

Abstract

In an innovative effort to address people's mental health, the "Youth YANA (You Are Not Alone) - Consulting Web App" was created. The software assesses students' mental health and depression levels by using proxies for surveys. It provides a distinctive user experience and assesses a person's condition using contemporary technologies and machine learning techniques. Using questionnaire results, the app matches users with suitable consulting levels. It also provides instructions for self-improvement and meditation, supporting users on their path to greater mental health. The user interface and design aim to provide a cozy and welcoming environment.

"YANA" is a web application designed to provide accessible and convenient mental health counseling. It offers 24/7 access to licensed professionals, personalized treatment plans, secure and confidential communication, interactive resources, and community support. The platform aims to make mental health support affordable and inclusive, breaking down geographical and time barriers to ensure everyone can access the help they need. It represents a significant step toward a more accessible and stigma-free mental health landscape, empowering individuals to take control of their well-being. Through the use of technology, empathy, and knowledge, the app seeks to enable young adults to confidently face their mental health difficulties.

Keywords: Mental Health, College Students, Depression Assessment, Surrogate Questionnaires, Consultancy, Machine Learning, Guided Meditation, User-Friendly Interface.

1. Introduction

1.1 Introduction

The "Youth YANA (You Are Not Alone) - Consulting Web App" stands out as a source of empowerment and support in a time when young people's mental health is frequently negatively impacted by the rigors and difficulties of college life. Through the integration of technology, knowledge, and compassion, this ground-breaking effort aims to address the widespread problem of mental health among college students. An inventive method of mental health examination is used to kick off the "Youth YANA" trip. With the use of proxy surveys, the online application assesses and measures college students' depression levels. Beyond evaluation, the app is a doorway to a world of assistance, communication, and direction.

By using machine learning algorithms, the project takes use of the strength of contemporary technology and goes one step further. These algorithms anticipate user behavior in addition to analyzing it, which makes it possible to provide tailored advice based on unique reactions. As a result, the online application turns into a reliable travel companion for mental health. "Youth YANA" is a comprehensive method to recovery that goes beyond evaluation. The software not only helps users understand their mental health but also offers helpful meditation suggestions. Meditation is a wonderful tool for self-improvement and healing. In order to create a calm, friendly, and relaxing environment, the user interface and design have been carefully considered. This helps users feel at ease and comfortable while they engage with the platform.

The project makes use of a technology stack that includes Bun.js, Elysia.js, React.js (Next.js), and MongoDB to make sure it is both technologically sound and user-friendly. "Youth YANA - Consulting Web App" seeks to reassure people and especially college students that they are not alone in their pursuit of mental well-being in a time when mental health is of utmost importance. Our initiative aims to enhance mental well-being by promoting mental health and assisting in navigating the challenges of college life through a combination of technology, skill, and steadfast devotion.

1.2 Motivation

People now deal with a distinct mix of difficulties and demands as they navigate the difficult shift from youth to adulthood or any, rigorous academic requirements, and personal development. Regretfully, their mental health may suffer greatly as a result of these difficulties. This project was started because we genuinely care about the welfare of our young people. Although college may be a life-changing experience, it can also be stressful, anxious, and depressing. Many students struggle silently with mental health issues because they don't know where to turn or are afraid of the stigma attached to getting treatment.

This common comprehension of the challenges encountered by People served as the impetus for "Youth YANA." Every young adult should, in our opinion, have access to the tools and resources necessary to deal with and get over mental health obstacles. Our motivation stems from the belief that no one should have to face these challenges on their own. We see "Youth YANA" as an online hand that reaches out to all, letting them know they are not alone in their pursuit of mental health. The initiative seeks to remove obstacles to asking for assistance, promote a feeling of community, and offer support and resources for navigating the challenges of college life.

1.3 Objectives

- Enhanced Mental Health and Well-Being
- Reduced fear and improved accessibility
- Enhanced User Empowerment and Self-Management
- Multi language Support
- Real-Time Crisis Support

1.4 Scope

The project aims to address the important problem of mental health among people by developing and implementing a complete and user-centric online application. The following describes the scope of the "Youth YANA - Consulting Web App" project:

- **Mental State Evaluation:** The project's main goal is to develop a reliable method for mental health assessments. The web application will include surrogate surveys

that are intended to measure college students' depression levels. It will make use of cutting-edge methods for gathering data in order to provide users a thorough grasp of their mental health.

- **Machine Learning Integration:** The project will include machine learning techniques to improve the assessment's efficacy and accuracy. These algorithms will provide individualized advice and suggestions by assessing users' present mental states as well as predicting their future behavior.
- **Guided Self-Improvement and Meditation:** Providing tools and direction for self-improvement and meditation is a major component of the project's scope. In order to support their mental health recovery, users will have access to a carefully selected selection of techniques, methods, and instructional resources intended to reduce stress, anxiety, and depression.
- **User Engagement:** A key component of the project will be methods for ongoing user interaction, gathering input, and system enhancement. This will guarantee that the web application continues to be useful, pertinent, and adaptable to the changing requirements of its user community. It also depends on the User's Condition.

2. Literature Survey

The importance of discussing mental health is growing, particularly within the realm of engineering education and employment. This topic is gaining traction in the media and academia as well. Many environmental factors, such as academic pressures, interpersonal conflicts, financial strains, and professional anxieties, can contribute to the development of mental health disorders. This problem is further compounded by the demanding nature of engineering as a career.

One significant issue is the lack of information and awareness about the experiences of individuals with diagnosed mental health disorders within the engineering community. It is crucial to identify and understand these difficulties to address them effectively. In conclusion, the first step towards enhancing engineering education to better support individuals with mental health disorders in their pursuit of professional goals is the recognition of these challenges.[11]

A study involving 450 students from Malaysian technical universities found that both engineering and non-engineering students face mental health challenges. They also use similar methods to deal with these challenges. This means that students, regardless of their field of study, often experience similar mental health issues and try to cope with them in similar ways.

This highlights the need for schools and institutions to take proactive steps in helping students who are struggling with mental health problems. It's essential to support students in both engineering and non-engineering programs. This research has given us a better understanding of how students in these fields deal with mental health, which can help us provide better support and care for all students.[7]

Mobile health (mHealth) applications are those that are designed to be utilized for mental health. These programs have a great chance to start a revolution in mental health. mHealth apps are taught using deep learning (DL) models using vast amounts of data.[5]

Many students in college and university with mental health concerns often don't seek help. To change this, there's a web-based program. It helps students assess their mental

health and encourages them to get support.

The program asks students questions about things like eating habits, alcohol use, attention issues, anxiety, and depression. If it suggests a student might have a mental health concern, it advises them to see a doctor for further help.

In a nutshell, this tool is meant to make it easier for students to connect with mental health services. It helps them become more aware of their mental health and guides them to the right support when needed.[6]

Researchers looked at 104 mental health apps from places like Google Play and the App Store. They read a massive 88,125 user reviews to see what people thought about these apps. They used computer programs to figure out if the comments were positive or negative.

They found that some of the bad stuff people mentioned in reviews included problems with how easy the apps were to use, issues with what the apps contained, and concerns about ethics, customer service, and billing. On the other hand, people liked the apps when they looked nice, worked well, had good content, and kept their information private.

The point of all this was to help design better mental health apps by understanding what users like and don't like. It's about making these apps more helpful and easy to use.[9]

Want to make sure kids have a good life and avoid problems. To do that, need to find and treat mental health issues early. One way to do this is by using computers to analyze medical information.

In a recent study, scientists tested eight different computer methods to find five important mental health issues in kids. They used data from sixty cases and picked twenty-five important clues for diagnosis. Then, they used special techniques to make things simpler and tested these computer methods.

The good news is that some of these computer methods, like Multilayer Perceptron and Multiclass Classifier, worked really well in finding issues. They performed almost as good with simplified information. So, this research shows that using computers can help us find and treat mental health issues in kids, which is important for their well-being.[13]

Looking at the current state of e-mental health research, and it's quite interesting.

This research explores the possibilities and challenges in the field. They're using technology in mental health care, which is a big deal. One key point is the early prediction of how well treatments will work, and they're also working on keeping patients engaged in therapy.

What's even more fascinating is the use of advanced techniques like sentiment analysis, tracking what people do, and using data mining to better understand and help people. It's like using technology to make mental health support smarter.[2]

2.1 Existing Methodologies

The narrative analysis, a qualitative method within the broader definition of narrative inquiry[11] technique, which focuses on comprehending the experiences and narratives of people with a mental illness in the engineering sector, is narrative inquiry. Participants were interviewed in semi-structured interviews, and the data was processed after many readings of the transcripts. It will involve increasing the sample size and examining the experiences of people who have various forms of mental diseases.

A collection of self-developed questionnaires and the DASS-21 inventory [7] used to determine the degree of mental health and strategies for dealing with mental health problems among engineering and non-engineering students. The samples were chosen using a stratified random sampling approach.

Mobile device-based mental health analysis, encompassing multitasking, continuous learning, reinforcement learning, and zero-/few-shot learning, is the methodology of [5]. This highlights the importance of looking at mental health from different angles and gathering detailed information about specific aspects of it.

The Methodology of [6] is a web-based self-screening and referral system created to assist college students in evaluating their mental health and seeking treatment. It serves four primary purposes: sending mental health center referrals through the internet; storing and transmitting Personal Health Information (PHI) and enabling secure messaging with medical personnel. The system seeks to overcome the difficulties that prevent students from obtaining mental health care, including lack of issue detection, delayed appointments, lack of time, financial limitations, and privacy concerns. The benefit of the suggested method is that it gives students an easier way to test themselves for mental health issues and get in touch with treatment providers. By offering a secure messaging system and encrypting data, it also solves concerns about privacy and security.

The extreme learning machine (ELM) algorithm and other techniques are used in [15], The model simulation and testing process to construct and evaluate the proposed mental health education system architecture. Improved classifier performance is achieved

by automatically removing hidden layer nodes that are detrimental to lowering network output errors using the ELM method. A data set experiment is also used to evaluate the proposed system, and the results demonstrate that it is superior to existing algorithms in terms of balancing the degree of privacy protection and classification accuracy.

The Critical Appraisal Skills Program (CASP) is used in [1], Certainly, The systematic review includes support vector machines, decision trees, and neural networks among the machine learning techniques utilized in mental health detection.

In [12] Interviews were transcribed verbatim using Otter.ai, a secure online transcribing software, Semi-structured interviews with psychiatrists and general practitioners are used to gather data using a qualitative method. The interviews were done using the video conferencing software Microsoft Teams, and they were audio-recorded, anonymised, and securely archived.

The Clustering Analysis Algorithm are used in [10], To help college students avoid mental health problems, they're improving how they manage psychological data. They use a technology called data mining, which is like searching for important information. This technology is tested to see if it can stop mental health crises. To make this technology work even better at preventing issues, they've built a special part called the "psychological data mining kernel" using a computer program called MATLAB 2014a. This part is then added to the system that takes care of students' mental well-being. Basically, it's about using technology to make sure students stay mentally healthy and avoid problems.

The application of artificial intelligence (AI) are used in [3] , Mental health problems are becoming more common worldwide, and our healthcare systems are feeling the strain. To tackle this, people are exploring how technology can help. They're using artificial intelligence (AI) to assess and treat mental health issues, which they call "digital psychiatry." This is about how digital psychiatry is not just for therapy. It's being used in education, work, money matters, social media, and the broader digital wellness field. In simple terms, it's about using technology to support mental health in different parts of our lives.

The utilization of plasma to feel the surface of its propagation medium is key to the operation of surface plasmon resonance sensing. The surface plasmon is valuable for sensing applications since it is extremely sensitive to any little disturbance close to the penetration depth.[8]

The methodology in [13] is a research on the use of machine learning techniques to predict mental health issues. It required selecting crucial characteristics for diagnosis, creating a model with machine learning methods, and assessing the model's precision. It has comparative study of (AODEsr, Multi Layer Perceptron (MLP), RBF Network, IB1, KStar, Multi-Class Classifier (MCC), FT, LADTree) all these algorithms.

The Bags of Words and ML models are used in [9] , The systematic and theoretical analysis of the procedures used in a field of research is referred to as methodology. It includes the guidelines, processes, and regulations followed when conducting research and gathering data. The study topic, the kind of data being gathered, and the research design all influence the approach chosen.

It uses Naive Bayes Algorithm as well as CNN (Convolutional Neural Network) with OpenCV [14] , It is a thorough analysis of how machine learning techniques are used to identify mental health issues. It addresses several machine learning methods, including support vector machines, decision trees, and neural networks.

The methodology of [2] is a method for educating college students about their mental health that is based on the Internet of Things and privacy security is presented in it. To guarantee the confidentiality and security of student mental health data, it makes use of encryption methods and IoT protocols. Additionally, the system uses machine learning and differential privacy techniques to enhance the data's accuracy and privacy.

The system is an affective computing intelligent signal processing system that uses deep learning to create user-centered mobile mental health applications. Data collection, feature extraction, model training, and model deployment are among the system's components [4].

2.2 Research Gap Analysis

In the realm of mental health, we can identify a number of research gaps and topics that require more investigation:

- **Comprehending Mental Health in Engineering Education:** The introduction stresses the importance of talking about mental health in engineering education. It points out that the pressures in the engineering field can be tough on the mental health of both professionals and students. But, it also mentions that we don't know enough about the experiences of those with known mental health issues in the engineering community. There's a gap in research when it comes to understanding the specific challenges faced by people with mental disorders and how education can do a better job of supporting them. It's an area where more investigation is needed.
- **A Comparative Analysis of Mental Health Concerns in Various areas:** The conversation goes beyond engineering students and considers the mental well-being of students in various fields. It highlights that both groups encounter mental health challenges and tend to handle them in similar ways. To provide more effective and customized support, it's vital to explore the unique stressors and difficulties that engineering students might face compared to those in non-engineering programs. This understanding can help in building support systems that cater to the specific needs of all students.
- **The efficacy of mobile health applications (mHealth):** It outlines how mHealth applications might completely transform mental health. It makes reference to deep learning models but doesn't discuss how successful they are. The actual effect and effectiveness of these applications in enhancing mental health outcomes might be the subject of future research.
- **Reducing the Disparity in Access to Mental Health Services:** The development of an online tool to motivate students to assess their mental well-being and pursue therapy. One area of unmet research need is how well these technologies work to close the accessibility gap and motivate students to get help from professionals.
- **Assessing Mental Health applications:** The evaluation of mental health applications using theme and sentiment analysis of user reviews. It highlights both

positive and negative Points. The precise features and design enhancements required to increase the efficacy of mental health applications might be the subject of future investigation.

- **Machine Learning for Early Detection:** It refers to the application of machine learning in the diagnosis and treatment of pediatric mental health problems. It touches on feature selection and classifier selection, but skips over the difficulties of implementing these systems in actual healthcare contexts or their scalability.

Every one of these study gaps offers a chance for more investigation and development in the area of technology and mental health. Particularly in the context of education and technology, researchers may dive further into these areas to develop solutions that better fulfill the requirements of individuals with regard to mental health.

3. Requirement Specification and Analysis

3.1 Problem Definition

People's mental health problems have become a significant and much disregarded social concern. A person's life enters a critical phase as they graduate from high school to college, which is characterized by more freedom and rigorous coursework. However, a number of stresses can also arise at this time, such as pressure to do well in school, social changes, financial difficulties, and the demands of exploring one's identity. These elements, together with the high standards that characterize college life, have contributed to a marked rise in mental health issues, most notably depression.

The project aims to tackle the concerning increase in depression and associated mental health problems among university students. Research has repeatedly shown how common these problems are, with symptoms varying from moderate worry and stress to sadness. Students are increasingly battling the emotional weight of these difficulties on college campuses, which ought to be places of growth, discovery, and support. Because of the fear associated with getting help or because they are unaware of the options that are available, students frequently struggle in silence.

3.2 Objectives

The main objective of project is towards providing precise mental health assessment, personalized guidance, meditation support, and a user-friendly interface to empower college students in their mental health journey, provide proper solutions related to their problems.

- To provide user friendly user interface in such way that user feel comfortable to interact with application
- To ensure security and privacy of users.
- To apply various data analysis algorithms to solve the mental health problems.
- To establish a responsive 24/7 support system for users seeking assistance.

- To obey the all relevant legal and ethical standards for mental health and data privacy.
- To design a surrogate questionnaire module for discreet mental health assessments.

3.3 Project Requirements

The Youth YANA project requirements cover a variety of components required to meet its goals. These are the principal needs for the project:

- **User Interface Requirements:**

- Intuitive, user-friendly design.
- Calming color scheme and visual elements.
- Interactive features for user engagement.

- **Functional Requirements:**

- Mental health assessment using surrogate questionnaires.
- Machine learning algorithms for user response analysis.
- Guided meditation and self-improvement resources.
- User community for peer support.
- User registration and profile management.
- Personalized guidance and recommendations.
- Data privacy and security measures.
- User feedback and engagement mechanisms.

- **Content Requirements:**

- A library of meditation practices.
- Educational resources for mental health and self-improvement.
- Extensive content related to depression and mental health.
- Regularly updated content for user engagement.

- **Technology Stack Requirements:**

- MERB technology stack (MongoDB, Elysia.js, React.js [Next.js], Bun.js).
- Scalability for future development.
- Cross-browser compatibility.
- Mobile responsiveness.
- **Data Management Requirements:**
 - Efficient data storage and retrieval (MongoDB).
 - Data analytics for user behavior analysis.
 - Data backup and recovery processes.
 - User data privacy compliance.

3.3.1 Functional Requirements

The Youth YANA function requirements are crucial for defining the features and functionalities of the platform. In a nutshell, these are the function requirements:

- **Machine Learning Integration:**
 - Algorithms to analyze user responses.
 - Prediction of future behavior.
 - Personalized guidance based on analysis.
- **Guided Meditation and Self-Improvement:**
 - Access to meditation practices and self-improvement resources.
 - A repository of content for mental health recovery.
- **User-Friendly Interface:**
 - Intuitive design for easy navigation.
 - Calming visual elements.
 - Interactive features for engagement.
- **User Registration and Profile Management:**
 - User registration and login functionality.

- User profile management and customization.
- **Data Privacy and Security:**
 - Data encryption and secure storage.
 - Measures to protect user data and privacy.
- **User Engagement and Feedback:**
 - Notification and alert systems.
 - Mechanisms for user feedback and engagement.

3.3.2 Non Functional Requirements

- **Usability:**
 - People with different degrees of technical proficiency should be able to easily navigate and utilize the platform.
 - Without requiring a lot of training, users must be able to quickly navigate the interface and comprehend its functions.
- **Performance:**
 - To ensure a flawless user experience, the web application has to be responsive and have quick loading times.
 - It needs to be capable of supporting several users at once without experiencing appreciable performance drops.
- **Scalability:**
 - The system needs to be built with room for development and growth, enabling the inclusion of additional functions and materials.
 - Scalability guarantees that the system can accommodate a growing number of users.
- **Security:**
 - The protection of data is crucial. To safeguard user data, the platform has to have robust encryption and security procedures in place.

- There should be safeguards in place to prevent data breaches, illegal access, and other security risks.

- **Privacy:**

- User data must be managed with the highest secrecy by the project, which means it must abide by data privacy laws and regulations.
- Users ought to be in charge of their privacy settings and data.

3.3.3 Hardware Requirements

- System: Desktop, PC with Intel 3/Ryzen 3 and above
- RAM: 2GB and above
- Hard Disk: 4GB and above
- Mobile: Android version 9 and above, IOS version 16

3.3.4 Software Requirements

- **Operating System:** Windows/Linux
- **Web Server:** Node.js for serving web content.
- **Database Management:** MongoDB for data storage.
- **Frameworks:**
 - * Elysia.js for seamless integration.
 - * React.js (Next.js) for user interface.
 - * Bun.js for application performance.
- **Development Tools:**
 - * Code editors (e.g. VS Code).
 - * Version control systems (e.g., Git).

3.4 Project Plan

3.4.1 Project Resources

1. Development Resources:

- **Web Development Team:** A team of experienced web developers, including front-end and back-end developers, to create the web application.
- **UI/UX Designers:** The app is user-friendly and visually appealing, making it easier for users to navigate and interact with the platform.

2. Software and Technology:

- **Programming Languages:** Chooosed appropriate programming languages for Project, such as Python.
- **Web Development Frameworks:** Considered using popular web frameworks like Elysia JS,Next JS,Bootstrap.
- **Database Management:** Utilize database management systems like MongoDB/RDBMS to store user data and app information securely.

3. Artificial Intelligence and Machine Learning:

- **AI/ML Frameworks:** AI/ML frameworks and libraries like TensorFlow or scikit-learn to build and deploy your models.

4. Counseling and Mental Health Professionals:

- **Mental Health Experts:** Collaborate with experts to design the mental health assessment and treatment algorithms.

5. IT Infrastructure:

- **Hosting Services:** Chooosed reliable hosting services for web application deployment. Consider cloud services like AWS, Azure, or GCP.
- **Data Security:** To have robust data security measures to protect user data and maintain confidentiality.

6. Pharmacy Integration:

- **Pharmacy Partners:** Establish partnerships with local pharmacies willing to offer medication delivery services through the app.

7. Project Management:

- **Project Manager:** A project manager to oversee the development process, coordinate teams, and ensure project milestones are met.

8. Training and Education:

- Train the counseling and support team to use the platform effectively and provide the best assistance to users.

9. User Documentation:

- Created a user guide and FAQs to help users understand how to use the app and its features.

10. Data Resources:

- Collected and curated mental health-related data for training and improving your AI/ML models.

11. Security and Privacy Resources:

- Security tools and measures to protect user data and maintain confidentiality.

12. Testing and Quality Assurance:

- Testers, both manual and automated testing tools, to ensure the app functions correctly and securely.

13. User Feedback Mechanisms:

- Various ways for users to provide feedback, which can be used to improve the app continuously.

14. App Support and Maintenance:

- Resources to ensure the app's ongoing maintenance and updates.

3.4.2 Module Split-up

1. Symptom Assessment Module:

- **Description:** This module focuses on assessing users' mental health through surrogate questions.
- **Functionality:**
 - * Surrogate questions to evaluate users' mental health.

- * Utilizes AI/ML models to analyze symptoms.
- * Determines users' mental health status based on their responses.
- **Output:** Users' mental health assessment results.

2. Counseling and Treatment Module:

- **Description:** Provides counseling and treatment based on users' symptoms and mental health status.
- **Functionality:**
 - * Offers in-app counseling with a user-friendly interface.
 - * User chat for counseling sessions.
 - * Tailors treatment based on users' assessed mental health.
- **Output:** Users receive counseling and treatment through the app.

3. Personal Counsellor Module:

- **Description:** Ensures users' safety by providing access to personal counselors in case of dangerous symptoms.
- **Functionality:**
 - * Identifies and flags dangerous symptoms.
 - * Connects users with a personal counselor within the app.
 - * Maintains strict confidentiality about user information.
- **Output:** Users have access to a personal counselor for immediate assistance.

4. Pharmacy Integration Module:

- **Description:** Facilitates medication delivery if prescribed by the counselor.
- **Functionality:**
 - * Integration with local pharmacies for medication orders.
 - * Medication delivery to users' locations.
 - * Medication tracking and alerts.
- **Output:** Users can receive prescribed medications through the app.

5. Web Application Development Module:

- **Description:** The core development of the mental health web app.

- **Functionality:**
 - * Front-end and back-end development for the app.
 - * User-friendly interface design.
 - * Integration of all the above modules into the web app.
- **Output:** The fully functional YOUTH YANA web app.

6. AI/ML Integration Module:

- **Description:** Integration of artificial intelligence and machine learning for symptom analysis and assessment.
- **Functionality:**
 - * Data collection and analysis for symptom assessment.
 - * Development and training of AI/ML models.
 - * Real-time symptom analysis and mental health assessment.
- **Output:** Integration of AI/ML capabilities into the app for symptom analysis.

7. Security and Confidentiality Module:

- **Description:** Ensures the security and confidentiality of user data and counseling sessions.
- **Functionality:**
 - * Implementation of robust data security measures.
 - * User data protection policies.
 - * Encryption of confidential information.
- **Output:** Data and user information remain secure and confidential.

8. User Feedback and Improvement Module:

- **Description:** Gathers user feedback for continuous app improvement.
- **Functionality:**
 - * Mechanisms for users to provide feedback.
 - * Feedback analysis for app enhancement.
 - * User engagement for continuous improvement.
- **Output:** The app is continuously improved based on user feedback.

3.4.3 Functional Decomposition

1. User Registration and Profile Management:

- User registration
- User profile creation and management
- Profile settings and preferences

2. Symptom Assessment and AI/ML Integration:

- Surrogate questionnaires
- AI/ML symptom analysis
- Mental health assessment
- Symptom data collection and storage

3. Counseling and Treatment:

- In-app counseling
- User-friendly interface for counseling
- Real-time chat with counselors
- Tailored treatment plans

4. Web App Development :

- Front-end development
- Back-end development
- User-friendly interface design
- Integration of all modules into the web app

5. AI/ML Model Development and Integration:

- Data collection for AI/ML models
- Feature selection
- AI/ML model development and training
- Real-time symptom analysis and mental health assessment

6. Security and Confidentiality:

- Data security measures
- User data protection policies
- Encryption of confidential information
- User data privacy and security

3.4.4 Project Team Role and Responsibilities

1. Sumit :

- Develop the front-end of the web app for a user-friendly interface.
- Design an engaging and visually appealing user interface.
- Integrate all project modules into the web app for a seamless user experience.

2. Tanmay :

- Oversee the entire project's development process.
- Coordinate and manage the project team.
- Ensure that project milestones are met and address any project-related issues.

3. Harshvardhan :

- Lead the development of AI/ML models for symptom assessment.
- Collect and analyze data for training AI/ML models.
- Develop and train AI/ML models.
- Integrate AI/ML capabilities into the app for real-time symptom analysis and mental health assessment.
- Implement robust data security measures for user data protection.
- Ensure encryption of confidential information to maintain data security and privacy.

4. Onkar :

- Develop proper planning of project
- Keep note of the changes told by the guide and reviewers.
- Develop the back-end of the web app for data management.
- Integrate the back-end with the front-end for a seamless user experience.
- Ensure the efficient and secure handling of data.
- Implement any necessary data management features.

3.4.5 Project Plan 3.0

– Phase 1: Project Initiation

- * Define the project's scope, objectives, and target audience.
- * Assemble the project team and assign roles and responsibilities.
- * Develop a project charter and secure any necessary approvals.
- * Outline the overall project plan and timeline.

– Phase 2: Requirements Gathering and Analysis

- * Gather detailed requirements for each module.
- * Analyze user needs and expectations.
- * Define the specific features and functionalities of the app.
- * Identify any legal and ethical considerations related to mental health services.

– **Phase 3: Design and Prototyping**

- * Create wireframes and prototypes for the app's user interface.
- * Design the app's visual elements and user experience (UI/UX).
- * Plan the architecture for data storage, security, and integration.
- * Develop a detailed design document.

– **Phase 4: Development**

- * Develop the front-end of the web app (Sumit) for a user-friendly interface.
- * Implement the back-end logic and database (Onkar) for data management.
- * Develop AI/ML models for symptom assessment (Tanmay and Harshvardhan).
- * Build the in-app counseling and chat features.
- * Implement data security measures to protect user information.

– **Phase 5: Testing and Quality Assurance**

- * Conduct rigorous testing of the app's functionality, including symptom assessment.
- * Test data security and confidentiality measures.
- * Gather user feedback and perform user testing to identify issues.
- * Make necessary adjustments and fixes based on testing results.

– **Phase 6: Deployment and Beta Testing**

- * Deploy the web app to a hosting environment.
- * Offer the app to a selected group of users for beta testing.
- * Collect feedback on user experience and functionality.
- * Ensure data security and confidentiality in a real-world environment.

– **Phase 7: User Feedback and Iteration**

- * Analyze user feedback and test results.
- * Make iterative improvements to the app's features.
- * Refine the AI/ML models for more accurate symptom assessment.
- * Enhance the user interface and user experience based on user suggestions.

– **Phase 8: Full-Scale Launch and Marketing**

- * Launch the YOUTH YANA app to the public.
- * Implement a marketing strategy to promote the app (marketing team).
- * Outreach to the target audience for widespread adoption.

– **Phase 9: Ongoing Support and Maintenance**

- * Provide ongoing user support through a dedicated support team.
- * Continuously monitor data security and privacy.
- * Update the app as needed to maintain smooth operation.

– **Phase 10: Evaluation and Future Development**

- * Evaluate the app's performance and impact.
- * Plan for future enhancements and new features based on user needs and feedback.
- * Consider potential partnerships or expansion opportunities.

3.4.6 PERT Table

Task	Duration	Predecessors	Expected Time
Project Initiation and Literature Survey	2	-	2
Research and Detailed Design Component	2	1	2
Technical Survey Paper 1	1	2	1
Implementation of front end	1	2	1
Implementation of ML algorithms	3	4	3
Testing	1	5	1
Technical Survey Paper 2	1	6	1
Final Report	1	7	1

Table 3.1: PERT Table (months)

3.4.7 PERT Diagram

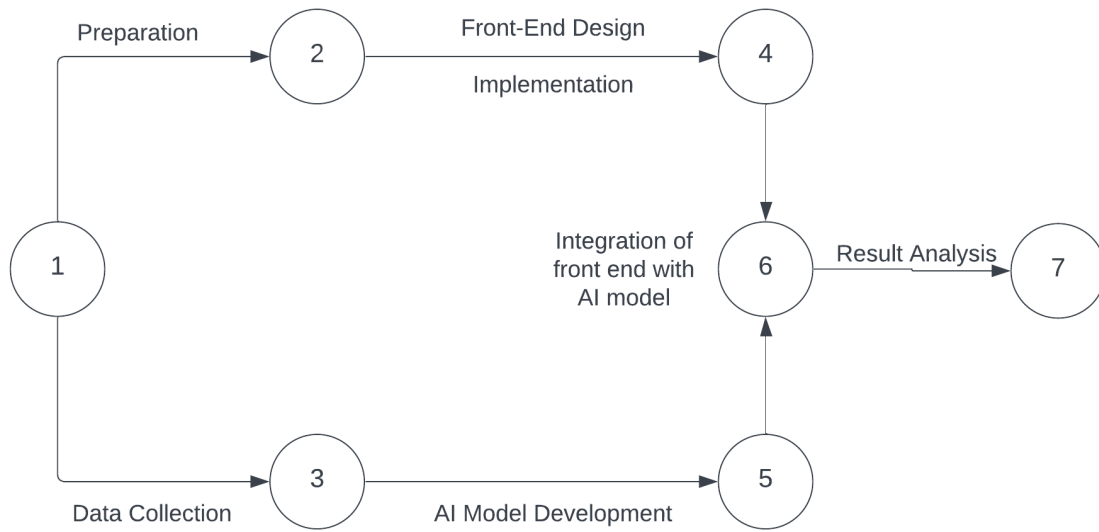


Figure 3.1: PERT Diagram

4. System Analysis and Design

4.1 System Architecture

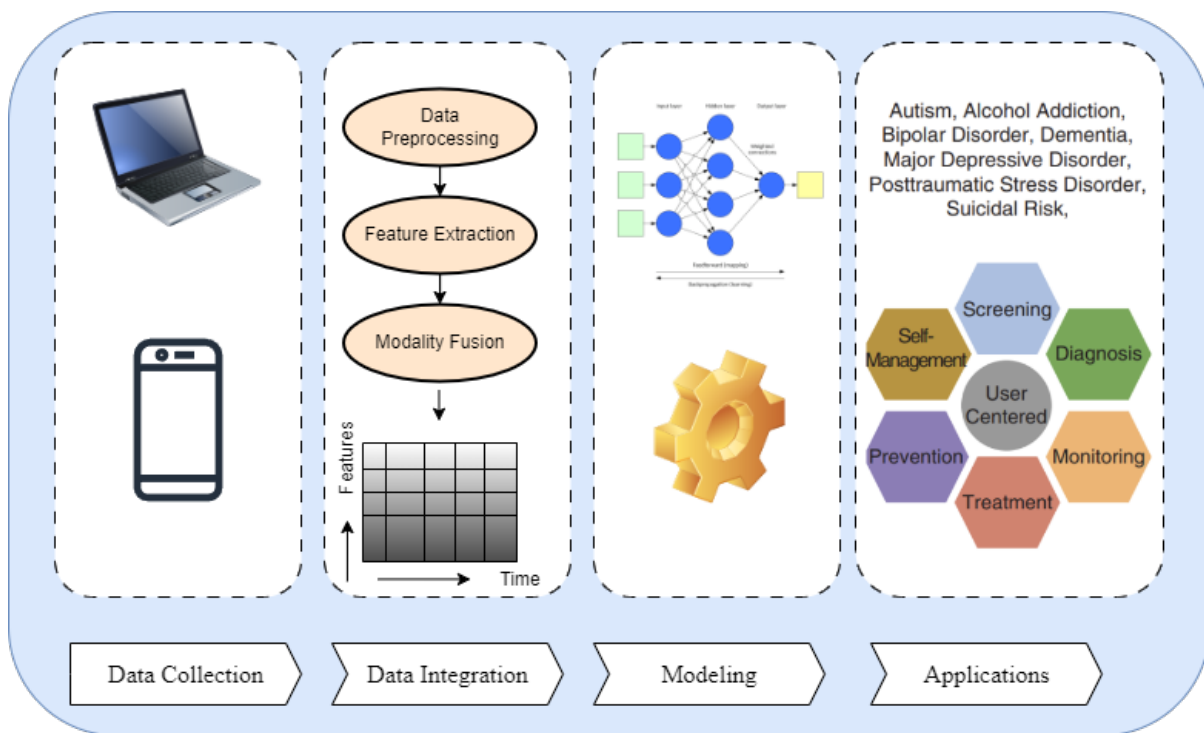


Figure 4.1: Block Diagram

4.2 Necessary UML Diagrams

4.2.1 Use Case Diagram

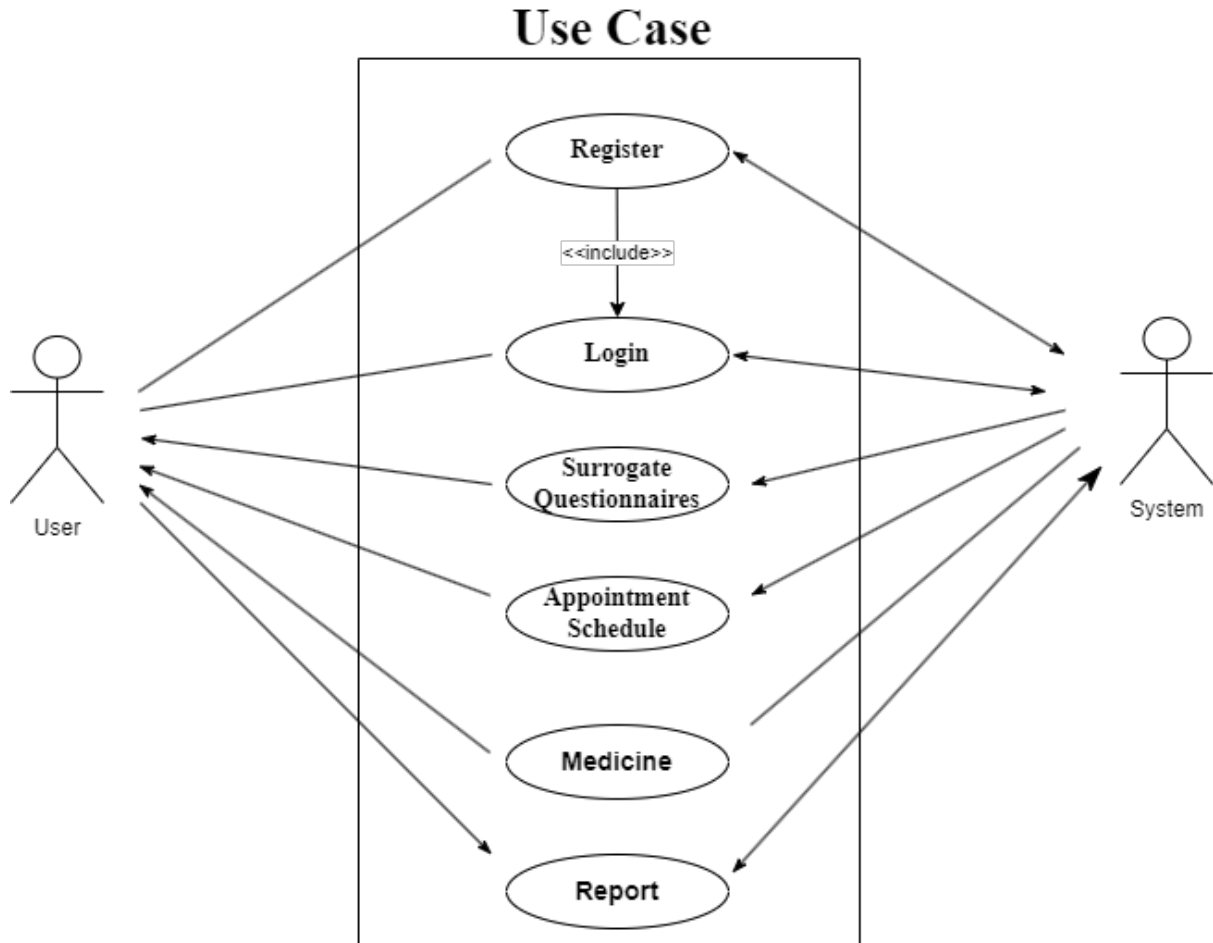


Figure 4.2: YANA Counseling Usecase Diagram

4.2.2 DFD

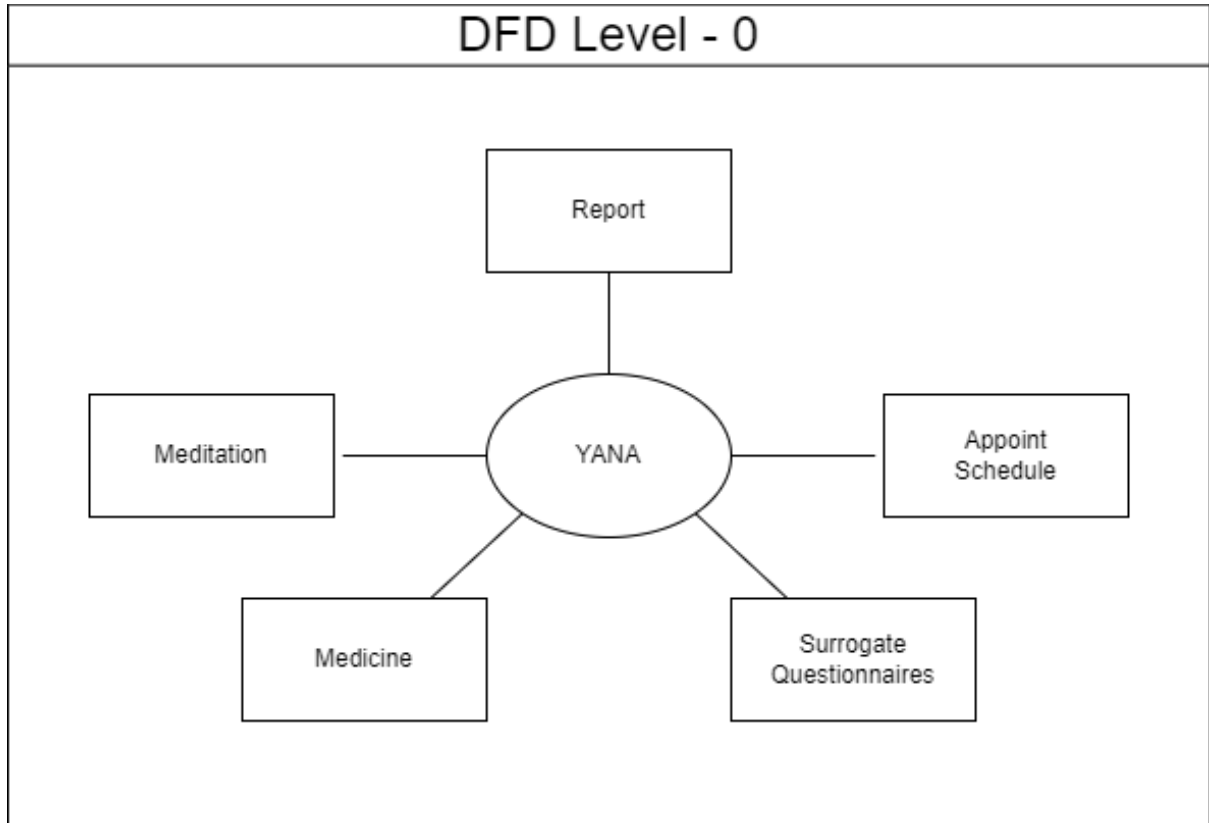


Figure 4.3: DFD Level-0 Diagram

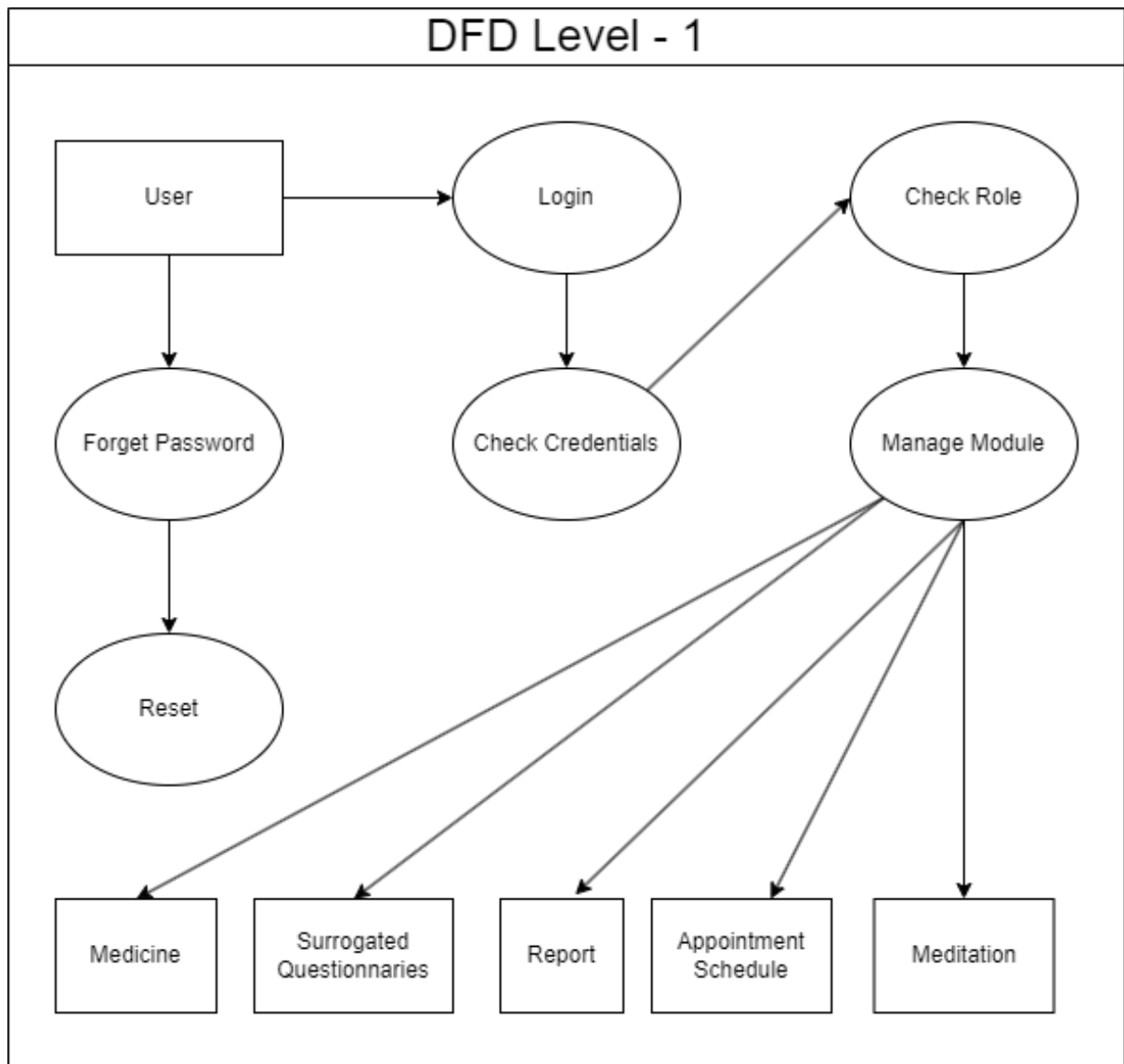


Figure 4.4: DFD Level-1 Diagram

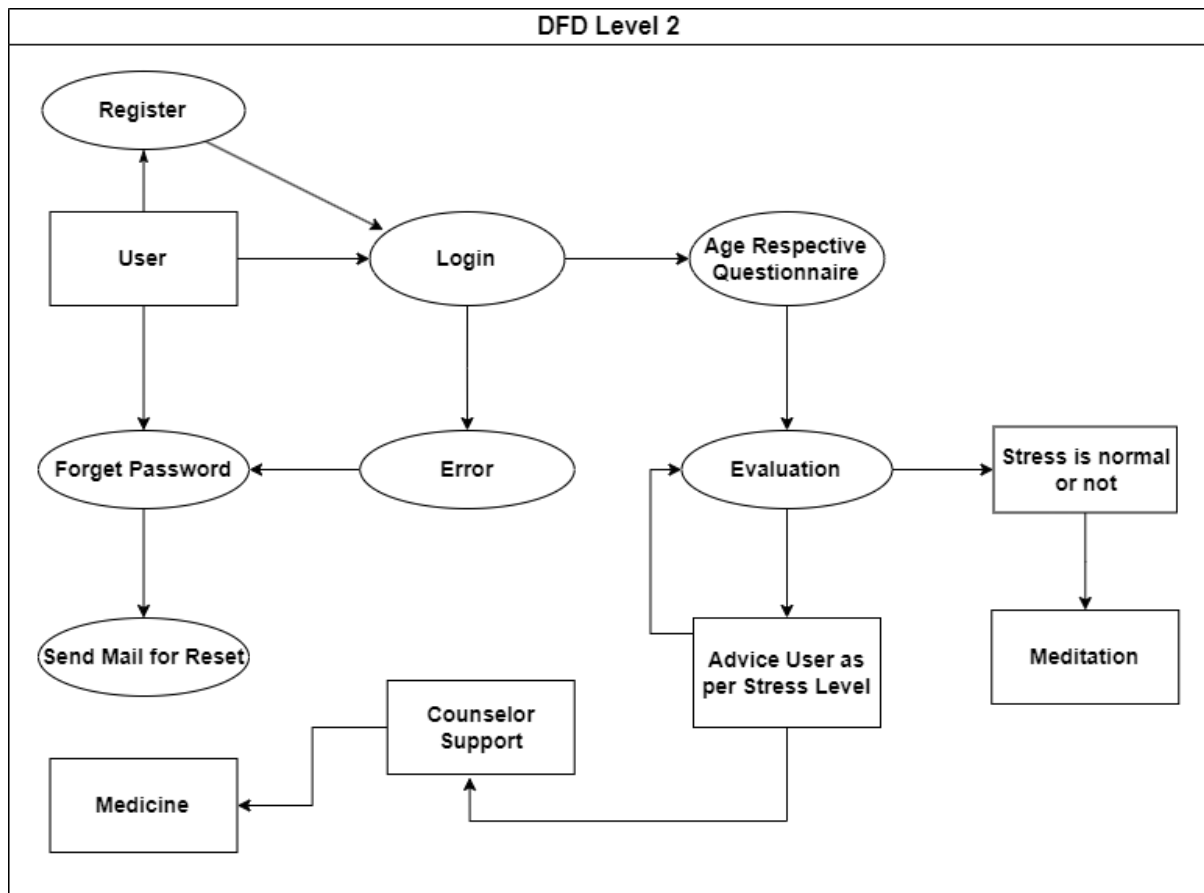


Figure 4.5: DFD Level-2 Diagram

4.2.3 Activity Diagram

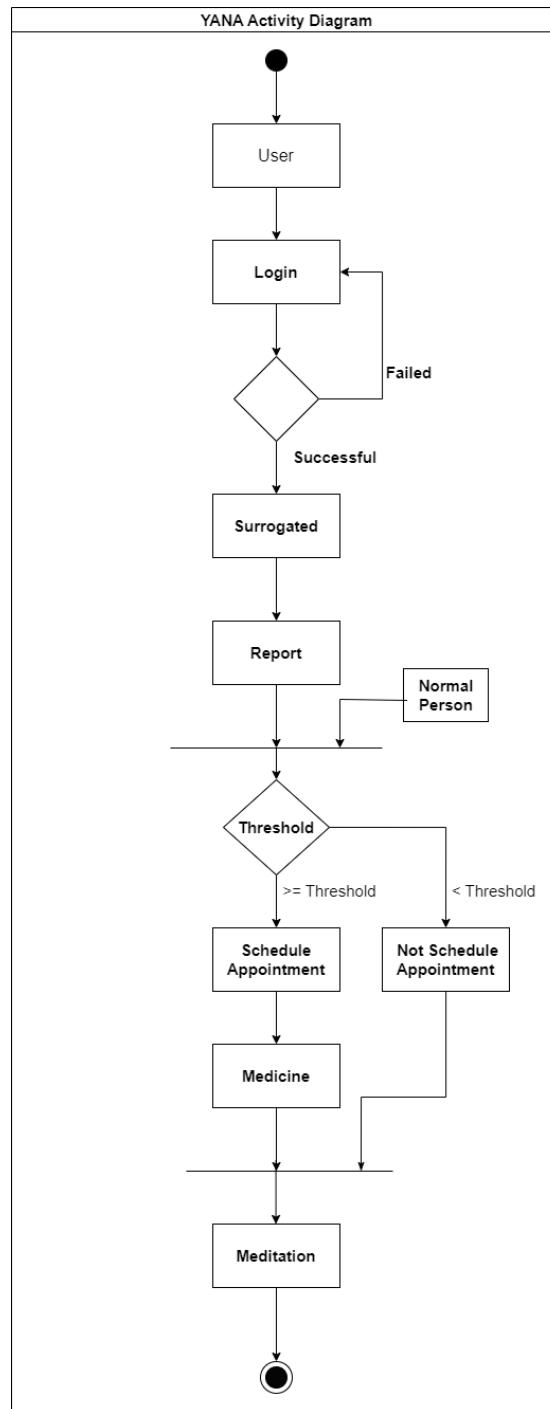


Figure 4.6: YANA Activity Diagram

4.2.4 Sequence Diagram

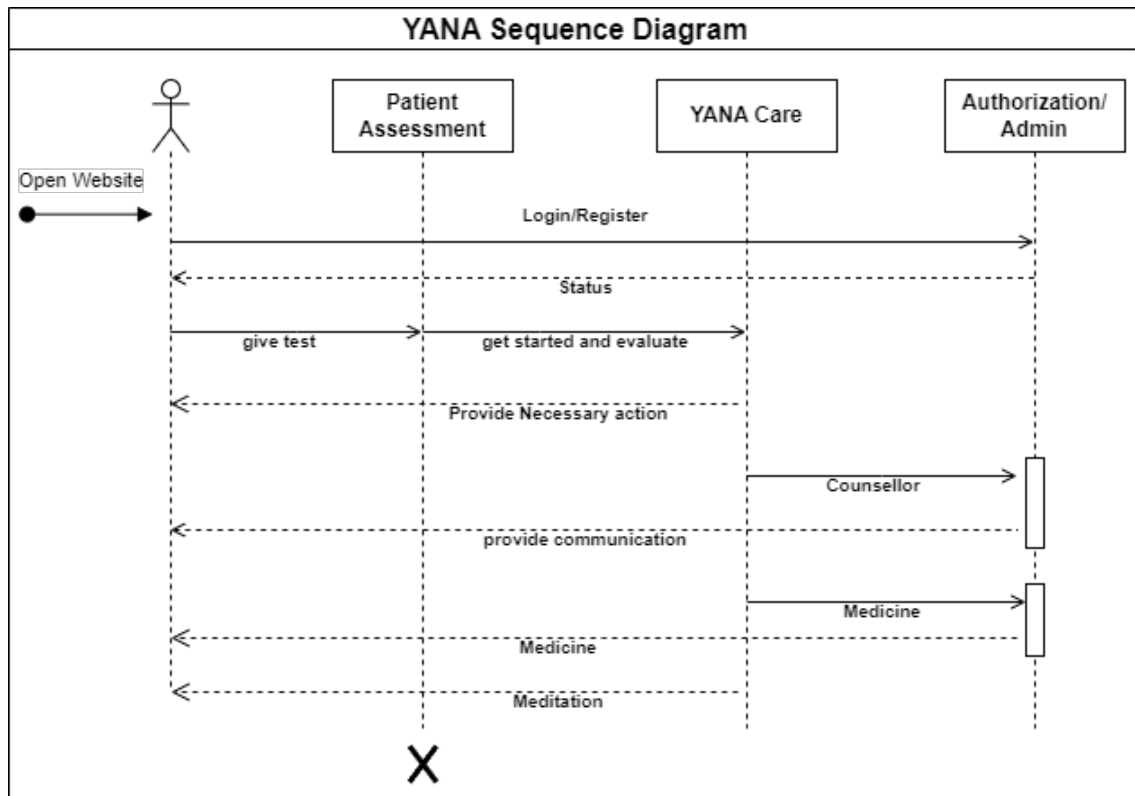


Figure 4.7: YANA Sequence Diagram

5. Implementation

5.1 Stages of Implementation

5.1.1 Implementation of Modules

Home Page

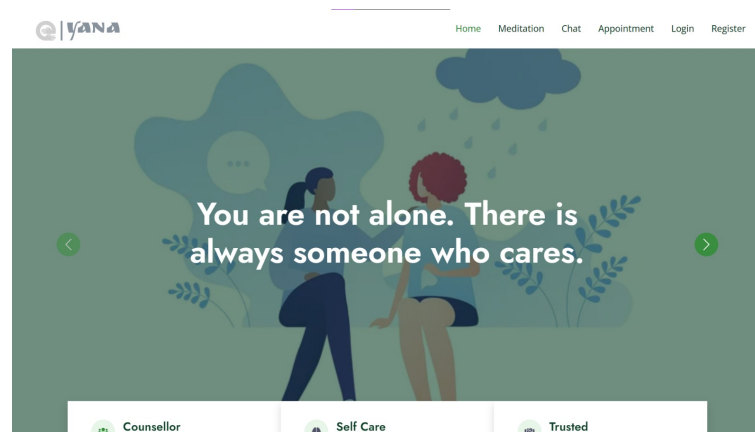
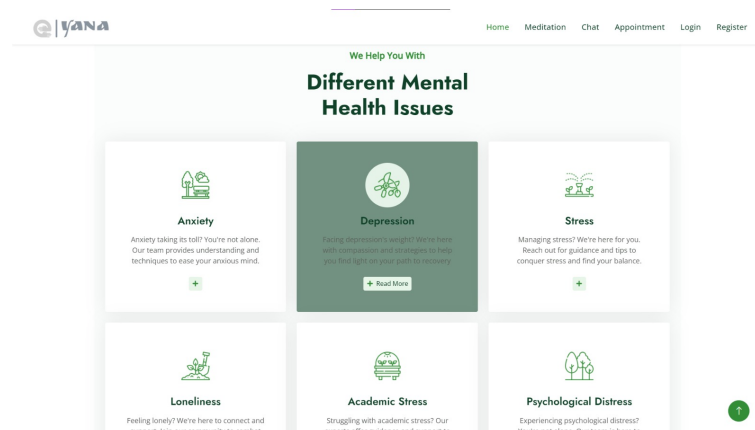


Figure 5.1: YANA Home Page



The home page of the 'Youth YANA - Consulting Web App' is designed to extend a warm and inviting welcome to users. Upon landing on the home page, visitors are greeted with a message that encapsulates the essence of our platform. It conveys the promise that on Youth YANA, no one has to face the challenges of college life and mental health struggles alone.

Meditation

Introducing the 'Breath' page, a serene haven for mindfulness meditation. This dedicated space invites you to delve into the art of self-connection. Begin by following our expertly crafted breathing instructions, tailored to your experience level

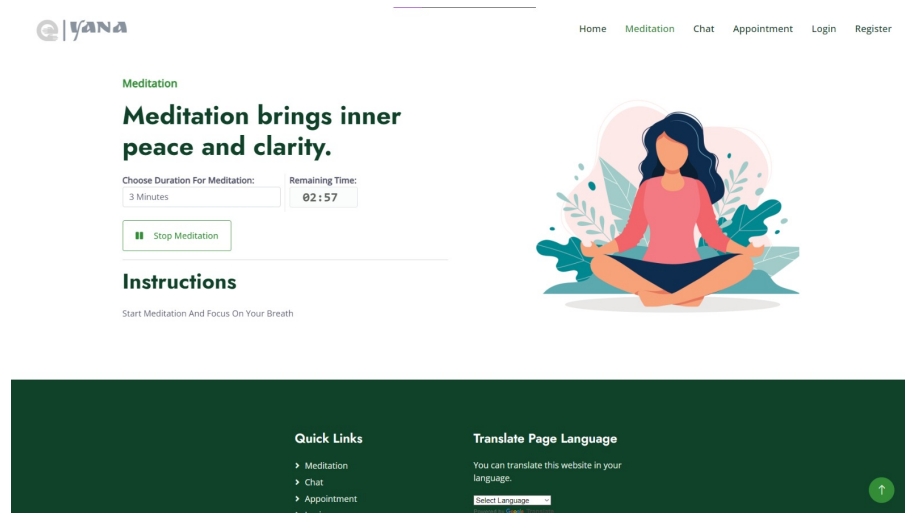


Figure 5.2: YANA Meditation Page

Chat

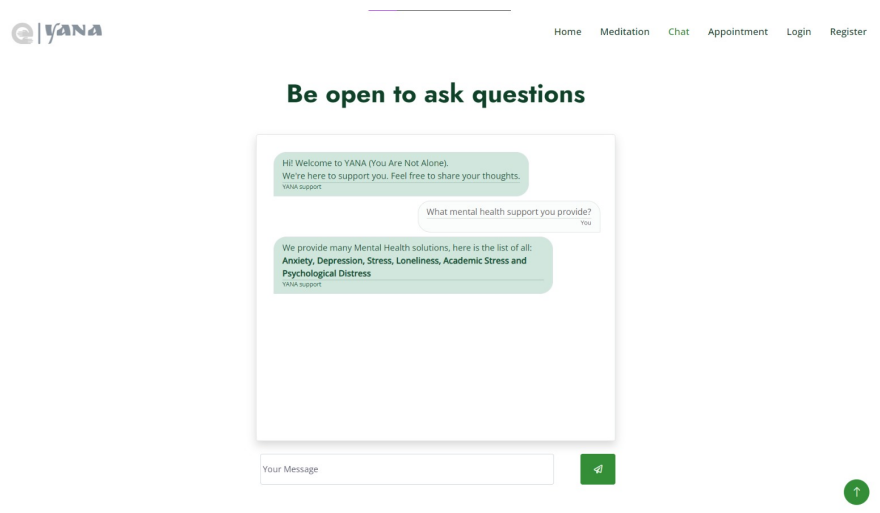


Figure 5.3: YANA Chat page

Step into our 'Chat' space, where authentic conversations flourish. Engage with like-minded individuals, exchange stories, and discover real-time support. Whether

you're seeking a compassionate ear or offering your own, our chat platform is your gateway to connection. Join the conversation and nurture a community of empathy today.

Profile

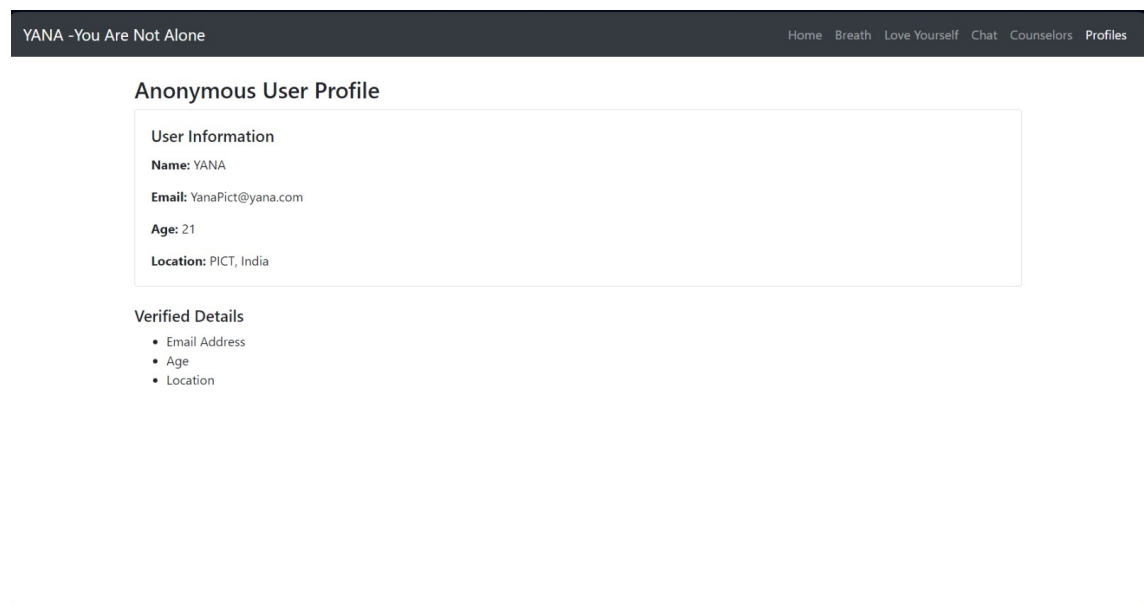


Figure 5.4: YANA Profile page

Profile page is your unique corner in our community. Personalize it, update your details, and monitor your growth. Empower yourself in managing your well-being journey and transform this space into your very own haven.

6. Conclusion and Future Scope

6.1 Conclusion

A web-based tool for mental health called YOUTH YANA is intended to assist users in having uncomfortable talks about their mental health. To comprehend users' emotions, the app asks gentle inquiries, and it employs cutting-edge technology to spot possible problems. To ensure that customers feel heard and supported, it provides a cozy, user-friendly atmosphere where they may chat with a counselor immediately. Users have the option to speak with a personal counselor directly and keep all information private if circumstances get challenging. Users of the app may also order and have delivered prescription Medicines. The platform aims to alter how mental health support is viewed by fusing considerate technology with a caring mentality. You are never alone in your journey to better mental health, as YOUTH YANA serves to remind you.

6.2 Limitations of the Project

- **Accuracy of Diagnosis:** The accuracy of AI-driven mental health diagnoses may not be perfect. There can be false positives or false negatives, which could lead to incorrect conclusions about a user's mental health.
- **User Understanding and Honesty:** Users might not always answer surrogate questions honestly or might not fully understand the questions, which could impact the accuracy of the AI model's diagnosis.
- **Access Barriers:** Users without access to a smartphone or the internet won't

be able to benefit from the app, limiting its reach.

- **Regulatory Compliance:** In the healthcare and mental health industries, complying with all the regulations can be difficult and complicated, and failure to do so may result in legal problems.

Bibliography

- [1] Rohizah Abd Rahman, Khairuddin Omar, Shahrul Azman Mohd Noah, Mohd Shahrul Nizam Mohd Danuri, and Mohammed Ali Al-Garadi. Application of machine learning methods in mental health detection: a systematic review. *Ieee Access*, 8:183952–183964, 2020.
- [2] Dennis Becker. E-mental health: Contributions, challenges, and research opportunities from a computer science perspective. In *Encyclopedia of E-Health and Telemedicine*, pages 928–936. IGI Global, 2016.
- [3] Christopher Burr, Jessica Morley, Mariarosaria Taddeo, and Luciano Floridi. Digital psychiatry: Risks and opportunities for public health and wellbeing. *IEEE Transactions on Technology and Society*, 1(1):21–33, 2020.
- [4] Yan Ding, Xuemei Chen, Qiming Fu, and Shan Zhong. A depression recognition method for college students using deep integrated support vector algorithm. *IEEE access*, 8:75616–75629, 2020.
- [5] Jing Han, Zixing Zhang, Cecilia Mascolo, Elisabeth André, Jianhua Tao, Ziping Zhao, and Björn W Schuller. Deep learning for mobile mental health: Challenges and recent advances. *IEEE Signal Processing Magazine*, 38(6):96–105, 2021.
- [6] Eung-Hun Kim, Anil Coumar, William B Lober, and Yongmin Kim. Addressing mental health epidemic among university students via web-based, self-screening, and referral system: a preliminary study. *IEEE Transactions on Information Technology in Biomedicine*, 15(2):301–307, 2011.
- [7] MF Lee and WMH Wan Adam. A comparison study of methods to solve the mental health problem between the engineering and non-engineering students. In *2016 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*, pages 179–183. IEEE, 2016.
- [8] Jing Li. Optimal modeling of college students’ mental health based on brain-computer interface and imaging sensing. In *2021 5th International Confer-*

- ence on Intelligent Computing and Control Systems (ICICCS), pages 772–775. IEEE, 2021.
- [9] Oladapo Oyeboode, Felwah Alqahtani, and Rita Orji. Using machine learning and thematic analysis methods to evaluate mental health apps based on user reviews. *IEEE Access*, 8:111141–111158, 2020.
- [10] Jiang Qinghua. Data mining and management system design and application for college student mental health. In *2016 International Conference on Intelligent Transportation, Big Data & Smart City (ICITBS)*, pages 410–413. IEEE, 2016.
- [11] Matilde Sánchez-Peña, Xinrui Rose Xu, Nichole Ramirez, and Nikitha Sambamurthy. Engineering students and professionals living with a mental illness: an exploration of their experiences and challenges. In *2019 IEEE Frontiers in Education Conference (FIE)*, pages 1–5. IEEE, 2019.
- [12] Yusuf Sheikh, Ayesha Ali, Aya Khasati, Alan Hasanici, Urvi Bihani, Raja Ohri, Keerthi Muthukumar, and James Barlow. Benefits and challenges of video consulting for mental health diagnosis and follow-up: A qualitative study in community care. *International Journal of Environmental Research and Public Health*, 20(3):2595, 2023.
- [13] MR Sumathi and B Poorna. Prediction of mental health problems among children using machine learning techniques. *International Journal of Advanced Computer Science and Applications*, 7(1), 2016.
- [14] Xiaohui Tao, Xujuan Zhou, Ji Zhang, and Jianming Yong. Sentiment analysis for depression detection on social networks. In *Advanced Data Mining and Applications: 12th International Conference, ADMA 2016, Gold Coast, QLD, Australia, December 12-15, 2016, Proceedings 12*, pages 807–810. Springer, 2016.
- [15] Ruijian Xiao and Xingeng Liu. Analysis of the architecture of the mental health education system for college students based on the internet of things and privacy security. *IEEE Access*, 9:81089–81096, 2021.