CS 147 Final Report

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Accessing Healthcare: Kith&Kin

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Project Value Proposition

Our group was in the Accessing Healthcare studio focused on creating and leveraging technology that will make healthcare more accessible and equitable for everyone. As a team, we decided to focus on the access to holistic health resources and community for parents and families.

Team Roles

Tenzin Dolkar - Developer

Esi Korantemaa Donkor - Designer

Haven Whitney - Developer/Designer

Problem and Solution

The problem addressed by our project is the isolation and feelings of overwhelm parents face as they begin to raise children, leading to detrimental mental and physical health effects. Our solution is to provide parents greater access to in person communities: guidance, empathy, and shared experience improves parent and child health.

Needfinding

Interviews

We interviewed seven parents, healthcare professionals, and educators. In the first round of interviews we recruited: Cat, a pediatric resident at Lucille Packard working across the board with clinics and hospitals; Mohammed, a Diversity, Equity, and Inclusion (DEI) educator & father of 2; and Emma, an early childcare educator and professional & mother of two. In the second round, we interviewed Adrienne, an early childhood educator and mother of three; Kelli, an early childhood educator & mother of two; Kathleen, a high school educator serving patients at Lucille Packard; and Jiwon, an immigrant, recent PhD graduate, and new mother.

We recruited these participants by contacting personal networks, institutions traditionally frequented by parents and child caretakers, and nearby healthcare workers for interview requests. We conducted the majority of interviews in persona, interacting at outdoor, nearby cafes, or on site at Bing Nursery school. We interviewed two participants over Zoom.

Analysis

We synthesized need finding data by assigning values to key points and quotes from interviews:

- Empathy: Child patients want to be treated as people, not just “sick kids” by their healthcare providers.
- Timeliness: Parents need to stay informed and professional opinion to determine urgency of concerns.
- Early support: There’s a steep learning curve to parenting and most feel unprepared.

- Community : Guidance, empathy, and shared experience improves parent and child health.

POVs and Experience Prototypes

POVs and HMWs

Of our seven participants, we generated POV statements for each one. However, in our transition to the next phase of generating How Might We (HMW) statements, we focused on three in particular: Emma, Cat, and Jiwon. These statements and several HMW questions for each are listed below.

Emma

We met Emma, a seasoned teacher at a nursery and recent first-time pandemic mom of two. We were surprised to notice that, although she says she believes in the expertise of doctors and credentials from healthcare providers, when it comes to her children she doesn't trust them if she doesn't feel a personal connection. We wonder if this means that empathy is just as important as knowledge when it comes to the healthcare experience for first-time parents. It would be game-changing for Emma to be able to access empathetic, personalized care from a trusted source.

In order to better help Emma, we wondered:

- How might we make first-time parents excited rather than stressed?
- How might we make parenting advice more personalized?

- How might we expose parents to a variety of parenting frameworks?

Cat

We met Cat R., a third year pediatric resident working in both clinic and hospital settings. We were surprised to notice that, despite the large percentage of non-English speaking people in the area, it can be very difficult to locate an interpreter for patient visits, which often is correlated with worse health outcomes. We wonder if this means that language barriers can significantly worsen patient experiences and/or health outcomes. It would be game-changing to help Cat communicate with all of her patients effectively.

For Cat, we thought:

- How might we employ more people who speak rare indigenous languages and get them certified and involved?
- How might we make it easier to monitor your health at home/for low income patients?
- How might we follow up on patients once they leave the hospital?

Jiwon

We met Jiwon, a first time mother of a 13 month old and busy, recently graduated PhD. We were surprised to notice that she felt she didn't measure up to other parents, despite how much effort and love she puts into her child's care. We wonder if this means lack of connection to or isolation from other parents can lead to unrealistic expectations for first-time parents. It

would be game-changing if parents had a way to feel secure and confident in their own parenting while experiencing a sense of community with other first-time parents.

After Jiwon's interview, we wondered:

- How might we create a more collaborative and supportive parent network that prevents comparison among parents?
- How might we make it easier for new mothers to exercise and regain their strength postpartum?
- How might we make first-time parents feel more confident in their care and knowledge?

Top Solutions

Extended brainstorming on more how might we statements and solutions for the ones we had come up with left us with roughly 45 solutions. We performed several rounds of voting with each team member picking their favorite set of solutions, with the number of votes allotted decreasing with each round. Eventually, we were left with our top three solutions to bring into the experience prototyping phase.

The first solution was a community-building platform to connect families 1-on-1 or in groups. Through this app, parents would be able to find emotional and communal support through local events or matching based on similar profiles, while simultaneously children can form new friendships from all backgrounds with the children of other parents within the community.

The second solution we pursued was a collaborative and holistic wellness dashboard. This could then be shared and made accessible to all caregivers of the child, including nannies, grandparents, or any other guardians. This would both serve as a one-stop resource for all information regarding the child's care, while also serving to help alleviate the burden of responsibility from a sole caregiver, as we noticed in our interviews that mothers often felt overwhelmed by the labor expected of them and had no time to care for themselves.

Finally, the third solution was a meal planner for infants to help parents build nutritious and varied meals for several eating frameworks, dietary preferences, and developmental stages of the child. This also was focused on alleviating stress from caregivers by reducing overall decision fatigue, as taking care of a newborn while also researching healthy meals can be difficult for new parents.

We then took these three potential solutions and used each as a basis for an experience prototype experiment.

Experience Prototypes

Community App

With this experience prototype, the critical assumption we sought to address was that people are willing to share parenting experiences with strangers. To that effect, we decided to set up short, “blind date” style meetups between strangers who happened to both be parents. As the end goal of this app would be to connect parents to in-person communities and resources, we went to a public area (Tresidder Memorial Union) and asked potential participants if they would be willing to have a 15 minute conversation with another parent over coffee. We offered participants a few conversation topics to discuss if they’d like and had them fill out a survey describing their experience and how likely they would be to want to do something similar again afterwards.

We were gratified to learn that participants expressed much interest in more chances to connect in this way. They seemed to have no trouble and felt comfortable speaking to a stranger, and one wrote that they thought such an app would be very helpful while trying to build

community in a new neighborhood or city. However, we felt that the completely random aspect of the prototype didn't capture the ability to choose the community a user feels most affinity to that we wanted to include in the app, and as such we had participants at very different places in their parenting journeys. This helped us realize the importance of self-selection and providing filtering options if we were to continue developing this app.

Health Dashboard

After reviewing our solution for the health dashboard, we surmised that our critical assumption was that tracking and monitoring health is relatively painless and can be easily added to a person's day. In order to verify this, we created a sample tracking log on a sheet of paper. This pseudo-dashboard included several questions related to monitoring a child's overall health, including sleep, nutrition, exercise, and mental wellness for both the caregiver and the child. We asked several participants to fill these out to the best of their ability and memory of the day and

then answer a few quantitative questions measuring the ease of use of the log, how long it took them, and whether they believed they could find time to complete it everyday.

Our team found this prototype very useful in determining how long it would take the average person to enter information into the dashboard. We also found that participants thought it was useful as well, as one participant said she would have found it very helpful in monitoring her newborn's health. However, the prototype didn't offer much high resolution detail into the wellness of the child or caregiver as it asked fairly simple, scalar questions. The insight we garnered from this was that many more fields and areas for elaboration would need to be developed to create a true, holistic picture of the child's care.

Meal Planner

Our critical assumption was that users find meal planning to be a helpful tool that reduces the stress of feeding their child. Thus, the goal of this experience prototype was to emulate simplified meal planning in a potential solution.

In the experience prototype, we offered participants photos of individual ingredients based on their dietary preferences (fruits, vegetables, etc), suggested simple meals based on the chosen ingredients, then asked them to plan one day of meals using the images provided.We recruited participants at Tresidder Memorial Union, a busy eating and gathering place in the center of campus. Paula, a mother of two and the primary meal planner of her household, volunteered to participate in this prototype. She emphasized that she was often looking for new recipes for her family, making her a great candidate.

Positive aspects of the prototype were its tactile and intuitive approach, and participant feedback that it was more useful than stressful. Negative aspects included participant desire for more choices for ingredients and a lack of data specific to our critical assumption from the prototype. The implications of our results was a need to curate a wide range of ingredients and meals, while focusing more narrowly on nutrition in infant and toddler developmental stages to maintain a feasible scope.

Design Evolution

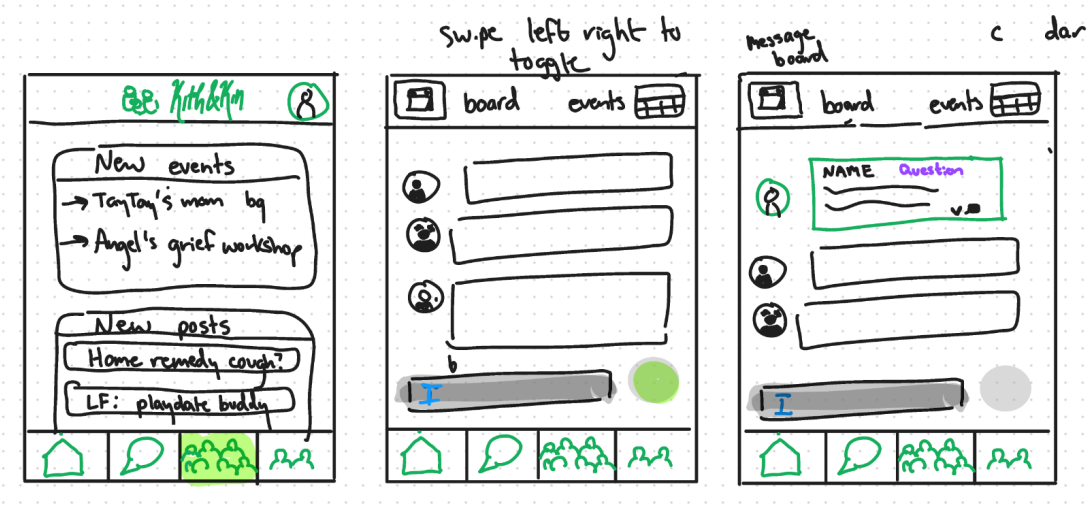
The final solution chosen was the parent-matching and community building app. The importance of community was a consistent theme across interviews. As we probed parent support networks and wellbeing, we found most if not all of our participants expressed that they'd have liked a larger community during the early and stressful periods of parenthood.

Moreover, there are many avenues we can explore to create community and improve mental health for not only parents, but also for children.

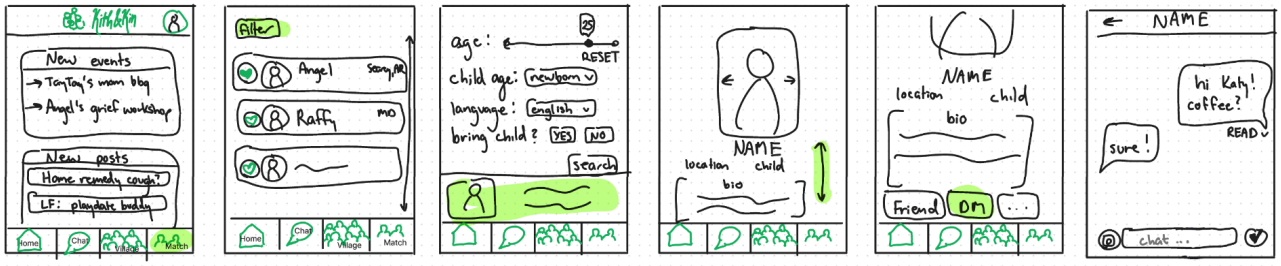
To realize the product, we considered an augmented reality tool and mobile application. While AR is an innovative and untapped market with potential for an intuitive interface for non-tech savvy parents, AR hardware is often expensive and has yet to see mainstream adoption: in a 2021 Morning Brew-Harris poll of US adults across generations and income levels 72% of people were neutral or unexcited about virtual and augmented reality. Consequently, AR technology is overall less accessible and used. Since our goal is to create a community app for parents and families, we decided that having a wide and easily accessible user base would be vital to the creation and strength of connection between parents.

Tasks

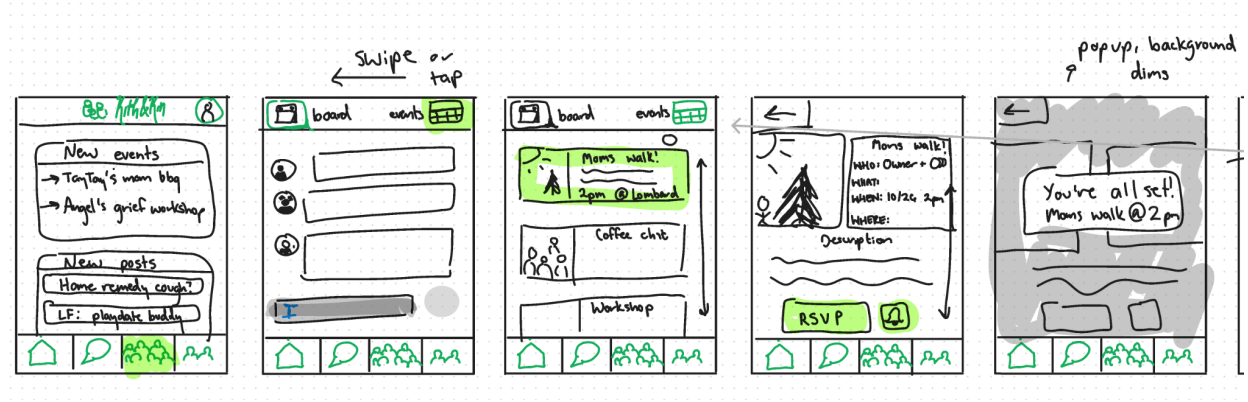
Our simple task for users was to publish a post or question on a community board. As the entire focus of our app is for parents to find communities and resources with each other, we thought it would be best that users of our prototype started out attempting to do just that.



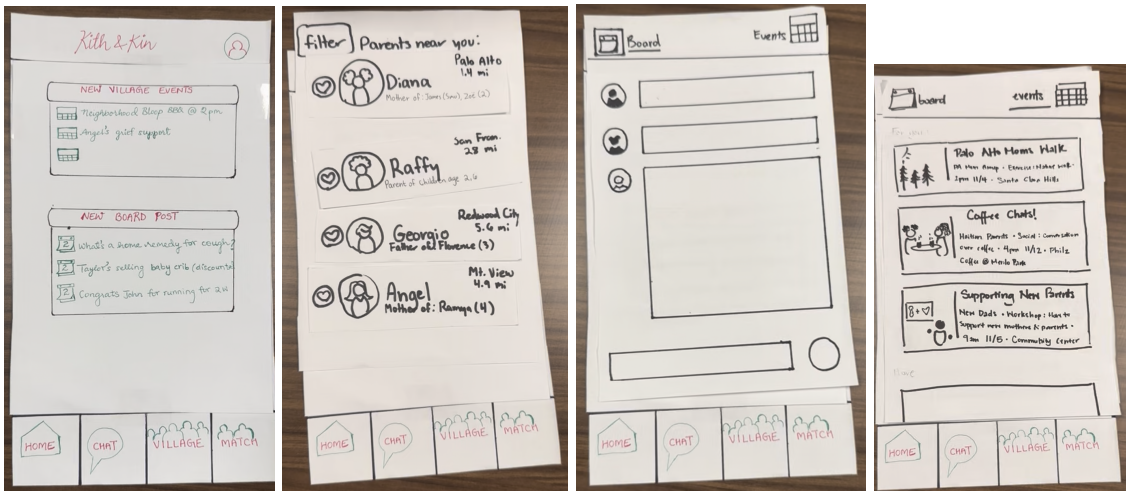
The moderate task is to find and send another parent a direct message (DM). We anticipate that one-on-one communication will be just as important as public forums in the use of kith&kin. Further, through this task flow users are able to see more information about a user including whatever they're inclined to share, such as interests, more on their children, what they're looking for out of the app, or anything else.

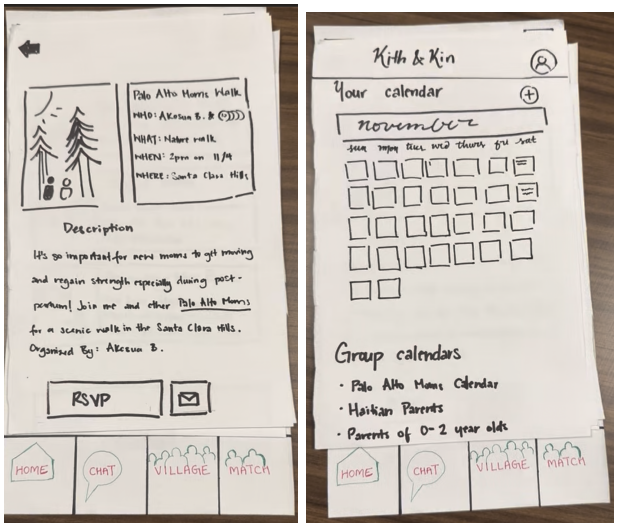


Finally, our complex task was to find and RSVP to an event. This will facilitate users getting off the app and into real life social scenes. As found during our needfinding phase, feeling socially connected and emotionally supported by people who are physically present has a strong positive effect on parents' mental health and overall feelings of well being.


New events
→ TayTay's mom bbq
→ Angel's grief workshop
New posts
Home remedy cough?
LF: playdate buddy
Swipe or tap
board
events
Moms walk!
2pm @ lombard
Coffee chat
Workshop
Moms walk!
WHO: Owner + OD
WHAT:
WHEN: 10/26 2pm
WHERE:
Description
RSVP
popup, background dims
You're all set!
Moms walk @ 2pm

Low fidelity UI





Evaluation technique:

With one person acting as a facilitator, a "human computer," and another the record we set up paper screens of a selection of screens in the UI that made up the 3 key tasks.

We tested with a single screen in front of the user, with all other screens facing the human Computer and moved to the user when selected. All participants were recorded as they were

presented with our three tasks and asked to complete them with minimal to no guidance from the facilitator. The facilitator provided additional guidance in response to questions or user confusion.

Results:

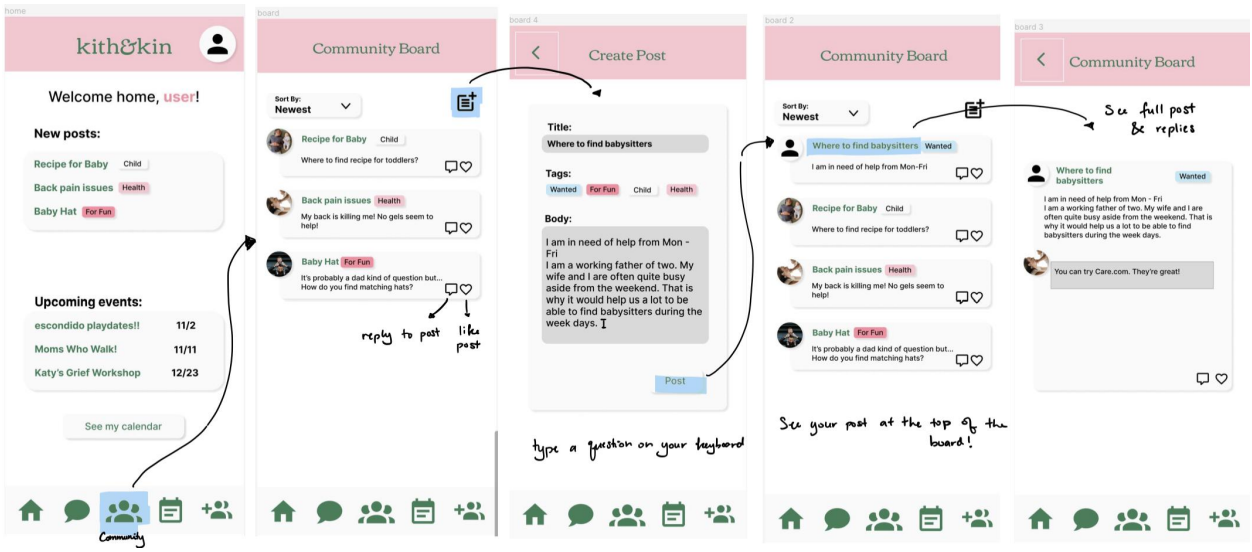
Participants found the proposed graphical app layout intuitive and aesthetically pleasing. The most significant barrier to ease of use was navigating to the events and community board.

In response, we used eliminated terms and icons that users may not have encountered or for which they would have existing conceptual models that did not fit our app.

- The village tab which encompassed events and community board was divided into 2 tabs for each
- Terms like match and friend were replaced with connect for consistency
- Shorthand phrase DM was replaced with a button labeled “Message”; the icon to send a chat message which resembled the email icon was replaced with a button labeled “Send”

Medium fidelity

To create the medium fidelity prototype we refined our design by creating style guidelines, including fonts, icon vectors, and a color palette with associated meanings. We digitized our low fidelity sketches and updated them with participant feedback from testing. We also added elements like sorting and search options to parse profiles and events and tags to label community board posts.



We used usability heuristics to evaluate our medium fidelity prototype. Analysis of heuristic violations revealed 3 key areas of improvement.

- Consistency and aesthetics: Visibility issues (ex. Distinguishing the background color, making buttons more clear); Alignment/polish consistency
- Clarity: No visible system update with regards to screen change; Meaning of icons were unclear; Chat history did not display message timestamps
- Error prevention: Event RSVP was final after a single-click with no confirmation or cancellation; Posts to a community board were public and permanent after a single click

Detailed discussion of all severity 3 and 4 violations

Severity 4

1. H3 User control and freedom: There is no way to delete a post or edit a post once you've made one.

Given that this limits the user's ability to recover from common mistakes, we added buttons to delete and edit posts on the community board.

2. H6 Recognition not Recall / Severity: 4. Task: Ask a question on a community board. Description: There are only profile pictures and no names associated with each post.

   We added usernames to each community board post.

3. H6 Recognition rather than Recall / Severity : 4 / Found by: A, B, D. Task: Ask a question on a community board. Description: The user has no way to determine which posts are theirs visually, besides by remembering their profile picture and title. There is no centralized location to see all of your posts.

   We will be implementing a page on profile where the user can see all their posts.

4. H6 Recognition not Recall / Severity: 4 / Found by: D. Task: Ask a question on a community board. Description of the problem: It is hard to remember that in order to make a new post on a community board, I have to click new posts in order to then see the full community board, where I then have an option to make a new post

   We eliminated the new posts preview to minimize confusion. To ask a question, users click on the community board tab, then click the make a post button.

5. H8 Aesthetic and minimalist design / Severity : 4 / Found by: A, D. Task: Ask a question on a community board. Description: On the home page, for New Posts, the button area is too large. The entire home page has weird spacing and is not visually appealing.

   We eliminated the home page. The home button leads users directly to events.

6. H12 Value Alignment & Inclusion / Severity: 4 / Found by: D. Task: Ask a question on a community board. Description of the problem: I feel that this platform feels very parent focused, less room for guardians / other caretakers to feel included (even in the lingo of an event like “moms who walk”)

   We prioritize users being able to make and title their own events, however will encourage inclusive language in community guidelines. We also encourage users to create events that cater to their specific identity group i.e. “mom”.

7. H2 Match between system and the real world / Severity: 4 / Found by: B, C, D. Task: Find and connect with a parent by sending a DM. Description of the problem: Moving from the DMs page to pressing the DM to view it, leads me back to the contact page not the DM contents.

   Clicking on a chat opens the chat.

8. H4 Consistency & Standards / Severity: 4 / Found by: D. Task: Find and connect with a parent by sending a DM. Description of the problem: It is super confusing what the difference between the Connect tab and the Chat tab is especially when there has been no DM sent i.e. when you go to the DM tab there is no option to connect with a new person.

   We made no changes here as linking the connect page within chat may increase confusion. Chat displays existing chats. Connect allows users to browse other users and message them. This is part of the app design that we expect users to learn with familiarity.

9. H1 Visibility of System Status / Severity: 4 / Found by: D. Task: Search for and RSVP to an event nearby. Description of the problem: What happens when you click the RSVP button is / entails is not clear / predictable

   RSVP explanation can be found in the app guidelines (ReadMe).

10. H4 Consistency and Standards / Severity: 4 / Found by: A, B, C. Task: Search for and RSVP to an event nearby. Description: On the event page, there is still the make a post button. It doesn't belong there.

    We kept the make new post and make new event button the same for consistency.

11. H4 Consistency & Standards / Severity: 4 / Found by: D. Task: Search for and RSVP to an event nearby. Description of the problem: Not clear what the more tab means, is it more from the community? Like all the community events not tailored to you or is it more tailored events?

    We eliminated the for you and more sections, unifying the list of events.

Severity 3

12. H1 Visibility of System Status / Severity: 3 / Found by: B, C. Task: Ask a question on a community board. Description: There are no numbers next to the comment and heart icons on each post, even though the "Where to find babysitters" post has one reply.

    We added counters (numbers) next to the like and reply buttons on each post.

13. H6 Recognition rather than Recall / Severity : 3 / Found by: A. Task: Ask a question on a community board. Description: On the Community Page, there's no way of seeing which posts you've already opened and seen.

    We want to model the community board after a real life push pin board or existing social media app. Moreover, graying out opened posts discourages users from going back to posts and prompts them to read every single post to gray them all out: this conflicts with our model and intended use.

14. . H9 Help Users w/ Errors / Severity: 3 / Found by: D. Task: Ask a question on a community board. Description of the problem: It is not clear what qualifies as a valid or relevant post for a user. & H1 Visibility of System Status / Severity: 3 / Found by: A. Task: Find and connect with a parent by sending a DMDescription: On the Connect tab, there is no indication of the criteria for why certain profiles are displayed, causing confusion about the relevance of the profiles shown (Zeinab, Kofi, Ruth, Raffy).

    Relevant users and posts would be determined by the Kith&Kin algorithm. Users can use filters and tags to search for more specific types of posts.

15. H1 Visibility of system status / Severity: 3 / Found by: A. Task: Find and connect with a parent by sending a DM. Description: On the Connect Page where you can search for users, we get a lot of results but we are given limited information on the person besides their location, making it hard to make a decision on who to pick.

    We did not change the profile previews since displaying more information would clutter the page, making information harder to glean.

16. . H3 User Control and Freedom / Severity: 3 / Found by: A, C, D. Task: Find and connect with a parent by sending a DM. Description: Users cannot delete their chats or unsend messages. Rationale: A user might want to delete a message for privacy reasons or unsend a message that they mistakenly sent. & H12 Value alignment and inclusion/ Severity: 3 / Found by: C Task: Find and connect with a parent by sending a DM. Description: The camera button for sending pictures is enabled from the onset of a new direct message, which could lead to privacy violations.

    We built the chat function off of basic text messaging so users will not be able to do this for now, but possibly in future updates to the app.

17. H11 Accessible Design / Severity: 3 / Found by: B. Task: Find and connect with a parent by sending a DM. Description: The font size for the locations of recommended users to connect with is much too small.

    We increased font sizes.

18. . H3 User Control and Freedom / Severity: 3 / Found by: A, B, C, D. Task: Search for and RSVP to an event nearbyDescription: There is no way to cancel an event that you RSVPed to.

    Users can now click on an event to which they have RSVPd and click on the RSVP button to be prompted with an RSVP cancellation confirmation.

19. H5 Error Prevention / Severity: 3 / Found by: A. Task: Search for and RSVP to an event nearby. Description: When a user clicks RSVP, they automatically RSVP Yes, but maybe that’s not the response they wanted to give.

We chose not to include RSVP maybe and no because an organizer of an event would not need and or want to know this information from a large group of app users.

20. H7 Flexibility and efficiency of use / Severity: 3 / Found by: A, D. Task: Search for and RSVP to an event nearby. Description: There is no way to search for or filter events, you just have to see all the events at once.

    We added a search option to events.

21. H8 Aesthetic and Minimalist Design / Severity: 3 / Found by: A. Task: Search for and RSVP to an event nearby. Description: The event description page has chunks of text which is difficult to read all at once quickly

    Partitioning event descriptions and user biographies into sections limits user control and freedom; we decided to prioritize making these personal by allowing users full control.

Values in Design

In constructing our app, we discovered several key values that were essential to our vision that we wanted to intentionally embed in its design. One of the most prominent of these values was the promotion of health and wellness, as the goal of kith&kin is to increase holistic and social health. To do this, we focused on engaging with a minimal visual aesthetic that is aligned with many other modern health and wellness apps, as well as by promoting content for wellness events and community that can be discerned from the first read of the home page. Ideally, most events posted by users of the platform would be geared towards this same goal.

Our application is fundamentally social, and as such we wanted to make sure we prioritized both inclusion and community safety for all of our users. To do this, we included many options to customize your experience and social network, including filtering new parents by things such as language, age, child developmental stage, proximity, and more. We also in a further iteration would want to include moderation features such as blocking and reporting and instilled community guidelines that must be agreed upon before being allowed to create an account.

Finally, we wanted to emphasize the importance of in-person, human interaction and connection. Our goal with our app is not to keep people on it but rather to help them leave it and get out and build a supportive community in the real world. To that end, we included multiple avenues of communication, including posting on community boards and direct messaging other parents, while also prioritizing in-person communication through events. We found this goal of connection came into conflict with our goals of safety, as we have to inevitably limit some types and quantities of connection and communication in order to best protect our entire user base. However, we found that this wasn't an undue trade off given how highly we value the aforementioned values.

Final Prototype

Framework and Tools

The final prototype was coded using React Native to allow for seamless export across devices. To use React Native, we coded in Visual Studio Code and used Node.js and Expo to run a server on our local machine that could then be connected to either from a mobile emulator or

device to use the application. This allowed for real-time development and quick iteration. We used GitHub for collaboration and version control.

Finally, we used a third-party package called gluestack-ui as a resource for the content of the application. Gluestack-ui, the successor to a similar package called NativeBase, is an unstyled library of common and useful components often used in web and mobile applications. All of their components are inherited from simple, base React components and have a standardized set of attributes to customize their functionality and appearance. As they are unstyled, they can fit seamlessly into any theme or application, making them particularly useful in our work for the quick construction of functionality like search bars, dropdown menus, and more.

Limitations: Hardcoded and Wizard-of-Oz Techniques

Much like our medium fidelity prototype, there were several elements in our high-fidelity prototype that we had to simulate or otherwise hardcode to present the intended functionality of our application. The messaging system, for example, is stored locally and resets upon reload rather than being a fully-fledged networking solution. We thought it would be more important to showcase the intended feature of being able to connect with another parent than to work on less-relevant details, like message encryption and database structure and storage of conversations between every possible combination of users. Similarly, the list of parents available to message is hard-coded, with no way at this time for a new user to sign up. This is again due to the social nature of our app that is hard to replicate in an isolated, standalone prototype. We performed the same curation of events on the home page.

Finally, user settings and authorization are all nonfunctional as well. Ideally, in a full application the user would have the ability to change their privacy settings, have access to moderation features such as a block list or the ability to report others, as well as be able to change their profile information visible to other users.

Conclusion

Reflection

Overall, our team felt we grew and learned a substantial amount about the design thinking process, what it means to make a good user experience, and the overarching issues we discussed in the studio about healthcare accessibility. Through lecture and hands-on experience, we learned that design thinking is a problem-solving approach that focuses on understanding the needs and perspectives of users to create innovative solutions. Our experience interviewing participants showcased the varied set of desires and ways to solve a particular problem and that there is no one right answer, only an infinite number of potential solutions. The iterative design and prototyping process demonstrated that refinement is never finished, and that a larger sample size and more rounds of changes help to make the top websites and applications as good as they can be.

Next Steps

While we are quite proud of our progress in developing kith&kin, we are nowhere close to achieving our full vision. If we had more time to work on the platform in the future, we'd like

to continue adding features that are as of now only simulated. This means finalizing the backend to allow for dynamic changes to the events, parent profiles, and community boards. We'd also like to include the option for multiple community boards, perhaps separated by groups or affiliations.

Further, we'd like to add more moderation and safety options as mentioned above in the discussion on values in design. Having the ability to block and report as well as mandated user guidelines that can be used to remove people from the community if they act against its interests would go a long way to improving overall safety and inclusion. Other features we'd love to add include adding more integration to the calendar, creating a suite of push notifications for various triggers on the app, more fleshed-out filtering options, and full multi-user support.