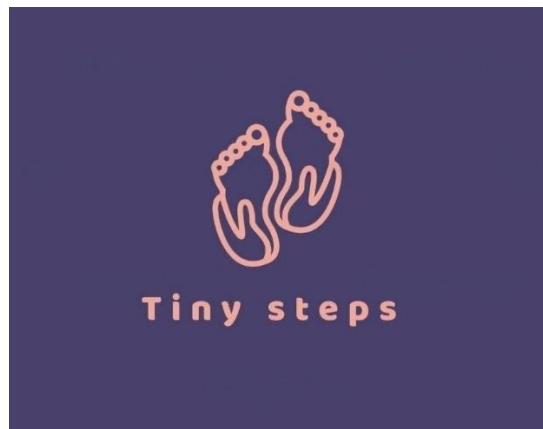


King Saud University
College of Computer and Information Sciences
Information Technology Department
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Phase 3&4: Prototype, Testing



Project Name: Tiny Steps

Section Number: 54989

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1- Problem statement:

It is no surprise the parenting journey can be difficult. Parents today face many issues, such as balancing work and family life. Which often leads to neglecting to engage with and monitor their child's growth. Additionally, due to this digital age, plenty of conflicting online advice can confuse parents to find effective advice and helpful platforms for donating or recycling items their children no longer need, resulting in cluttered spaces. Finally, there is a thirst for knowledge about local parenting workshops; however, attendance challenges outweigh their curiosity. In short, the primary challenges parents face today are mainly due to the lack of accessibility.

2- Methodology:

to understand our targeted user demographic more effectively, we conducted eight interviews and a questionnaire. From our discussion, we decided to target two main samples: new mothers who are seeking all the advice they can receive, and experienced mothers or mothers of multiple children who are willing to share their knowledge and expand their expertise. Our goal through the interviews and questionnaire was to figure out the behaviors and motivations of our users and how we could implement features that would cater to their needs.

To ensure a comprehensive understanding of our samples, we conducted in-person interviews with mothers of varying numbers of children, thereby encompassing a wide range of experiences and perspectives. We asked ten questions each to find out the gaps in resources in parenting they encounter and identify the preferred support/content sources, which would reveal patterns that can help the app connect users with trusted resources, peer support, or expert opinions. Additionally, one of our general questions was to assess literacy levels to ensure that our application's features were tailored for varying literacy levels.

To conduct the questionnaire, we created an online survey to reach as many mothers as possible and shared the link through WhatsApp among discussion groups specifically for mothers. The questionnaire consisted of ten questions: the first three questions were curated to identify which sample the respondents belong to, while the remaining questions assisted in gathering insights into parents' needs, preferences, and challenges regarding parenting. These questions aimed to gather specific areas of interest or concern among parents, helping us create relevant content and resources. Additionally, we aimed to understand the preferred format for receiving information (such as articles, videos, podcasts, etc.) to ensure the presentation of information is in the most accessible and engaging way possible. Finally, we wanted to determine the best channels (such as email, social media, etc.) to keep our users informed and connected.

3-Results

Interview results

From the interviews, several challenges emerged for parents regarding managing their children's growth, disposing of outgrown equipment, and finding reliable parenting advice. The most frequently cited issue was the difficulty in disposing of items that were still in good condition. Many parents struggled to find organizations that accept all types of baby equipment or recipients who needed them. Emotional attachment to certain items further complicated disposal, and concerns about damage or loss during transportation were common.

Another recurring theme was the inconsistency of online parenting advice. Parents were overwhelmed by conflicting opinions and repetitive content across various websites, which often did not address their specific concerns and led to confusion. Many were frustrated with the idealistic nature of online advice, which did not align with the practical challenges they faced.

In terms of buying, selling, or exchanging items, parents focused on clothes, toys, and strollers. Clothes were frequently purchased due to rapid growth, while strollers and toys were often sold or exchanged after brief use. This highlights a need for a platform that facilitates the easy exchange or sale of lightly used items, helping parents save money and reduce waste.

Tracking children's developmental milestones was also a challenge. Parents frequently forgot important information, such as vaccination dates or growth stages, and expressed a need for a centralized system to log and monitor their child's development.

Attendance at workshops and events was hindered by busy schedules or forgetfulness. Some parents missed events due to lack of prior knowledge, inconvenient timings, or distant locations.

The findings indicate a strong need for a reliable platform that offers expert advice, community support, and practical features. This platform should provide access to professional parenting advice, facilitate the donation or exchange of baby equipment, and offer reminders for important workshops and developmental milestones. Overall, parents expressed a desire for an all-in-one solution that combines professional support with community engagement, making the parenting journey more manageable and connected.

Appendix A: Interview

Interview questions:

Q1: How many children do you have?

Q2: Are you able to read and write?

Q3: What are the issues you face when disposing of your baby's outgrown equipment?

Q4: What types of items do you most frequently buy, sell, or exchange for your child? (e.g., clothes, toys, equipment)

Q5: What are the troubles you face with finding baby advice online?

Q6: Where do you typically go for parenting advice or support?

Q7: How do you currently stay informed about local events and workshops relevant to parents and their children?

Q8: What are the reasons you miss events or workshops you plan to attend?

Q9: What challenges do you face in keeping track of your child's growth and development?

Q10: Have you ever been unsure about your baby meeting milestones? What support would help?

1- Interview

Interviewee: Badreyah.
Interviewer: Norah.

A1: I have two children.

A2: Yes, I am fully capable of reading and writing.

A3: One of the biggest challenges I face is not having a clear or convenient place to donate the equipment that my child no longer uses. I often struggle to find organizations that accept these items.

A4: I frequently buy and exchange children's clothing, toys, baby bags, shoes, and other related items. These are the most commonly needed things as my child grows.

A5: One major issue is the repetition of the same content across different websites. I often come across the same information, making it difficult to find anything new or particularly useful that adds to my knowledge.

A6: I usually turn to my mother, who has a lot of experience, for advice. Additionally, I sometimes rely on social media for support and tips from other parents.

A7: I mostly rely on TV and online forums that are specifically tailored for mothers. These sources often provide information about upcoming events or workshops for parents.

A8: The primary reason is the lack of a reliable reminder system for these workshops, which often causes me to forget about them. Additionally, my work schedule can be demanding, making it hard to find time.

A9: One of the main challenges I face is forgetting key developmental milestones, and unfortunately, there's no system in place to remind me about these stages, which would be helpful.

A10: Yes, for example, when my child was late in walking or teething, I felt uncertain and worried. The only support that helped me was visiting the nearest hospital to seek medical advice. It would be great if there were more accessible resources or guidance available for parents in such situations.

2- Interview

Interviewee: Khawla.

Interviewer: Norah.

A1: I have three children.

A2: Yes, I can read and write.

A3: It's difficult to find a suitable place for recycling or donating them. Also, my children's emotional attachment to these items makes it harder to get rid of them.

A4: I frequently buy clothes because my children are growing, and I also buy toys as I don't want my children to always focus on their phones.

A5: The advice can sometimes be unreliable or contradictory.

A6: I turn to my mother or experienced people, and I also search on social media for advice.

A7: I stay updated on workshops and events through social media, and my friends and relatives inform me when there are events or workshops that could benefit my children.

A8: Something may come up that causes me to miss these events or workshops, or they might conflict with my work schedule.

A9: I face difficulty remembering and keeping track of important dates like vaccinations and regular checkups. Sometimes I worry if my child's development is progressing normally compared to others.

A10: Yes, sometimes I feel concerned. Getting advice from experienced people or medical support could help me.

3- Interview

Interviewee: Fatimah.

Interviewer: shooq.

A1: I have five children.

A2: Yes.

A3: It is often difficult to dispose of them if they can still be used, so I look for charities or someone in need. If they are worn out, I just dispose of them.

A4: I buy anything for my child, personal things such as baby bottles or underwear, and sometimes items that can be reused, like expensive clothing for visits only worn once or twice, or devices like baby bottle sterilizers and strollers.

A5: I don't have any issues online; it's just that there are multiple sources of information. Every time I search, I find more answers.

A6: Usually specialists and doctors.

A7: Since most of my children are teenagers, when I look for a workshop or event, it needs to be targeted toward teens. I stay informed through advertisements, messages from WhatsApp groups, brochures, a friend, or by searching on social media.

A8: If they clash in timing with my important tasks or work; also, if the location is quite far. But if they are online, I don't have problems attending.

A9: Sometimes due to life's busyness, I forget to follow up. For example, whether I've organized enough time for sleep or a proper diet—life gets in the way and I forget.

A10: Yes! At one point, I felt my child wasn't growing enough, and the support that helped me came from the advice of everyone, including doctors and specialists, and through check-ups.

4- Interview

Interviewee: amal.

Interviewer: shooq.

A1: I have four children.

A2: Yes.

A3: Getting rid of unconsumed or excess items is always frustrating for me due to the difficulty in finding people in need. I don't want to throw away anything that another mother could benefit from.

A4: Mostly toys and clothes, and sometimes strollers like baby walkers.

A5: My biggest problem is when I can't find an answer that directly corresponds to my question. Sure, the internet is full of information, but the available answers don't always address my specific inquiries.

A6: I go to my mother and my sisters.

A7: Honestly, I don't keep up due to the pressure of my job, but when announcements about workshops come out at work, I attend.

A8: Time and not knowing about them in the first place.

A9: Not knowing if my child's growth is slow is normal and sometimes forgetting to follow up.

A10: Yes, I felt this many days, especially with my first child! The support I needed the most was all kinds of advice.

5- Interview

Interviewee: Ebtisam
Interviewer: Noura.

A1: I have four children.

A2: Yes.

A3: There are no organizations that accept all the equipment, and some items are still in good condition, so I can't dispose of them. Some things get damaged by heat, or children's chairs might break during transportation or get lost.

A4: Clothes, educational toys, shoes.

A5: There's a lot of conflicting opinions. Every mother has a different opinion, which causes confusion.

A6: From trusted sources, such as reliable children's channels or specialists. I don't take advice from just anyone.

A7: I follow them through social media and from acquaintances.

A8: Due to being busy, I forget the dates.

A9: Each child's growth is different, and conflicting opinions make it hard to know which information is accurate.

A10: Yes, because children differ, and I can't apply one experience to all. Specialists clarifying the growth stages accurately and scientifically would be helpful.

6- Interview

Interviewee: Khawlah

Interviewer: Noura.

A1: I have four.

A2: Yes.

A3: I can't easily find people who need these things, so I have to give them to charities, but I don't know how they handle them or how they transport them.

A4: Clothes, toys, strollers, and other equipment like children's chairs, etc.

A5: Excessive idealism and lack of realism in addressing problems.

A6: I consult experts and doctors, as well as some accounts related to children.

A7: Through social media.

A8: Sometimes I forget the time, and sometimes they are not convenient.

A9: There's no reliable, dedicated place where I can get all the information, so I end up reading from different places and encountering various studies and theories, which causes confusion and lack of focus. Even doctors sometimes give different answers.

A10: Yes, especially since I care for my baby, and I need to be more cautious to ensure there are no issues. A place that gathers accurate medical and scientific information would help me avoid confusion from conflicting sources.

7- Interview

Interviewee: amal.

Interviewer: Reema.

A1: I have 5 children.

A2: Yes, I am able to read and write.

A3: I can't return or dispose of it because of the memories attached to those items.

A4: I frequently buy age-specific toys and clothes.

A5: I encounter issues related to behavioral or health concerns.

A6: I usually go to social media for parenting advice and support.

A7: I stay informed by searching online.

A8: I often miss them due to being busy and not knowing the dates or details of the events.

A9: I struggle with a lack of knowledge about child development information.

A10: No, I believe in giving each age its time and not rushing. Reading, researching, and having reliable sources for this information helps me.

8- Interview

Interviewee: souad.

Interviewer: Reema.

A1: I have 2 children.

A2: Yes, I am able to read and write.

A3: There isn't a suitable platform for donating items for children, and they are in good condition with minimal usage.

A4: I frequently buy clothes because they grow quickly and toys.

A5: I find it difficult to get reliable information because children are in a sensitive stage, and advice may vary from child to child.

A6: I usually go to my mother or sister, who are experienced mothers.

A7: I stay informed through advertisements on social media platforms and TV ads.

A8: The distance and the cost of events can be prohibitive.

A9: I face challenges due to being busy and not noticing the stages of my child's growth.

A10: Yes, consulting a doctor and getting their advice regarding the child's growth would be helpful.

B-Questionnaire result:

We discovered a great deal about the parenting issues and preferences of the 80 participants based on their responses. The age range of most of respondents' children is from 1 to over 6 years old, and they are over 40 and between 31 and 40 years old. 67% of respondents indicated a strong desire to learn more about behavior and discipline; 58% were also interested in health and nutrition-related topics, and 45% wanted to study about child development.

Unexpectedly, only a small percentage of those responding—55 percent—said that, considering their hectic schedules, virtual workshops would be more practical. This emphasizes how important it is for parents to have flexible, easily available learning options for developing their parenting and have a healthy life style with their children .

In summary, respondents are primarily focused on improving their knowledge in areas such as behavior management and child health, with a preference for online resources. There is potential for creating affordable, accessible, and practical parenting workshops to meet their needs.

Appendix B: Questionnaires

Questionnaires questions:

Q1: what is your age ?

Q2: Do you have children ?

Q3: What is the age of your child/children ?

Q4: What topics would you like to learn more about regarding parenting?

Q5: What is your preferred format for receiving parenting information ?

Q6: How do you prefer to receive information about children-related activities or events ?

Q7: What are the main challenges you face as a parent ?

Q8: Do you believe that the experiences of other parents can compensate for a lack of information from experts ?

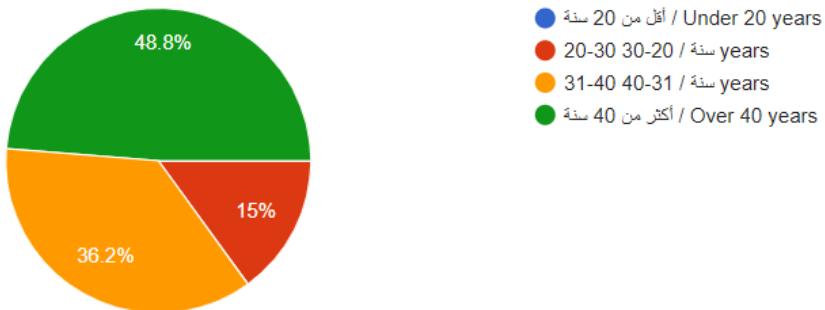
Q9: How important are events and workshops to you as a parent ?

Q10: What sources do you rely on for parenting information ?

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1. ما هو عمرك؟ / what is your age? ?

رداً 80



1 Figure

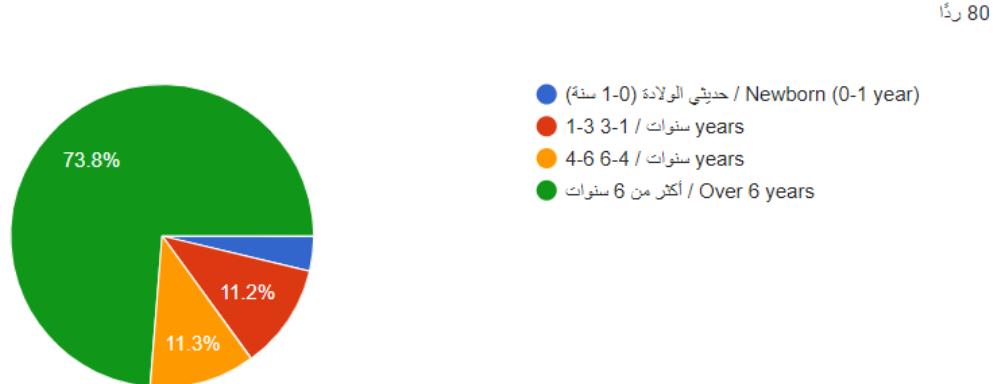
2. هل لديك أطفال؟ / Do you have children? ?

رداً 80



2 Figure

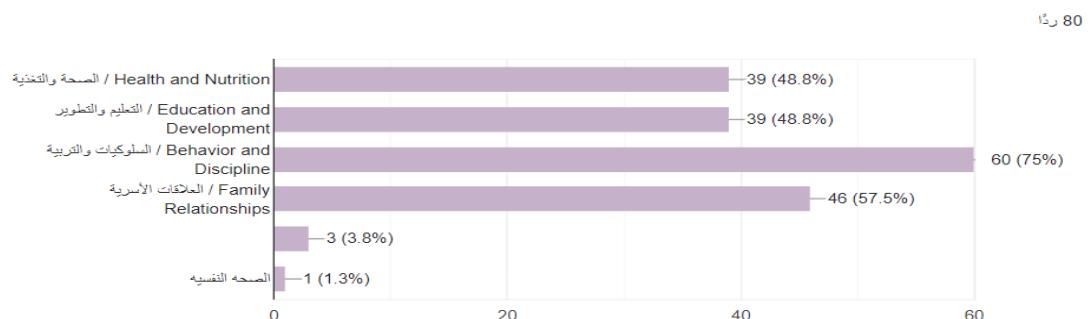
3. ما هو عمر طفلك/أطفالك؟ / What is the age of your child/children? /



3 Figure

نسخ

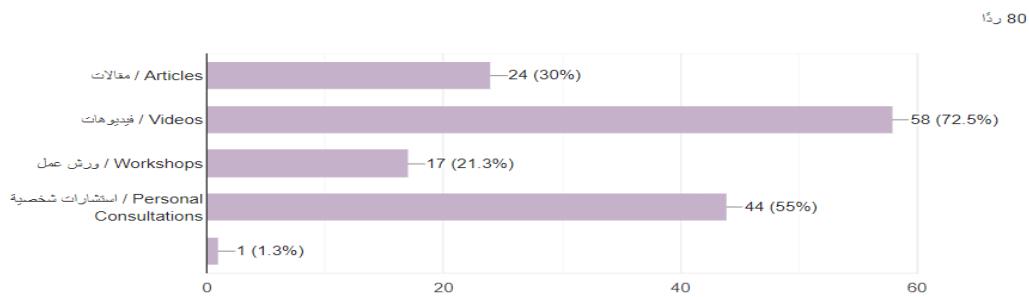
4. ما هي المواضيع التي تود معرفة المزيد عنها فيما يتعلق ب التربية الأطفال؟ / What topics would you like to learn more about regarding parenting



4 Figure

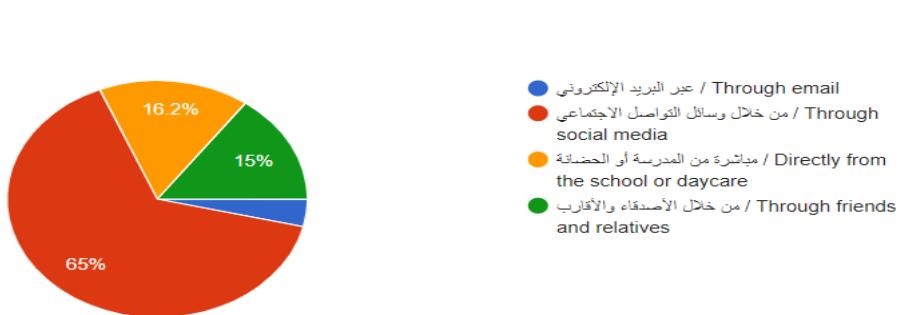
نسخ

5. ما هو الشكل المفضل لديك للحصول على المعلومات حول تربية الأطفال؟ / What is your preferred format for receiving parenting information



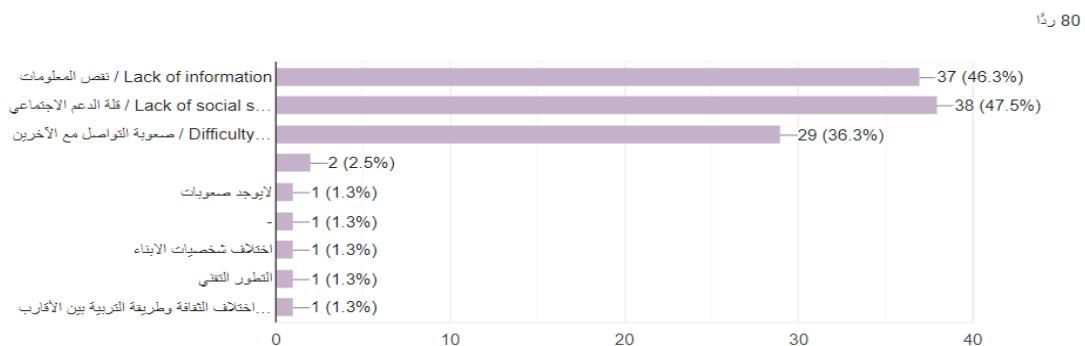
5 Figure

6. كيف تفضل الحصول على المعلومات حول الأنشطة أو الفعاليات المتعلقة بالأطفال؟ / How do you prefer to receive information about children-related activities or events



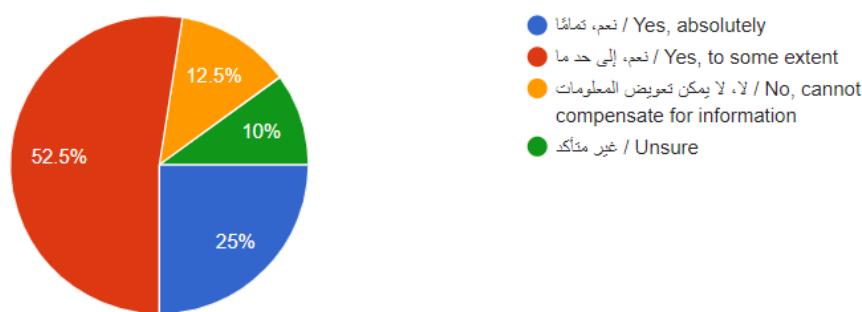
6 Figure

7. ما هي التحديات الرئيسية التي تواجهها كوالد؟ / What are the main challenges you face as a parent



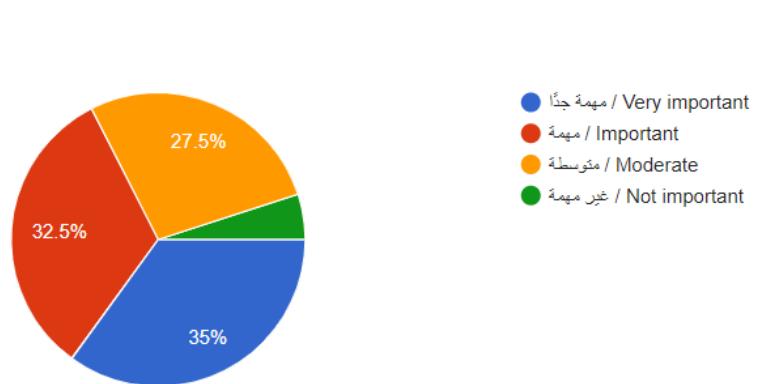
7 Figure

8. هل تعتقد أن تجارب أولياء الأمور الآخرين يمكن أن تعوض عن نقص المعلومات من الخبراء؟ / Do you believe that the experiences of other parents can compensate for a lack of information from experts



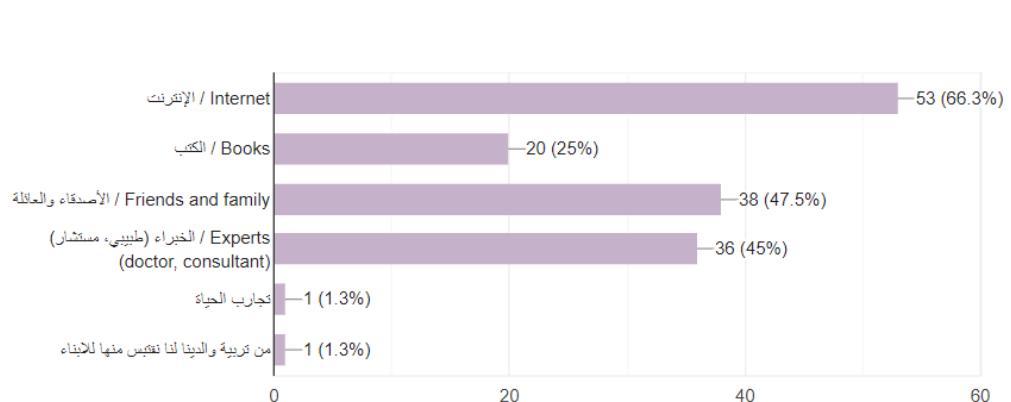
8 Figure

9. ما مدى أهمية الفعاليات وورش العمل بالنسبة لك كوالد؟ / How important are events and workshops to you as a parent



9 Figure

10. ما هي المصادر التي تعتمد عليها للحصول على معلومات حول تربية الأطفال؟ / What sources do you rely on for parenting information



10 Figure

4. Personas:

Persona : new mother

New mother	Goals	
	<ul style="list-style-type: none"> Find easy ways to dispose of equipment. Obtain accurate and reliable information on baby care. Develop a system for tracking and recording child growth. 	
	Needs	
Name: hessah age: 28 gender: female location: riyadh marital status: married family: one child (6 months)	<ul style="list-style-type: none"> Access to local charities or organizations that accept baby equipment. A reliable source for parenting advice, such as trusted websites or forums. Tools or apps to help track child development milestones and important dates. 	
	Frustrations	
Difficulty Disposing of Baby Equipment: <ul style="list-style-type: none"> There are no organizations that accept all types of equipment. Concern about how to handle items that are still in good condition. Loss or damage of items during transportation. 	Searching for Reliable Advice: <ul style="list-style-type: none"> Conflicting opinions among mothers. Difficulty finding accurate and direct answers. 	Challenges in Tracking Child Development: <ul style="list-style-type: none"> Lack of a reliable system for tracking growth. Daily life distractions lead to forgetting follow-ups.

11 Figure

Persona : Experienced mother

Experienced mother	Goals
	<ul style="list-style-type: none"> Benefit from local workshops. Seek reliable parenting advice from trusted sources. Share her experiences with new moms and provide support.
	Needs
Name: layla age: 36 gender: female location: jeddah marital status: married family: 3 children (10 years, 7 years, 4 years)	<ul style="list-style-type: none"> A comprehensive calendar or reminder system for local events and workshops. Access to reliable and diverse sources of parenting advice. Opportunities for networking with other experienced parents to share insights.
	Frustrations
Difficulty Keeping Up with Events: <ul style="list-style-type: none"> Forgetting dates and not knowing details. Work commitments affect her ability to attend 	Challenges Finding Good Advice: <ul style="list-style-type: none"> Repetition of information across different sites. Lack of clarity regarding available information on child development stages.

12 Figure

5. Solution:

The **Tiny Steps** app serves as an all-inclusive solution to basic parenting problems and answers some of the main needs that have come out of the feedback from parents. A major problem lies with the parents: how to manage the mountain of conflicting advice online. Tiny Steps solves this with an **Interactive Tips Library** of reliable childcare tips, sorted by age and common challenges, so that parents will be able to quickly find trustworthy information based on real experiences, reducing confusion.

Other difficulties include observing the development of children. The **Growth Milestone Tracker** within this application allows parents to track a child's development, but also provides access to personalized advice and education at each stage of their life. This graphic tool contrasts the milestones a child has achieved against the standard age norms, which comforts and directly informs parents about the progress their child is making in his or her development.

The **Support and Consultation Community** provides parents with a reliable arena in which they could raise questions and receive answers from both advanced parents and experts. It helps further create a sense of shared support and access to trustworthy advice.

With the Events and Workshops Calendar, parents will be on track with every necessary event in parenting: workshop classes, events, and so on. It can also allow users to set reminders to make sure they never miss an important event.

Finally, Tiny Steps incorporates a Marketplace into the site, where parents will be able to purchase, sell, or trade items for their baby-this will help the parents hand on gear that has become too small for their child and find good options inexpensively.

Overall, **Tiny Steps** equips parents with a community-oriented yet reliable platform that merges practical tools, expert advice, and support into one application for easier and more connected parenting.

6. User stories:

1- As a new mother (User), I want to inquire about a platform that provides expert advice on parenting challenges (Action) so that I can feel more confident in my parenting decisions (Outcome).

-Acceptance criteria: The platform should have a dedicated section for articles, videos, and Q&A features with parenting experts, allowing users to submit their questions and receive professional guidance.

2- As a mother of multiple children (User), I want to find a community of other parents interested in swapping or donating items (Action) so that I can easily exchange outgrown equipment while helping others (Outcome).

- Acceptance criteria: A community forum or group feature is available for connecting parents, and users can list items for exchange or donation, filtering based on location and item type.

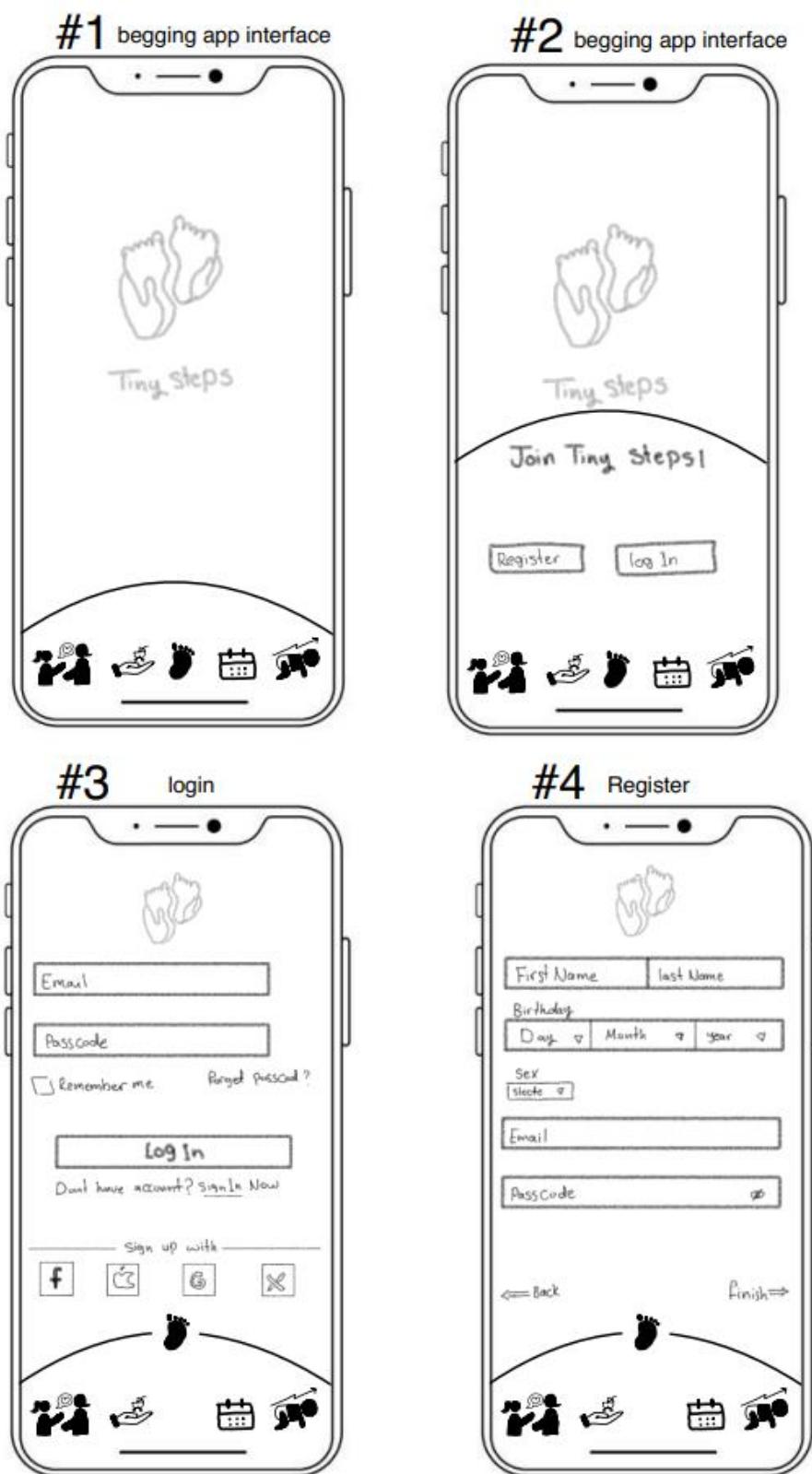
3- As a mother of multiple children (User), I want to track the growth milestones of my kids in one place (Action) so that I can monitor their development and ensure they meet their age-appropriate goals (Outcome).

-Acceptance criteria: The platform should provide a centralized growth tracking tool that allows users to enter and update their children's height, weight, and developmental milestones, with visual graphs for easy analysis.

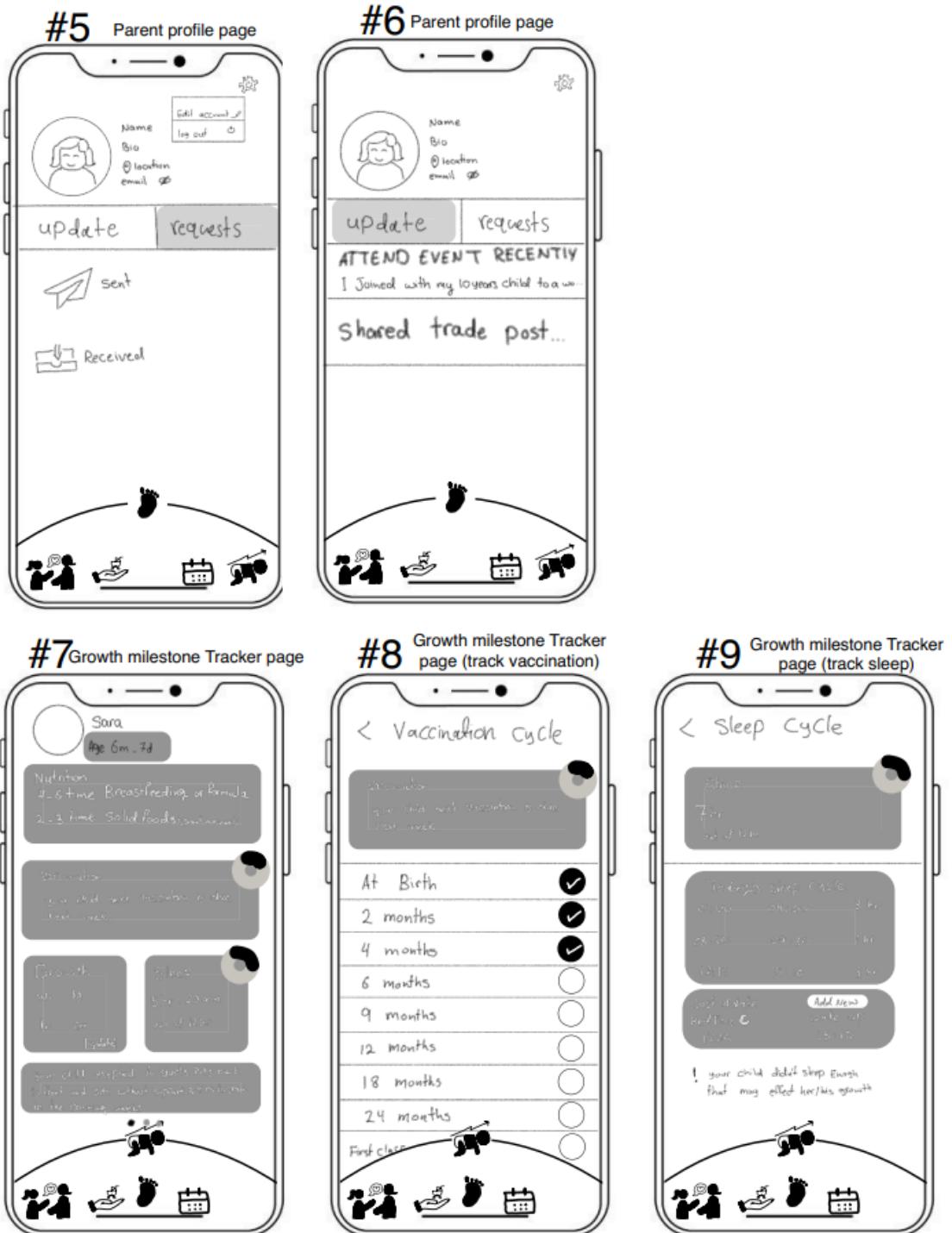
4- As a new mother (User), I want to receive notifications about upcoming parenting workshops and events (Action) so that I can manage my schedule and not miss valuable opportunities to learn (Outcome).

-Acceptance criteria: The platform should allow users to opt into notifications based on specific interests, provide reminders for upcoming events, and offer a summary of topics to be covered at each event.

7. Sketches:

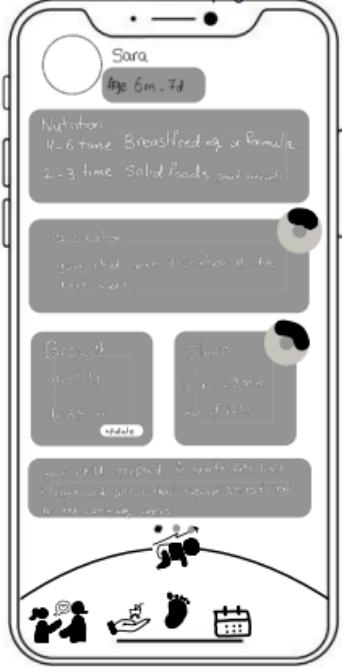


13 Figure



14 Figure

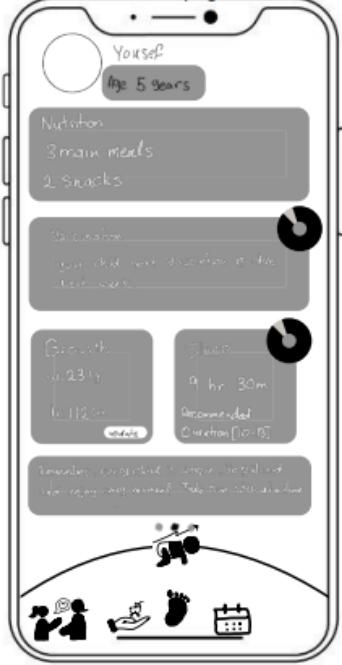
#10 Growth milestone Tracker page



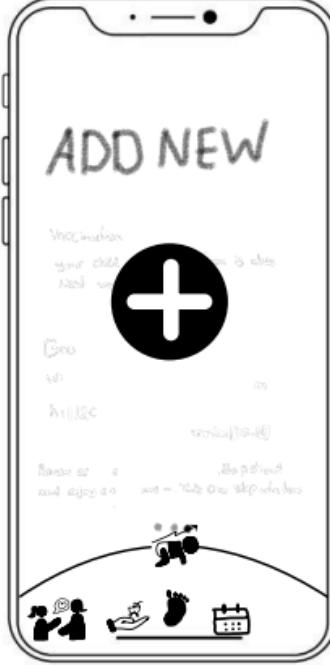
#11 Growth milestone Tracker page (track sleep)



#12 Growth milestone Tracker page

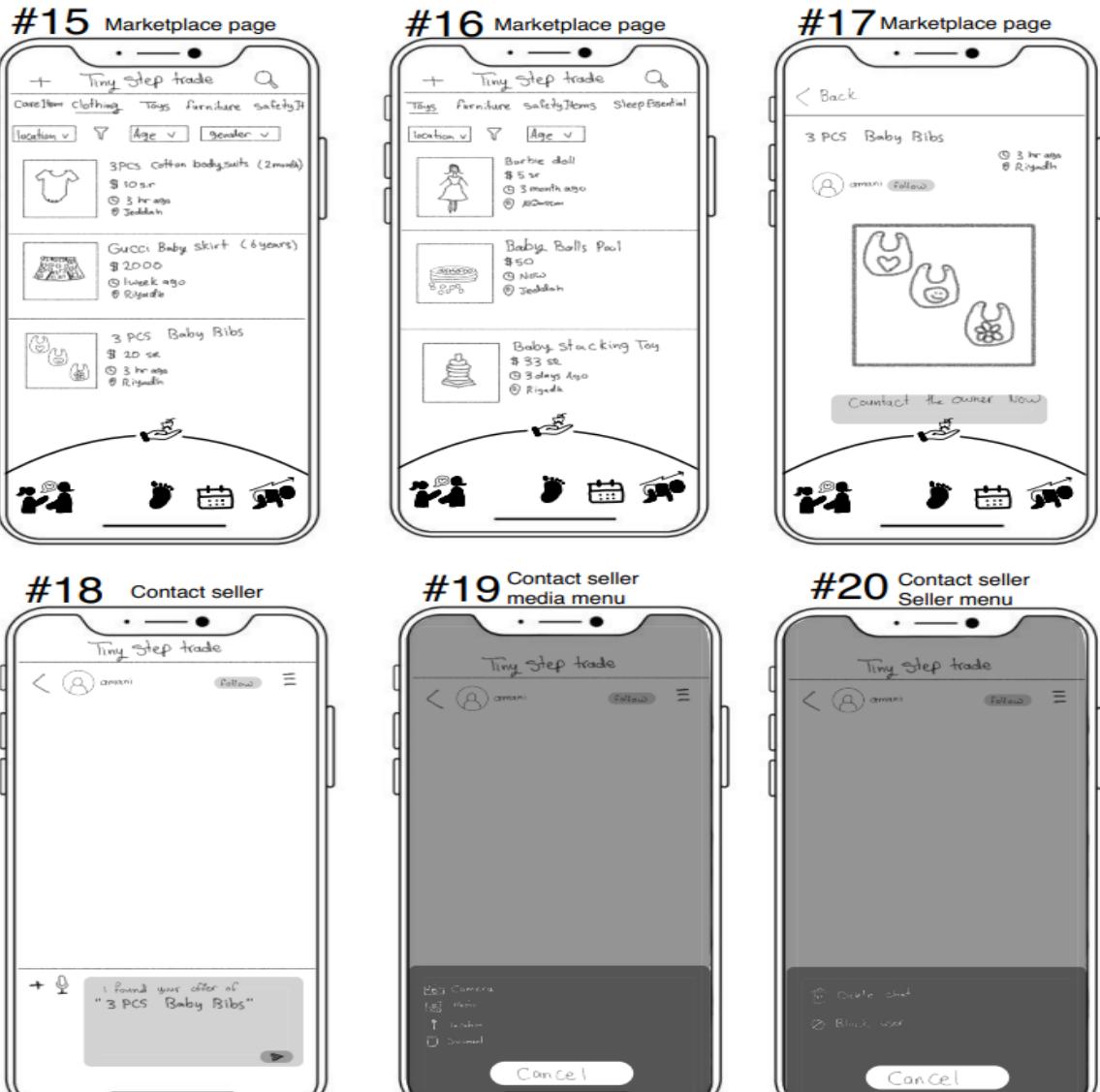


#13 Growth milestone add new child



#14 Growth milestone add new child

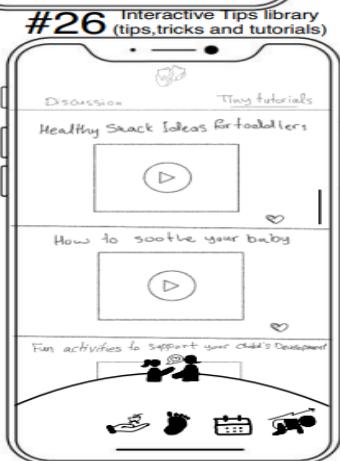
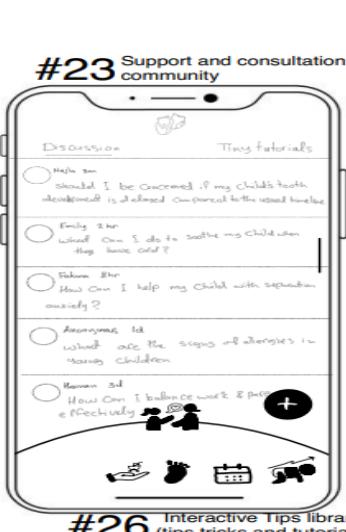




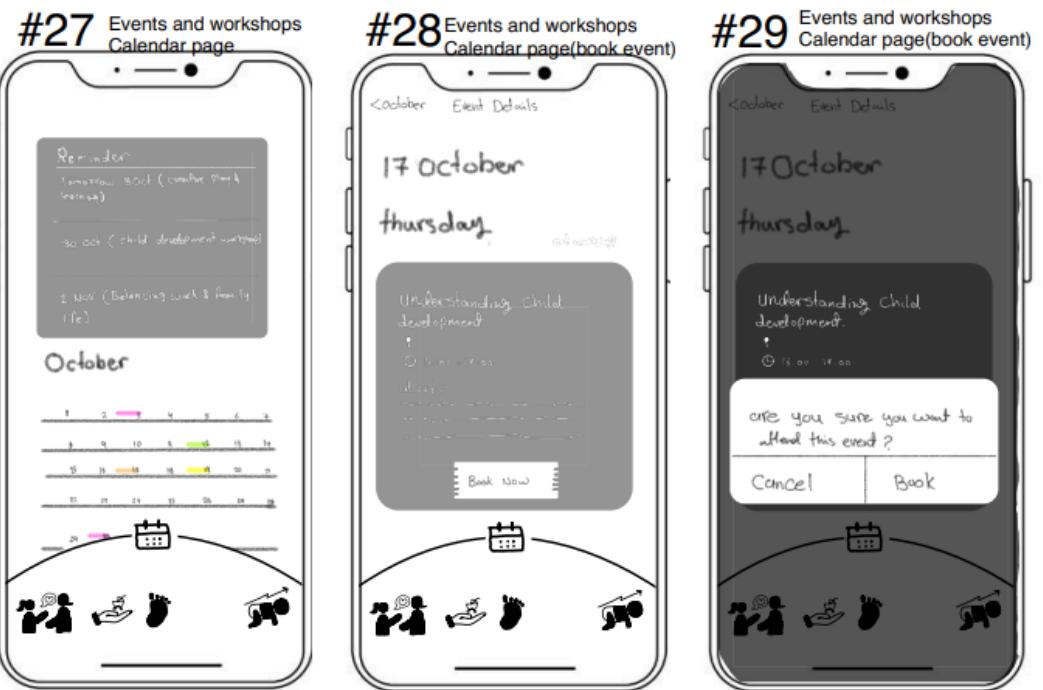
16 Figure



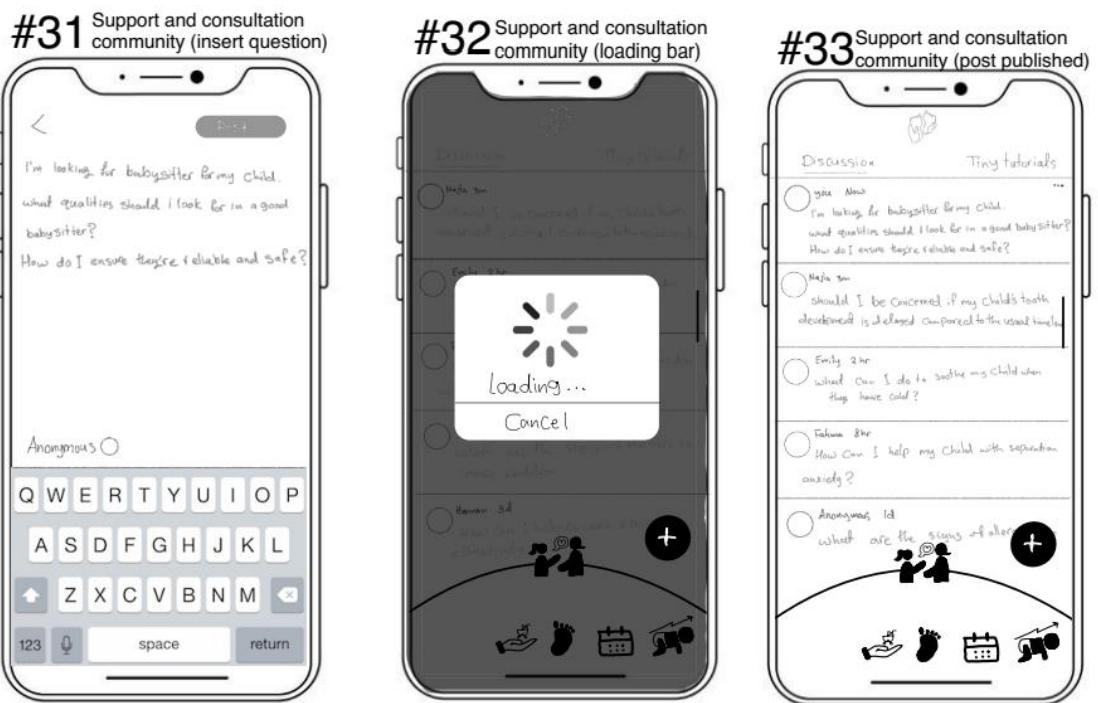
17 Figure



18 Figure



19 Figure



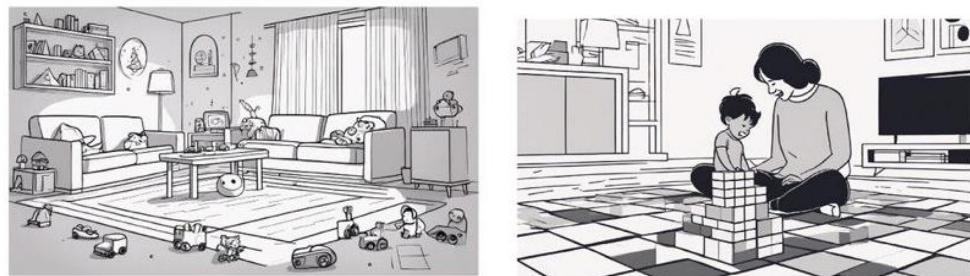
20 Figure



Figure 21

8. Story Board:

a-



22 Figure

A toy-filled living room after playtime.

Sarah and her child building blocks
Together.



23 Figure

Her child grows up and start to
play with his phone instead of the
toys.

Sarah is wondering what she should do
with all this toys.



24 Figure

A television ad showcases an app designed to help moms.



25 Figure

After downloading the application, she donates her child's toys.



26 Figure

Another mother happily opens toys with her child.

b-

z



29 Figure

Jack's mom sitting on the couch,
scrolling through her phone.



28 Figure

Jack is laying down in the stroller,
looking tired.



31 Figure

(jack's mom phone)



30 Figure

Jack's mom's phone shows a
notification about an appointment for
jack.

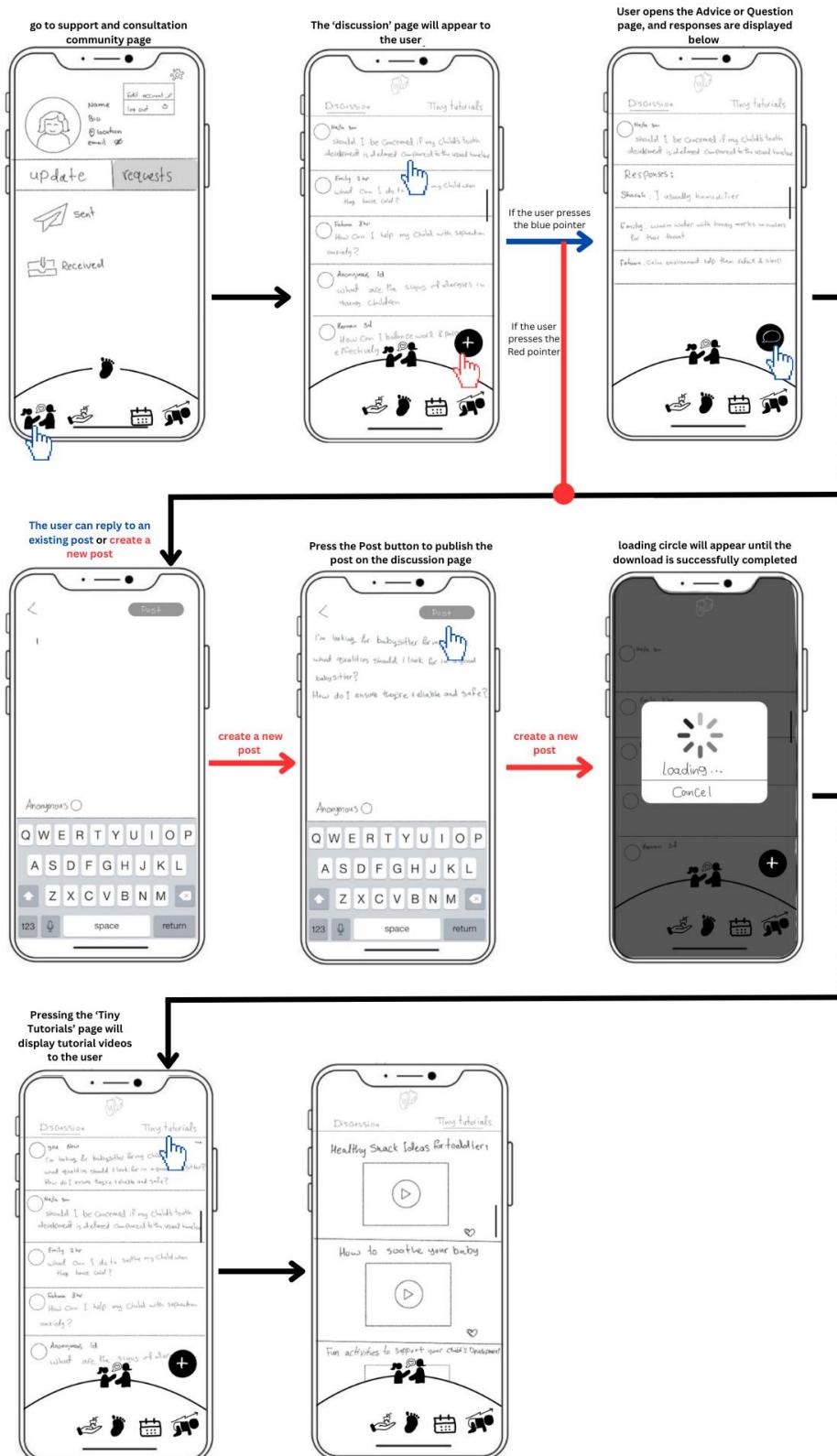


32 Figure

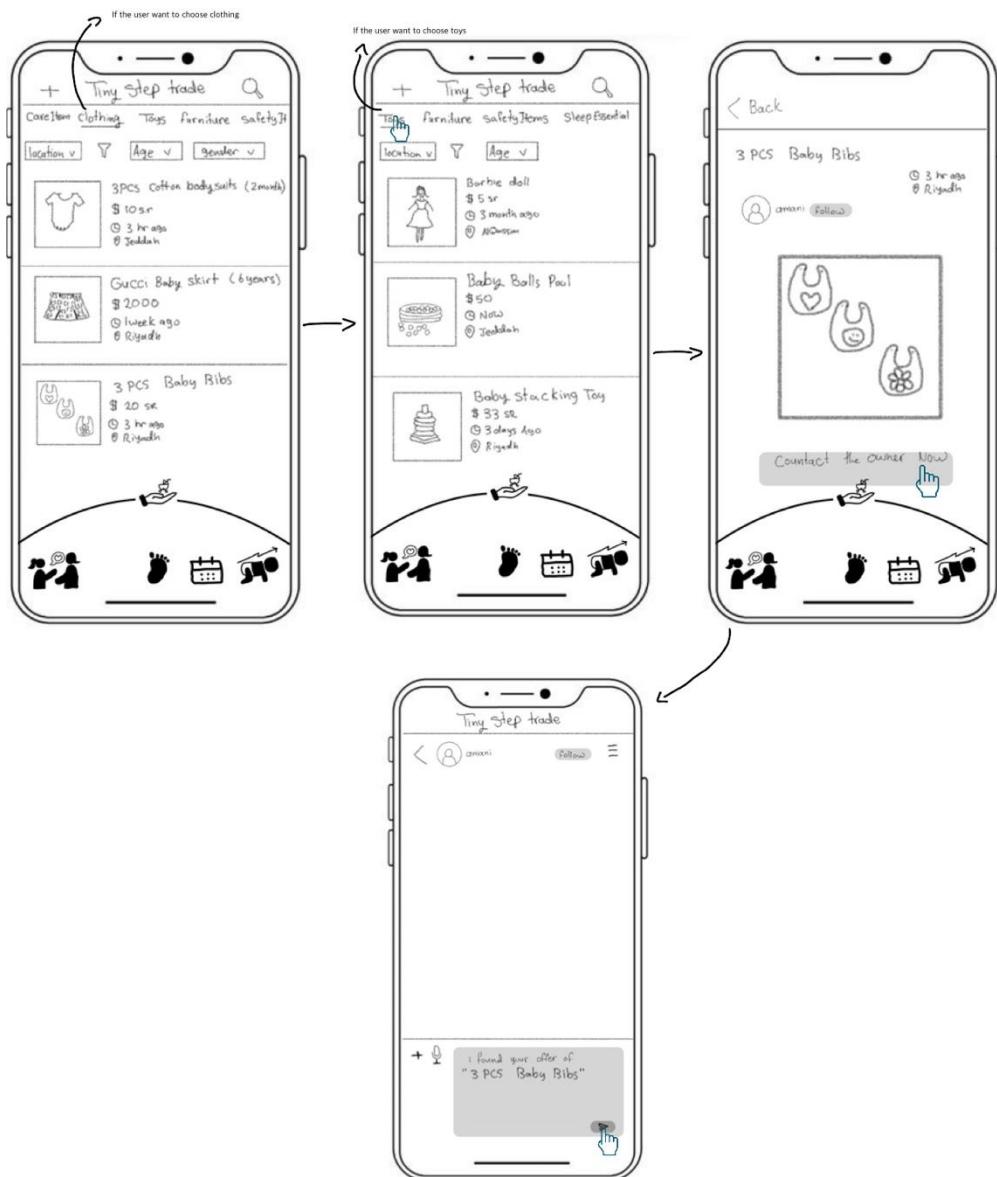
Jack and his mom go to the doctor, and after the
visit, jack starts feeling better.

9. User Flow:

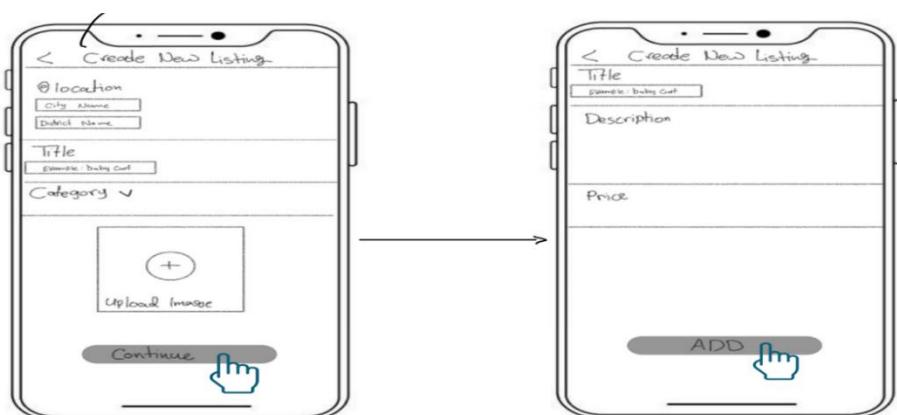
1- (first user story)



2-(second user story)

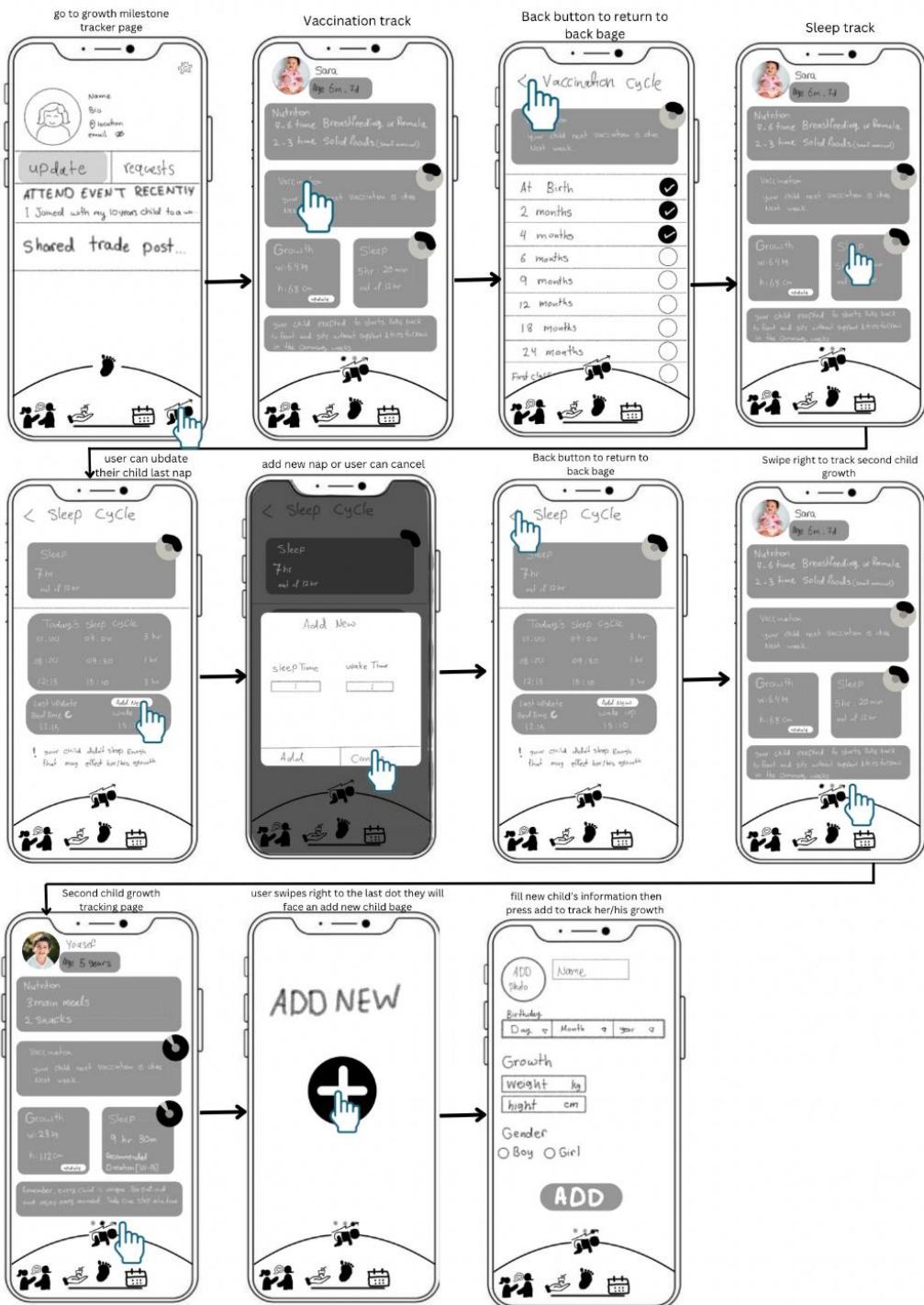


34 Figure



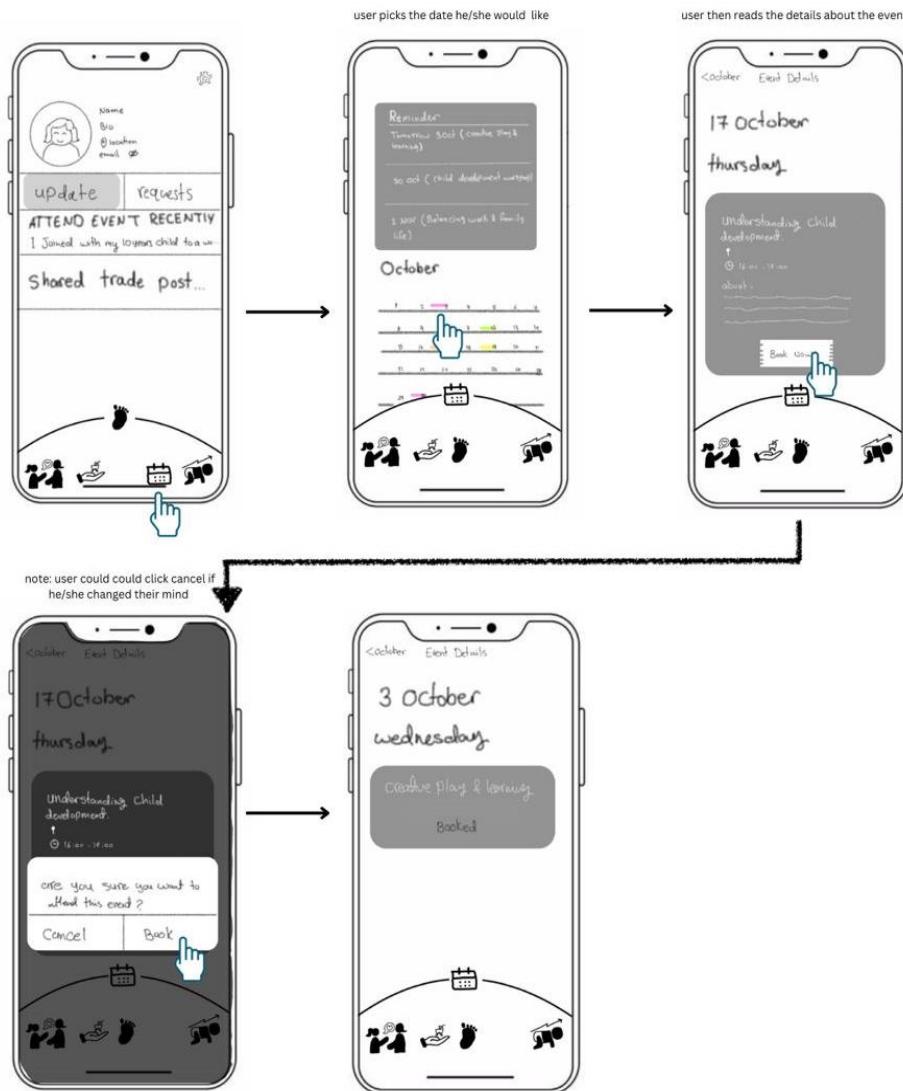
35 Figure

3-(third user story)



35 Figure

4-(fourth user story)



36 Figure

10. Design Rules:

A. Learnability Principles:

1 Table

Rule#	Principle		Sketch No/ User Flow No	Describe how you applied this principle
1	Predictability		Sketch 2,3 ,4 Sketch 8 Sketch 27 Sketch 15,16	<ol style="list-style-type: none"> 1. The user can predict how to register or log in 2. The user can predict to check off vaccinations 3. The user can predict the day of events and the details of events by simply pressing on the day in the calendar 4. The user can predict how to search from the magnifying glass icon and how to add a product by the plus sign icon
2	Operation visibility			
3	Synthesizability		Sketch 29,30	<ol style="list-style-type: none"> 1. When an event or workshop is booked the button of "book" will disappear and the word "booked" next to the account is shown
4	Familiarity		Sketch 18,19	<ol style="list-style-type: none"> 1. Using the microphone icon as a recording voice messages option is familiar to the user also, using the plus icon as an option to upload extra pictures, files, etc... 2. is familiar to the user.
5	Generalizability		Sketch 3 User flow 1	<ol style="list-style-type: none"> 1. The log in page has similar operations as other applications 2. The support and consultation community page has similar operations as other applications 3.
6	Consistency		Sketch 27	<ol style="list-style-type: none"> 1- The calendar to book workshops and set dates has the same form of consistency in other applications

B. Flexibility Principles:

2 Table

Rule#	Principle	Sketch No/ User Flow No	Describe how you applied this principle
7	Dialog initiative	Sketch 29 User flow 1 User flow 2 User flow 3	<p>1- System pre-emptive: the user must answer the pop-up message to confirm the booking of an event or workshop</p> <p>2- User pre-emptive: The user can add as many listings as possible to his or her account, as well as posts in the support and consultation community page, and children in the growth milestone tracker.</p>
8	Multi-threading (if applicable)		
9	Task migratability (if applicable)	Sketch 26	<p>1- The system automatically pauses the tutorial if user leaves the tiny tutorials page</p>
10	Substitutivity	Sketch 14	<p>1- The user can switch the unit of the height and weight of his/her child in the growth milestone tracker page</p>
11	Customizability	Sketch 10	<p>1- The system adapts to the user's child information and preview advice over nutrition vacations, and general information related to the child's age</p>

C. Robustness Principles:

3 Table

Rule#	Principle	Sketch No/ User Flow No	Describe how you applied this principle
12	Observability	Browsability	All user flows 1- The user can view the current page at the bottom of the interface through the icons presented forward
13		Defaults	Sketch 4 1- The separate inputs bars of the child's birthday reduce incorrect inputs
14		Reachability	All user flows 1- Users can navigate easily through the app by using the bottom icons
15		Persistence	Sketch 5 1- When the user receives a request, a dot will remain on the request icon until the user opens it
16	Recoverability	Sketch 3 Sketch 8	 1- If the user accidentally enters the log in page without an account, he /she can press on the "sign in " button that's after the question "don't have an account?" 2- If the user accidentally checks the wrong vaccination, he/she could just simply uncheck it by pressing the check mark again
17	Responsiveness	Sketch 32 User flow 1	 1- When the user creates a new post a loading circle will appear to show the user the application is working on the upload
18	Task Conformance	User flow 4	 1- When user books a workshop a message of successfully booking will appear

11. Prototype:

Our app includes the following features:

1. During registration, users can select their date of birth and choose a “Remember Me” option.
2. On the profile page, users can view updates and requests.
3. Users can comment on discussion posts and like tutorials.
4. Create a new post on the discussion page.
5. On the tutorials page, users can watch video content.
6. Purchase a product and communicate with the seller.
7. List a product for sale on the app.
8. When communicating with a seller, through the requests page, users also have the option to delete the chat or block a user.
9. The app includes a calendar that displays all possible events scheduled for a given month.
10. Reserve a spot for an event or workshop.
11. Track information about your child, including completed vaccinations.
12. Monitor your child’s sleep and weight.
13. Add a child profile to the app.

A- Tools:

Figma, an online design platform that enables productive teamwork to design projects, was the tool used to build our prototype. Some of the several useful features included in Figma, including live team collaboration, interactive prototype creation tools, and straightforward alternatives for sharing concepts with others.

B- YouTube Video:

https://youtu.be/j_6swk-E5hE?si=54B8iEFHIGWow7Z1

C- Prototype Design:

<https://www.figma.com/proto/ov8ew5QsUsnMarFH0lfEB/Tiny-Steps?node-id=630-226&node-type=canvas&t=aEE52NXLRi0XnrLm-1&scaling=scale-down&content-scaling=fixed&page-id=603%3A2&starting-point-node-id=630%3A205>

12. Usability Testing:

12.1 Participants:

Participant Profiles

Our participant group for the usability test consisted of six individuals, aged between 22 and 43. The majority were female, while one participant was male. Participants had varied experiences with the application, rating their familiarity from 1 (poor experience) to 5 (excellent experience). This diverse demographic mix and varying levels of experience provided a comprehensive perspective for evaluating the app's usability and accessibility.

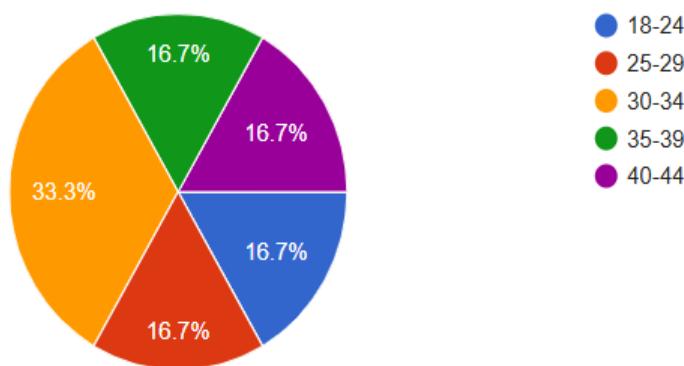
Most participants had some familiarity with mobile interfaces, as all reported regular use of mobile devices. While experience with similar applications varied, most had at least moderate experience, providing a range of perspectives to assess the application usability and design suitability.

Table 4

<i>Participant name</i>	<i>Age</i>	<i>Gender</i>	<i>Experience with similar products (1-5)</i>	<i>Use of mobile/website interface (1-5)</i>
1.Fatimah	30	Female	2	5
2.Najla	22	Female	3	4
3.Amal	43	Female	1	3
4. Ebtisam	28	Female	3	5
5.Khawla	33	Female	4	1
6.Mohammed	37	Male	1	3

٦ ردود، عمر المشاركون؟ Participant Age?

ردود 6



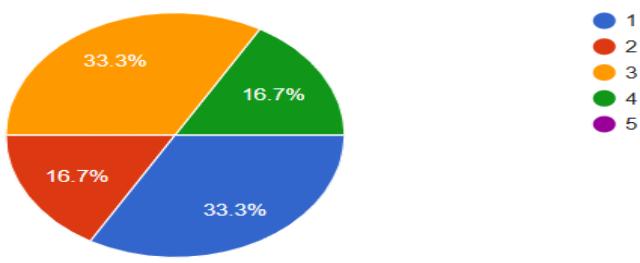
37Figure



38Figure

Participant Experience with similar products (1-5) : تجربة المشارك مع منتجات مشابهة : (5-1)

ردد 6



39Figure

Use of mobile/website interface (1-5): مدى استخدام واجهة الهاتف المحمول/الموقع الإلكتروني : (5-1)

ردد 6

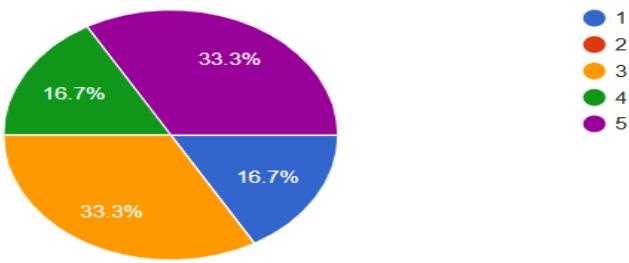


Figure 40

12.2 Procedure:

Outline of the procedure:

To start our testing process, we invited a group of participants from our targeted demographics, including mothers and fathers, to test the application in a comfortable setting.

Before conducting our test, participants were given a pre-testing briefing in which we explained the testing process, instructed and encouraged the participants to think aloud while using the application, and informed them of the ethical considerations regarding their consent to record their interactions with the application through a consent form.

In the first task, participants were asked to create an account and set up a profile. In the second task, participants were asked to add a child's profile to track their growth milestones and health progression. Following that, for the third task, participants were asked to schedule an event or workshop. The next task was to make a purchase from the trade market page. Finally, for the final task, participants were asked to check updates and requests on their profile page and to interact on the discussion page by creating a new discussion topic. Furthermore, additional tasks included tracking vaccination records, health data for their child.

Once the tasks were completed, the participants filled out an online questionnaire and were interviewed to collect their feedback. We concluded by thanking them for their valuable time and contributions to improving the application.

Timeline:

The test was conducted on 8 of November 2024, Ebtisam finished the test in **2** minutes which is the least time, while Mohammed and Amal finished the test in **5** minutes. The durations of sessions varied from **2- 5** Minutes.

Table 5

<i>Participant name</i>	<i>Day</i>	<i>Date</i>	<i>Start session time</i>	<i>Finish session time</i>	<i>Duration of session</i>
1.Fatimah	Friday	8/11/2024	3:20pm	3:23pm	3 minutes
2.Najla	Friday	8/11/2024	4:40pm	4:43pm	3.5 minutes
3.Amal	Friday	8/11/2024	5:10pm	5:14pm	4 minutes
4. Ebtisam	Friday	8/11/2024	8:00pm	8:02pm	2 minutes
5.Khawla	Friday	8/11/2024	9:20pm	9:23pm	3 minutes
6.Mohammed	Friday	8/11/2024	10:30pm	10:35pm	5 minutes

Tasks:

The 5 tasks we decided upon were chosen to test the application's measure of usability, navigation, and overall user experience.

Table 6

Task #	Task	Objective of the task
1	Create an account	This task was designed to measure the ease of account creation, how clear the registration process was.
2	Add a Baby/Child	This task was designed to measure how easily users can add a profile for a baby or child. It tested the application input fields, ease of navigation, and overall usability when users are managing profiles for children.
3	Book an event or workshop	The goal of this task was to test the booking process for events and workshops, including how easy it is for users to select, book, and confirm bookings participation.
4	Purchase a product	This task aimed to evaluate the purchasing process within the application, measuring the clarity and simplicity of the steps involved in selecting and buying a product.
5	Create a new discussion and Check requests on received messages.	This task was intended to assess the application communication features, specifically how easily users can start new discussions and interact with other users.

Performance Measures and Feedback:

In analyzing our application, we focused on three key metrics: Effectiveness, Efficiency, and Satisfaction. These metrics provided insights into the application's performance and highlighted potential areas for improvement.

Effectiveness was assessed based on whether participants successfully completed each of their tasks. Efficiency was measured by recording the time it took each user to finish each task. Finally, Satisfaction was gathered through a feedback survey, where participants shared their feedback on their overall experience with the application.

Table 7

Metric	How was it measured?	How was the data created/captured?
Effectiveness	Task success	By one of our team members through keeping track of task completion during the session.
	Number of Errors	By writing down any errors made during the task.
Efficiency	Time on a Task	By using a stopwatch to recorded the time it took for each participant to finish the task.
Satisfaction	User surveys	By Google Forms to gather participant feedback after each task.

12.3 Results:

Results:

1- Task Completion Success Rate and Time on Task

All participants successfully completed all tasks except for one of the six in Task 2 (add a baby/child) which had a completion rate of 83.33%. Furthermore, Task 5 took the longest time to complete with an average time of 55.83 seconds. On the other hand, Task 1 (Create an account) took the shortest time to complete with an average of 15.6 seconds. Overall, completion time for all completed tasks ranged from 15.6 seconds to 55.83 seconds.

Table 8

Participant	Task 1		Task 2		Task 3		Task 4		Task 5	
	complete task	Time on Task								
P1	✓	15	✓	50	✓	30	✓	40	✓	45
P2	✓	12	✓	60	✓	38	✓	56	✓	44
P3	✓	18	✓	84	✓	36	✓	32	✓	70
P4	✓	13	✓	17	✓	20	✓	46	✓	24
P5	✓	14	✓	66	✓	25	✓	35	✓	40
P6	✓	22	-	-	✓	28	✓	48	✓	112
Completion Rates	6/6 100%		5/6 83.33%		6/6 100%		6/6 100%		6/6 100%	
AVG . Time on Task		15.6		46.16		29.5		42.83		55.83

2- Errors

During the testing session participants made the most critical errors in Task 2 (add a baby/child). We believe these errors happened because of unclear navigation. Additionally, Task 3 (Book an event or workshop) presented a critical issue not within the task itself, but rather with the calendar feature. When one of our users booked the wrong workshop, there was no option for cancellation. In contrast, Tasks 1, and 5 had no errors.

Table 9

Tasks	Number of errors	Errors description	Critical or non-critical (C,NC)
Task 1	0		
Task 2	3	The user had difficulty realizing they needed to scroll to add/view the second child.	C
Task 3	1	users cannot cancel an event or workshop booking once the booking has been confirmed.	C
Task 4	3	The current trade/buy icon is unclear to users, causing confusion.	NC
Task 5	0		

3- Satisfaction questionnaire

We collected feedback from our participants using a questionnaire to understand their experience with the application through each task. The results were excellent, as results varied from 4.2 to 4.5 out of 5 for all tasks except for Task 2, which got 3.39. the questionnaire allowed us to gain insights into how our participants felt about each task. The results were as follows:

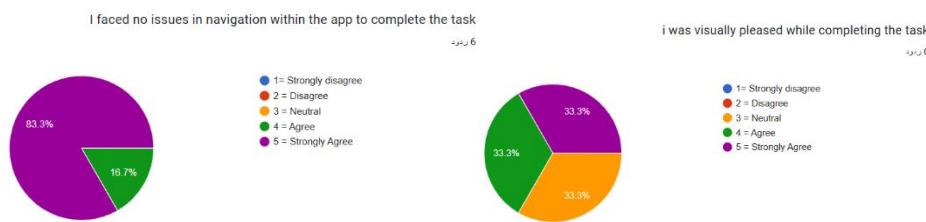
Notes :

To measure user's satisfaction with their experience. Each choice equaled a number of points

- "Strongly agree" = 5 points
- "Agree" = 4 points
- "Neutral" = 3 points
- "Disagree" = 2 points
- "Strongly disagree" = 1 point

A score of 1 means the user found the task difficult, resulting in a lower level of satisfaction. In total the average was 5.

Task1:



41Figure

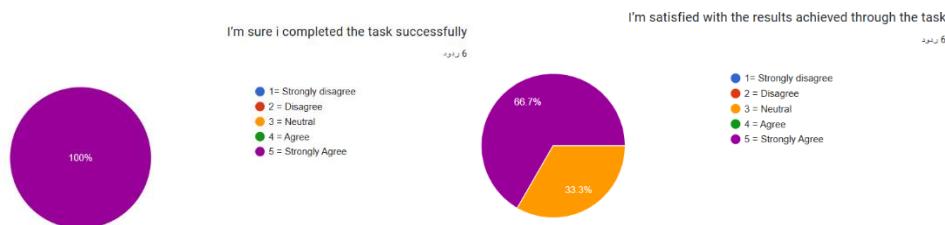


Figure 42

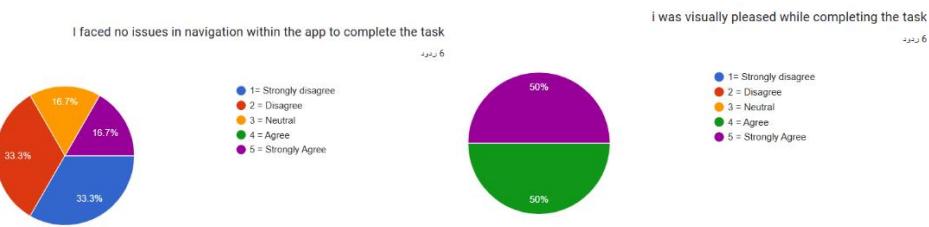
43Figure



Figure 44

Figure 45

Task2:



46Figure

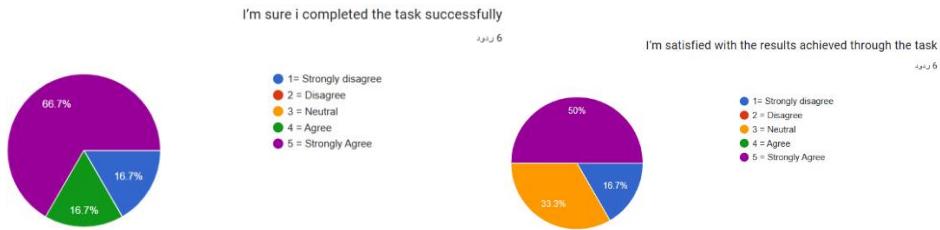


Figure 47

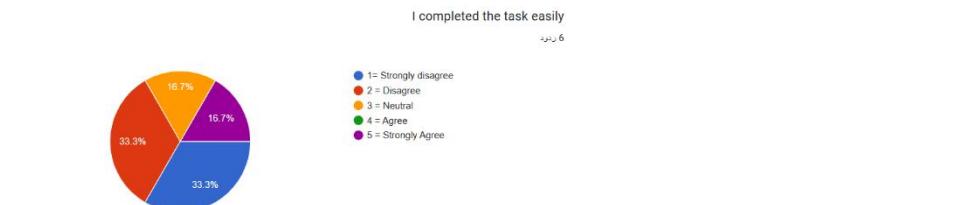
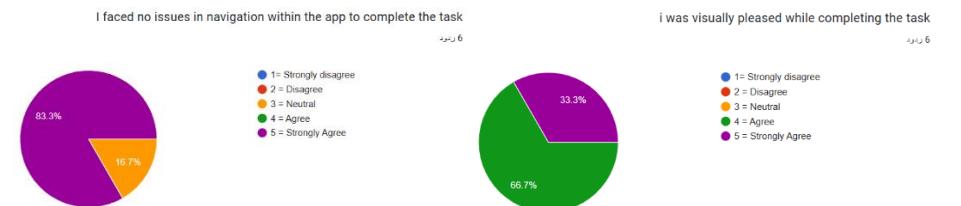


Figure 48

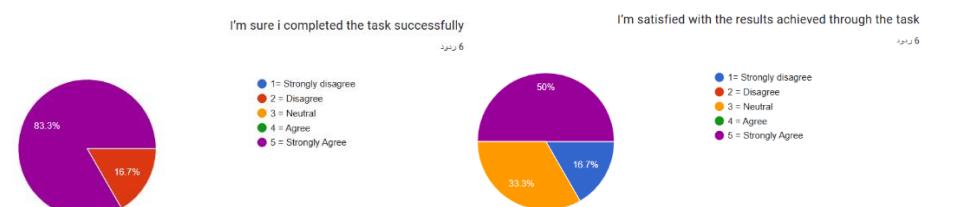
49Figure

50Figure

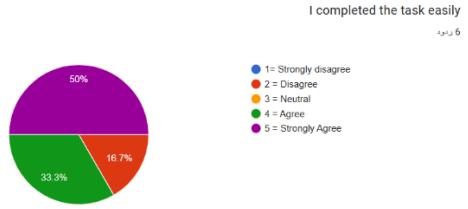
Task3:



51Figure



52Figure

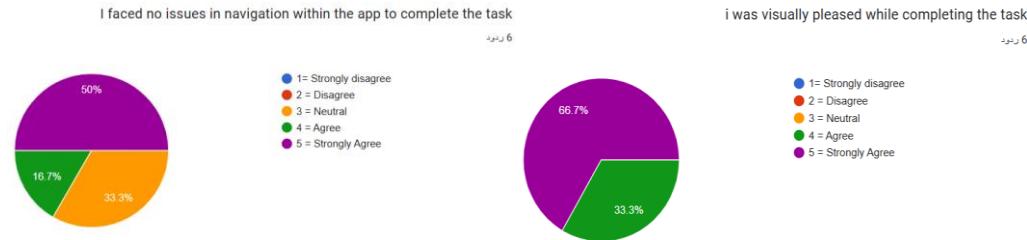


53Figure

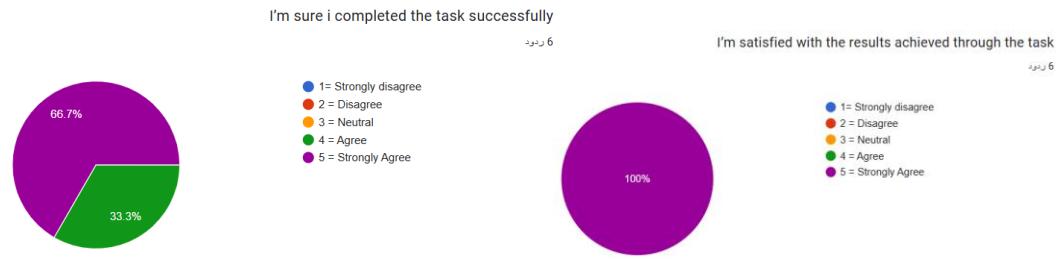
54Figure

Figure 55

Task4:

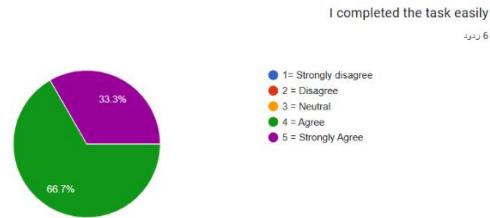


56Figure



57Figure

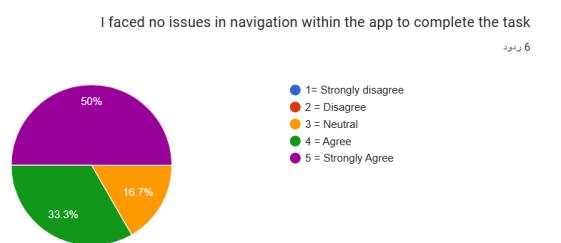
Figure 58



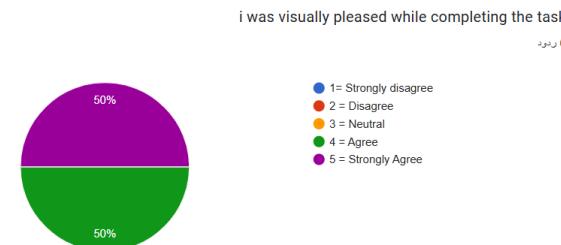
59Figure

Figure 60

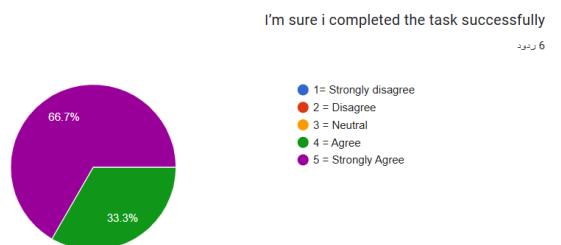
Task5:



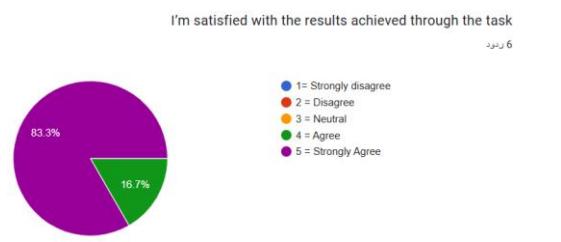
61Figure



62Figure



63Figure



64Figure

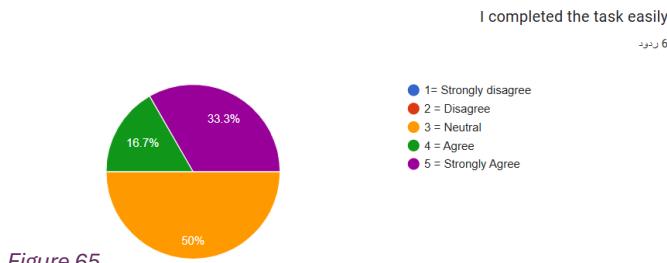


Figure 65

Satisfaction table:

Table 10

Task	Question 1 Avg.	Question 2 Avg.	Question 3 Avg.	Question 4 Avg.	Question 5 Avg.	Overall
1	4.83	4.0	5.0	4.33	4.66	4.56
2	2.33	4.5	4.16	3.66	2.33	3.39
3	4.66	4.33	4.5	3.66	4.16	4.26
4	4.16	4.66	4.66	5	4.33	4.56
5	4.33	4.5	4.66	4.83	3.83	4.43

4- Summary of Data

Summary of Completion, Errors, Time on Task, Average Satisfaction

Table 11

Task	Task Completion	Errors	Time on Task	Satisfaction*
1	6	0	15.6	4.56
2	5	3	46.16	3.39
3	6	1	29.5	4.26
4	6	3	42.83	4.56
5	6	0	55.83	4.52

12.4 Discussion:

1-(task 2), Major

Sometimes, users didn't notice how there were more children than could fit in the app and that they needed to scroll horizontally. Guidance was weak, and typically users would expect to see all related information within one view.



Figure 66

2-(task 3), Critical

The user cannot cancel an event or workshop once booked. This issue creates frustration for users who may need to change their plans but are unable to do so, limiting their flexibility and control over their bookings.

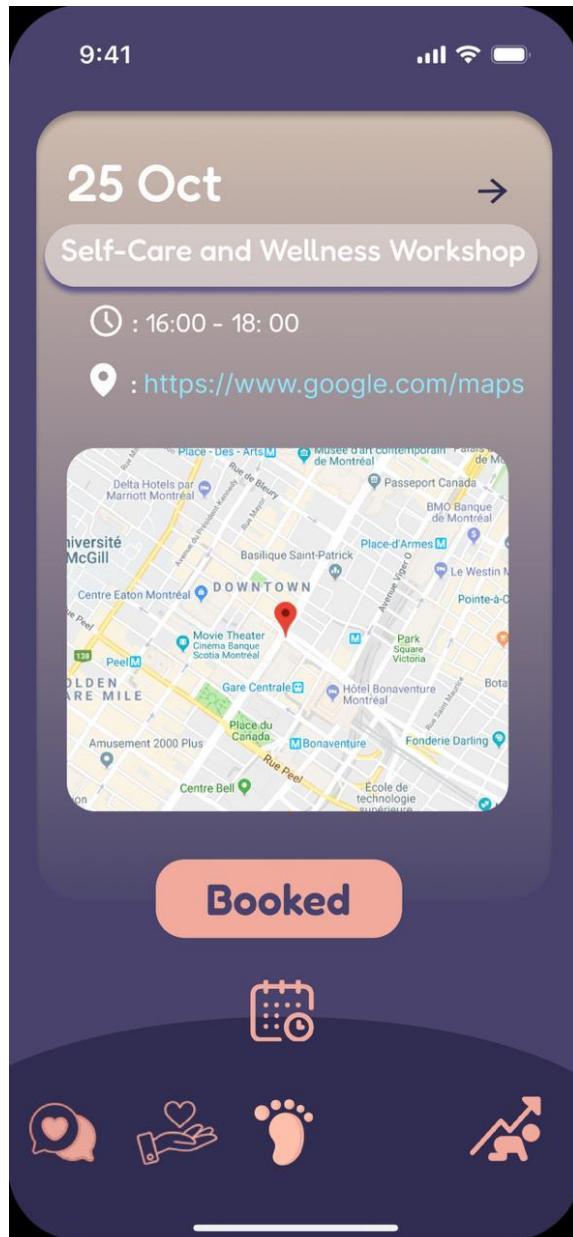


Figure 67

3-(task 4), Minor

The current icon representing the “buy” or “trade” action is not intuitive for users. As a result, users are having difficulty recognizing or understanding the purpose of the icon, leading to confusion and potential hesitation when attempting to engage in purchasing or trading actions. This can impact the overall user experience, reducing user engagement and possibly affecting sales or transactions on the platform.



Figure 68

12.5 Recommendations:

Based on the discussion of the feedback given by the participants and the behaviors observed, recommendations that could be made for improving design and usability of the app are as follows:

A key issue that was brought up was a lack of realization by users that more content was available when it was out of view, especially in cases that required horizontal scrolling. Therefore, subtle clear arrows or a gradient should be implemented that subtly fades into the background towards the edge of the content area, indicating there is more information available that is not currently in view. This will meet users' expectations to have the relevant content visible within one view allowing them to practice better navigation behavior with satisfaction.

Another issue was that one could not cancel an event or workshop once booked; this frustrated some users and limited flexibility. Adding the ability to cancel will make users feel more in control of their plans and make for a better experience in case changes in schedules occur. Lastly, the icon representing the action of "buy" or "trade" was not clear, which confused the users, limiting them from interacting with this feature. This redesign of the icon is based on one that is more broadly familiar to users, such as a shopping cart or trading arrows. By doing so, the future function is made more clear and invites users to improve engagement and, in turn, facilitate smoother transactions. These changes will make the app more intuitive and user-friendly.

13. Conclusion:

Our application was developed as a user-friendly companion for mothers, addressing challenges in accessing reliable advice and peer support. These interviews and subsequent surveys helped us define the main needs and preferences of the target audience, which then meant designing features including event scheduling, vaccination tracking, and a marketplace for baby items. From our research, we derived invaluable insights from users; implemented features that users requested; and carried out effective usability testing that showed, in general, high task completion rates and user satisfaction. We also identified key areas for improvement, including enhancing navigation with additional visual indicators, adding cancellation options for booked events, and redesigning icons for purchase and trading features to better convey their purpose. We also recommend a continuous feedback system to evolve the app based on dynamic user needs and expand the content to include more resources, such as expert advice and community discussions. Conclusively, our project has developed a very important tool for parents, and by addressing usability concerns we identified, we can further improve it.

Appendix C: Usability Test

Facilitator Script:

Scenario:

Ahlam is a mother of three children, all under the age of 10. With a busy lifestyle, she's always looking for ways to stay on top of her children's health, milestones, and daily activities. She wants a simple way to track their growth, ensure they're on track with their development, and get helpful advice from other parents. After some research, Ahlam finds the Tiny Steps app, which promises to make parenting easier with features for tracking health milestones, booking events, and connecting with other parents through discussions and exchanges. Ahlam is also interested in the ability to purchase products and share her experiences with other parents.

Tasks:

1. Create a New Account
2. Create a New Discussion
3. Book an Event or Workshop
4. Purchase a Product
5. Add a Baby/Child

Satisfaction Questionnaire Form:

1- I faced no issues in navigation within the app to complete the task.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

2- I was visually pleased while completing the task.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

3- I'm sure I completed the task successfully.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

4- I'm satisfied with the results achieved through the task.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

5- I completed the task easily.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

Consent Form:

Evaluation Tiny Steps tool



69Figure

Goal:

The purpose of this evaluation is to test the usability of the Tiny Steps app, with the aim of making it more user-friendly and effective for parents.

Procedure:

You will be asked to complete a series of tasks using the Tiny Steps app, guided by a facilitator. As you carry out these tasks, we encourage you to think aloud to help us better understand your experience. After the tasks, you will complete a short questionnaire and answer some follow-up questions from the facilitator. The evaluation is expected to take around 15 minutes.

You may stop, take a break, or ask questions at any time.

Recording:

Participant doesn't have any risks or consequences for you

- Your answers and details will be processed anonymously.
- We judge the quality of the prototype, not your performance.

Informed Consent:

By signing this form, you confirm that you have read and understood the information provided and agree to participate in this evaluation.

Name:.....

Do you agree to be recorded? Please select one of

Date:.....

the options below:

Signature:.....

- Yes, I consent to video and sound recording.
- Yes, I consent to sound recording only.
- No, I prefer not to be recorded.

References :

<http://www.canva.com/>

<https://g.co/kgs/UGhe3ML>

<https://www.remove.bg/>

<https://www.grammarly.com/>

<https://chat.openai.com/chat/>

<https://youtu.be/KS1OJefOYRE?si=a6yWGAXqd7TMzRM2https://www.pexels.com/videos/>

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<https://www.design.com/maker/logo/d3f4d42f-9f51-418d-b3ee-e8a8072c5415/draft/e8ee3fed-9533-4e26-a73d-7888fde0f1dc?savedDraft=True>

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<https://www.figma.com/community/file/1128570662923831097/diverse-collection-of-1785-memojis>

#Num	Student Name	ID	Responsibilities
1	Norah Aljayan	444200832	Story Board Second user flow Prototype Testing
2	Noura Alamro	444200941	Learnability Principles Flexibility Principles Robustness Principles First user flow Prototype Testing
3	Shooq Alawdah	444201083	Learnability Principles Flexibility Principles Robustness Principles Fourth user flow Prototype Testing
4	Reema Alraqibah	444201069	Sketches Third user flow Prototype Testing