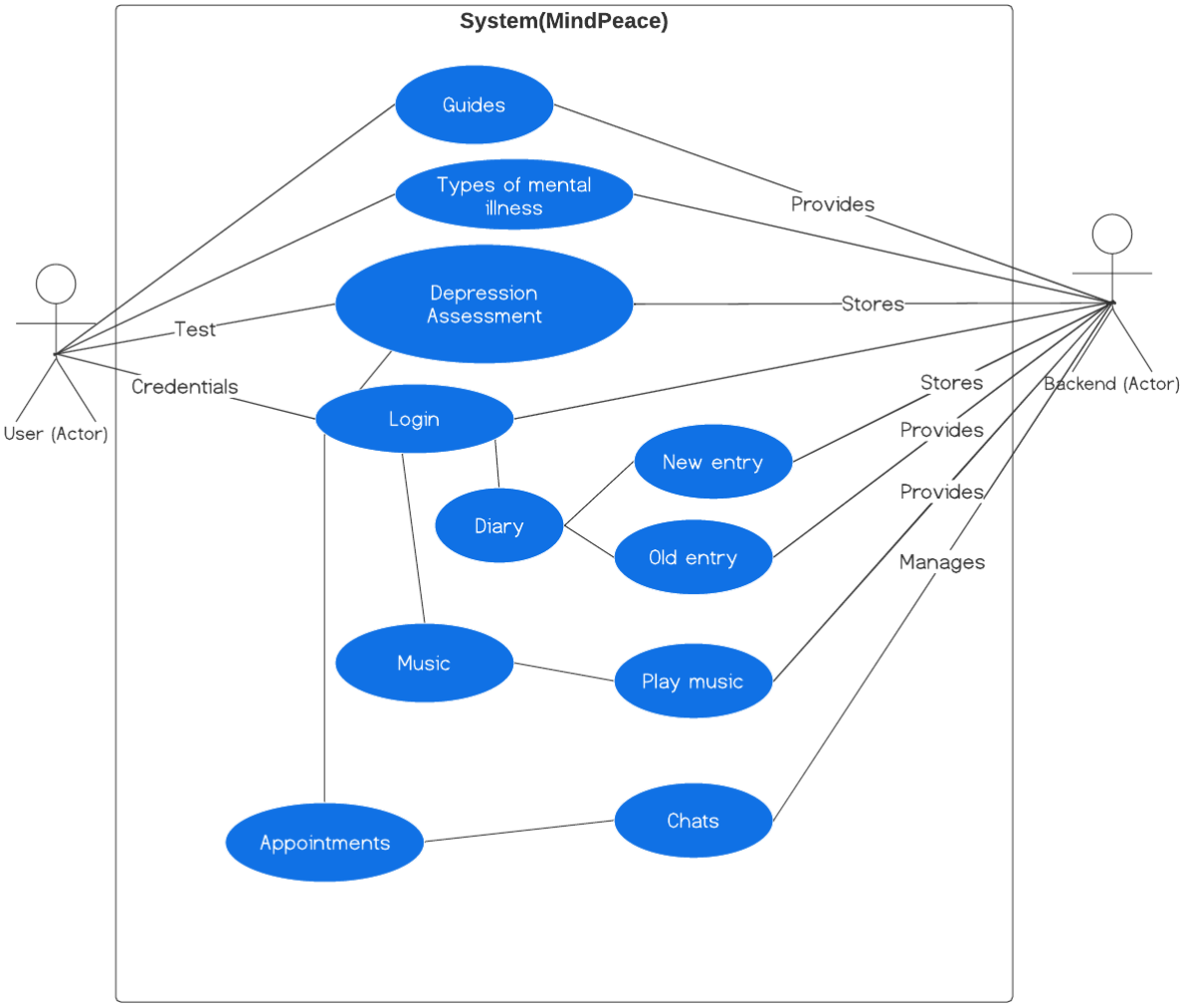


*figure (2): UML Use Case Diagram*

The application initially went through a prototyping phase in order to make the design scalable, and usable at a large capacity to serve the community. In the initial phase, user personas were created from available data to simulate real users and identify the problem statement. Later with some basic wireframes and a low fidelity prototype, an unmoderated usability study was conducted in order to isolate the pain points of the users in the initial design. From the study it was found that users had some major pain points, which were solved by implementing several new features like chat options, music therapy etc. Finally a high fidelity prototype which final user flows was designed to be implemented in the main project.

(b) Working Principle:

The Mindpeace web application is made using ReactJS, JavaScript, Node.js, EasyPeasy, MongoDB, and Firebase. The web application starts with a homepage that provides links to different sections of the application with a brief description of the section the links are directed to. The sections are Home, Types, Guides, Diary. All the sections are accessible to the user without needing to log in except the dairy section and the depression assessment, as the diary is private and personalized for each user and the depression assessment is stored to each user to help them keep a track of their mental health.

The Guides feature different directions and indications for depression as to how to diagnose if someone has depression and the common causes of depression. The guide section also points the user to the diary showing the benefits of writing about their thoughts and feelings. It also contains guides specific to different age groups: adult, teenager, and child. A special section has been dedicated only to cyberbullying in the guide section. It can guide victims and their peers in providing the necessary help required with additional information regarding the cause, effects, and aftermath of cyberbullying.

The types section provides an overview of the existing mental illnesses. Different mental illnesses such as PTSD, anxiety, depression, etc. are explained. The indications, symptoms, and remedies for various mental illnesses are also given in a proficient manner.

The Diary section features a personal diary for the user in which the user can store notes and information about their feelings, which can be retrieved on command by the user. Internally, the diary notes are retrieved from MongoDB through node js and Express API so that it is easy to display the diary in the frontend in an efficient and well-formatted manner.

For the users who require more direct support in diagnosing their condition or professional help rather than automated tools, MindPeace features a fully-fledged Appointments section. Through the Appointments portal, users can view all registered professional therapists and can do one-to-one consultations with any available therapist in the real-time chat feature. The real-time chat system is developed using the socket.io library which is used to create a WebSocket connection between the clients for real-time data transfer.

Music therapy is one of the clinical applications of music to achieve stress reduction, mood enhancement, and self-expression, and it is proven to be very helpful for people suffering from depression or other mental health issues. MindPeace offers a fully-featured music therapy solution built into the platform itself, where users can browse and listen to clinically proven playlists of music according to their age group. There are different genres of music listed in different playlists concerning different age groups that genre of music has proven to help. The music therapy system has been developed using React.js, Redux,

and its client-side state handling system in order to carry out different functionalities throughout the usage of the feature.

The Login process for Mindpeace is facilitated using the Firebase authentication gateway to provide the user with a seamless experience. The users log in through their Google accounts and this process is required for the users to access their personal diary and depression assessment.

(c) Results and Discussion

Users of the Mindpeace application are anticipated to be able to combat mental health issues or support anyone who is experiencing mental health issues. And, ideally, make a complete and healthy recovery from any mental health issues and challenges.

MindPeace makes use of data analytics and data visualizations as well. This data was collected using an anonymous survey with over 120 responses in 2 weeks. The questions were aimed to get information about age, sex, the experience of dealing with stress, and personal habits which affect stress in an individual. The responses were converted to a comma-separated value (CSV) file which was then cleaned and processed. This data was then visualized on a Jupyter notebook using NumPy, pandas, mathplotlib, and seaborn libraries. Various Python libraries were used to find trends and patterns in data to draw conclusions. These trends and conclusions were then used to steer research, and features of the project to cater to the young audience in a customized method.

It offers a range of features including healthy journaling, music recommendations that serve as emotional channels as a therapeutic effect, and information related to the most common mental illnesses that could help people dealing with them, along with the people who are the sole caretakers. Mindpeace combines all its survey data to extend easy self-diagnosis procedures to provide a proper awareness in regards to symptoms that go unnoticed.

It is also expected to assist professional therapists in more efficiently and effectively handling and assisting their patients by appointment scheduling. Mindpeace also aspires to be a superset of all currently accessible features on the market.

The source code of both MindPeace and its Music Therapy platform can be found in these GitHub repositories:

- https://github.com/supanthapaul/mindpeace
- https://github.com/IUC4801/mindpeace-music-therapy

(d) Individual Contribution by members:

- **Smriti Panda (19BCE10141):**
    - Researched various publications relating to mental health problems suffered by society as a whole.

- Researched available mental health platforms and deduced the missing aspects of them.
- Documented problems that need to be addressed so as to benefit patients dealing with such issues.
- Gathered verified resources to study various mental health issues
  - Resources included articles from WHO, NMHP-[National mental health program], etc.
  - Studied mental illnesses such as depression, anxiety, eating disorders, etc, and compiled the required dataset.
- Documented symptoms for mental illnesses - Depression, Anxiety, Eating Disorders, and PTSD.
- Designed a step-by-step manual on how to assess and detect the degree of severity of mental illnesses.
- Designed approach manual for self-help if someone is suffering from depression and/or Anxiety disorders.
- Formulated the survey quiz along with other Team members.
- Participated in the circulation of the survey.
- Segregated the researched data into modules of categories depending on age groups for the age-wise assessment section of our web application.
- Documented official report of our project.
- Contributed to the overall Research-based modules of the project.

- **Anushka Khare (19BCE10273):**
  - Data collection and cataloging of various mental illnesses - Depression, PTSD, Eating Disorders and their different types including- Anorexia Nervosa, Bulimia Nervosa, and Binge Eating, documented their symptoms and treatments that are:
    - affecting each age group (childhood, adulthood)
    - assembled from credible and tested resources like WHO, surveys, etc.
  - Researched different existing software like InnerHour, Moodfit, Being, Headspace, etc, and gained an insight into where they lacked and what can be done to fill the gap in the existing market.
  - Researched necessary steps required to mitigate the current social stigma against mental health.
  - Contributed to Ideas like:
    - Mood Boards,
    - expansion in accessibility especially in rural areas by implementing Mental Health Micro-centres,
    - incorporation of music therapy and stories, and
    - active collaborations with Government and NGOs.

- Curated Data-set for Mood Board which had a collection of all the activities based on different moods and also took into account the daily insights and self-care of users.
- Participated in the formation and circulation of survey forms for data visualization of our project.
- While collecting all the qualitative data, focused on cataloging information regarding different ways in which one can diagnose as well as treat themselves or someone close to them timely.
- Documented the official report of our project.

- **Supantha Paul (19BCG10011):**
  - Developed reusable components using React.js for the platform.
  - Implemented User Authentication with Google using Firebase SDK
  - Implemented front-end state management using the library 'easy-peasy'
  - Implemented a date-wise diary feature.
    - Developed a backend API using NodeJS and Express.js in order to create the diary API.
    - Used MongoDB Atlas as a managed NoSQL database for storing diary entries.
    - Developed the front-end of the diary component so that users can easily read from and write to the diary
    - Implemented the diary API on the front-end using Axios in order to fetch the diary data.
  - Implemented self-help portal as a form of Depression Assessment
    - The Depression Assessment provides a depression metric based on 15 highly curated questions from real-world data and scenarios.
    - Each answer option in every question carries a weightage that contributes to the final metric number.
    - Hence the depression metric is projected to provide a realistic quantification of the current situation of the user.
    - Upon completion of the depression assessment, the user is presented with different suggestions of activities that are medically proven to help with depression based on the metric received by the user.
  - Implemented a real-time Appointments system with registered therapists
    - Users may view all registered professional therapists and schedule one-on-one consultations with any available therapist using the Appointments portal's real-time chat feature.
    - The therapist's details like name and online status are shown and users can click on any of the therapist's names in order to consult with the therapist.
    - The socket.io library is used to generate a WebSocket connection between the clients for real-time data transfer in the real-time chat system.

        - The UI of the Appointments section has been created with the help of React components and it has been styled using CSS with the help of various layout attributes. Component-level states and Hooks have been used to manage the data flow of the components.
    - Contributed to the official report of our project.

- **Ayushi Chaudhuri (19BCY10116):**
    - Developed reusable components using React.js for the platform.
    - Implemented the frontend of the platform 'MindPeace' using React.js
        - Made the website responsive and implemented designs using React-Bootstrap.
        - Implemented routing of the website using react-router-dom.
        - Created reusable CSS classes for styling different components of the application like buttons, sections, etc.
    - Added additional features like Types, Guides, etc.
        - Implemented different sections for different mental illnesses providing necessary information about them to the users.
        - Sub-divided guides into different age groups i.e. child, teenager, and adult.
        - Each sub-divided guide provides information and remedies for mental illnesses for each particular age group.
        - Implemented different information and characteristics of mental illnesses into those subcategories of the guide section.
        - Implemented the types section which provides the indication, direction, and the remedies for different types of mental health issues like anxiety, depression, PTSD, eating disorders, etc.
        - Styled the website and its components like the guide section, types section, etc., and make it user-friendly with reusable CSS classes.
        - Implemented a separate section for cyberbullying which provides necessary information and remedies for the mental illnesses that happened due to cyberbullying and its aftermath.
    - Implemented a fully-featured music therapy system
        - Created a fully-featured music therapy solution built into the platform itself, where users can browse and listen to clinically proven playlists of music according to their age group.
        - Listed different genres of music in different playlists with respect to the age group that genre of music has proven to help.
        - Made the system user-friendly, customizable, and easily accessible using material-UI. A global state management system is implemented through react-redux for easy data access.
        - Created SCSS classes for styling for different components of the system like designing the playlist, music player, etc.

        - Users can look for songs by searching for the song title or the author's name. Our user-friendly layout makes it simple to locate tunes.
    - Contributed to the official report of our project.

- **Aadira Anil Ramakrishnan (19BCG10012):**
    - Researched for symptoms and visible signs of depression on different parameters like age, gender, and society.
    - Contributed ideas for guides and sections which helps one approach and help others facing issues.
    - Curated dataset from UK Government's records and statistics with parameters like age and residence for the initial stage.
    - Drafted a side report with ideas, data, approach, and technologies used.
    - Cleaned and analyzed data, using Python and Jupyter notebook, to come to conclusions about relations between visible signs of depression, age, and region of residence at the initial stage of the project
    - Visualized data using Python.
        - Used NumPy, Pandas, Seaborn, and MathPlotLib libraries.
        - Created Pie Charts, Bar Graphs, and Scatter plots to help understand the data better.
    - Documented official report of our project.
    - Conducted an anonymous survey with over 120 responses in 2 weeks.
        - Researched questions and responses to aim at the right factors and get the aptest answers from respondents.
        - The questions were aimed to get information about age, sex, the experience of dealing with stress, and personal habits which affect stress in an individual.
        - The scoring system was out of 5 for the majority of questions with a few questions asking for description as well. A liner scale was also used to account for responses for answers with variables involved.
        - This data was cleaned and processed to make it fit for analysis using Excel.
    - The data from the survey was then visualized on a Jupyter notebook using NumPy, pandas, mathplotlib, and seaborn libraries. These visualizations were used to illustrate the project and spread awareness about trends in mental health in the age group of 18-to 21-year-olds.

- **Deepargh Chatterjee (19BCG10024):**
    - Synthesized and designed the approach of the application
        - Designed the logical path of approach using empathy maps

        - Formulated problem statement using personas and data sets
        - Isolated the pain points of users
        - Ideated and designed solution approaches for the pain points
    - Designed the visuals and designs of the application
    - Synthesized the main workflow and UX of the application
    - Conducted research for User Experience:
        - Fabricated UX research study plan
        - Conducted usability study
    - Designed wireframes and low-fidelity prototypes for testing the usability and functioning of the application
        - Used Figma for designing digital prototypes
    - Documented and analyzed the main System architecture of the application along with documentation for the official report via UML Diagrams: Activity diagram, Use case diagram.

- **Sanjyot Sanjay Khardekar (19BEE10021):**
    - Provided necessary data for websites.
    - Research the different mental issues of different age groups of people i.e. adults, teenagers, and children.
    - Did research on various causes of mental disorders in different age groups of people.
    - Research about cyberbullying: what are ways that can help to get out from it and how to affect mental health.
    - Research on how to overcome different mental issues for different age groups.
    - Did research on symptoms of mental health issues in adults, teenagers, and children.
    - Research on data from different platforms regarding different mental disorders like emotional disorders, Mood disorders, and remedies and their effect on different age groups.
    - Contributed to the official report of our project.

- **Deepshikha Sen (19BEE10029):**
    - Research and Data Collection
    - Research the different kinds of mental disorders in different age groups of people i.e. adults, teenagers, and children.
    - Researched different reasons that cause the mental disorder in different age groups of people.
    - Collected data from different websites regarding different mental disorders and their effect and remedies for different age groups.

- Researched the different ways that can help people to get out of different mental health issues.
- Research about how many people get affected by these mental disorders and generate reports about different mental health issues data on different age groups of people.
- Research about the different levels of depression that cause the problem for all age groups of people and ways to get out from it. based on the age group of people.
- Data collection through the form and by discussing with people about our project and getting feedback from them.

## 4. CONCLUSION

MindPeace is an application that creates awareness about mental health, a safe space for many, and provides the community with the resources they need to battle mental health issues from burnout to depression and eating disorders. The application brings the best features like community help, guides, quizzes, music therapy, real-time appointment scheduling, and personal insight to oneself, of all existing apps to one platform as well. MindPeace brings a safe space with the right help to one and all.

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