

**ENHANCING MEDICATION REMINDER MOBILE APPLICATION
CONCEPT DESIGN BASED ON USER-CENTRED PRINCIPLE**

A Project Report
SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE
OF

MASTER OF DESIGN
IN
VISUAL COMMUNICATION

Submitted by:

ANANYA ROY
(2K22/MDVC/11)

Under the supervision of
PROF.RANGANATHM.SINGARI,SUPERVISOR
MS. MONICA SINGH,JOINT SUPERVISOR



DEPARTMENT OF DESIGN
DELHI TECHNOLOGICAL UNIVERSITY
(Formerly Delhi College of Engineering)
Bawana Road, Delhi - 110042

DEPARTMENT OF DESIGN
DELHI TECHNOLOGICAL UNIVERSITY
(Formerly Delhi College of Engineering)
Bawana Road, Delhi – 110042

DECLARATION

I hereby declare that the work presented in this report titled "Enhancing Medication Reminder Mobile Application Concept Design Based On User-Centred Principle" submitted as part of the requirements for the award of the Master Of Design degree in Visual Communication at Delhi Technological University, New Delhi, is an authentic record of my own work carried out during my degree under the supervision of Prof. Ranganath M. Singari.

I have not submitted the work described in this report for the granting of any other degree or certificate.

Date: 30th May, 2024

Place: Delhi

Ananya Roy
(2K22/MDVC/11)

DEPARTMENT OF DESIGN
DELHI TECHNOLOGICAL UNIVERSITY
(Formerly Delhi College of Engineering)
Bawana Road, Delhi – 110042

CERTIFICATE

This is to confirm that Ananya Roy, Roll No: 2K22/MDVC/11 has successfully completed the project titled " Enhancing Medication Reminder Mobile Application Concept Design Based On User-Centred Principle" under my supervision as part of the Master Of Design degree in Visual Communication at Delhi Technological University. To the best of my knowledge this work has not been submitted in part or full for any Degree to this University or elsewhere.

Date: 30th May, 2024
Place: Delhi

Prof. Ranganath M. Singari
SUPERVISOR
Department of Design
Delhi Technological University

DEPARTMENT OF DESIGN
DELHI TECHNOLOGICAL UNIVERSITY
(Formerly Delhi College of Engineering)
Bawana Road, Delhi – 110042

ACKNOWLEDGEMENT

First, I would like to thank the Almighty, who has always guided me to follow the right path of the life. My greatest thanks are to my parents who bestowed the ability and strength in me to complete this work. My thanks are addressed to my supervisor Prof. Ranganath M. Singari, also Ms. Monica Singh, joint supervisor whose guidance, support and valuable insights were instrumental throughout the entire duration of this project. Their expertise and encouragement have been invaluable in shaping this thesis and enhancing my understanding of the subject matter. Their belief in me has been a constant source of motivation, and I am deeply grateful for their love and encouragement. Last but not least, I would like to express my heartfelt appreciation to all the individuals, institutions, and resources that have directly or indirectly contributed to this thesis project. Thank you all for being part of this journey and for your invaluable contributions.

Date: 30th May, 2024
Place: Delhi

Ananya Roy

ABSTRACT

Medication non-adherence remains a pervasive issue in healthcare, leading to sub-optimal treatment outcomes and increased healthcare costs. Mobile reminder applications offer a convenient and accessible solution to address this challenge by providing timely alerts and personalized medication management features. This abstract provides an overview of the efficacy and user experience of medication reminder apps in improving adherence. Medication reminder apps represent a promising approach to addressing medication non-adherence, offering a user-friendly and accessible solution to improve treatment adherence and ultimately enhance patient outcomes. Continued efforts to refine app features and engage users are crucial for maximizing their impact in clinical practice. Preliminary analysis indicates that medication reminder apps significantly enhance adherence rates across various patient populations and therapeutic regimens. Customizable reminder settings, medication tracking functionalities, and integration with electronic health records are identified as key factors contributing to app effectiveness. Moreover, user satisfaction with these apps is generally high, with positive feedback regarding ease of use, reliability, and perceived benefits. However, challenges such as user engagement sustainability and app fatigue are recognized, necessitating continuous app optimization and innovative engagement strategies. Future research should explore the long-term impact of medication reminder apps on clinical outcomes and cost-effectiveness, as well as the integration of behavioural interventions to further enhance adherence behaviour. In conclusion, medication reminder apps represent a valuable tool in promoting medication adherence and improving health outcomes. However, further research is warranted to optimize their design and implementation strategies for maximal impact in clinical practice.

TABLE OF CONTENTS

Candidate's Declaration	1
Certificate	2
Acknowledgement	3
Abstract	4
Contents	5-8
List of Figures	9
CHAPTER 1 INTRODUCTION	10
CHAPTER 2 LITERATURE REVIEW	11-12
CHAPTER 3 METHODOLOGY	13-15
3.1 Methods	14
3.2 Principal elements of the system proposed	15
CHAPTER 4 SECONDARY RESEARCH	16-18
4.1 Research and Define Goals	16
4.2 Metrics for Evaluation	16-17
4.3 Problem Statement	17-18
4.3.1 Medication Schedule Complexity	18
4.3.2 Inconsistent Compliance with Medication	18
4.3.3 Restricted Usability in Current Apps	18

4.3.4 Insufficient Access to Information about Medication	18
4.4 Possible Solution	18
4.5 Hypothesis Statement	18-19
4.5.1 Assumptions	18
4.5.2 Simple User Interface and Personalization	19
4.5.3 Intelligent Notifications and Reminders	19
4.5.4 Detailed Information about Medication	19
4.5.5 Connectivity and Integration	19
4.5.6 Assistance and Instruction	19
4.6 Scope Of Work	19-20
4.6.1 Research and Analysis	20
4.6.2 User Flows and Wire framing	20
4.6.3 UI Design	20
4.6.4 UX Design	20
4.6.5 Feature Set	20
4.6.6 Prototyping and Testing	20
4.6.7 Documentation	20
4.6.8 Maintenance and Updates	20
4.7 Empathize Phase	20-22
4.7.1 Interview Questions	20-21

4.7.2 Online/Offline Survey	21-22
CHAPTER 5 Result and Discussion	23-26
5.1 Survey Result	23
5.2 Define Phase	24
5.3 Findings from an Interview	25-26
CHAPTER 6 DESIGN PROCESS	27
6.1 Target Audience	27
6.2 My Role	28
6.3 Design Thinking Process	28
6.3.1 Empathize	28-29
6.3.2 Define	29
6.3.3 Ideate	29
6.3.4 Prototype	29
6.3.5 Test	29
6.3.6 Implement	29
6.4 Timeline	30
6.5 Paper Wireframes	31
6.6 High Fidelity Paper Wireframes	32
6.7 Competitive Analysis	32
6.8 Style Guide	33-35

6.9 Visual Design	35-48
6.10 All Screen	49
CHAPTER 7 Conclusion	50
REFERENCES	51-52

List of Figure

5.1 Survey Result	23
5.2 User Persona	24
5.3 Target Audience	27
5.4 My Role	29
5.5 Design Thinking Process	29
5.6 Timeline Chart	30
5.7 Paper Wireframes	31
5.8 High Fidelity Wireframes	32
5.9 Competitive Analysis Chart	32
5.10 Style Guide	33
5.11 Care	35
5.12 Sign In interface	36
5.13 Language Interface	37
5.14 Home Screen Interface	38
5.15 Image Adding Interface	40
5.16 Medicine Settings Interface	42
5.17 Medicine Settings Interface	42
5.18 Medicine Settings Interface	43
5.19 Medicine Settings Interface	43
5.20 Alarm Settings Interface	45
5.21 Location and Appointment Interface	47
5.22 All Interface	48
5.23 All Screens	49

CHAPTER 1

Introduction

All people fall within this category of patients, including educators, learners, workers, businesspeople, homemakers, and kids. We all lead frantic, busy lives. Life in the modern era is hectic, stressful, and full of tasks. Because people are susceptible to a wide range of illnesses, it is up to us to take care of our own health and fitness. If the patient stays at home, someone may be able to take care of him or her; but, when a patient travels or is not in the same state, family members may find it difficult to constantly remind them of their medication schedules.

We completely rely on devices, especially smart ones, in our technologically advanced and dependent lives. telephones. All people have smartphones these days. With this we get an options to use technology in a better way so that it can be made useful to us. And it plays an important role in our daily life and helps us staying healthy in many ways possible. The main problem is that patients forget to take their medicines on time. Also they forget to take the right medicines in right proportion. Medication adherence, which refers to the degree or extent to which a patient takes the perfect medication at the perfect time according to their doctor's prescription, has recently emerged as a serious issue because many studies have reported that non adherence may critically affect the patient, thereby raising medical costs. Medication non-adherence is a prevalent, intricate, and expensive issue that drains medical resources and results in subpar treatment.

Thus, I'm presenting an Android application that uses an alarm ringing mechanism to remind patients of their dosage timings so they won't forget and can continue to be healthy. patients can simply find doctors, hospitals, and contact information via this app, ensuring that patients receive the right care on time. This program is intended for those who frequently forget when to take their medications. Users are able to make a customizable alarm by recording options for various medicines at varying time intervals, along with the medicine's photo, date, time, and description.

When an alarm is set, the notification system will send a notification. The user has the option to accept or reject the notification.

Patients can look up doctors based on their conditions and geographic location, making it convenient for them to find the doctor's contact details, location, and hours of availability. Reminders for medications aid in reducing incorrect dosages and mistakes in medicine delivery.

This user-friendly tool has an excellent user interface and can save lives, money, and time.

CHAPTER 2

Literature Review

Numerous ideas and concepts have served as the foundation for the development of various medicine systems. Although the number of apps related to medications is increasing, there are numerous issues with their performance. A medicine reminder system called My Care is available to whosoever it may concern. It is compatible with mobile devices, including smartphones, and offers user interfaces for adhering to prescription schedules as well as alerts to remind users when and what kind of medication to take at specific times.

The current reminder systems have numerous flaws. To mention a few: They don't offer disease-specific doctor searches, voluntary notification that is only required, the ability to record voice alarms, or the ability to schedule doctor appointments.

They do not include any option to add photos of medicines that's why medicine photos will not be showed when alarm will be ringing. Without a doctor's prescription, the scheduled reminder automatically suggests any kind of medication, dosage, etc., which could be harmful to the patients. Finally, a lot of the systems that are available call for specialized hardware that must be bought.

According to a research conducted by the World Health Organization (WHO), many developed countries have an average adherence rate of 50% to long-term therapy for chronic illnesses. The percentages are significantly lower in undeveloped nations. A fundamental need for achieving successful health results is the proper compliance with recommended drug regimens. Reduced effectiveness of medication is one of the potential effects of poor adherence. Efficacy of therapies, decline in health conditions, lengthier recovery periods, more expenses, permanent health harm, hospitalization, and even death. Patients' drug adherence rates are notably poor, despite the serious implications[1][2][3].

Pillsy [4] and AdhereTech [5] are two examples of smart bottles that employ sensors to track medication intake and notify caregivers and users when a dose is missed. For the purpose of tracking intakes and sending medication reminders, app stores offer a variety of smartphone applications with various functions [6] [7]. According to a functionality analysis of 229 of the apps, as published in [8], many of them are deficient in crucial functions like rescheduling, images of medications, as well as data export. For instance, just 17% of the apps included the ability to postpone or reschedule a reminder. Additionally, researchers have created, developed, and assessed tracking and reminder apps for smartphones.

UbiMed [9] offers a solution that uses smartphone apps to track prescription medication for the elderly and disabled population and to send out reminders. As previously mentioned, there are some drawbacks to smartphone-based medication tracking and reminder systems. Certain constraints are revealed by a feasibility study [10]. Wedjat [11] is one such system that, in addition to offering medication reminder and tracking functions, informs users of possible drug-drug or drug-food interactions. Although Medsy is a less feature-rich application, it attempts to offer a medication remaindering mechanism. If the user is meant to take a drug three times a day then this application does not permit the alarm to be set appropriately. However, we have addressed this drawback in our work by enabling customers to create several alarms and notifications. [12]. Numerous platforms have seen the development of Medication Reminder Systems. For many of these systems to remind patients of the times for taking their medications, specific hardware items are needed. New hardware purchases become more expensive and require more time and resources. Thus, an effort has been made in the assigned job to put in place a system that is affordable, simple to use, and increases drug adherence. Health care systems bear a financial burden and a treatment's effectiveness is diminished by medication non-adherence [13] [14]. The patients will receive

an email or message notification system, a navigation system, an automatic alarm ringing system, and a schedule of medicine intake times along with a description of the medication and its start and end dates. Reminders can also be synchronized with smart watches using some smartphone apps [15]. Nevertheless, these systems only make use of the wrist device's tiny display and as a result are unable to offer comprehensive information about a reminder using just the wrist gadget. Furthermore, rescheduling the reminders is not supported by the wrist devices utilized in the current systems. A platform called SPARK [16] monitors Parkinson disease patients' symptoms by integrating wearable's and cellphones. Also most of the apps are one language based. There is no option to change language if patient wants. Some of the systems have a default alarm tone so the users cannot change them. Some of the apps have clumsy design. Some have many options which makes patient puzzle to use. Some designs of apps are hardly visible which makes problem for senior patients who have eye related problem. I have tried to fill this kind of gaps in my app.

CHAPTER 3

Methodology

This medicine reminder software for Android includes an automated alarm that will sound on schedule. The alarm system with the photo medicine is the main topic. Because they can set an alarm for when to take their medications, patients don't need to remember when to take them. Patients don't need to utilize any standard alarm apps that aren't tailored specifically for taking medication. Numerous medications and timings, such as the date, time, and description of the medication, can be programmed into the alarm.

There is a record option for setting alarm to set instant voice recording alarm by anyone/patients favorite persons voice whom he/she wants which will touch the patient differently to feel interest to take medicine. They will receive a notification via email or system message, preferably one that the patients select. It will offer a multilingual option so you can switch to the language that makes you feel most comfortable. Patients will receive the doctors' contact information based on their availability. In order to find the closest clinic or hospital, patients will track the position. Additionally, readers can view various articles about medical topics and health-related advice. The system prioritizes a user-friendly design and simple navigation. Additionally, this system emphasizes fewer, more user-friendly options. Large fonts are present and are plainly observable.

The interface emphasizes choices that are simple to comprehend. Many of these medical reminder systems have been created with the need for additional hardware, but in my work, I've tried to create a system that is affordable, efficient, and promotes medication adherence.

The study utilizes a mixed-methods approach, combining quantitative data from app usage analytics with qualitative feedback from user interviews. A selection of popular medicine reminder apps were analysed to compare different UI/UX features and their impact on user behaviour and satisfaction.

Designing a medicine reminder app involves several steps to ensure it's user-friendly, visually appealing, and effective in its purpose.

Methods

User Research: Understand your target users - their demographics, needs, preferences, and pain points related to medication management. Conduct surveys, interviews, or user testing to gather insights.

Define User Personas: Create personas representing different user segments based on your research. This helps in keeping the user at the center of your design decisions.

User Flows: Develop user flows to map out how users will navigate through the app to set up reminders, add medications, and receive notifications. Identify potential pain points and address them in the design.

Wire framing: Start with low-fidelity wireframes to sketch out the layout and basic functionalities of the app. Focus on the structure and placement of elements without delving into visual design details.

Prototyping: Create interactive prototypes using tools like Adobe XD, Sketch, or Figma. Prototyping helps in testing the flow and usability of the app before investing in full development.

Visual Design: Design the visual elements such as colour scheme, typography, icons, and imagery to create a visually appealing and intuitive interface. Ensure readability, accessibility, and consistency across the app.

Information Architecture: Organize the information hierarchy in a way that makes it easy for users to find and manage their medications. Use clear labels, categories, and navigation paths.

Feedback Mechanism: Implement feedback mechanisms such as ratings, reviews, or surveys within the app to gather user feedback continuously. This helps in identifying areas for improvement and enhancing user experience.

Accessibility: Ensure that the app is accessible to users with disabilities by following accessibility guidelines such as WCAG (Web Content Accessibility Guidelines). Consider factors like screen reader compatibility, colour contrast, and font size.

Usability Testing: Conduct usability testing with real users to evaluate the effectiveness and usability of the app. Observe how users interact with the app, identify usability issues, and iterate on the design based on feedback.

Iterative Design: Design is an iterative process, so be prepared to make adjustments and refinements based on user feedback and testing results. Continuously strive to improve the app's usability and user satisfaction.

Principal elements of the system proposed

Medication Reminder: The app's configurable medication plan allows users to choose their own dosages according to several instructions or a set schedule. By using these features, users can customize their prescription regimens to suit their individual needs and preferences. The gadget can be used for a wide range of pharmaceuticals, even if there are multiple drugs or complex dose instructions at different times of the day. Because of the configurable schedule, users are ensured to always take their doses on time. With its convenient and easy-to-use prescription planner, the device can help people manage their pharmaceutical habits and improve drug adherence. This may enhance general health and well-being.

Medication Finder: Users can learn about available medications by using this program. With its assistance, users can get important information about their prescription, including drug names, dosage recommendations, and usage. Through the tool's display of this vital information, consumers can easily and rapidly obtain important details about their prescription. Regardless of the accuracy of the analysis or the user's understanding of the treatment plan, users may rely on the device to provide clear and concise information. This feature increases drug safety and awareness and gives users full knowledge of their prescriptions and the ability to make informed treatment decisions.

Compliance History: Through careful recording of critical information such as administered doses, omitted doses, and delayed doses, the mobile application provides users with an

extensive overview of their medication compliance. Customers can track their compliance with the suggested timetable and gain valuable insights into their prescription habits with the aid of this application. Observing patterns or trends in the way they take their prescriptions might help users become more compliant and make informed decisions about their health. The compliance tracking component of the gadget is a helpful tool for promoting better professional communication and medication management, both of which enhance treatment outcomes overall and ensure a higher level of patient involvement in their healthcare experience.

Side Effect Checker: With just the medicine name, users can now retrieve an extensive list of possible adverse effects. This new feature is incredibly beneficial. This study addresses and documents serious adverse effects, minor ailments, and even problems resulting from the usage of specific medications. There is a spectrum of serious to more serious side effects. In addition, the description of the drug's ingredients and chemical composition helps the user understand it better. Because this characteristic has a significant impact on both doctors and patients, its significance goes beyond its apparent utility. When patients are fully informed about the potential side effects of the prescription medications they are taking, they are better equipped to make decisions about their health. These qualities assist patients become aware of their symptoms and practice self-care by preventing surprises.

CHAPTER 4 SECONDARY RESEARCH

Research and Define Goals:

Start by understanding the target audience. Who will be using this app? What are their age groups and habits?

Define the primary goal of the app: to remind users to take their medicine regularly and on time.

Create User Personas: Develop user personas based on your research. These personas represent the typical users of your app and help you keep their needs and preferences in mind during the design process.

Feature Prioritization: List down all the features you want in the app. Prioritize them based on their importance to the core functionality of the app. Remember to keep it simple and focused on the primary goal.

Wire framing: Start with low-fidelity wireframes to sketch out the basic layout and structure of the app. Focus on key screens such as the homepage, medicine input screen, reminder settings, and notifications.

Prototyping: Create interactive prototypes using tools like Adobe XD, Sketch, Figma, or In vision. This allows you to test the flow and usability of the app before moving into the final design phase.

Visual Design: Once you're satisfied with the prototype, start working on the visual design. Choose a colour scheme and typography that aligns with the app's purpose and target audience. Design icons, buttons, and other visual elements those are intuitive and easy to understand.

Accessibility: Ensure that the app is accessible to all users, including those with disabilities. Pay attention to factors like colour, contrast, font size, and screen reader compatibility.

Testing and Iteration: Real users should participate in usability testing to provide input on the functionality and design of the app. Use this feedback to make iterative improvements to the app, refining both the user experience and visual design. **Development Handoff:** Once the design is finalized, prepare design specifications and assets for handoff to the development team. Provide them with all the necessary resources to ensure the app is implemented accurately.

Metrics for Evaluation:

Medication Adherence Rate: Measure the percentage of users who consistently take their medications as prescribed after using the app compared to before.

User Engagement: Track metrics such as daily active users, session duration, and frequency of medication updates to assess user engagement with the app.

User Satisfaction: Gather feedback through surveys or user reviews to evaluate user satisfaction with the app's UI/UX design and features.

Retention Rate: Monitor the percentage of users who continue using the app over time to gauge long-term user retention.

Task Completion Time: Measure the time it takes for users to complete common tasks such as adding a new medication or setting up a reminder to assess the efficiency of the app's user interface.

Experiment Design: A/B Testing: Test variations of the app's UI design, navigation layout, or reminder frequency to determine which elements contribute most to medication adherence and user engagement.

Usability Testing: Hold user testing sessions to watch how users interact with the application and find any problems or areas of difficulty that require attention.

Iterative Design: To increase usability and efficacy, iterate the app's design continuously based on user feedback and testing outcomes.

Problem Statement

People usually forget to take their medicines on time and face problems tracking their intake habit. They sometimes take incorrect medicines due to lack of information or misjudgment. Neither do they have a proper listing of the medicines they are taking and when to consume them. Some people don't feel interest to take medicine for laziness or for nothing. They find it boring. They need any interesting thing to use the app, they need emotional or mental attachment with the app. Then some people find it difficult to learn new difficult apps. People need an easy way to remember to take their medicine without having to learn how to use complicated apps. And in Bengali language based area many people facing problems for using English based app for their language lacking's.

Medication Schedule Complexity:

Several drugs with different dosages and schedules can be difficult for users to remember. It becomes difficult and error-prone to remember which prescriptions to take when.

Inconsistent Compliance with Medication:

Reminding themselves to take their medications on time is a challenge for users who are prone to forgetting. Missed doses reduce the effectiveness of treatment and can worsen preexisting medical issues or cause new ones.

Restricted Usability in Current Apps:

Current medication reminder applications sometimes have confusing navigation and crowded user interfaces, which discourages users from utilizing them.

Users are unable to customize the app to meet their own medication management needs and preferences due to a lack of customization possibilities.

Insufficient Access to Information about Medication:

It is difficult for users to obtain complete drug information, such as dosage guidelines, possible adverse effects, and refill status.

Inadequate drug information might lead to unpleasant reactions or medication errors and makes it difficult to make well-informed decisions.

Possible Solution

Create a basic, easy-to-use app so that users don't forget their medicine schedules, can easily use the app, discover clinics near them and can be directed through the app by their loved ones if necessary. No need of many options. Complex words, signs, options won't be there. Only the vital signs will be there in big font which is easily visible, understandable and usable. Easy access to track and edit medication info and reminder. Create a Bengali language based app with customized alarm.

Hypothesis Statement

Assumptions:

Users will find a minimalist design visually appealing and less overwhelming, encouraging them to engage with the app regularly. Intuitive navigation and clear labelling will make it easy for users to add medications, set up reminders, and view their medication schedule.

Timely reminders via push notifications will prompt users to take their medications as prescribed, reducing the risk of missed doses.

Providing additional features such as medication information and refill reminders will enhance the overall user experience and encourage long-term usage of the app.

Accessible design elements will ensure that users with varying levels of technological proficiency and physical abilities can effectively use the app.

Our medication reminder app offers a complete solution that takes user experience and efficacy into consideration in order to address these issues:

Simple User Interface and Personalization:

We prioritize having a clear and intuitive user experience to provide easy navigation and little cognitive strain.

Customers can enjoy a more tailored experience by tailoring their prescription regimens to suit their own requirements, routines, and preferences.

Intelligent Notifications and Reminders:

Our app provides timely reminders when it's time to take your prescription, using intelligent reminders that adapt to users' routines and preferences.

To increase user engagement and adherence, contextual information such as drug names, dosages, and reasons to take is included in personalized reminders.

Detailed Information about Medication:

Users have access to an extensive database of medication information that includes dosage recommendations, side effects, interactions, and refill status. Detailed medication profiles help users make informed decisions about their treatment and help them better comprehend the medications they are prescribed.

Connectivity and Integration:

An vast database of prescription information is available to users, which includes advice on dose, interactions, adverse effects, and status of refills. In-depth drug profiles assist patients in understanding the prescription drugs they are prescribed and in making decisions regarding their course of care.

Assistance and Instruction:

To help customers efficiently manage their health, we also offer extra support resources like dosage tracking tools, medication adherence suggestions, and instructional materials.

Scope of Work

Research and Analysis: Understanding the target audience (age, medical needs, etc.). Analyzing competitors' apps to identify strengths, weaknesses, and opportunities for differentiation. Researching existing medication reminder apps to gather insights into best practices and common pitfalls.

User Flows and Wire framing: Creating user flows to map out the journey users will take within the app. Developing wireframes to outline the layout and structure of key screens, focusing on functionality rather than visual design.

UI Design: Creating the application's visual components, such as the font, colors, icons, and images. Putting together a unified design framework to guarantee uniformity on all screens. Creating user interfaces that are simple to use, navigate, and comprehend. Creating aesthetically pleasing layouts that provide key information and actions top priority.

UX Design: Ensuring that all users, including those with disabilities, can utilize the app. putting interaction design concepts into practice to create a responsive and interesting application. Checking for usability in order to find and fix any problems. Enhancing the app's speed and functionality to guarantee seamless loading and navigation.

Feature Set: Defining the core features of the app, such as medication scheduling, reminders, dosage tracking, and refill notifications. Considering additional features that could enhance the user experience, such as medication information lookup, integration with wearable devices, or family member notifications. Prioritizing features based on user needs and technical feasibility.

Prototyping and Testing: Creating interactive prototypes to test the functionality of the app and get input from stakeholders and consumers. Adjusting the design in response to user comments and testing outcomes. Conducting usability testing to identify areas for improvement and validate design decisions.

Documentation: Creating design documentation to communicate the design decisions, including style guides, design rationale, and specifications for developers. Collaborating with developers to ensure the design is implemented accurately and efficiently.

Maintenance and Updates: Providing ongoing support for the app, including bug fixes, performance improvements, and updates to accommodate changes in technology or user needs. Monitoring user feedback and analytics to identify opportunities for further optimization and enhancement.

Empathize Phase

Interview Questions

1. What is your general health like?
2. What is your daily/weekly/ monthly medicine schedule?
3. Do you prefer to take your medicine with water or particular drink/food?
4. Tell me about your medicine taking habits during the past week?
5. Do you miss the time of your medication?
6. What are the reasons for missing?
7. Tell me about the best time, worst time and recent time you took or missed your medicine.
8. What type of technology do you use?
9. What difficulty do you face while using the above method?
10. What is your current practice to get reminded of taking your medicines?
11. What struggles you face as a responsible person for others medication schedules?

12. Have you used a medication reminder app before?
13. Which apps have you used, and what do you like or dislike about them?
14. Upon opening the app, how would you describe your initial impressions of the design and layout?
15. Did you find it easy to locate and select your preferred language in the app? 16. How would you rate the clarity of language options provided?
17. How easy or difficult was it to add a new medication to the app?

Online/Offline Survey

I already know clearly about myself and also my family members habits and problems they are facing about taking medications. Then I have taken some offline survey here in Delhi like from our grand uncles I have taken some online survey by video call, audio call etc. which fell under the category of my user base.

Experience with Medication Reminder Apps: Have you used a medication reminder app before? If yes, which apps have you used, and what do you like or dislike about them?

Initial Impressions: Upon opening the app, how would you describe your initial impressions of the design and layout?

Language Options: Did you find it easy to locate and select your preferred language in the app? How would you rate the clarity of language options provided?

Adding Medications: How easy or difficult was it to add a new medication to the app? Were the fields for medication name, dosage, frequency, etc., clear and understandable?

Reminder Settings: Did you find it easy to customize reminder settings such as frequency and time? Were the options for customizing reminders intuitive and comprehensive?

Visual Design: How would you rate the visual design of the app overall? (Scale: 1-5) Were the colors, icons, and typography used in the app visually appealing and easy to understand?

Notification Experience: Did you receive notifications for medication reminders during the test? Were the notifications clear and easy to understand?

Accessibility: Did you encounter any accessibility issues while using the app? If yes, please specify the accessibility issues you faced.

Overall Satisfaction: On a scale of 1 to 10, how satisfied are you with the overall user experience of the app? What aspects of the app do you think could be improved to enhance the user experience?

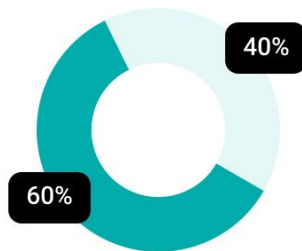
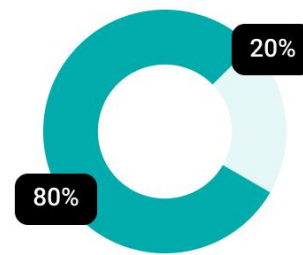
Additional Feedback: Do you have any additional comments or suggestions for improving the medication reminder app?

CHAPTER 5 Result and Discussion

● Survey Result

Do you forget to take your medicines on time?

■ Yes ■ No

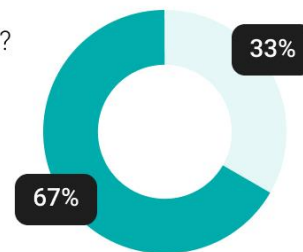


Do you forget the name of the medicines you have to take?

■ Yes ■ No

Do you face problems remembering how to take the medicine?
For ex : you have to take the medicine before or after lunch?

■ Yes ■ No



5.1 Survey Result

Define Phase

● User Persona

I reached out to my grandmother to understand her needs mostly in an informal conversation as she is always willing to share her thoughts with me. From my childhood I know her well. And last 15 years she is living on medicine. I know about her all problems and medications clearly. Day by day she is getting older. She can't remember much now. I have seen she is facing many problems about medication for last 3 years. Still we talked on Google Meet so I can grasp more of her response as I could not be with her in person nowadays.

My questions were mostly about her habits and what she would want in an app like I am going to design. I also send her few prototypes to see how she is interacting with them.



Shanti Roy

Age 80
Status Married
Occupation House wife

Goals

- Take my medications on time with proper dose.
- Stay healthy and well by following prescription properly. Want the devices or apps to be simple to use.

Frustrations

- Forgets to take medicines on time.
- Sometimes take wrong medicine due to confusion.
- There are so many medicines to take therefore loose count or leave out some medicine.
- Sometimes forgets the dose of the medicine.
- Don't feel that attachment with helping hand.
- Missing me when to take medicine.



Shankar Sarker

Age 60
Status Married
Occupation Retired Bank Manager

Goals

- Want to set the details of medication and alarm system by himself, without his daughters help.
- He doesn't want to disturb anyone always for his medication.
- Needs an easy to use app.

Frustrations

- Forgets to take medicines on time.
- Sometimes take wrong medicine due to confusion.
- Sometimes forgets the dose of the medicine.
- The app, he is using is very difficult to use. He can't set the medication system and alarm himself.
- His daughter sets all things and then the thing he can do is listen the alarm, take medicine and off the alarm.



Anamika Begum

Age 40
Status Married
Occupation House wife

Goals

- Don't skip the time to take medicine of her and her childrens.
- Need something interesting in this app that will make her child interested to take medicine without force.
- Also need Bengali language option.

Frustrations

- She is a mom of 2 children and now pregnant with third child. She has a constant lack of free time for her daily busy houseworks.
- She takes vitamins for pregnancy period. Also she has to ensure her younger daughter's medication beside her.

5.2 User Persona

Findings from an Interview:

Determining What Users Need from a Medication Reminder App.

Several important conclusions came out of the interviews that were done to learn more about user preferences and needs for a medication reminder app:

Medication Regimen Complexity:

Managing several prescriptions with varying amounts and times caused aggravation, according to users.

A lot of people reported that forgetfulness was the main cause of missing doses, particularly when complicated drug schedules were involved.

Need for Personalization and Adaptability:

Users made it clear that they would greatly welcome customization options that would enable them to modify the app to suit their own needs and preferences for medication management.

Priorities included flexibility in setting up prescription lists and reminders based on individual routines and preferences.

The value of intuitive design

The significance of an interface that is easy to use, with clear visual cues and navigation, was stressed by the participants.

The two biggest barriers to app usage and engagement were identified as convoluted workflows and cluttered UI.

Comprehensive Medication Information Is Needed:

The significance of having access to thorough medication information within the app was emphasized by users.

This improves pharmaceutical safety by facilitating educated decision-making and providing information on possible adverse effects, dosage guidelines, drug interactions, and refill status.

Preference for Intelligent Alerts and Reminders:

Smart reminder features that adjust to users' schedules and routines were deemed appealing by the participants.

More contextual information, such prescription names and dosages, was included in personalized reminders, which were found to be more successful in encouraging adherence.

Need for Integration and Connectivity:

Features that would enable connectivity with outside sources, like pharmacies or healthcare providers, were requested by users.

Benefits included seamless connectivity for prescription updates, medication refills, and data syncing across several devices.

Support and education are needed:

The app could include more educational materials and advice on drug adherence, according to the participants.

It was believed that evaluating progress and keeping track of drug adherence were important ways to encourage motivation and accountability.

Result and Discussion

The following design factors are suggested for the medication reminder app based on the findings of the interview:

Giving top priority to a simple, user-friendly interface that can be customized with functionality to meet the needs of a wide range of users.

Incorporate intelligent reminder functionalities that adjust to users' routines and preferences, augmenting involvement and compliance.

Giving consumers all the knowledge they need to make educated treatment decisions by including complete pharmaceutical information in the app.

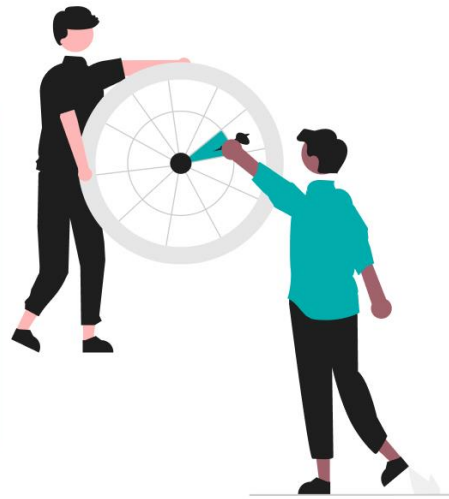
Enable integration and communication with outside resources to ensure smooth drug administration.

Providing supplementary assistance and instructional materials to enable consumers to better manage their health.

CHAPTER 6 DESIGN PROCESS

Target Audience

To whom it may concern. Senior citizens aged 60-80 who don't have someone own of them to take care of them 24 hours a day, or who live alone and Caregivers age 30-60, who forget to take medicine for their busy schedule, who uses smart phone and mobile apps, expressed interest in learning more about medicine reminder app.



5.3 Target Audience

Age Range:

Adults are the target audience in the main, especially those who are 18 years of age and older.

This demographic may contain subgroups such as older folks, who would need larger text for easier reading and simpler interfaces.

Health Issue:

The main target group consists of users with long-term medical issues that need constant prescription administration.

People with autoimmune diseases, diabetes, hypertension, heart disease, mental health issues, or other problems may fall under this category.

Technological Acuity:

People who are at ease utilizing smartphones and mobile apps to manage several elements of their lives may be among the target audience.

However, people with different degrees of technological literacy should also be taken into account, since they might need an interface that is more user-friendly and intuitive.

Family members and caregivers:

The target audience also includes caregivers who are in charge of overseeing prescription schedules for others, such youngsters or elderly relatives.

Remote monitoring and notifications are two examples of features that the app should include in order to encourage caregiver participation and communication.

Professionals with busy schedules:

A medication reminder app can help professionals who lead hectic lives and have demanding schedules remembered to take their medications on time. It can also help them keep organized.

This subgroup could find features like programmable reminders and calendar app integration especially useful.

People who are concerned about their health:

To improve medication adherence and health outcomes, those who value wellness and preventative care and are concerned about their health could find it useful to use a medication reminder app.

This demographic may be attracted to features that support overall well-being, such as integration with exercise applications, health advice, and medication adherence tracking.

Patients shifting from inpatient to outpatient care:

A pertinent target audience is patients who need continuous medication management as part of their post-discharge care after being released from hospitals or other healthcare facilities.

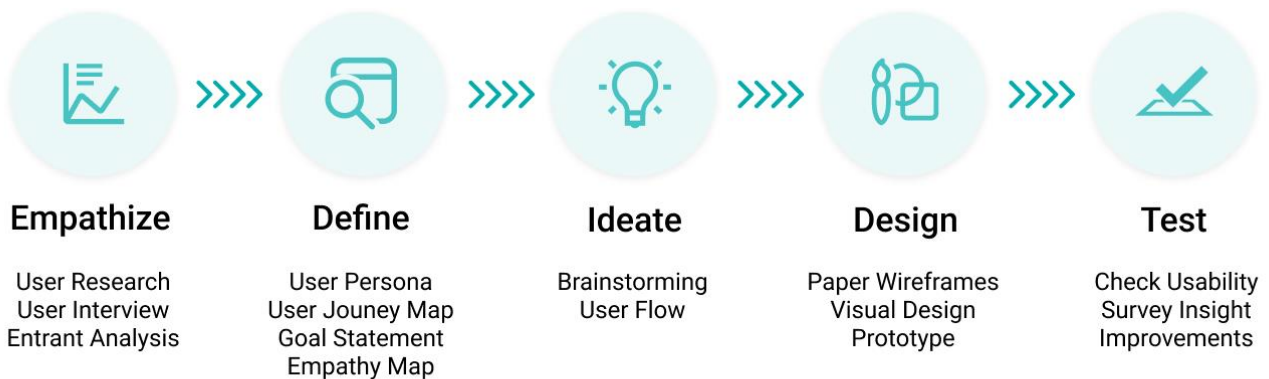
By offering resources for medication reconciliation, adherence to discharge instructions, and follow-up care, the app ought to facilitate a seamless transition from hospital to home care.

My Role



5.4 My Role

Design Thinking Process



5.5 Design Thinking Process

Utilizing research techniques like user interviews, surveys, and observations, begin by gaining a grasp of the requirements, preferences, and problems experienced by the target users.

Learn about the difficulties that users encounter when managing their medications, as well as what they hope to get out of a medication reminder app.

Define: Using the knowledge acquired during the empathize phase, define the problem statement. Clearly state the purposes and goals of the medication reminder app, taking into account the demands of the user and the needs of the company. Determine the essential features and functions that will satisfy the wants and pain points of the specified user base.

Ideate: Gather inspiration for the UI/UX design of the app while taking into account several strategies for resolving the specified issue.

Promote originality and experimentation with various design ideas while maintaining the user as the focal point of the brainstorming process.

Prototype:

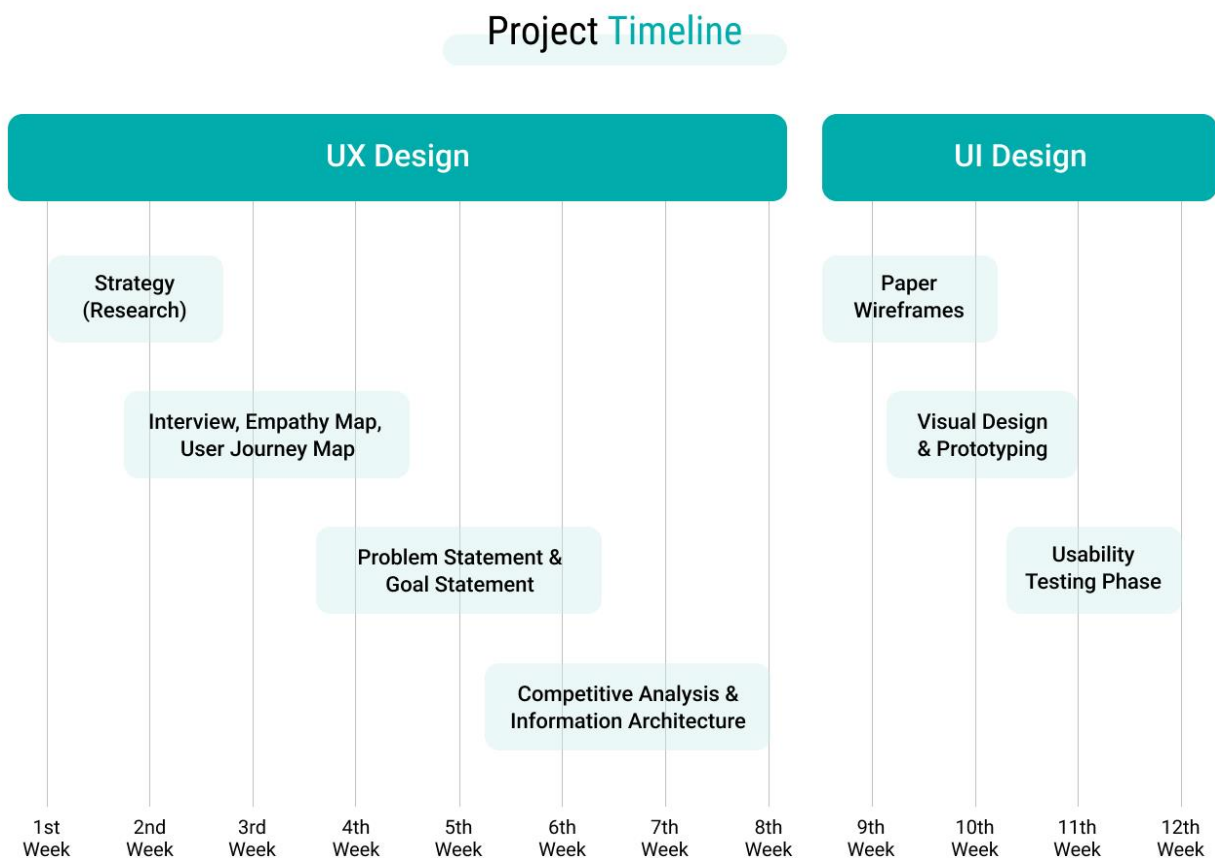
To test and validate design concepts, create both high-fidelity and low-fidelity prototypes of the app's UI/UX design. Create interactive prototypes that mimic the functionality and user interactions of the app using prototyping tools.

Test:

To assess how well the app's UI/UX design works, do usability testing with the intended audience. Get opinions on the usability, navigation, aesthetics, and general user experience of the app.

Implement:

Closely collaborate with developers to turn the completed UI/UX design into a usable application. To guarantee correct design implementation, supply assets, documentation, and design.



5.6 Timeline Chart

Paper Wireframes

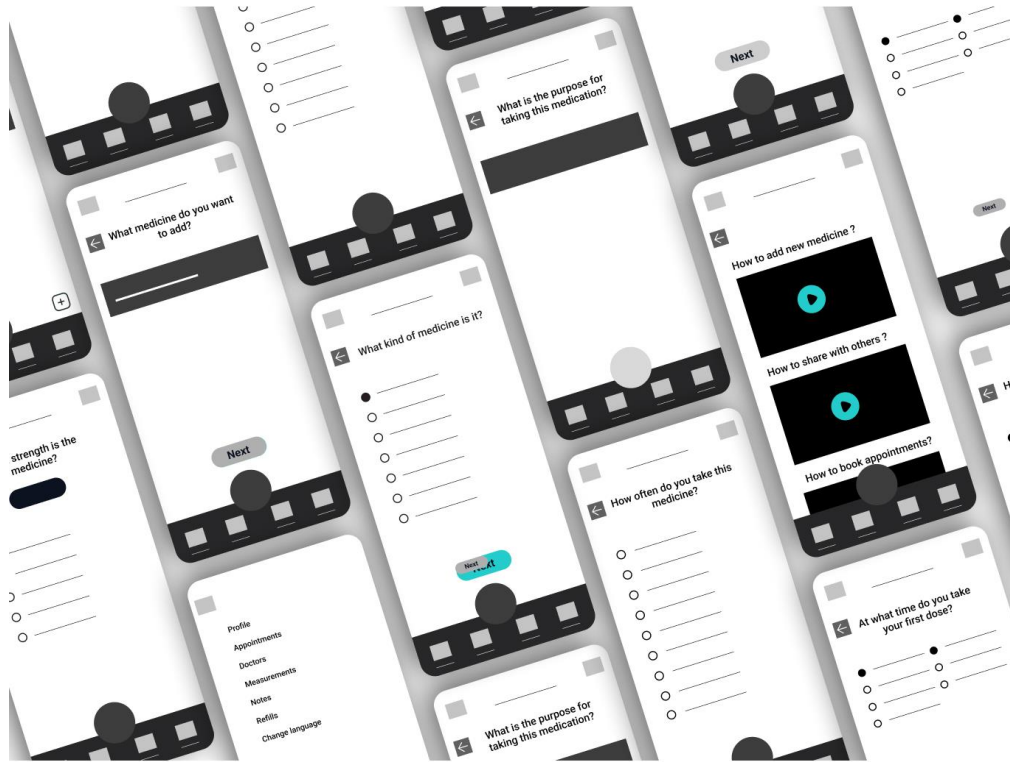
The wireframes are organized as follows:

- Row 1:**
 - Screen 1: "Create new account" with fields for Full name, Password, Email, Mobile no, and a "Sign up" button.
 - Screen 2: "Welcome" with fields for Email, Password, and a "Sign in" button.
 - Screen 3: "Good morning" with a time display (8:00 AM), a list of medicines (Aspirin, Paracetamol), and buttons for "Add medicine" and "Save Prescription".
 - Screen 4: "Add medicines" with a question "What medicines do you want to add?", a search field, and a "Next" button.
 - Screen 5: "Add medication" with a question "What medication do you want to add?", a search field, and a "Next" button.
- Row 2:**
 - Screen 6: "What kind of medicine is it?" with a list of options: Pill, Solution, Injection, Powder, Drops, Inhaler, Other.
 - Screen 7: "What kind of medicine is it?" with a list of options: Pill, Solution, Injection, Powder, Drops, Inhaler, Other.
 - Screen 8: "What strength is the medicine?" with a "Type" field and a list of options: g, IU, mcg, mg.
 - Screen 9: "What strength is the medicine?" with a "Type" field and a list of options: g, IU, mcg, mg.
 - Screen 10: "What is the purpose for taking medication?" with a "Next" button.
- Row 3:**
 - Screen 11: "What is the purpose for taking this medication?" with a "Next" button.
 - Screen 12: "How often do you take this medicine?" with a list of options: Daily, Once a week, 2 days a week, Once a month, Alternate days.
 - Screen 13: "Choose the days you need to take the med." with a list of days: Sunday, Monday, Tuesday, etc.
 - Screen 14: "At what time do you take your dose?" with a list of times: Morning, Afternoon, Evening, Night.
 - Screen 15: "Set Time" with a table for Hours, Min, Sec and a "Done" button.
- Row 4:**
 - Screen 16: "Medicine name" with a table for Hours, Min, Sec and buttons for "Alarm", "Record", and "Done".
 - Screen 17: "Recordings" with a time display (00:00:55), "High quality" text, a waveform, and playback controls.
- Row 5:**
 - Screen 18: "Recordings" with a time display (00:00:55), playback controls, and "Save" and "Delete" buttons.

Emotional attachment
 By this we can records our personal voice or favourite person's voice for medicine alarm that will touch the patient's heart. That will make him/her feel interest to take medicine.
 Like:
 "Hello mom, it's time to take your medicine / that medicine (Napa). Please take it dear."

5.7 Paper Wireframe

High-Fidelity Wireframes



5.8 High Fidelity Wireframes

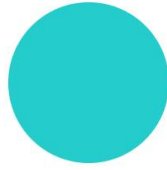
Competitive Analysis

Features	Care	Pill Reminder	True Meds	Drugs.com
Appointment				
Medicine Image				
Hospital, Clinic, Pharmacy Location				
Alarm				
Scan Prescription				
Language Friendly				
Alarm With Voice Record				

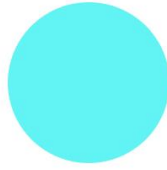
5.9 Competitive Analysis Chart

Style Guide

Colours



24CCCC



62F4F4



065353



0C1320

Typography

ROBOTO

Regular - 10, 14, 18, 22
Medium - 24
Bold - 25, 33

Buttons



5.10 Style Guide

Primary Color Scheme: To convey a sense of dependability and trust, use colors that are soothing and comforting. Use blue hues, which are frequently connected to wellbeing and health. Staying away from colors that are too strong or dazzling as they could strain the eyes or be distracting.

Accent colors: Emphasize crucial components like buttons, alerts, and reminders by using a contrasting accent color. Choosing a color that contrasts with the main color scheme but still works well with it. To preserve visual coherence, use accent colors consistently throughout the application.

Error and Warning Colors: Indicate errors, cautions, or urgent alerts using different colors.

Background Colour: Choosing a neutral background colour that provides good contrast with text and UI elements. Consider using a light background colour to enhance readability, especially for users with visual impairments.

Font Selection: Choosing a clear and legible font for body text to ensure readability on various screen sizes. Sans-serif fonts are generally preferred for digital interfaces due to their

clean and modern appearance. Consider using a serif font for headings or titles to add hierarchy and visual interest.

Font Size and Weight: Using a consistent font size and weight throughout the app for a cohesive look and feel. Opt for a larger font size for body text to improve readability, especially for older users or those with vision impairments. Use different font weights (e.g., regular, bold) to create hierarchy and emphasize important information.

Line Spacing and Letter Spacing: Ensuring adequate line spacing (leading) to prevent text from appearing crowded or cramped. Adjusting letter spacing (tracking) for optimal legibility, especially at smaller font sizes. Avoiding excessive line lengths to prevent eye fatigue and make reading more comfortable.

Accessibility Considerations: Choosing fonts and font sizes that meet accessibility standards and guidelines, such as WCAG (Web Content Accessibility Guidelines). Test typography choices with users of different ages and abilities to ensure readability and usability for all.

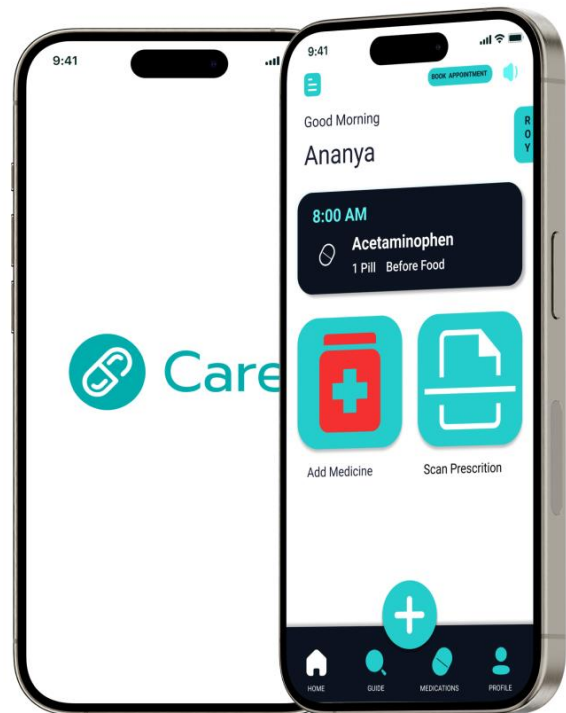
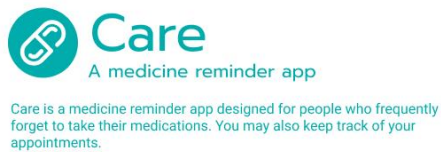
Consistency and Branding: Using a limited colour palette and typography styles to maintain visual consistency across the app. Ensure that colours and typography reflect the app's branding and overall design theme.

Accessibility Testing: Conducting accessibility testing to evaluate colour contrast ratios and readability for users with visual impairments.

Adjusting colours and typography as needed to improve accessibility and ensuring compliance with accessibility standards.



UI/UX Case Study 



5.11 Care

Took into account the following elements when choosing a name:

Memorability: Picked a name that is simple to say and recall.

Relevance: Tried to make sure the app's name accurately communicates its role in medication management as well as its goal and functionality.

Uniqueness: To stand out in the market, staying away from names that are overly generic or identical to already-existing apps.

Brand ability: Choosing a name that will work well for upcoming marketing and branding initiatives, such creating a logo and promotional items.

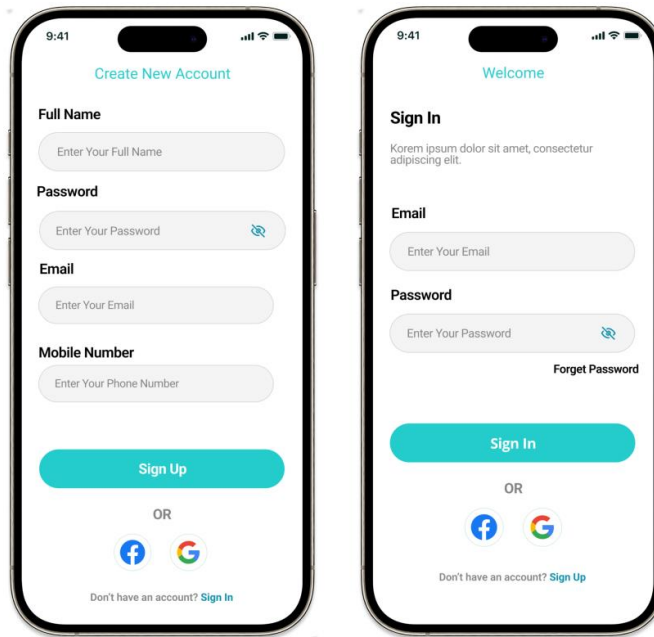
Incorporating a simple icon representing a capsule to symbolize medication management. Stylize the icon to be modern and minimalistic.

Keeping the design simple, scalable, and versatile to ensure it looks great across various platforms, including mobile devices and marketing materials. Additionally, ensuring the logo aligns with my app's branding and conveys its key features and benefits effectively.

Visual Design

Sign in/ Sign up

I added a quick google and facebook sign up/sign in option to make the use more comfortable, and any information needed then user can update them in-app only.



5.12 Sign In interface

A breakdown for the sign-in details screen:

Sign-In Options: Offering multiple sign-in options such as email/password, social media login (Facebook, Google). Presenting these options clearly, possibly with recognizable icons, allowing users to choose their preferred method.

Input Fields: Include input fields for the chosen sign-in method (email, password, or social media credentials). Use clear labels and placeholders to indicate what information is required in each field.

Error Handling: Display informative error messages if users enter incorrect credentials or encounter other sign-in issues. Provide clear instructions on how to resolve common errors, such as resetting passwords or verifying email addresses.

Forgot Password/Forgot Username: Providing links/buttons for users who forgot their password or username, directing them to the appropriate recovery process. Ensure the recovery process is straightforward and secure, following best practices for password reset flows.

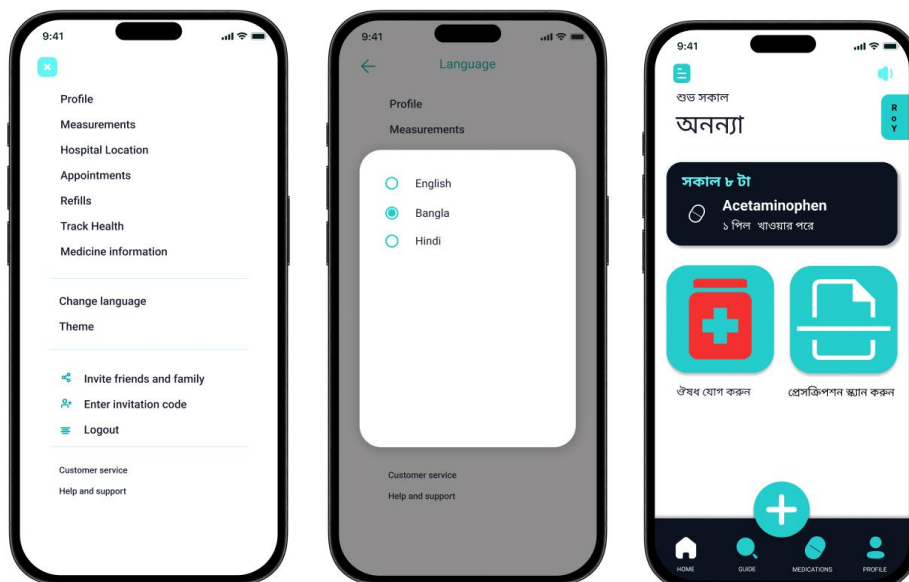
Create Account Option: Including a prominent link/button for users who don't have an account yet to navigate to the sign-up/register screen. Clearly communicate the benefits of creating an account and how it enhances their experience with the app.

Visual Design: Maintain consistency with the app's overall visual design, including colours, typography, and iconography. Make sure there is enough contrast between the text and the background to enhance legibility, particularly for those who are visually impaired.

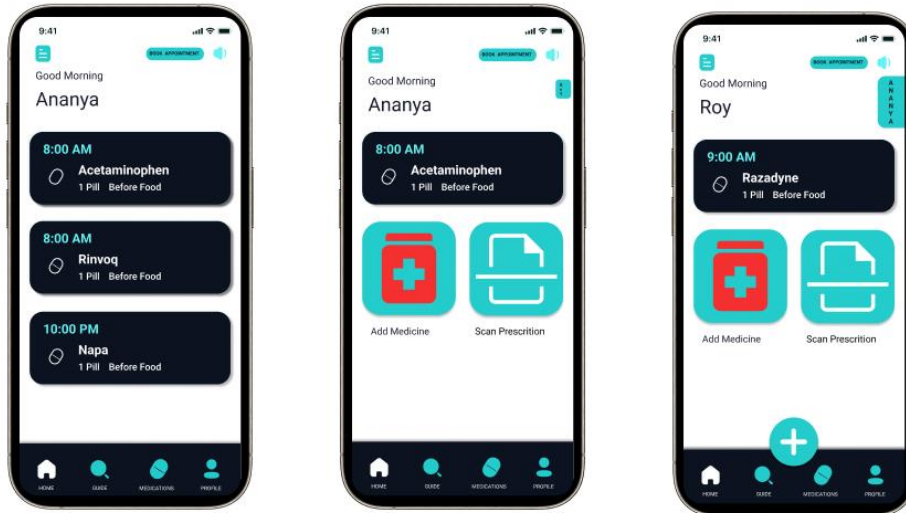
Language Selection: Include a language selection option on the app's initial screen or in the settings menu. Provide a list of languages supported, possibly represented by their respective flags or written in their native scripts.

Homepage: Display a clear and intuitive homepage with options for adding medications, viewing reminders, and accessing settings. Use universally recognizable icons and symbols for easy navigation.

Medication Input: Create a form for users to input their medications, including fields for name, dosage, frequency, and time. Ensure clear labelling and provide tooltips or help text if needed.



5.13 Language Interface



5.14 Home Screen Interface

Home screen

Home screen is the first screen that opens up when you use the app.

Medication Overview: Provide a brief overview of the user's prescription regimen, including the next doses, the ones that need to be taken now, and any missed ones. For easy identification of various medications and dose schedules, use visual cues like icons or color-coded labels.

Upcoming Reminders: On the home page, make sure to prominently display any forthcoming medicine reminders. Give users the ability to snooze or dismiss reminders straight from the home screen, allowing them to take immediate action without switching between displays.

Daily Schedule: Provide the user with a daily medication schedule that includes a timeline or list view with the precise dosing timings and medications. Permit customers to quickly switch between days so they can see their schedule ahead of time or check their past prescription history.

Medication Details: Provide a link to view comprehensive details about every drug, including dosage guidelines, possible adverse effects, and refill status. Provide simple controls so users may add new prescriptions or change existing ones right from the home screen.

Dosage Tracking: Give consumers the option to record prescription drugs as taken right from the home screen, along with a visual cue to indicate that the dosage tracking was successful. Present an overview of medication adherence data, including the proportion of missed or promptly taken doses over a given time frame.

Notifications and Alerts: Make sure that messages that are crucial, like alerts about medication interactions or refill reminders, are shown clearly on the home screen. Give users detailed control over their medication reminders by enabling them to alter notification preferences and settings straight from the home screen.

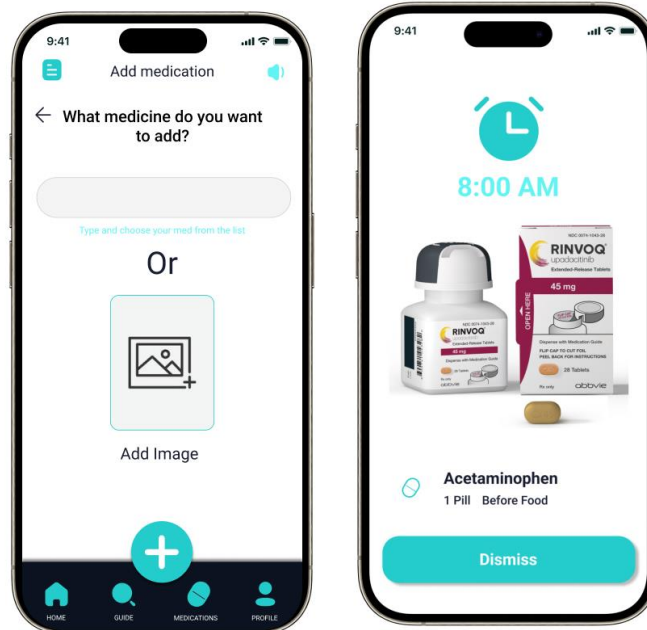
Personalization Options: Providing possibilities for customization so that each user's preferred content and home screen layout can be achieved. Give customers the option to reorder prescription lists, prioritize particular medications or dosage schedules, or change the display's settings to better fit their requirements.

Accessibility Considerations: Making sure that interactive components are simple to use and that text is readable for people with impairments is part of designing the home screen with accessibility in mind. Support assistive devices like screen readers and provide alternate text descriptions for visual elements.

Visual Design: keeping all aspects of the app's visual design language—including layout, typography, and colors—consistent. To arrange content and highlight key components on the home screen, use whitespace and visual hierarchy. Add visually appealing elements to the home screen to improve the user experience, such as graphics or icons for medications.

Add Image

Alarm with medicine picture. It will help people specially over aged who cant identify easily the medicine packet by their name.



5.15 Image Adding Interface

The inclusion of an image adding option in a Medication Reminder App can significantly enhance the user experience and provide several benefits:

1. Visual Recognition:

Enhanced Identification: When a user has several drugs with similar names or appearances, images help them rapidly identify their medications at a glance.

Enhanced Memory Recall: Linking pharmaceuticals to pictures can help users remember to take the right drug at the right time by improving memory recall.

3. Individualization

Customization: Giving customers the option to upload their own photos gives them a feeling of control and individuality over their pharmaceutical profiles.

Preference Alignment: Users can select pictures that directly speak to them, including pictures of the package for their medications or well-known symbols.

3. Accessibility

Universal Understanding: Regardless of a user's level of linguistic proficiency, images enable universal medication identification.

Enhanced Accessibility: Images can function as natural cues for drug recognition and adherence for individuals with cognitive or visual disabilities.

4. User Engagement:

Enhanced Interaction: By allowing users to upload photographs, the app encourages more active user interaction, which may raise adherence rates.

Positive User Experience: Adding pictures to pharmaceutical profiles can make the user experience more pleasurable and fulfilling.

5. Error Prevention:

Error Reduction: Medication mistakes, such taking the wrong medication by accident or forgetting a dose, are less likely when medications are displayed visually.

Confidence Boost: When users can visually verify the prescriptions they are taking, their confidence in their medication management increases.

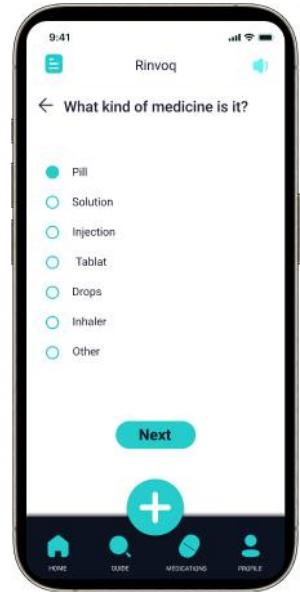
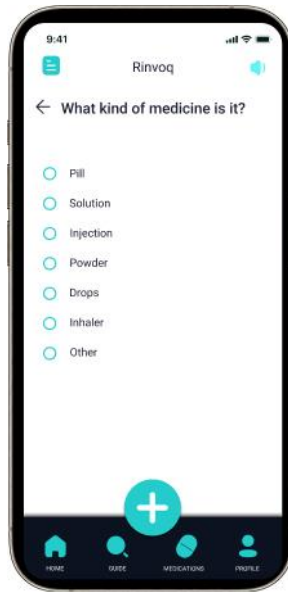
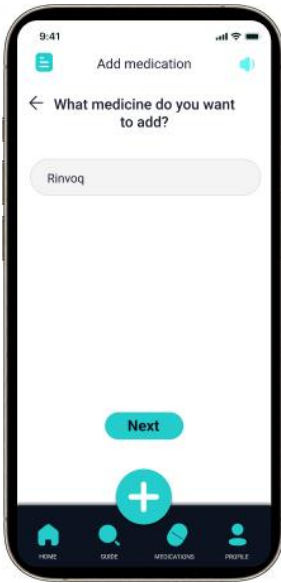
6. Usability

User-Friendly Interface: Images offer a recognizable and simple interface feature that facilitates users' navigation and interaction with the application.

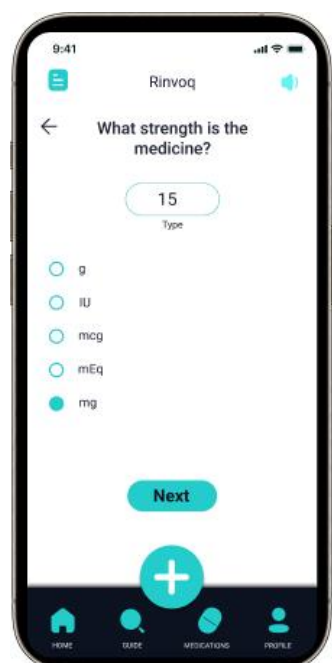
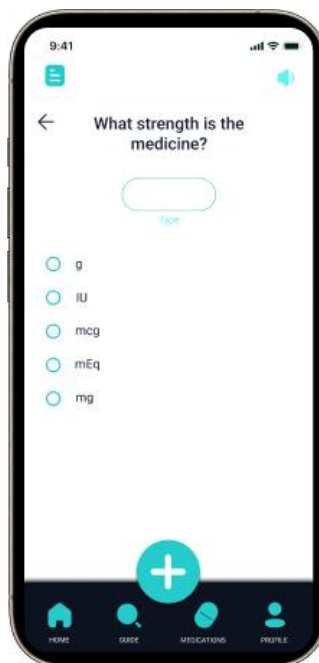
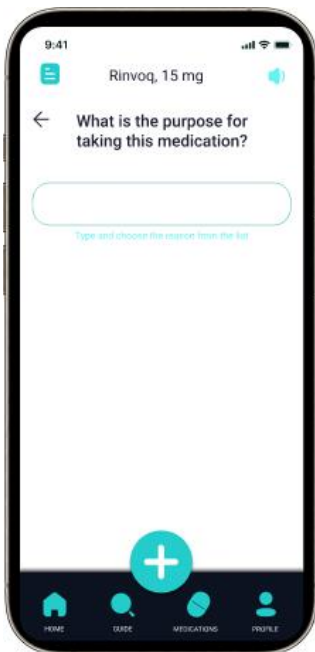
Streamlined Workflow: The process of setting up medication reminders is streamlined when users can easily find and manage their medications thanks to visual signals.

Compliance and Adherence: Research has demonstrated that visual cues, such pictures of prescription drugs, might enhance medication adherence by motivating people to take their meds as prescribed.

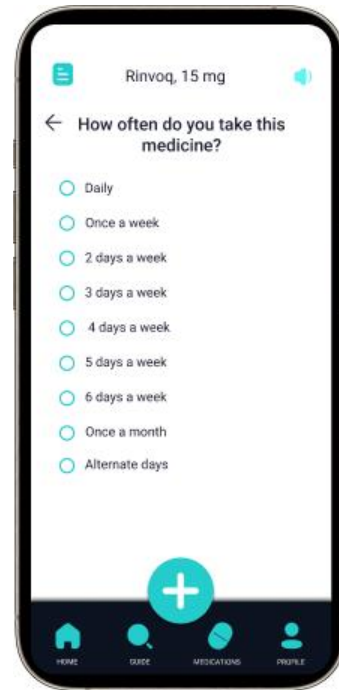
Behavioral Reinforcement: Pictures act as visual cues to help people remember to take their drugs on a regular basis, which improves health outcomes.



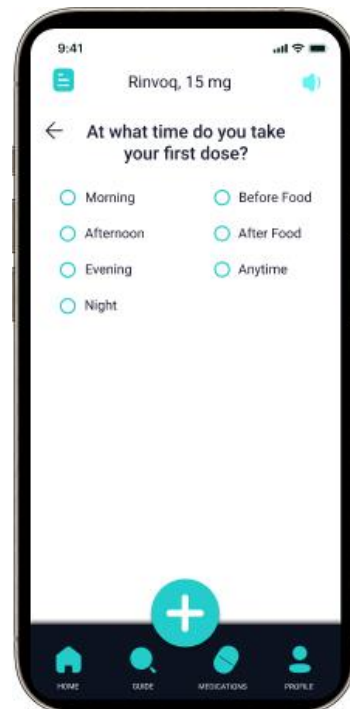
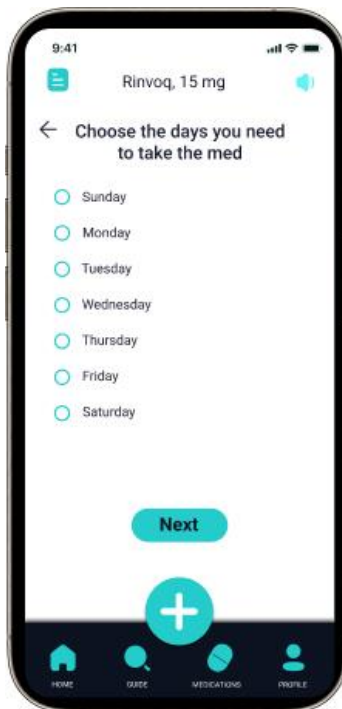
5.16 Medicine Settings Interface



5.17 Medicine Settings Interface (2)



5.18 Medicine Settings Interface (3)



5.19 Medicine Settings Interface (4)

Dosage Information:

Dosage Form: Providing options for users to specify the dosage form of each medication (e.g., tablet, capsule, liquid, injection).

Dosage Strength: Allowing users to input the dosage strength of each medication (e.g., milligrams, micrograms, international units) to ensure accurate dosing.

Frequency and Timing: Dosage Frequency: Allow users to set the frequency of each medication dose (e.g., once daily, twice daily, every 8 hours).

Dosing Schedule: Provide options for users to specify the timing of each dose (e.g., morning, afternoon, evening) or specific time intervals (e.g., every 4 hours).

Duration and End Date:

Treatment Duration: Enable users to set the duration of treatment for each medication (e.g., number of days, weeks, months) to track medication courses accurately.

Customization Options: Personalized Preferences: Allow users to customize medication type settings according to their preferences and specific needs.

Default Settings: Provide default settings for common medication types (e.g., prescription drugs, vitamins) to simplify the setup process for users.

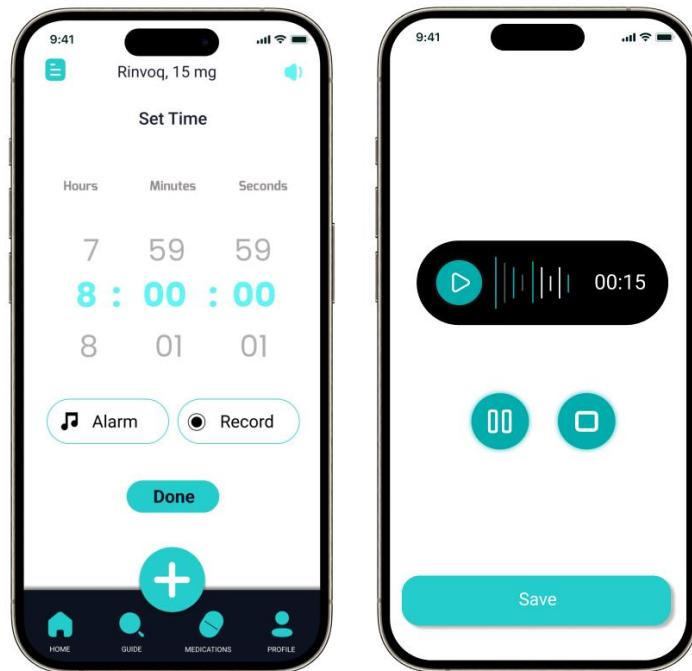
Visual Representation:

Iconography: Use visual icons or symbols to represent different medication types, dosage forms, and frequency/timing settings for easy identification and recognition.

Colour Coding: Implement colour coding or visual cues to distinguish between different medication types and settings within the app's interface.

Alarm

If the user wants, the alarm sound can be recorded manually by her closest persons voice. This will help her to feel very own in absence of own persons.



5.20 Alarm Settings Interface

Incorporating a voice record option for alarms in a Medication Reminder App can offer several advantages for users, enhancing usability and accessibility.

1. **Accessibility:** Voice Interaction: Enhances accessibility for all users by enabling voice commands to be used to engage with the app by users with disabilities or impairments.

Hands-Free Operation: This feature allows users to create voice memos and set medicine reminders without having to manually enter text, making the app usable in scenarios when it is required to operate hands-free.

2. **Ease of Use:**

Natural and Intuitive Interface: Voice commands offer a smooth and natural interface for users to engage with the application, lowering the learning curve and simplifying use.

Fast Setup: The medication management process is streamlined by users' ability to easily set voice memos and drug reminders with little effort.

3. **Personalization:**

Customized Messages: Users can personalize medication reminders with voice-recorded messages, such as instructions for taking medications or personal reminders.

Human Touch: Voice-recorded messages add a human touch to medication reminders, making them more engaging and personal for users.

4. Improved Adherence:

Enhanced Engagement: Voice-recorded reminders are more engaging than traditional text-based reminders, increasing user engagement and adherence to medication schedules.

Better Retention: Users may be more likely to remember medication instructions or reminders when they are presented in their own voice or in a familiar voice.

5. Flexibility:

Adaptability: Voice recording allows users to record reminders in their preferred language, dialect, or tone, providing flexibility to accommodate diverse user preferences.

Dynamic Content: Users can record dynamic content, such as personalized messages or instructions that may not be possible with static text-based reminders.

6. Safety and Security:

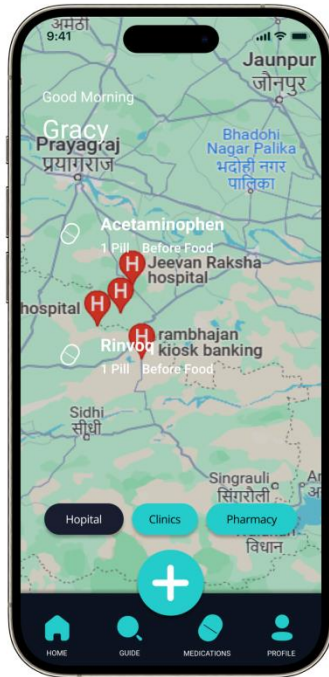
Confirmation: Voice-recorded reminders can provide an additional layer of confirmation for medication adherence, reassuring users that their reminders have been set correctly.

Privacy: Users can record voice memos privately without the need to input sensitive information manually, enhancing privacy and security.

7. Emotional Support:

Encouragement: Users can record motivational messages or words of encouragement to boost their motivation and adherence to medication schedules.

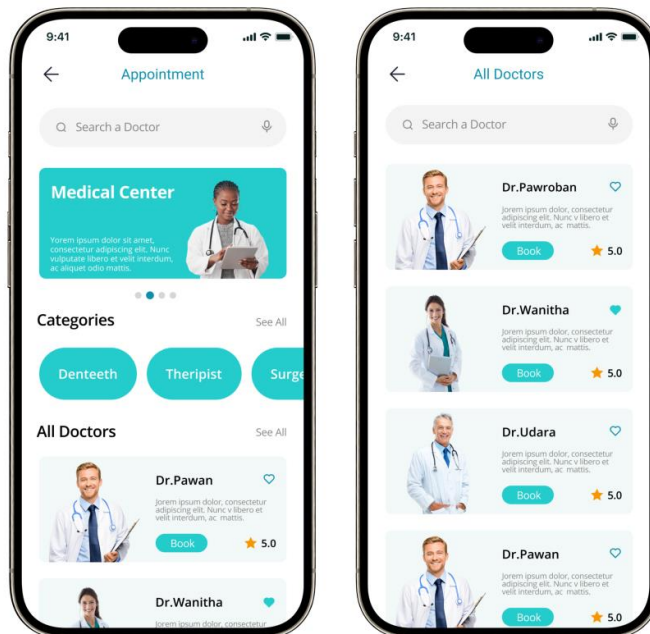
Emotional Connection: Voice-recorded reminders can create an emotional connection between users and the app, fostering a sense of support.



8. Search Functionality: Allow users to search for clinics and pharmacies by name, address, or proximity to their current location.

GPS Integration: Turn on GPS to find and recommend local pharmacies and clinics to the user automatically.

Manual Input: If the address or phone number of the user's preferred clinic or pharmacy is not automatically recognized, provide them the option to manually enter it.

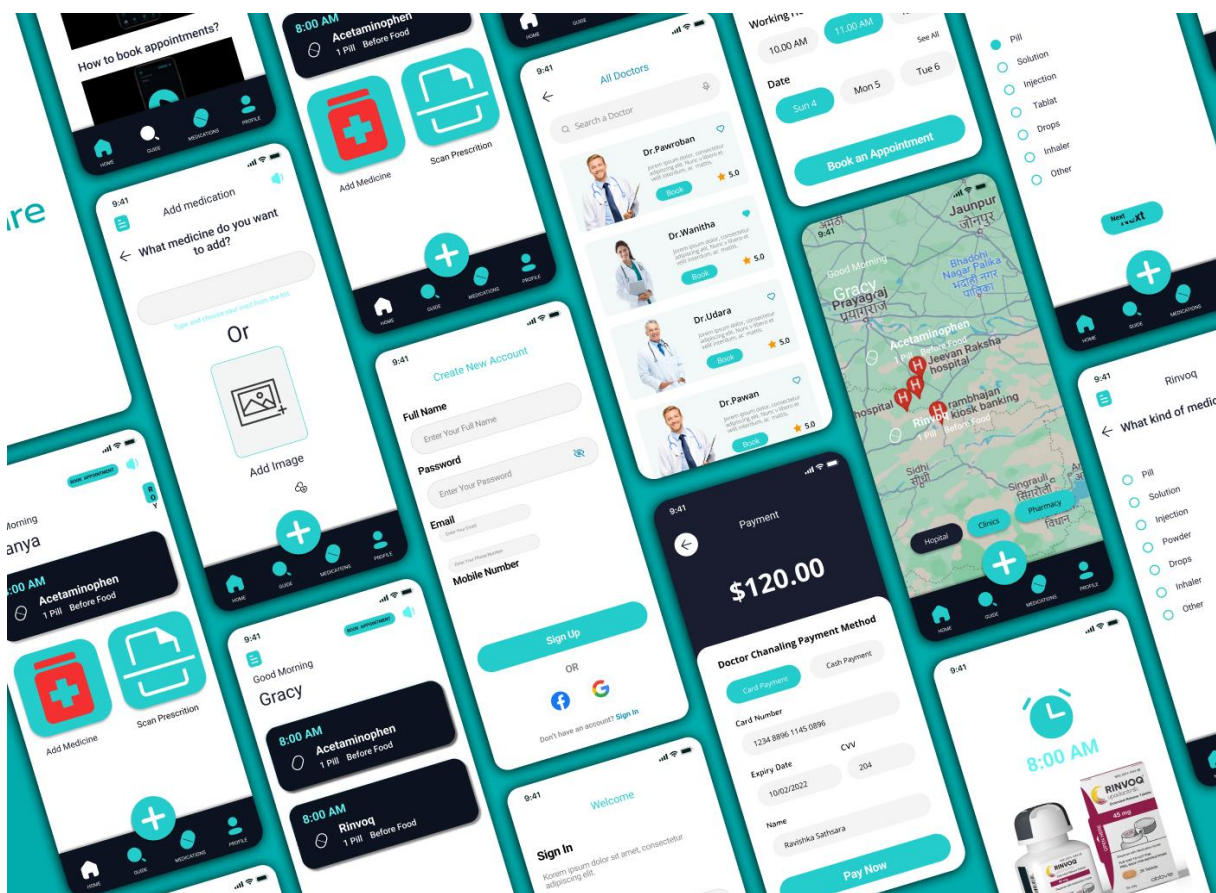


5.21 Location and Appointment Interface

Location tracking and geofencing: Give peoples the option to build personalized geophones around the pharmacies and clinics they commonly visit.

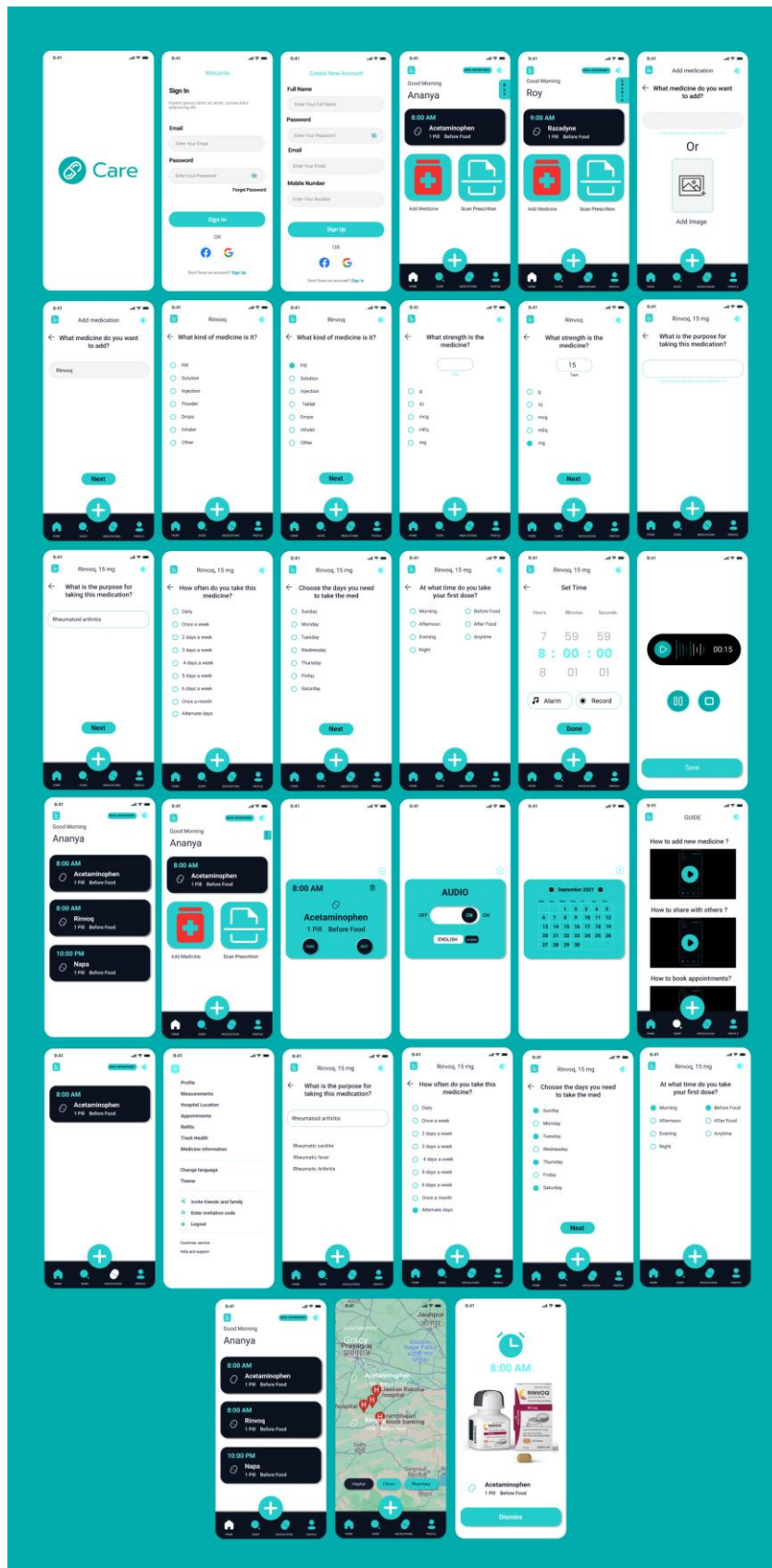
Automatic Reminders: To remind users to pick up medicines or show up for appointments, set up automatic reminders that are triggered by geophone entry or exit.

Real-Time monitoring: Use real-time location monitoring to give users the most recent information about how close they are to the specified pharmacy or clinic.



5.22 All Interface

All Screens



5.23 All Screens

CHAPTER 7 CONCLUSION

Understanding the requirements, preferences, and constraints of the target users mainly patients managing complicated prescription schedules was given top priority during the design process. Throughout the app's development process, usability testing and user feedback were included, which helped the design of the application improve and better satisfy user needs. The UI/UX design sought to be both simple and intuitive so that users could set up medicine reminders and browse the app with ease. To improve use, simple language, intuitive iconography, and clear visual hierarchy were used.

The app provides for personalization and flexibility in recognition of the wide range of medication regimens and preferences among its users. To suit their particular needs and routines, users can personalize notification options, prescription types, dosage information, and reminder schedules. The application's design was incorporated with accessibility concerns to guarantee inclusion for users of varying abilities. This includes functions that allow users with visual or hearing impairments to be accommodated, like high contrast settings, font size adjustments, and screen reader compatibility. The application integrates feedback systems to apprise users of their medication adherence status and furnish prompt reminders. Clear error messages and instructions are also included to assist users in resolving any problems or misconceptions that can occur during app engagement. The app's usefulness and user convenience are increased through integration with current digital health ecosystems and connectivity with wearable technology or smart pill dispensers. Better health outcomes are encouraged and a comprehensive approach to drug management is fostered by this connectivity. Future work should put constant user feedback and iterative design improvements ahead of the thesis scope. It will be essential to incorporate user insights into the app to ensure it remains relevant and effective as technology advances and user needs change. The app may be essential in enabling virtual consultations, prescription reviews, and remote vital sign monitoring in the light of the changing healthcare trends toward telemedicine and remote patient monitoring. The ability to integrate biometric sensors and telehealth platforms may allow for the delivery of complete remote care.

REFERENCES

- [1] E. Sabat e, Adherence to long-term therapies: evidence for action. World Health Organization, 2003
- [2] A. Bozek and J. Jarzab, “Adherence to asthma therapy in elderly patients,” *Journal of Asthma*, vol. 47, no. 2, pp. 162–165, 2010.
- [3] P. Latry, M. Pinet, A. Labat, J.-P. Magand, C. Peter, P. Robinson, K. Martin-Latry, and M. Molimard, “Adherence to anti-inflammatory treatment for asthma in clinical practice in france,” *Clinical therapeutics*, vol. 30, pp. 1058–1068, 2008.
- [4]. Pillsy Inc, “Pillsy,” Pillsy.com. [Online]. Available: <https://www.pillsy.com>. [Accessed: 17-Nov-2022].
- [5]. Eross, “AdhereTech and the smart pill bottle,” *Technology and Operations Management*, 18-Nov-2016. [Online]. Available: <https://d3.harvard.edu/platformrctom/submission/adheretech-and-the-smart-pill-bottle/>. [Accessed: 11-Nov-2022]
- [6] “Android app store,” <https://play.google.com/store/apps?hl=en>.
- [7] “Apple app store,” <https://itunes.apple.com/us/genre/ios/id36?mt=8>.
- [8] K. Stawarz, A. L. Cox, and A. Blandford, “Don’t forget your pill!: Designing effective medication reminder apps that support users’ daily routines,” in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, 2014, pp. 2269–2278.
- [9] J. M. Silva, A. Mouttham, and A. El Saddik, “Ubimeds: a mobile application to improve accessibility and support medication adherence,” in *Proceedings of the 1st ACM SIGMM international workshop on Media studies and implementations that help improving access to disabled users*. ACM, 2009, pp. 71–78.
- [10] M. Hayakawa, Y. Uchimura, K. Omae, K. Waki, H. Fujita, K. Ohe, et al., “A smartphone-based medication self-management system with realtime medication monitoring,” *Appl Clin Inform*, vol. 4, no. 1, pp. 37–52, 2013.
- [11] M.-Y. Wang, P. Tsai, J. W.-S. Liu, and J. K. Zao, “Wedjat: a mobile phone based medicine intake reminder and monitor,” in *Bioinformatics and BioEngineering, 2009. BIBE’09. Ninth IEEE International Conference on*. IEEE, 2009, pp. 423–430.
- [12] “Healthful Reminders for Medications, Beyond an Apple a Day”, available at: http://www.nytimes.com/2010/09/30/technology/personaltech/30smart.html?_r=0
- [13] Hughes, D. A., Bagust, A., Haycox, A., and Walley, T.O.M. (2001) “The impact of non-compliance on the cost effectiveness of pharmaceuticals: a review of the literature”, *Health Economics*, pp. 601–615.
- [14] “Adherence to long term therapies: Evidence for Action” (2003), Report by World Health Organization.
- [15] “Medisafemeds & pill reminder,” <https://play.google.com/store/apps/details?id=com.medisafe.android.client&hl=en>

[16] V. Sharma, K. Mankodiya, F. De La Torre, A. Zhang, N. Ryan, T. G.Ton, R. Gandhi, and S. Jain, "Spark: personalized parkinson disease interventions through synergy between a smartphone and a smartwatch,"in Design, User Experience, and Usability. User Experience Design or Everyday Life Applications and Services. Springer, 2014, pp.103–114.