IT215

DESIGNING AND EVALUATING A MEDICATION REMINDER MOBILE APPLICATION

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1. Abstract

In this project, we chose to work on a Medication Reminder App because it's a simple and useful idea that a lot of people can relate to, especially elderly users who often face difficulties remembering their medication schedules. Many users —particularly older adults who may take multiple medications daily— forget their doses, whether due to busy routines or memory challenges. The goal of the app is to help them remember their doses by sending clear and organized reminders. To understand what elderly users really need, I used a short questionnaire and asked a few people some quick questions about their experiences. The responses helped me identify the most important features the app should have, like easy reminder setup and reliable notifications. This report explains the problem, why this topic was chosen, and the main user requirements based on the data I collected [6].

2. Introduction and Problem Statement

introduction

For this project, we decided to work on a Medication Reminder App because it addresses a real problem that affects many people, especially elderly users who often struggle with remembering medication times. Older adults, in particular, may take several medications a day and can easily forget their doses due to age-related memory challenges or complex schedules. Since this issue is very common, we wanted to explore a solution that helps this specific user group stay consistent by organizing their medication schedule and sending clear reminders. Our goal is to understand what elderly users actually need and then design an app that supports them in an easy and practical way.

Problem Statement

The main problem we are focusing on is that many users —especially elderly individuals— forget to take their medication on time. Common methods like phone alarms or written notes are not always helpful, particularly for older adults who take several medications at different times. Missing doses can affect the treatment's effectiveness, which makes the problem more serious. Because of this, we believe there is a need for a simple and reliable application that sends timely reminders and helps elderly users manage their medication schedule without confusion [6].

3. Analysis Phase

3.1 Data Collection

To understand what users actually struggle with when it comes to remembering their medication, we collected data in two simple ways. First, we shared a short online questionnaire with people who take medication regularly. The questions were mainly about how often they forget their doses and whether they currently use any reminder method. Second, we talked to a few participants in short, informal interviews to get more detailed opinions.

From both methods, we noticed similar patterns. Many users said they forget their medication when their daily routine changes or when they are too busy. Some of them rely on phone alarms, but they mentioned that alarms are not enough when they have more than one medication. Overall, the feedback helped us understand what features would actually make a reminder app useful and not just another regular alarm.

3.2 User Requirements

Based on the information we collected, we summarized the main requirements that users expect from a medication reminder app.

Functional Requirements:
- The app should allow users to add a medication with its name, dosage, and reminder time.
- Users should receive a clear notification at the time they chose.
- The app needs to let users edit or delete a reminder easily.
- There should be a simple page that shows all upcoming medications for the day [7].
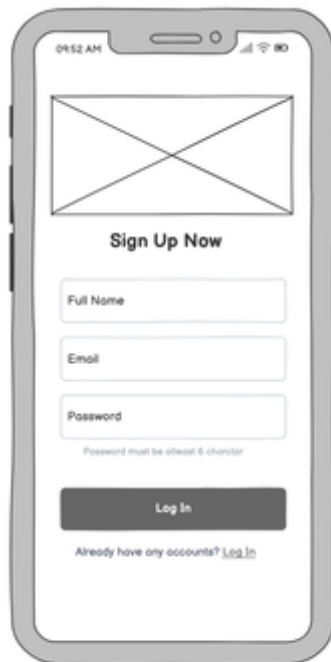
Non-Functional Requirements:
- The app should be easy to use, even for people who are not familiar with technology.
- Notifications must be reliable and appear at the correct time.
- The design should be clean and readable.
- Basic tasks, like adding a medication, should only take a few steps [8].
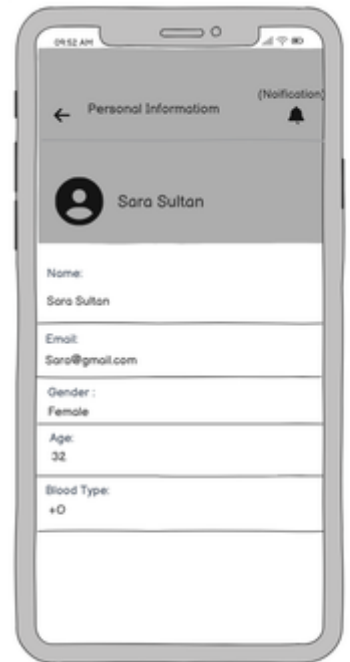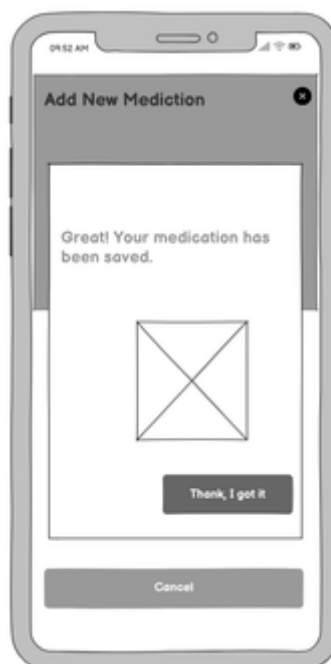
4. Design Phase

4.1 Wireframes:

1. Log In

2.Sign In

3.Home

4.Personal Information

5.Add medicine

6.Alter

7.Notification

The wireframe presents the core screens of the Medication Reminder App. It is designed in a simple black-and-white layout that focuses on structure rather than visuals, clearly showing the placement of buttons, text fields, and navigation elements.

This wireframe serves as a foundational step to simplify and support the development of the interactive prototype, ensuring the design is clear and consistent before implementation [9].

1. **Login Screen** – Contains email and password fields with "Forgot Password" and "Sign Up" options.
2. **Sign-Up Screen** – Includes full name, email, and password fields, along with a password-length validation note.
3. **Home Screen** – Displays a personalized greeting and a list of today's medications with name, time, and notes, along with an "Add New Medication" button.
4. **Profile Screen** – Shows organized personal information such as name, email, gender, age, and blood type.
5. **Add Medication Form** – Provides fields for medication name, time, dosage, and optional notes, with Save and Cancel actions.
6. **Success Confirmation Screen** – Shows a confirmation message after saving a medication.
7. **Notifications Screen** – Lists upcoming medication reminders in chronological order with dates and times.

4.2 Prototype

The prototype represents an interactive version of the system's design, built after finalizing the wireframe structure. the prototype includes colors, images, and screen transitions to provide a more realistic preview of the final application.

It allows users to experience the actual flow between screens, interact with buttons and forms, and visualize how the interface will look and feel. The added visual elements and transitions help evaluate usability, refine the user experience, and identify improvements before moving to full implementation [5].

🔗 Prototype Link: https://balsamiq.cloud/s6f90lm/pmk633t

Note: press this button 🖵 to view the navigations

4.3 Design Decisions & HCI Principles

The design of the application was shaped by core Human–Computer Interaction (HCI) principles to ensure clarity, usability, and consistent interaction across all screens. The overall interface relies on simple layouts, clear labeling, and predictable navigation paths to reduce cognitive load and support user efficiency.

The Login and Sign-Up screens were designed with straightforward form fields and immediate feedback. This aligns with Nielsen's emphasis on keeping users informed about what is going on through timely feedback, which enhances user confidence and reduces uncertainty. Error messages—such as password validation—provide direct, understandable guidance, supporting system transparency.

On the Home screen, information is arranged using a clear hierarchy, placing "Today's Medications" at the top to help users quickly identify the most relevant tasks. The large "+ Add New Medication" button follows usability recommendations related to visibility and ease of access, ensuring that essential actions remain prominent to the user.

The medication-creation form uses structured fields for the name, time, dosage, and optional notes. This approach reflects usability principles that highlight preventing errors before they occur by offering clear input constraints and a visible Cancel option to maintain user control. These design decisions help users correct mistakes without navigating through unnecessary steps.

The Personal Information screen prioritizes consistency by using uniform typography, spacing, and labeling, supporting recognition rather than recall—another heuristic emphasizing reduced memory load. Likewise, the Notifications screen presents reminders in chronological order, enabling users to scan information efficiently and maintain a clear understanding of upcoming tasks.

Overall, the design adheres to established usability heuristics such as visibility of system status, consistency and standards, and error prevention. These principles collectively ensure the interface remains intuitive, predictable, and supportive of users' needs throughout the medication-management process.

5. Evaluation Phase

5.1 Usability Testing Method

The interactive prototype was evaluated through a usability test involving **three elderly participants**, since the application is designed specifically for older adults who may face challenges in memory, vision, and smartphone interaction. Each participant was asked to complete a set of predefined tasks that represent core functions of the Medication Reminder App.

A direct observation method was used, where the participant performed the tasks while the evaluator recorded difficulties, errors, and level of required assistance. Notes were taken on navigation clarity, visibility of interface elements, and overall user satisfaction.
This approach is particularly suitable for older adults, for whom observable interaction difficulties (e.g., struggling with small text or low-contrast elements) may be more revealing than self-reported feedback, given known age-related changes in vision and technology familiarity [1, 4].

Participants

User	Age	Smartphone Experience	Notes
User A	62	Limited experience	No major vision issues, but sometimes confused by unclear or unfamiliar icons.
User B	71	Not really familiar with smartphones	Has mild visual limitations and requires reading glasses; struggles with low-contrast elements.
User C	58	Average user	Familiar with smartphones; takes multiple medications daily.

Tasks Evaluated

1. Log in to the app.
2. Navigate from the Home screen to Personal Info.
3. Navigate from the Home screen to Notifications.
4. Navigate from the Home screen to Add a New Medication.
5. Save the medication and return to Home.

Task Completion Summary

Task	User A	User B	User C
1- Log in to the app	**Completed** (needed to find Sign Up option; small text)	**Needed Help** (Sign Up text too small & low contrast; difficult to notice)	Completed
2- Navigate from the Home screen to Personal Info	**Needed Help** (icon was unclear & not intuitive)	**Needed Help** (icon was unclear & not intuitive)	Completed
3- Navigate from the Home screen to Notifications	Completed	**Completed but Slow** (took time to locate bell icon)	Completed
4- Navigate from the Home screen to Add a new medication	Completed	Completed	Completed
5- Save the medication and return to Home	**Completed but Confused** (uncertain which button returns to Home)	**Completed but Confused** (Cancel button low contrast; unclear which button returns Home)	Completed

5.2 Results & Discussion

User C completed all tasks efficiently with no errors, confirming that the prototype is usable for individuals with average smartphone experience.
In contrast, Users A and B —representing elderly users with limited familiarity— encountered several usability challenges that affected visibility, navigation, and button recognition consistent with documented interaction patterns for this demographic [4].

In **Task 1**, both users struggled to notice the "Don't have any accounts? Sign Up" link due to its small font size and low contrast light blue color. This aligns with research showing that reduced contrast and small text negatively affect readability for older adults [1, 2].

In **Task 2**, neither User A nor User B recognized the three-line menu icon as a path to Personal Info. Older adults generally rely on more familiar and concrete icons, such as a profile silhouette, rather than abstract navigation symbols [2, 4].

In **Task 5**, both users were confused on the Alter screen because multiple buttons ("X", "Thank, I got it", "Cancel") lacked clear meaning. The low-contrast Cancel button caused additional difficulty for User B due to his visual limitations. This confusion stems from ambiguous labeling and low visual salience, which are known to create hesitation and errors in interfaces for elderly users [2, 3].

Despite these issues, all participants easily located the **Add New Medication** button, indicating that the main action flow is clear.
Users A and B recommended larger text, higher-contrast buttons, and more recognizable icons feedback consistent with accessibility guidelines for elderly populations [2, 3].

6. Conclusion and Future Work

6.1 Conclusion

The evaluation demonstrated that the prototype is usable for individuals with moderate smartphone skills but requires adjustments to better support elderly users, who are the primary target audience of the medication reminder application.
The most significant usability challenges were related to:

- Low-contrast text and buttons
- Small font sizes
- Unclear or unfamiliar icons
- Ambiguous navigation on the confirmation screen (Alter)

These issues directly align with known accessibility barriers documented in gerontechnology literature [1, 2, 4]. Despite these challenges, all participants were eventually able to complete core tasks, indicating that the overall structure and workflow of the app are functionally sound.

6.2 Future Work

To improve usability for elderly users, the following enhancements are recommended:

1. **Increase contrast and font size** for links and essential interactive elements, implementing specific visual design guidelines proven to enhance readability for older adults [2, 3].
2. **Replace the menu icon** with a universally recognized profile icon, addressing the recognized need for concrete symbolism in senior-friendly interfaces [2, 4].
3. **Redesign the Alter screen** to use clearer labels such as "Return to Home" instead of ambiguous buttons, thereby reducing cognitive load and potential error [2, 3].
4. Add **voice-assisted navigation** as a multimodal input option for users with low visual ability or dexterity limitations, aligning with inclusive design principles for vulnerable populations [3].
5. Conduct further usability tests with a larger and more diverse cohort of elderly participants to validate these design improvements statistically [4].
6. Develop a **high-fidelity prototype** and, eventually, a functional version of the app to test the reliability and user experience of real-time reminders in a more ecologically valid setting [4].

These targeted improvements, grounded in our evaluation findings and supported by established research and guidelines [1-4], will significantly increase the application's accessibility, user satisfaction, and task success rates, ensuring it effectively meets the needs of its intended elderly audience.

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