

MediLinker

powered by Dell Medical School

User Testing Report

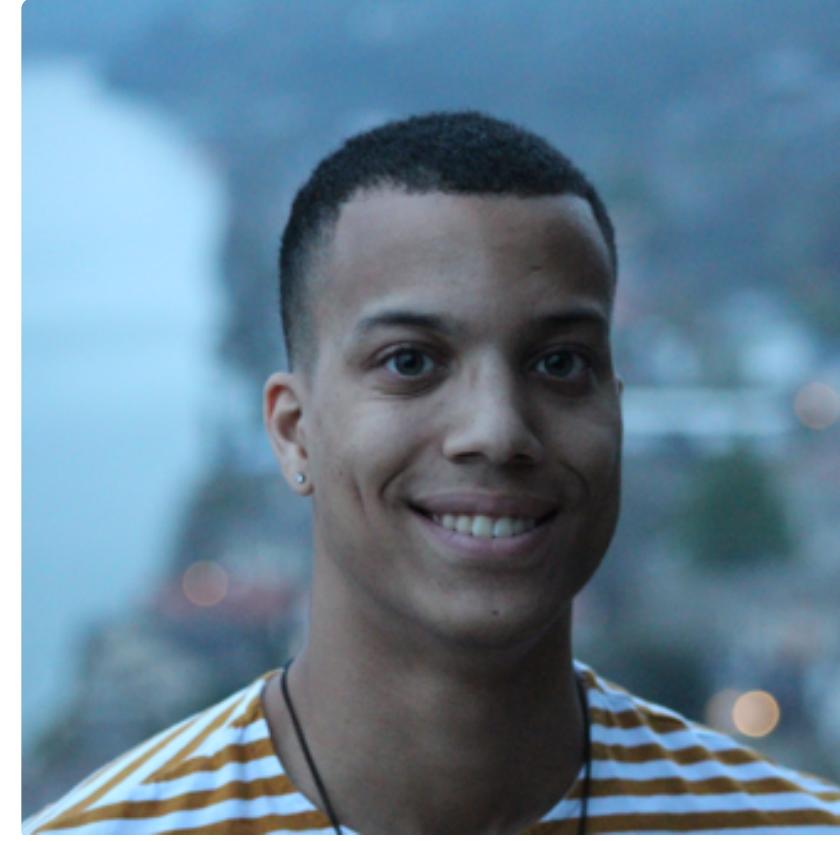
Fall 2021

Team Introduction



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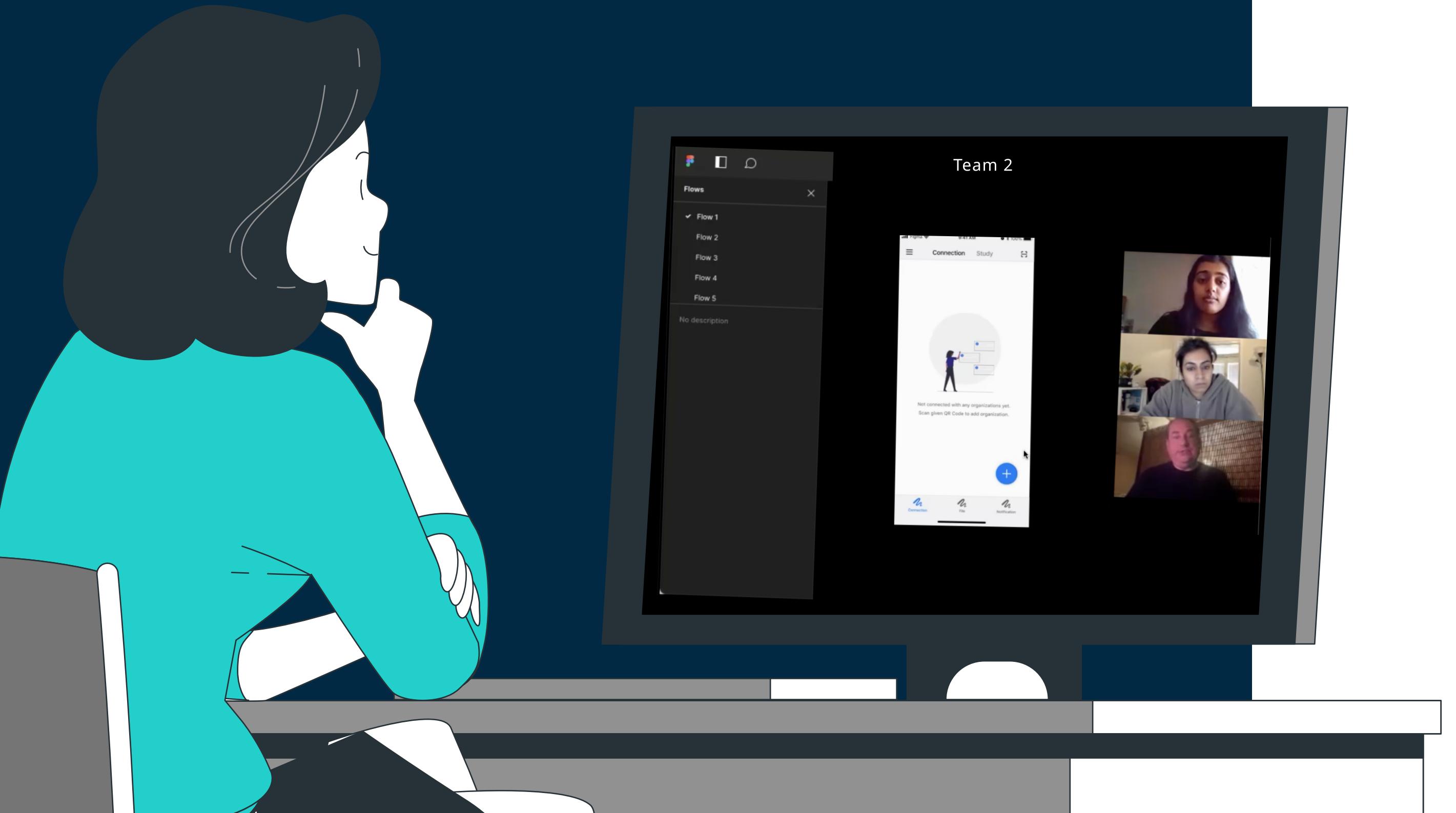
Sanjana Ajit Kumar

MS Information Studies
[UX Research & Design]

Research Design

Moderated 8 one-on-one usability tests remotely via Zoom

- Designed 8 task scenarios
- All participants performed the same set of tasks using a computer



- Think-Aloud protocol to identify users' thought-process
- Tasks were not timed
- After each task, participants were asked to answer a post-task questionnaire related to that particular task
- After the end of all the 8 tasks, participants were asked to rate on two factors applicable to the entire application

Data Collection:

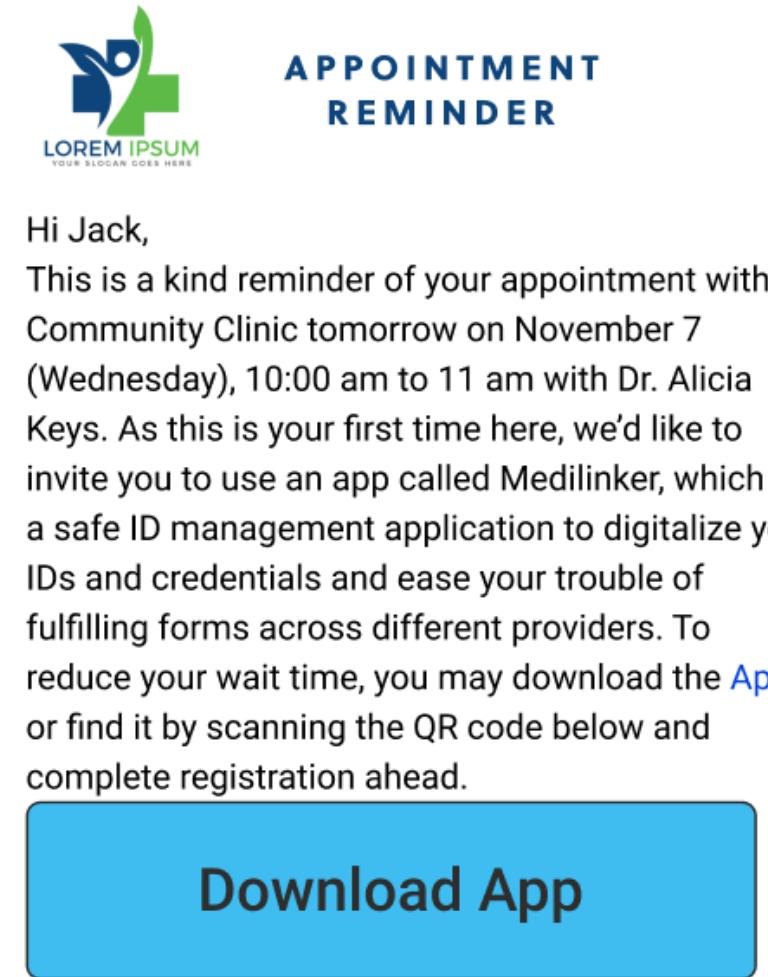
- Screen (Video and Audio) recordings of all test sessions
- Observation notes on Google sheets so all team members can add their notes and collaborate
- Subjective ratings:
Ease-of-Use scale (Likert) - measured after completing each task
- Rating based on overall app comprehension and how frequently would they like to use this system.

Task 1: Onboarding - Download, Sign up and create an account

Assume you've just made an appointment with a clinic. In a confirmation email, they've invited you to download an app and fill out your medical information in advance, before the appointment. You download the app and begin creating an account.

Purpose of this task: To understand the Medilinker application onboarding experience of a user.

- 1 Patient receives a confirmation Email after booking an appointment with a clinic which suggests to download an app called "Medilinker" and complete the patient registration process



2

After downloading the app, the patient/user is shown tutorial screens where the application and its purpose is introduced.

A Safe Wallet of Digital Files Using Blockchain Technology

MediLinker was developed as a research project at the University of Texas at Austin.

All Files & Information in One Place

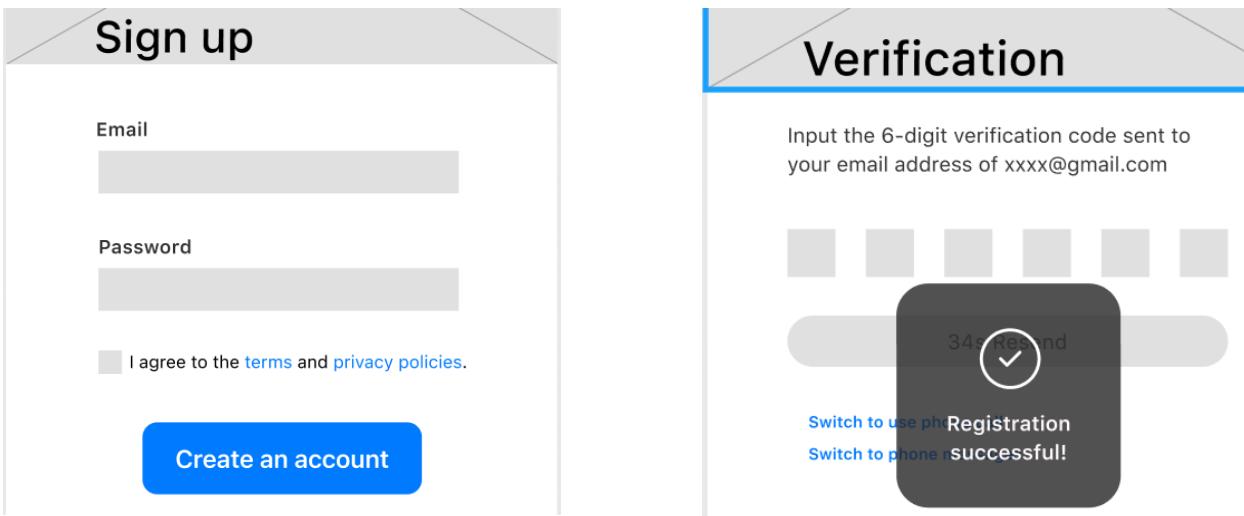
Medilinker helps you digitalize and manage your profile, medical history, credit card, and insurance information.

Easily Control and Share Information with Providers

Using MediLinker, you are able to securely control how your wallet information is being shared with participating medical institutions from your device.

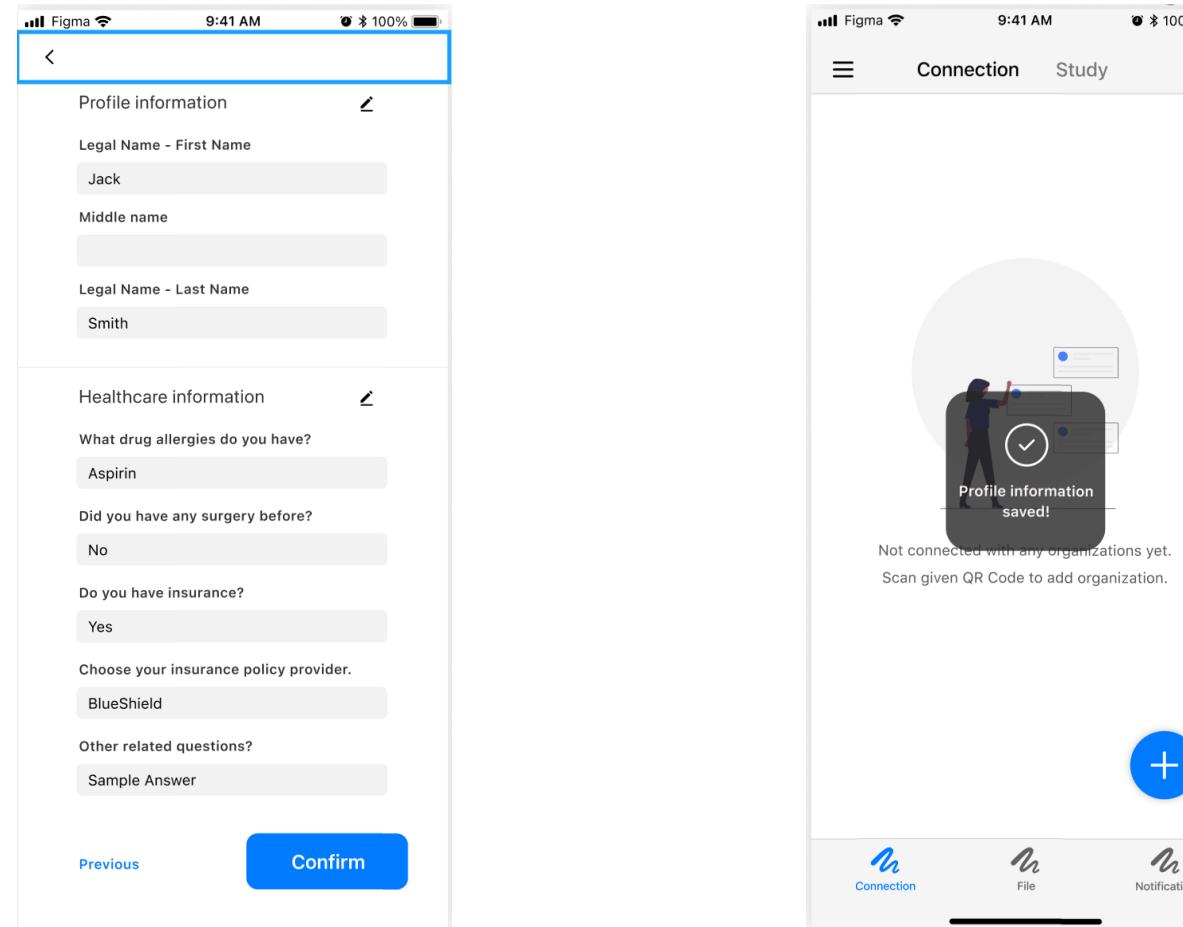
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The patient/user is now asked to Sign Up and verify their contact details on the MediLinker app.



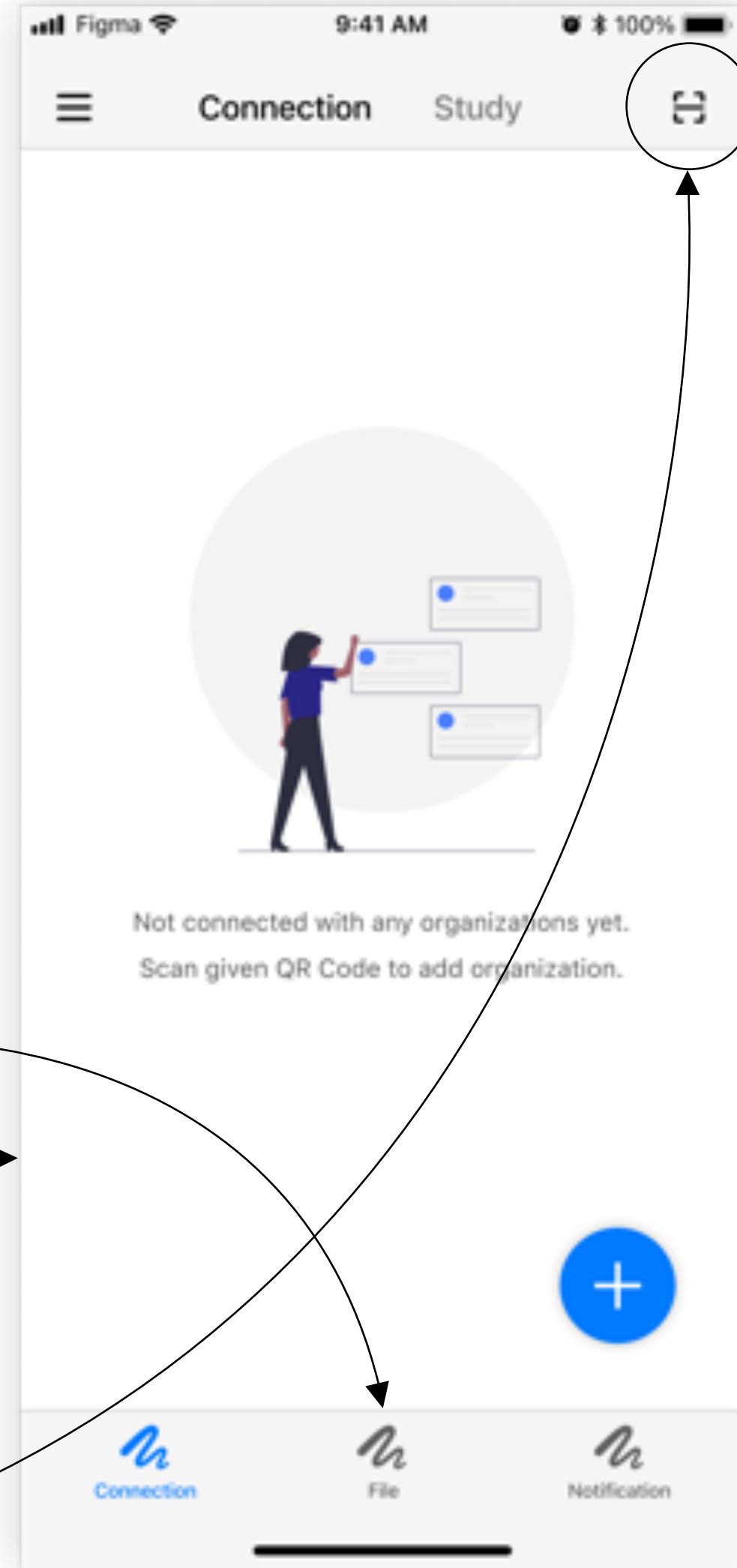
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The patient fills in and save their profile information and medical information on the Medilinker app.



Task 1: Observations

- Participants didn't have clarity of understanding with application terms such as **connection**, **wallet and study**.
- Lack of understanding of the **underlying technology** i.e., **Blockchain** in this case dissuades the user from using the app.
- Participants expressed the onboarding process as overwhelming, dense and not greatly explained.
- One of the participants asked about what files might be stored in the "**Files**" section.
- **One participant expressed that the last step was jarring, said it "came out of nowhere".**
- One other participant didn't understand the icon on the top right corner of the connection-study screen distracting them from the task.



Recommendations

- Meaning of these words in the **context of the application** must be explained to the user. Options like "**Learn more**" sections can be added.
- The tutorial screens can introduce the user to the app and its functions/usage. The underlying technology might not be important to some users.
- For people curious to understand underlying technology can navigate to a tab in the menu where this information can be elaborated.
- The icons used must be recognizable. If not, a tutorial about app features must be given at the start.

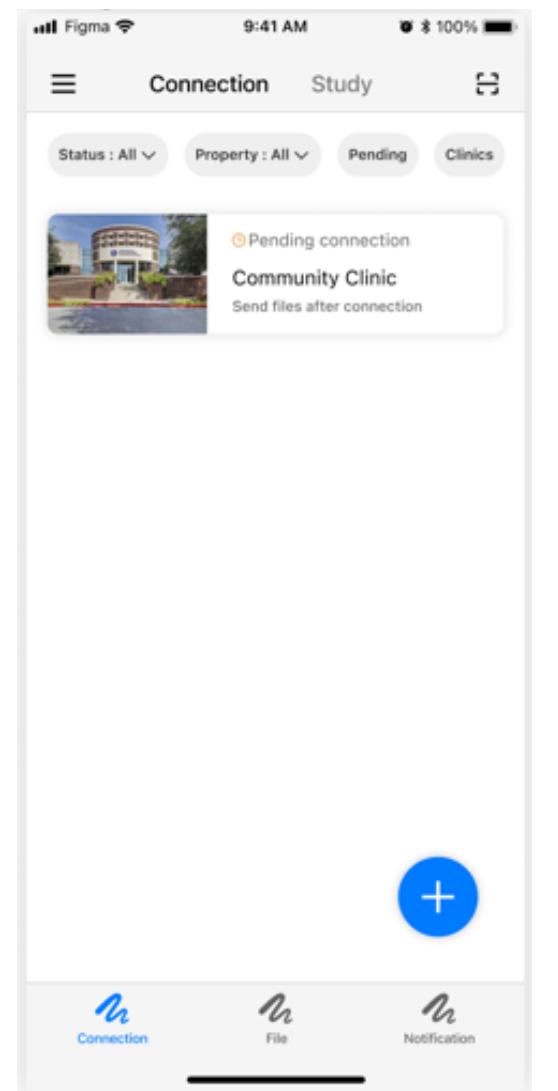
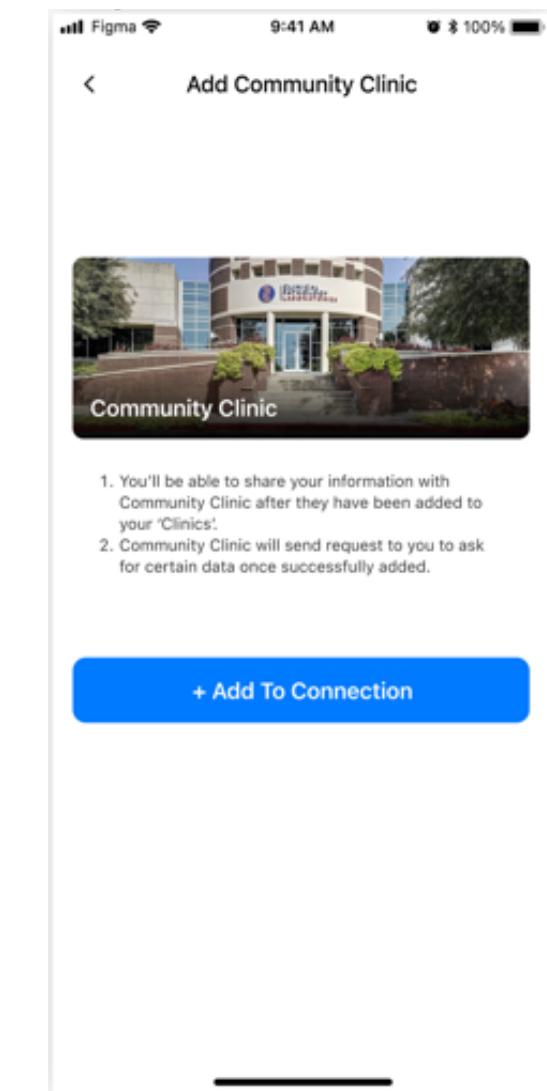
Ease of Use Rating: 4.75/5

Task 2: Enrolling with a clinic

You're at the clinic and they've asked you to enroll with them on the app you downloaded by scanning the QR code available at their reception desk.

Purpose of this task: To understand the experience of the user while enrolling with a clinic in the Medilinker app.

- 1 To enroll with a clinic on the Medilinker app, the patient scans a clinic specific QR code via the app.
- 2 The patient now can send a connection request to their clinic. This will help them share their information with the clinic with ease.
- 3 Now, the patient can see the "Pending Connection" status associated to their clinic on their "Connection" screen. The patient will have to wait until the clinic accepts the connection request.



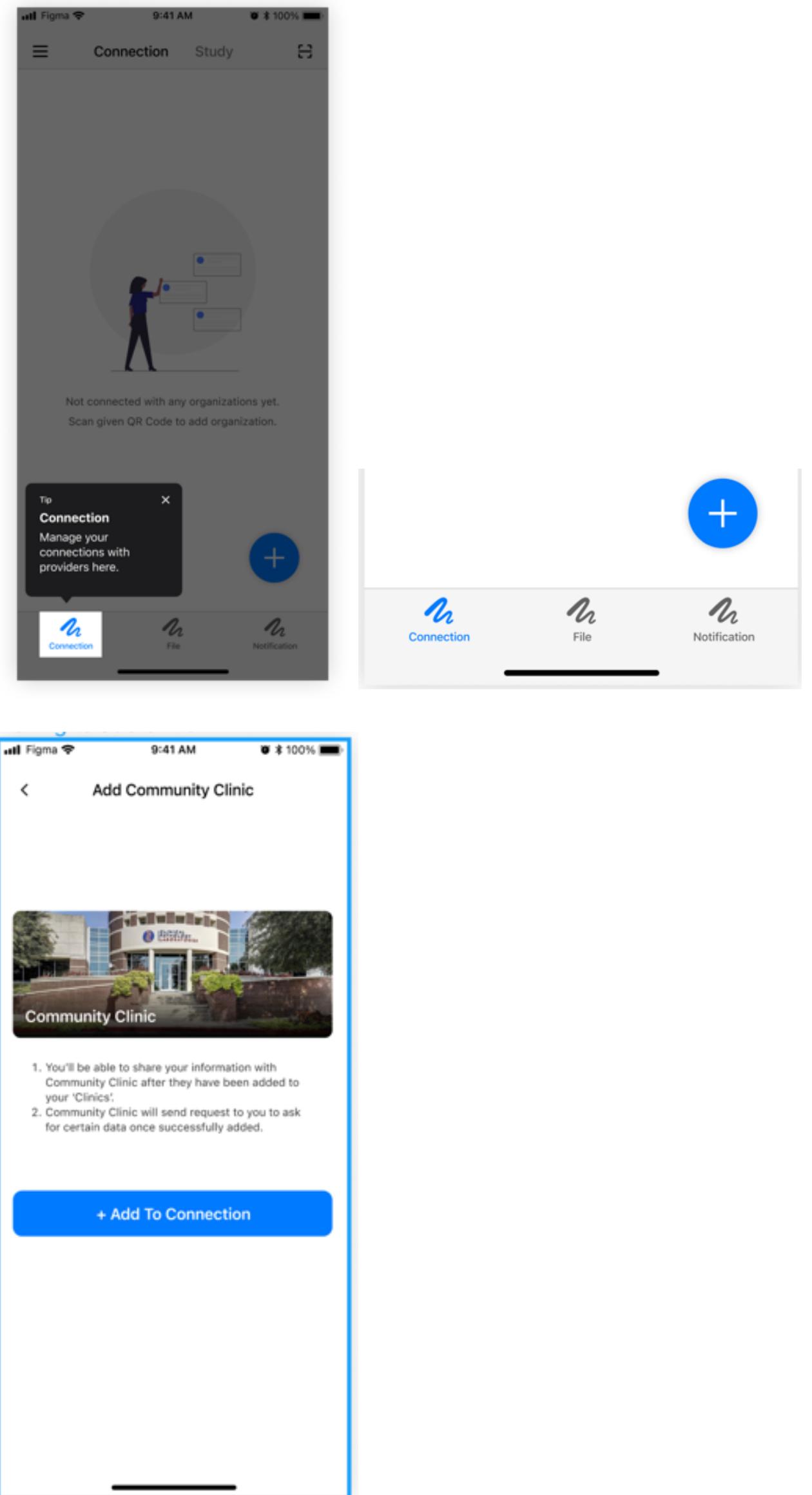
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Task 2: Observations

- Participants didn't understand what QR code they were scanning and for what purpose.
- The placement of the tooltip got participants thinking they have to click on the bottom tab to add connection
- The blue "+" symbol reminded one of our participants of the "Gmail" application from Google, which has more to do with messaging. Participants got distracted from the task and tried to understand the symbol.
- Participants were confused about the meaning of connection in the context of the MediLinker app causing confusions in understanding the "Connection" button navigating them to "Clinics" page.

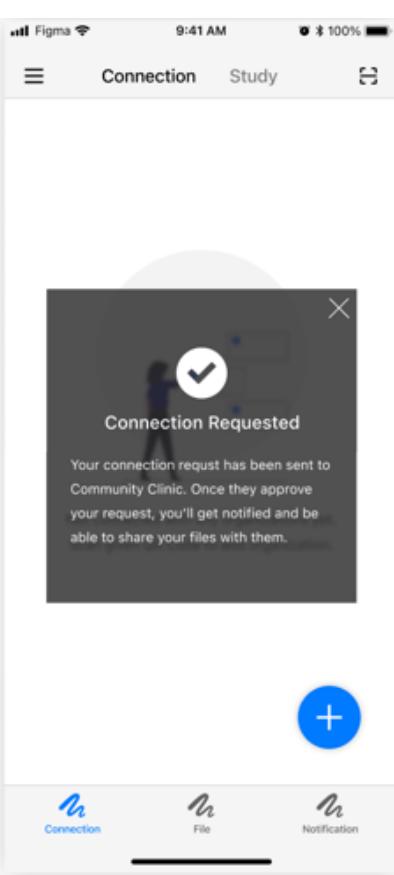
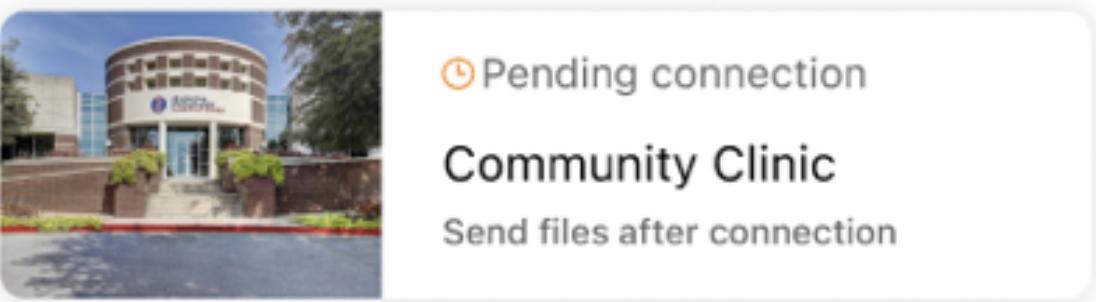


Recommendations

- On the QR code screen under "Position QR code or barcode in this frame" there must be a "Why am I scanning this?" or "Learn more" section where new users can be introduced to the concept.
- The purpose of the blue "+" symbol when compared to the "Connection" option on the bottom of the screen must be clear. If they serve the same purpose, the approach needs to be revisited.
- In our initial presentation, we suggested MediLinker to be **healthcare specific**. So, here "**Connections**" can be called "**Clinics**" for easy understanding.

Task 2: Observations (contd.)

- There was confusion on the processing aspect of connections made - lack of clarity on the “Pending” status. Users couldn’t pay enough -up attention to “Connection Requested” and closed the popup because they didn’t understand “Connection”.



- One of our participant expressed that there were too many steps before the appointment and asked “what if phone is unavailable before appointment?”.



Recommendations

- If “Connection” is changed to “Clinics”, the status message can be modified to something like “Pending from Clinic”, where users can understand that there is something pending from the clinic’s side.
- If Medilinker has a website via which patients can access the system with other digital devices, an alternative to a QR code such as a **clinic number** can be given. This can be used even when the physical QR code sticker is damaged and users are unable to scan it.

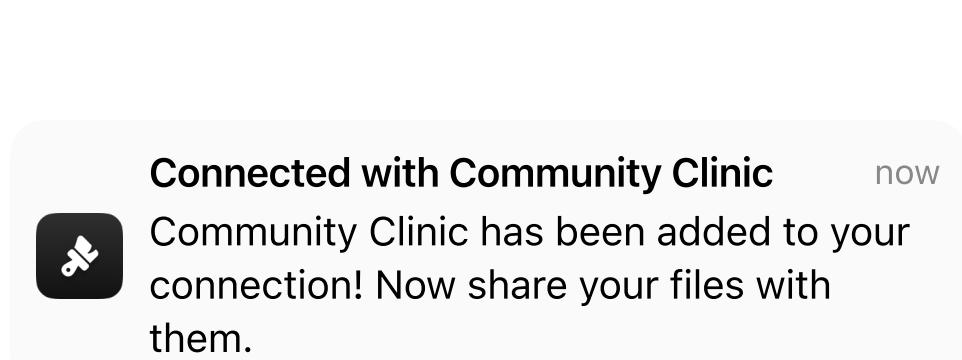
Ease of Use Rating: 4/5

After the clinic has accepted the user's enrollment request, it needs some more information from the user through the app. In the context of the task, the participant is asked to add their Driver's License

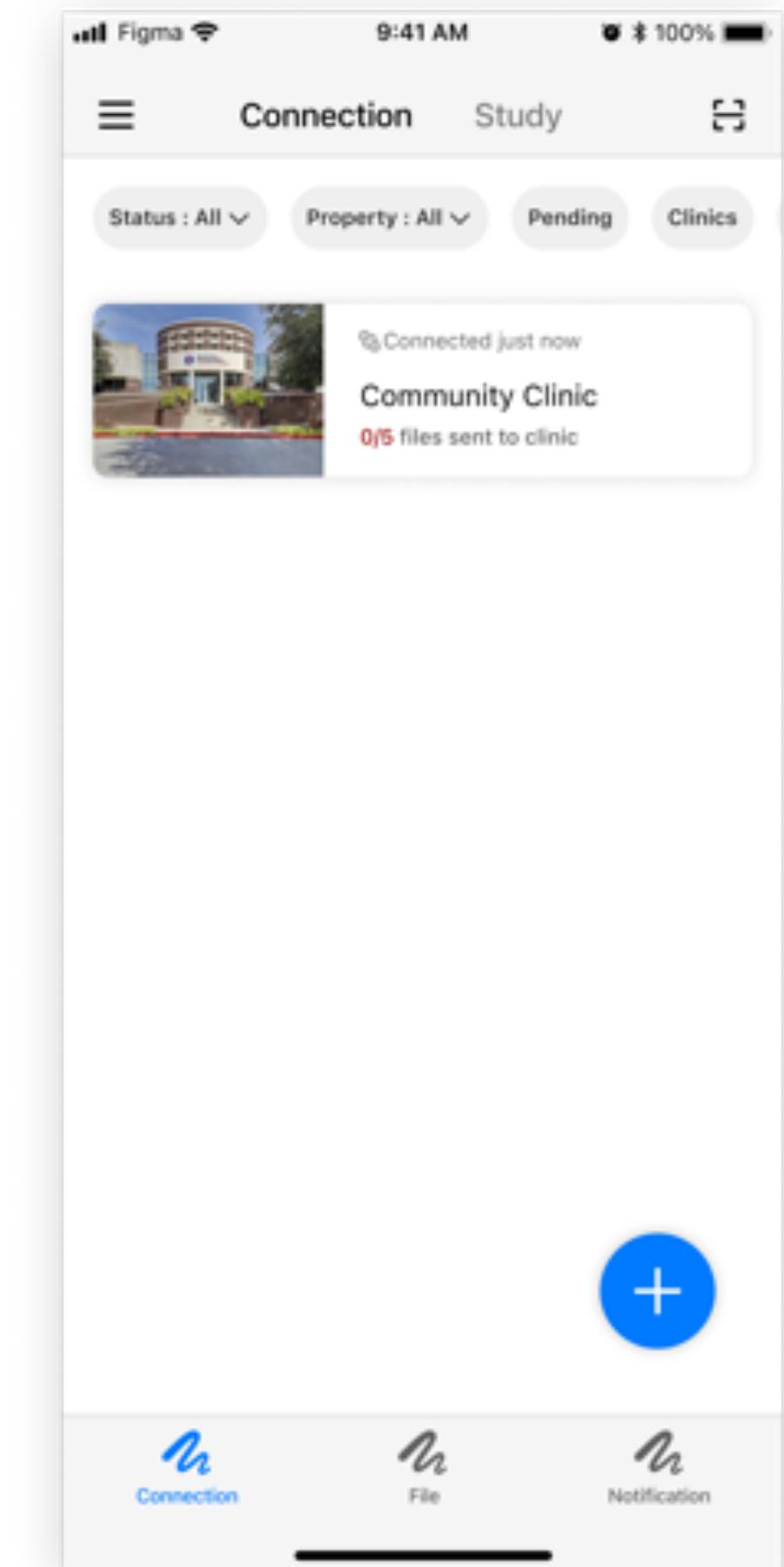
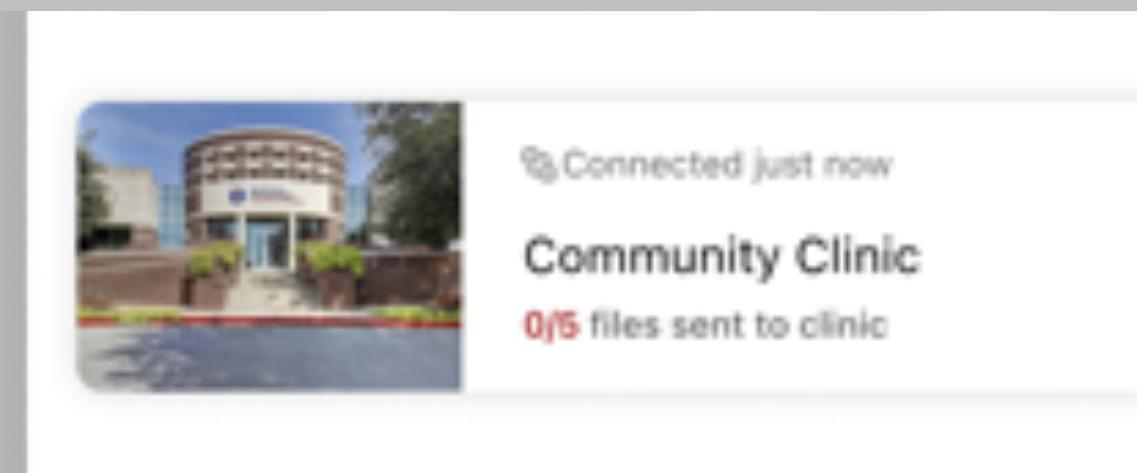
Purpose of the task:

Every clinic needs identity proofs of patients because it is crucial to verify the patient's identity for compliance.

1



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Patient clicks on the Clinic card, comes to the Clinic details page that includes clinic information card as well as a list of information needed from the patient. Upon landing on the screen, two tool tips appear, one asking to get the driver's license verified and other one regarding sending attributes

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Patient clicks on Driver's License card that has the status "Not Verified"

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Verification Process begins: step 1 - Prefilled information pulled from existing files on the app

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Step 2: Fill in missing information

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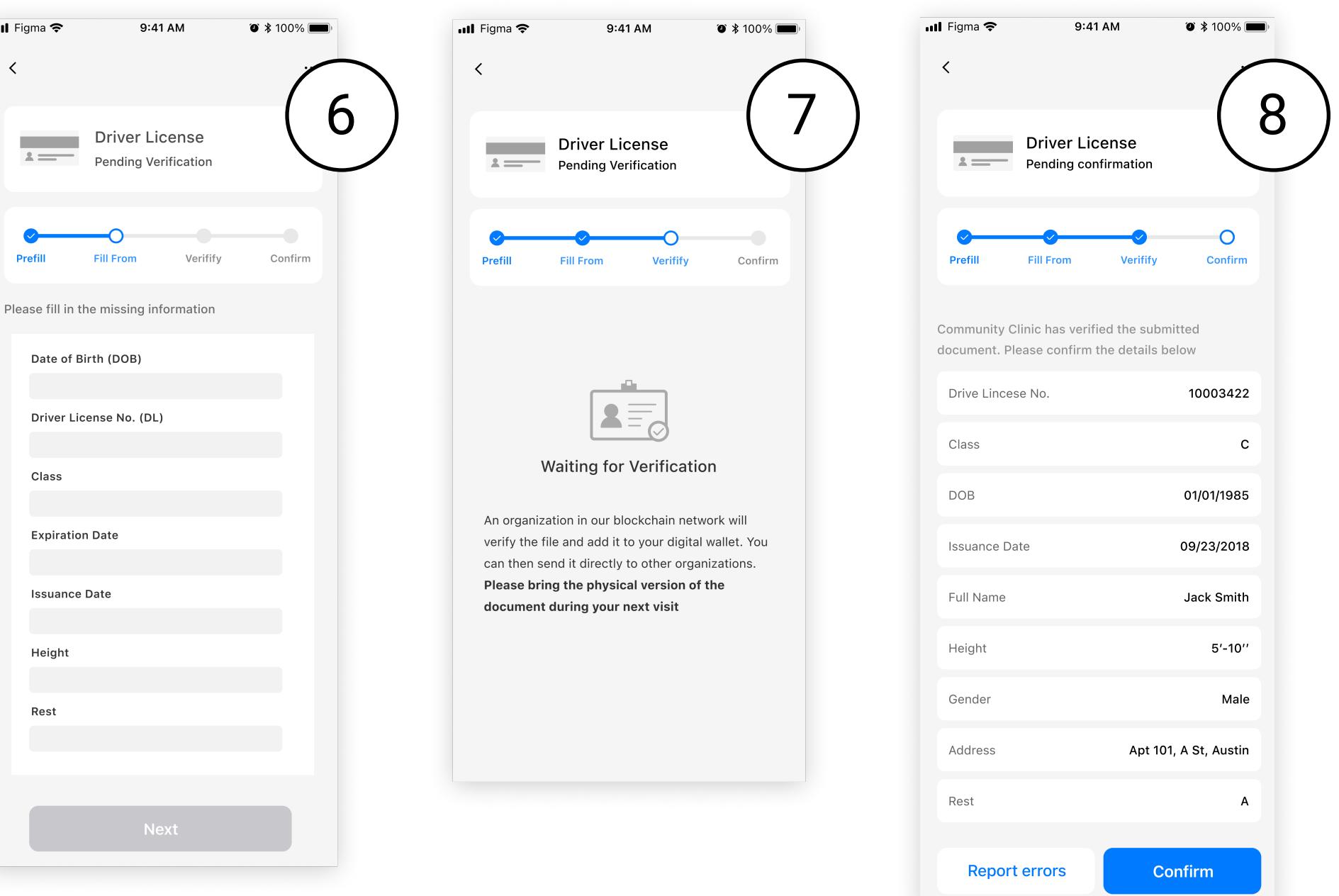
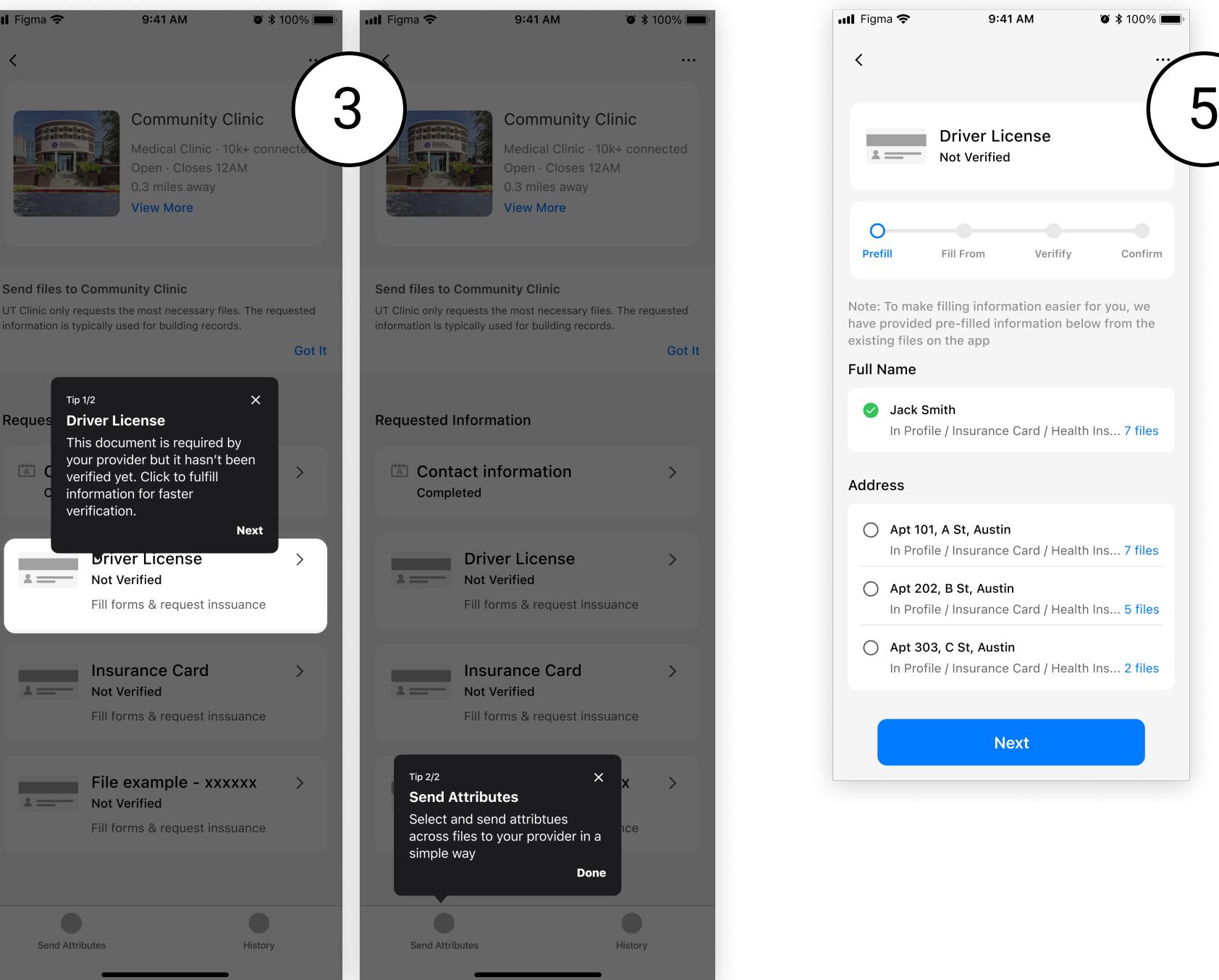
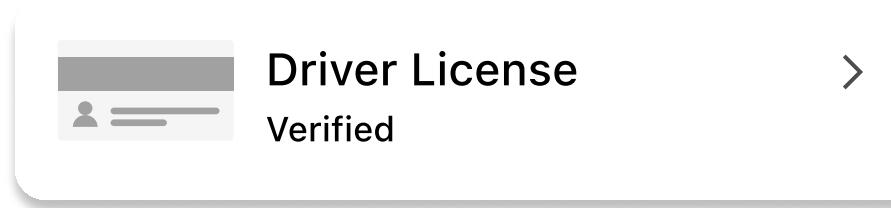
Step 3: Verification screen where the patient has to wait till their driver's license is verified

8

Step 4: Confirmation from the patient on the information retrieved from the blockchain network

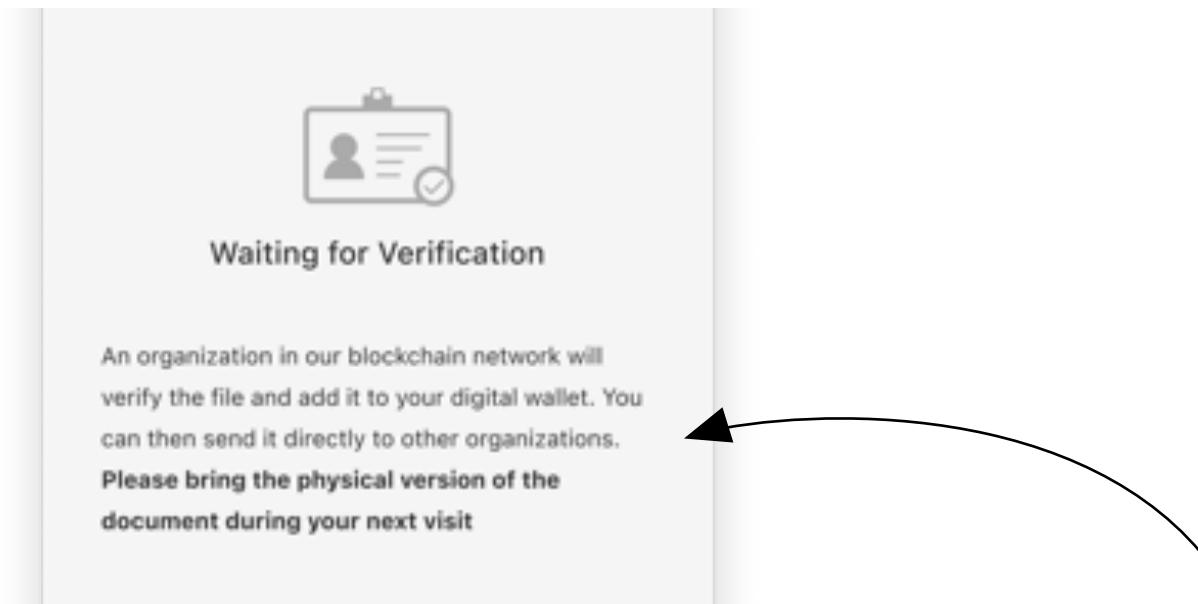
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Step 9: Driver's license has been verified. Status on Driver's license changes to "verified"

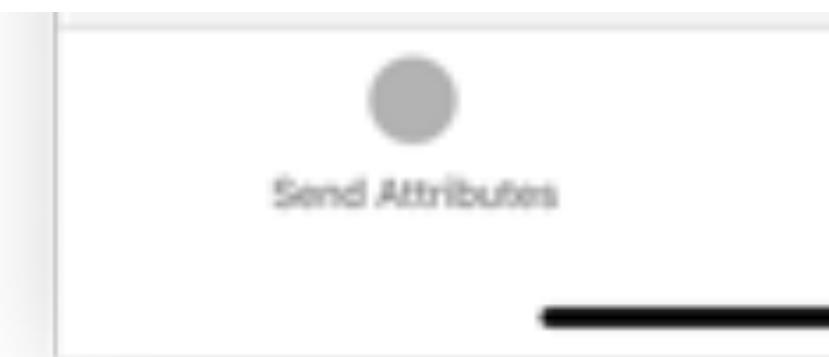
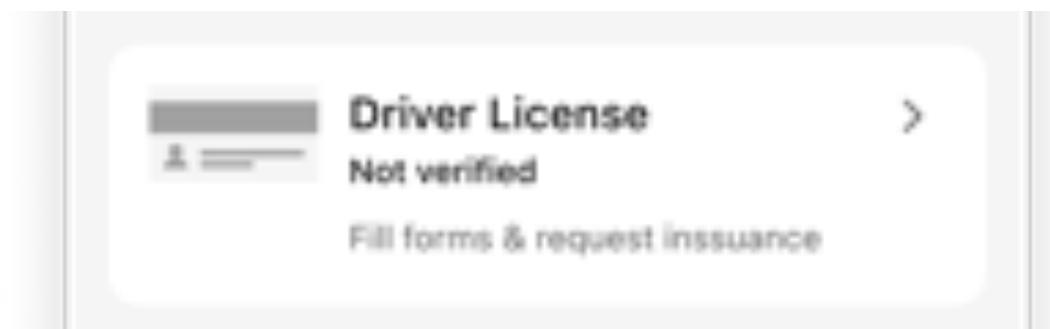


Task 3: Observations

- Participants had a hard time understanding if they have already shared the Driver's License with the clinic, what is being verified and who is verifying.
- Another term that was difficult to comprehend for most participants is "**attribute**". They said it seemed unusual for a medical app.
- Some participants asked why do they have to confirm after the ID has been verified



- A couple of participants pointed out that asking patients to bring physical copies of document on their next visit defeats the purpose of the app



Recommendations

- Use of simpler and user-friendly explanation about verification
- Alternative terms** for "attributes" like information bits or items or details
- Maintain consistency across similar tasks
- System status**: Let the patient know how long it will take for their document to be verified

Ease of Use Rating: 4/5

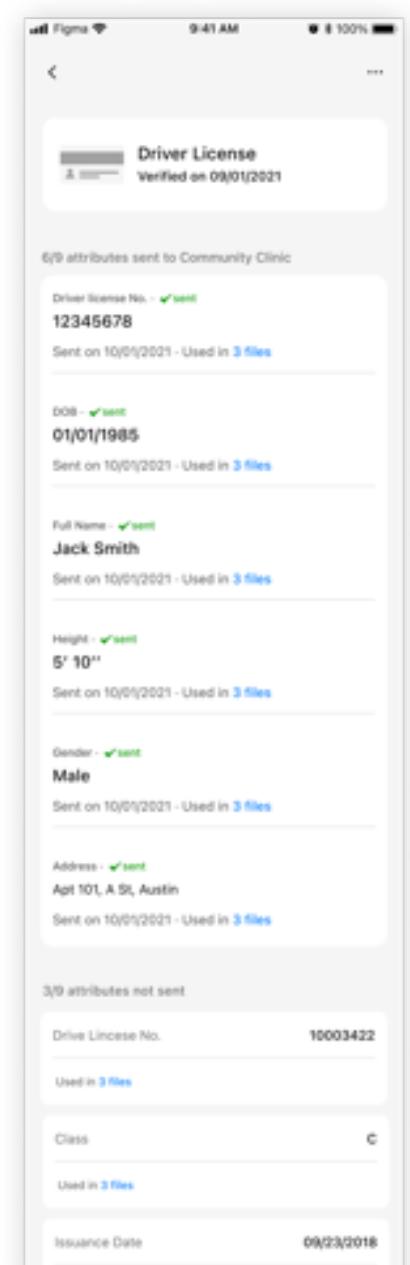
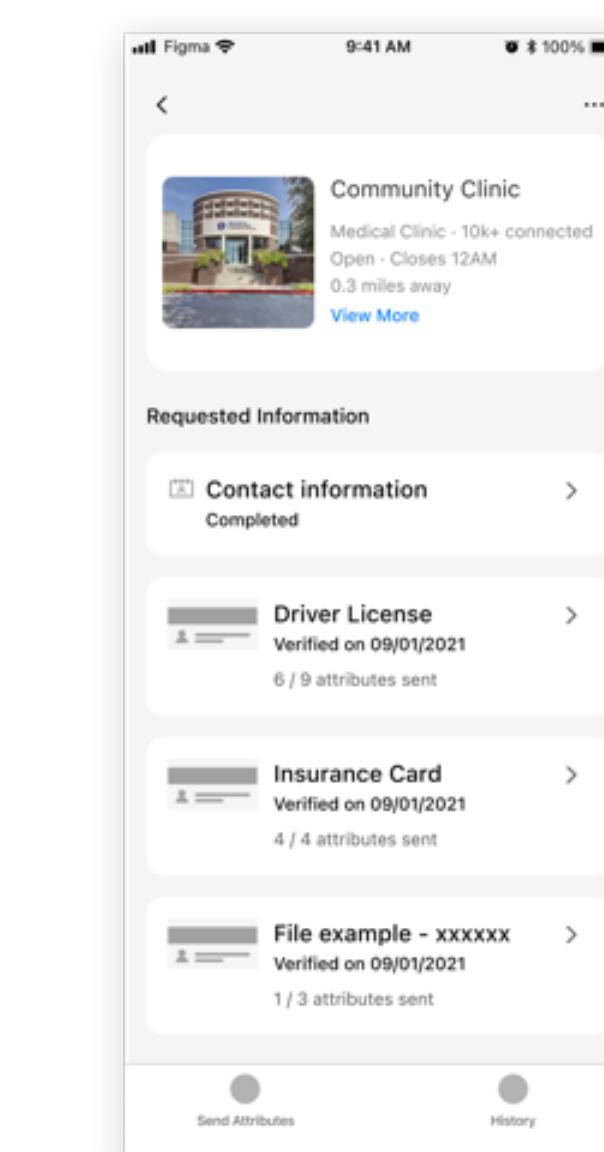
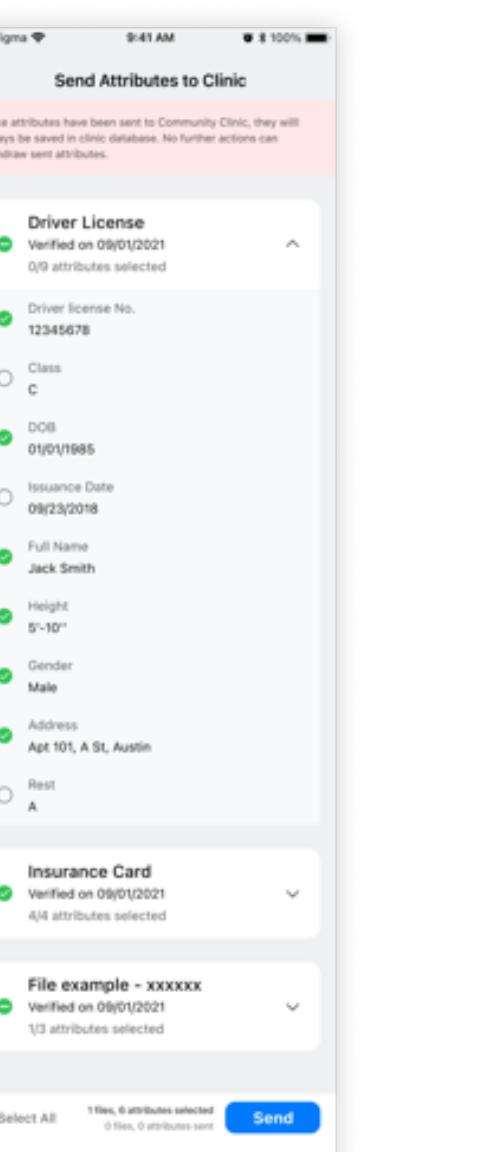
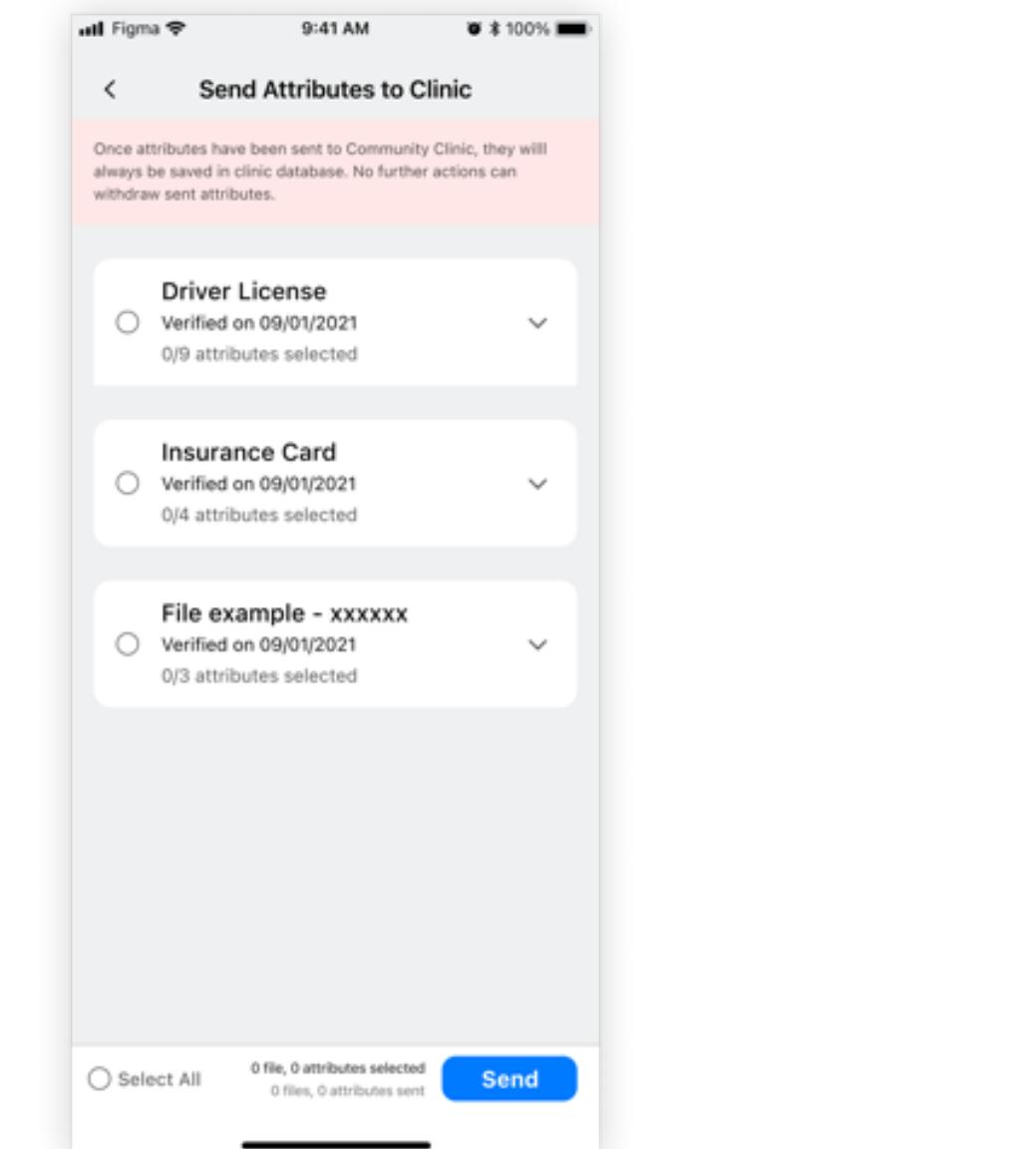
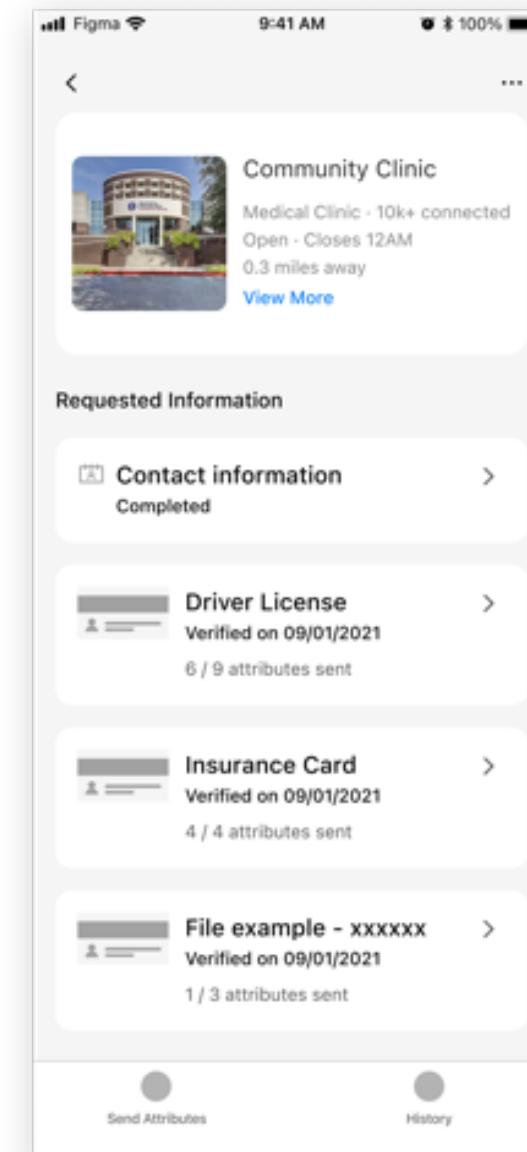
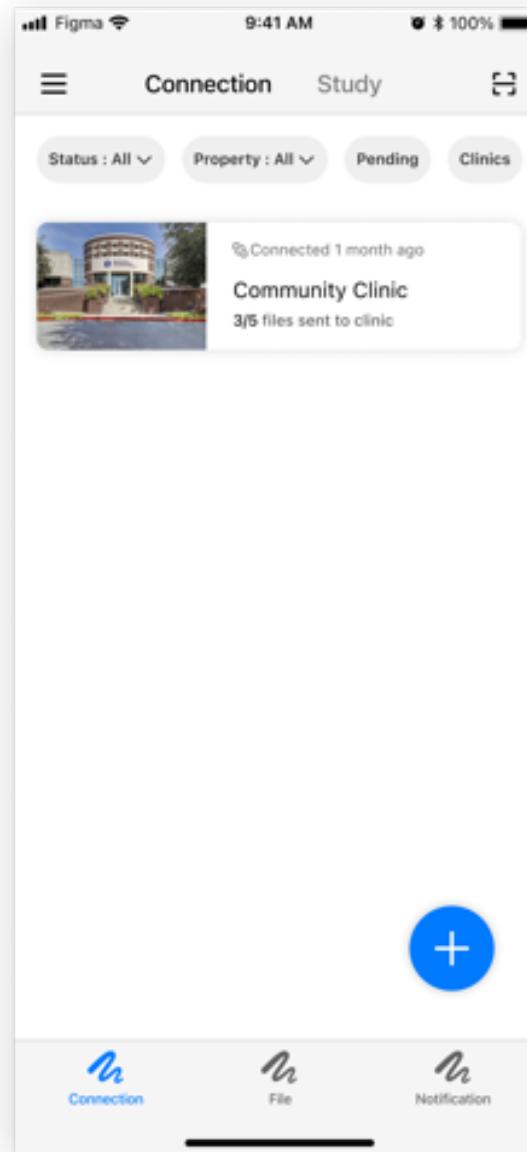
Task 4: Sharing details as specified by the clinic

Task 4

In a later visit to the same clinic, the clinic requests the following information on the app:

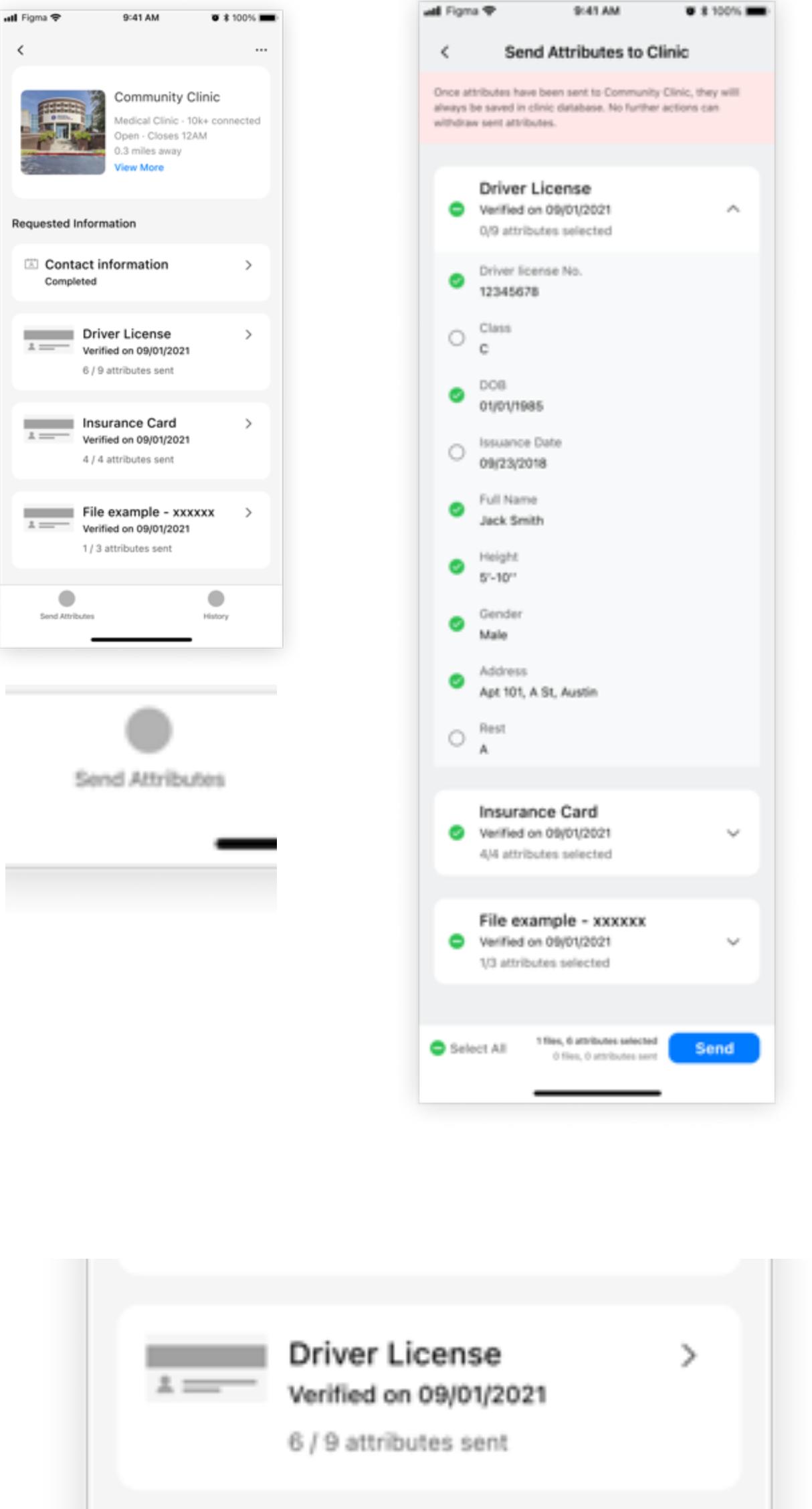
Driver License no., DOB, Full Name, Height, Gender and Address

- 1 On the connections screen, patient clicks on the Clinic card
- 2 Patient clicks on “Send Attributes”
- 3 Patient selects the document from where they want to send attributes
- 4 Patient selects the attributes requested by the clinic from within the document and clicks on “Send”
- 5 Attributes get sent to the clinic. Status on the document changes according (6/9 attributes sent)
- 6 Specific document detailed view



Task 4: Observations

- Participants took a lot of time to figure out the navigation
- Another term that was difficult to comprehend for most participants is **“attribute”**. They said it seemed unusual for a medical app.
- One participant said why did she had to send again when she has already authorized
- Most of the participants weren't sure that they had completed the task
- Some participants were confused about the number of attributes sent compared to the total number of attributes



Recommendations

- The Notification on “Notification” tab indicating the clinic is requesting for the specific attribute
- Having the patient select from the list of documents is cumbersome. Is it possible to have a list of attributes screen instead?
- There needs to be a “Accept” and “Decline” feature for the user
- Clear success message when the attributes are sent.
- Also getting a “Attributes received. Thank you!” message would be helpful. There is a need to make the interaction more patient-friendly to move away from the mundane business like nature of the app

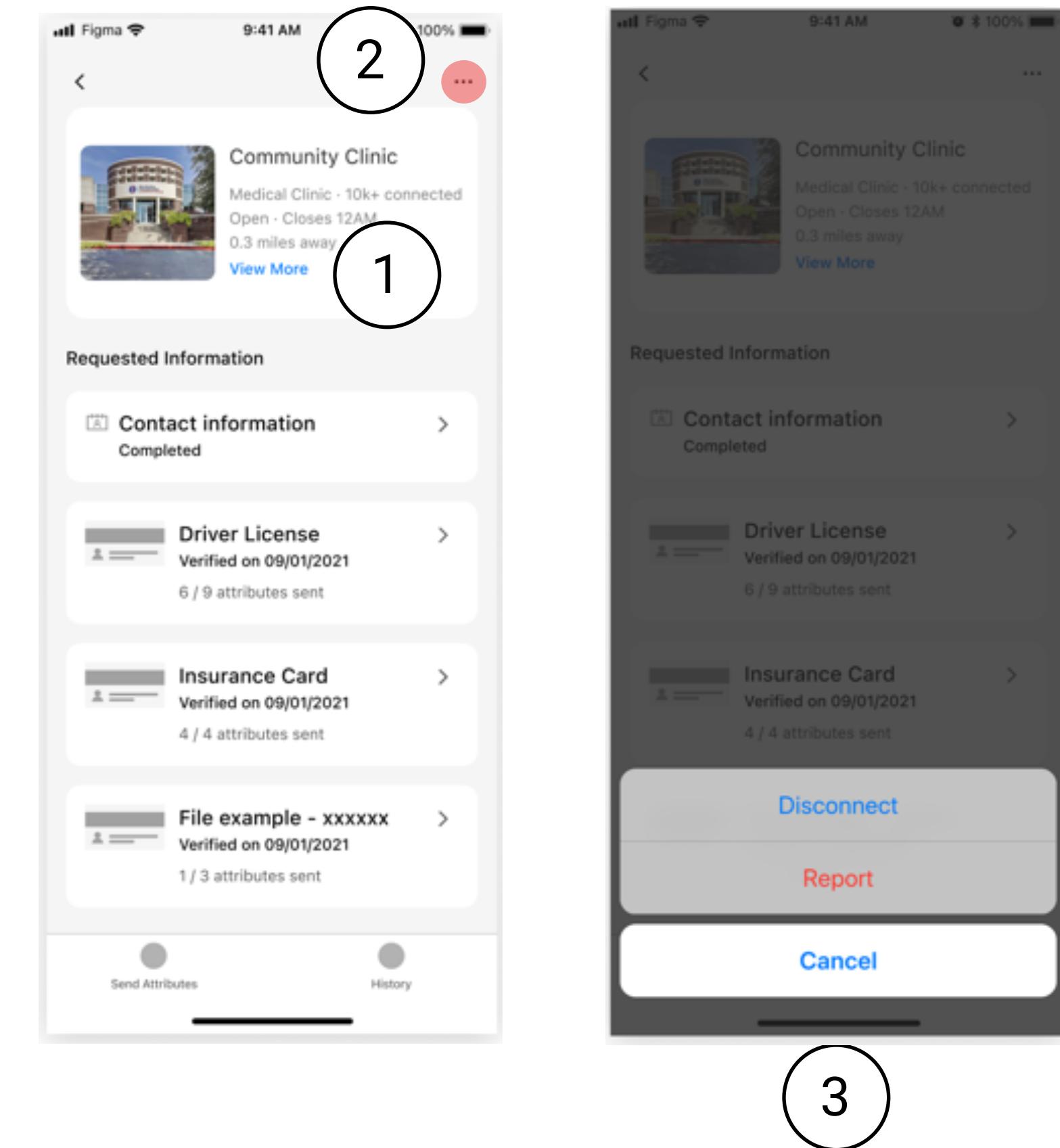
Ease of Use Rating: 3.5/5

Task 5: Unerolling with a clinic

To check if the user can unenroll or disconnect from a clinic

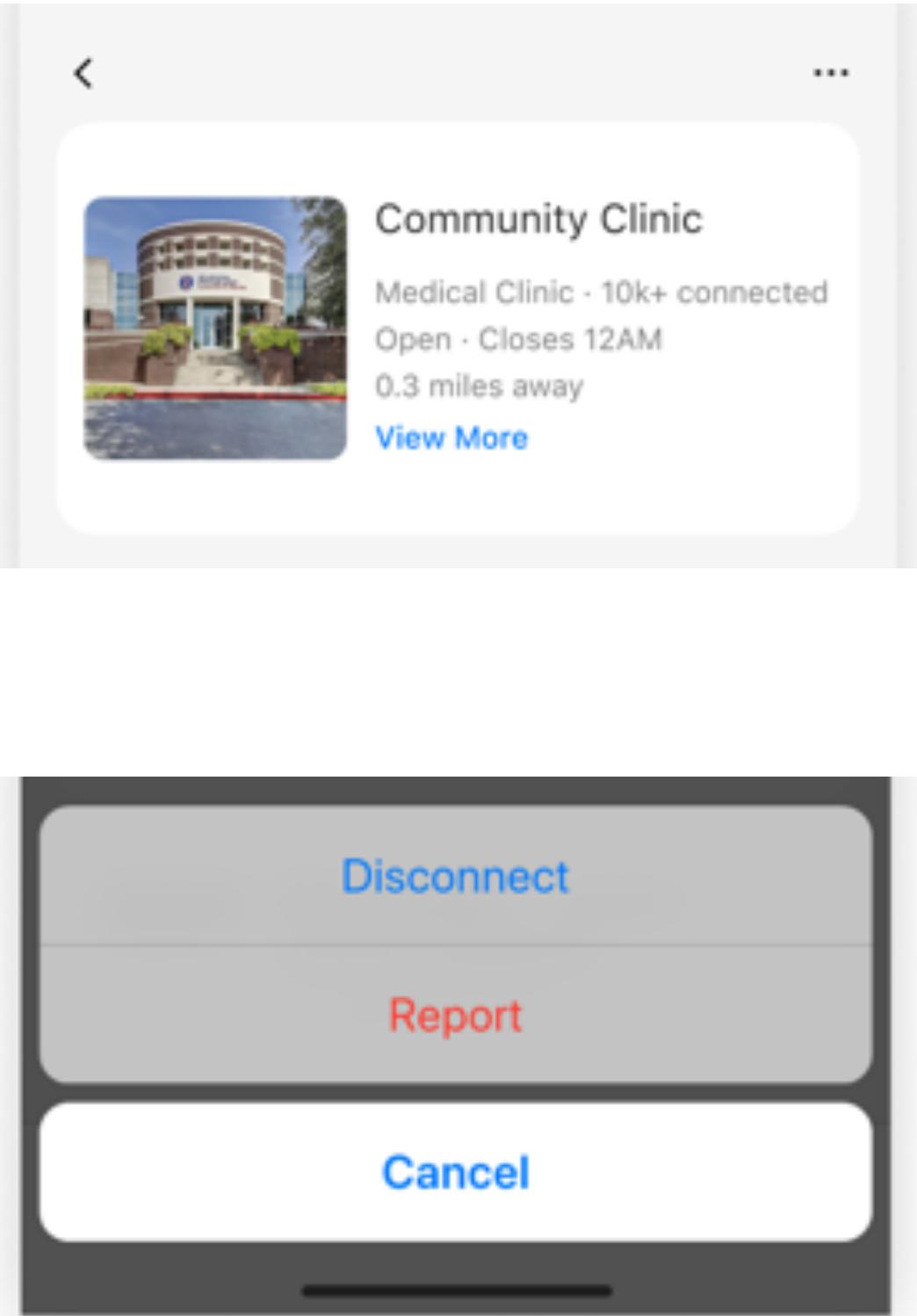
Purpose of this task: To know if the user understands what unenrolling means and their experience finding the option to accomplish this task.

- 1 The patient/user has decided to unenroll themselves from a clinic they have been connected to. They see all their clinics on the app dashboard.
- 2 The patient/user now clicks on the “3-dots menu” present on the top-right corner of the screen which then shows the available options for selection.
- 3 The patient/user finds “Disconnect” as one of the options and understands that choosing it will unenroll them from the clinic.



Task 5: Observations

- The “Unenroll” or “Disconnect” option was not a part of the clinic card, the navigation was placed outside - in the generic menu. This made the location of the disconnect option difficult to find.
- The disconnect option doesn’t convey to the user, from which clinic the patient is unenrolling from.
- Participants were curious to understand unenrolling from the clinic’s point of view. There were questions about information access.



Recommendations

- Each clinic must have its own menu (3 dots) which helps users understand that the options belong and apply to a clinic of their choosing.
- There could be a “Disconnect” option appearing on the Clinic Details screen when the patient clicks on “View More”
- There must be a mention of the name of the clinic while disconnecting. The user will need reassurances while performing the action, if they are going on a path they intended to or not. There must also be a confirmation message like a yes/no question before the action is performed for a user to back out.
- The concept of unenrolling from user’s and clinic point of view must be explained as a “Learn More” or “App Privacy section”. This gives transparency to the process and trust for users to use the app in terms of privacy.

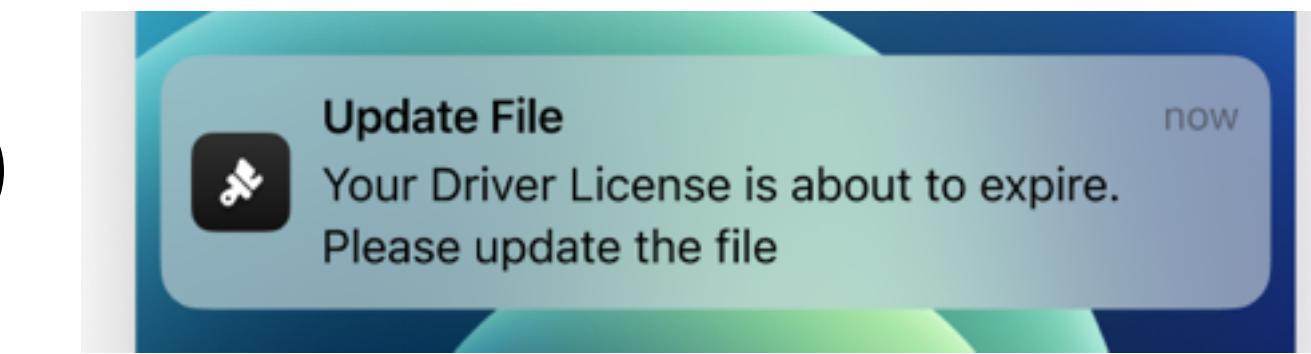
Ease of Use Rating: 3.25/5

Task 6: Updating an expired ID document

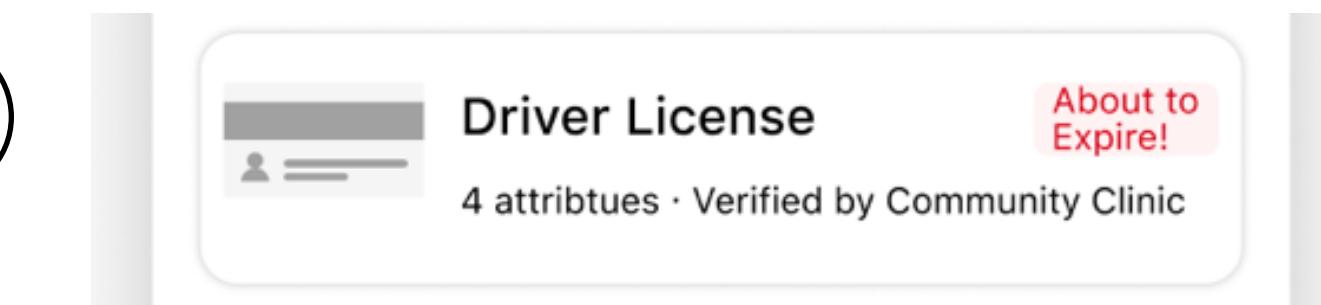
A scenario where the user's driver license is about to expire and the new details have to be updated via the Medilinker app.

Purpose of this task: To understand the user's experience while updating their expired personal documents like ID's and health related documents like insurance cards.

- 1 The patient/user receives a notification from the Medilinker app which indicates that their updated driver's license be uploaded via the app because the existing one will expire soon.



- 2 The patient/user is navigated to the app upon notification selection where there is an expiry label against the driver's license information.



- 3 Upon selection of the driver's license option, the patient/user is given an option to update their information on file.

A screenshot of a form titled "Update File" for a driver's license. The form includes fields for "Drive Lincense No." (with value "10003422"), "Class" (with value "C"), and "Issuance Date" (with value "09/23/2018"). Each field has a note below it stating "Used in 3 files". At the bottom, there is a large blue button labeled "Update File". Above the form, a message says "3/9 attributes not sent".

4

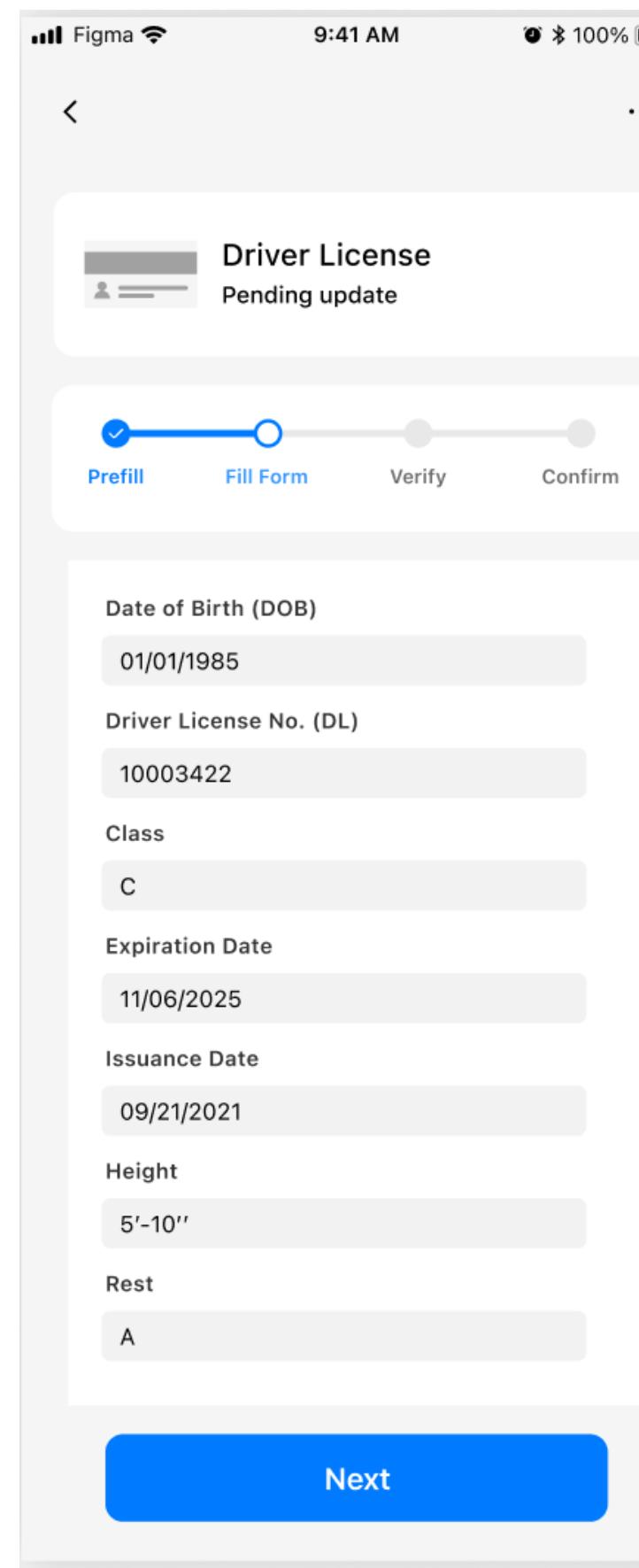
This option will navigate the user to modify/update any of their information which will require a verification.

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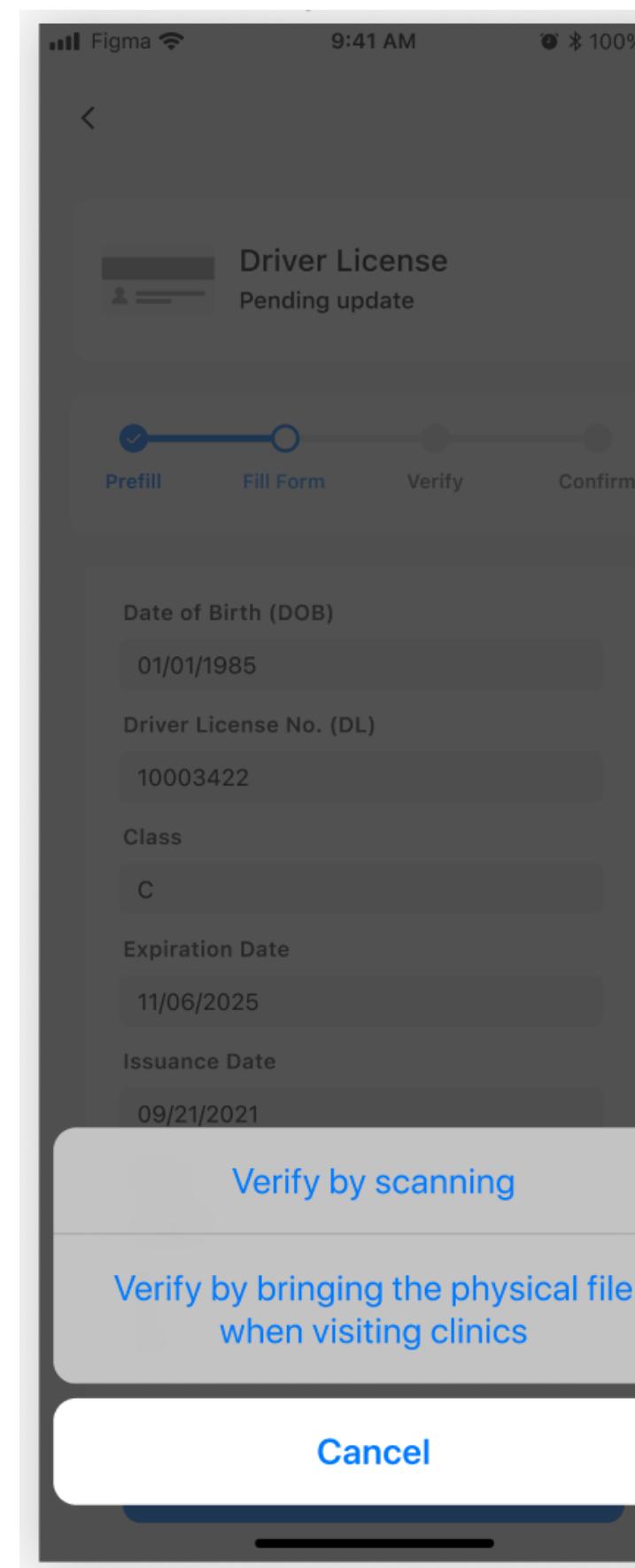
There are two ways to verify patient information namely, “Verify by scanning” via the app and “Verify by bringing the physical file when visiting clinics”

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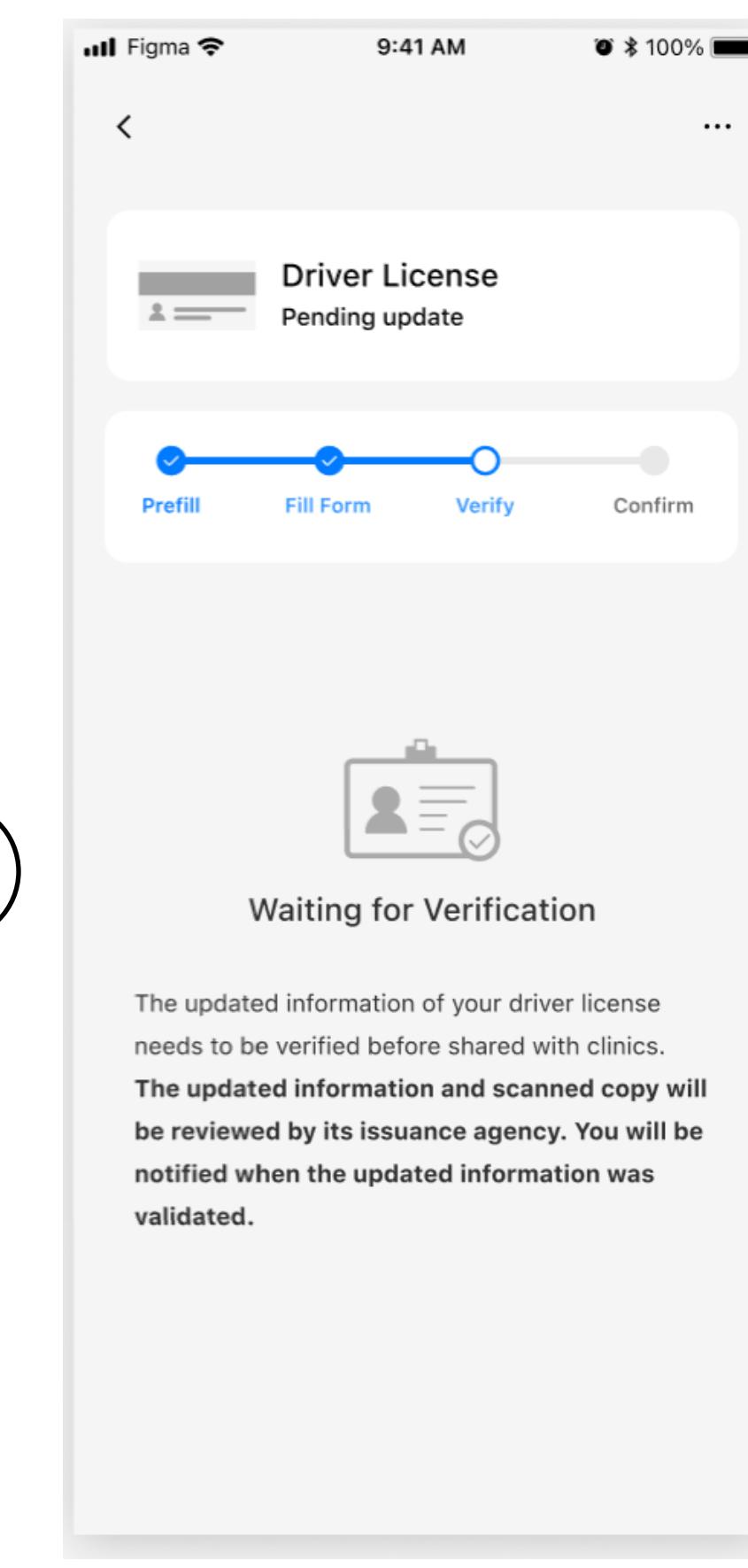
The clinic will take time to process and update this information on the Medilinker app.



4



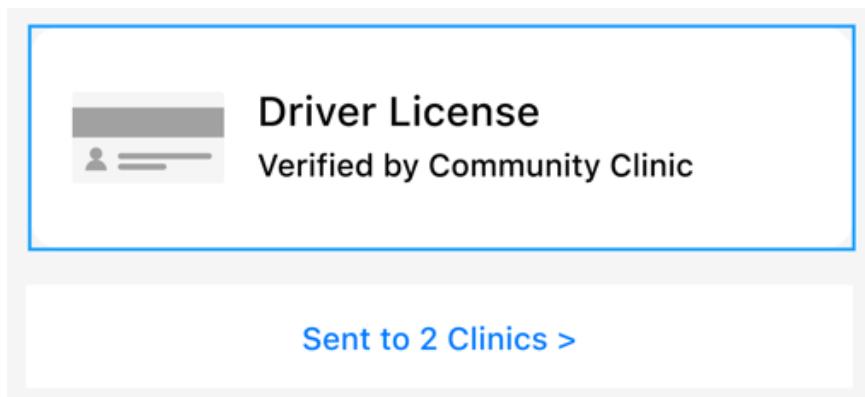
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Task 6: Observations (Part 1)

- Participants were unsure about the information exchange between patients and clinics. They asked if credentials will be auto-updated to all their connection or if they would have to re-send them.



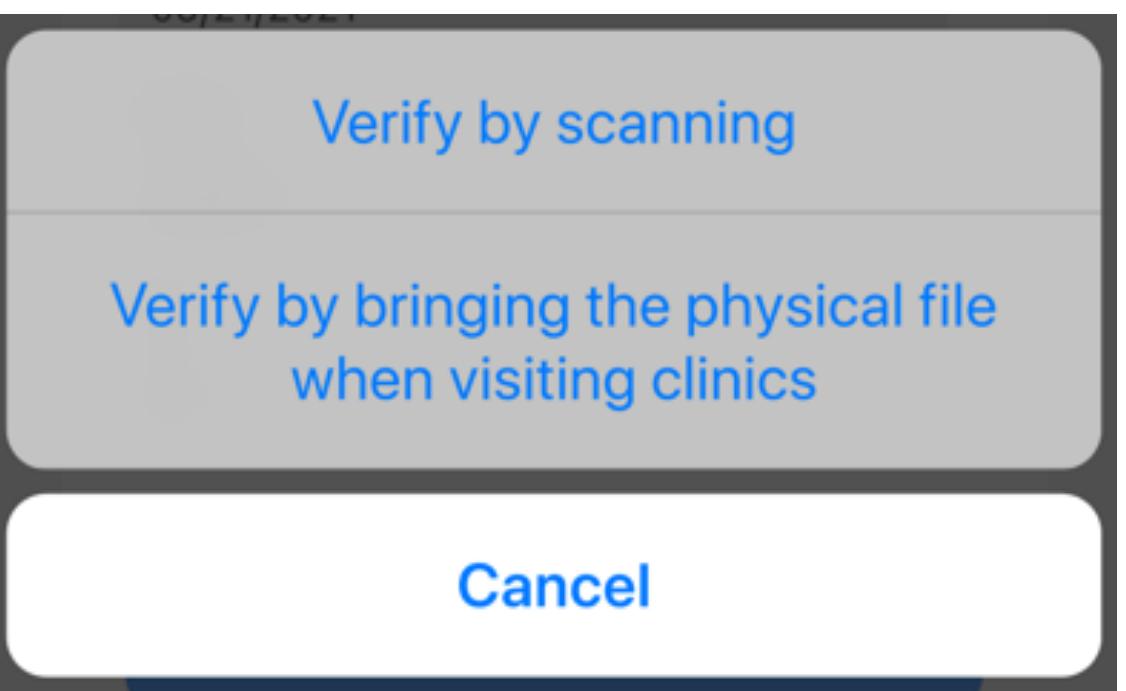
- Participants felt lost because they couldn't see a "modify" tool or an "Update" button to enter in the new driver's license details
- Two participants expressed ambiguity regarding consequences for ignoring expirations for documents. There were questions like - What happens if the document is not updated? What are the repercussions of this during health emergencies?

Recommendations

- The process of information exchange and permissions must be explained in a "Learn More", "Help" or "FAQ" section.
- There is a need of edit tool (pencil) and the Next button needs to read "Update"
- Keep the users aware of consequences of not keeping their data and documents updated would encourage them. There can be a "Learn More" section where they can understand why they need to keep records updated.

Task 6: Observations (Part 2)

- There was no confirmation after the driver's license was updated which made participants doubt if they accomplished the task.
- Participants unfamiliar with the Apple ecosystem didn't understand that there were two options for verification of documents i.e., "Verify by scanning" and "Verify by bringing the physical file when visiting clinics". They thought it was a pop-up message which notified them to complete both these steps as steps for verification. This made participants feel the task was "tedious".
- In Task 3, while adding ID proof, the user was not asked to scan documents for verification. Some participants asked why wasn't this method used in sharing Driver's License information: lack of consistency



Pop-up messages on the Apple ecosystem

Recommendations

- A confirmation message must be added to notify the successful completion of any action on the application like "Driver's license successfully updated" message.
- More elaborate information about verification and its options must be included as a "Learn More" section on the "Waiting for Verification" screen.
- Users must be given familiar ecosystems for a better understanding of application features.

Ease of Use Rating: 4/5

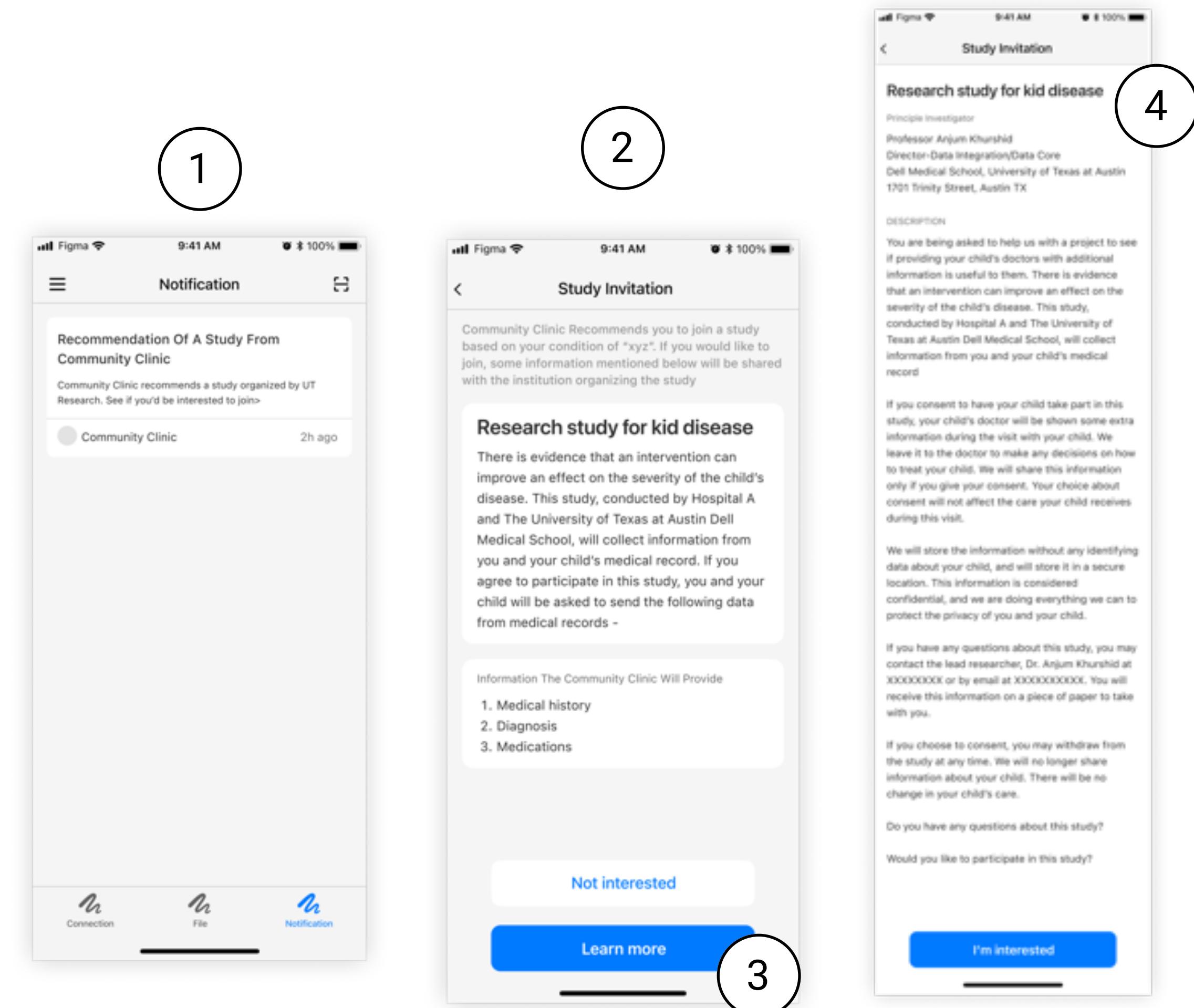
Task 7: Consent To a Research Study

The clinic has recommended you for a study you're eligible for and you've decided to participate.

- 1 The user receives a notification that they are eligible for a research study at their clinic
- 2 The user clicks on the notification and is given a brief description of the study and a list of what information they will need to share.
- 3 The user then clicks on learn more and can read the formal study invitation before they decide to give consent.
- 4 On Learn More, the user can view the details of the research study. There is a "I'm interested" button

Purpose of the task:

To determine if the user understands what research study means and is able to send a consent credential.



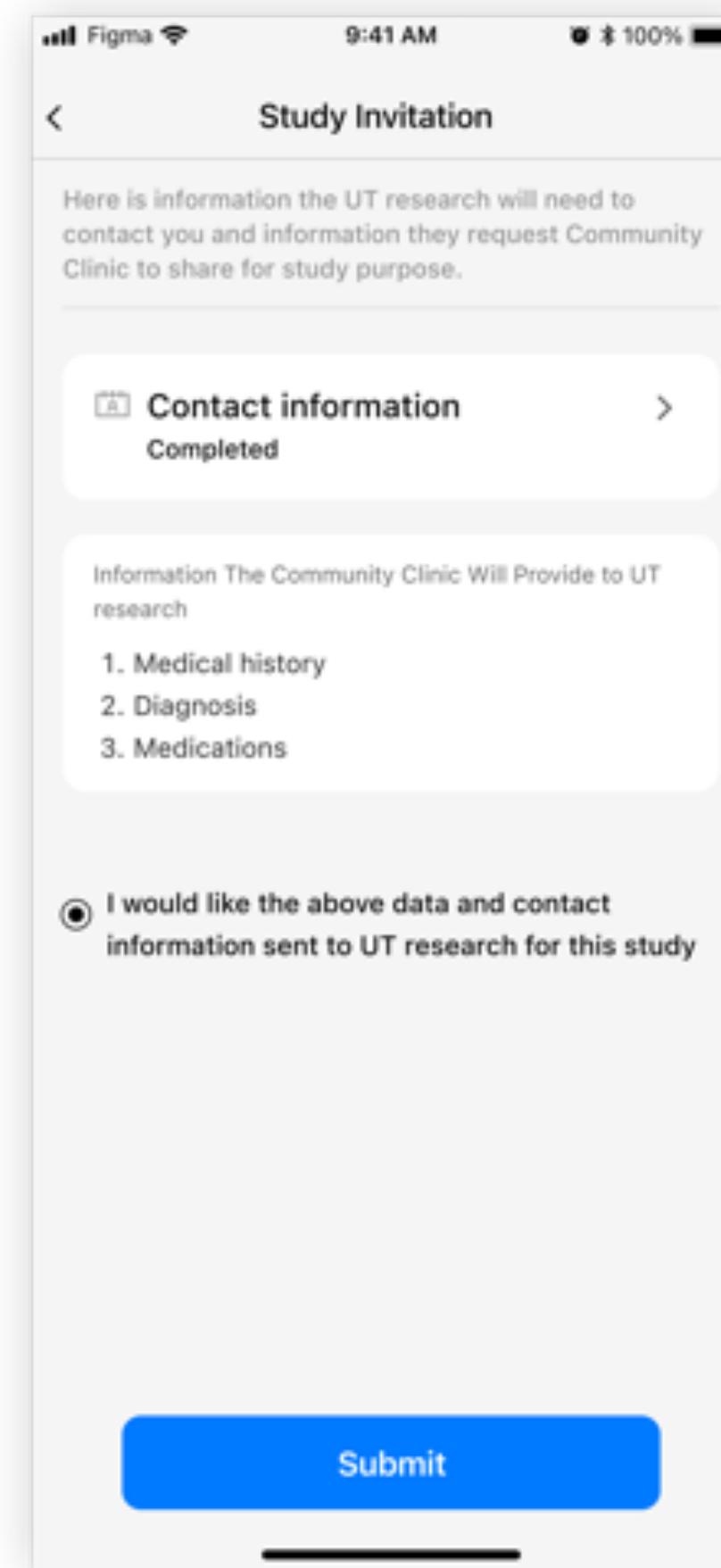
Task 7: Consent To a Research Study (Contd)

5 The user is given the option to share their contact information and the information requested by the study.

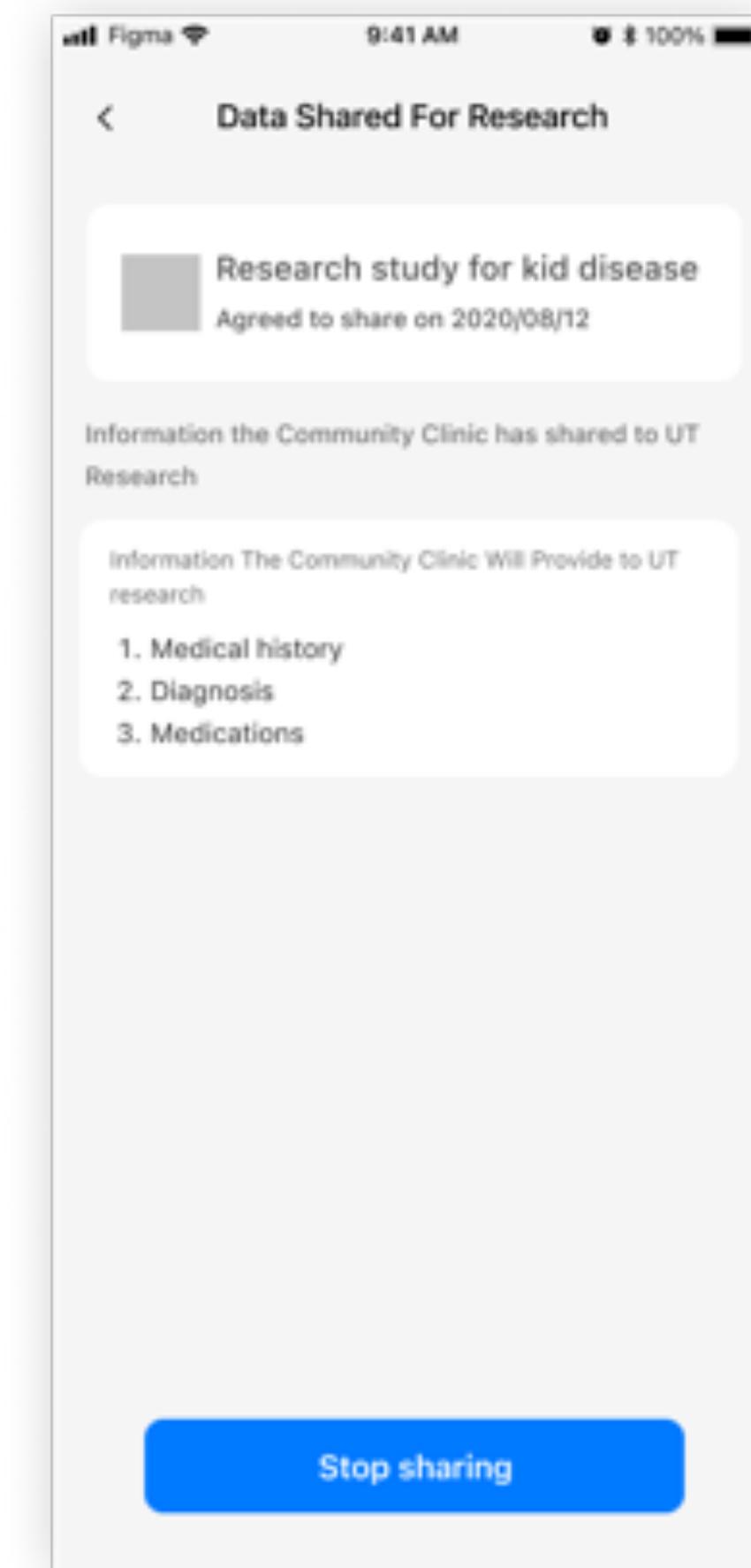
6 After the user gives consent for the study, they can stop sharing their information with the study at anytime.

7 The research study the user gave consent for now appears in the list of studies they are participating in

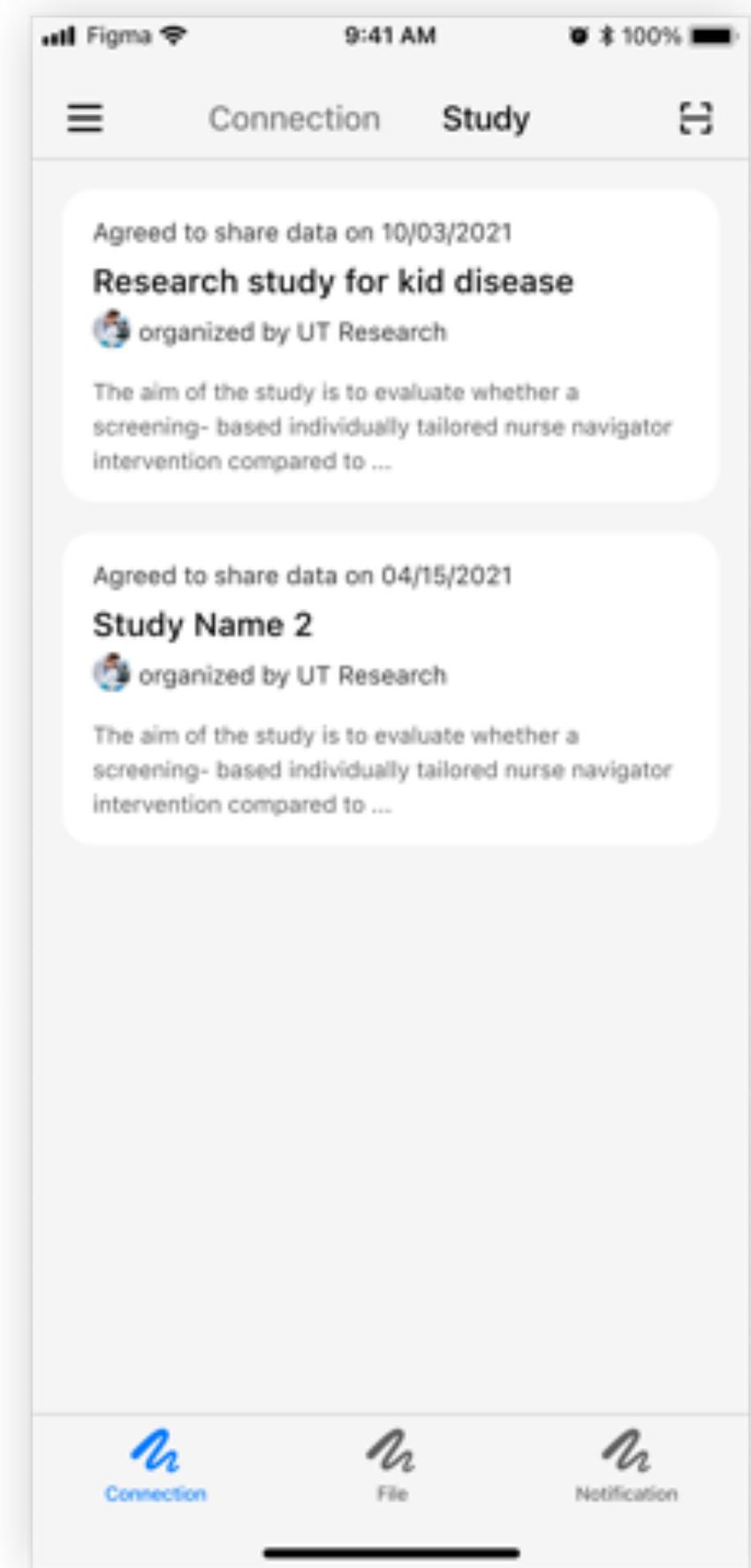
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Task 7 - Observations

Observations:

- After the initial study invitation, there is no way for users to decline participation in the research study.
- 
- The participants said they would feel uncomfortable giving consent for a research study via an app
- There is a contact number included in the details of the research that was missed by most of the participants: information overload
- The process did not fully connect the users to the researchers which made the users less confident in the confidentiality of the study with no options to gain a clearer or more accurate understanding of the study
- Disconnect between previous disclaimer that info shared with clinics can't be fully deleted.

Recommendations

- Add a "back" button or an "I'm no longer Interested" option in each step of the consent process.
- Feature to contact the researcher leading the participant-recruiting for additional questions and clarification on the study [Call Button] via the app
- List criteria that user meets that makes them eligible for the study and which of their connections recommended them for the study.
- Add disclaimer note that explains the difference between sharing information with clinic and for a research study.

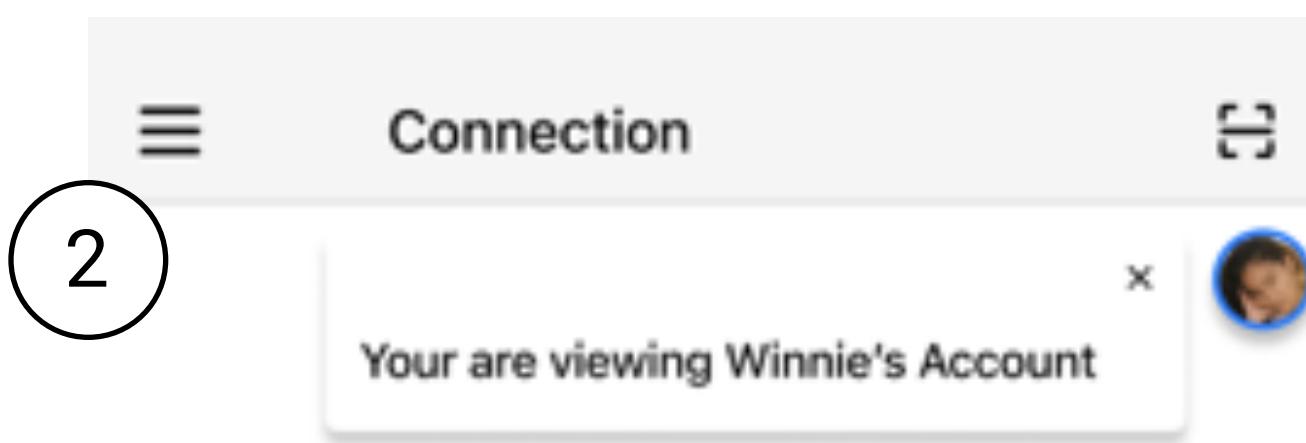
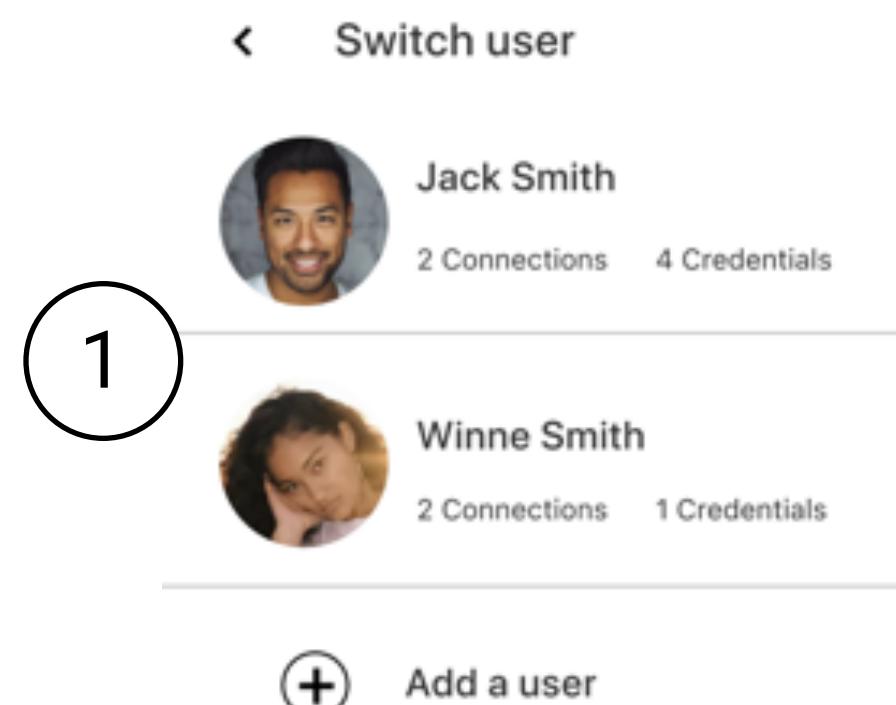
Task 8: Switch Users

Your daughter is a minor. Before her appointment with the same clinic, you need to update her details on her behalf as a parent via the app.

1 The user begins on their personal connections screen and navigates to the menu, where they find the switch users option.

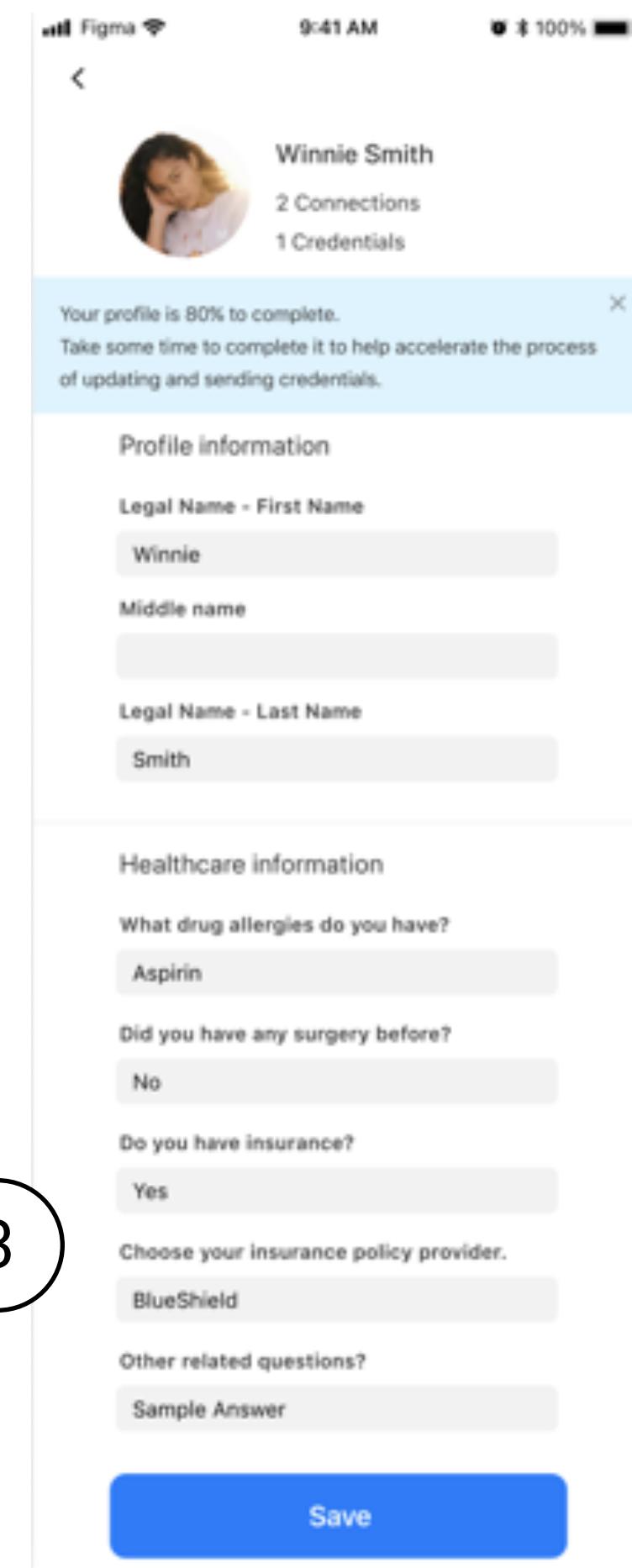
2 From this point they will select a different user they wish to login in as and are notified that they are now viewing that user's account.

3 The user can then update the information on the different user.



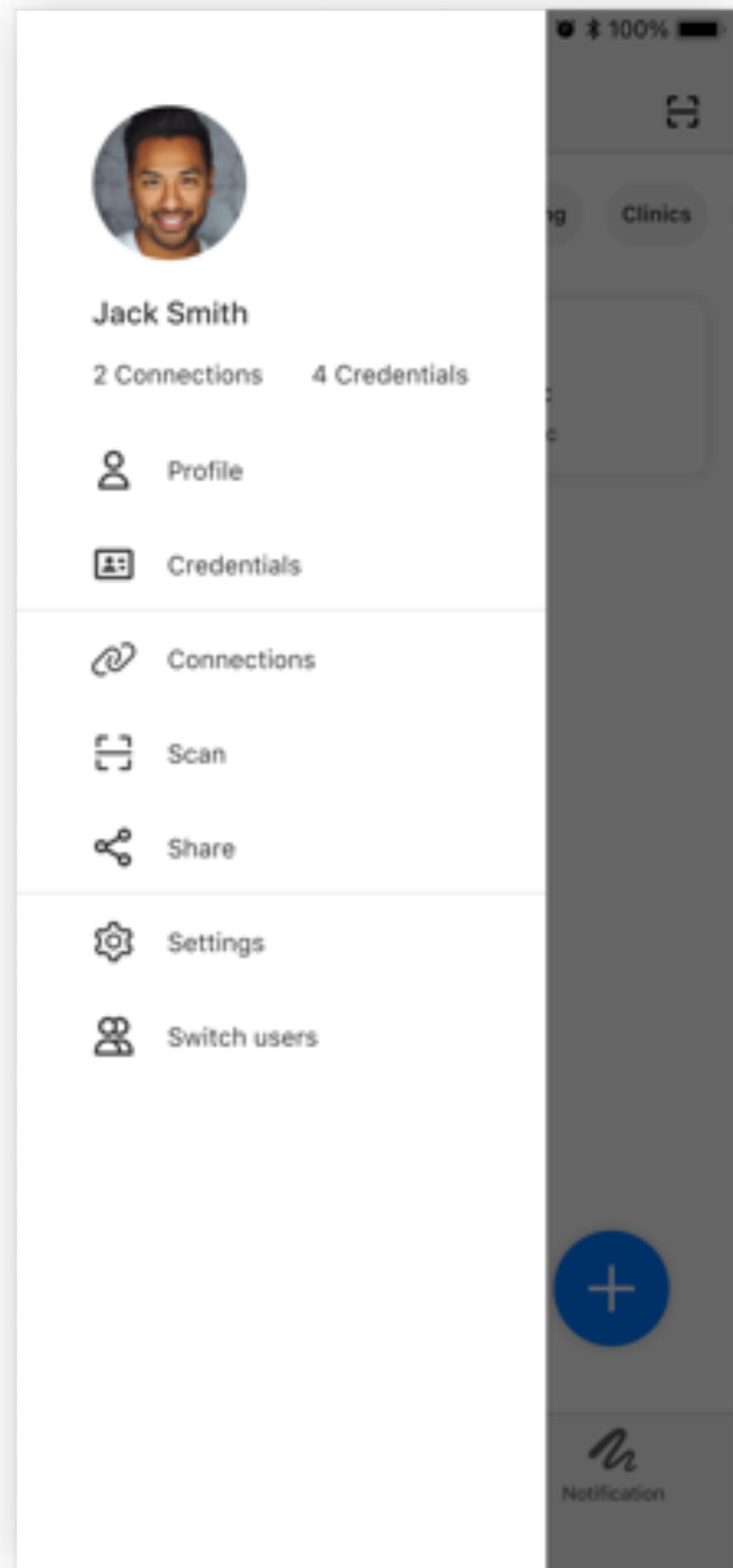
Purpose of the task:

To evaluate the user's ability to switch between multiple user profiles.



Task 8 - Observations

- Users thought that the "+" symbol could be used to add another user; thought that the account was a shared account that you can add other users to.
- Users were confused by having a "Profile" and "Switch Users" menu option
- Users had difficulty finding the second user's information



Recommendations

- Add a tutorial on "adding and switching between users"
- Make the "switch users" option a part of the "profile" option or have users names in a drop down menu
- There needs to be a clear mention right on the home screen that there is a facility for maintaining nested profiles of family members
- Add a tutorial on "editing or updating new user information"

Ease of Use Rating: 3.38/5

Key Takeaways: Summarising Recommendations

5

Visibility of System Status

Notify/Update users about in-app processes and sections.

For Example:

1. "Success" message when attributes are sent to the clinic.
2. Elaborate about the "Verification process" on the "Waiting for Verification" screen, estimated time
3. Confirmation message while disconnecting from clinic

4

Recognition rather than recall

User's used prior knowledge while testing and found the following.

For Example,

- QR code icon - not recognized
- Blue "+" button resembled "Compose Email" on Gmail app
- Menu Button for each clinic (3 dots) - specific disconnect option
- There was no "Pencil" option (editing) or "Update" button while updating ID documents

1

Lack of Error prevention

Prevent errors - a system should either avoid conditions where errors arise or warn users before they take risky actions

For Example:

Before disconnecting from the clinic, there needs to be confirmation step where the user is made aware of the consequences

Key Takeaways: Summarising Recommendations

3

Mismatch with real world terminologies

- **Attribute** - *Items/Details*
- **Wallet** - *Document Folder*
- **Connections** - *Clinics*

The call-to-action buttons and section titles need to be more healthcare-centric. For example, wallet doesn't seem fit for a space where medical records are going to be stored. Show information in ways users understand from how the real world operates, and in the users' language.

2

Lack of control to Users

Offer users control and let them undo errors easily.

For example,

1. Accept/decline option to share attributes
2. "Not interested" button for research consent at every step

3

Inflexibilities

Keep it flexible so experienced users find faster ways to attain goals.

Examples:

1. System Onboarding alternatives - QR code as well as Clinic specific code
2. Keep Switch users option in a familiar spot: Profiles or accounts
3. Give familiar ecosystems -- design familiar to both Android and Apple users

Key Takeaways: Summarising Recommendations

9

Lack of visibility of guiding information

Have visible information, instructions, etc. to let users recognize options, actions, etc. instead of forcing them to rely on memory.

Examples:

- FAQ section for Blockchain
- QR Code
- “Pending connection” message:
who is it pending from?
- Document upload for Verification
- Unenrolling from whose POV
- Consequence of not updating
expired ID

2

Lack of Consistency

Keep it flexible so experienced users find faster ways to attain goals.

Examples:

1. Connections leading to clinics screen
2. Method used to update expired DL not same as updating DL for the first time

Thank You.