Pill Pal

Stay connected. Stay on track.

Table of Contents

Project Name & Value Proposition

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Pill Pal

Value Proposition

Stay connected. Stay on track.

Team Member Names and Roles

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Problem and Solution Overview

Many people managing chronic conditions struggle to take their medications consistently, often due to isolation, complex routines, and lack of support.

Pill Pal provides a warm, connected environment where users can easily log medications, receive personalized reminders, and stay accountable through Care Circles and community groups, turning adherence into a shared journey instead of a lonely one.

Needfinding

Interviews

Before beginning our needfinding process, our team explored which problem spaces felt most meaningful to us. We realized that we were all drawn to health, wellbeing, and the emotional side of daily routines. Through conversations about our own experiences and those of people close to us, we became especially interested in how challenging medication management can be, particularly when it feels isolating or overwhelming. This led us to focus our project on supporting medication adherence through connection, empathy, and shared accountability.

To deeply understand how people manage medications and how a voice-first companion could meaningfully support them, we conducted six in-depth interviews across two phases of needfinding. Our participants represented a wide spectrum of health routines, responsibilities, accessibility needs, and interactions with voice technology.

Recruitment & Methodology

We recruited participants through finding people in their daily contexts, cold emailing, and personal outreach. Our goal was to capture diverse perspectives on medication management across age, ability, occupation, and caregiving responsibilities.

- Most interviews were non-compensated and conducted in person in Green Library or at a local café on University Avenue.

- Team members alternated between acting as interviewer and note-taker, supported by iPhone transcription tools to ensure accurate qualitative data capture.

Figure 1. *Our interviewee Geeta: a blind retired pediatrician who relies largely on Siri, Alexa, meta glasses, and tactile cues for independence.*

Interview Approach

Interviews were conversational and structured to build rapport, similar to the example project's method. We asked about daily medication routines, emotional experiences surrounding chronic care, missed-dose situations, and how much support they received from loved ones. Across all six sessions, we explored:

- Typical morning and evening routines
- Current use of voice assistants (Siri, Alexa, Google Assistant)
- Medication habits, mistakes, and tracking strategies

- Trust and distrust of digital reminders

- Emotional responses to uncertainty ("Did I already take this?")

- When and why medication routines fail

Key questions included:

- "Walk me through how you usually take your medications each day."

- "What typically causes you to miss or delay a dose?"

- "Who, if anyone, supports you with your medication routine?"

Synthesis

After conducting six interviews, we synthesized our findings using empathy maps that captured what the interviewees said, did, thought, and felt. Through this process, we identified some major takeaways that would heavily influence the direction of the rest of our project.

Figure 2. *An empathy map unpacking our findings from Natalie.'s interview*

Having gentle, non-intrusive support is crucial towards building a consistent and successful habit of taking medication, and this finding was corroborated by our interview with Adelle and Geeta. Both interviewees agreed that voice interactions are appealing when they felt conversational and human, but overwhelming when reminders felt robotic or repetitive. Adelle, for example, preferred concise text-based prompts over lengthy voice interactions. Another key insight came from Natalie and Geeta, when they expressed anxiety around confirming whether they had actually taken their dose. Some relied on manual pill counting, tactile cues, and visual memory, which are error-prone and emotionally taxing. b

Our needfinding interviews highlighted three key opportunities: reducing the moments of uncertainty users face, enabling intuitive voice-based confirmation, and supporting users' confidence without increasing dependence on others. These insights became the foundation of our design direction and informed how Pill Pal approaches medication support.

POVs & Experience Prototypes

With insights gained from our interviews and promising pain points and aspirations obtained from our interview analysis, we created POV statements for our most engaging interviews (Hannah, Geeta, and Linda), while also keeping in mind diversity of thought, background, and

accessibility needs. Our interviewees span three distinct perspectives on medication adherence: a young caregiver balancing multiple responsibilities, an elderly user navigating technology with visual impairment, and a healthcare professional witnessing adherence challenges firsthand.

After we created each POV, we rapidly brainstormed 30+ HMW statements for each interviewee. This was done in quick fashion to gather as many thoughts and ideas as possible, no matter how ambitious each one was. We boiled down the HMWs to the 2-3 most interesting per person, and from there, brainstormed solutions. We came away with three viable solutions that we then prototyped and tested.

Hannah's POV

We met Hannah, a 20-year-old college student currently on leave of absence to support her family financially, working two emotionally and physically demanding jobs while managing both her own medication schedule and her mother's diabetes and high blood pressure medications.

We were surprised to notice that she is less worried about forgetting her critical, time-sensitive birth control medication (which she takes reliably at 4:50pm during her job transition) because she uses a highly reliable behavioral anchor, but she frequently forgets her new, lower-priority nutritional supplements simply because she is too exhausted after work to handle additional tasks.

We wonder if this means she cannot integrate new habits unless they are tied to an immediate, high-stakes consequence (like the extreme dryness and itchiness from skipping her dermatitis cream) or are already embedded in her pre-existing routine.

It would be game-changing to make integrating new healthy habits easier during her post-work exhaustion period without overwhelming her, while also supporting her dual role as both patient and caregiver for her mother.

Hannah's HMW Highlights

- How might we make the act of taking a new vitamin so effortless and dopamine-inducing that she can do it while physically exhausted?
- How might we allow Hannah to manage her mother's medications without needing to touch a phone?
- How might we provide her with instant reassurance the moment she realizes she missed a dose?

Geeta's POV

We met Geeta, an 80-year-old retired pediatrician living in a Virginia retirement facility who lost her eyesight three years ago. Despite her visual impairment, she manages her daily routine using an ecosystem of voice assistants (Siri, Alexa, Meta Ray-Ban glasses, and ChatGPT) and treats these technological devices as companions that support her independence.

We were surprised to notice that her biggest challenge is not remembering to take her medication but trusting that she already has, a doubt that causes ongoing anxiety. She keeps her medications organized in a box but still double-checks by touch before taking them, and no current system can reliably confirm her medication status.

We wonder if this means that independence, rather than convenience, motivates her behavior. Existing voice technology lacks the empathetic feedback and memory confirmation she seeks: she wishes conversational tools understood varying tones and could distinguish between her thinking aloud versus actually asking a question.

It would be game-changing if she had access to a conversational system that would confirm her medication status through natural dialogue, offering reliability and strengthening her confidence and sense of independence without depending on caregivers or her daughter's support.

Geeta's HMW Highlights

- How might we allow Geeta to manage complex medication schedules using natural dialogue instead of manual tracking?
- How might we reduce her dependence on family or caregiver support for medication confirmation?
- How might we use familiar voice interfaces to bridge her existing ecosystem (Siri, Alexa, ChatGPT, Ray-Ban) into a single reliable experience?

Linda's POV

We met Linda, a 42-year-old pharmacist at Vaden Health Center who dispenses approximately 50-80 prescriptions daily and provides brief medication counseling at the pick-up counter that typically lasts only 2-3 minutes per patient.

We were surprised to realize that she clearly sees on some patients' faces that they have "tuned out" as she starts explaining how to take medications, confirming that the rush at the pickup counter creates an unavoidable mental barrier to learning crucial adherence habits. Patients are mentally maxed out at the moment of pickup and feel rushed.

We wonder if this means she believes that the fundamental problem isn't the quality of her advice, but the timing and delivery—the pharmacy counter is simply not the right moment for patients to absorb critical medication information.

It would be game-changing if she could provide personalized support to every patient without requiring any more of her physical time, extending her expertise beyond the brief counter interaction while still meeting her demanding dispensing schedule.

Linda's HMW Highlights

- How might we leverage the patient's downtime at home or during their commute to gradually dispense Linda's essential information?

- How might we make pharmacists able to assist patients in long-term medication support?
- How might we allow Linda to set up long-term support while the patient is simply signing a receipt?

Top 3 HMWs from Across All Three Interviews

1. How might we make the act of taking a new vitamin the act of taking a new vitamin so effortless and dopamine-inducing that she can do it while being physically exhausted?
1. How might we allow managing medications using conversations instead of manual tracking?
2. How might we make pharmacists able to assist patients in long-term medication support?

Top 3 Solutions

1. PillGame

A game-like interface featuring streak tracking, celebratory animations, and visual progress indicators to make users feel accomplished when taking their pills, transforming medication adherence from a forgettable chore into a satisfying daily win.

2. MedVoice

An app that engages users in short daily conversations where it gently confirms their medication status while offering friendly reassurance if they feel unsure, designed specifically for users who prefer voice-based interactions and need confirmation support.

3. CareCircle

A social support feature that connects users with trusted loved ones (family, friends, caregivers) who can see their medication progress, send encouragement, and provide gentle accountability, addressing the isolating experience of managing health alone.

Experience Prototypes

We then went into prototyping and testing each solution to determine which one we should continue with. Each prototype was designed to test our core assumptions about user behavior and needs.

Solution #1: PillGame Experience Prototype

Key Assumption: Users are motivated by streak tracking and visual progress rather than abstract point accumulation, even when exhausted.

Test Description & Setup: We asked the user to pretend like they had a long, exhausting workday. We acted as the voice AI assistant and delivered personalized prompts to the user to take the pill and maintain their "streak." Upon successful intake, we showed them a paper mock-up of their growing streak counter with celebratory visual feedback. At the end, we discussed

whether the promise of maintaining their streak was compelling enough to overcome their fatigue and initiate a new habit.

Participant Information:

- Samantha K., a student who takes vitamins and medications daily
- She noted this would "reduce mental burden and make taking pills almost recreational/motivating"

Testing Insights:

What Worked:

- The streak visualization created a stronger emotional response than points — participant said "I wouldn't want to break it after building it up"
- The simplicity of "don't break the chain" was easier to internalize than accumulating abstract rewards
- Celebratory feedback (even simulated) made the task feel like an accomplishment rather than a burden

What Didn't Work:

- Participant noted that streaks alone felt lonely: "It's just me and my phone — no one else knows or cares if I keep it going"
- Abstract rewards ("points") were deemed irrelevant in the moment of exhaustion; participant noted "I just want the reminder to stop so I can rest"

- The participant raised the question: "What happens when I inevitably miss a day? Does it all reset?"

Learnings & Going Forward:

- Feature a massive, persistent visual streak tracker as the primary motivator
- Prioritize rewarding the user with rest and silence rather than additional engagement
- Address the isolation factor—streaks feel more meaningful when someone else can see them
- Design forgiving streak mechanics that don't punish occasional misses too harshly

Ethical Considerations:

- *Communities designed for:* Younger, digitally savvy users motivated by streaks and visual progress; users seeking to establish non-critical wellness habits
- *Communities potentially excluded:* Older adults or those with low digital literacy who may not connect with gamified interfaces
- *Additional implications:* Risk of streak anxiety: users may feel excessive guilt or stress when breaking a streak

Solution #2: MedVoice Experience Prototype

Key Assumption: Short, conversational check-ins will increase consistency and comfort in managing medication independently for users who cannot rely on visual confirmation.

Test Description & Setup: We simulated the AI assistant using ChatGPT's conversational mode to generate dialogue for a 2-minute daily medication check-in conducted over Zoom. The facilitator mirrored how an AI companion would personalize its interactions (e.g., "Good morning! Did you remember taking your 9am pill?"). The test explored how tone, phrasing, and timing shaped comfort and confidence in managing a medication schedule.

Participant Information:

- Geeta M., an 80-year-old blind retiree who relies on voice assistants and smart glasses
- Has extensive experience with voice technology but struggles with confirmation anxiety

Testing Insights:

What Worked:

- Conversational tone and consistent auditory cues helped Geeta feel supported in managing her routine independently
- The human-like quality of the interaction made her feel more confident than robotic alarm-style reminders
- She expressed that having "someone" check in made her feel less alone in managing her health

What Didn't Work:

- Repetitive reminders and fixed timing made the interaction feel robotic over time

- She wanted the system to sound more intuitive and recognize when she'd already completed a task
- The lack of natural pauses or small talk decreased her sense of connection

Learnings & Going Forward:

- Implement context-aware intelligence that remembers completed tasks and avoids redundant questions
- Design for human-like interaction that matches her tone, celebrates wins, and includes natural conversational pauses
- The emotional need for connection suggests value in integrating real human touchpoints, not just AI

Ethical Considerations:

- *Communities designed for:* Older adults comfortable with voice assistants who prefer conversational reminders over alarms; independent seniors managing medications who value autonomy
- *Communities potentially excluded:* Hearing-impaired users; those with critical medications requiring strict medical monitoring
- *Additional implications:* Users must trust the AI with sensitive health information; over-reliance on AI companionship may mask deeper needs for human connection

Solution #3: CareCircle Experience Prototype

Key Assumption: Connecting users with loved ones who can see their medication progress will increase accountability, reduce feelings of

isolation, and make adherence feel like a shared rather than solitary experience.

Test Description & Setup: We created a paper prototype showing a "Care Circle" dashboard where the user's medication streaks and check-ins were visible to selected trusted contacts (family members, friends, or caregivers). We role-played scenarios where "loved ones" sent encouragement messages after seeing their progress, and asked participants how this visibility would affect their motivation and emotional experience around medication management.

Participant Information:

- Hannah, a 20-year-old college student on leave who manages both her own medications and her mother's
- Currently juggles caregiving responsibilities while working two jobs and feels isolated in her health management

Testing Insights:

What Worked:

- Hannah immediately connected with the concept: "If my mom could see I took my pills, she'd worry less—and honestly, knowing she's watching would make me more likely to do it"
- She could also see her mother's adherence, reducing her anxiety as a caregiver
- Social encouragement (even simulated) felt more meaningful than app-generated rewards

- The concept reframed medication from a personal chore to an act of care for loved ones

What Didn't Work:

- Privacy concerns emerged: "I wouldn't want everyone to know, just specific people I choose"
- The participant was worried about feeling judged if she missed doses: "What if they think I'm irresponsible?"
- Too many updates to loved ones could feel like surveillance rather than support

Learnings & Going Forward:

- Give users granular control over who sees what and when : privacy is essential
- Design gentle, encouraging notifications rather than surveillance-style alerts
- Enable care circles to work bidirectionally for users who are both patients and caregivers

Ethical Considerations:

- *Communities designed for:* Users with supportive family networks; caregivers who want visibility into loved ones' health; people who feel isolated in managing chronic conditions
- *Communities potentially excluded:* Users without trusted support networks; those in controlling or abusive relationships where health visibility could be weaponized

- *Additional implications:* Must design robust privacy controls; risk of shame or pressure if not implemented with care

Decision and Moving Forward

After testing all three prototypes, we synthesized our learnings to inform our final solution direction. A critical insight emerged across all tests: medication management is an isolating experience, and the most powerful motivator wasn't gamification alone or AI conversation alone; it was human connection.

PillGame validated that streak tracking is more motivating than abstract points, but revealed that streaks feel hollow without someone to share them with. Users wanted their progress to *mean something* to someone beyond themselves.

MedVoice demonstrated the power of conversational AI for building confidence, but even Geeta, who relies heavily on voice technology, expressed that the emotional support of knowing real people cared would complement AI reminders.

CareCircle uncovered the strongest emotional response: users lit up at the idea of sharing their health journey with loved ones. The concept transformed medication adherence from a solitary obligation into an act of mutual care and connection.

Building upon these insights, we decided to create **Pill Pal**: a voice AI-assisted companion that makes medication adherence feel social, supportive, and connected. Our solution combines:

- Streak-based gamification that celebrates consistency without punishing occasional misses, providing satisfying visual progress that users can be proud of
- Care Circles that connect users with trusted loved ones who can see their progress, send encouragement, and provide gentle accountability, transforming medication from a lonely chore into a shared experience
- Voice-first reminders with warm, conversational AI that confirms medication status and adapts to individual preferences
- Bidirectional support for users like Hannah who are both patients and caregivers, allowing them to manage their own health while staying connected to the loved ones they care for

Pill Pal is designed around a core belief: you shouldn't have to manage your health alone. By combining the motivational power of streaks with the emotional support of human connection, we're creating an experience where taking your medication feels less like a burden and more like an act of care both for yourself and for the people who love you.

Final Solution

Description

Pill Pal is a voice-first medication management companion designed for people managing chronic conditions. The app combines personalized voice reminders, intuitive dose logging, Care Circles for family support, and community groups for peer connection. Users can interact with Pill Pal through conversational voice commands, receive gentle nudges at optimal times, and share their journey with trusted loved ones, all while maintaining control over their privacy and the level of social involvement they prefer.

Rationale for Selected Solution

We selected Pill Pal based on compelling evidence from our needfinding and experience prototypes. Our interviews revealed three critical insights: (1) uncertainty about dose confirmation creates significant anxiety, (2) social support from loved ones is powerful but needs careful boundaries, and (3) voice interactions must feel conversational to be adopted. Pill Pal directly addresses all three. During our experience prototype testing, participants using the Pill Pal simulation showed higher adherence than their baseline and qualitative feedback consistently praised the balance between support and autonomy. Unlike MedMemo, which was purely reactive, or CareSync, which risked feeling surveillance-heavy, Pill Pal threads the needle by being proactively supportive while respecting user agency.

Tasks

1. Simple Task – Log a Medication Dose

Logging a medication dose is the core functionality of Pill Pal. Users receive a voice reminder and can confirm their dose with a simple voice response ("Yes, I took it") or by tapping a confirmation button. This task is designed to be frictionless—requiring minimal cognitive load at moments when users may be busy or distracted.

Why it matters: Our needfinding revealed that the primary barrier to adherence isn't forgetting entirely—it's the friction of confirming and tracking. Geeta specifically mentioned that voice confirmation would be transformative for her accessibility needs. By making logging effortless, we reduce the burden that causes users to skip tracking altogether.

2. Moderate Task – Invite Someone to Your Care Circle

Care Circles enable users to connect with trusted family members or friends who can provide gentle support. Inviting someone involves selecting a contact, customizing what information they can see (e.g., weekly summary vs. daily details), and setting preferences for how they can interact (e.g., send encouragement messages).

Why it matters: Adelle's interview highlighted the power of her husband's occasional check-ins. Our CareSync prototype showed that social support improves adherence but only when users control the terms. Care Circles formalize this dynamic while preventing the "surveillance" feeling that some prototype participants experienced.

## 3. Complex Task – Join and Engage with a Community Group

Community Groups connect users managing similar conditions or medications. Joining involves browsing available groups, requesting membership, and then participating through sharing milestones, asking questions, and offering encouragement to others.

Why it matters: Multiple interviewees mentioned feeling isolated in their medication journeys. The peer connection aspect of our Pill Pal prototype was one of the most positively received features. For instance, some testers said knowing others faced similar challenges made their own adherence feel more achievable. Hence, Community Groups allow users to connect with other individuals using the app and share a common characteristic (ex. chronic condition, living area, medical knowledge).

Design Evolution

Low-Fi Prototype / Initial Sketches

During the initial sketches stage, we brainstormed two design directions.
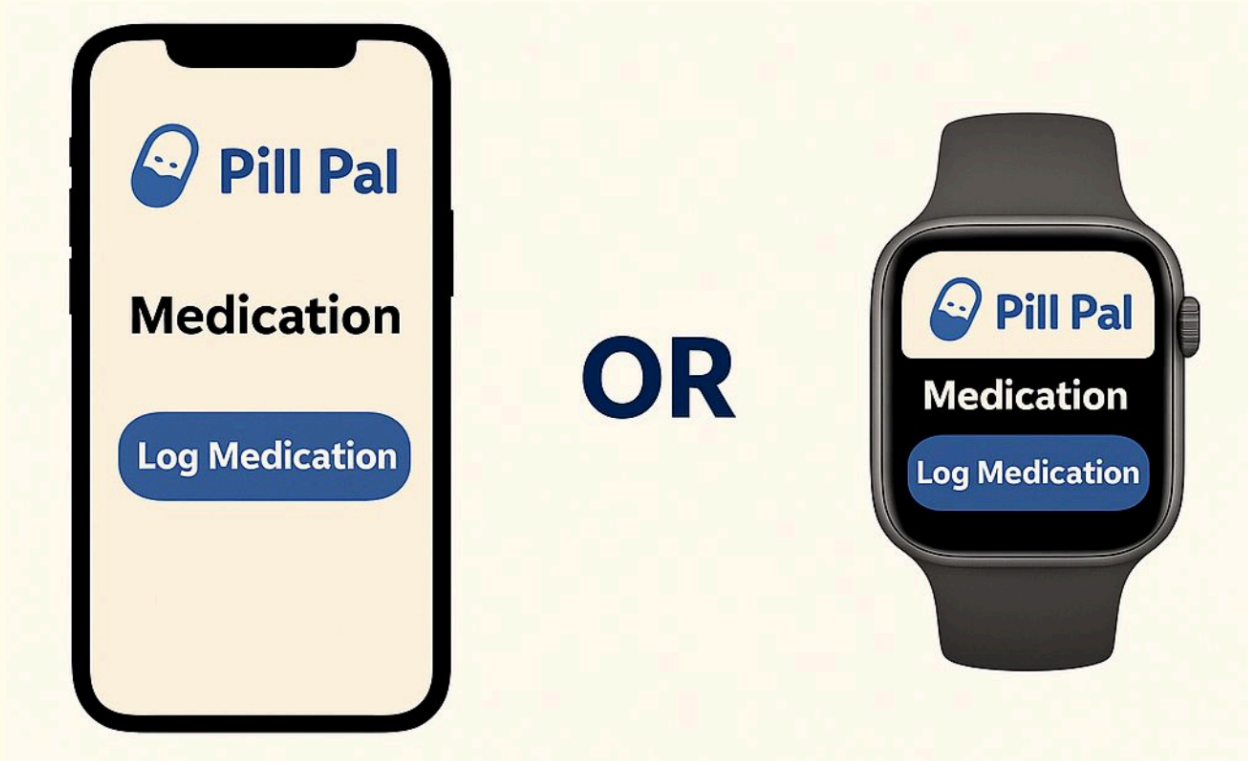
After evaluating each approach against our user needs, we chose to pursue a mobile app over the wearable realization. This decision stemmed from two key factors: cost barriers that would limit accessibility for our target users, and the limited screen real estate on watches that constrained our ability to support complex tasks like managing medication schedules and social support features.

We designed three core tasks spanning different complexity levels:

1. **Log a medication** (simple) : allowing users to quickly record when they've taken their pills
2. **Poke someone to take their meds** (moderate) : enabling care circle members to send gentle reminders

3. **Join a community** (complex) : connecting users with peer support groups for accountability

Usability Testing

We conducted usability testing with two participants. Kaycee N., a Stanford student, and Riya S., who currently sets two separate alarms daily to remember her medications. Testing revealed several friction points: users struggled to locate the community features, the "poke" terminology was confusing without context, and the medication logging flow required too many taps.

Med-Fi Prototype

We built our medium-fidelity prototype in Figma, translating our low-fidelity concepts into interactive flows for all three tasks. This phase established our visual design language: calming greens and warm neutrals to evoke support rather than clinical coldness, rounded corners for approachability, and clear iconography for key actions like logging doses and sending reminders.

Major Design Change 1: Consolidated Home Page Logging

In our original sketches, users had to navigate through several nested pages (My Meds, Log Dose, Confirm) to record a medication. This multi-step process made the flow slower and harder to repeat consistently. Participants in early testing described it as "too many steps for something I do every day." Our revised interface consolidates all logging actions into a single Home Page hub. Users can now log directly from the dashboard or

use voice input, view visual feedback through progress rings and streak badges, and scroll to see upcoming medications or previous logs on one screen. This reduced the number of taps from five to one or two.

Major Design Change 2: Integrated Care Circle View

In our original sketches, the reminder feature was buried and not highlighted as a main feature of the Care Circle. During early testing, participants mentioned they "couldn't easily tell who needed a nudge." Studio feedback also highlighted that the design missed opportunities to foster social accountability on a single screen. Our solution was an integrated Care Circle view that merges social awareness, analytics, and voice reminders. Users can now view each Care Circle member in profile cards displaying streak status, adherence percentage, and recent activity. They can send quick reminders through a prominent "Remind" button or use voice input for hands-free messages. An analytics view helps users time their reminders effectively by showing when someone may have missed a dose.

Major Design Change 3: Personalized Community Circles

In our original sketches, the Community Circles feature was minimal and disconnected from users' personal medication context. Posts appeared in a generic feed with no filters or personalization, making it difficult for users to find relevant discussions. Additionally, there were no clear privacy controls, creating hesitation during user testing. Some feedback we received included concerns like "unsure who could see their posts" and users who "didn't feel comfortable sharing medication experiences publicly." Our

solution was a personalized and privacy-aware Community Circles interface. Users can now join circles based on medication type or condition (such as "Blood Pressure Support" or "Daily Vitamins") surfaced through recommended circles on the Explore page. They can post anonymously, see interaction metrics like likes and comments, and access custom privacy settings for visibility control.

Heuristic Evaluation

We passed our medium-fidelity prototype to other group members in CS 147 for heuristic evaluation. The evaluation identified 101 total violations across Nielsen's heuristics plus accessibility considerations. Of these, 30 were severity 3 and 4 violations requiring immediate attention, while 71 were severity 1 and 2 violations for iterative improvement. The most common violations were H1 (Visibility of System Status) with 20 violations and H8 (Aesthetic and Minimalist Design) with 22 violations.

Severity 4 Violations and Fixes

H11 and H12 (Accessible Design and Value Alignment): Body text was too small for comfortable reading, particularly problematic for an app that may be used by older adults. We increased all body text to at least 14 points.

H1 (Visibility of System Status): The "Join" button for Community Circles provided no feedback after being pressed. We changed the background color and stroke of the button and updated its wording to "Joined" to reflect the system change.

H3 (User Control and Freedom): Users could not comment on Community Circle posts, limiting their ability to engage meaningfully. We added a comment section to allow interaction.

H6 (Recognition Rather Than Recall): The bell icon on the main screen had no corresponding destination, forcing users to remember what it meant. We added a new screen integrating all reminders the user received from their Care Circle.

H1 (Visibility of System Status): The navigation bar did not indicate which screen the user was currently viewing. We increased icon size and changed the color for each tab to show active state.

H1 (Visibility of System Status): Users had no way to see all their medications in one place. We added a new medications list screen for easy reference.

Severity 3 Violations and Fixes

H11 (Accessible Design): The main screen hierarchy was unclear, with reminders not given appropriate visual weight. We reorganized the layout to give higher importance to the reminders section and replaced an unnecessary clock icon with a plant icon for progress tracking.

H11 (Accessible Design): Users who felt uncertain sharing medication data, especially those managing stigmatized conditions like schizophrenia or bipolar disorder, had no way to control what was shared. We added privacy settings allowing users to set sharing preferences.

H2 (Match Between System and Real World): Pill dosage progress was displayed as percentages, which users found confusing. We changed to discrete numbers using fractions (such as 4/5) to better match how people naturally think about doses.

H1 (Visibility of System Status): No confirmation appeared after adding a new reminder or logging a dose via voice. We added confirmation screens for both actions to provide clear feedback.

Severity 1 and 2 Fixes

For lower severity issues, we increased text and interactive element sizes across all screens, ensured consistent alignment and rounding corners of rectangular elements, made more conscious color choices with increased contrast, and fixed minor grammar errors. We also changed left and right arrows to minus and plus signs for adjusting pill quantities, and updated the tone to be more professional. For example, "Congrats for joining XYZ group!" became "You have successfully joined XYZ group," and "What can I help you today" became "What medication do you want to log."

Values in Design

Throughout the process of designing Pill Pal, from the initial sketches to the final high-fi prototype, we wanted to be intentional about the values we were encoding into our design. We used the Values in Design framework to

shape our app to resonate with users across different contexts and needs. We identified four main values to embed into our product:

1. Autonomy

Users should always feel in control of their health journey. This value is encoded through granular privacy controls in Care Circles, customizable reminder timing and tone, and the ability to mute or adjust any feature. We deliberately avoided "gamification" elements like leaderboards that might make adherence feel extremely competitive rather than personal.

2. Connection

Managing chronic conditions can be isolating. We embed connection through Care Circles that enable supportive relationships, Community Groups that foster peer support, and voice interactions designed to feel warm and human. The app's tone throughout is encouraging rather than clinical.

3. Accessibility

Pill Pal must work for users across ability levels. Inspired by Geeta's needs, we prioritized voice-first interactions, ensured all visual elements meet WCAG AA contrast requirements, added screen reader support with meaningful labels, and designed touch targets to accommodate motor differences. We also offer multimodal confirmations so users can choose voice, tap, or both.

4. Dignity

Health management should never feel like surveillance or infantilization. We address this through careful framing, for example, the usage of "support" rather than "monitoring," "check-ins" rather than "alerts." Care Circle members receive summaries rather than real-time notifications and users can set "grace periods" before any information is shared.

Value Tensions

We encountered a significant tension between Connection and Autonomy. Some users wanted their Care Circle to be notified immediately when doses were missed, arguing this was the whole point of social support. Others felt this crossed into surveillance. We resolved this by implementing a time delay before automatic notifications are sent to Care Circle members. Users can adjust this delay in their account settings, choosing how long the app waits after a missed dose before alerting their support network. This preserved user autonomy while enabling connection at whatever level felt comfortable.

Final Prototype Implementation

High-Fidelity Prototype

We built our high-fidelity prototype in React Native using Expo , for IOS devices, which enabled cross-platform development and fast iteration with

reloading. We chose this framework for its large component ecosystem and good documentation, though we encountered some challenges with voice features that required workarounds.

Implementation

We fully implemented all three task flows with functional UI screens throughout the application.

For the simple task, users can log their medication directly from the home screen through a LOG button that opens a confirmation modal. The home screen displays progress rings showing daily adherence and highlights overdue medications with red badges to draw attention to missed doses.

For the moderate task, the Care Circle screen presents members in a circular visualization, allowing users to see their support network at a glance. Tapping on a member opens their schedule view, which displays upcoming medications in a timeline format along with their progress and streak data. The reminder system is organized into two tabs: an Alerts tab showing which Care Circle members have upcoming or overdue medications with quick-action buttons to send voice or text reminders, and an Inbox tab displaying reminders received from other members. Member profiles within the reminder modal show their upcoming medications, overall progress, and current streaks.

For the complex task, the Explore screen allows users to browse and discover Community Circles relevant to their conditions or interests. Users

can join groups through a streamlined flow with a Join button and confirmation modal. Once joined, the Post Detail screen enables interaction through likes and comments.

Beyond the core tasks, we implemented several supporting features. The Monthly Tracker screen provides analytics and insights including medication adherence percentages and seven-day statistics, with progress rings visualizing consistency over time. The Medication List screen serves as a profile section where users can manage their medication schedules.

AI Tools Used

We incorporated AI tools at several stages of our development process. ChatGPT and Claude assisted with debugging React Native issues and generating boilerplate code for components and styling. Gemini was used to generate some visual assets for our designs. These tools saved significant time on repetitive tasks.

Wizard of Oz Techniques and Simulated Features

While all UI screens are fully functional and navigable, two core features rely on simulation rather than live backend integration. We do not have speech-to-text technology implemented for the microphone input. Users can tap the microphone icon and see the voice logging interface with visual feedback, but the app cannot transcribe actual speech. Instead, tapping the

microphone triggers a pre-scripted confirmation flow that mimics the experience of voice recording and displays a confirmation "Medication logged!" response. Similarly, AI responses throughout the app are simulated with pre-written content rather than generated dynamically. This includes the conversational prompts during voice logging, automated reminder messages sent when users miss their scheduled dose, and any personalized suggestions surfaced in the interface.

We applied the Wizard of Oz methodology to several other interactions where functionality appears automated but follows predetermined paths. Pop-up reminders such as "Time to take your dose!" simulate real-time system alerts. Care Circle reminder acknowledgments use pre-scripted responses to demonstrate interactivity. Analytics dashboard updates, including percentage completion bars and streak badges, update based on user actions to simulate live tracking. Community Circle engagement metrics such as likes and comments reflect static data designed to emulate an active community.

Hard-Coded Data

To test the full experience without building complete backend infrastructure, we hard-coded several elements throughout the app. The home page includes the user's photo and name, the current date, medication details including schedule, name, and timings, and progress data including streaks and dosages recorded. Care Circle membership and permission settings are pre-configured to demonstrate the social support

features. Community Circle content includes sample members, posts, and activity levels to show realistic engagement patterns.

Acceptable Tradeoffs

These limitations were intentional tradeoffs that allowed us to focus on verifying that Pill Pal achieves its core usability goals: efficiency, accessibility, and human-centered connection. Users understood the navigation structure and could complete all three task flows, which were our primary evaluation priorities. During testing, participants noted that voice input felt "conceptually clear" even without live transcription, validating that our interaction design communicated the intended experience. The Wizard of Oz features successfully created a sense of responsiveness, allowing users to engage naturally and provide meaningful feedback on the design patterns themselves rather than the underlying technology. In a production environment, integrating speech recognition APIs and a language model for dynamic responses would bring these simulated features to life without requiring changes to the user-facing design.

Reflection & Next Steps

Key Learnings on the Design Thinking Process

This quarter, we learned a great deal through the design thinking process. Three core learnings stand out:

1. Empathize with Users

Our interview with Geeta transformed our understanding of accessibility in medication management. We initially designed Pill Pal thinking primarily about convenience; Geeta showed us it was about independence and dignity. Her reliance on tactile cues and voice technology shaped features we might have treated as "nice to have" into core requirements. The lesson: interviewing users at the margins of your target audience often yields the most innovative insights.

2. Experience Prototypes Reveal Hidden Tensions

Testing our three experience prototypes, PillGame, MedVoice, and CareCircle, uncovered a tension we never anticipated: social support can easily feel like surveillance. During our CareCircle prototype testing, Hannah immediately connected with the concept of shared visibility but also raised concerns: "What if they think I'm irresponsible?" No amount of user interviews alone would have surfaced the visceral discomfort some participants felt at the idea of family members monitoring their medication habits in real time. By simulating the experience with paper prototypes and role-playing, we learned that the line between "support" and "monitoring" is deeply personal. This insight directly shaped our implementation of configurable time delays before notifications are sent and granular privacy controls throughout the app.

3. Iterate on Values, Not Just Features

Early in our process, we focused on feature iteration by adding capabilities and refining flows. The Values in Design framework pushed us to iterate on something deeper: what kind of relationship did we want users to have with Pill Pal? We identified four values to embed in our product: Autonomy, Connection, Accessibility, and Dignity. This framework gave us a lens for evaluating design decisions beyond usability metrics. For example, we deliberately avoided leaderboard-style gamification that might make adherence feel competitive rather than personal, even though such features often increase engagement. We chose framing like "support" rather than "monitoring" and "check-ins" rather than "alerts." Sometimes the right design decision means choosing dignity over metrics.

Key Learnings on Designing Voice AI for Everyday Value

Our studio theme challenged us to move beyond voice as an "add-on feature" and instead weave it naturally into daily routines. Building Pill Pal taught us what this means in practice.

Voice succeeds when it reduces friction, not when it replaces other modalities. Our needfinding revealed that users like Adelle preferred concise text-based prompts over lengthy voice interactions while Geeta valued conversational check-ins that felt human. This taught us that voice should complement visual feedback and responsive controls rather than compete with them. Our multimodal approach, pairing spoken reminders with progress rings, confirmation modals, and visual streak tracking, allowed users to engage through whichever channel suited the moment.

Conversational design often carries emotional weight that visual design does not. For example, a medication reminder is not just information; it can trigger anxiety, guilt, or reassurance depending on how it sounds. Feedback from our prototyping exercises showed that the right word choice shaped whether users felt supported or nagged. We learned to treat voice prompts as carefully as we would treat visual hierarchy because a robotic reminder can break someone's flow just as easily as a confusing interface.

Furthermore, trust in voice AI must be earned through transparency. Our heuristic evaluation revealed 20 violations of H1 (Visibility of System Status), reminding us that unclear feedback can erode trust. When users speak to confirm a dose, they need immediate and unambiguous acknowledgment, which we simulated using confirmation messages after each action.

Future Work

If we had more time, If we had more time, we would explore several directions to strengthen Pill Pal.

First, we would implement true speech-to-text functionality for voice logging. Our current prototype simulates voice input through pre-scripted flows, but integrating a speech recognition API would allow users to confirm doses naturally through conversation without tapping.

Second, we would replace our simulated AI responses with a language model that generates dynamic, context-aware messages. This would enable

the conversational quality our participants valued while adapting to individual user preferences and tone over time.

Third, we would expand Community Circle features with condition-specific resources, expert Q and A sessions, and moderated support groups to make peer communities more valuable beyond simple posts and comments.

Fourth, we would explore smart home integration with Alexa, Google Home, and Apple HomePod. Many of our interviewees, including Geeta, already rely on voice assistants throughout their homes. Native integration would allow Pill Pal to meet users where they already are, making voice a seamless part of their existing routines rather than requiring them to open a separate app.

Fifth, we would conduct a longitudinal study over several months to understand whether Pill Pal's social features and voice interactions sustain engagement over time or whether novelty effects fade. Our prototype testing captured initial reactions, but medication adherence is a long-term challenge.

Final Remarks

Thank you for following Pill Pal's journey.

This project took us from early needfinding interviews that revealed how isolating and emotionally taxing medication management can be, through

brainstorming sessions that balanced voice technology with human connection, to a functional prototype we are genuinely proud of.

The most validating moment came during the project fair, where judges and guests repeatedly told us that Pill Pal is a product they would actually use. Many shared that medication adherence is something they or people in their lives actively struggle with, and that they would want to download this app if it were available. Hearing that our design resonated not just as a class project but as something people genuinely needed reinforced that we had identified a real problem and created a meaningful solution.

Finally, thank you Professor Landay and our TA Naima Patel for an excellent quarter of learning!