

# Final Report

CSC 591 UX - Spring 2019

#digitalfamilyhistories, Optum Health

## Team

- Aditya Joshi (ajoshi6)
- Amber Raza (araza3)
- Abhishek Arya (aarya)
- Darpan Dodiya (dpdodiya)
- Neeraj Deshpande (ndeshpna)
- Karthikeyan Vaideswaran (kvaides)

## Client

Optum Health

# 1. Stage 1 - Research

## Long term goal

Our long term goal is to design a digital family health history application that is:

- User-friendly and easy to use
- Capture all essential health data
- Focusing on younger and typically healthy individuals (14 - 40 years)
- Accessible to the population with low literacy

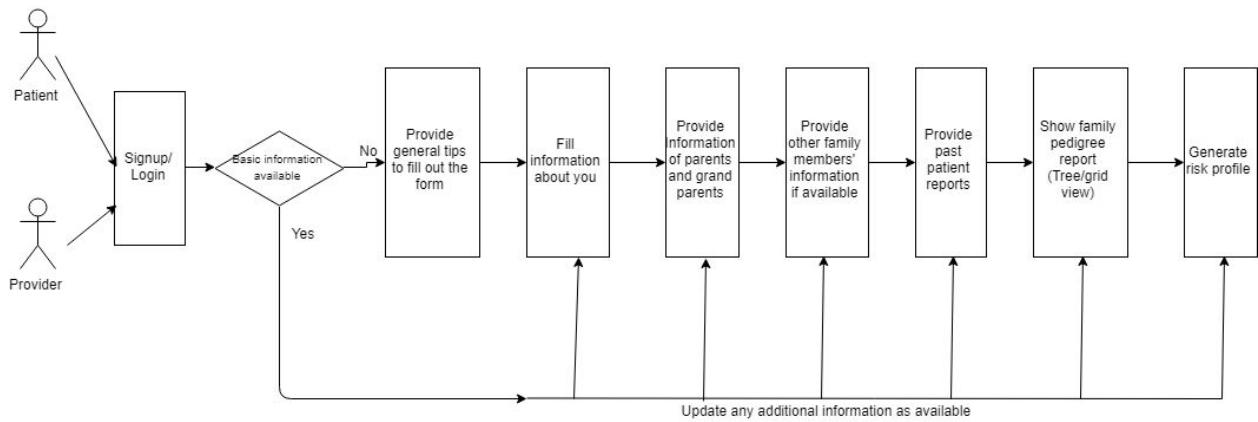
The solution will benefit the patients, health care providers as well as payers.

## List of challenges

1. People are generally not comfortable with sharing their health history. What can be done to make them share more comfortably?
2. Many people have a fear that their family's health history may be used against them by payers. What can be done to make them believe that health history will be beneficial to them in the long term with their health and finances?
3. What can we do to make undereducated people aware of the importance of family history and make it easy for them to use the application?
4. Young and healthy people do not understand the value of family history. What can be done to make them understand the usefulness of family history?
5. Many people think it is just a waste of time. What changes can be done with the application, so it will not take more time to fill all the details?
6. Most applications don't engage people as they are not easy to use (forms are very long). How can we improve our application to make it more easy to use and engaging?

# Experience map

Digital health history experience map



*Original experience map can be found in the Appendix.*

## Expert notes

Our client for this project is Optum Health. We had our first meeting at Optum Health's Raleigh office. The meeting was attended by 8 stakeholders from Optum Health, UX project teams and Prof Watson. The meeting flagged off with representatives from Optum offering a high-level view of the matter and level setting between all people involved. The first few minutes of the session were extremely helpful for us in understanding the business aspect of family history.

As the meeting progressed, we discussed the following ideas:

### Background and business use case

- What is family health history
- Family history is not usable if it doesn't have all information
- Its patient-generated health data
- Challenge: get the users to fill data as accurately as possible
- Beneficial to all: Insurance, care providers, patients

### Barriers to collect family history

- Patient

- User experience
  - Patient engagement
  - Education
  - Accuracy
- Provider
  - Time
  - Awareness
  - Complexity

## **MeTree - The current family history solution**

### **Workflow**

1. Patient encounter
2. Clinician provisions MeTree account
3. Patient accesses and fills out information
4. Patient and clinician collaborate on patient's MeTree report

### **Tool demo**

- About you
- Patient and grandparents
- Other family members
- Patient reports
- Risk profile.
- FINISHED

### **Adam - Mentor for UX Team 1**

- Actual work and application goals
- As the user is giving lots of information by spending time, what does he get back in the result
- Deliverable for the first phase: Process map

### **Jamaal - Mentor for UX Team 2**

- Demo of the process map
- What's persona
- What's sitemap
- What's user flow

The meeting concluded with a Q&A session. Overall, it was a great introductory session for us to get started on the project. By the end of the session, we had a clear goal of the family history project.

Later on, we discussed the project internally in our group to brainstorm on all possible goals and creative ideas to solve the problem. The long term goals are outlined in the section above.

*Raw meeting notes from the meeting can be found in the Appendix.*

## Problems/opportunities

- 1) Improve information collection system.
  - a) Can we make a simpler and engaging application?
  - b) Can we make the UI that is more friendly to various age groups and low literacy population?
- 2) Increase and improve patient data.
  - a) How can we make people more aware of the importance of family history?
  - b) Can we convince the patients that the information provided by them would not be misused?

## Target

Our decider is Adam Nahirnyj(Senior UX Designer at Optum) and per his ideas, following are the key points to focus:

1. The patient must have a clear understanding of what the application is and the value it provides.
2. The application must be usable keeping in mind the user experience and allow the patient to enter their family health care data.
3. The application should focus on engaging younger and typically healthy individuals (14 to 40 years) that would usually ask the question: Why do I need this?
4. After using the application, the user should feel positive about their experience.
5. Patients with low literacy (fifth grade and above) should be able to use the application.

## References

MeTree - <https://metree.familyhistory.duke.edu/demo/login>

# Appendix

## Raw meeting notes

### UX Meeting 1

**Location:** Optum Health, North Hills, Raleigh

**Time:** 11.30 AM, 26th Feb 2019

**Attendees:** Optum Team, UX Team 1, UX Team 2, Prof Ben Watson

#### Meeting Notes:

##### Introduction

- Introduction of all team members of Optum and student teams
- Challenge: how to think creatively to collect family history data
- The creative part is important. How to make it really really easy for patients.
- Instead of form fields - what other ways of input can be used
- Why UX class
- How to present the data model for the business
- Understand people to improve/develop the data model
- Fitz law - even small things like changing the size of a button - matters. It can have a very big impact.
- Understand patients - have empathy
- Think about how the data relates globally
- Value of history is enhanced by how complete the history is

##### Level setting

- What is Family health history
- It is a record of health information about a person and his/her close relatives.
- A complete record is 3 generations of relatives.
- It is not usable if it doesn't have ALL information
- Its patient-generated health data
- Challenge: get the folks to fill data as accurately as possible
- Benefit: Insurance, care providers, patient. Benefits to all.

##### Barriers to collect family history

- Patient
  - User experience

- Patient engagement
- Education
- Accuracy
- Provider
  - Time
  - Awareness
  - Complexity

### **Current solution - MeTree**

- It's a detailed form. Some form field mandatory, most aren't
- About overview to granular information

### **Workflow**

- Patient encounter - Clinician provisions MeTree account - Patient accesses and fill out information - Patient and clinician collaborate on patient's MeTree report

### **Tool demo**

- MeTree - family history-based risk assessment tool
- Can collect complete data of around 117 diseases
- Assumes that you might not be digitally savvy
- A lot of personal information
- Retain all information in UX design
- Think about other tools [FHIR tool, family general, turbotax] and how easy it is to use them.
- Shows demo
- Info:
  - About you
    - Personal info
    - Latest lab result
    - Diet and exercise
    - Disease
  - Patient and grandparents
  - Other family members
  - Patient reports
    - After DONE - It creates Family Pedigree Report
    - It's a visual. Tree view, grid view.
  - Risk profile
    - Gives suggestions, screening.
  - FINISHED
- Why not use the tool?
  - 37% of Americans collected
  - But only 3% collected
  - 100% doctors say FH needed

- 17 tools available
- Even though FH is needed, not many tools available due to the complexity
- Even young people don't like to spend time on the tool, the same goes for doctors

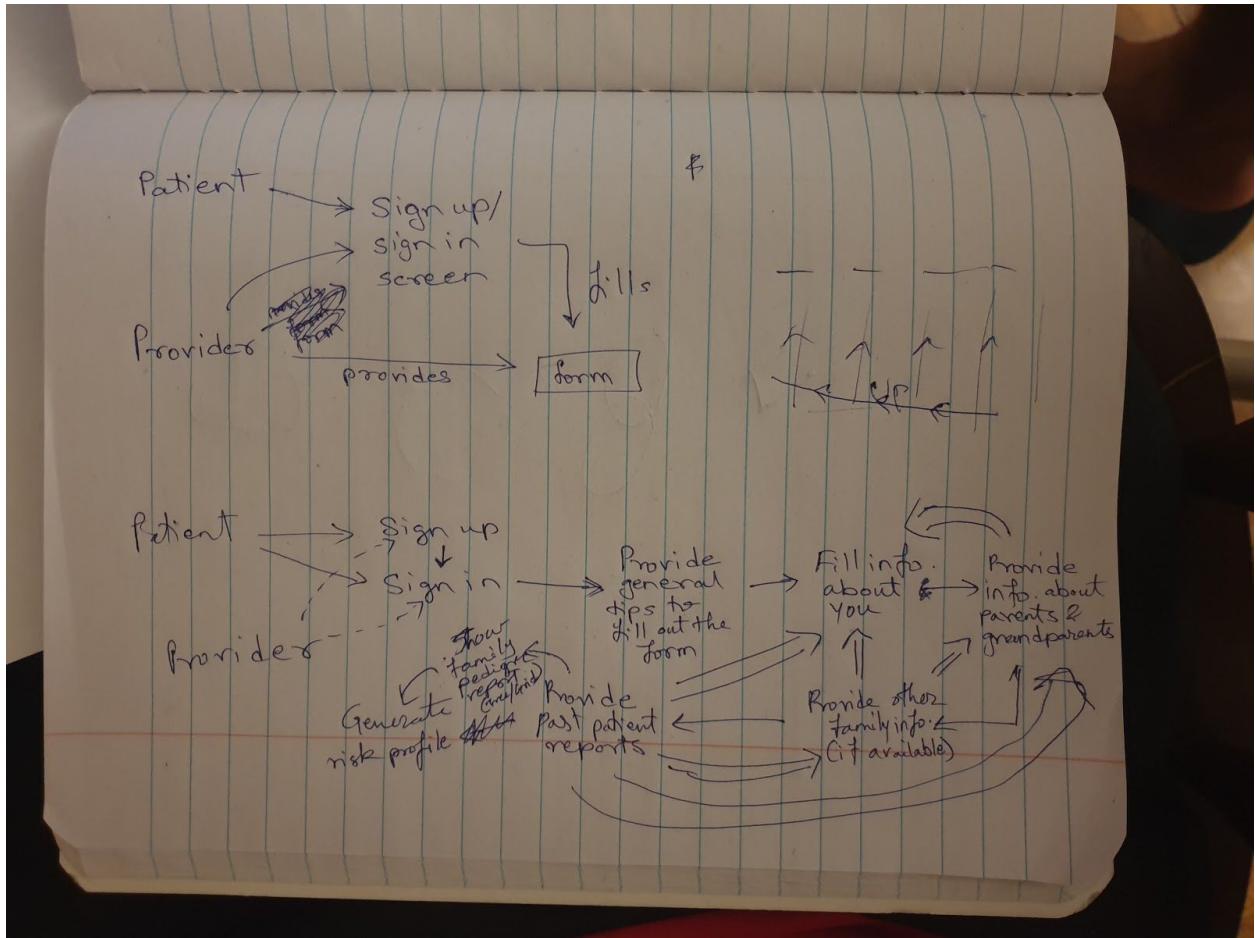
### **Adam**

- They explained the business use case [Olusoia]
- Adam will explain the actual work and application goals
- As the user is giving lots of information by spending time, what does he get back in the result
- Deliverable for the first phase: Process map

### **Jamaal**

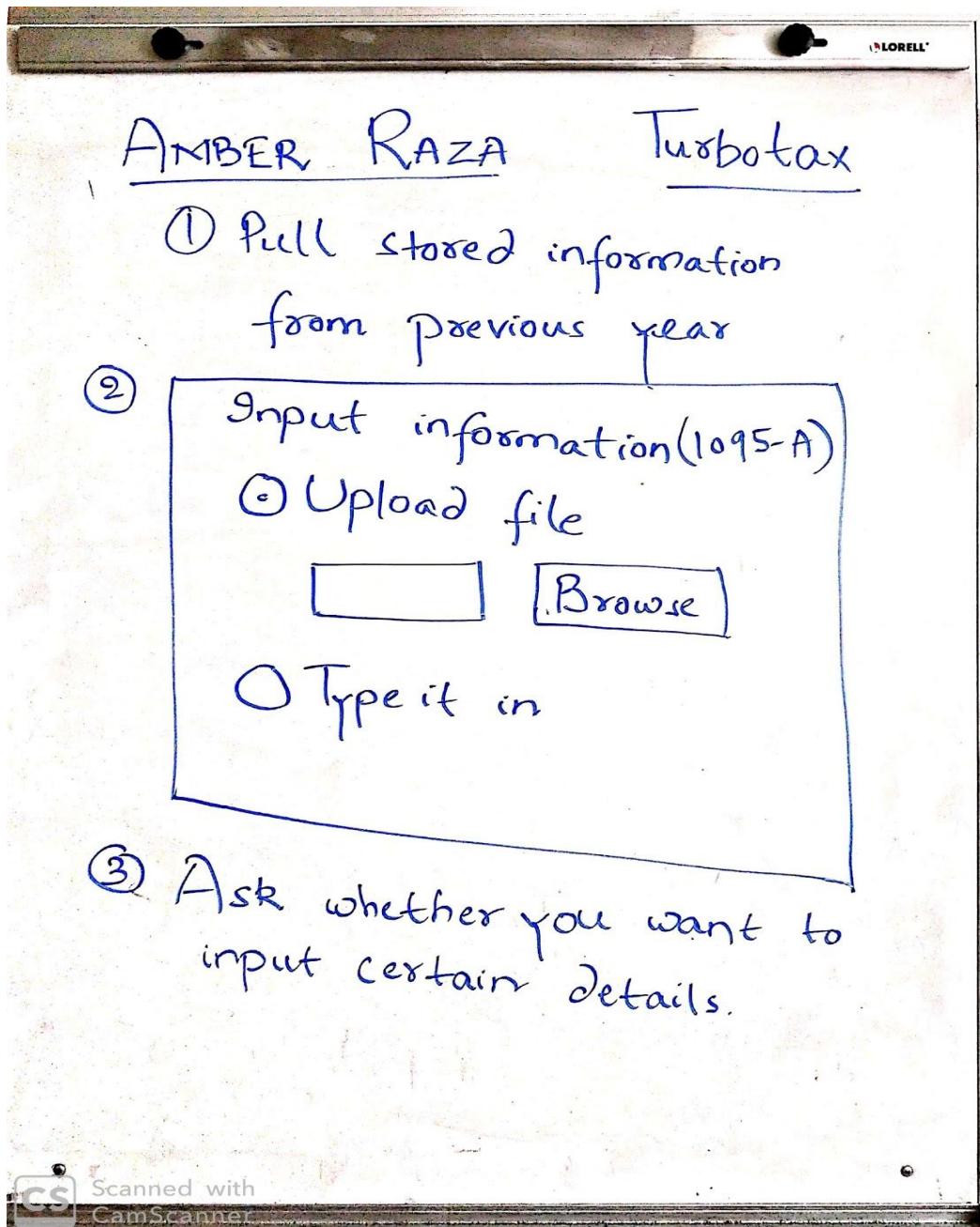
- Demo of the process map
- What's Persona
- What's sitemap
- What's user flow

## Experience map



## 2. Stage 2 - Generate

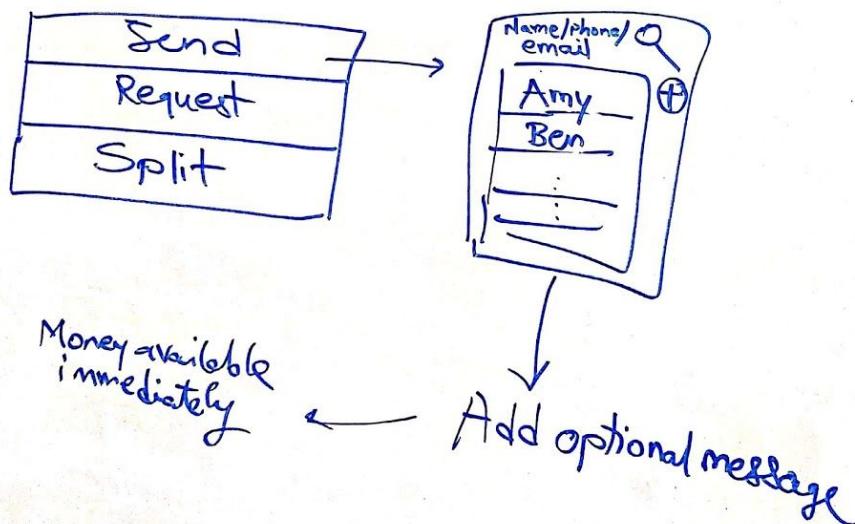
### Demos



Neeraj Deshpande

Zelle

1) Directly linked to bank account  
(Uses mobile no./email)



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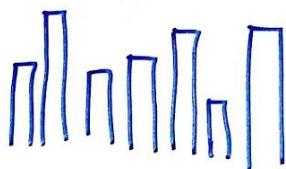
Karthikeyan Vaidhyanathan

Monondo

From

To

Date



Cheapest

Quickest

Best

Custom

Flight 1

Flight 2

Compare sites

Expedia

CheapOAir

Hotwire



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Darpan Dodiya      Google flights

Round trip ▾

[From: ] ↗ [To: ]    Mar, 15    Mar, 30

[Bags ▾] [Stops ▾] [Airlines ▾] [Prices ▾] [Times ▾] [More ▾]

[Date grid] [Price graph] [Nearby Airports]

Best departing flights

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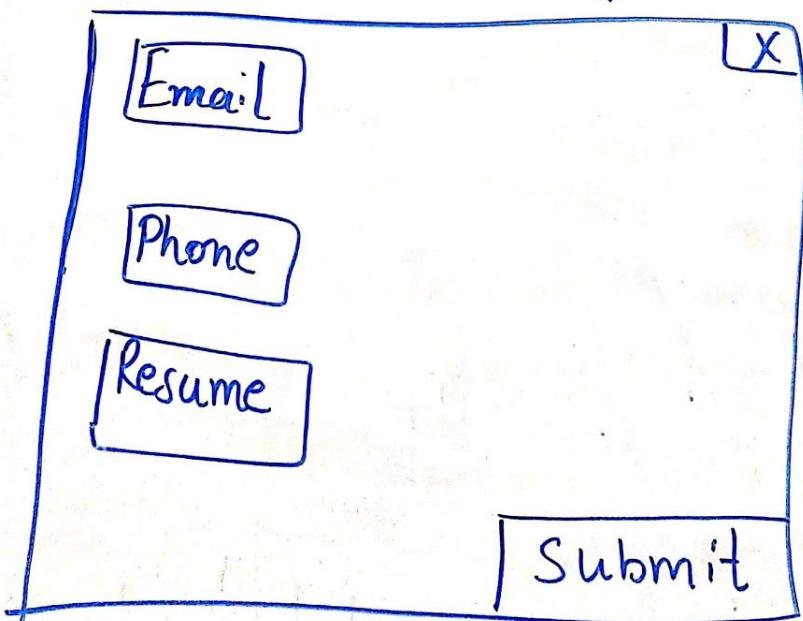
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Aditya Joshi

[linkedin  
easy apply]



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Abhishek Arya. [Labcorp]

1

Locate Me.

Enter Zip

Service ↕

2)

Location 1  
Location 2



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# Ideas

## Amber

- Inspiration 1: Turbo Tax
  - Fill information about forms that are relevant to the person.
  - Fetch history about the person from his previous filings.
  - Ask user whether the user wants to enter certain details or not.
- Inspiration 2: Flipkart Lite
  - Lighter version of flipkart app that uses least memory.
  - Good interface having relevant information visible.
  - Efficient search options available to look up a product.

## Aditya

- Inspiration 1: LinkedIn Easy Apply
  - Does not require the applicant to fill out lengthy application forms.
  - Share complete profile to the recruitment without giving unnecessary information.
  - Requires the applicant to just upload the latest resume.
  - Saves application time.
  - Sends notification for new jobs.
- Inspiration 2: Robinhood
  - Provides graphical trends regarding the value of a particular share.
  - Provides suggestions based on market fluctuations.
  - Provides all required information to the user so that he can make an informed decision.
  - Provides gesture-based UI for stock transactions.

## Abhishek

- Inspiration 1: LabCorp
  - Location based search displays all nearby labs without requiring the user to enter address details.
  - Search result page enables to view all the services provided, book an appointment, and rate the lab on a single page for all the nearby labs.
- Inspiration 2: Disneyworld
  - Can choose different travel style based on informative glyphicons.
  - Interactive Layout eliminates the need for filling out lengthy forms.

## Darpan

- Inspiration 1: Google Flights
  - Shows price graph with varying dates.
  - Options to filter out stops, airlines, connecting airports etc.
  - Provides a list of nearby airports as an option for a direct airport.
- Inspiration 2: TypeForm
  - User can select from templates provided in the homepage.
  - Can export responses to multiple formatted files.
  - Can connect multiple services like Google Drive, Dropbox etc.
  - Very clean interface.

## Neeraj

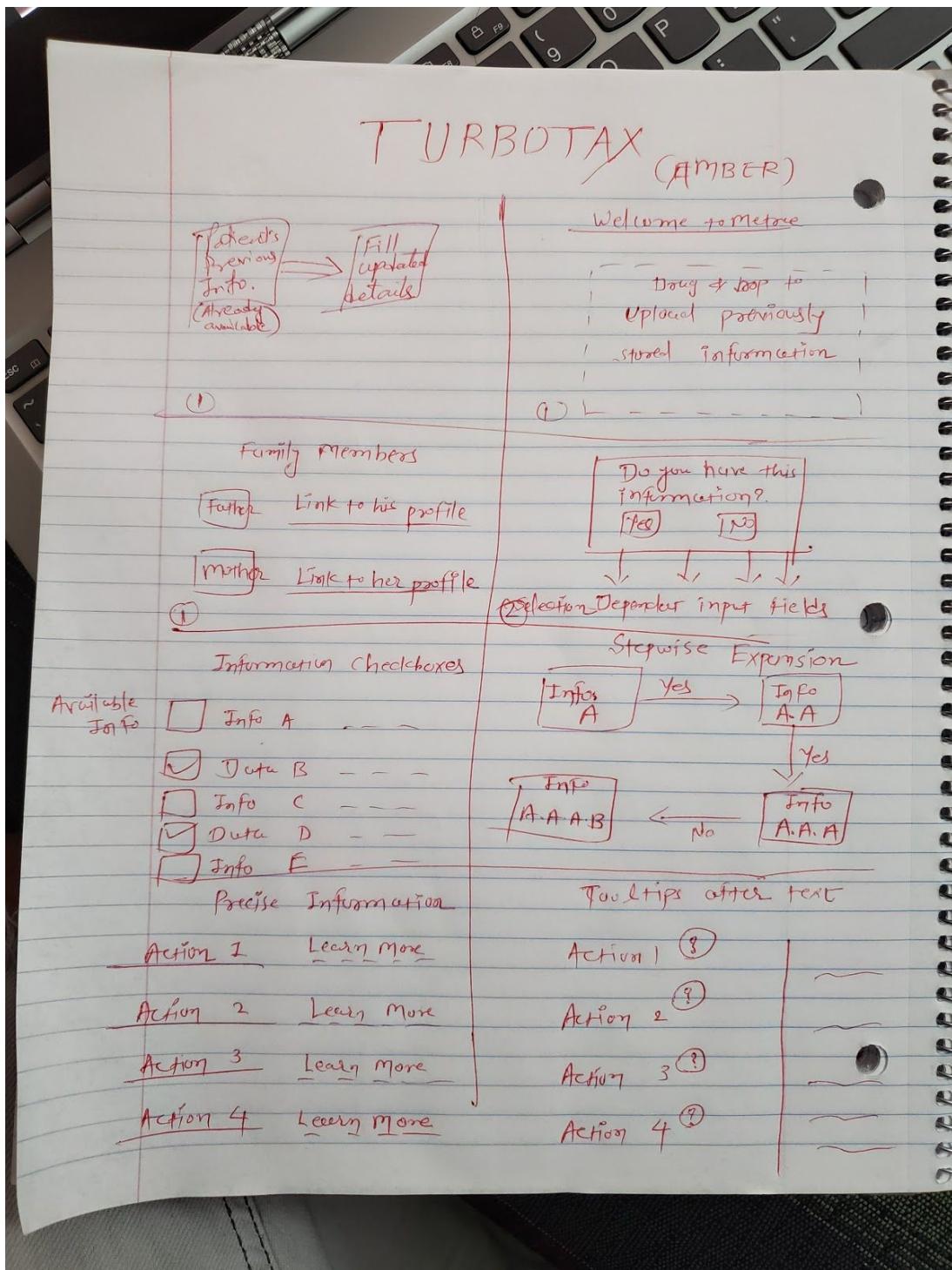
- Inspiration 1: Zelle
  - Integrated with various mobile banking applications.
  - Directly transfer instantly from one bank account to another.
  - Requires only email address or mobile number for a transaction.
- Inspiration 2: Ubereats
  - Directly linked with Uber account.
  - Provides restaurant options for the customer's food choice and location.
  - Provides scheduled delivery.

## Karthikeyan

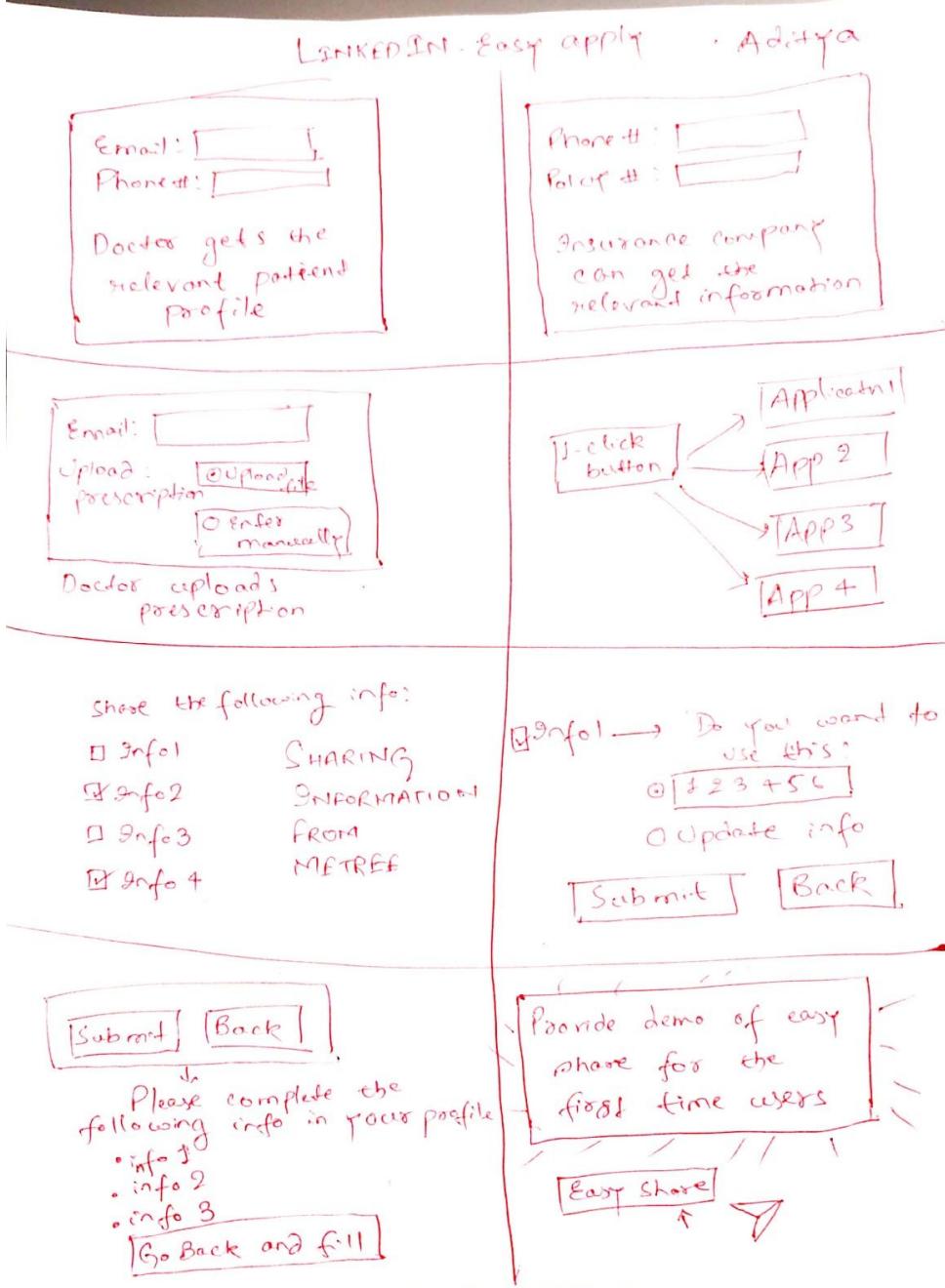
- Inspiration 1: Momondo
  - Flexibility of different dates without reentering date information.
  - Provides quickest, cheapest and best flight options.
  - Compares flight prices with other websites without page navigation to the other website.
- Inspiration 2: Glassdoor
  - Complete package for interview questions, company reviews and job application.
  - Easy apply for job applications.
  - Sends email notifications regarding new job opportunities.

# Variations (Crazy 8s)

Amber



Aditya



Abhishek

LabCorp & DisneyWorld

The wireframe illustrates a user flow for a family tree application:

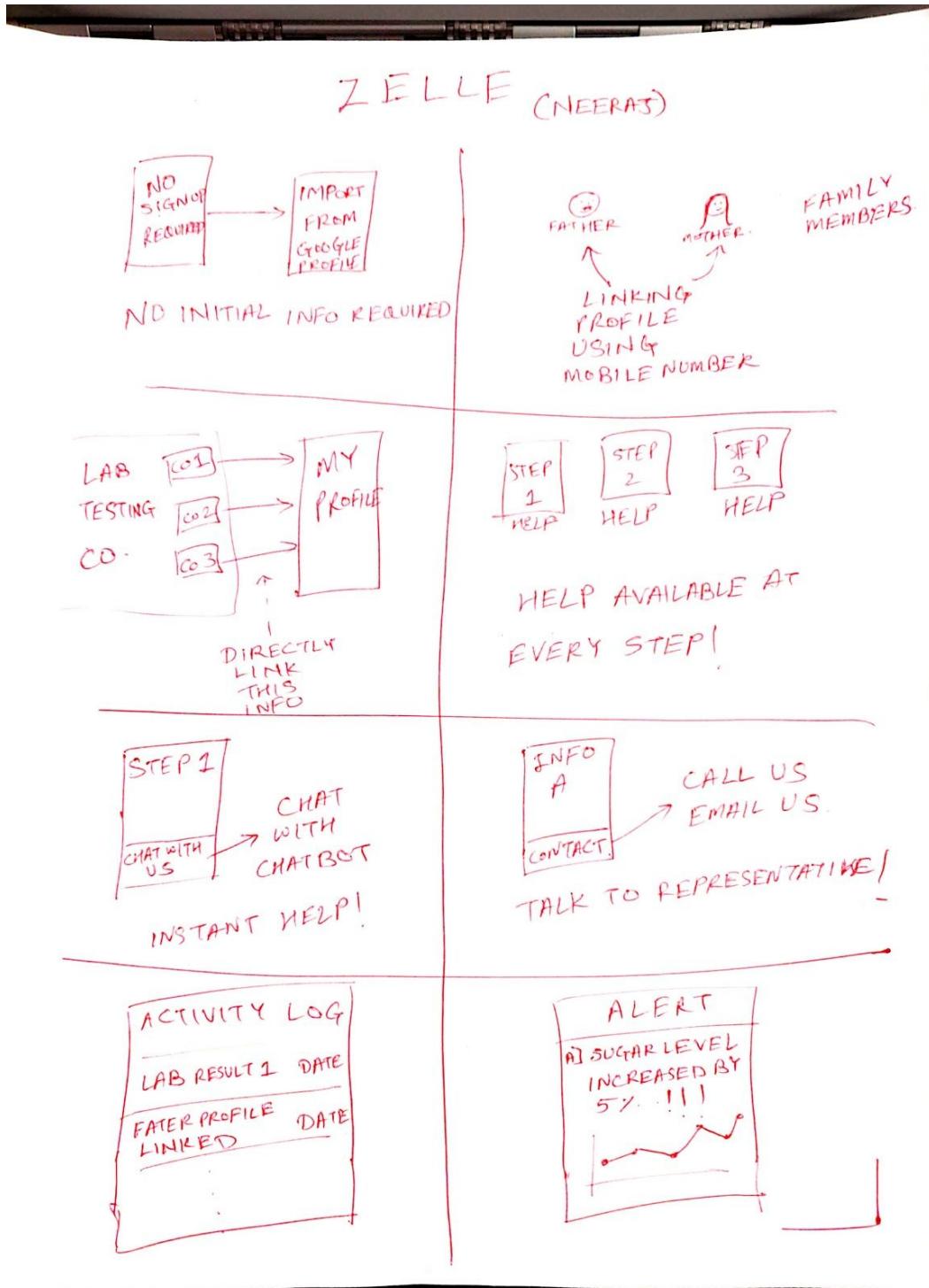
- User Log/SignIn:** A form with fields for Username, Password, and Birthtype (Lynn).
- Metree Home:** Shows a user icon and a family icon. Text: "click to Post to relative view".
- My details:** Form fields for Name, Sex (M/F), Age range (radio buttons), and a Submit button.
- Family Members:** A grid showing Father, Mother, Uncle, and Brother. A button "Add new family member" is present. Text: "click to view or edit details".
- Add Family Member:** A search interface with "Name/ID" and "Search" buttons. Below it, text says "Search if the family member have Mytree account".
- Result:** Shows a "found" result for "John Doe" with an "Email" button and a "Send request" button. Text: "click to send request to be added to your account" and "enter member email to send request to create acc."
- Request Confirmation:** Text: "John doe has accepted your request."
- Family Members:** A grid showing Father, Mother, Uncle, Brother, and John Doe. A button "Add new" is present.

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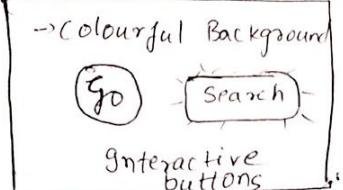
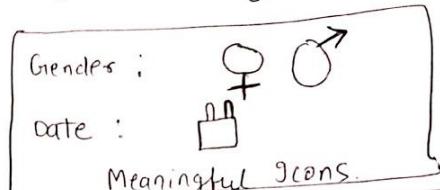
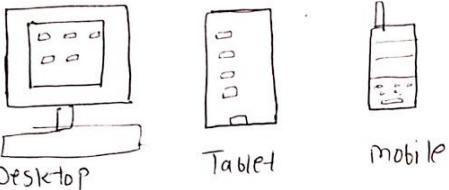
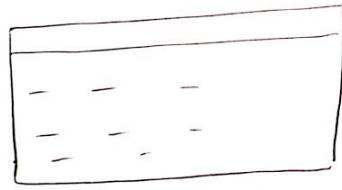
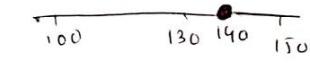
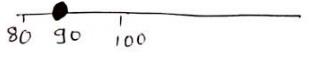
## Darpan

<p>TypeForm</p> <p>Templates    Template 2    Template 3</p> <p>choose your template.</p>	<p>Export your info -</p> <p>PDF DOC TXT PPT</p> <p>multiple format export</p>
<p>Dropbox Google Drive One note AWS</p>	<p>↑ left   right   return ↓ down</p>
<p>store in cloud</p> <p>Question 1 YES NO</p> <p>Question 2 YES NO</p> <p>Question 3 YES NO</p> <p>YES   NO   AGE   HEIGHT   WEIGHT</p>	<p>Navigate using arrow keys</p> <p>YES   NO   AGE   HEIGHT   WEIGHT</p>
<p>Conversational Window Navigation</p> <p>Info 1</p> <p>progress Bar</p>	<p>1. Name [ ] 2. Info <input type="radio"/> Yes <input checked="" type="radio"/> No → 15. Age [ ] 16. Height [ ] 17. Weight [ ]</p>

Neeraj



# Karthikeyan

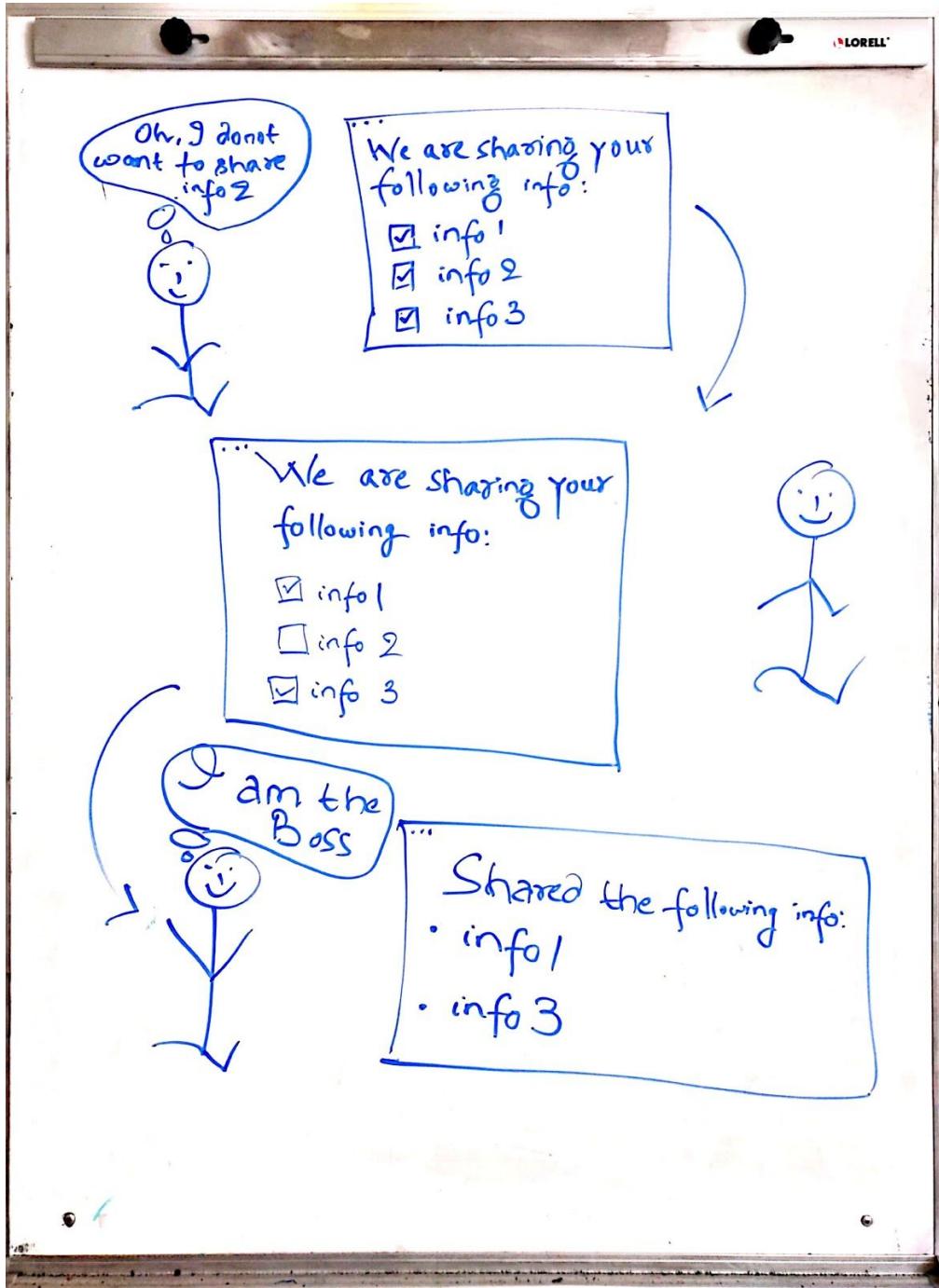
<p>MeTree version 2.0</p>  <p>→ colourful Background Interactive buttons</p>	<p>Momondo Flight Booking (Karthikeyan)</p>  <p>Genders : ♂ ♀ date :  Meaningful Icons.</p>
 <p>Desktop      Tablet      mobile</p> <p>Responsive UI</p> <p>Detailed View</p> 	<p>English  Spanish  French  German  Italian </p> <p>Multi lingual Feature</p> <p>Select Plan</p> <ul style="list-style-type: none"> <li>→ Dental</li> <li>→ Dental + vision</li> <li>→ Skin</li> </ul> <p>Price Suggestion</p>
<p>→ Age 200 !! → Height : -100 cm</p> <p> Success</p> <p>use of colours. (Errors)</p>	<p>Sugar level</p>  <p>B.P</p>  <p>Height</p>  <p>Interactive input</p>

# Storyboards

Amber



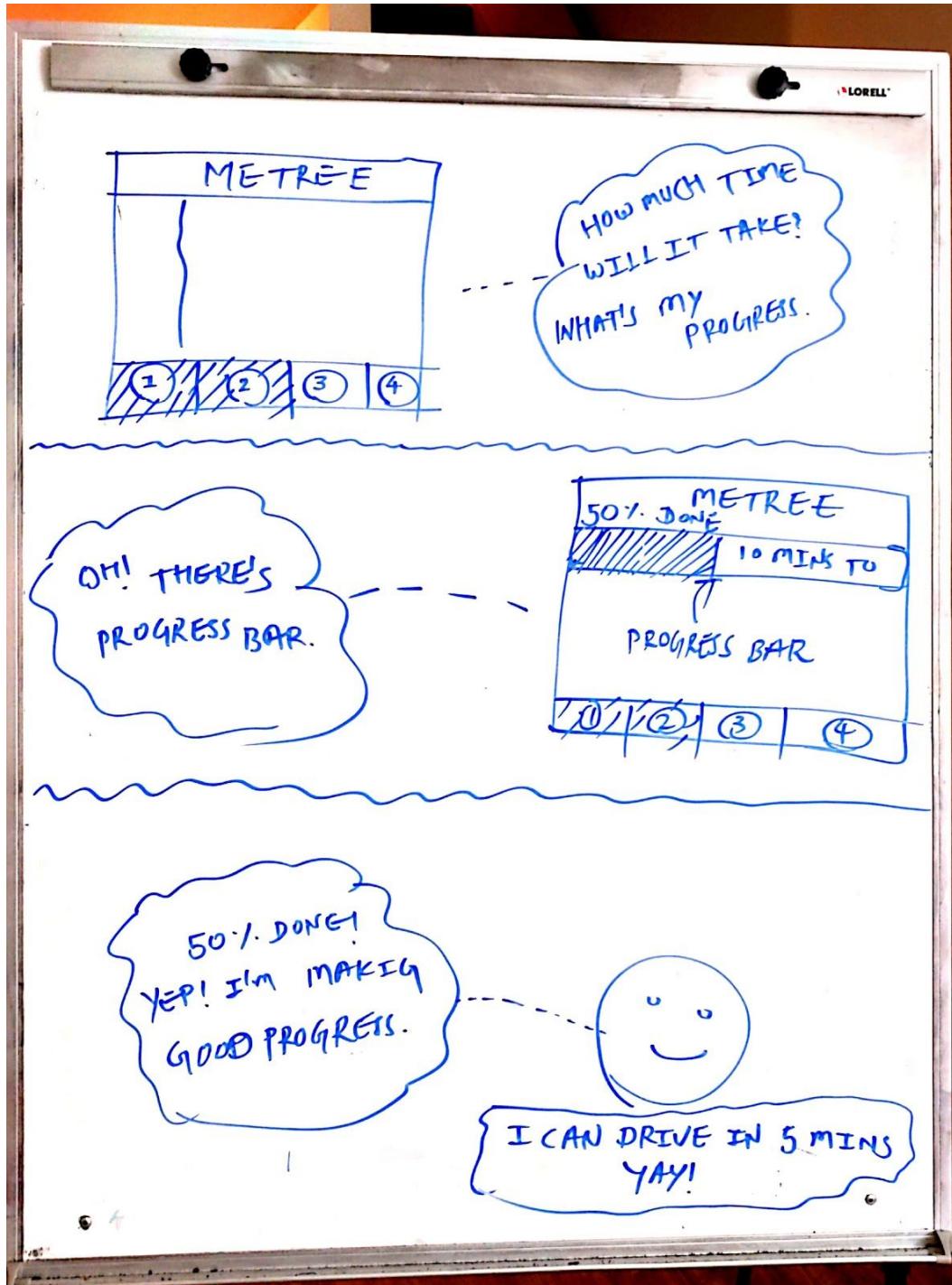
Aditya



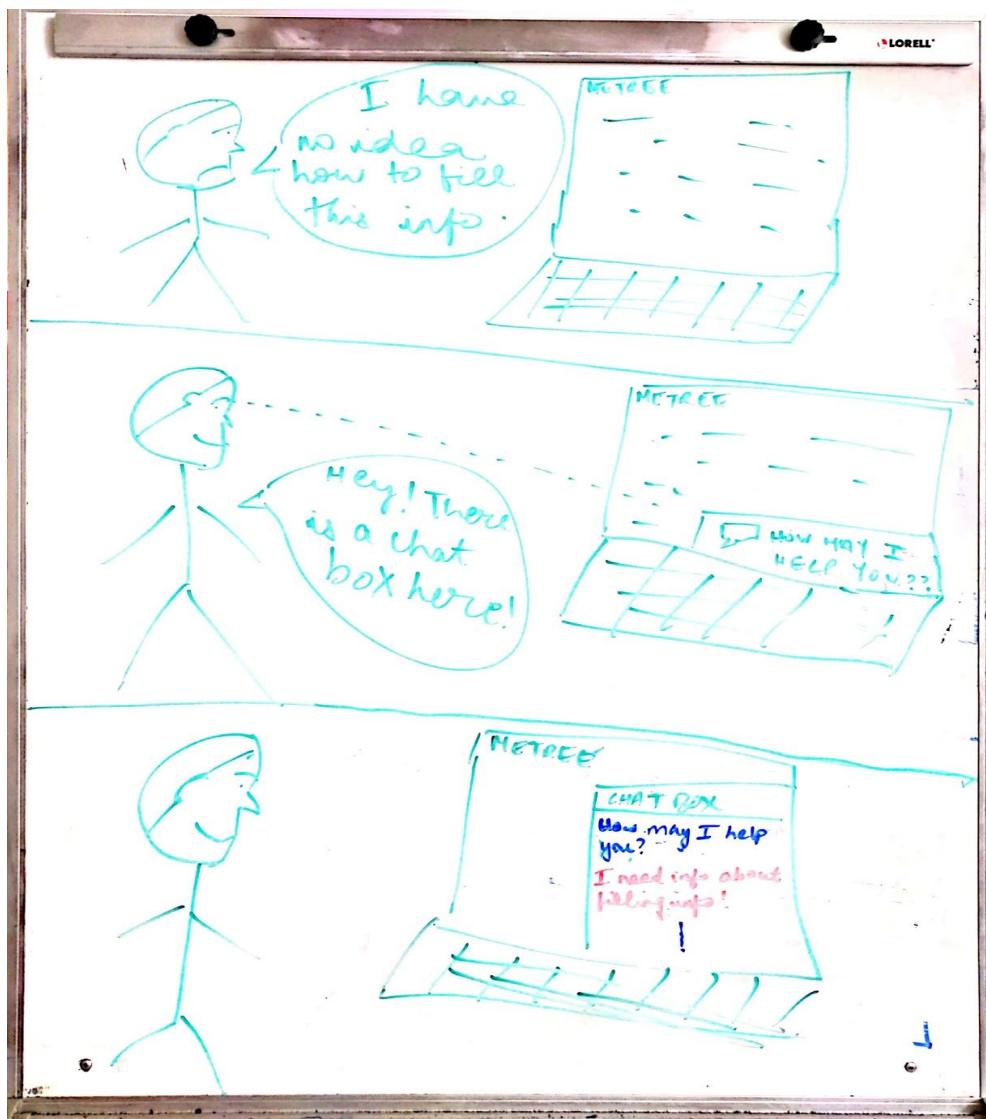
Abhishek



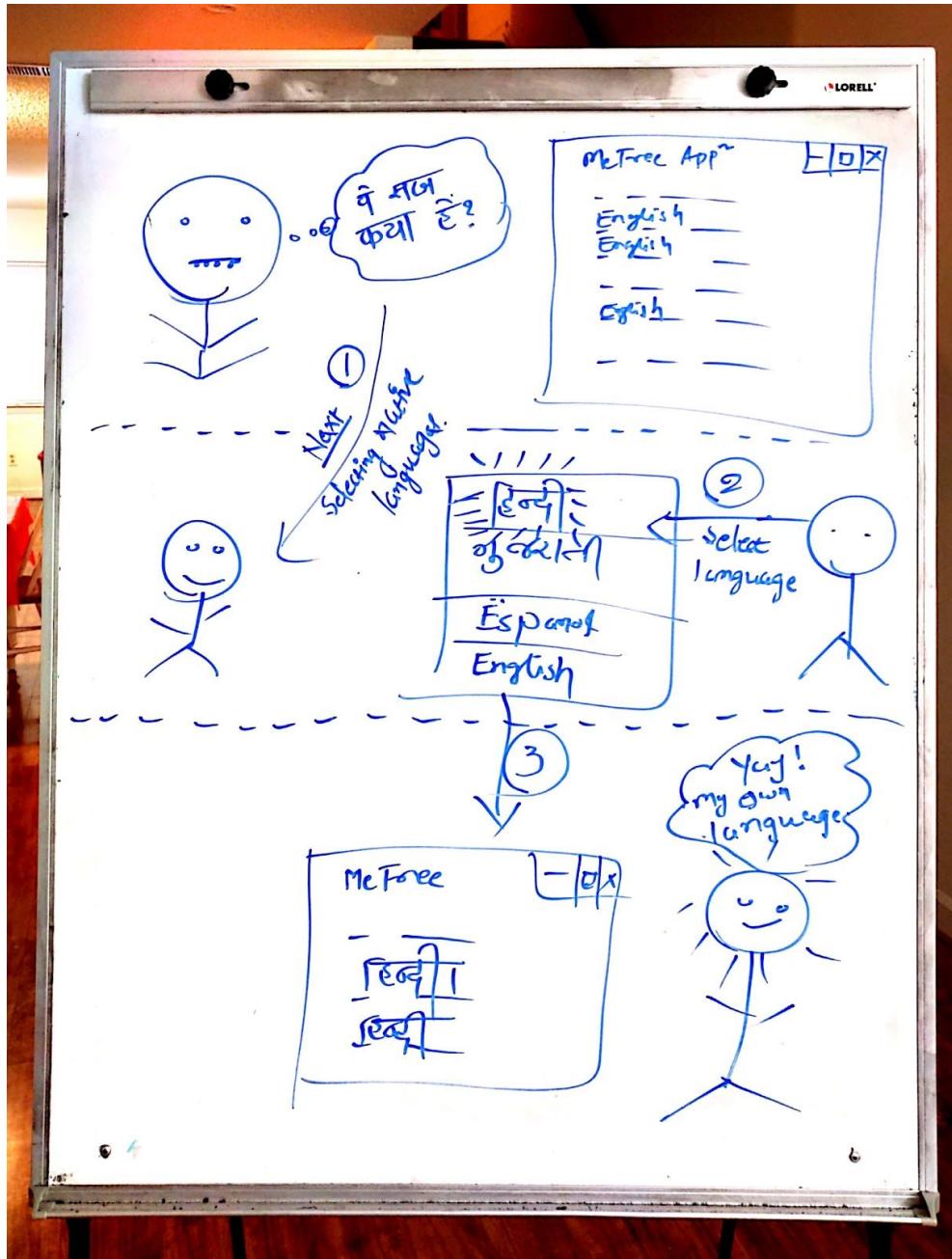
Darpan



Neeraj



Karthikeyan



## References

MeTree - <https://metree.familyhistory.duke.edu/demo/login>

Google Flights - <https://www.google.com/flights>

TurboTax- <https://turbotax.intuit.com/>

TypeForm - <https://www.typeform.com/>

Momondo - <https://www.momondo.com>

LinkedIn - <https://www.linkedin.com>

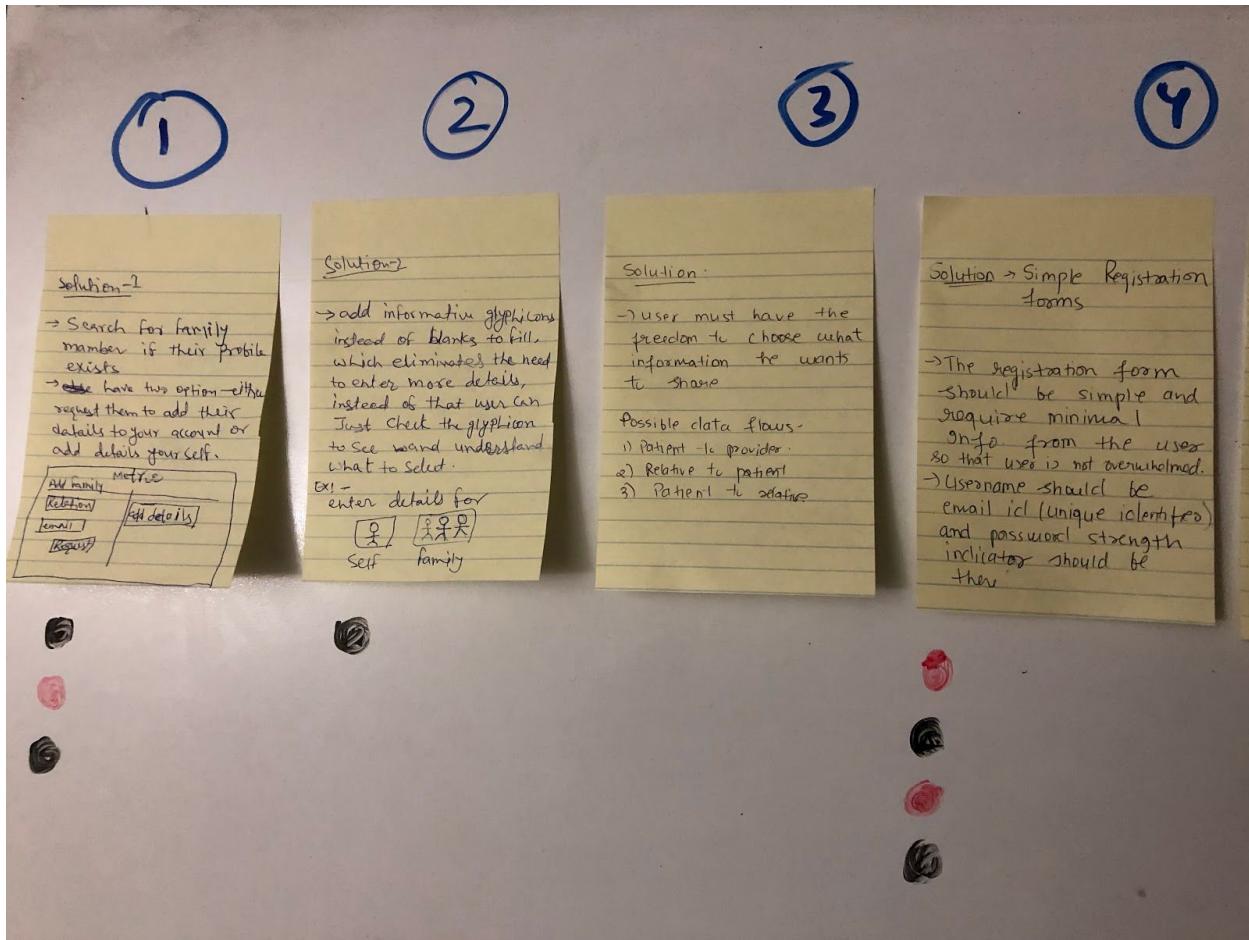
Zelle - <https://www.zellepay.com/>

Flipkart - <https://www.flipkart.com/>

Labcorp - <https://www.labcorp.com/>

DisneyWorld - <https://disneyworld.disney.go.com/>

### 3. Stage 3 - Choose Displays and Votes



①

⑤

⑥

### Solution 1

• Pulling stored information from third party sources. The user can use a web service to pull this information. If the information is locally available in the form of a file it could also be uploaded.

### Solution

The homepage after registration should auto populate the known fields. Only the fields required based on selections should be displayed. For example: Parents details can be skipped if the user is adopted.



7

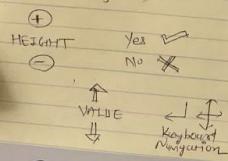
## PROGRESS BAR & GAMIFICATION



8

## SOLUTION: MORE VISUAL INPUT ELEMENTS

- Add easy to understand buttons and input fields
- Allow keyboard navigation (like Typeform)



9

## Solution

The lab reports can be directly linked to the patient's account via a 3rd party web service

10

## Solution -

Whenever a doctor updates any patient information, then the patient is notified and is able to approve the changes to be reflected on Metree.

11

Solution

~~Starts here~~

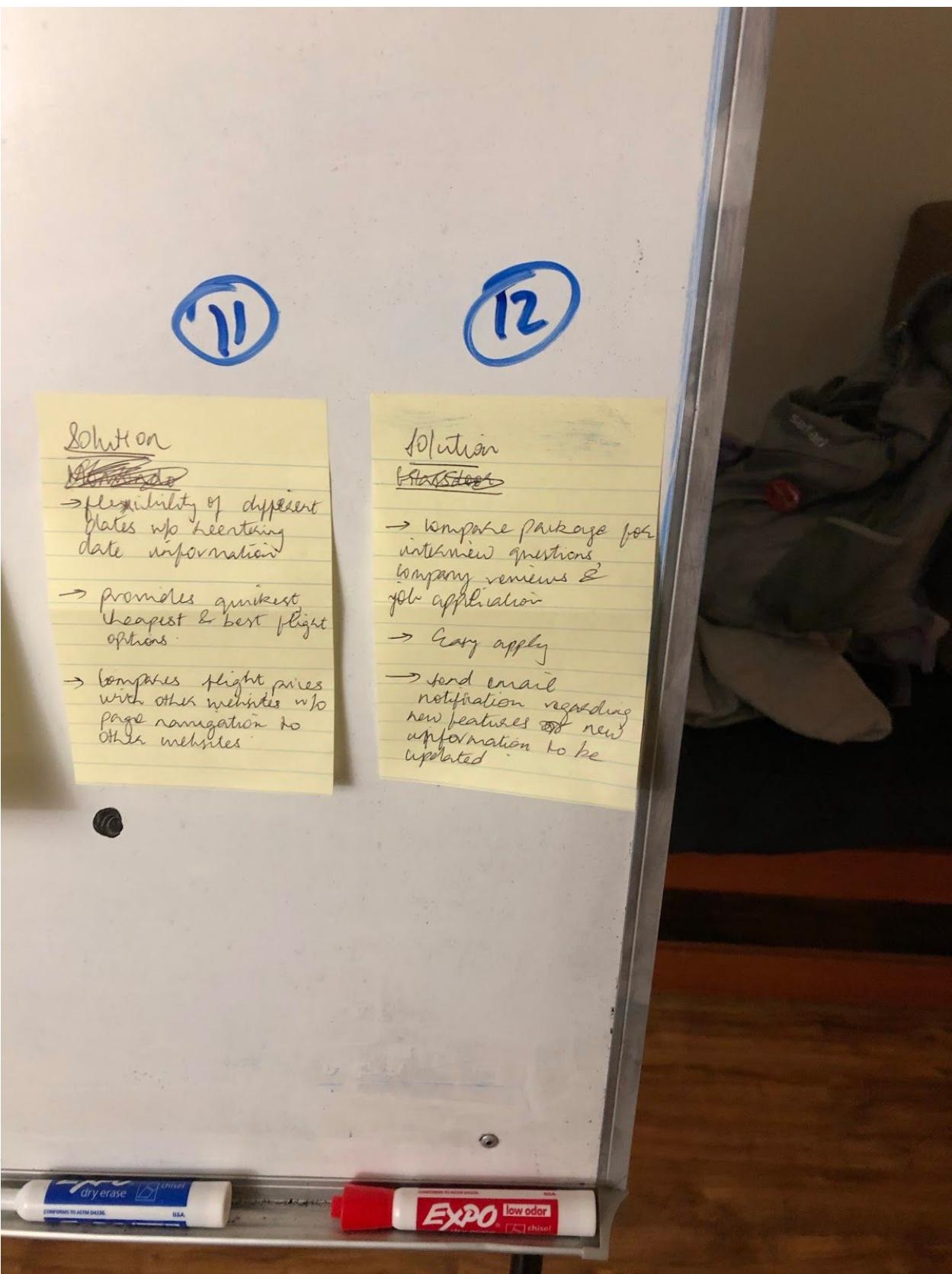
- flexibility of different dates w/o entering date information
- provides quickest, cheapest & best flight options
- compares flight prices with other websites w/o page navigation to other websites

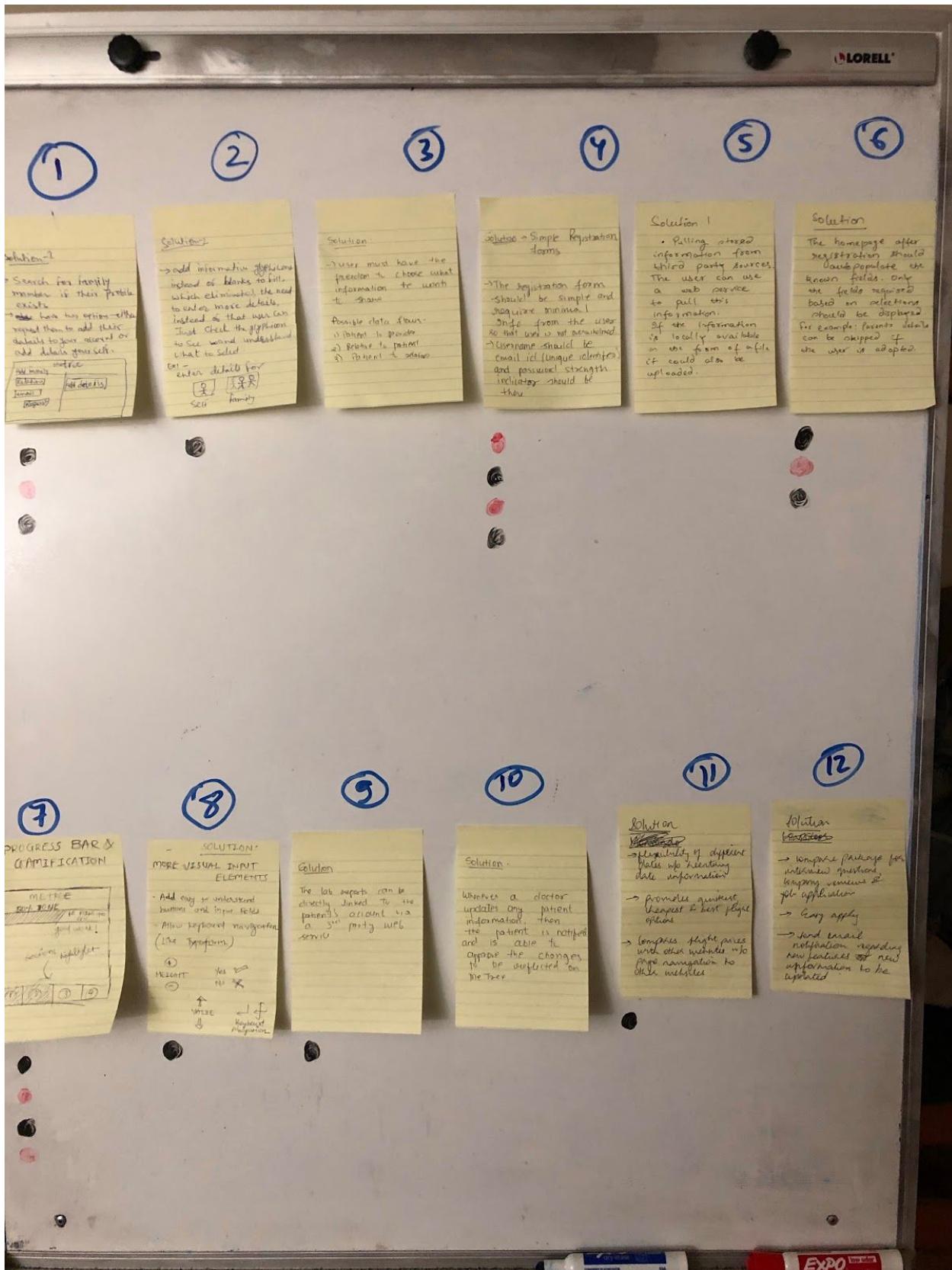
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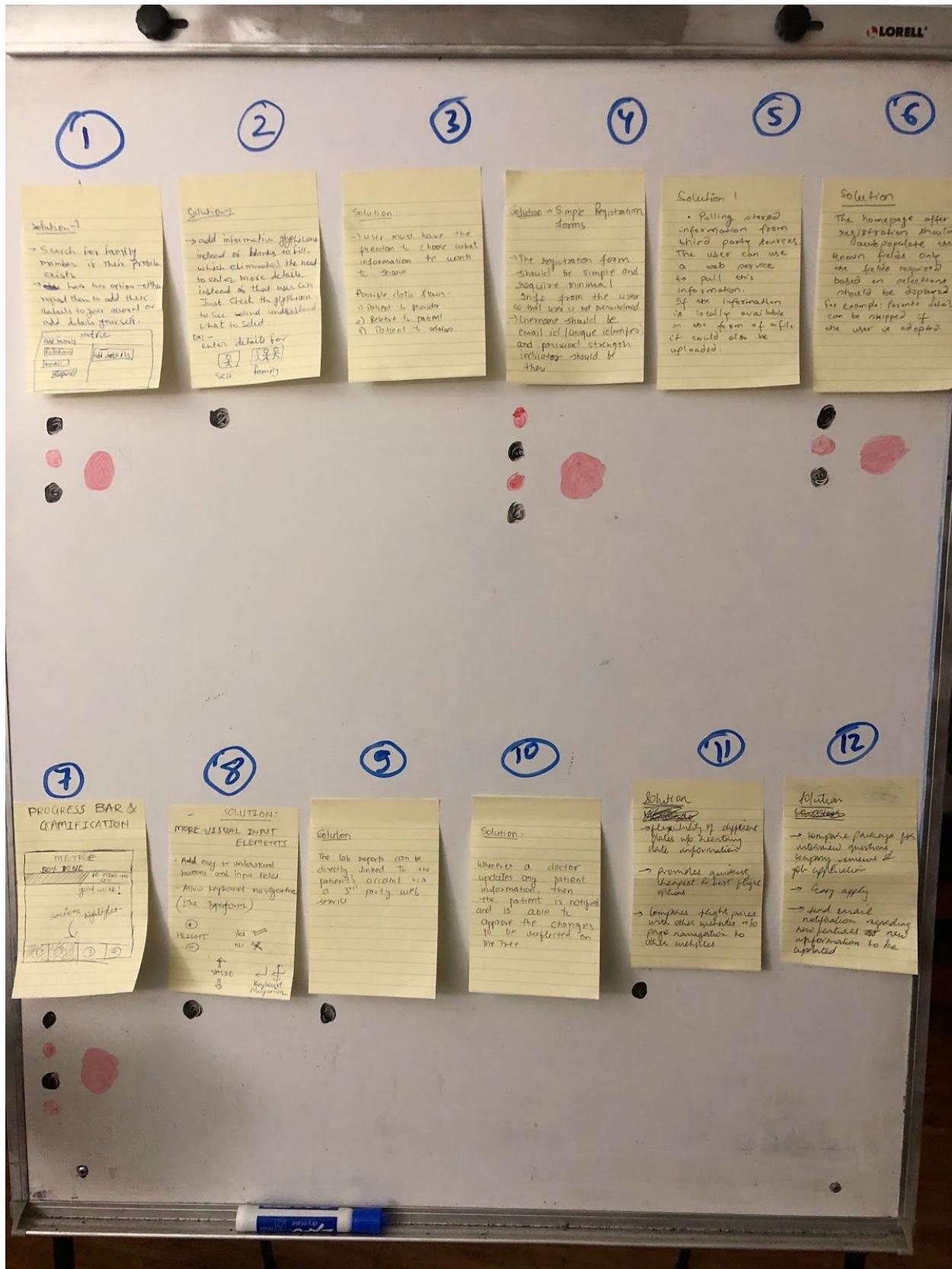
Solution

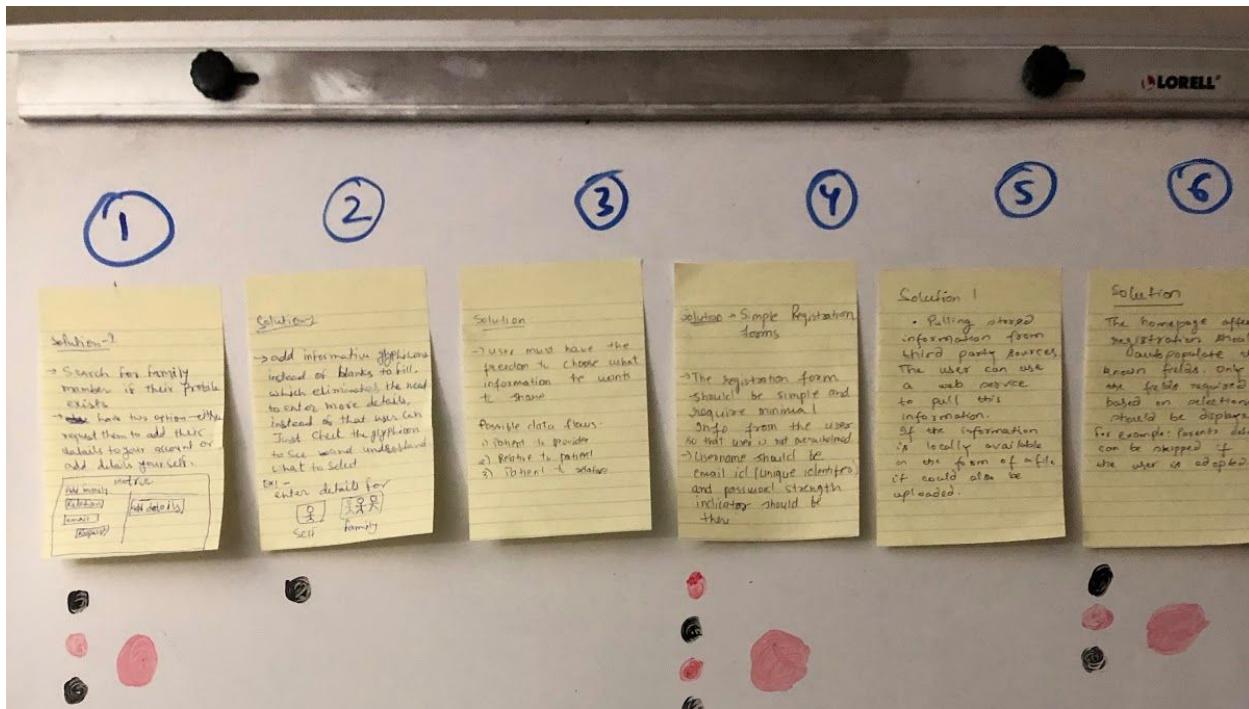
~~Starts here~~

- compare package for interview questions, company reviews & job application
- Easy apply
- send email notification regarding new features & new information to be updated

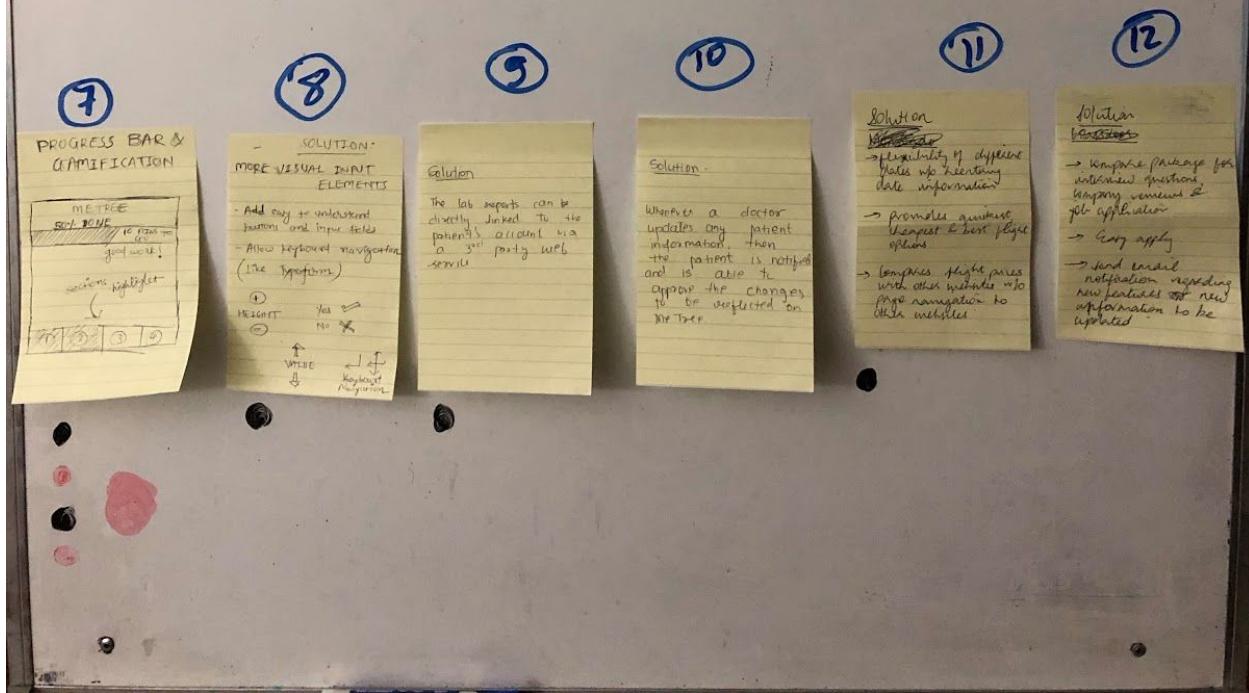








Decider chooses 1, 4, 6, 7



# Voting results

Solution number	Number of votes+Decider vote
1	<b>3+1</b>
2	1
4	<b>4+1</b>
6	<b>3+1</b>
7	<b>4+1</b>
8	1
9	1
11	1
Others	0

The highlighted results in the above table are winners

## Critique

1. Add family details by sending them request to add their details to your accounts if their account exists
  - a. If a family member accepts the request then it will save a lot of time and effort.
  - b. The accuracy of the information will be higher.
  - c. What if the family member rejects the request?
2. Visual input (informative glyphicons) instead of all text
  - a. It is visually appealing and easier to use even for lesser educated population
  - b. What if the user does not understand the glyphicons?
  - c. They(informative glyphicons) might not be available for all the use cases.
3. User has the freedom to choose what information to share
  - a. What are the possible data flows?
    - i. Patient to provider
    - ii. Relative to Patient
    - iii. Patient to relative
  - b. The pedigree generated won't be very efficient if the user chooses to skip the details.
4. Simple registration form with username, password and password strength indicator

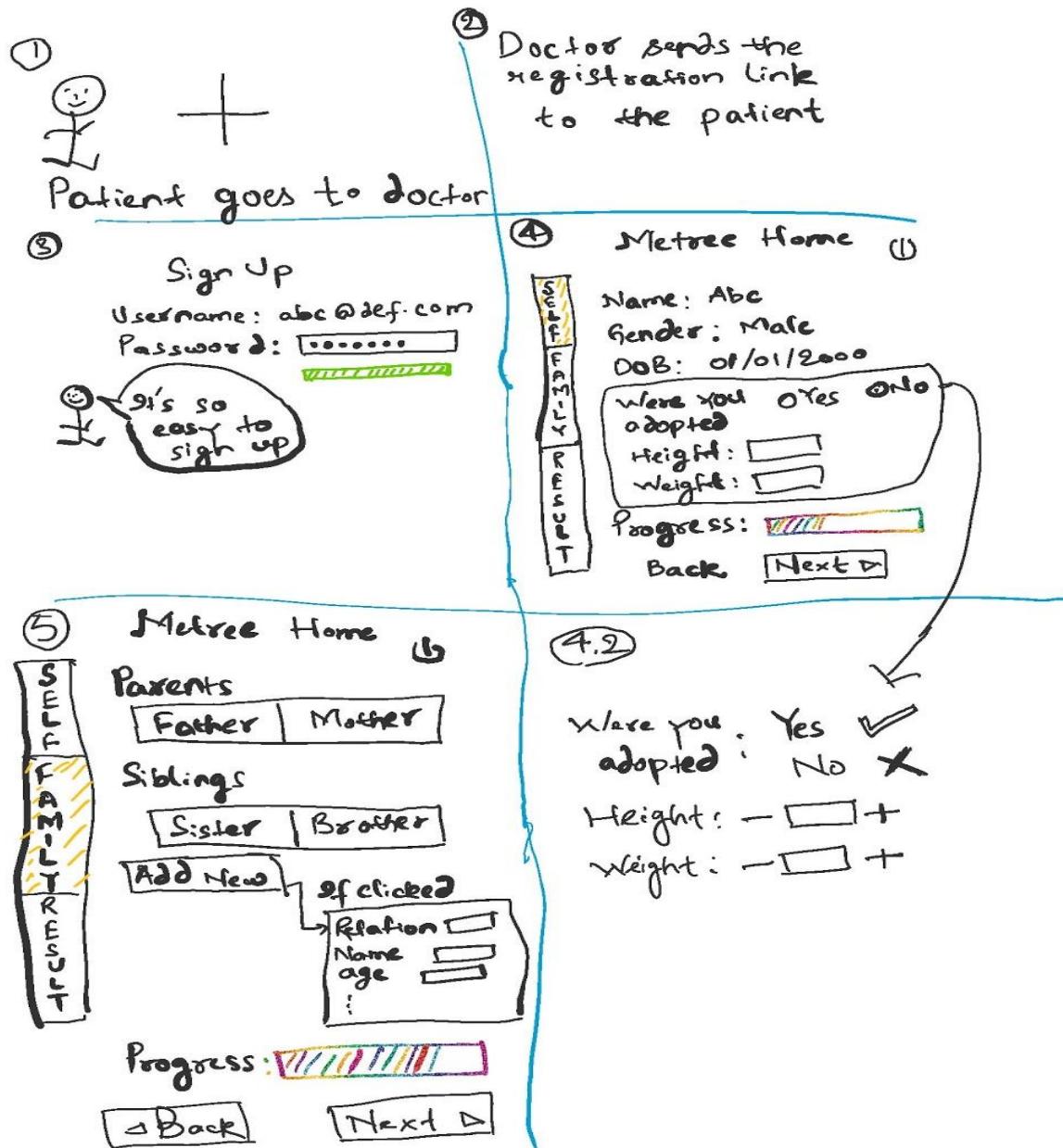
- a. User is not overwhelmed.
  - b. How will the user know how to make the password stronger?
- 5. Drag and drop lab report from system and integrate it with 3rd party web services
  - a. There is no fix template for different lab reports
  - b. There will be parsing problem with reports via web services
  - c. Additional overhead of extra authentication with web services
- 6. Some basic details are pre-populated based on the information provided by the provider when the user signin on the Home screen
  - a. Less details to fill for user
  - b. If the user is adopted then family details forms will not be shown
- 7. The interface might look graphical and childish due to gamification visual elements. However, some users might find this engaging.
  - a. Visually appealing progress bar could inspire user to fill out form faster.
  - b. User can always see his/her progress at any time.
  - c. User can also know the estimated time to complete the form.
- 8. Some input fields which are easier to understand and interpret for one user might be more difficult for another user. Some users might not be aware of keyboard navigation, however demo can be shown to the user to get familiarized with the interface. Also it might be difficult to find relevant icons for input fields.
- 9. Lab reports can be directly be linked to the patients' accounts.
  - a. Authentication is an overhead.
  - b. Since we are using third party web service, maintaining the privacy of sensitive health data could be an issue.
  - c. Overhead of integrating third party service.
  - d. Erroneous third party service.
- 10. If provider updates patients' information, patients' get notified of the same and he/she can approves of the same leading to updation in MeTree database.
  - a. Implementing the notification system would be a challenge. It might require development of a mobile app.
  - b. Doctor might not have the resources and time to update the individual information.
- 11. Not at all relevant idea to the MeTree application although it is a very good idea.
- 12. Some features could be picked up for the MeTree application such as the update notification system
  - a. This idea might not solve the core problem of the MeTree application. It just adds a good side feature so while development, this feature might be given a lower priority.

## Merge Or Not

The selected ideas were relevant to the MeTree application and could be combined to enhance the experience of the application.

After interacting with the involved stakeholders, we decided to merge the ideas with the highest votes, ie, we merged the ideas 1,4,6 and 7 from the idea display board.

# Storyboard



## Storyboard Narration

The patient visits the doctor. The doctor then sends the registration link to the patient for sign up. Our sign page does not need too many details. The username is auto-populated with the email id and we only ask for the password. The password strength is also provided to the user. On signing in the user goes to the MeTree homepage with basic fields pre-populated. Also, only the required details are asked first. For example: if the user says he/she is adopted, we do not ask for the parent details. We also show a status bar in the left panel that tells what section of the information has been provided currently. There is also another progress bar at the bottom of the page that shows the progress for that section.

We are providing more visual for the input elements like height and weight with the plus and minus buttons. For the family section we are providing the option to send request to the family members. In case, we want to add more members; we also provide an add new button.

## **4. Stage 4 - Prototype**

### **Tools :**

We used Axure RP 8 for our prototyping. Axure RP is a wireframing, rapid prototyping, documentation and specification software tool aimed at web, mobile, and desktop applications. It offers drag and drop placement, resizing, and formatting of widgets. It enables creating simple click-through diagrams or highly functional, rich prototypes with conditional logic, dynamic content, animations, math functions, and data-driven interactions without writing a single line of code.

We tried out some other tools such as Balsamiq and Sketch. However, we found Axure RP to be simple yet most feature rich prototyping software. It also had superior template library and easy to share online platform.

Axure RP generates HTML web sites for preview and team collaboration as well as Microsoft Word documents as output for production documentation.

More details can be found at: [https://en.wikipedia.org/wiki/Axure\\_RP](https://en.wikipedia.org/wiki/Axure_RP)

### **Roles:**

We divided the roles based on story board we generated in previous stages. Half of the team decided to work on the *core* idea of the storyboard - profile completion page for the user. Other team members worked on the rest of the storyboard features. More specific details are given below:

**Aditya, Amber and Abhishek** - We completed the profile page for the user. This involved discussions with the stakeholders in deciding the fields to be chosen in the final version of the profile. We also generated a dummy risk profile and a family tree page. The process of linking all the pages was done at the end.

**Karthikeyan, Neeraj and Darpan** - We were responsible for creating a prototype for the signup page and the family members' page. The signup page was created to enable a user to create a new account in MeTree and the family members' page was created to either link another account with this account as a family member or enter the details manually.

## Prototype:

**URL of the prototype:** <https://7nv5ku.axshare.com>

- i) The user gets this email from the provider to set up his/her MeTree account.



Just one step left to do and your MeTree ID will be ready to use. Click the button:

Activate my MeTree ID

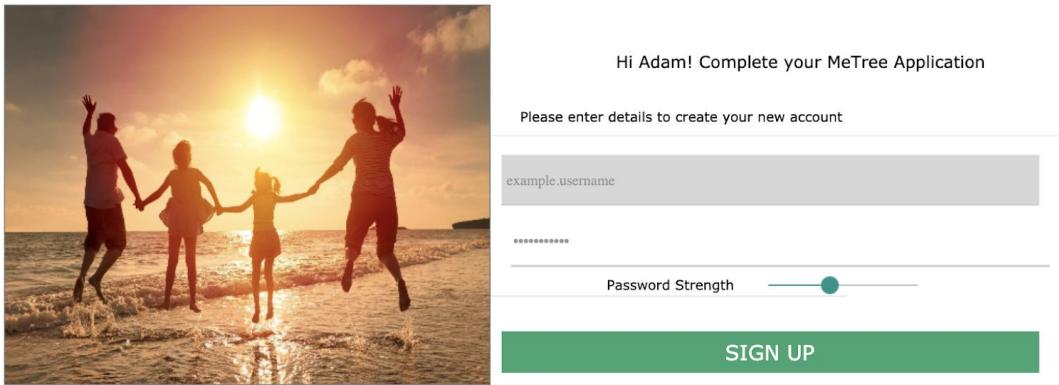
If you prefer, copy this 10-digit code<#####> and paste it into the box for the activation code on the Activate Your MeTree ID page.

If you did not request an activation link or code, or if you have questions about setting up a MeTree ID, contact us at 1-999-999-9999 or metreesupport@example.com.

Thank you,  
MeTree Team



- ii) This is the signup page. The username is the email id of the user and is prefilled.



iii) Only the relevant details are asked by the user while completing his/her profile.

**metree** English ▾ Logout

Name: Given Name  
Gender: Female

Were you adopted?  Yes

Race:  American Indian or Alaska Native  
 Asian +  
 Black or African/American  
 Native Hawaiian or Other Pacific Islander  
 White

**About your diseases and conditions** ?

Let's get started. Have you been diagnosed with any of the following diseases or conditions?

Abdominal Aortic Aneurysm  
 Blood clots/ clotting disorder +  
 Brain Disorder +  
 Cancer and Adenoma (Non - cancer tumor) +  
 More ...

**Done**

iv) This page represents the family details filled so far with a green tick. The unfilled information is shown in red. We also have the option of sending a request to the family members to provide their details if they have an existing MeTree account.

metree

English ▾ Logout

Grandparents

Paternal Grandfather Grandmother Maternal Grandfather Grandmother

Parents

Father Mother

You

Add Other Family Member

Your Siblings

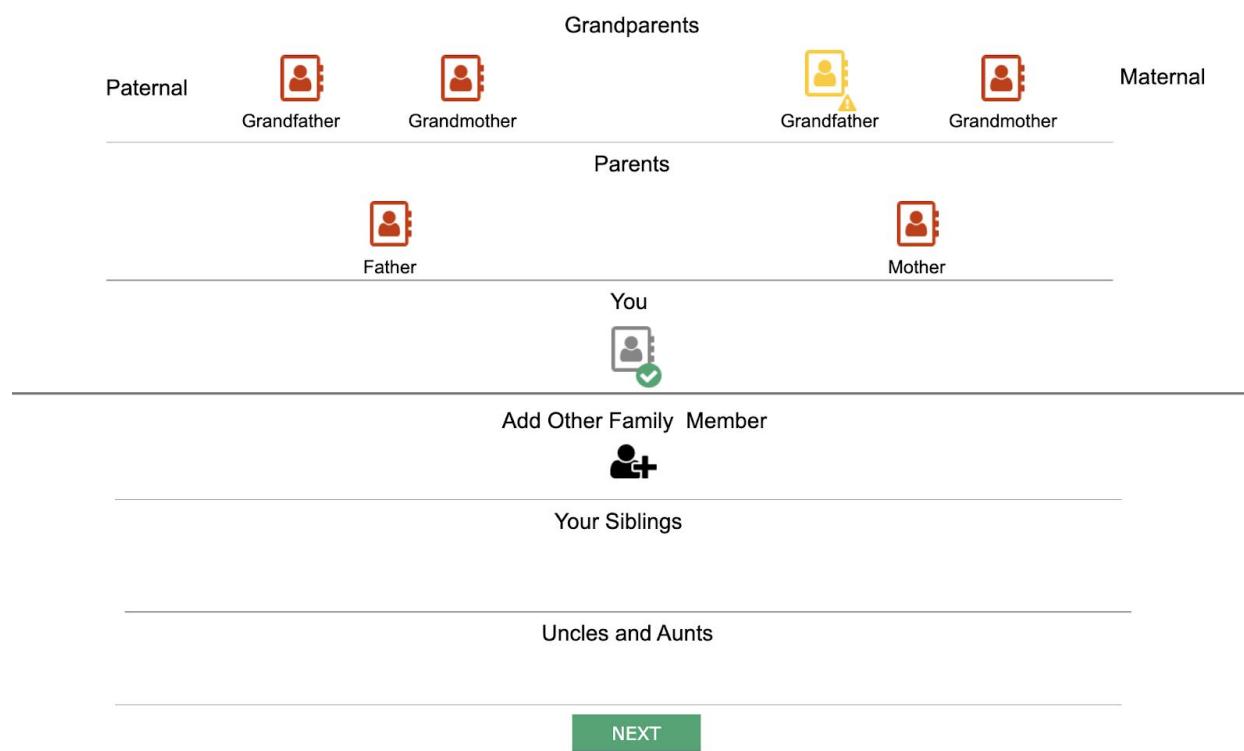
Uncles and Aunts

NEXT

The screenshot shows a family tree interface from the 'metree' platform. At the top right, there are language and logout buttons. Below that, the 'Grandparents' section is shown with icons for Paternal Grandfather (filled), Paternal Grandmother (empty), Maternal Grandfather (empty), and Maternal Grandmother (empty). The 'Parents' section follows, with icons for Father (empty) and Mother (empty). The 'You' section is highlighted with a green checkmark icon. Below these sections is a button for 'Add Other Family Member'. Further down are sections for 'Your Siblings' and 'Uncles and Aunts'. At the bottom is a large green 'NEXT' button. The overall design is clean with a white background and a minimalist aesthetic.

- v) Once a request is sent to a family member, his/her corresponding icon is displayed in yellow. Once the request is approved, we change its color to green.

The screenshot shows a mobile application interface for 'metree'. At the top right, there are language and logout buttons. The main area features a large central box with rounded corners. On the left side of this box, the word 'Paterna' is written vertically above three horizontal lines. On the right side, the word 'Maternal' is written vertically above one horizontal line. In the top right corner of the central box is a small 'X' button. Inside the box, there are two radio buttons: one for 'Import from Existing Profile' and one for 'Create a New Profile'. Below these buttons is a text input field containing the text 'Hello'. To the right of the input field is a green rectangular button with the word 'REQUEST' in white capital letters. At the bottom center of the screen, below the main box, is the text 'Uncles and Aunts'. At the very bottom center is a green rectangular button with the word 'NEXT' in white capital letters.



vi) We also have the option of adding new family members to our family tree. We follow the same process as described in the previous point to add a new member.

Paterno

Maternal

X

How is this member related to you?

Aunt

Uncle

Aunt

Brother

Sister

Son

Daughter

SUBMIT

Uncles and Aunts

---

NEXT

Grandparents

Paternal

Grandfather

Grandmother

Maternal

Grandfather

Grandmother

---

Parents

Father

Father

Mother

Mother

---

You

You

---

Add Other Family Member

---

Your Siblings

---

Uncles and Aunts

---

NEXT

vii) In the end, we display the patient's risk profile and his family tree based on the information provided by him/her.



English ▾

Logout

## Personalized Risk Profile



No risk of diseases based on current profile.



Critical risks found based on your data. Please visit doctor at the earliest.

[More Details](#)

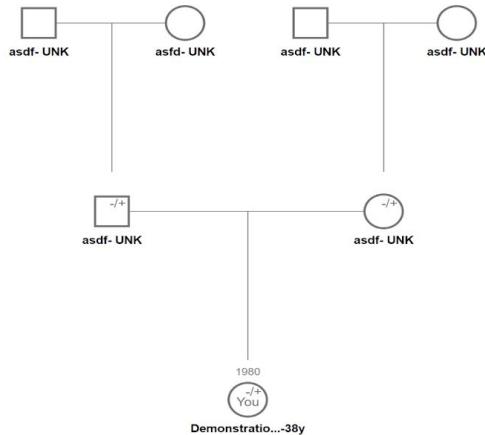
Share risk profile details via email -

[Send](#)

[BACK](#)

[NEXT](#)

## Family Tree

[BACK](#)[FINISH](#)

### Trial:

- 1) Choosing a particular prototyping tool 'Axure' from the various prototyping tools available that were tried and tested with.
- 2) It was a challenge to use the prototyping tool 'Axure' as none of the team members had prior experience working with it.
- 3) Multiple iterations were required to come up with the final version of the prototype that is agreeable with the stakeholder.
- 4) As the work was distributed among different team members, learning how to integrate all the parts together was time consuming.
- 5) At first run, the prototype wasn't cohesive. For instance, the fonts varied across pages, navigation didn't work and each page had different screen size. We fixed all those inconsistencies iteratively.
- 6) Linking elements from different page for smooth navigation was difficult at first. It wasn't very intuitive with Axure.
- 7) Since our prototype was of web application, we first struggled with prototype elements specific to a web application. Then we learned that Axure has a templates library which can be downloaded and imported. This made our job much easier.

## 5. Stage 5 - Evaluate

# Participants

We needed qualified participants to do a usability survey of our prototype. We sent out a link to the screening survey to our class group and friend groups.

Link to the survey: <https://forms.gle/QXGKgP7np3siL4w48>

A total of 11 responses were received and we chose 6 out of them who met the characteristics we were looking for.

List of characteristics wanted / not wanted:

- Wanted:
  - Balanced gender ratio (equal number of male and female participants)
  - Wide range of age distribution (as the application is targeted for a wide set of users)
  - Some experience/knowledge with health history forms (so that they can compare our solution with previous ones)
  - Have available time slot for an interview
  - Don't have an issue with their anonymized data shared in our study
- Not wanted
  - Uneven gender ratio
  - Similar age range
  - No availability

Survey results:

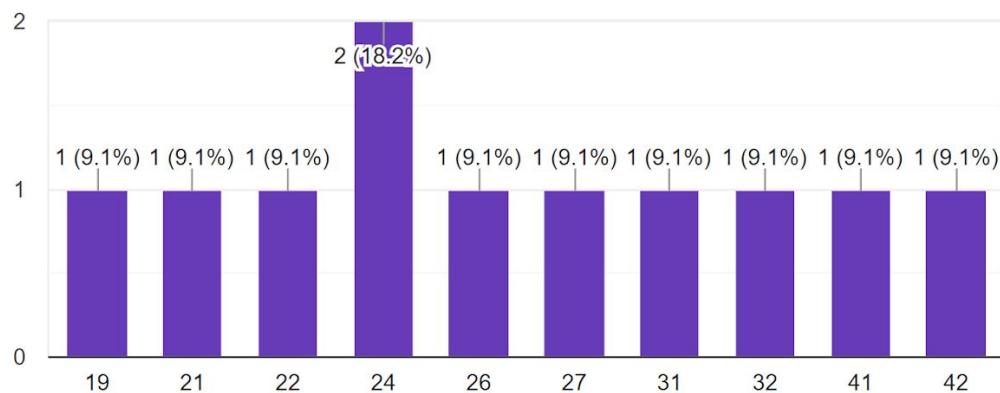
We chose 6 participants

- Who had some experience with health history forms
- Had available time slots
- Didn't have an issue their anonymized data shared
- Were from varied age group/gender

Below are the survey responses:

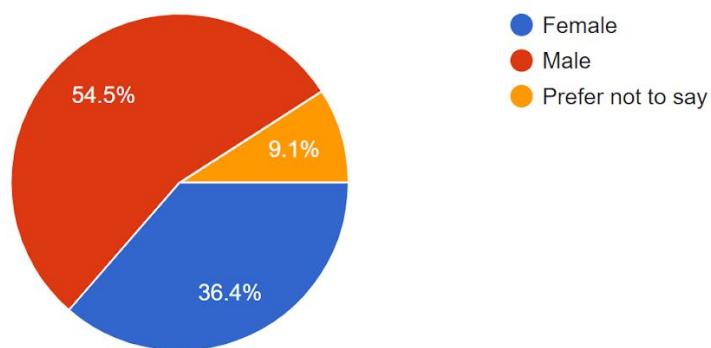
## Age

11 responses



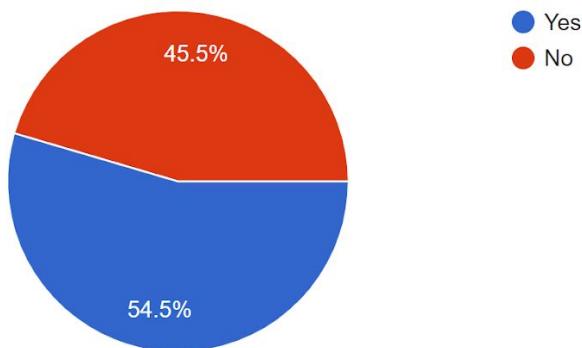
## Gender

11 responses



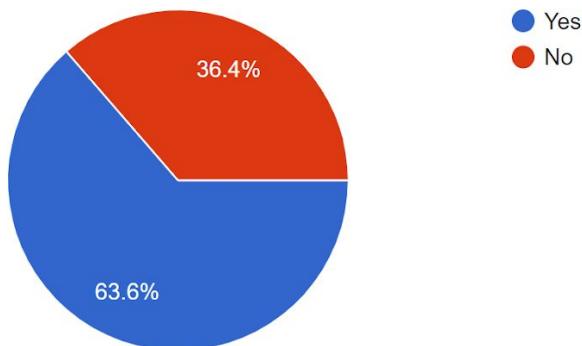
Have you filled any health history form before?

11 responses



Do you have any experience using any healthcare website?

11 responses



If yes, can you share some details about the form you used? (how easy was it? what was the thing you liked about it? Did you think the form was very lengthy?)

5 responses

It wasn't that easy

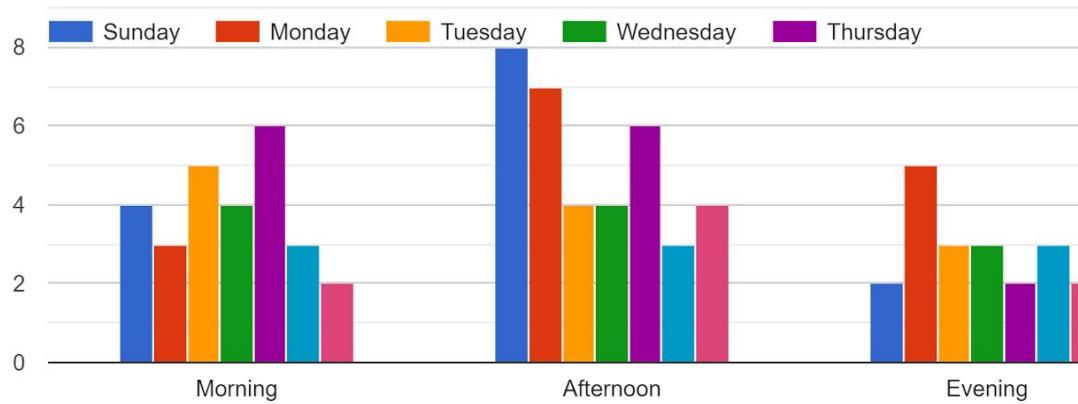
The form was quite lengthy & somehow felt that there were a lot of fields I did not understand or had to take help of the doctor.

i don't remember much about it...except that it was needed to fill forms

I felt the form was bad. It did not show good on mobile!!!!!!

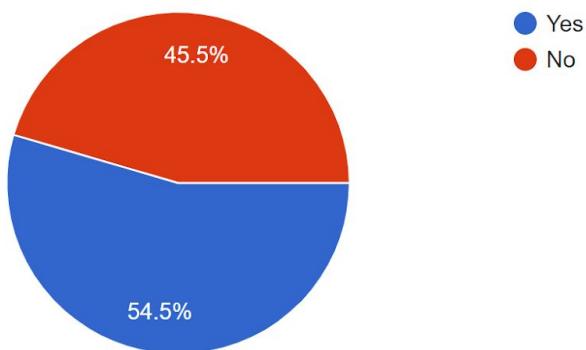
yes it was easy. I liked the end summary.

## Availability for survey



Is it fine if we share your personal details like age, gender, etc. for the survey? (Email address will not be shared irrespective of the choice you make)

11 responses



# Lab

- We reserved a room in the James B. Hunt library according to the availability provided by the selected participants.
- We used a laptop to demo the prototype we designed. The participant was allowed to freely navigate in the presented application.
- The laptop had Skype video call running in the background so that the reaction of the person along with the shared screen will be viewed by the rest of the team at a remote location. Apartment of one of the team members was used as a remote location. Also, the call was one way; mute from the remote apartment.
- One of us was sitting with the participant and interacting with him.
- Rest of the team was sitting in a remote location taking notes of the participant's responses.



Room at Hunt Library



Remote location for taking participant notes

## Interview Script

- Welcome
  - Hi, my name is \_\_\_\_\_. I am a student of the UX class here at NC State.
  - Thank you so much for giving us your time to help us evaluate the prototype of our app!
  - This is a no pressure evaluation session - feel free to think out loud whatever you have in mind, before, during or after the session.
- Introduction
  - Have you been to any health care center recently?
  - You might have filled out a form of your health history. The health history form is the topic of our discussion today. We have made a prototype of the form that I'd like you to use and give your feedback.

- We wanted to improve the experience of filling out family health history digitally. Throughout the semester we have designed a prototype. It's not perfect and all the functionalities may not work yet.
  - Once again, feel free to think out loud your thoughts.
- Prototype
  - So here's our prototype of the health history form. Please go ahead, you can start here. (Give control of laptop and open the application)
  - Here we have a tool that takes the medical information about you and your family and generates a risk profile based on the information provided. We also generate a pedigree based on the same information. Please note that we are in no way trying to evaluate your capabilities and just want to see how our application would be received.
- Testing
  - These are the different features we want to test out:
    - Sign up screen from the invite email
    - Your profile module
    - Family history module:
      - Ability to request/add parents information.
      - Ability to request/add grandparents information.
      - Ability to request/add other family members information.
    - Risk profile generation section.
    - Family pedigree generation section
  - We ask the following questions in order to encourage the user to think aloud:
    - What do you think about the alignment of columns?
    - How do you like the other member details addition feature?
    - Are the colors on the family page self-explanatory or do you think we should add legends for them?
    - Was there any information that you think we could have made mandatory?
- We thank the user and provide them the promised coffee!

# Grid

Feature / Participant #	1	2	3	4	5	6
Accept Invitation	It clearly looks like an email which contains all necessary information and help if needed.	The invitation contained his doctor name. He thought there was too much unappealing text to read before getting started.	Assures me about data privacy	The purpose of the application was made clear	Easy to understand	Contains all the necessary information regarding the purpose of using the application
Sign Up	Usually, when creating an account, there is a re-enter password field. It seems missing here.	He liked this page and mentioned that it was good that it did not contain many fields for signing up.	No password policy is mentioned for creating passwords	Although, the password strength field is present, but it does not suggest how to make a strong password	Simple and easy to fill	It would have been better if there was a confirm password field.
Login	Nothing particularly different	No comments	Simple	Easy to fill	Concise	Good UI

Feature / Participant #	1	2	3	4	5	6
Own Profile	Looked like just another form.	He did not understand what was the more checkbox in the form. Rest seemed okay to him.	Less interactive	Compact	Straightforward and self-explanatory.	Wanted to see his name populated instead of a placeholder for the prototype.
Family Details	Really liked the interface. It was clear that when I completed my own profile, it turned green and acceptable. However, the rest red icons indicated the remaining data. I feel it was quite self-explanatory.	The interface was pretty good as per him. He was clear in understanding that green indicated completed profile and red was the profiles yet to be completed. However, he suggested not to show uncles and aunts section if there wasn't any members added in that list.	It gives him the choice to fill out the information that he was comfortable sharing.I	Visually appealing	It is not clear as what does different icon mean	The user wanted to understand what the colors indicated. Probably add a legend box.

Family details from an existing profile	he liked the idea that he did not need to fill his parent's profile again if they already have an account. Simply import that!	He really liked this import feature. However, when the icon turned yellow, he thought that profile was incomplete and action should be taken by him to complete it.	Could have provided more information about the different profile creation options	The user liked the fact that he doesn't need to fill the form again.	Not clear how to use this feature	The user wanted to have a validation for the username when sending the request to a family member.
Add New Family Member	He asked why were there options for son and daughter as my health will not be dependent on the health of my son or daughter. It will only be vice-versa. So, these two options should not be included.	He liked the way that the feature was reused, that is, when you add an uncle, it is redirected to the same import/ create feature.	No comments	He liked the subtle changes made to the family profile page to incorporate the family details information.	He was able to navigate through easily	He had a question as to what happens when we want to add details regarding our great grandfather.

Feature / Participant #	1	2	3	4	5	6
Risk Profile	The profile looked complete. However, he wasn't sure how will he receive the analysis, will it all be in a descriptive email or a PDF file of the same.	He did not know how to interpret the profile. He was sure that tick was something good and cross something bad. He felt if there were a few more ticks and crosses then it would have been more meaningful.	Informative enough	There can be more level of risks as if only Red is given as an indication of disease. That can make patient worrisome.	User was satisfied with this page	The profile generated looked good but he still wanted to see the legends.
Family Tree	He was unsure about the generated Family tree.	He did not think that this is some other page showing more details.	More information about what does circle and square mean could have been provided.	The family tree structure is intuitive.	Should have provided legends to better explain family tree	Had a few questions regarding the meaning of the tree generated.

# Results

## Patterns

1. Registration email is informative enough [+]
2. No Password policies were mentioned for password strength field in Signup page [-]
3. UI for Login page is good [+]
4. Own profile page received good reviews as it was easy to fill and self explanatory[+]
5. Legends could be added to Family details and Family tree page [-]
6. Family details page received positive feedback overall as the user liked the UI and freedom to fill the family details [+]
7. The users were happy to see the ease with which they could add a new family member [+]
8. Users liked the Idea of importing existing profile functionality [+]
9. Add new family member received mixed reviews [Natural]
10. Risk level can be granularized into different levels [-]
11. Family tree could be made more informative [-]

Overall, the user feedback was positive. Users found the application to be functional but suggested some feedback that could enhance the overall usability. The import from existing profile feature was consistently appreciated by every evaluator.

## Follow up

Based on the feedback, we propose the following changes: -

1. We will add password creation guidelines to assist users in creating a strong password.
2. Some users were confused by the layout of Family details page. More visual guides can be added to help the user to accurately identify input types.
3. We will add placeholders in the form fields wherever required.
4. We will provide a more granularized risk profile.
5. Current family tree information didn't initiate much interest from users, even though it is a critical stage of the application. More information, data points and visualizations can be added to engage users.

We didn't provide a more granularized report and tree because it was beyond the scope of this project.