Final Year Project Report

Group No. 43 – Recovery Road- “Awakening the spirit of sobriety.”
BS Computer Science
Batch 2020F.

Dr. Muhammad Nadeem
Assistant Professor

Submitted by

2020F-CS-015	**Aakifah**
2020F-CS-016	**Fareeza Tariq**
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In Partial Fulfillment
Of the Requirements for the degree
Bachelor of Science in Computer Science

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August 2024

DECLARATION

We hereby declare that this project report entitled **Recovery Road- "Awakening the spirit of sobriety."** submitted to the **"Department of Computer Science and Information Technology",** is a record of an original work done by us under the guidance of Supervisor **"Dr. Muhammad Nadeem"** and that no part has been plagiarized without citations. Also, this project work is submitted in the partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science.

Name : Aakifah Signature: _____

Name : Fareeza Tariq Signature: _____

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Name : Syed Hashir Signature: _____

Supervisor: **Signature:**

Dr. Muhammad Nadeem _____
Assistant Professor

Date _____

ACKNOWLEDGMENTS

First and foremost, we would like to thank Almighty Allah for providing us with the strength, courage of conviction, and strong sense of dedication to our project, which enabled us to reach the level of achievement we have today. Undoubtedly, we wouldn’t be here if it weren't for His Mercy and Blessings.

This work would have been impossible without the abundant help, patience, and encouragement from our kind supervisor, **Dr. Muhammad Nadeem**. We would like to thank him for teaching us so much, inspiring us with his example of hard work, and providing invaluable assistance and key information throughout the time required for the completion of this project report, particularly in the risk and cost estimation and testing phases. We also extend our gratitude to the entire faculty for their unwavering support and encouragement, which enabled us to complete this project report.

To our family, thank you for allowing us to pursue our passions and supporting our decisions, no matter how unconventional they may seem. You have always been there for us. Our deepest love and gratitude go to our parents, who have played a vital role throughout our lives, always putting our interests ahead of their own. This project is dedicated to our parents—thank you for guiding us every step of the way, for praying for us and with us during times of trouble, and for celebrating with us every small victory. During our studies, our families constantly provided us with the hope we needed to complete our higher education. We also extend our thanks to all other family members and friends whose love and prayers have always been with us.

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ABSTRACT

Drug addiction is a pervasive issue, often exacerbated by limited resources and public awareness. The "Recovery Road App" aims to support individuals in overcoming addiction and help with relapse management by providing comprehensive assistance, including personalized recovery plans, AI-driven chatbot support, educational resources for counseling purposes, and professional telehealth services.

The app addresses the challenges posed by the scarcity of accessible resources and societal stigma, which often hinder individuals from seeking help. It offers tailored recovery plan for various addictions, particularly for non-potent drugs. Ensuring real-time support and reliable information through an AI chatbot, while addressing the emotional and psychological aspects of recovery, is a key focus.

The Recovery Road App features personalized recovery plan that adapt to each user's needs. It integrates an AI-driven chatbot for 24/7 assistance and emotional support. Additionally, the app serves as a resource hub, offering educational materials and facilitating connections with healthcare professionals. The app’s approaches include advanced algorithms for dynamic recovery plan, AI integration for continuous support, resource aggregation for high-quality educational content, and professional support giving quick access to healthcare providers.

The app provides a holistic solution by bridging the gap between digital and on-ground healthcare services. It distinguishes itself from other methods by being cost-effective and easily accessible on various devices, without subscription fees. Its personalized approach and AI-driven support set it apart from existing applications.

In conclusion, the Recovery Road App addresses critical gaps in addiction recovery support and relapse management. By offering personalized plan, continuous AI support, and access to professional help, it aims to improve the recovery journey for individuals who are and had struggled with addiction. Future enhancements could include expanding the range of substances covered, incorporating advanced AI features, and increasing professional services. Ongoing user feedback will be essential in refining and improving the app to meet evolving needs.

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Chapter 1

Introduction

1.1 Project Background

The chosen project revolves around addressing the pervasive issue of drug addiction within our society. Drug addiction poses a significant challenge, intensified by limited resources and awareness to effectively combat the problem. The prevalence of addiction necessitates innovative solutions to provide accessible support for individuals struggling with substance abuse. Considering this, the project focuses on developing a mobile application aimed at mitigating the challenges associated with drug addiction and relapse management.

The Recovery Road App serves as a pivotal tool in the battle against substance abuse, providing individuals with comprehensive assistance throughout the challenging process of addiction recovery. The app boasts a user-friendly interface, empowering users to navigate their recovery journey confidently. Key features include a personalized withdrawal plan, tracking reports, and access to educational resources about addiction and recovery which acts as counseling material for individuals. Going beyond conventional support, the app incorporates advanced algorithms to deliver personalized recovery plan. This dynamic approach enhances the effectiveness of the recovery process. The overarching goal of the Drug Addiction Relapse Management App is not only to aid individuals in managing the physical and emotional challenges of withdrawal but also to inspire hope and furnish the necessary tools for a successful journey towards a healthier, addiction-free life.

1.2 Project Objectives

1. Provide personalized drug recovery plans tailored to individual needs.
2. Support individuals during the withdrawal process.
3. Integrate an AI-driven Chatbot system for immediate access to support.
4. Offer an extensive resource hub to encourage users on their path to sobriety.
5. Enable users to reach out for clinical help through public helpline numbers.

1.3 Problem Statement

The problem at hand is the widespread issue of drug addiction within our society. Most individuals lack access to the necessary resources required to support their path to recovery, while there remains a significant deficit in public awareness regarding the severity of this problem. There are no such apps to guide addicts and the limitation of resources, and the societal pressure of reputation prevents people from getting help from the facilities that already exist on-ground.

1.4 Product Scope

The Recovery Road App aims to accomplish a multifaceted set of objectives to address the widespread issue of drug addiction. The scope of the product encompasses the development of a mobile application with the primary goal of providing comprehensive support to individuals on their path to recovery. The app will provide personalized drug recovery plan, promoting a flexible and adaptable approach to sobriety. It will address various substances particularly non-potent substances, which are the focal points of the app. Additionally, it will play a crucial role in supporting individuals during the challenging withdrawal and relapse management process, offering features such as motivational reminders to enhance focus and motivation of the users.

The inclusion of an AI-driven Chatbot system sets the app apart by providing immediate and continuous access to information, resources, and emotional support, 24/7 acting as a virtual counselor. This innovative feature ensures that users have a reliable companion throughout their journey, addressing the limitations of existing resources and societal barriers that often hinder individuals from seeking help.

Furthermore, the app will offer an extensive resource network, consolidating information and assistance to encourage individuals in their pursuit of sobriety. It will facilitate awareness about addiction issues, contributing to a broader understanding of the severity of the problem within society. Notably, the app goes beyond virtual support by enabling users to reach out to rehab centers through their public helpline numbers, bridging the gap between digital assistance and on-ground healthcare facilities.

In summary, the product scope is designed to create a holistic mobile application that not only guides individuals through the recovery process but also addresses the systemic issues surrounding drug addiction, providing a comprehensive and accessible solution.

Chapter 2
Literature Review

2.1 Existing Systems

2.1.1 Title: I Am Sober Application

Description:

The I Am Sober application is a supportive tool designed to assist individuals on their journey to sobriety. It provides features for tracking sober days, setting personalized goals, and fostering a sense of community by connecting users with like-minded individuals. The app focuses on encouragement and motivation as key elements in the recovery process. [1]

System Features:

1. Sober Day Tracking.
2. Personalized Goal Setting.
3. Community Interaction.
4. User Engagement.

2.1.2 Title: Quit Now Application [2]

Description:

The Quit Now application is a comprehensive tool specifically tailored to aid individuals in their efforts to quit smoking. It offers features for monitoring progress, unlocking personalized achievements, and accessing a supportive community. The app aims to keep users motivated and engaged throughout their smoke-free journey. [2]

System Features:

1. Personalized Achievements.
2. Supportive Community.
3. Streak tracking.

2.1.3 Title: Quit Tracker Application [3]

Description:

Quit Tracker is a personalized companion designed to assist individuals in achieving a smoke-free life. The application allows users to easily monitor their progress, celebrate milestones, and receive insights to stay motivated and committed to quitting smoking. [3]

System Features:

- Streak tracking.
- Milestone Celebration Features.
- Motivational Insights.

2.2 Comparative Analysis:

Table 1 Comparative Analysis

COMPARISON CHART

Recovery Road

Features / Applications	I AM SOBER APPLICATION [1]	QUIT NOW APPLICATION [2]	QUIT TRACKER APPLICATION [3]	RECOVERY ROAD
TAPER SCHEDULING	✗	✗	✗	✓
STREAK TRACKING	✓	✓	✓	✓
CHATBOT SUPPORT	✗	✗	✗	✓
TELEHEALTH	✗	✗	✗	✓

Chapter 3

Requirement Analysis

3.1 External Interface Requirements

3.1.1 User Interfaces

User Registration and Profile Setup:

- Users create an account and select a drug from a dropdown list to set up their profile.
- They can edit their profile by clicking the "Edit Profile" option.

Home Screen Interface:

- The home screen displays a user-friendly layout with User's profile and profile Settings that allow for customization while the Profile Summary displays the user's name or chosen text.
- It also includes motivational resources such as podcasts.
- The home screen also shows the number of streaks achieved by the user.
- An Emergency Button is available for quick access in urgent situations.
- Navigation icons like Heart to access Streak Tracking, Calendar to access Taper Scheduling, Star to access Podcasts/Articles, Phone to access Telehealth, and Home for home screen are provided to visit each feature.

Motivational Resources Page:

- A separate page is dedicated to motivational resources, accessible from the home screen.
- Users can easily select between podcasts, articles, videos, and group related to drug withdrawal, aiming to motivate users on their journey to recovery.

Streak Tracking Interface:

- Users can access the streak tracking page from the home screen.
- The streak tracking page displays the current streak of the user.
- Two buttons, "Update Streak" and "Reset Streak," are available on the streak tracking page for updating and resetting the streak.

AI Chatbot Chat-head:

- Users can communicate with an AI chatbot via given chat head for immediate assistance and support.

Telehealth Module Interface:

- Users can view rehabilitation center addresses and contact information to reach out Psychologist through public helpline numbers if needed.

Taper Schedule Interface:

- We're transforming the manual taper scheduling process used in rehabilitation centers into a digital feature within our app, allowing users to gradually decrease substance dosage.
- Users can view personalized taper charts on basis of their daily dosage intake. Each chart is personalized for the individual current usage of drugs.

- At the top right corner of the taper screen, there's a dropdown menu for dosage update and taper reset. Users can update and reset their taper schedule from this menu.
- A "See Report" button displays the user's streak, relapses, and taper chart on a new page.

3.1.2 Hardware Interfaces

- Android based smart phone.

3.1.3 Software Interfaces

Our project interfaces with various software components to ensure seamless operation. We've crafted our UI with Figma and brought it to life with Flutter (3.19) for app development, providing a comprehensive suite of tools and libraries for constructing and managing application logic effectively. Additionally, the project integrates an AI/chatbot API to deliver immediate support, allowing users to search and access content related to their needs through the app. For data management, PostgreSQL(16.16.3) is employed as the database management system, ensuring secure storage of user data.

Android is selected as the operating system to enhance accessibility, ensuring compatibility with a wide range of mobile devices. Android Studio Iguana serves as the primary development tool, offering an integrated environment for coding, debugging, and testing.

Several libraries will streamline the Android app development process. The "http" package will facilitate HTTP requests to external APIs. Additionally, for real-time communication via WebSocket, the "web_socket_channel" package is essential, contingent upon the requirements of the API being used. State management libraries like "flutter_bloc" or "provider" will aid in managing app states during API interactions. Other libraries such as "json_serializable," "flutter_spinkit," "flutter_secure_storage," and "connectivity" will also be utilized. However, the selection of libraries may vary based on the development phase and real-time project requirements.

3.1.4 Communications Interfaces

In our product, we utilize various communication interfaces for seamless interaction. For network server communication, we rely on protocols like HTTP or HTTPS for secure data exchange. Email functionality is integrated for tasks such as user verification and notification delivery, following standard MIME formatting. Web browser integration enables access to external content, while electronic forms ensure efficient data input. All communication is secured using TLS or SSL encryption protocols, and data transfer rates are optimized for speed and efficiency. Synchronization mechanisms are implemented to maintain data consistency across devices and platforms, ensuring a smooth user experience.

3.2 Functional Requirements

Table 2 Functional Requirements

ID	Requirement
REQ-1	**Customize user profile and recovery plan:** The application shall allow users to create and customize their profile and recovery plan tailored to their specific needs.
REQ-2	**Progress tracking and report generation:** The application shall track user progress and generate reports on their recovery journey.
REQ-3	**Telehealth facilities , helpline and AI chatbot support:** The application shall provide telehealth facilities, access to a helpline, and continuous support through an AI-driven chatbot.
REQ-4	**Streak management and tracking:** The application shall manage and track the user's streaks, providing motivational support for maintaining sobriety.
REQ-5	**Information resources:** The application shall offer a comprehensive resource hub with educational materials and motivational resources related to addiction recovery.

3.3 Other Nonfunctional Requirements

3.3.1 Performance Requirements

Performance requirements ensure the application operates efficiently and effectively. This includes quick response times for user interactions, such as loading screens or processing requests within a specified timeframe. The AI-driven Chatbot system shall provide responses to user queries within seconds to maintain conversation flow. It should be able to handle concurrent user requests efficiently and maintaining optimal performance Overall, the application's performance should ensure a smooth and seamless user experience, enhancing usability and satisfaction.

3.3.2 Safety Requirements

The application must prioritize user safety by implementing measures to prevent misuse of information and ensure secure handling of sensitive data. The application should include features like emergency buttons or access to support resources in case of emergencies related to drug withdrawal or addiction and safety requirements aim to protect users from potential risks and help when needed, promoting a secure and trustworthy user experience.

3.3.3 Security Requirements

The application must implement security measures to safeguard user data and prevent unauthorized access, to ensure its authenticity and integrity. Furthermore, to protect user privacy, the device should feature a login/signup option, thereby securing and safeguarding user data from unauthorized access.

3.3.4 Software Quality Attributes

- **Usability:** The application interface should be simple and easy to navigate, so its users shall use it easily.
- **Adaptability:** The application should be designed to adapt to different screen sizes and devices
- **Reusability:** Design components or modules that can be reused across different parts of the application or in future projects.
- **Availability:** The application shall be available on the store whenever users want to download it.
- **Reliability**: The application should ensure it is available and accessible to users whenever needed.
- **Robustness:** Ensure the application remains stable and functional even under unexpected conditions or stress.
- **Maintainability**: The application shall respond to any change to the requirements.
- **Testability:** Design the application in a way that facilitates easy and effective testing of its functionalities and components.
- **Flexibility:** The architecture shall be flexible to any change of the requirements.
- **Performance:** The application should response within time for loading screens and user interactions, maintaining optimal performance under typical usage scenarios.
- **Correctness:** Ensure that the application performs tasks accurately and without errors.
- **Portability:** Ensure the application can be easily transferred or adapted to different environments or platforms.
- **Interoperability:** Ensure the application can seamlessly communicate and work with other systems or platforms.

3.4 Cost Estimation

Table 3 Cost Estimation

S.no	Project Expenditure	Cost in Rupees
1.	**Software Tools & APIs:** • GPT Turbo 3.5	$50 = 14,000 PKR
		Total = 14,000 PKR
2.	**Deployment:** • Deploy on Play store	$25 = 7,000 PKR
		Total = 7,000 PKR
3.	**Domain Name & Hosting:** • Domain name registration • Hosting	$1 - $5 = 280 – 1,400 PKR $50 per month = 14,000 PKR
		Total = 15,500 PKR
4.	**Printing Cost:** • 4 FYP Reports • Standee • Brochure (10x) • Poster • 2 DVDs/USBs	500 PKR 1,100 PKR 1000 PKR 1500 PKR 800 PKR
		Total = 4,800 PKR
	Total Aggregate of the Project = 41,300 PKR	

3.5 Project Plan with Gantt Chart

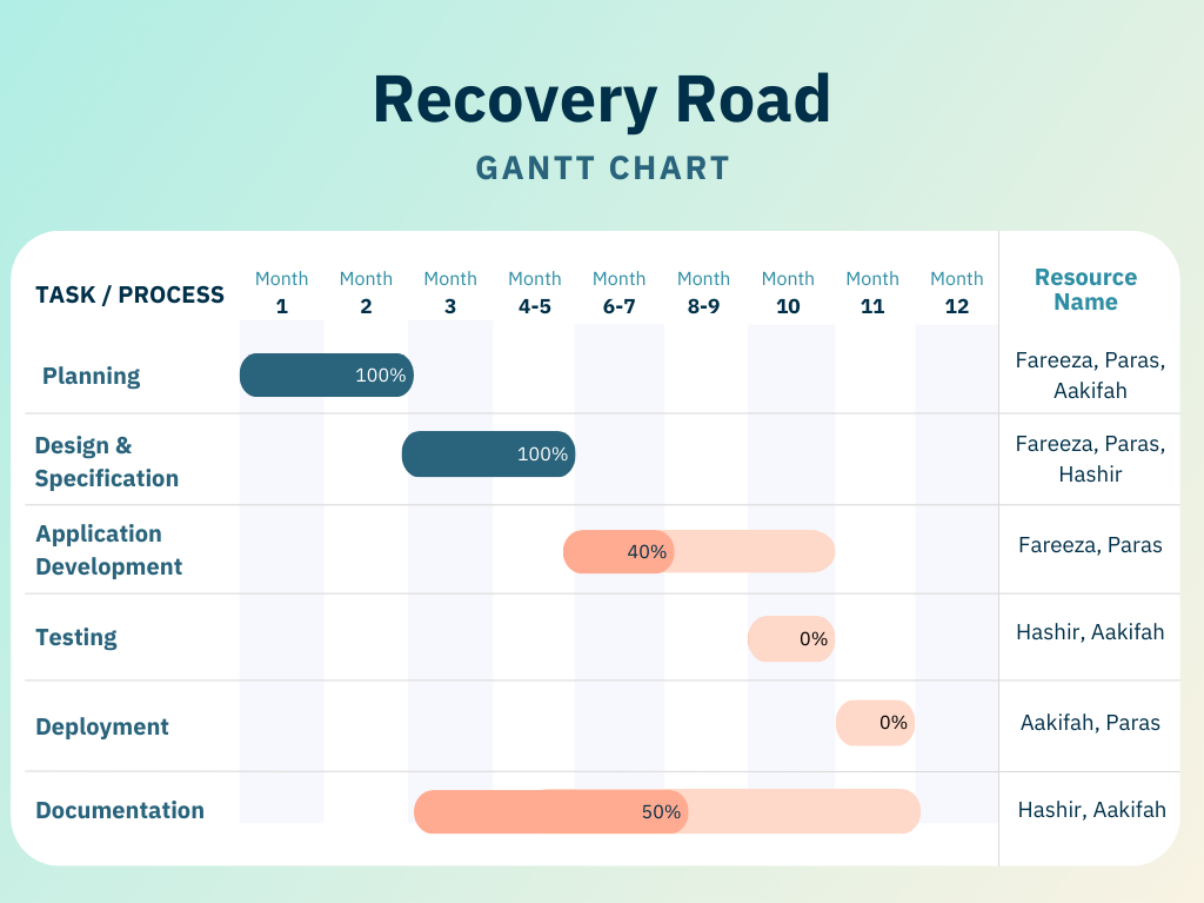
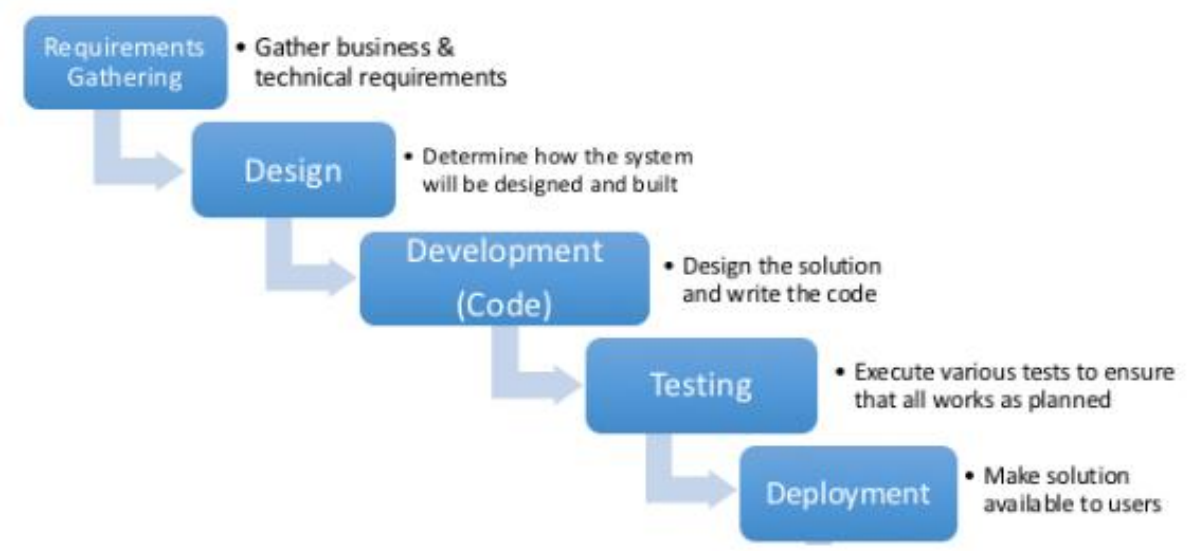


Figure 1 Gantt Chart

3.6 Software Development Life Cycle Model



Software Development Life Cycle Model

Requirement Gathering:

To develop Recovery Road, we begin by understanding users' experiences and needs through interviews, surveys, and feedback sessions with affected individuals by drug addiction. We aim to integrate personalized recovery plans, AI-driven Chatbot support, and sobriety resources based on user insights. By this analysis, we identify key user classes and requirements, visualizing them using tools like use case diagrams to guide development. This process ensures our app effectively supports individuals on their journey to recovery.

Design:

After a clear understanding of the requirements, we move to the design phase. The project design involves creating wireframes, and prototypes based on the gathered requirements, ensuring an intuitive user experience.

Development:

The Android-based application is developed using appropriate programming languages and frameworks, following best practices and guidelines for mobile app development.

Testing:

Testing is conducted to detect errors and ensure the application functions are as intended. Various testing methods exist, each with distinct requirements, but we focused solely on acceptance testing. We will be testing the application on an Android-based device using acceptance testing strategy.

Deployment:

The result of the project is the deployment of the mobile application to app stores and make it available for users to download and use.

3.7 Mapping Project Objective with Functional Requirement

Table 4 Mapping Project Objectives with Functional Requirements

PO: Project Objective	FR: Functional Requirement	% of the Entire Project Achieved
PO1: Provide personalized drug recovery plans tailored to individual needs	**FR1**: Customize user profile and recovery plan	**40%**
	FR2: Progress tracking and report generation	**10%**
PO2: Support individuals during the withdrawal process	**FR3:** Telehealth facilities, helpline, and AI chatbot support	**30%**
	FR4: Streak management and tracking	**10%**
PO3: Integrate an AI-driven Chatbot system for immediate access to support	**FR3:** Telehealth facilities, helpline, and AI chatbot support	**20%**
PO4: Offer an extensive resource hub to encourage users on their path to sobriety	**FR5:** Information resources	**15%**
PO5: Enable users to reach out for clinical help through public helpline numbers	**FR3:** Telehealth facilities, helpline, and AI chatbot support	**15%**

Chapter 4

System Design

4.1 System Architecture Diagram

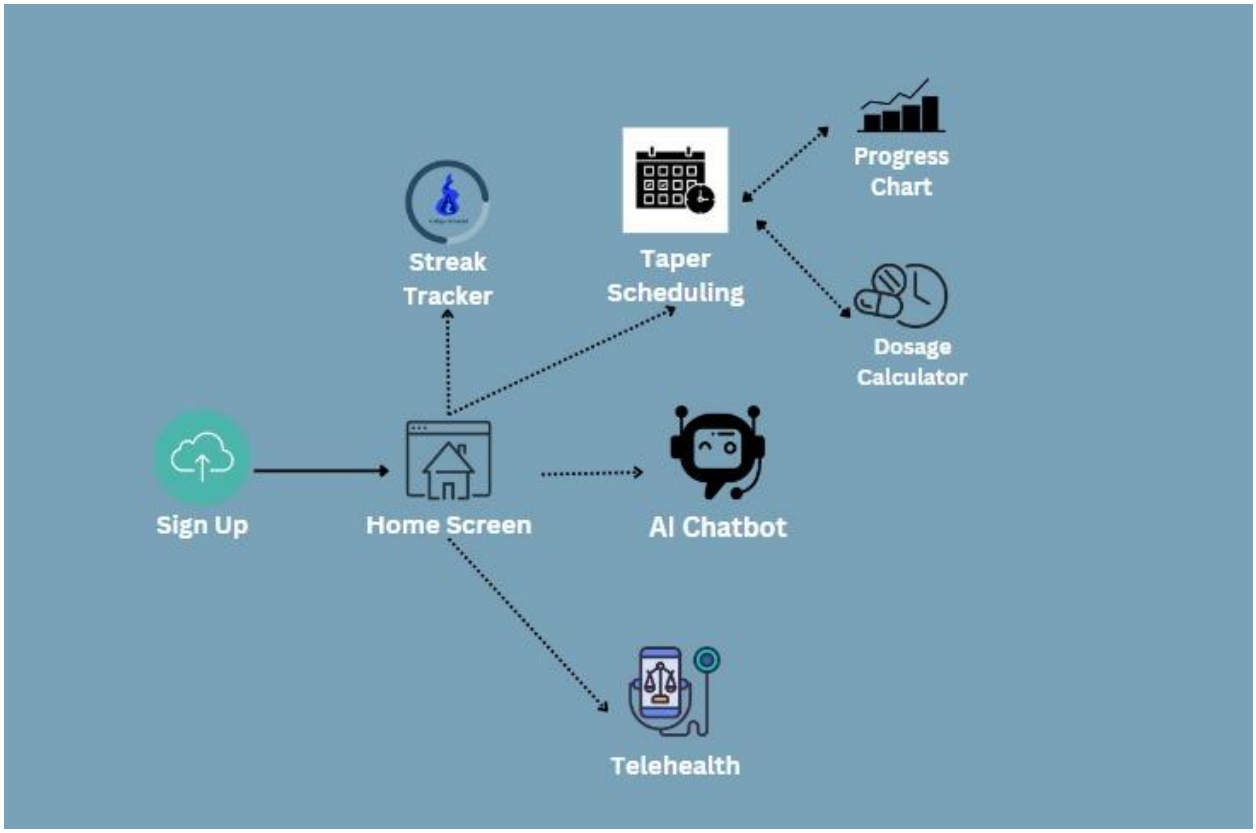


Figure 2 System Architecture

The system model showcases the interconnected components of our addiction recovery mobile application. At the core of the system lies the personalized taper scheduling feature, allowing users to create tailored withdrawal plans. Integrated with this is the AI-driven chatbot, providing real-time support and information. Users can track their progress and streaks of sobriety while accessing telehealth facilities for remote consultations with healthcare professionals through public helpline numbers. Additionally, the system offers a library of podcasts covering educational and motivational content to inspire users on their recovery journey. These features work synergistically to provide comprehensive support and guidance, empowering individuals in their pursuit of a healthier, addiction-free life

4.2 System Operations

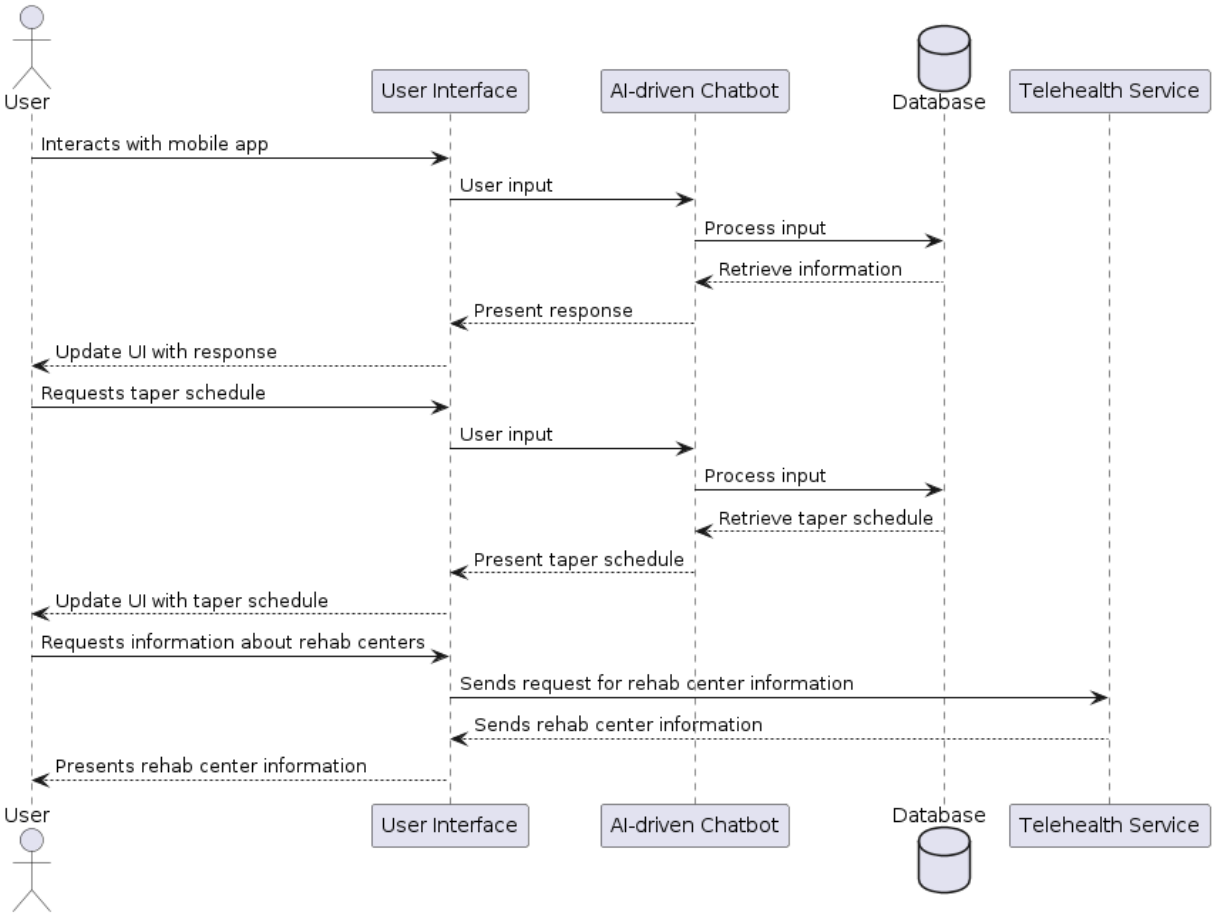


Figure 3 UML Sequence Diagram

1. **User Interaction:** The user interacts with the mobile app through the user interface.
2. **User Input:** The user provides input to the chatbot regarding their needs or queries.
3. **Process Input:** The chatbot processes the user's input and interacts with the database to retrieve relevant information.
4. **Retrieve Taper Schedule:** Upon user request, the chatbot retrieves the taper schedule from the database and presents it to the user through the user interface.
5. **Request Information about Rehab Centers:** The user requests information about rehab centers through the user interface.
6. **Telehealth Service Interaction**: The user interface sends a request to the telehealth service for information about rehab centers.
7. **Send Rehab Center Information:** The telehealth service sends information about rehab centers back to the user interface.
8. **Present Rehab Center Information:** The user interface presents the information about rehab centers to the user.

4.3 System Model

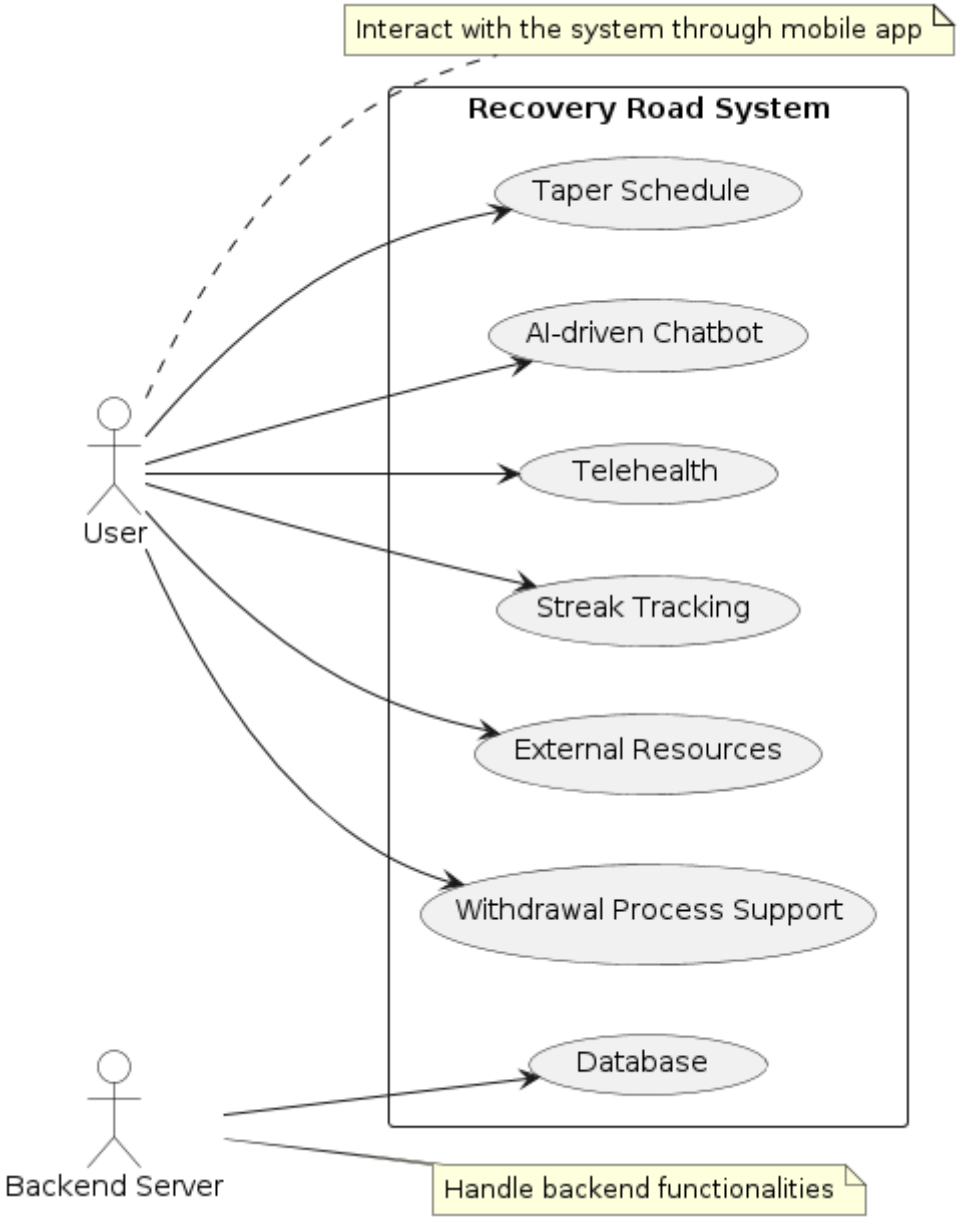


Figure 4 UML Use Case Diagram

The UML use case diagram represents the interactions between the user and the Recovery Road System, along with the functionalities handled by the Backend Server. Users can interact with the system through the mobile app, accessing features such as Personalized Drug Recovery Plans, Withdrawal Process Support, Access to Resources, Raising Awareness, and Arranging Consultations with Clinical Psychologists through public helplines. The Backend Server is responsible for handling backend functionalities, including managing the AI-driven Chatbot, accessing the database, and utilizing external resources to support the system's operations.

4.4 Object Model

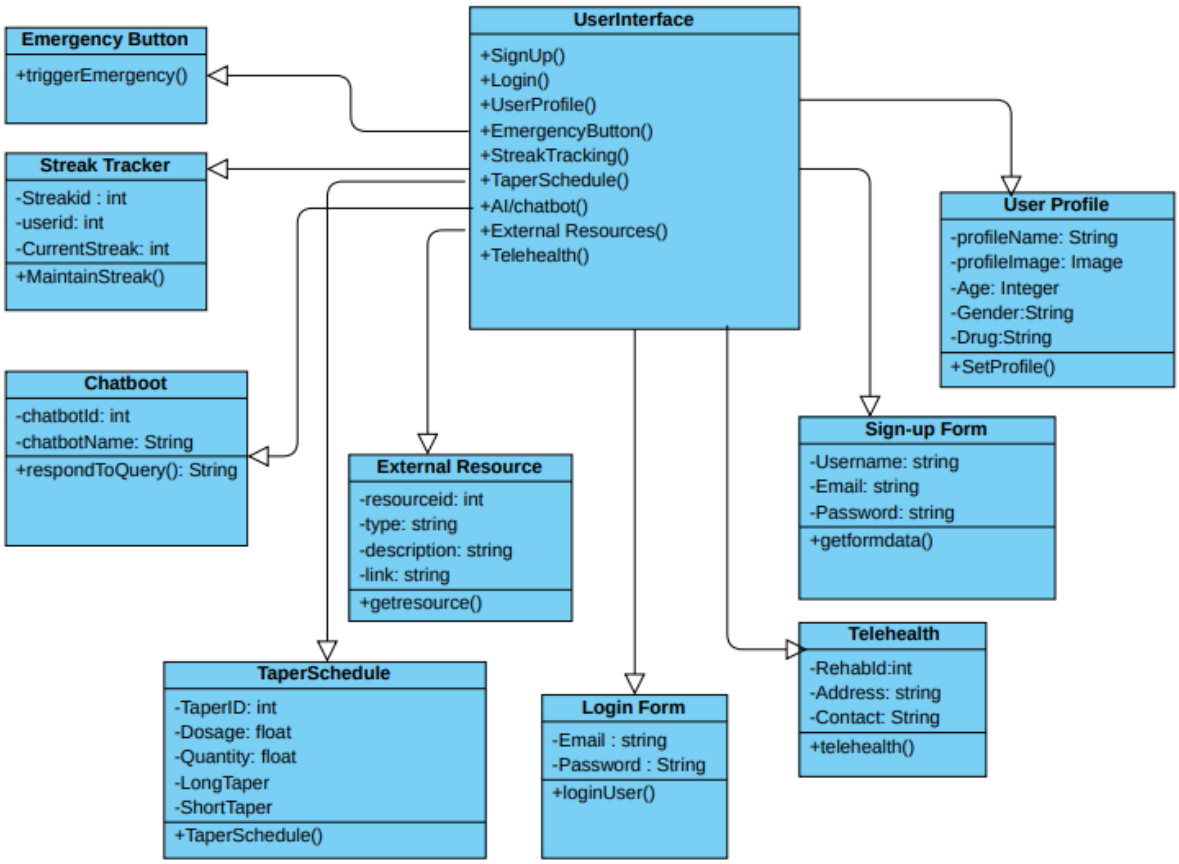


Figure 5 UML Class Diagram

The UML class diagram outlines key components of the application. Operations such as signup, login, user profile management, taper schedule tracking, streak tracking, external resource access, AI/chatbot interaction, Telehealth , and emergency services are represented. Each operation corresponds to a class with specific attributes and methods. For instance, the Signup class manages the signup process, UserProfile handles user profile management, and TaperSchedule manages taper schedule tracking. These classes collectively provide users with essential features to support their recovery journey.

4.5 Data Model

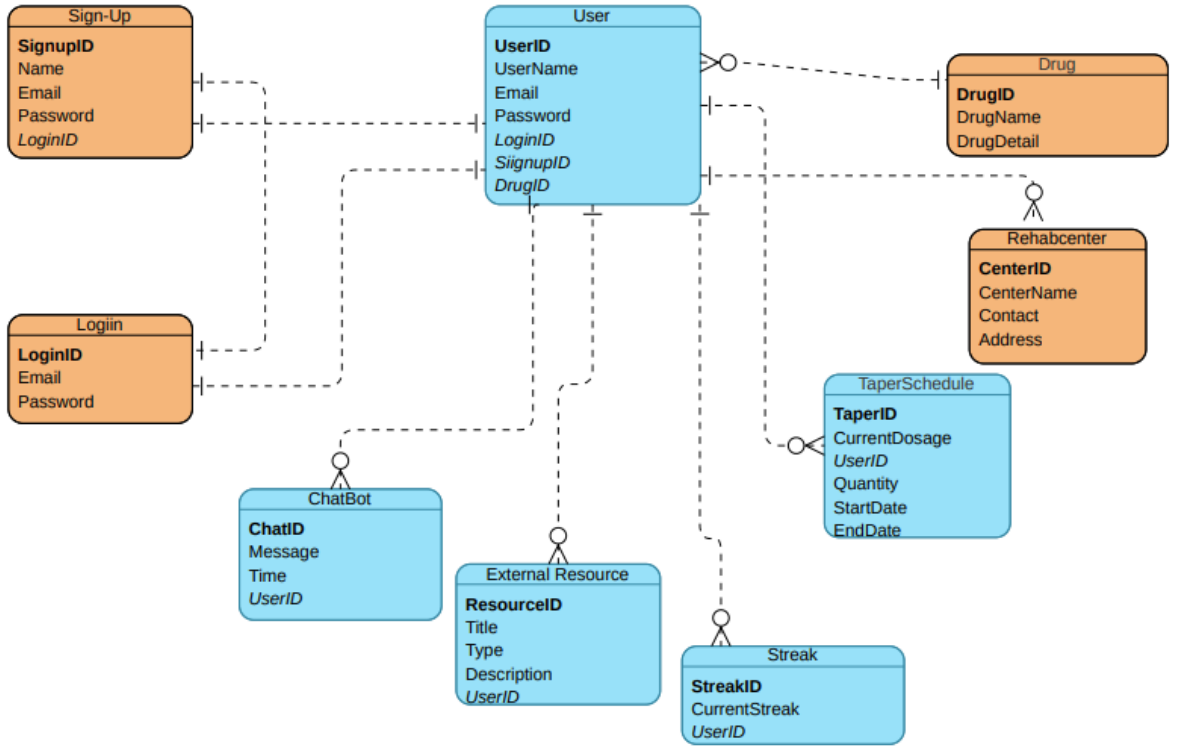


Figure 6 Database Diagram

1. **User Table:** Represents users of the system, storing information such as user ID, name, email, etc. It is connected to the Signup and Login tables through a one-to-one relationship, indicating that each user has one signup and one login credential.
2. **Signup Table:** Stores user signup credentials, linked to the User table through a one-to-one relationship. Each user has one signup credential.
3. **Login Table:** Contains user login credentials, linked to the User table through a one-to-one relationship. Each user has one login credential.
4. **Resource Table:** Stores information about resources available for users, such as articles, podcasts, etc. It has a one-to-many relationship with the User table, indicating that each user can access multiple resources.
5. **Chatbot Table:** Represents data related to the AI-driven chatbot integrated into the system. It also has a one-to-many relationship with the User table, as each user can interact with the chatbot.
6. **Streak Table:** Stores information about user streaks, such as current streak etc. It is linked to the User table through a one-to-many relationship
7. **Telehealth Table:** Contains details of rehabcenter helpline number, address, connected to the User table through a one-to-many relationship.
8. **Taperschedule Table:** Contains data related to personalized taper schedules for users. It has a one-to-many relationship with the User table with the Recovery Plan table, suggesting that each taper schedule is associated with one recovery plan

4.6 User Interface Design

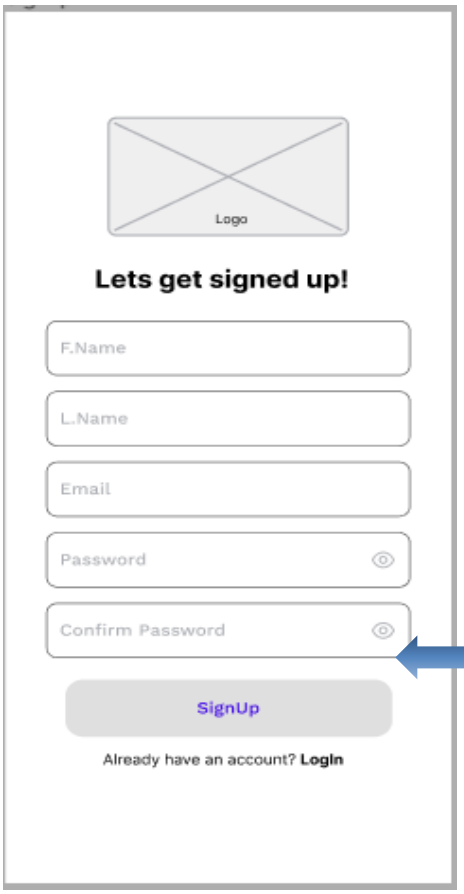


Figure 7 Sign-up

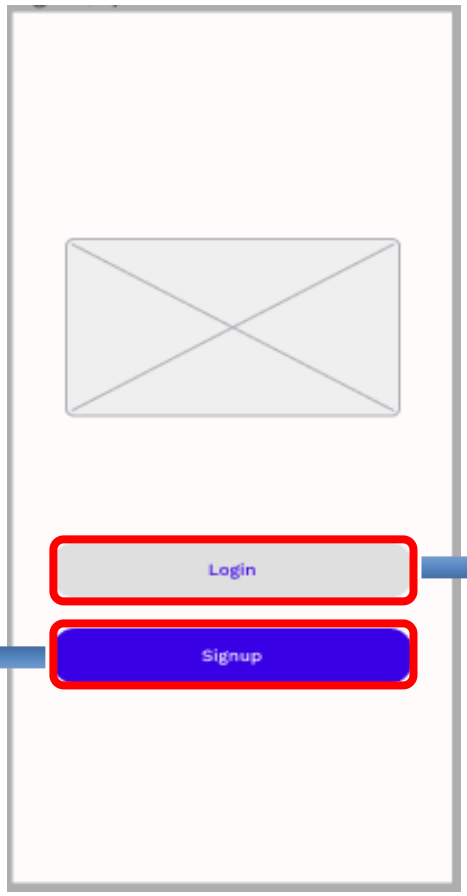


Figure 8 *Signup / Login*

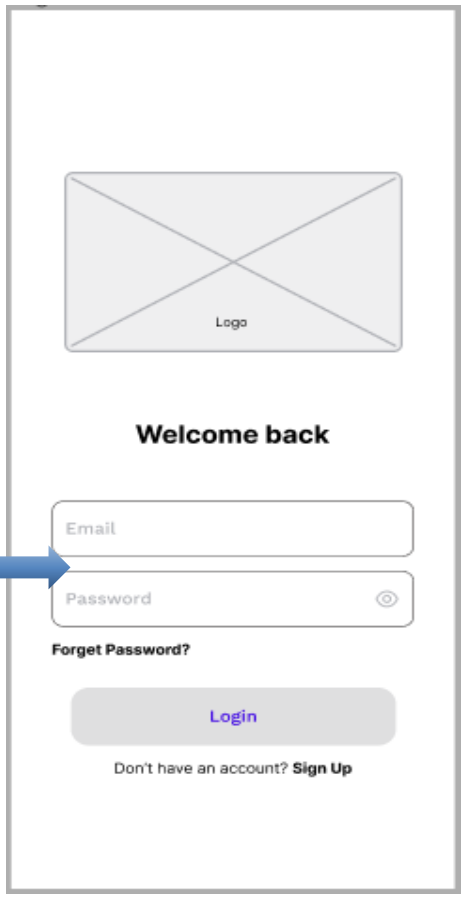


Figure 9 Login

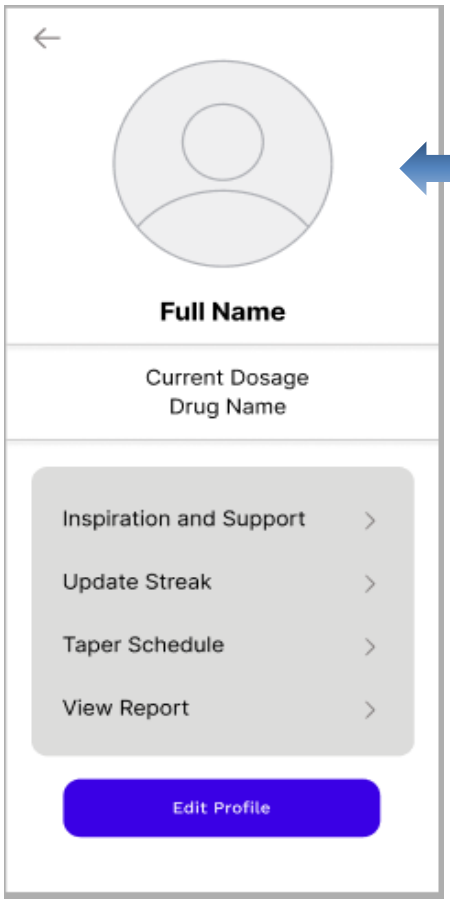


Figure 10 **Profile**

Figure 11 **Home Screen**

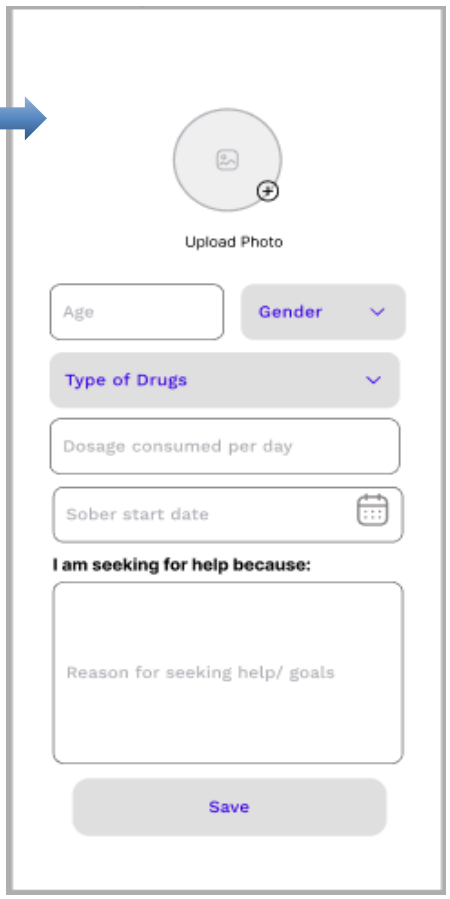


Figure 12 Edit Profile

Figure 13 Podcasts

Figure 14 *Podcasts/ Videos*

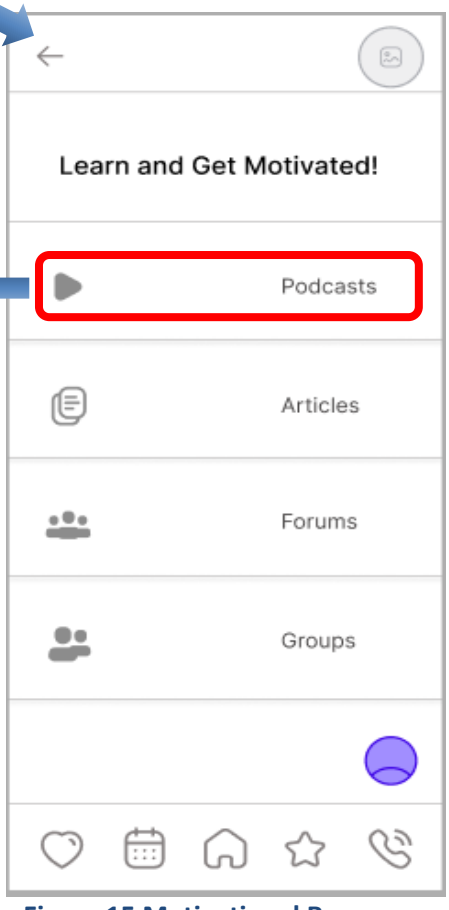


Figure 15 Motivational Resources

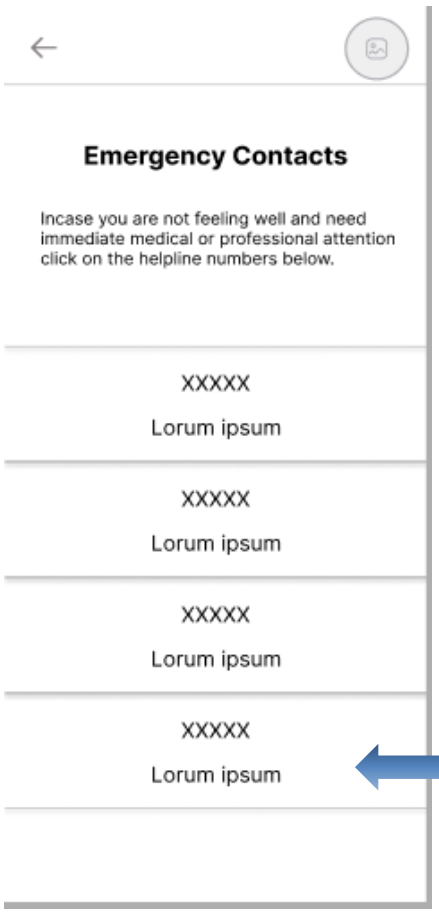


Figure 16 Emergency

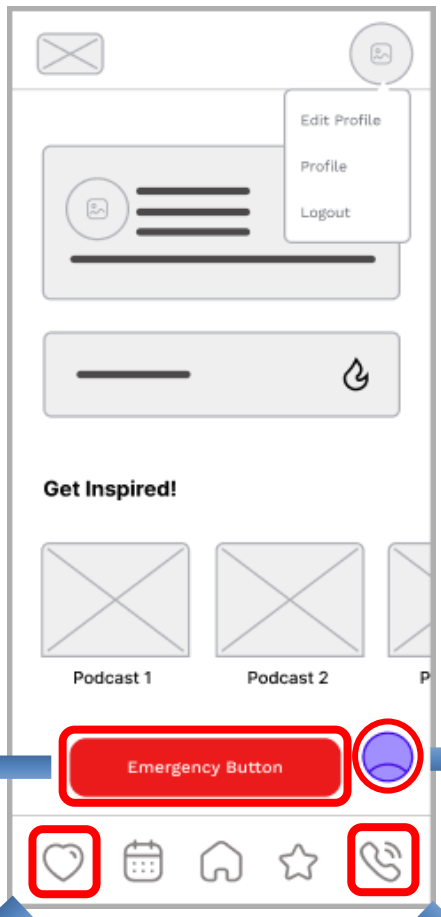


Figure 17 Home Screen

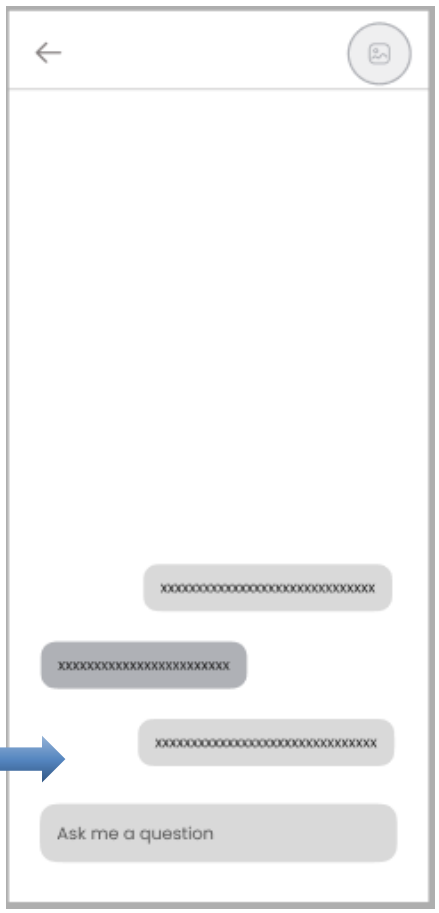


Figure 18 AI Chatbot

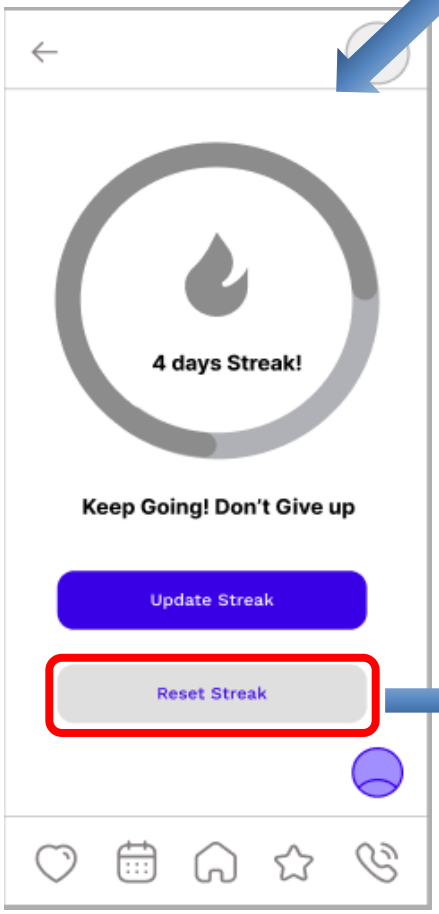


Figure 20 Streak Tracking

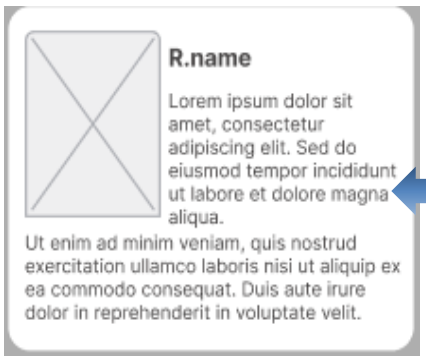


Figure 19 Rehab Pop-up

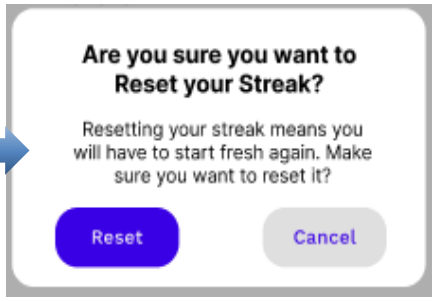


Figure 21 Reset Streak

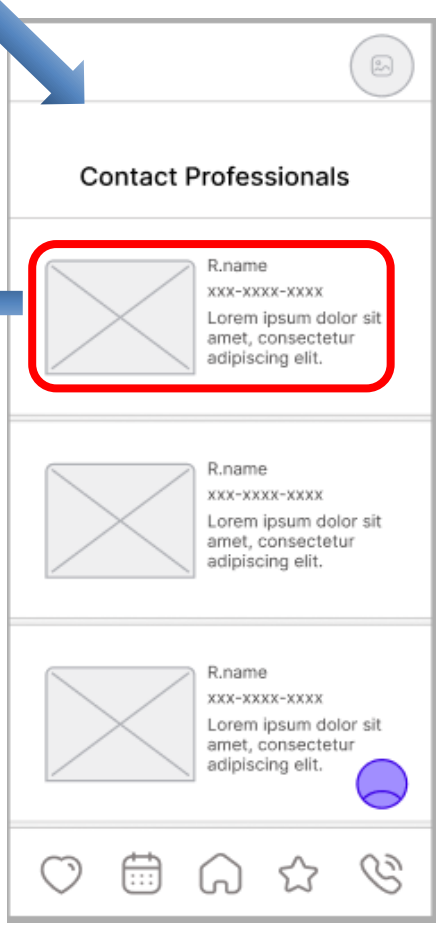


Figure 22 Telehealth

Figure 23 Home Screen

Figure 24 Taper

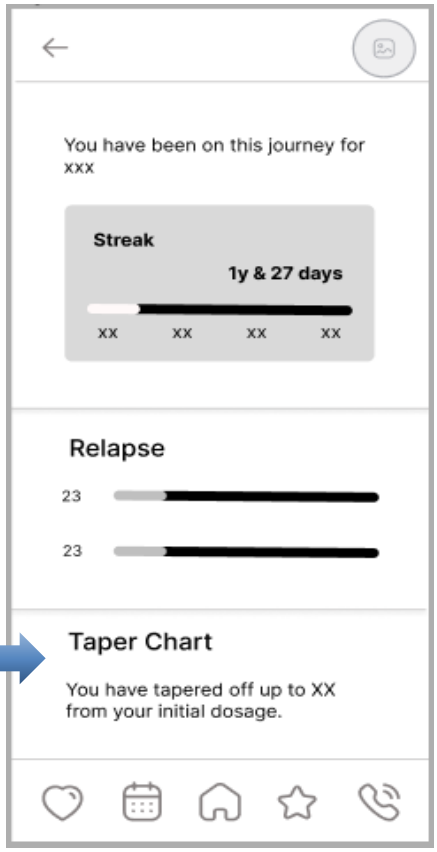


Figure 25 See Report

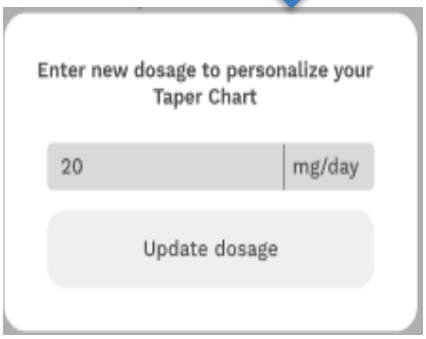


Figure 26 Update Dosage

Figure 27 Taper Update / Reset

Chapter 5

Business Model

5.1 Business Model Canvas

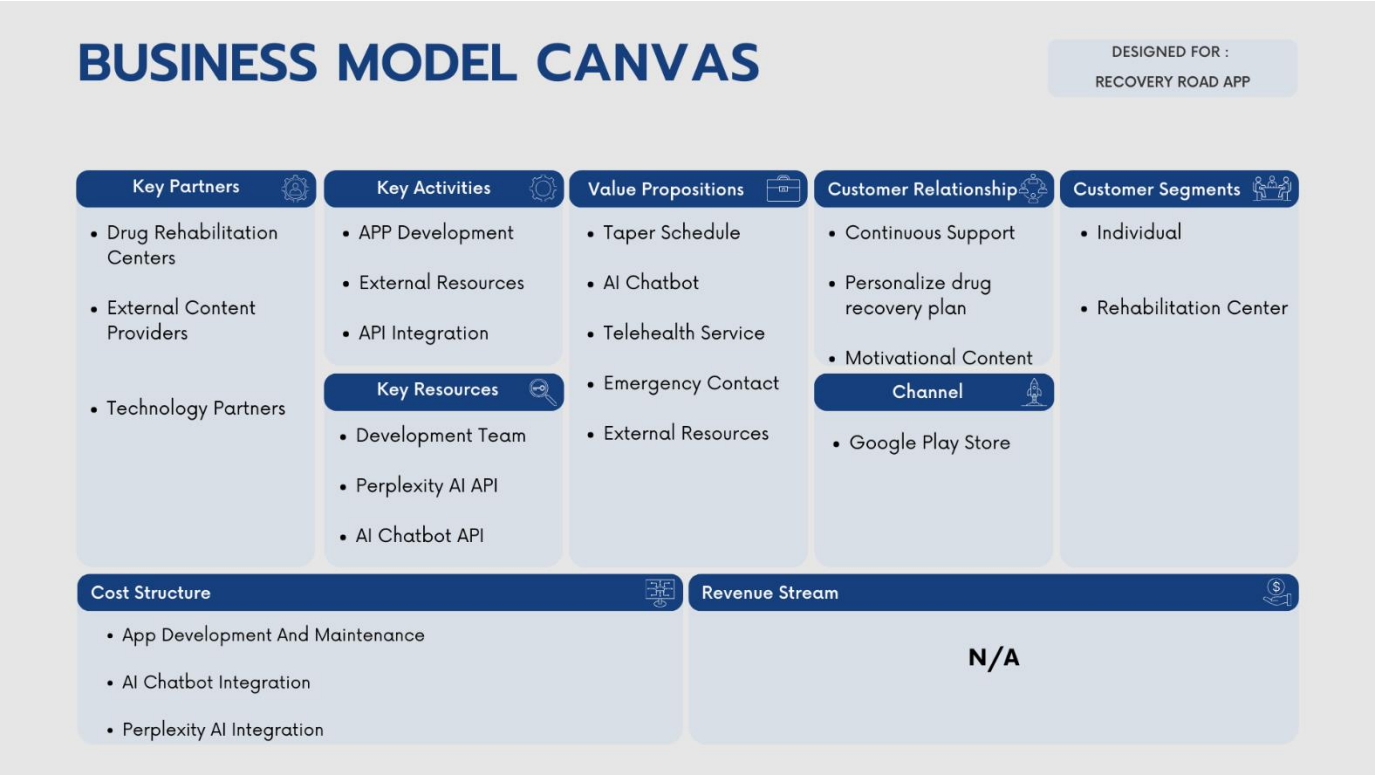


Figure 28 Business Model Canvas

5.1.1 Key Partners

Drug Rehabilitation Centers:

- These centers are crucial partners for providing professional support and guidance to individuals seeking recovery from drug addiction.
- Key activities performed by these partners include offering free counseling through their public helpline numbers.

Content Providers:

- Partnerships with content providers, including podcasts, articles, blogs, and YouTube channels focused on addiction recovery, are valuable.
- These partners contribute educational resources and motivational content to the app's resource hub, enriching the user experience and supporting their journey towards sobriety.
- **Motivations for partnerships:** Acquisition of resources and activities, such as informative and engaging content, to provide users with a comprehensive support network.

Technology Partners:

- Partnerships with technology companies providing AI chatbot services and app development platforms are essential for integrating advanced functionalities into the app.
- These partners contribute AI-driven chatbot technology and development tools to enhance the app's features and user experience.
- **Motivations for partnerships:** Optimization and economy in leveraging existing AI technologies and development platforms to streamline app development and enhance performance.

Key Suppliers:

- Key suppliers may include software companies offering development tools and platforms, and content creators supplying educational materials for the app's resource hub.

Key Resources Acquired from Partners:

- Expertise and guidance from drug rehabilitation centers.
- Educational and motivational content from content providers
- AI chatbot technology and development tools from technology partners

Key Activities Partners Perform:

- Drug rehabilitation centers perform activities such as counseling, therapy sessions, and medical guidance.
- Content providers create and supply educational resources and motivational content for the app's resource hub.
- Technology partners contribute AI chatbot technology and development tools for integrating advanced functionalities into the app.

5.1.2 Key Activities

Production:

- **Developing and maintaining the mobile application:** This involves designing, coding, testing, and updating the app to ensure it functions smoothly and effectively.
- **Selecting content for the resource hub:** Content Selection includes researching, educational materials, articles, podcasts, and videos related to addiction recovery.
- **Integrating and optimizing AI-driven chatbot functionality:** This activity involves incorporating AI technology into the app.

Problem Solving:

- **Personalizing drug recovery plans:** Address the unique needs of each user by creating personalized recovery plans.

- **Providing immediate support and assistance through the AI-driven chatbot:** Offering real-time responses to user inquiries and emotional support to address challenges.
- **Facilitating appointment scheduling with drug withdrawal doctors:** Helping users connect with healthcare professionals for medical guidance and support during the recovery process.

Platform/Network:

- **Establishing partnerships with drug rehabilitation centers:** Building relationships with key stakeholders to provide users with access to professional support and services.
- **Collaborating with content providers:** Partnering with organizations and individuals to source high-quality educational and motivational content for the app's resource hub.

Distribution Channels:

- Distributing mobile applications to users through Google Play Store for easy access and download.

5.1.3 Key Resources

Personalized Drug Recovery Plans:

- **Intellectual:** Data analytics algorithms for personalized plan generation, content copyright for external content.

AI-Driven Chatbot Support:

- **Intellectual:** AI technology for chatbot functionality, data analytics for user interaction analysis.

Comprehensive Resource Hub:

- **Intellectual:** Content copyright for external resources.

Distribution Channels:

- **Google Play Store:**
  - Physical: Server infrastructure for app distribution.
  - Financial: Funds for app store registration fees.

5.1.4 Value Propositions

- **Newness**: Our app introduces innovative features such as personalized taper schedules and AI-driven chatbot support, providing new solutions to the challenges of addiction recovery.
- **Performance:** The app is optimized for performance, offering timely motivational reminders, seamless access to resources, and immediate assistance through the chatbot, ensuring an effective support system for users.
- **Customization:** Users can customize their recovery plan based on their daily drug intake, providing a tailored approach to addiction recovery.
- **"Getting the Job Done":** Our app helps users overcome drug addiction and manage relapses by providing them with the tools, resources, and support needed to successfully navigate the recovery process and achieve sobriety.
- **Design:** With a user-friendly interface and intuitive design, the app makes it easy for users to navigate and access the features they need, enhancing their overall experience.
- **Brand/Status:** Our app aims to establish itself as a trusted brand in the field of addiction recovery, providing high-quality support and resources to users seeking help, enhancing its status and reputation.
- **Price:** The app may offer a freemium model, with basic features available for free ensuring affordability and accessibility for users.
- **Cost Reduction:** By providing access to resources and support within the app, we aim to reduce the overall cost of addiction recovery for users compared to traditional methods such as therapy or rehabilitation centers.
- **Risk Reduction:** The app's personalized taper schedules and access to professional support help reduce the risks associated with drug withdrawal and relapse, promoting safer and more effective recovery journeys.
- **Accessibility:** The app is accessible on various devices and platforms, ensuring users can access support and resources whenever and wherever they need them.
- **Convenience/Usability:** With features such as appointment scheduling and immediate chatbot support, the app offers convenience and usability, streamlining the recovery process for users and enhancing their overall experience.

5.1.5 Customer Relationships

Types of Customer Relationships:

Continuous Support and Guidance:

- **Customer Expectation:** Users expect continuous support and guidance throughout their addiction recovery journey, including immediate access to assistance and information.
- **Integration with Business Model:** This relationship is integrated with the app's value propositions, particularly the AI-driven chatbot support and comprehensive resource hub.
- **Cost:** Continuous support may require significant resources for maintaining updating content including APIs for forum and video integrations.

Personalized Interaction:

- **Customer Expectation:** Users expect personalized interaction tailored to their individual needs and progress, such as customized recovery plans and timely responses to inquiries using AI assistant bot.
- **Integration with Business Model:** This relationship is integrated with personalized recovery plans and AI-driven chatbot functionality.
- **Cost:** Personalized interaction may require investment in data analytics algorithms and AI assistant APIs for customer support and inquiries.

Trust and Reliability:

- **Customer Expectation:** Users expect trust and reliability in the app's functionality, content accuracy, and data security.
- **Integration with Business Model:** This relationship is integrated with maintaining high-quality app performance, content integrity, and data protection measures.
- **Cost:** Data protection requires dedicated security measures including active SSL certificate, maintained server and secure database which all come with monthly/yearly subscriptions.

5.1.6 Channels

Mobile App Stores (Google Play Store):

- **Customer Preference:** Users prefer to discover and download mobile applications through official app stores.
- **Current Reach:** The app is available for download through APK.
- **Integration:** App store presence is integrated with digital marketing efforts and referral campaigns.
- **Effectiveness:** App stores work well for reaching a wide audience
- **Cost Efficiency:** Initial app store registration fees and ongoing optimization efforts may incur costs.

5.1.7 Cost Structure

Key Activities:

Most Expensive:

- **App Development and Maintenance:** Designing, developing, and updating the mobile application.

Business Model Orientation:

- **The business model for the Drug Addiction Withdrawal Support App is value-driven:**
  - **Value Creation:** Focused on creating value for users by providing comprehensive support and resources for addiction recovery and relapse management.
  - **Value Proposition:** Offering personalized recovery plans, immediate access to support, and a comprehensive resource hub.
  - **Investment in Key Resources and Activities:** Willingness to invest in human resources, technology infrastructure, and content creation to deliver high-quality services to users.

5.1.8 Revenue Streams

N/A

Chapter 6

System Development Methodology

6.1 Development Methodology

Based on the project requirements and objectives, the Waterfall Model is the most appropriate software development life cycle model for this project.

The Waterfall Model is a sequential and linear approach to software development that is best suited for projects with clearly defined requirements, a fixed budget, and a well-understood timeline. In this model, each phase of the development process is completed before moving on to the next phase. The five main phases of the Waterfall Model include requirements gathering and analysis, design, implementation, testing, and maintenance.

For this project, the requirements are well defined, and the project timeline is clearly outlined. Therefore, the Waterfall Model is suitable as it provides a structured approach to software development, ensuring that each phase of the project is completed before moving on to the next phase. The model also enables the team to identify and address any potential issues early in the development process, which helps to ensure the final product meets the requirements and is delivered on time.

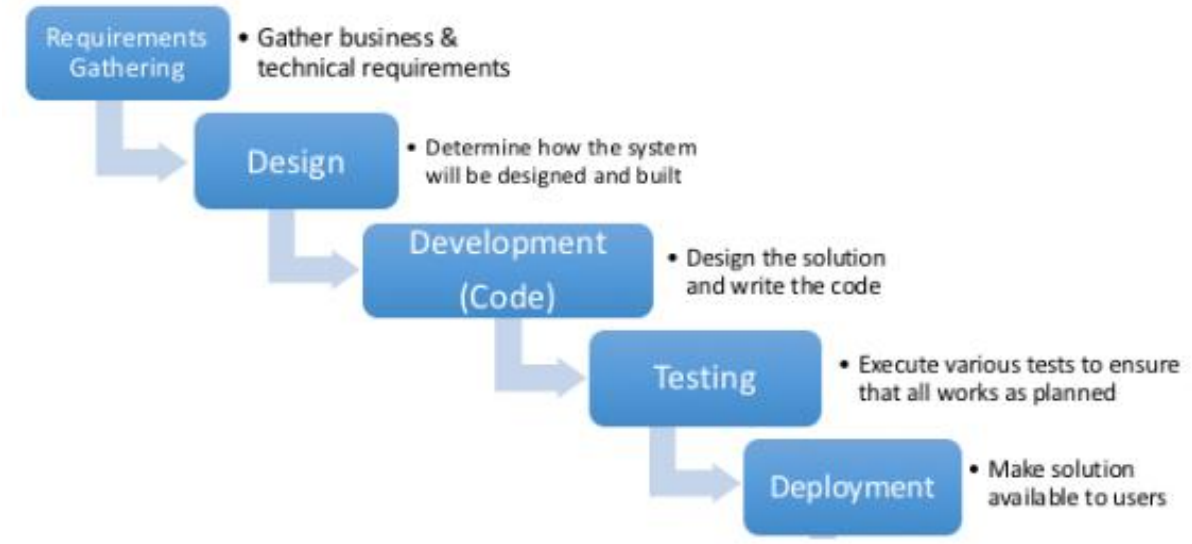


Figure 29 Software Life Cycle Development

6.2 Key Milestone

Table 5 Key Milestones

S.no	Milestone	Completion Work
1.	Requirement Gathering	Week 10
2.	Interim Report Submission	Week 12
3.	Proposal Defense	Week 14
4.	Progress Report	Week 18
5.	Technical Report	Week 25
6.	Prototype Development Complete	Week 26
7.	Project Submission and Presentation	Week 28

6.3 Project Plan with Gantt Chart

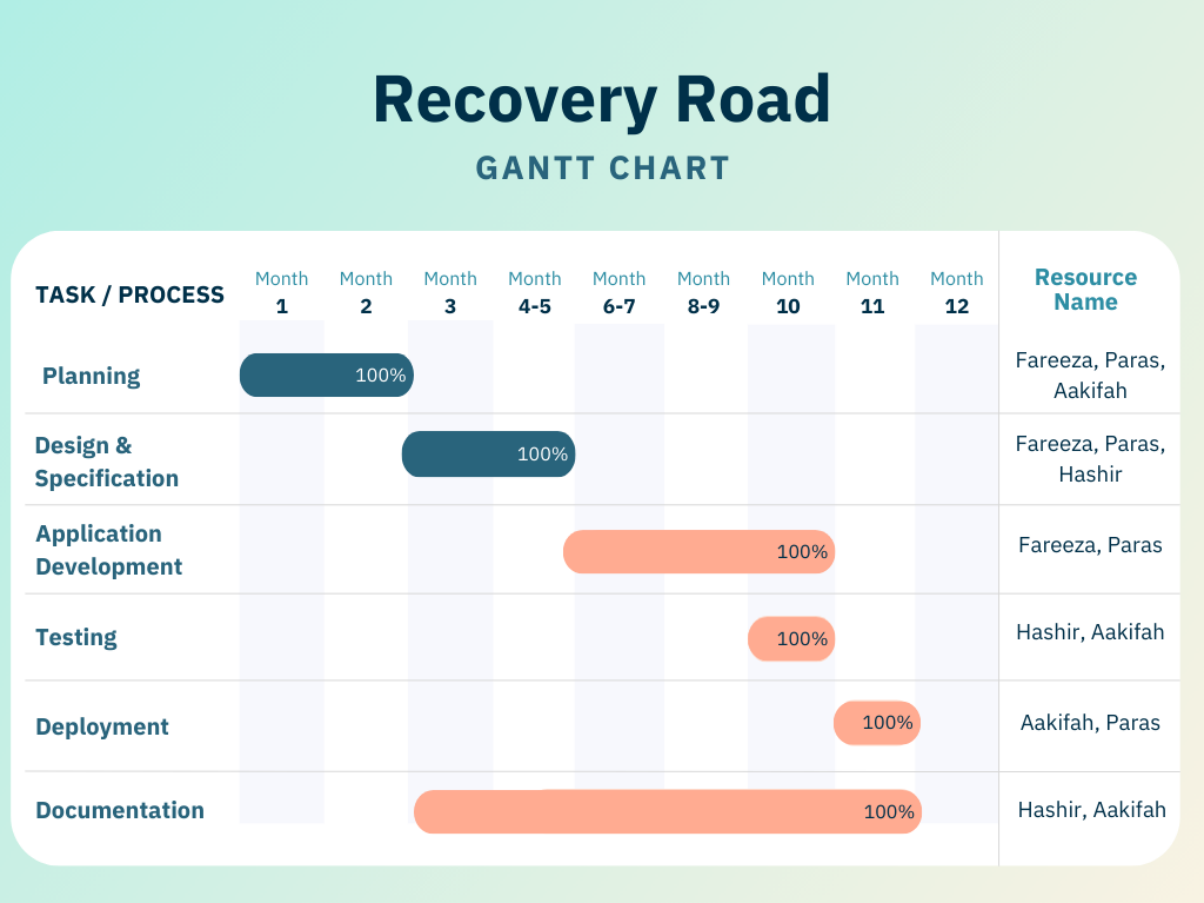


Figure 30 Gantt Chart

6.4 Tools Used for Development

To develop Recovery Road, several tools and requirements were necessary to ensure the system runs efficiently. Below are the minimum requirements and tools used:

- **Personal Computers:** Windows platform, 1 GB RAM (minimum), 50 GB hard-disk space, including 115 MB of available space on the hard disk containing the operating system, to store all files and documents related to the system.

- **Figma:** Used to design the user interface of the system, incorporating all the necessary features and functions.

These tools and specifications provided the foundation needed to develop and manage the application effectively, ensuring a smooth development process and a functional end product.

6.5 System Implementation:

The Recovery Road App is developed to address drug addiction with a comprehensive approach, utilizing the following system implementation details

- **Technology Stack:** The app is built using Flutter (3.19) for cross-platform compatibility, leveraging its rich libraries for UI and application logic. The AI-driven Chatbot is integrated using GPT-4.0 API for real-time support.

- **User Interface:** Designed with Figma and implemented using Flutter, the app provides a user-friendly interface that includes features such as personalized recovery plans, streak tracking, motivational resources, and access to telehealth services.

- **Database Management:** PostgreSQL (Version) is used for secure and efficient storage of user data, including recovery plans, motivational reminders, and educational resources.

- **Integration:** The app integrates various APIs for functionality such as chatbot support and customizing recovery plans. It employs HTTP/HTTPS protocols for secure communication and uses libraries like http for network operations.

- **Performance and Security:** The application ensures high performance with quick response times and secure handling of user data, implementing TLS/SSL encryption and privacy measures.

- **Deployment:** The app is available on Android, developed using Android Studio Iguana, and designed to be easily accessible across various devices without subscription fees.

This implementation strategy supports a holistic and user-centric approach to addiction recovery.

Chapter 7

System Testing and Evaluation

7.1 Introduction

7.1.1 Purpose

This is a testing document for **Recovery Road** System Testing, produced by the FYP members. It describes the testing strategy and approach to testing the team will use to verify that the application meets the established requirements of the business prior to release.

7.1.2 Objectives

- Meets the requirements, specifications and the Business rules.
- Supports the intended business functions and achieves the required software standards.
- Satisfies the Entrance Criteria for User Acceptance Testing.

7.2 Test Methodology

The Recovery Road App will employ Black Box Testing to ensure it meets all functional and performance requirements. In this method, testers will focus on validating the application's functionality against the defined requirements without considering the internal code structure. Test cases will be created based on user interactions and the app's features, including personalized recovery plans, AI-driven chatbot support, streak tracking, educational resources, and telehealth services. This approach will help ensure that the app behaves as expected and supports the intended business functions while achieving the required software standards.

7.3 Test Plan

Table 6 Test Plan

ID	Requirement
REQ-1	**Customize user profile and recovery plan:** The application shall allow users to create and customize their profile and recovery plan tailored to their specific needs.
REQ-2	**Progress tracking and report generation:** The application shall track user progress and generate reports on their recovery journey.
REQ-3	**Telehealth facilities , helpline and AI chatbot support:** The application shall provide telehealth facilities, access to a helpline, and continuous support through an AI-driven chatbot.
REQ-4	**Streak management and tracking:** The application shall manage and track the user's streaks, providing motivational support for maintaining sobriety.
REQ-5	**Information resources:** The application shall offer a comprehensive resource hub with educational materials and motivational resources related to addiction recovery.

7.4 Test Approach

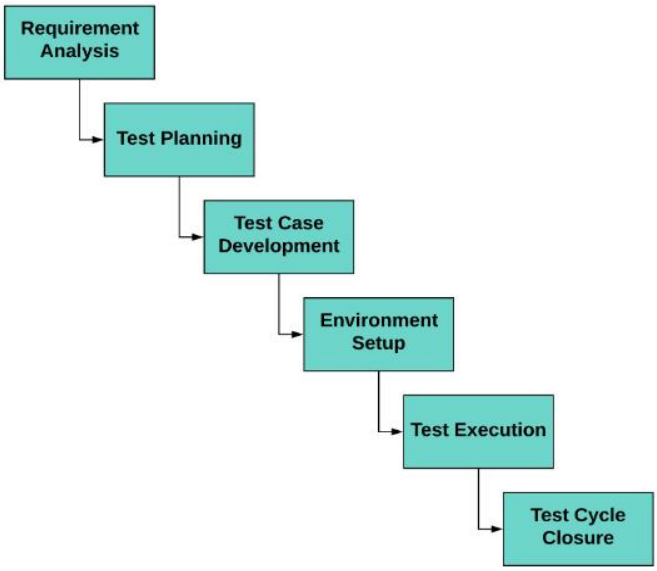


Figure 31 Test Approach

7.5 Test Environment

The test environment for the Recovery Road App includes both hardware and software components to facilitate comprehensive testing activities. The hardware setup consists of Android-based smartphones, which represent the primary devices on which the application will run. These devices ensure that the app is tested in real-world usage scenarios.

On the software side, the application is developed using Flutter (3.19) for creating a responsive and interactive user interface. The backend operations are supported by a PostgreSQL database, ensuring reliable and efficient data management. The development and testing processes are carried out using Android Studio, which provides an integrated environment for coding, debugging, and testing the application. Additionally, various libraries are employed to streamline the development and testing process, including packages for HTTP requests, WebSocket communication, state management, and data storage. The test environment is designed to replicate real user conditions, ensuring that the Recovery Road App functions seamlessly and effectively across different devices and scenarios.

7.6 Test Entrance Criteria

Before commencing the testing process, the following prerequisites must be achieved:

- **Completion of Development:** All app features and functionalities must be fully developed and integrated.

- **Requirement Validation:** Verification that all requirements, as specified in the functional requirement table, are implemented.
- **Initial Code Review:** Conducting a preliminary code review to identify and rectify any obvious issues or bugs.
- **Setup of Test Environment:** Ensuring the test environment is fully configured with the necessary hardware and software.
- **Test Plan Approval:** Approval of the test plan by the project supervisor confirming readiness for testing.

7.7 Testing Acceptance Criteria

The acceptance criteria for testing the Recovery Road App are as follows:

- **Major Functionality:** All the major functionalities of the application must work as intended. This includes personalized recovery plans, AI-driven chatbot support, educational resources, telehealth services, and streak tracking.
- **Pass Percentage:** The passing percentage of the test cases should be more than 95%. This ensures that the vast majority of the application's features are functioning correctly and reliably.
- **Critical Bugs:** There should not be any critical bugs. A critical bug is defined as an issue that significantly impacts the usability, performance, or security of the application. The absence of such bugs is essential to ensure a smooth and safe user experience.

Meeting these criteria indicates that the application is stable, reliable, and ready for deployment.

7.8 Test Cases

Table 7 Test Case

Test Case ID	Test Objective	Test Data	Expected Result	Actual Result	Test Status Pass / Fail	Bug ID
TC1	Verify user can sign up successfully	F.name: Aakifah L.name: Jahangir Email:aakifahjahangirahmad@gmail.com Phone no:03322511178 Password:aakifah123	User successfully create account and receive confirmation mail	User successfully create account and but does not receive confirmation mail	Fail	Bug-ID 01
TC 2	Verify user can login Successfully	Email:aakifahjahangirahmad@gmail.com Password:aakifah123	User successfully logs in and redirected to the Profile setup	User successfully logs in and redirected to the Profile	Pass	

			screen	setup screen		
TC 3	User setup profile after login	Set profile image: image DOB:29/12/2002 Gender: Female Types of drugs: Smoking Dosage consumed per day: 50 Sober start date: 1/8/2024	Profile setup completed successfully user redirected to Home page	Profile setup completed successfully but user does not redirect to Home page	Fail	Bug-ID 02
TC 4	Verify error for invalid login	Email:aakifahahamad@gmail.com Password:aakifah123	Display error message “User not found”	Display error message “User not found”	Pass	
TC 5	Verify user can reset password	Email:aakifahjahangirahmad@gmail.com	User receives an OTP code via email, enters the new password, and redirected to the login page after resetting it.	User receives an OTP code via email, enters the new password, and redirected to the login page after resetting it.	Pass	
TC 6	Verify user can access AI chatbot	User: Aakifah Jahangir Logged in: yes	User successfully accesses the AI chatbot and can interact with it, receiving appropriate responses.	User successfully accesses the AI chatbot and can interact with it, receiving appropriate responses.	Pass	
TC 7	Verify AI Chatbot is accurate and functional	User: Aakifah Jahangir Logged in: yes Ask me a question: what the best relapse management tips for drug addict are	Ai generates answer: “ Give best tips for relapse management ”	Ai generates answer: “ Give best tips for relapse management ”	Pass	
TC 8	Verify user can access emergency button	User: Aakifah Jahangir Logged in: yes	User successfully accesses the emergency button and redirected to the “Emergency Contacts” page	User successfully accesses the emergency button and redirected to the “Emergency Contacts” page	Pass	
TC 9	Verify user can dial emergency contact	User: Aakifah Jahangir Logged in: yes	After pressing on any emergency contact user is redirected to phone dialer with the contact	After pressing on any emergency contact user is redirected to phone dialer with the	Pass	

			number pre-filled	contact number pre-filled		
TC 10	Verify user can access streak tracking	User: Aakifah Jahangir Logged in: yes	User successfully access the streak tracking page, where the current streak is displayed correctly. The user should also be able to update and reset the streak by pressing the respective buttons.	User successfully access the streak tracking page, where the current streak is displayed correctly. The user should also be able to update and reset the streak by pressing the respective buttons.	Pass	
TC 11	Verify user can update streak	User: Aakifah Jahangir Logged in: yes Current streak: 4 Update streak button: Press	Streak is updated to 5 days, and the updated streak value is displayed correctly	Streak is updated to 5 days, and the updated streak value is displayed correctly	Pass	
TC 12	Verify user can reset streak	User: Aakifah Jahangir Logged in: yes Current streak: 5 Reset streak button: Press	Streak is reset to 0 days, and the updated streak value is displayed correctly	Streak is reset to 0 days, and the updated streak value is displayed correctly	Pass	
TC 13	Verify user can access taper schedule	User: Aakifah Jahangir Logged in: yes	User successfully accesses the Taper scheduling page, which displays the taper chart and includes buttons to see the report, update dosage, and reset the taper chart.	User successfully accesses the Taper scheduling page, which displays the taper chart and includes buttons to see the report, update dosage, and reset the taper chart.	Pass	
TC 14	Verify user can see report	User: Aakifah Jahangir Logged in: yes See report button: Press	Redirected to the report page, where the taper report is	Redirected to the report page, where the taper report	Pass	

			displayed correctly.	is displayed correctly.		
TC 15	Verify user can update dosage	User: Aakifah Jahangir Logged in: yes Current dosage:30mg/day Update dosage: 50mg/day	The new taper chart is displayed with updated dosage to 50	The new taper chart is displayed with updated dosage to 50	Pass	
TC 16	Verify user can reset taper chart	User: Aakifah Jahangir Logged in: yes Reset taper chart button: Press	Taper chart is reset to its default state with no user modifications.	Taper chart is not reset	Fail	Bug-ID 03
TC 17	Verify user can access the informational resources	User: Aakifah Jahangir Logged in: yes	User successfully access the informational resources page which display Podcast, Articles, Forum and Groups.	User successfully access the informational resources page which display Podcast, Articles, Forum and Groups.	Pass	
TC 18	Verify user can access Podcast	User: Aakifah Jahangir Logged in: yes	Multiple Podcast video will be displayed user can select and access each podcast individually	Multiple Podcast videos are displayed user can select and access each podcast individually	Pass	
TC 19	Verify user can access Articles	User: Aakifah Jahangir Logged in: yes	Multiple Articles links will be displayed user can select and access each article individually	Multiple Articles links are displayed user can select and access each article individually	Pass	
TC 20	Verify user can access Forum	User: Aakifah Jahangir Logged in: yes	Multiple Forum links will be displayed user can select and access each forum individually	Multiple Forum links are displayed user can select and access each forum individually	Pass	
TC 21	Verify User can access Groups	User: Aakifah Jahangir Logged in: yes	Multiple Groups links will be displayed user can select and access each	Multiple Group links are displayed user can select and access	Pass	

			group individually	each group individually		
TC 22	Verify user can access telehealth	User: Aakifah Jahangir Logged in: yes	User successfully access the Telehealth page which display rehab center information and contact number	User successfully access the Telehealth page which display rehab center information and contact number	Pass	
TC 23	Verify User can contact rehab center	User: Aakifah Jahangir Logged in: yes	User successfully clicks on the contact number, which redirects to the phone dialer with the rehab center's number pre-filled, allowing the user to initiate the call.	User successfully clicks on the contact number, which redirects to the phone dialer with the rehab center's number pre-filled, allowing the user to initiate the call.	Pass	

7.9 Bug Reporting

7.9.1 Bug Tracking

- No specific tool is used, only manual testing is done.

7.9.2 Bug Severity Definitions

Table 8 Bug Severity

Levels	Definitions
Critical	The defect causes a catastrophic or severe error that results in major problems and the functionality rendered is unavailable to the user. A manual procedure cannot be either implemented or a high effort is required to remedy the defect. Examples of a critical defect are as follows: • Data cannot flow through a business function/lifecycle • Data is corrupted or cannot post to the database
Medium	The defect does not seriously impair system function can be categorized as a medium Defect. A manual procedure requiring medium effort can be implemented to remedy the defect. Examples of a medium defect are as follows: • Form navigation is incorrect • Field labels are not consistent with global terminology
Low	The defect is cosmetic or has little to no impact on system functionality. A manual procedure requiring low effort can be implemented to remedy the defect. Examples of a low defect are as follows: • Repositioning of fields on screens • Text font on reports is incorrect

7.9.3 Bug Priority Definitions

Table 9 Bug Priority

Levels	Definitions
High	Must be fixed in any of the upcoming builds but should be included in the release.
Medium	May be fixed after the release / in the next release.
Low	May or may not be fixed at all.

7.9.4 Bug Life Cycle

Bug life cycle includes the following steps or status as shown in following diagram.

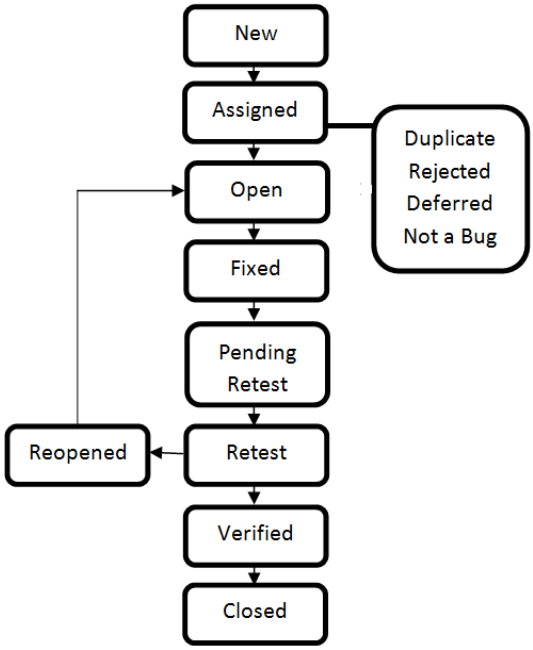


Figure 32 Bug Life Cycle

New: When a defect is logged and posted for the first time. Its state is given as new.

Assigned: After the tester has posted the bug, the lead of the tester approves that the bug is genuine and he assigns the bug to corresponding developer and the developer team. Its state given as assigned.

Open: At this state the developer has started analyzing and working on the defect fix.

Fixed: When developer makes necessary code changes and verifies the changes then he/she can make bug status as 'Fixed' and the bug is passed to testing team.

Pending retest: After fixing the defect the developer has given that particular code for retesting to the tester. Here the testing is pending on the testers end. Hence its status is pending retest.

Retest: At this stage the tester do the retesting of the changed code which developer has given to him to check whether the defect got fixed or not.

Verified: The tester tests the bug again after it got fixed by the developer. If the bug is not present in the software, he approves that the bug is fixed and changes the status to "verified".

Reopen: If the bug still exists even after the bug is fixed by the developer, the tester changes the status to "reopened". The bug goes through the life cycle once again.

Closed: Once the bug is fixed, it is tested by the tester. If the tester feels that the bug no longer exists in the software, he changes the status of the bug to "closed". This state means that the bug is fixed, tested and approved.

Duplicate: If the bug is repeated twice or the two bugs mention the same concept of the bug, then one bug status is changed to "duplicate".

Rejected: If the developer feels that the bug is not genuine, he rejects the bug. Then the state of the bug is changed to "rejected".

Deferred: The bug, changed to deferred state means the bug is expected to be fixed in next releases. The reasons for changing the bug to this state have many factors. Some of them are priority of the bug may be low, lack of time for the release or the bug may not have major effect on the software.

Not a bug: The state given as "Not a bug" if there is no change in the functionality of the application. For an example: If customer asks for some change in the look and field of the application like change of color of some text then it is not a bug but just some change in the looks of the application.

7.9.5 Bug Reports

Table 10 Bug Report

Bug ID	Test Case ID	Bug Description	Reported By	Status	Fixed by	Severity	Priority
Bg-01	TC-01	User successfully create account and but does not receive confirmation mail	Aakifah	Fixed	Fareeza	Critical	High
Bg-02	TC-03	Profile setup completed successfully but user does not redirect to Home page	Aakifah	Fixed	Fareeza	Medium	Medium
Bg-03	TC-16	Taper chart is not reset	Aakifah	Fixed	Fareeza	Critical	High

7.10 User Acceptance Testing

Table 11 User Review 1

User# 1 Review : Effective Recovery Tool with Seamless Navigation			
The Recovery Road App has proven to be an effective tool in supporting addiction recovery. The personalized recovery plans were highly beneficial, providing tailored guidance that addressed my unique needs. The app's interface is clean and easy to navigate, making it simple to track progress and access resources. I particularly appreciated the AI-driven chatbot, which offered timely and supportive responses. The app's overall performance exceeded my expectations, and I would highly recommend it to anyone looking for comprehensive support in their recovery journey.			
Name	Areeba Mirza	Signature	

Table 12 User Review 2

User# 2 Review : Comprehensive Support for Recovery			
As someone who has been through multiple recovery programs, I found the Recovery Road App to be a comprehensive and reliable resource. The educational materials were both informative and easy to understand, helping me stay motivated. The telehealth feature allowed me to connect with professionals effortlessly, which was a significant plus. The ability to track daily activities and maintain a recovery streak added an extra layer of accountability. The app's features worked seamlessly, and I had a smooth experience throughout. This app is an essential tool for anyone serious about their recovery.			
Name	Zehra Batool	Signature	

Table 13 User Review 3

User# 3 Review : Excellent Resource with Personalized Care			
The Recovery Road App offers excellent value with its range of features tailored for addiction recovery. I was impressed by the personalized recovery plans, which were created based on my profile and needs. The synchronization of data across devices ensured that I could track my progress from anywhere. The app's design is user-friendly, and the inclusion of forums and group access provided a sense of community, which is crucial during recovery. Overall, the app delivered on its promises and proved to be a valuable resource for maintaining long-term recovery.			
Name	Faizan Qureshi	Signature	

Chapter 8

Result and Discussion

The Recovery Road app was thoroughly tested to ensure that it meets the specified functional and non-functional requirements. The app's features, such as streak tracking, relapse monitoring, taper scheduling, and AI chatbot support, have proven to be effective tools in assisting users with their recovery journey.

Evaluation of Key Features:

Case 1. Streak Tracking: As shown in the screenshots, the streak tracking feature effectively displays the user's progress, with a clear visual representation of days completed and streaks maintained. This feature is critical in motivating users to stay on track with their recovery plan.

Figure 33 Streak Tracking

Case 2. Taper Results and Chart: The taper results and chart functionality provide a detailed overview of the user's dosage reduction plan. The app's ability to track and visualize the tapering process helps users follow a structured plan, reducing their dependency gradually and effectively.

Figure 34 Taper Chart

Case 3. Relapse Monitoring: The relapse feature offers insightful data on how often the user has relapsed, enabling them to understand patterns in their behavior. By visualizing both recent and past relapses, users can gain better control over their recovery process

Figure 35 Report Output

Case 4. AI Chatbot Support: One of the standout features of the app is the AI-driven chatbot, which offers users instant, personalized support throughout their recovery. The AI chatbot is designed to provide motivational messages, coping strategies, and answers to common questions, making it an invaluable resource for users at any time of day. By offering 24/7 support, the AI chatbot ensures that users are never alone in their journey, providing timely interventions that can prevent relapses and promote long-term recovery.

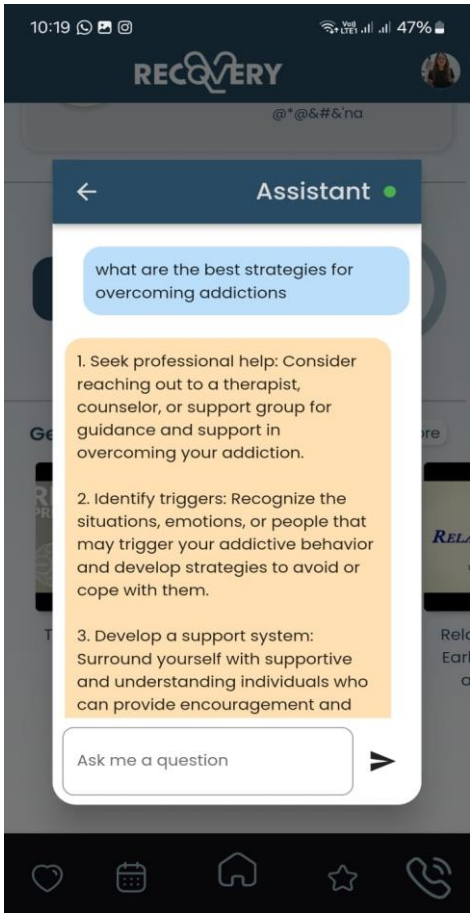
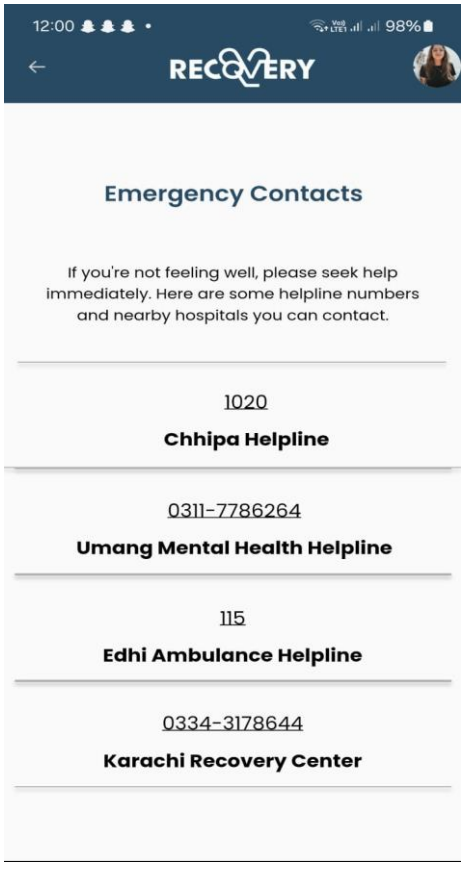


Figure 36 AI Chatbot

Case 5. Emergency Contact and Support: Although not directly visible in the screenshots, the app includes essential features like emergency contact buttons and support options. This ensures that users can access help immediately when required, enhancing the app's safety and reliability.



Case 6. Telehealth and Helpline Services: The app integrates telehealth services and a helpline, ensuring that users can access professional assistance whenever needed. These features provide users with immediate access to healthcare professionals who can offer advice, counseling, and emergency support. The inclusion of telehealth services ensures that users receive comprehensive care, bridging the gap between self-help and professional intervention.

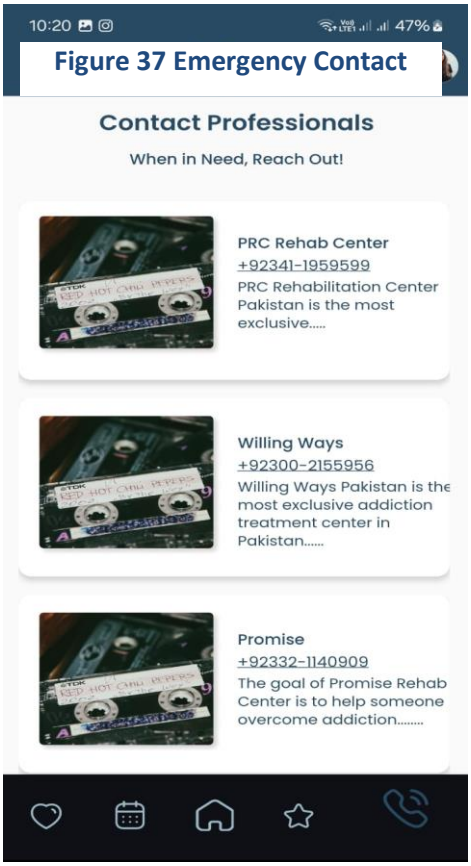


Figure 37 Emergency Contact

Figure 38 Telehealth

Case 7. Informational Resources: The informational resources section of the app includes a variety of educational materials, such as podcasts, Articles, Forum and Groups that cover topics related to addiction recovery. The podcasts are designed to educate, inspire, and empower users by providing expert insights and personal stories. This feature enhances the user's knowledge and understanding of addiction, offering valuable perspectives that can aid in their recovery journey.

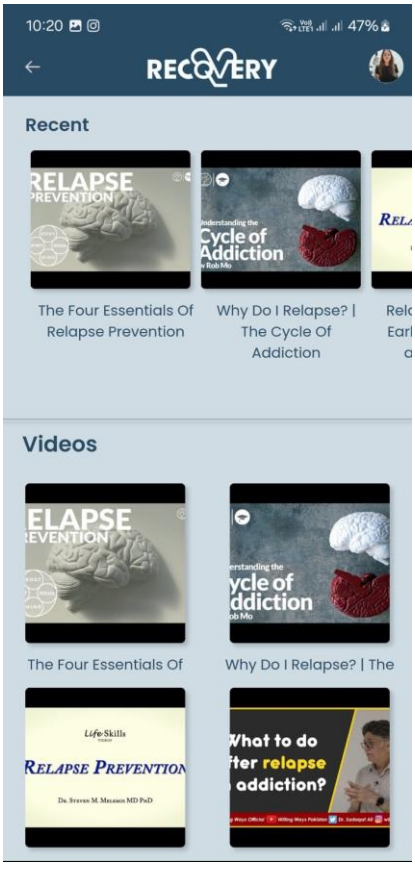


Figure 39 AI Podcast

Figure 40 Video

Case 8. Motivational Popups: To further encourage users, the app features motivational popups that appear every hour. These popups deliver positive messages and reminders that change each time, keeping the user engaged and motivated throughout their recovery journey. The dynamic nature of these popups ensures that the user receives continuous inspiration and support, reinforcing their commitment to sobriety.

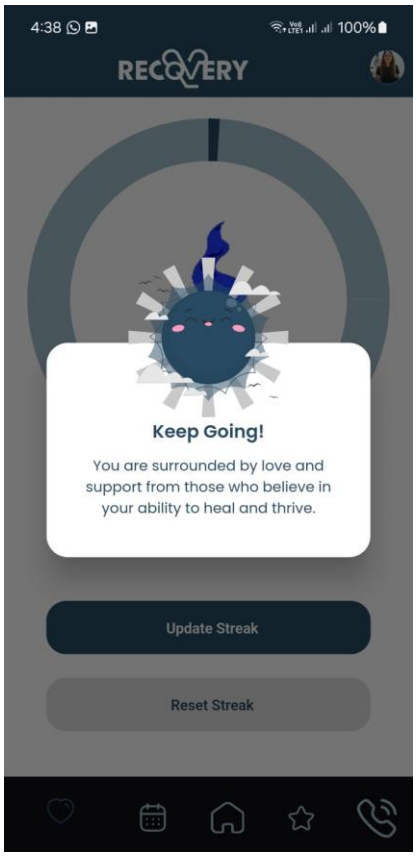


Figure 41 Motivational Pop-up 1

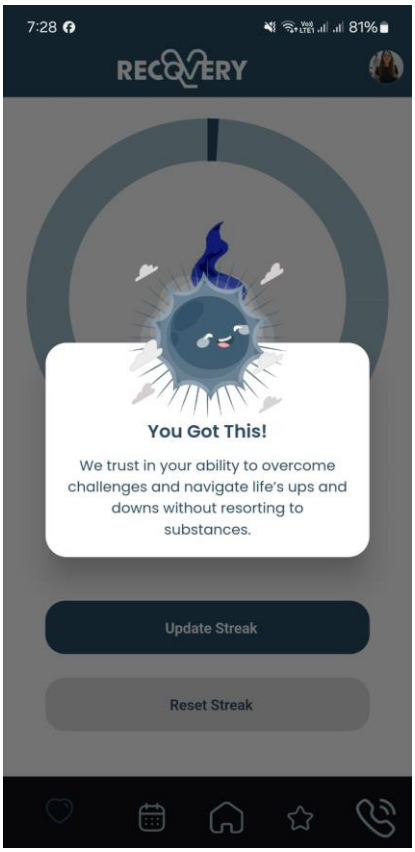


Figure 42 Motivational Pop-up 2

Discussion:

The results indicate that the Recovery Road app successfully combines functionality with user-centric design to deliver an effective and supportive recovery tool. The app's key features—streak tracking, relapse monitoring, taper scheduling, AI chatbot support, telehealth services, informational resources, and motivational popups—work together to provide a comprehensive and holistic recovery experience.

The AI chatbot and telehealth services extend the app's capabilities beyond standard self-help tools by offering personalized, real-time support and access to professional care. The inclusion of educational podcasts and dynamic motivational popups further enriches the user's experience, providing a well-rounded approach to recovery that addresses both the mental and emotional aspects of overcoming addiction.

In conclusion, the Recovery Road app has proven to be a robust and reliable companion for individuals striving to achieve and maintain sobriety. Its combination of innovative technology, accessible resources, and continuous motivational support positions it as a valuable tool in the field of addiction recovery.

Chapter 9

Conclusion and Future Work

9.1 Conclusion

The Recovery Road App was developed to address the significant challenge of providing comprehensive support for individuals undergoing addiction recovery. The problem statement outlined in the introduction highlighted the need for a digital solution that could offer personalized recovery plans, continuous emotional support, and accessible educational resources. The Recovery Road App has successfully met these needs by integrating a range of features, including AI-driven chatbots, telehealth services, and a community support system, all designed to assist users throughout their recovery journey.

Throughout the development process, the app underwent rigorous testing to ensure it met the desired objectives. Unit testing and integration testing were conducted to verify the functionality of individual components and their interaction within the system. User acceptance testing (UAT) played a crucial role in validating that the app not only functioned as intended but also provided a user-friendly experience that was well-received by those in recovery. The high pass rate of test cases, coupled with positive user feedback, provided compelling evidence that the Recovery Road App effectively addresses the issues identified in the problem statement. By combining innovative technology with user-centered design, the app has proven to be a reliable and impactful tool in supporting addiction recovery, making a meaningful difference in the lives of its users.

9.2 Future Work

1. **Integration of Advanced AI Features**
    - Enhance personalized and adaptive recovery plans using real-time data analysis.
2. **Expansion of Telehealth Services**
    - Broaden telehealth capabilities to include specialized counselling and support for various addiction types.
3. **Incorporation of Gamification Elements**
    - Introduce gamification features to increase user engagement and motivation.
4. **Partnerships with Healthcare Providers**
    - Explore collaborations with healthcare organizations to extend the app's reach and impact within the healthcare ecosystem.

5. **Enhanced Data Analytics**

- Develop more sophisticated data analytics to track and predict user progress, providing deeper insights for users and healthcare providers.

References:

[1] "I Am Sober - Apps on Google Play," *play.google.com*. https://play.google.com/store/apps/details?id=com.thehungrywasp.iamsober

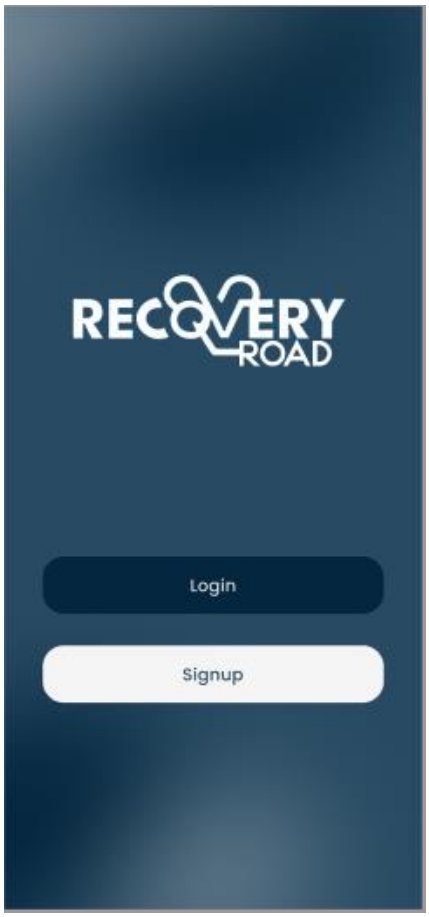
[2] Fewlaps, "QuitNow: Quit smoking for good," *Google.com*, 2021. https://play.google.com/store/apps/details?id=com.EAGINsoftware.dejaloYa (accessed Aug. 21, 2024).

[3] despDev, "Quit Tracker: Stop Smoking," *Google.com*, 2021. https://play.google.com/store/apps/details?id=com.despdev.quitsmoking (accessed Aug. 21, 2024).

Appendices

Appendix 1: User Manual

1. **Account Setup**
    - **Sign Up:** If you don't have an account, click the "Sign Up" button.
    - **Login:** If you already have an account, click on the "Login" button



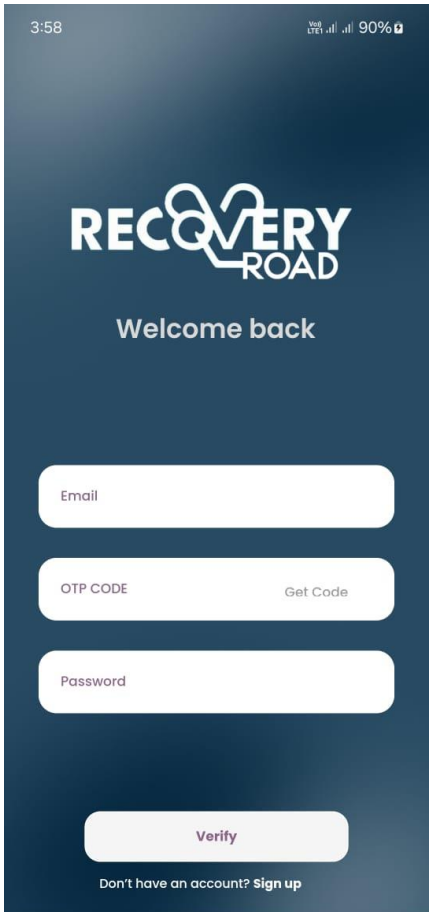
2. **Sign Up**
    - **Enter Details:** Fill in your first name, last name, email, phone number, and create a password.
    - **Verify Email:** You will receive a confirmation email.
    - **Create Account:** Once confirm, your account will be created, and you can proceed to the login screen.

3. **Login**

   - **Enter Details:** Input your registered email and password.
   - **Access Profile:** Upon successful login, you will be redirected to the profile setup screen.

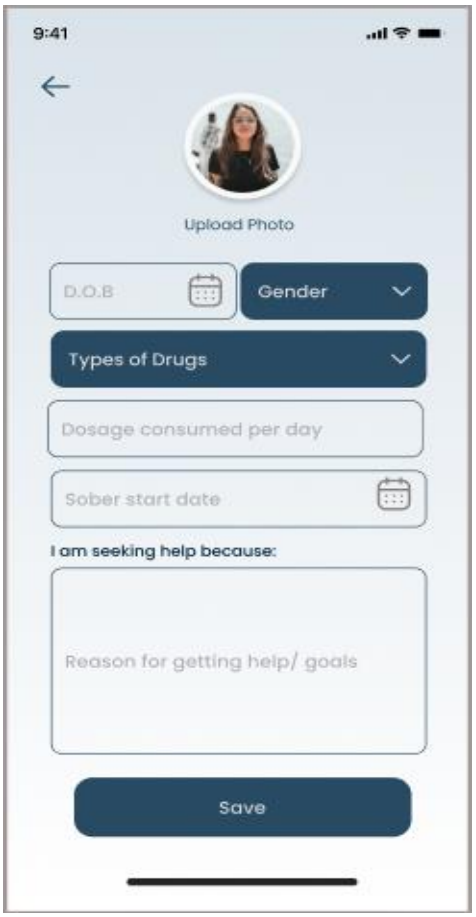
4. **Forgot Password**

   - **Enter Email:** Provide your registered email address.
   - **Reset Password:** You will receive an OTP via email. Enter the OTP and set a new password.
   - **Login:** Use your new password to log in.



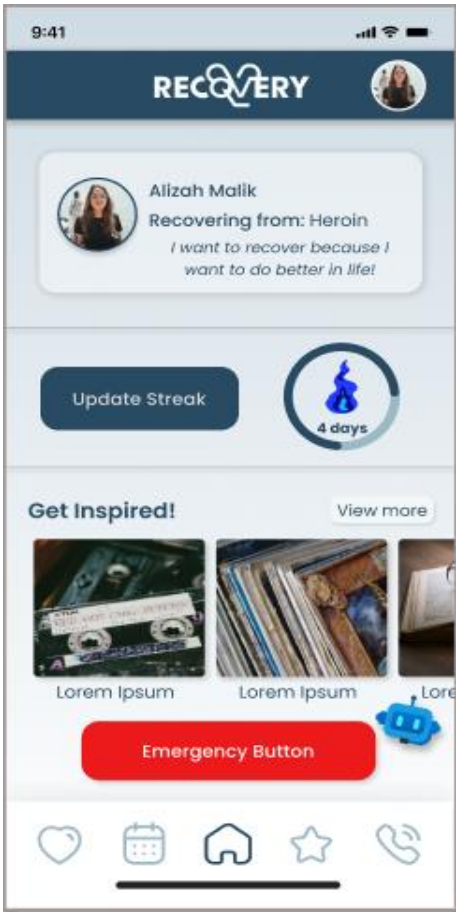
5. **Profile Customization**

- **Profile Setup:** After logging in for the first time, you will be prompted to set up your profile.
- **Add Details:** Upload a profile image, enter your date of birth, gender, types of substances you are recovering from, dosage consumed per day, and your sober start date.
- **Save Profile:** After filling in the details, click "Save" to complete the setup. You will be redirected to the home page.



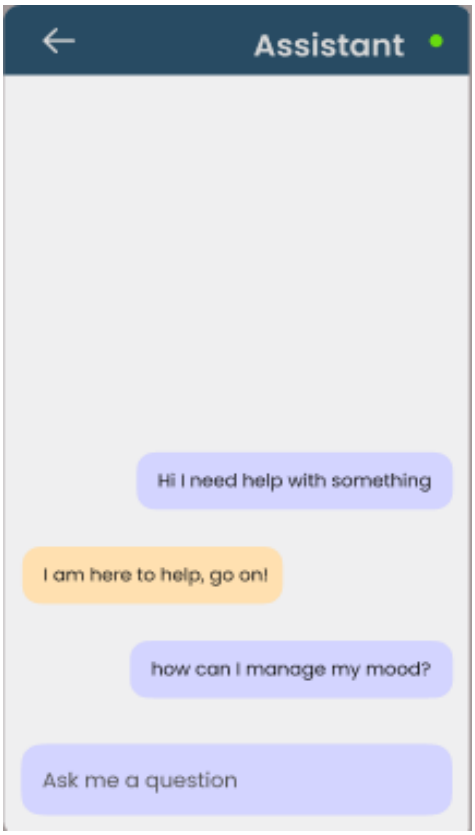
6. **Navigating the Home Page**

- **Home Page Overview:** From the Home Page, you can access all the main features of the app.
- **Profile Update:** Update your profile information by clicking on the profile icon.
- **Emergency Button:** Access the emergency button to quickly connect with helplines.
- **AI Chatbot:** Interact with the AI Chatbot to get support and answers to your queries related to your recovery journey.
- **Taper Schedule:** View and manage your personalized taper chart to track dosage reduction.
- **Streak Management:** Monitor and update your streak
- **Informational Resources:** Access podcasts, articles, forums, and support groups for additional guidance and community engagement.
- **Telehealth:** Explore rehab centers, call them directly, and schedule appointments if needed.



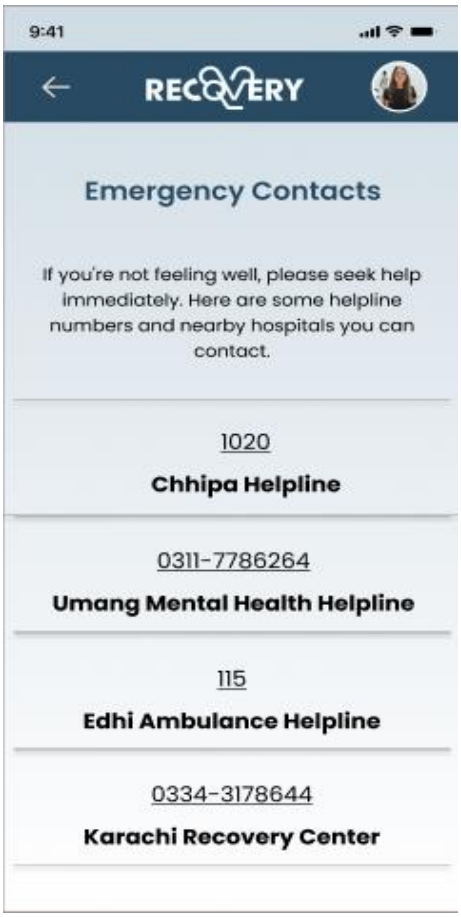
7. **Using the AI Chatbot**

- **Access AI Chatbot:** From the Home Page, click on the chatbot icon to open the chat interface.
- **Interact:** Type in any queries or concerns, and the AI-driven chatbot will provide relevant guidance and support.



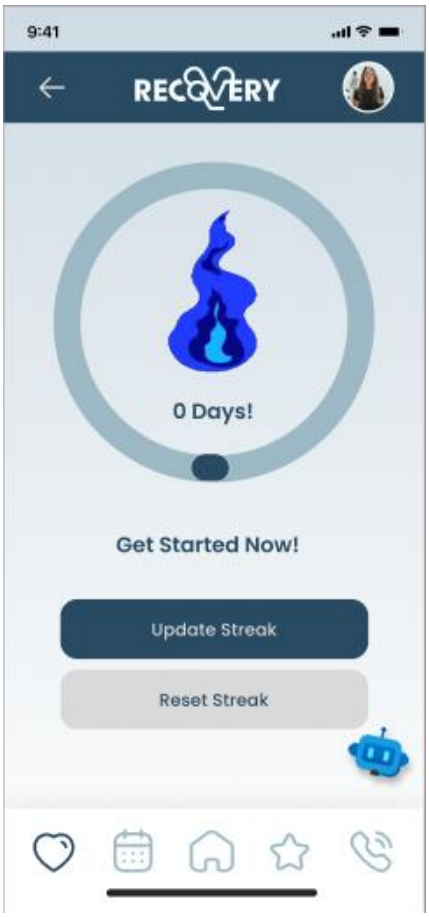
8. **Emergency Button**

- **Access Emergency Button:** From the Home Page, click on the emergency button.
- **Select Helpline:** Choose an emergency contact from the list of helplines provided.
- **Call Helpline:** Click on the number, and the app will redirect you to your phone's dialer to make the call.



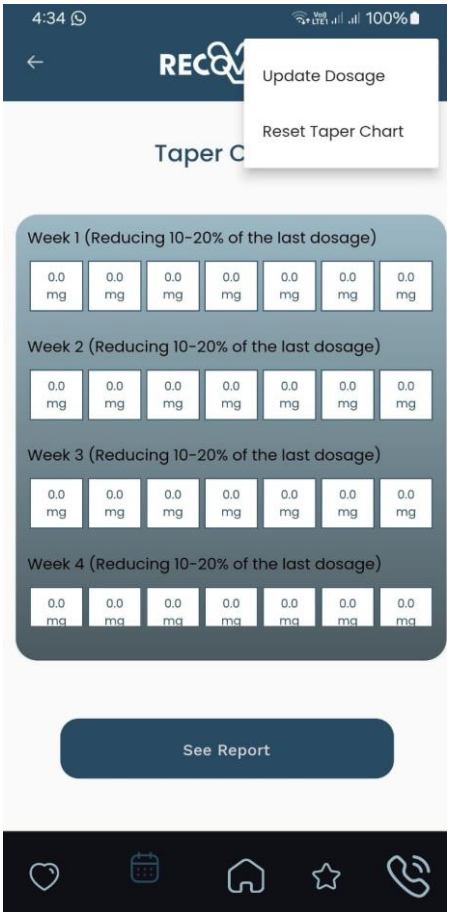
9. Streak Management

- **Streak Overview:** Track the duration of your sobriety on the Streak Management page.
- **Update Streak:** Press the "Update Streak" button to log your progress. Note that the streak can only be updated once every 24 hours.
- **Reset Streak:** If necessary, you can reset your streak by pressing the "Reset" button.



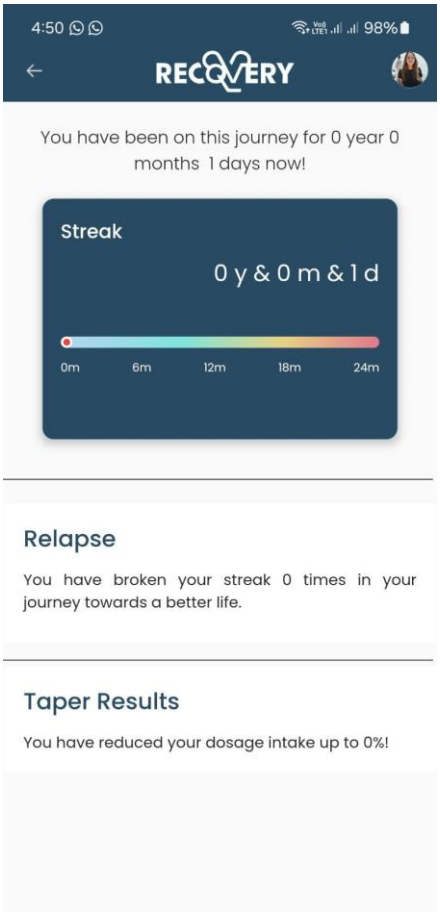
10. Taper Schedule

- **View Taper Chart**: The Taper Schedule page displays your personalized taper chart, showing your dosage reduction plan.
- **Update Dosage**: To modify your current dosage, click on the profile option and select "Update Dosage."
- **Reset Taper Chart**: If you need to start your tapering process over, click on the profile option and select "Reset Taper Chart."
- **Report**: Click on "See Report" to view a detailed analysis of your taper progress.



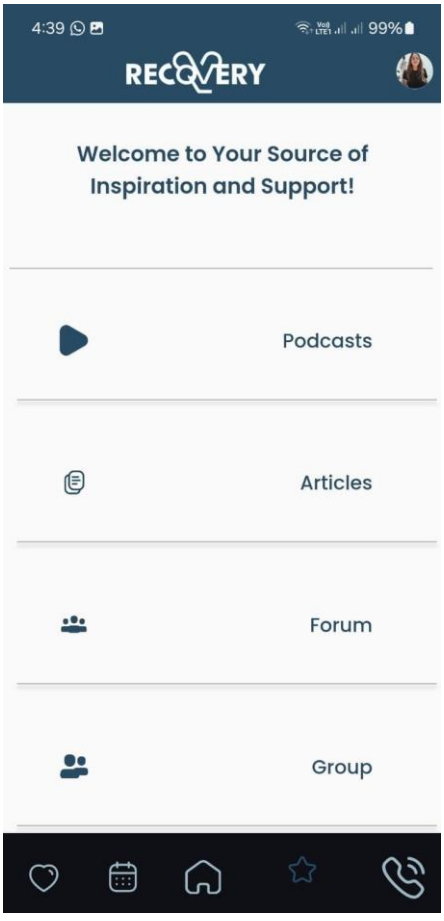
11. Report Generation

- **Generate Reports:** View detailed reports on your progress, including streaks, relapses, and taper results. This data helps you and your healthcare provider assess your recovery progress.

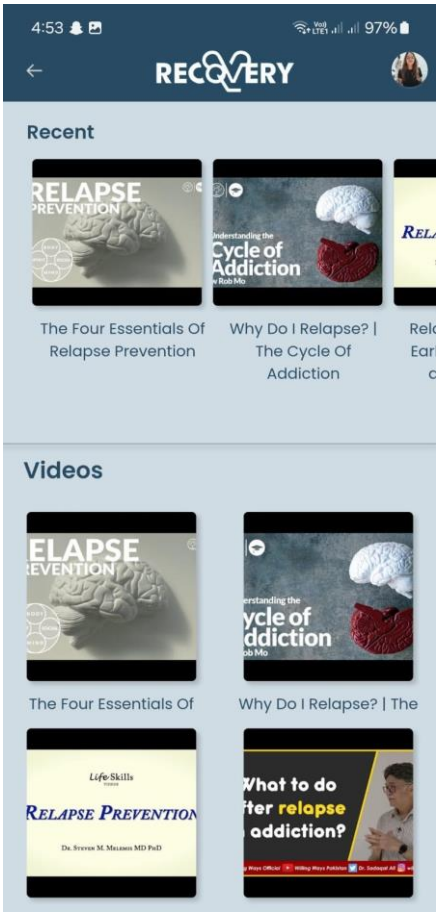


12. Informational Resources

- The Informational Resources section includes Podcasts, Articles, Forums, and Groups.



- **Podcasts:** When you click on "Podcasts," a new page will open where multiple videos related to recovery are available for streaming.

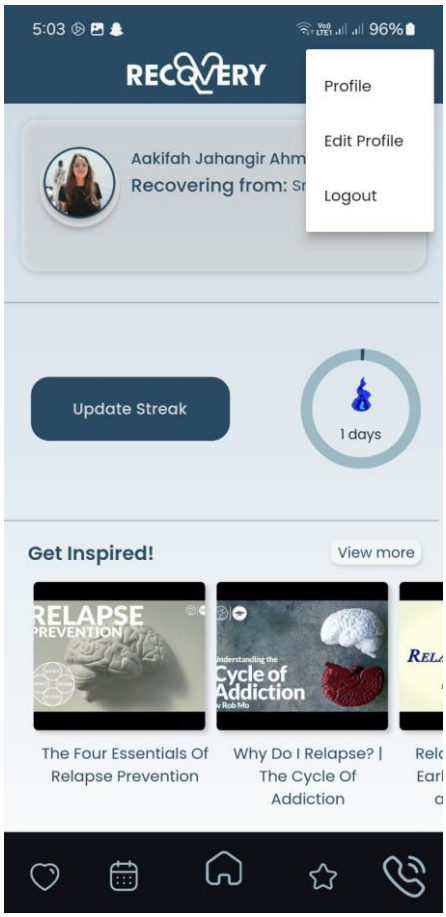


- **Articles:** Clicking on "Articles" will open a new page containing various links to informative articles about addiction recovery.
- **Forums:** When you select "Forums," a separate page will open with links to different discussion forums where you can engage with the recovery community.
- **Groups:** By clicking on "Groups," you'll be directed to a new page with links to support groups where you can connect with others in your journey.

13. Accessing Telehealth Services

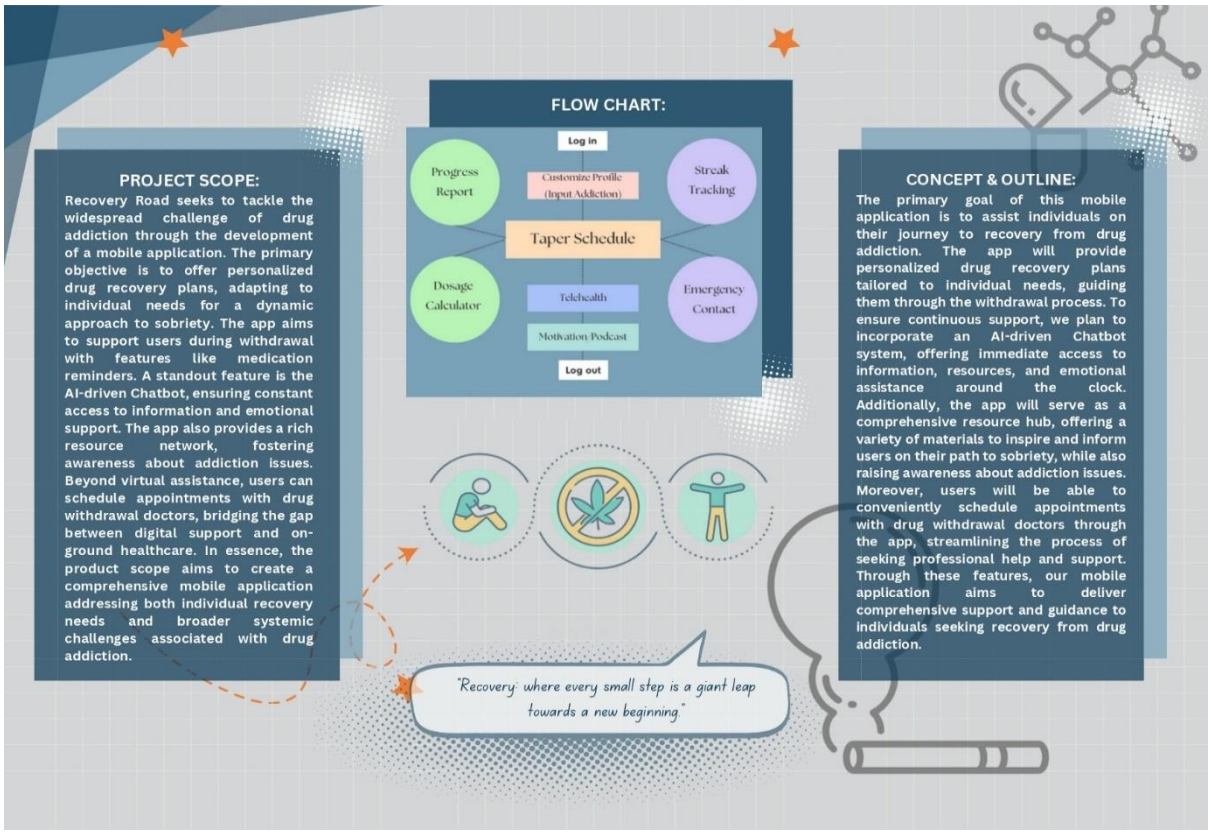
- **Telehealth**: Access telehealth services by clicking on the "Telehealth" icon on the dashboard.
- **Schedule Appointments**: Book appointments with healthcare professionals directly through the app.
- **Helpline**: Use the helpline feature to get immediate assistance when needed.

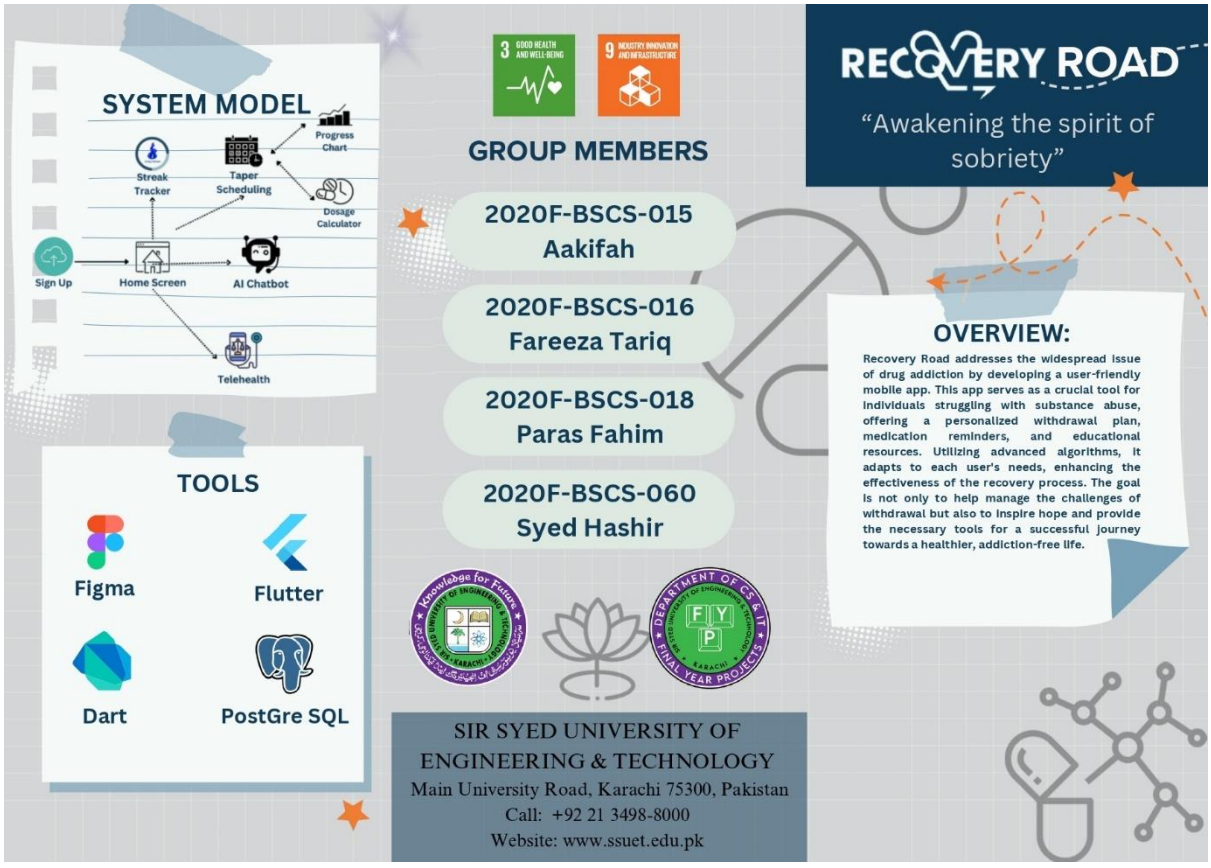
14. **Profile Settings:** Update your profile information, including your password, email, and personal details.
15. **Logout:** To log out of the app, click on your profile icon and select "Logout."



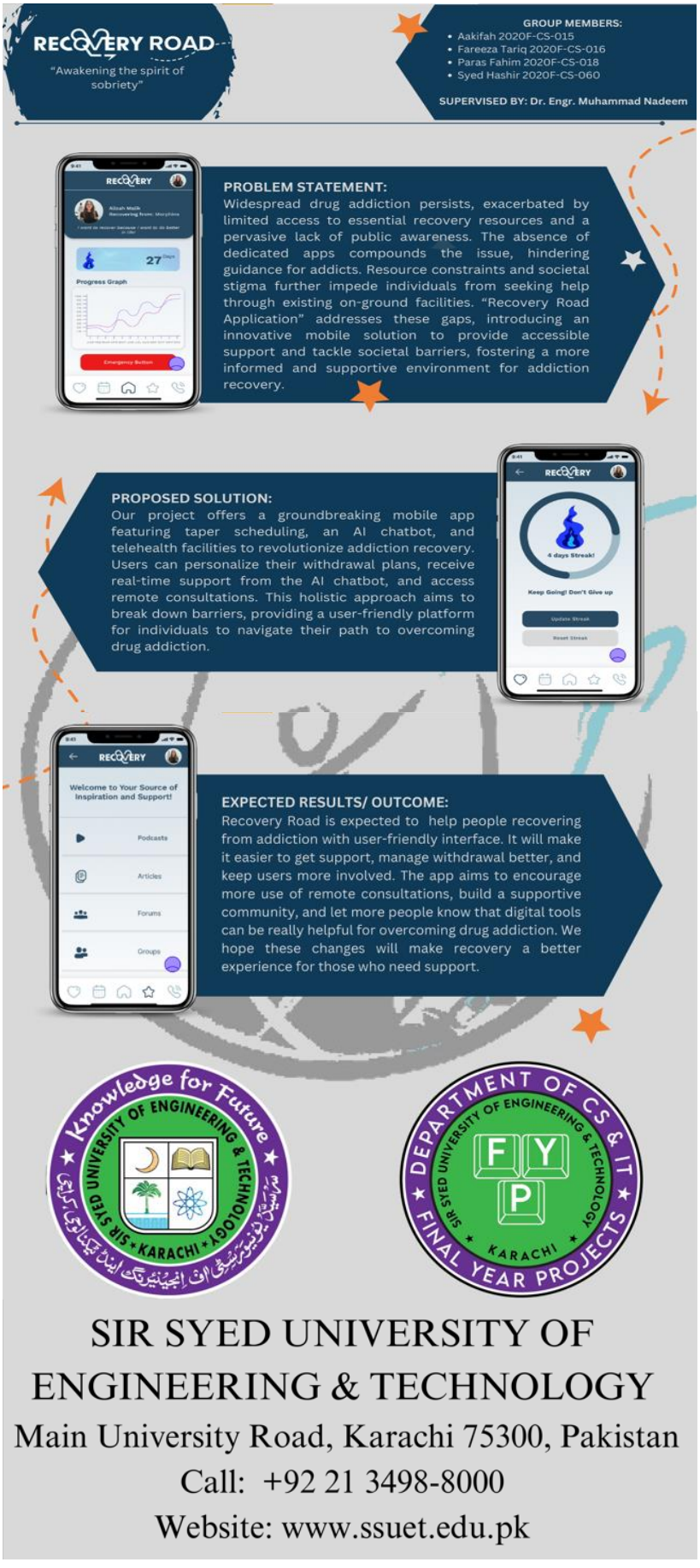
Appendix 2: Wall Poster

Appendix 3: Boucher

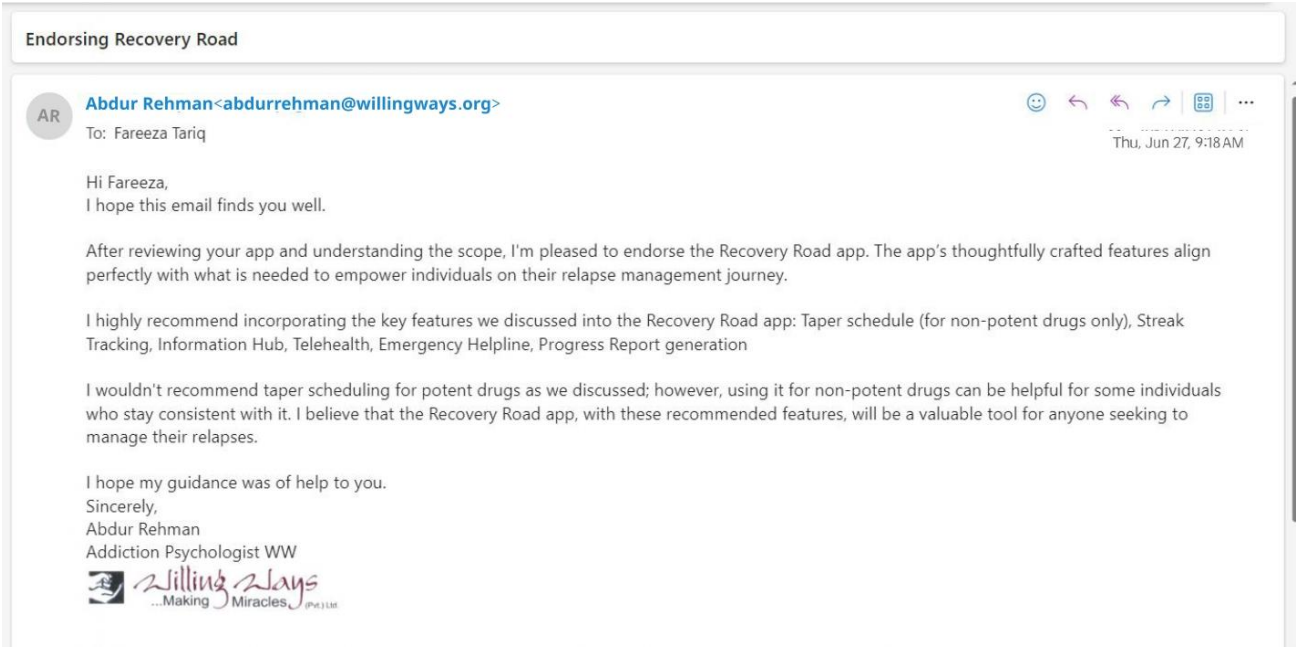




Appendix 4: Standee



Appendix 5: Research Paper / Publication / Publication acceptance letter



Endorsing Recovery Road

AR **Abdur Rehman<abdurrehman@willingways.org>**

To: Fareeza Tariq

Thu, Jun 27, 9:18 AM

Hi Fareeza,
I hope this email finds you well.

After reviewing your app and understanding the scope, I'm pleased to endorse the Recovery Road app. The app's thoughtfully crafted features align perfectly with what is needed to empower individuals on their relapse management journey.

I highly recommend incorporating the key features we discussed into the Recovery Road app: Taper schedule (for non-potent drugs only), Streak Tracking, Information Hub, Telehealth, Emergency Helpline, Progress Report generation

I wouldn't recommend taper scheduling for potent drugs as we discussed; however, using it for non-potent drugs can be helpful for some individuals who stay consistent with it. I believe that the Recovery Road app, with these recommended features, will be a valuable tool for anyone seeking to manage their relapses.

I hope my guidance was of help to you.
Sincerely,
Abdur Rehman
Addiction Psychologist WW
Willing Ways ...Making Miracles (Pvt.) Ltd.

Invitation to FICS First Stage 2 Event at NUST Islamabad Campus

F

FICS<reg.fics24@gmail.com>

To: Huma Anwar Ahmed; humaahmed688@gmail.com; **+39 others** Tue 4/9/2024 7:46 AM

Cc: Manager CAC <managercac@ric.nust.edu.pk>; daniyalbaig80@gmail.com; **+31 others**

CAC-FICS'24 Stage 2 Present...
130 KB

Dear Team Lead,

I hope this email finds you well. Firstly, I would like to extend my heartfelt congratulations to your team for successfully making it to the second stage of FICS First. Your hard work, dedication, and exceptional performance have earned you this well-deserved spot, and we are thrilled to have you continue in the competition.

I am writing to inform you that the Stage 2 event of FICS First will take place on April 30th, 2024 , at the NUST Islamabad campus.

This promises to be an exciting and challenging phase of the competition, and we are looking forward to seeing your team showcase their skills and expertise.

Additionally, I would like to provide some specific information for teams from UCP, SSUET, NBC, and PNEC. The dates for your respective Stage 2 events will be held in May, the exact date will be communicated to you shortly.

Rest assured, we are working diligently to ensure that you have ample time to prepare and participate effectively.

Please mark your calendars for the Stage 2 event on April 30th, 2024, and stay tuned for further updates regarding the schedule and logistics. If you have any questions or concerns in the meantime, please do not hesitate to reach out to us.

Once again, congratulations on your achievement, and we wish you the best of luck for Stage 2!

Warm regards,
Team Registrations
reg.fics24@gmail.com

PAGE FOR REMARKS / COMMENTS

PAGE FOR REMARKS / COMMENTS