

# Design Document

Welcome to the design document! This is where your team records the entire design process for your project, including team meetings and artifacts and write-ups for design activities.

The required content for each week is described in the lecture slides and the course website (e.g to-do's). Make sure you also update the contents inside the double curly brackets each week. There is flexibility on how you use the placeholders; for example, if you do not have any images to include, then you can delete the image placeholders; on the other hand, If you have multiple images to include, you can duplicate the image placeholders.

Your weekly design document to-do's are due **Mondays at 12pm ET**. Each week, the instructor and/or TAs will grade your work and provide comments and feedback in this document so that you can improve your design process, plans, and writing. Once you receive those comments, **do not delete them or click resolve! Instead, make improvements to your writeup based on the feedback**. It's expected that your final product will be based on an improved version of your design document that incorporates and addresses this feedback.

---

## Goosinator

### Project Topic:

C1 - Enhancing Information/Data Literacy

### Team Members:

- Elman Reasat <ereasat@uwaterloo.ca>  Reading Reflection (Elman Reasat)
- Daniel Phan <tdphan@uwaterloo.ca>  Daniel Phan (Reading Reflection)
- Yixin Yang <y39yang@uwaterloo.ca>  Reading Reflection (Yixin Yang)
- Minqi Xu <m259xu@uwaterloo.ca>  Reading Reflections (Minqi Xu)
- Yeeun Park <y44park@uwaterloo.ca>  Reading Reflection (Yeeun Park)

### Team Contract:

[Goosinator - Team Contract](#)

---

## #1 Activities

DUE MONDAY SEPT 26

[ Grade: 5/5 ]

## Team Discussion

### Attendance

- Minqi Xu
- Yeeun Park
- Yixin Yang
- Elman Reasat
- Daniel Phan

### Meeting Minutes

110 minutes on 19th, 75 minutes on 24th, and 55 minutes on 25th.

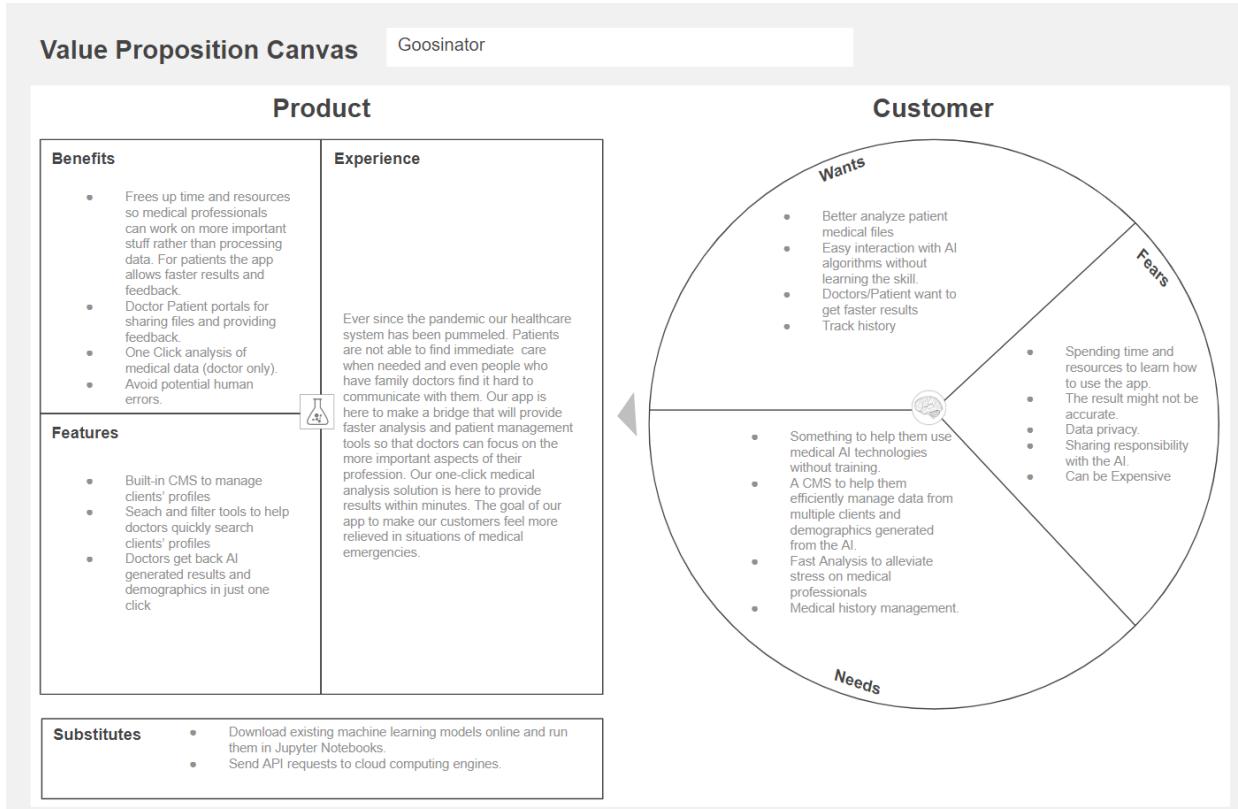
On the 19th, we completed the Team Contract and discussed our previous topic D8. At the end of the meeting, we decided to switch our topic.

On the 24th, we confirmed switching to topic C1, and finished Value Proposition Canvas.

On the 25th, we upload everything into the document, and do the final check.

# Value Propositions

## Artifacts



The value proposition canvas of our app.

## Writeup

Radiology is the process of using radiant energy to perform “a series of different tests that take pictures or images of various parts of the body” [1]. Prominent examples are X-ray and MRI scans. Proper analysis of radiology imaging can save lives by helping healthcare specialists perform early treatments on patients, preventing severe progression of diseases [2].

The world is facing a shortage of radiology labor, and “over 4 billion people have insufficient access to radiology services” [3, 4]. In addition, manually analyzing medical images is a time-consuming process and can take up to 4 hours [4]. Researchers have had great efforts in developing AI technologies to help detect various diseases from radiology images. For instance, ChexNet, developed by researchers at Stanford University, helps reduce the time of analyzing an X-ray photo from hours to minutes [4] and is capable of analyzing 14 different diseases [4, 5].

Despite many of the recent advancements, there is still a gap between human and interactions with AI technologies. From a black-box perspective, the users need to input radiology images into an AI-powered program, and the program will automatically perform checks and compute the result. In reality, this is usually done through running code in Jupyter Notebooks (or scripts)

or securely sending medical images to an AI-powered cloud computing engine (for example, making API requests). Such operations are complex and cannot be easily performed by a non-specialist. Moreover, every day, health care specialists have to process large volumes of data from various sources. Apart from radiology images and AI-generated statistics, healthcare specialists have to maintain countless client's profiles. As a result, integrating radiology imaging AI technologies into existing healthcare IT systems can introduce unnecessary complexity.

To address this problem, our goal is to design a platform to connect healthcare specialists, patients, and radiology AI technologies. The platform will help healthcare specialists interact with the AI technologies and maintain client profiles through a content management system (CMS). In addition, there will be a real-time update system, helping healthcare specialists track multiple concurrent patients. The design should facilitate rapid navigation around the system, aiding the management of emergency cases. Health care specialists will also have full control over the results generated by the AI; in particular, they can approve/reject/edit the results by interacting with a built-in viewer. Patients can see the results through their accounts' private dashboards or through their provided emails.

Alongside helping health care specialists automate repetitive tasks, the platform will give them the chance to apply and leverage practical data knowledge. They can interact with a CMS through various CRUD operations. In addition, they are now able to see how AI technologies function in real-world situations as well as analyzing AI-generated reports.

#### *References*

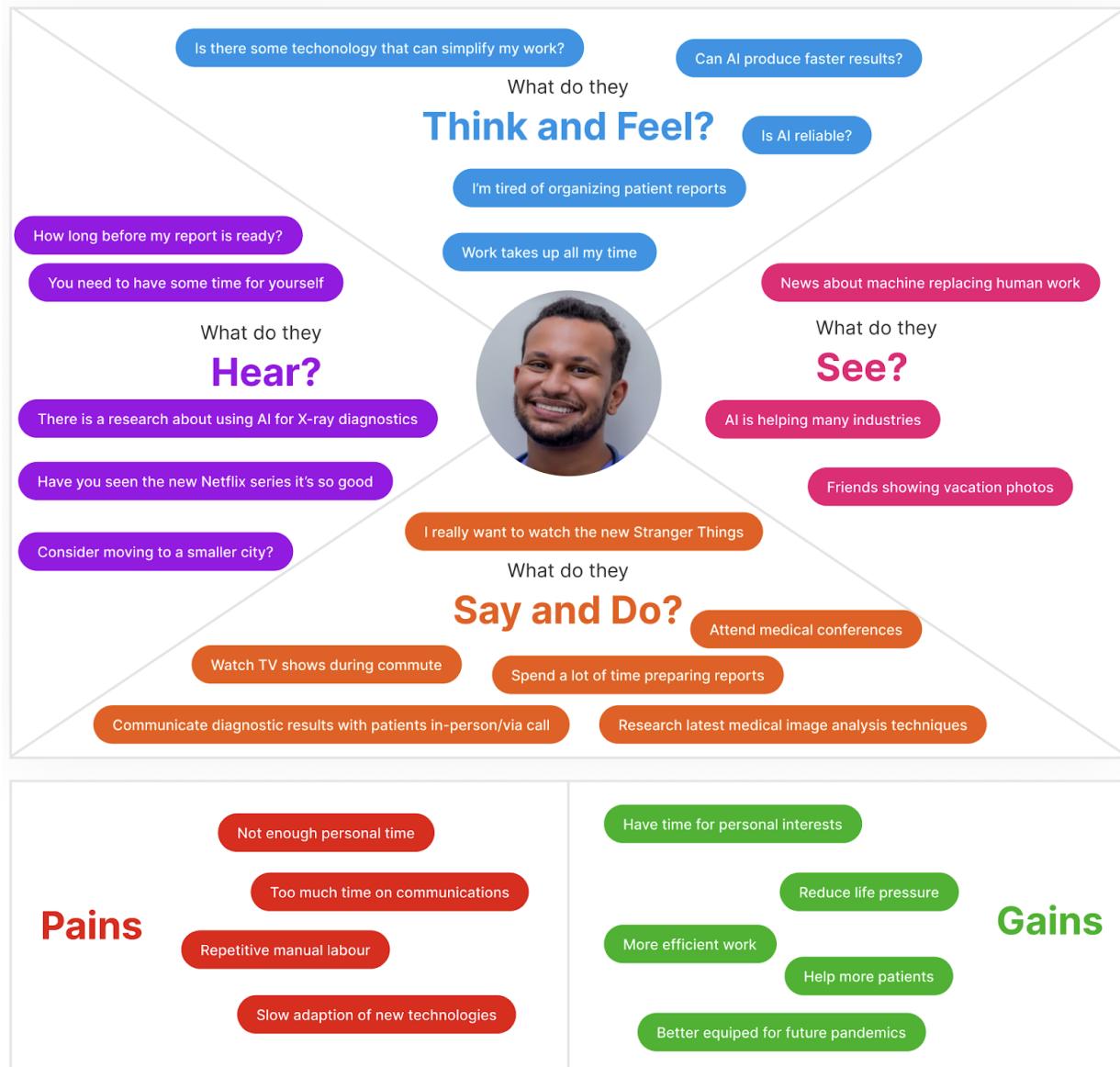
- [1] What is Radiology? Retrieved from <https://www.healthimages.com/what-is-radiology/>
- [2] Radiology. Retrieved from <https://oarinfo.ca/radiologists/importance-radiology#:~:text=Diagnostic%20imaging%20provides%20detailed%20information,there%20can%20be%20no%20cure.>
- [3] Radiology Facing a Global Shortage. Retrieved from <https://www.rsna.org/news/2022/may/Global-Radiologist-Shortage>
- [4] Stanford Researchers Create Algorithm to Interpret Chest X-rays. Retrieved from <https://www.youtube.com/watch?v=VJRCj-4E2iU>
- [5] CheXNet: Radiologist-Level Pneumonia Detection on Chest X-Rays with Deep Learning. Retrieved from <https://arxiv.org/abs/1711.05225>

# Persona and Empathy Mapping

## Artifacts

|   |   |  |   |
|---|---|--|---|
|    | <p><i>"Love to binge watch shows whenever I get time. Hate the hassle. My work takes up most of my time and I am afraid I might have to stop binging."</i></p>  | <p><b>Goals</b></p> <ul style="list-style-type: none"><li>• Manage work life balance</li><li>• Spend as little time as possible analysing irrelevant data</li><li>• More efficient patient management</li></ul>  | <p><b>Frustrations</b></p> <ul style="list-style-type: none"><li>• Having to spend too much time interpreting diagnostic imaging tests, making diagnoses and communicating results to physicians and patients</li><li>• Being exhausted by the hustle of work</li><li>• Having too little time for his own interests</li><li>• Being frustrated by the slow adoption of new technologies in the medical industry</li></ul>  |
| <p><b>Aron</b><br/>Soap opera addict</p> <p> Age/Identifying Gender<br/>34/Male       Location<br/>Toronto/ON</p> <p> Occupation<br/>Radiologist       Family Status<br/>Single/No Kids</p> | <p><b>Bio</b></p> <p>Aron has recently become a radiologist and decided to stay in the big city after finishing university. He loves watching tv shows but as he is moving on to a new chapter in his life he finds that its getting increasingly difficult to make time to do anything else but work. The amount of data he has to analyze and patients he has to manage is getting out of hand. Nowadays he just watches shows while he is commuting or on his lunch break.</p> | <p><b>Motivations</b><br/>(For More Efficient Work)</p> <p>Simplify Medical Image Interpretation<br/></p> <p>Get Faster Results<br/></p> <p>Get the Best Accuracy<br/></p> <p>Efficient Communications<br/></p> <p>Reduce Manual Analysis<br/></p> | <p><b>Brand Affiliations</b></p> <p> </p> <p> </p> <p> </p> |

User persona which represents a young radiologist who is frustrated by endless work



Empathy map for Aron

|  |   |  |  |
|--|---|--|--|
|   | <p><i>"My daughter and I have to see a doctor regularly due to a respiratory ailment. Since I'm keeping busy with my job, I don't want to waste time to wait for diagnosis."</i></p>  | <h3>Goals</h3> <ul style="list-style-type: none"> <li>Want to track the history of the medical analysis for my family</li> <li>Get a quick response of the diagnosis and the treatments</li> <li>Maintain good health for all members with the greatest treatment that is available</li> </ul>   | <h3>Frustrations</h3> <ul style="list-style-type: none"> <li>Sometimes feels the treatment does not improve health, and want to seek a new treatment</li> <li>Having to spend time at the hospital to wait just for the result or having treatment more than 30 minutes without doing anything</li> </ul>  |
| <b>Eleanor</b><br>The best treatment seeker<br><br> Age/Identifying Gender<br>43/Female  Location<br>Langley, BC<br><br> Occupation<br>Accountant  Family Status<br>Married/2 Children | <h3>Bio</h3> <p>Eleanor and her daughter have a medical history which is a respiratory disease, and because of this they need to see a doctor regularly. She became a leader of a account team lately and it's getting busier. Eleanor found out waiting for the diagnosis and the treatment fribbles away her time since she spends hours of her day when she see a doctor. Also, she would like to receive the best treatment available for herself and her daughter.</p> | <h3>Motivations</h3> <p>(For Receiving Treatment)</p>  Improve family's health<br> Treatment/diagnosis record<br> Get the Best Treatment<br> Save time<br> Price | <h3>Brand Affiliations</h3> <br><b>HEALTHLINE MEDIA</b><br> <br>  |

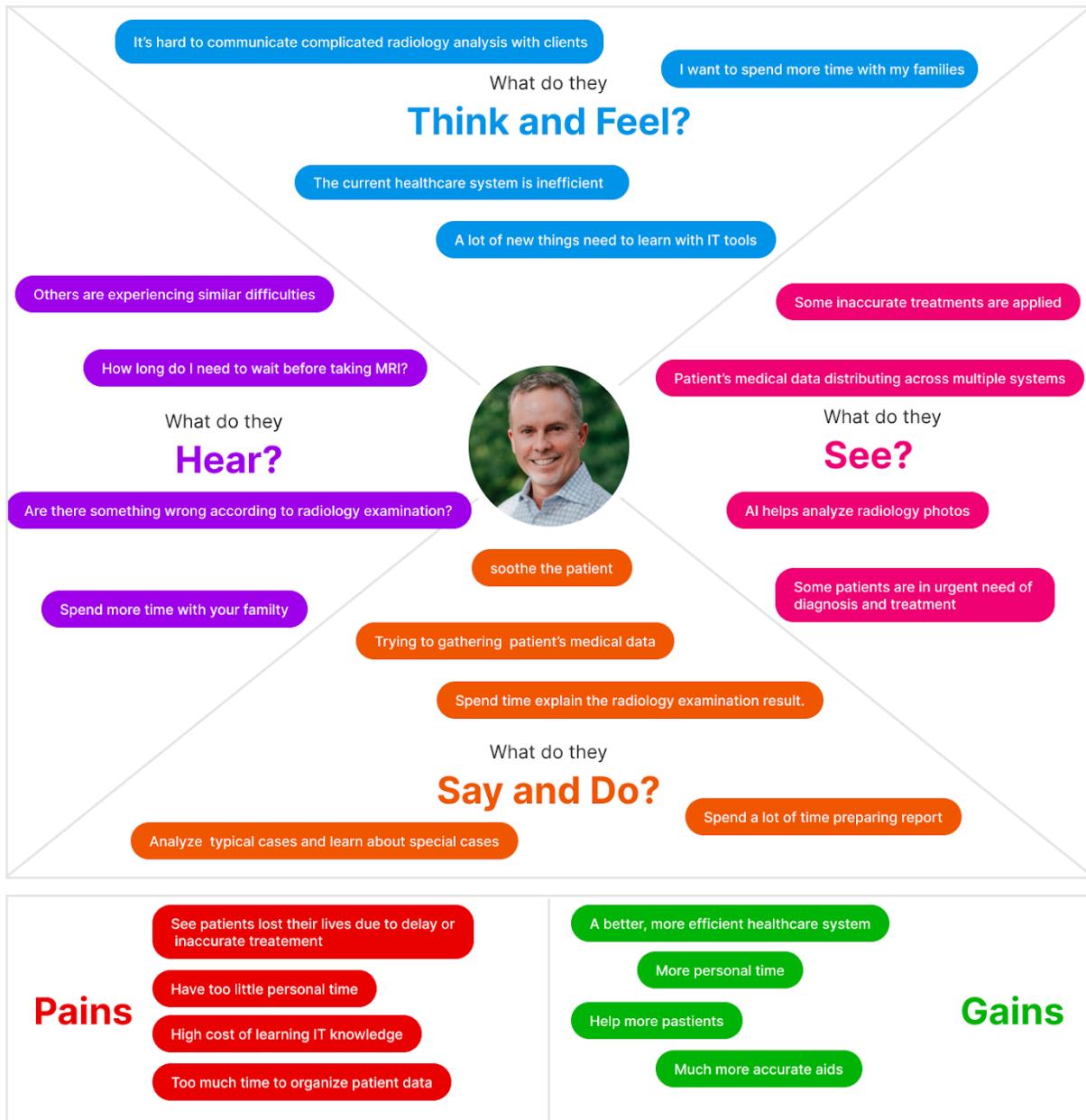
User persona which represents a patient who needs to regularly go to the doctor's



Empathy map for Eleanor

|   |  |   |  |
|---|--|---|--|
|    | <p><i>"Everyday, I strive to deliver better services to all of my customers. Radiology technologies allow me to early identify diseases and have accurate immediate treatments for my patients. I also want to see greater progression of the field."</i></p>  | <p><b>Goals</b></p> <ul style="list-style-type: none"> <li>• Improve radiology services</li> <li>• Contribute to the development of the healthcare system</li> <li>• Learn new IT tools to maintain different information sources</li> <li>• Help healthcare specialists who are facing similar difficulties</li> <li>• Be able to allocate more time for family</li> </ul>   | <p><b>Frustrations</b></p> <ul style="list-style-type: none"> <li>• Communicate complicated radiology analysis with clients without illustrative demographics</li> <li>• Customer profiles and reports scatter across different physical and digital sources</li> <li>• See patients overly paid for healthcare services due to system inefficiencies</li> <li>• See patients lost their lives due to delay or inaccuracy in treatments</li> </ul> |
| <p><b>Stephen</b><br/>Domain expert</p> <p> Age/Identifying Gender<br/>53/Male</p> <p> Location<br/>Los Angeles, CA</p> <p> Occupation<br/>Radiologist</p> <p> Family Status<br/>Married/2 Kids</p> | <p><b>Bio</b></p> <p>Stephen is an experienced radiologist with 20 years of experience. In addition, he has been conducting successful research in the field. His radiology clinic is experiencing an increasing number of patients. Many patients has complicated interrelated diseases, taking him a great amount of time to process the images as well as to properly communicate results and write reports. He heard about recent advancements in medical AI as well as how they function from high-level perspectives. He wants to learn more about AI and general IT technologies to better treat his customers. Deep inside his heart, he wants to have great impacts to help improve the healthcare system as a whole.</p> | <p><b>Motivations</b><br/>(For Healthcare)</p> <p>Provide High-quality Services</p>  <p>Read and Conduct Research</p>  <p>Integrate IT Technologies into Workspace</p>  <p>Reduce Clinic Wait Time</p>  <p>Better Pricing Strategies</p>  | <p><b>Brand Affiliations</b></p> <p><b>FUJIFILM</b><br/>Value from Innovation</p> <p><b>GE Healthcare</b></p> <p><b>SIEMENS Healthineers</b></p> <p><b>RSNA</b><br/>Radiological Society of North America</p> <p><b>DICOM</b><br/>Digital Imaging and Communications in Medicine</p>   |

User persona which represents an experienced radiologist who wants to help improve the healthcare system



Empathy map for Stephen

### Writeup

Aron is a newly graduated tech savvy Radiologist and is a very busy individual who wants to find faster solutions to make time for himself. He needs to spend a lot of time reading medical images, preparing patient reports, and communicating the results to the patients/physicians. He wants to use the latest and greatest technologies to help make his work easier. Aron

represents the young generation of medical professionals who have a hard time finding work life balance.

Eleanor is an imaginary character who is composed based on several people's data: cancer-free patient, hypertensive patient, and pregnant woman. She recently became a leader of an accountant team which makes her even busier while she needs to see a doctor with her daughter regularly because of a family disease. Eleanor represents the general public with basically no medical expertise.

Stephen is an expert in radiology with years of experience working as a radiologist. Moreover, he is also an admired researcher in radiology. He represents the domain experts who will have high standards for all aspects of healthcare delivery. He also wants to integrate new IT technologies into healthcare workspaces. Similar to Andrew Ng's point in [1], improving healthcare service requires collaboration of specialists from different fields; thus, insights from Stephen will be valuable assets.

In summary, we have three personas including Aron, Elenor, and Stephen who have different occupations, motivations and objectives. Aron and Stephen engage in the medical field while Elenor works as an accountant which is irrelevant to the medical field. All of them are important since they bring the common needs regarding the medical treatment and diagnosis. The reason that they are chosen is because everyone has dissatisfaction with the current medical system.

### References

[1] Stanford Researchers Create Algorithm to Interpret Chest X-rays. Retrieved from <https://www.youtube.com/watch?v=VJRCj-4E2iU>

### Team Contribution

- Elman Reasat contributed by Value Proposition, Persona creation, Writeup
  - Yeeun Park contributed by Elenor's Persona, Writeup
  - Minqi Xu contributed by writeup, Stephen's Empathy Mapping
  - Yixin Yang contributed by Aron and Eleanor's Empathy Mapping, Writeup
  - Daniel Phan contributed by Value Proposition, Writeup, Stephen's Persona
- 

## #2 Activities

DUE MONDAY OCT 3

**[ Grade: 5/5 ]**

### Team Discussion

#### Attendance

- Minqi Xu
- Yeeun Park
- Yixin Yang
- Elman Reasat

- Daniel Phan

## **Meeting Minutes**

90 minutes on September 27th

40 minutes on September 29th

40 minutes on October 2nd

On September 27th, we created the interview and questionnaire questions and finished the mock interview.

On September 29th, we made some changes to our interview and questionnaire questions.

On October 2nd, we completed the write ups in #2.

## Interview and Questionnaire Questions

### **Initial Questions for All Interviewees (Demographic Questions)**

1. Do you work in the medical field?
  - If yes. Do you use imaging technology to diagnose and treat diseases?
  - If no. [Interviewer simply proceeds to other questions.]
2. What is your age?
3. What is your gender?
  - a. Male
  - b. Female
  - c. Non-binary
  - d. Specify yourself: \_\_\_\_\_

### **Questions for Doctors/Radiologists**

#### **A. Health Information System (HIS)**

1. Do you use any software to manage your patients?
  - [Follow-up] On a scale of 1 to 10, how would you rate the user interface experience?
    - 1 hard-to-use — 10 easy-to-use
    - [Follow-up] What are the pain points of using the portal you currently employ?
2. How time-consuming is it to manage patient profiles, both physical and digital files?

- 1 really fast and convenient — 10 extremely cumbersome
3. How difficult is it to use the current health information system (HIS)?
    - 1 easy — 10 hard
  4. Rate current health information systems in aiding humans in handling emergency cases.
    - 1 unreliable — 5 reliable
  5. How do you feel about giving your patients feedback online?
  6. What are the most difficult aspects of the health information systems (HIS) that you are using?
  7. What are the improvements you want to see in the current health information system, or do you have any suggestions about how they should be improved?

## **B. Artificial Intelligence**

1. Have you used any AI tools to aid your work?
  - If yes, on a scale of 1 to 10 how easy is it to use the current tools you have?
    - 1 easy — 10 hard
2. How reliable do you think the AI-based results are?
  - 1 unreliable — 10 reliable
3. How long does it take on average to analyze results produced by an imaging technology?
  - [Follow-up] What do you think about sending a medical image (like X-ray or MRI) over the Internet to an AI, getting the results analyzed, and then performing extra analysis on those results?
    - [Follow-up] Do you have any extra concerns about using AI to aid doctors in detecting diseases?

## **C. Information/Data Privacy and Security**

- On a scale of 1 to 10, how would you rate the data privacy and security policies of your current information management system?
  - 1 anyone can steal data --- 10 being unbreachable

## **Questions for Patients**

### **A. Questionnaire For Patients**

1. Have you had any of the following examinations done in the past:
  - X-ray

- MRI
  - PET scan
  - CT scan
  - Ultrasound
2. On a scale of 1 to 10, how difficult is the sign-in process when you go for a doctor's appointment?
    - 1 easy — 10 hard
  3. How reliable do you think the AI-based results are?
    - 1 unreliable — 10 reliable
  4. On average, what is your wait time when you go to a doctor's appointment (not walk-in)?
    - a. <1
    - b. 1-3
    - c. 3-5
    - d. >5

## B. Interview Questions for Patients

1. Tell us about the last time you went for your medical imaging appointment.
2. How long did it take for you to get the results?
3. How was the initial screening process? How would you feel about filling up your medical forms online instead?
4. Would you like to see the Imaging results?

## Writeup

Since our target audience is both Doctors and Patients we have designed the interview questions to cater to both parties. For Patients we wanted to understand their experience with medical examination procedures (x-ray, MRI etc) that are currently being used. The key to understanding how to design our project is to understand the frustrations they have with getting an appointment, passing the initial screening process, getting the procedure done and waiting for the results. We have made the questionnaire to understand these ideas so we can design our program to alleviate some of the pain points presented by our interviewees.

For Doctors we wanted to know what type of Health Information Systems they currently employ, the pros and cons of using these systems. We also try to understand the patient profile

management software they are using and the security they provide. Finally we are trying to find out their perspective in using Artificial Intelligence for Medical assistance, if they are currently using any such tools or if they are willing to try out the benefits of using Artificial Intelligence. The questions were designed to get an overview of their current situation and how we can bridge the gaps by designing our program to solve their issues.

## Mock Interview

(with someone from the class; not teammate)

### **Writeup**

#### **Interview with P0**

P0 is a 4th year CS student at the University of Waterloo. Since he is not working in the medical field, we proceeded with the questionnaires and interviews for patients. We first asked if he had done any imaging examinations in the last two years. P0 said no but he told us he did have the experience more than two years ago. For the difficulty of the screening process before seeing a doctor, he rated it 5 (on a scale of 1 to 10) and found it a little cumbersome and can be simpler. P0 thinks AI generated results are relatively unreliable. The average wait time when he goes to see a doctor is less than 1 hour with an appointment and 1-3 hours if walk-in. About his last imaging exam, P0 described that he walked in, signed up, filled in some forms, which in total took him about half an hour; then he was brought to a place for changing clothes; after that, he waited for another half an hour before taking the examination. He did not quite remember how long it took to get the results back but it should be roughly 2-3 weeks. We asked how likely it is to fill up forms, and he stated it was around  $\frac{2}{3}$  of the time. After the results come out, he might need to go back to the clinic to review them and he thinks it would be nice if he can see the imaging results.

We conducted the questionnaires first and then did interview questions with P0. We realized that mixing the questionnaire and interview questions might be a better approach. Instead of going through the questions by their types (open-ended or closed-ended), it would be more coherent and organized if we group the questions by what they are about (HIS related, AI related...). We removed the 2-year time constraint in the question asking past imaging exam experience because the constraint does not contribute to the information this questionnaire designed to obtain from the audience. We deleted the question about the likelihood of filling up forms as the question is too general and the outcome of it depends on the type of exam and procedures of the hospital. Instead, we added a more specific question about how they feel

about filling up forms online, which is more relevant to our project topic. We also asked P0 thoughts about our questions for medical professionals. Based on his suggestions, we added questions about giving feedback online and data privacy.

## User Interviews

(with >=3 users; not in the class)

### **Writeup**

#### **Interview with P1**

P1 was diagnosed with complete remission of the breast cancer in 2009 so that P1 has CT, PET scan, X-ray and ultrasound once a year for detecting and preventing the cancer recurrence. For taking the medical imaging , P1 should have their blood test one day before to know the availability of the examination, and then on the day, P1 checks in at the hospital and gets the imaging test. Also, P1 needs to receive the medication and wait for 5 hours for PET scan. Because of this, when P1 has an appointment for the medical imaging, the wait time at the hospital/clinic is increased up to more than 5 hours while other appointments' wait times stay at less than one hour. To get the results of the image examination, it took one week on average. P1 does not want to get the result faster as well as to get it on the same day as the appointment because P1 feels tired after all the tests and wants to analyze and discuss the results with their doctor in detail. Moreover, P1 does not want to see the imagining results since P1 has no knowledge of the medical and can't understand the result anyway.

P1 thinks the difficulty of the sign-in process for a doctor's appointment is 4 (on a scale of 1 to 10) because it is troublesome work to write the same information and need to write in detail due to their medical history. Because of this, P1 100% wants to fill up the medical forms online; however, P1 worries about the data leak. Also, P1 relatively relies (6 on the scale of 1 to 10) on AI results because P1 has experienced helpful in the past.

This interview conflicts with the persona and the value proposition since P1 does not want a faster result while the persona and the value proposition stated a quick result of the test. On the other hand, it supports the online sign-in process since the interviewee wants it even though they are concerned about the data privacy. P1 suggests saving the sign in process so that the patients could use the older form whenever they visit a different hospital/clinic. This interview helps to empathize with the patient users by understanding the actual problems with the medical systems.

### **Interview with P2**

P2 used X-ray and ultrasound healthcare services, both from radiology clinics and hospitals. P2 went to a hospital in emergency cases (according to P2, radiology clinics only resolve cases raised by a family doctor). According to P2, most of the time, the check in process was quite fast and reliable, with waiting time durations ranging from 1 to 2 hours. However, at peak hours, it took her 2-3 hours (at a radiology clinic) and more than 5 hours at a hospital. In addition, although P2 has been to multiple X-ray checks, except from the results shown by doctors, P2 has never received back the medical images. P2 believes a copy (either upon request or not) should be provided back to the customer.

P2 has extreme concerns about sharing medical images with an AI to get the images analyzed. In addition, P2 believes that AI-powered software should always be just a companion tool for doctors and should not replace human doctors, for doctors might discover more insights as they have experience in resolving real-world situations. P2 believes sharing medical data over the Internet or just simply saving medical data to a cloud storage should also be performed securely.

Overall, there is no clear/complete conflict with the value proposition and the related persona (Eleanor's persona). One minor exception is, from P2's experience, P2 believes the accuracy of healthcare services was at an acceptable level (yet could still be improved), which is slightly different compared to that of the related persona.

A major finding is that data privacy concerns of P2 were much higher than expected. As a result, the design should factor in the finding accordingly and facilitate trust building among clients. Overall, the results help the design team not only empathize but also develop clearer understandings with potential users.

### **Interview with P3**

P3 is an Ophthalmologist in a foreign country. She supposed that the concept of a health information system is too general, and she only wants to talk about the situation of the software of her hospital. And all long questions about the health information system are skipped.

As a doctor, her evaluation of the systems and software which is basically used in her hospital to write medical records and do statistics is relatively average. It is not that difficult to use the system, but also it is not easy. And it takes time to manage patients' information but it is not

quite cumbersome. The most difficult aspect of using current software is doctors cannot fully grasp the use of the software, mostly, they can only master the daily needs of the department.

For diagnosing patients online and giving feedback online, she supposed that patients should first go to the hospital to get the most basic test results. Because through the Internet, doctors can only give some guidance or explain the inspection results, there still exists the risk of misdiagnosis.

In her experience, ophthalmology B-ultrasound, CT, and MRI are relatively simple, and generally trained doctors can quickly analyze images by themselves compared to other departments. She hasn't worked with AI yet, and suppose that the AI-based results should be reliable to some extent. By uploading medical images like X-ray or MRI to the AI and getting the results then analysis further could improve the diagnosis rate to a certain extent. But she still has some concerns about using AI. She thought people cannot rely entirely on AI, medicine is a human science, and the combination of humans and AI can make diagnosis more accurate.

Overall, she believes that the systems and software currently in use can perform basic needs for doctors, but there are still many aspects that can be optimized. AI should be a good aid for doctors, but it cannot be completely relied upon. Misdiagnosis can easily occur if only relying on AI.

It supports our value proposition and personas on wanting to better manage and analyze patient medical files and using AI to aid doctors' analysis. The conflict occurs in the time spent to analyze the medical image, probably because for different departments, the difficulty of analysis and the time required is not the same.

The major finding is that as a doctor, they want to ensure the diagnosis rate and accuracy rate stays at a high level. So For our product, we may need to ensure that the doctors are not completely relying on AI results, at least they need to do a check or even deeper analysis. This interview helps to empathize with the medical professional users by understanding the actual problems with the medical systems and their views on AI-assisted healthcare.

## Team Contribution

- Elman Reasat contributed by Interview Questions, Mock Interview, Writeup for Interview Questions
- Yeeun Park contributed by Interview/questionnaire questions, Interview with P1, Writeup for Interview with P1

- Minqi Xu contributed by Interview/questionnaire questions, Interview with P3, Writeup for Interview with P3
  - Yixin Yang contributed by Interview/questionnaire questions and Writeup for Mock interview
  - Daniel Phan contributed by Interview & Questionnaire Questions, P2's Writeup, and Mock Interview
- 

## #3 Activities

DUE MONDAY OCT 17

[ Grade: 4/5 ]

### Team Discussion

#### Attendance

- Minqi Xu
- Yeeun Park
- Yixin Yang
- Elman Reasat
- Daniel Phan

#### Meeting Minutes

15 minutes on October 12th.

60 minutes on October 14th.

80 minutes on October 15th.

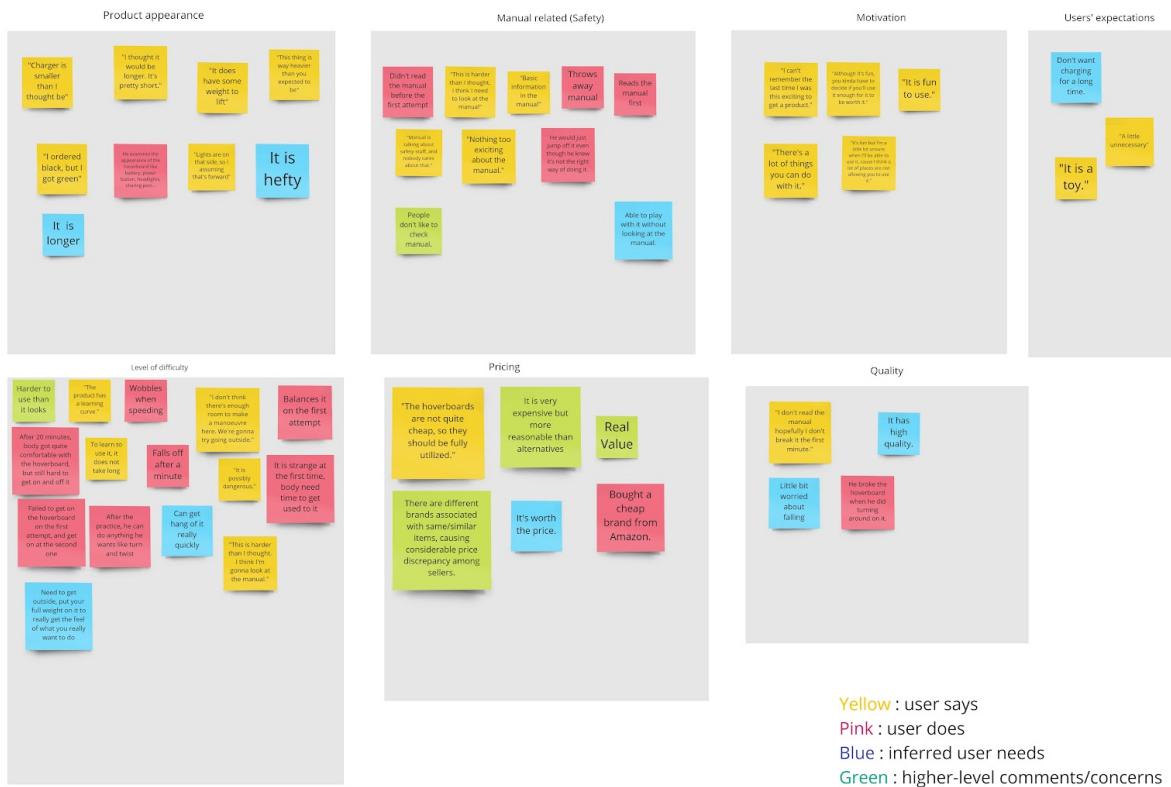
On the 12th, we make sure everyone understands this week's deliverables and assign the work to every group member (make notes individually) before our next meeting.

On the 14th, we organized our notes and categorized them by following the instructions on slides and finished the Affinity Diagram for the 3 hoverboard videos. Then we scheduled a meeting the next day to work on the Affinity Diagram for our interviews and we asked each member to make notes before the meeting.

On the 15th, we reviewed all the notes and grouped them to make the Affinity Diagram. Then we worked on the POV and HMV statements and write ups.

# Affinity Diagram from Observations

## Artifacts



## Affinity Diagram for Hoverboard (Miro)

### Writeup

While working on the affinity diagram we have come up with 7 different areas of focus that the users of the hoverboard brought up. To begin with we have some insight about the product's appearance. The information we gathered led us to believe that it is pretty hefty and durable. It has some indicators for conveying information such as battery life and charging status. The board is also equipped with headlights. Next, we get some insight into the manual that is provided with the product. Most users are able to start using the boards without looking at the manual. The manual has some basic safety information and nothing exciting. We move on to the level of difficulty of using the hoverboard. Since most users did not read the manual we see a lot of failed attempts. There is a learning curve but after about 15-20 minutes of use, all of the

users were comfortably riding the hoverboard. Some of them had to read the manual after a few failed attempts. We also got insights about the pricing of the product where all users seem to agree that it is quite expensive but there are cheaper alternatives that provide the same value. Finally, we got some insights about the usefulness or motivation to purchase this product and we see that hoverboards are fun and exciting but it is also a bit unnecessary and not very useful. The build quality is pretty good although the cheaper alternatives can be flimsy and it is also dangerous if you do not ride with caution. From the ideas discussed in the videos, we get a sense that the users think the product is a toy and should be enjoyed to get the most value.

# Affinity Diagram from Interviews

## Artifacts



## Affinity Diagram for Interviews (Miro)

## **POV Statements**

1. A patient who rarely uses complex IoT technologies needs a convenient way to view doctors' diagnosis back because that will help her save time, in addition, it's better to view the result in one's own time compared to in a doctor's appointment.
2. A patient who works at a company needs a same day result because he would rather see and analyze the result on the same day as the medical imaging test as it uses his time efficiently so that it does not bother his work.
3. An adult who has (both AI-related and non-AI-related) data privacy concerns needs a system to securely maintain all documents because she understands that leaked data can be reverse-engineered, and that can negatively affect her work and businesses.

## **HMW Questions**

1. How might we make the initial sign-in process for patients so that it is quick and easy for them at the hospital or clinic?
2. How might we protect data for patients so that they can be confident that their personal information and clinical history are being kept safely and securely?
3. How might we design the processes for doctors so that they will analyze deeper on AI results rather than blindly trust it?

## **Writeup**

We have grouped the interviewees' datas into seven groups by working on the affinity diagram. First of all, we have found insight about AI. Most patients do not find AI generated results reliable, which makes us realize that it would be hard for normal people to believe in and rely on AI generated results if it is regarding one's health. Some doctors pointed out that we cannot rely on AI but the combination of human and AI can make more accurate diagnosis. Thus, it is important that we make sure doctors will not blindly follow the AI results and make patients aware of that. Next, we get some insight about the wait time at the hospital or clinic. If the appointment is booked, the wait time is less than one hour on average; however, if it is not booked or there is a specific test such as PET scan, the wait time is increased significantly. The interviewees all agree that it would be good if there are improvements in the wait time. We also found some thoughts about the screening process before seeing a doctor. If a patient has a medical history, the initial screening process becomes bothersome while it is less complicated if there is no medical history. Many of them would like to fill in the forms online since it might be more convenient, and they can take as long as they want. Next, we have some insights about data privacy that lead us to think more deeply about the confidentiality of medical data and patient information. Next, we have found some thoughts regarding the image results. Most patients find that it takes a long time for them to get the results and hope they can get them sooner. They also want to see a detailed report about the results and need a doctor to explain them. However, some people do not want to see the imaging results since they cannot

understand them. Therefore, we think that verbal communication between doctors and patients is still quite necessary, and we cannot rely on online interaction. Next, we have some insight about the system that people do have some concerns such as if it is robust and secure enough and if it is easy enough for them to use. That is also a big area that we need to work on to make users feel confident and comfortable using our system.

## Team Contribution

- Elman Reasat contributed by Affinity Diagrams, Write-up
  - Yeeun Park contributed by Affinity Diagrams, POV statements, Write-up
  - Yixin Yang contributed by Affinity Diagrams, HMW questions, Write-up
  - Minqi Xu contributed by Affinity Diagrams, HMW questions
  - Daniel Phan contributed by Affinity Diagrams, POV statements
- 

## #4 Activities

DUE MONDAY OCT 24

[ Grade: 4.5/5 ]

## Team Discussion

### Attendance

- Minqi Xu
- Yeeun Park
- Yixin Yang
- Elman Reasat
- Daniel Phan

### Meeting Minutes

110 minutes on October 18th.

90 minutes on October 22nd.

70 minutes on October 23rd.

On October 18th, we came up with 3 goals that we think are important for our clients to use our system. We finished our first HTA, and basically finished the second one.

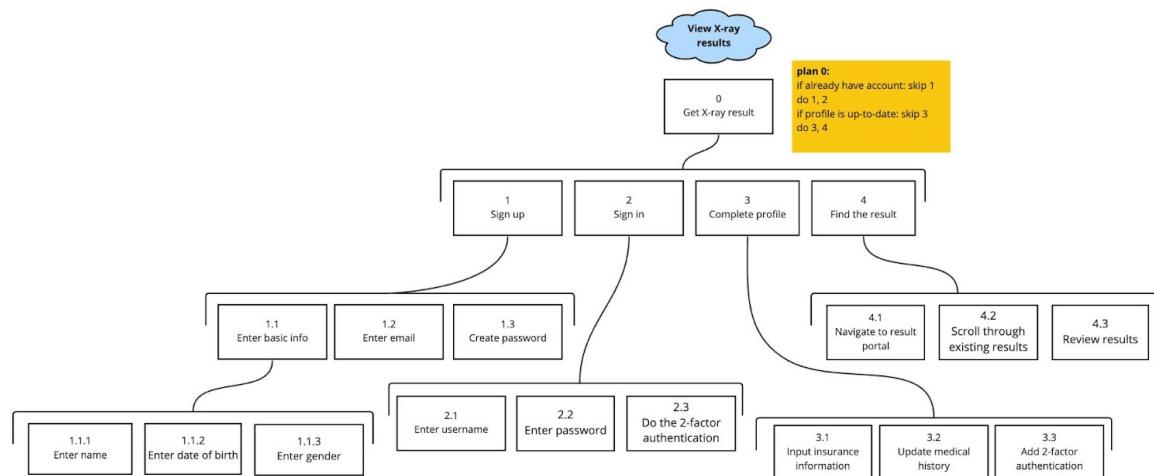
On October 22nd, we finished all 3 HTAs, brainstormed a number of design features and took a vote, discussed and finished the design arguments.

On October 23rd, we modified our second and third HTAs, and finished the write up section.

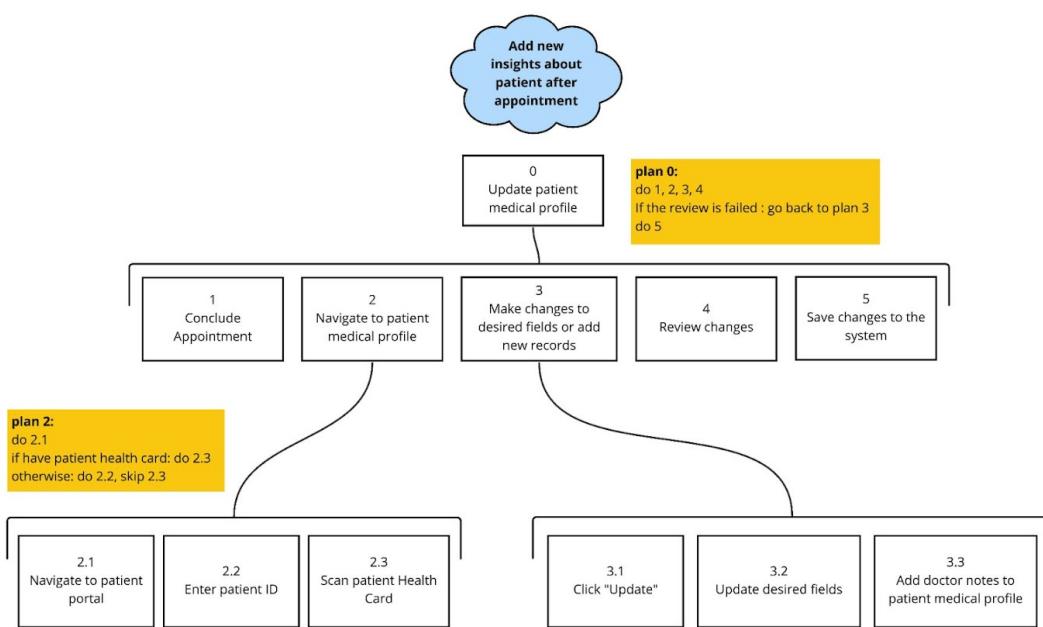
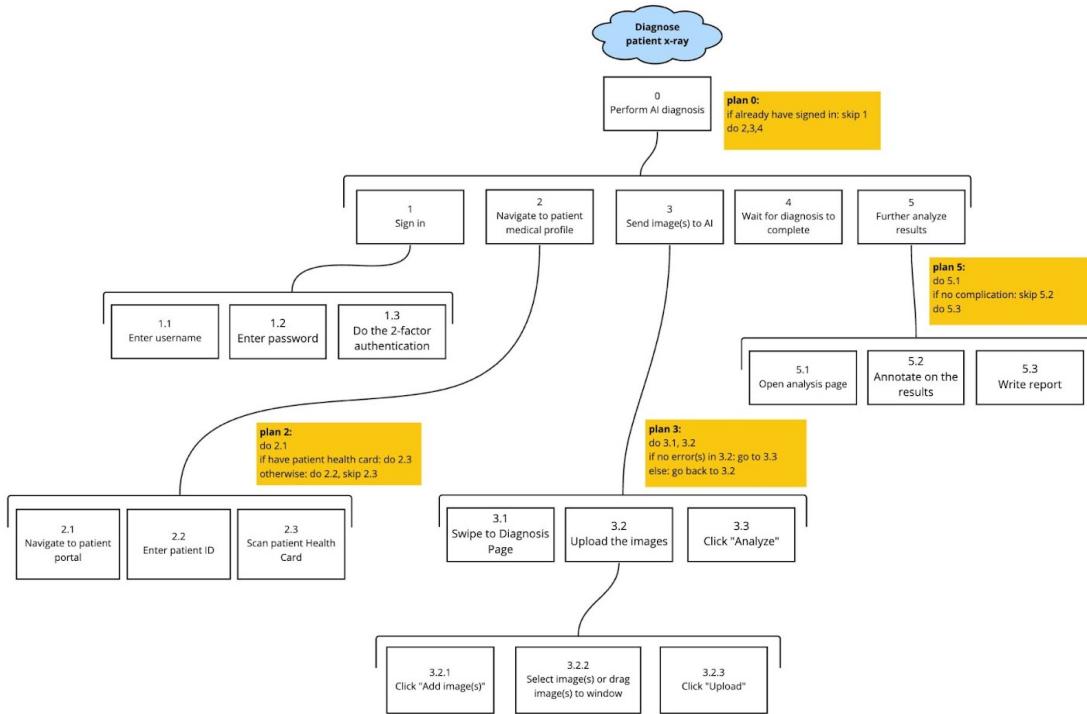
## Hierarchical Task Analysis

### Artifacts

[HTA diagrams \(Miro\)](#)



Goal 1 : View X-ray results



## **Writeup**

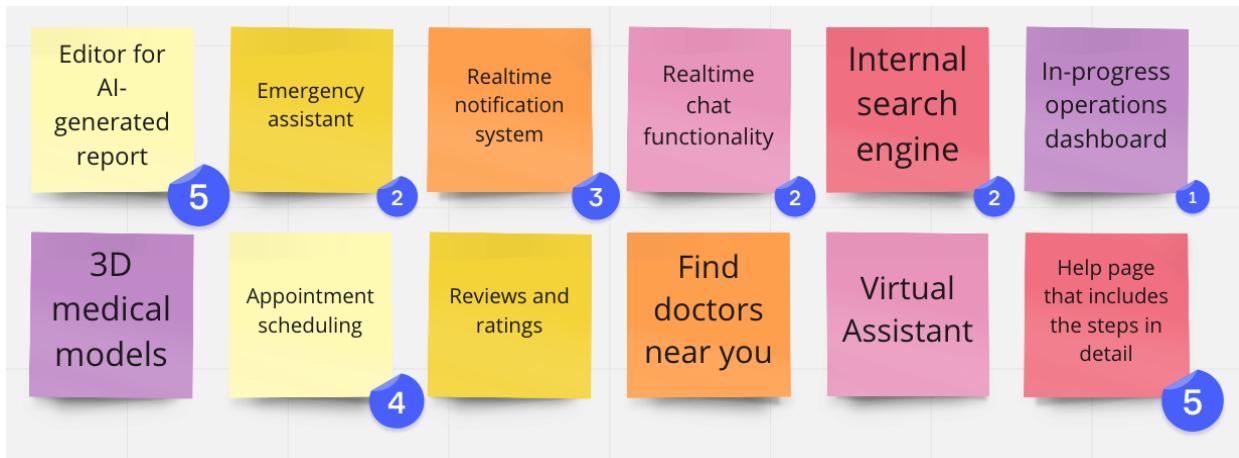
From the 3 HTAs we have designed to achieve some of the goals that our program offers we found a bunch of useful insights. From the first HTA we see a need to securely store all medical examination results into a content management system that is easy to use and can be accessed by patients whenever they want. This brings out another useful insight combined with the 3rd HTA we see the need for a search engine that will help doctors look for patient profiles and patients to search for past examination results. All patients need to be given a unique "ID" which will further make it easier for doctors to search for a patient. From the 2nd HTA we see the usefulness of an annotation feature which can be used to scribble over patient results to highlight key findings. With that we can also design a document editor so that doctors can write up a report without leaving our app making it seamless. When updating medical profiles we found that a review mechanism is useful to make sure the right fields get updated. This insight can be used to design a highlighting feature to help Doctors/Patients review their mistakes and fix them. The search engine needs to be optimized to look for fields when updating profiles as medical records can have a large collection of fields and data. Since the UI can be complex we have to create a help page which will offer assistance with navigation and frequently asked questions. We found out that there is some wait time when we run diagnosis so we want to add real time notifications as well so doctors and patients can get notified of important updates.

Also, we see every HTA has a sign-in process with 2-factor authentication. This reminds us of the ability to treat the sign-in information about the patients and the doctors with complete confidentiality, and apply two-factor authentication to verify the user themselves so that we can prevent unauthorized third party's access.

## Design Arguments

### **Artifacts**

[Design arguments \(Miro\)](#)



Design arguments in sticky notes with team vote (the number indicates the vote)

## Writeup

Design Argument Statements:

- Help Page:** There will be a “Help” icon that users can click to view the instructions of using the app. This feature is designed to assist users (Patients and Doctors) to understand the UI as it can be hard to navigate initially. The app deals with a lot of sensitive information regarding patients and according to the team the help page will be designed to guide users on how to safely use the features we have designed to help get them the best service with zero risk.
- Appointment scheduling:** Patients can use our system to find a clinic/doctor and view available time slots and schedule an appointment online. This feature basically provides convenience for patients in order to reduce wait time and simplify the screening process because wait time is a pain point according to our personas and user interviews. Compared to calling for appointment scheduling, our users can schedule an appointment whenever they want and are able to take as long as they need and don’t need to wait on the phone line and check their calendar to find a time immediately.
- Editor for AI-generated report:** Upon receiving the data back from the AI engine, the app will automatically render a detailed report consisting of all diagnosis by the AI. The editor will allow doctors to accept/reject the findings and add new findings to the report. An editor for incremental changes will be a great tool for doctors to perform further diagnosis outlined in our HTA. In addition, this can potentially help both doctors and patients visualize the results better, making the diagnosis process more accurate, satisfying clients across all our personas. The reliability of AIs is still a major concern among users, so, to gain customer trust, a human-centric approach is highly important when integrating AI technologies into the real world; therefore, this feature is selected as a top feature.
- Real Time notification system:** This feature is designed to keep users informed of the latest information about results. The users will receive a pop-up notification whenever the medical result is modified or updated. This feature is useful for those users who are busy or easily forget to check the result, like Eleanor from our persona. This is considered to be a top feature because users rarely stay on the app all the time, and

pop-up notifications keep them informed of results updates. This way they will not miss the latest report and can contact the doctor if they have any questions about it.

## Team Contribution

- Elman Reasat contributed by HTA, write-up, design argument statement
  - Yeeun Park contributed by HTA, write-up, design argument statement
  - Minqi Xu contributed by HTA, design argument statement
  - Yixin Yang contributed by HTA, design argument statement
  - Daniel Phan contributed by HTA, design argument statement
- 

## #5 Activities

DUE MONDAY OCT 31

[ Grade: 4.5/5 ]

### Team Discussion

#### Attendance

- Minqi Xu
- Yeeun Park
- Yixin Yang
- Elman Reasat
- Daniel Phan

#### Meeting Minutes

45 minutes on October 28th.

80 minutes on October 29th.

90 minutes on October 30th.

On October 28th, we finished our User Stories part, and have also assigned the sections of the midterm report.

On October 29th, we finished our Design Document, and started working on the midterm report. We have finished the background part and almost finished the context study part.

On October 30th, we worked on the midterm report, proofread through the report.

# User Stories

## Artifacts

[Epic] **As a patient, I want to** read the x-ray result with its diagnostic results in the application, **so I can** check the detailed reports whenever I want.

- [User Story] **As a** patient who is hard of hearing, **I want to** get a written diagnosis with x-ray results, **so I can** read the results without speaking to a doctor.
- [User Story] **As a** patient, **I want to** get the list of imaging results with attached guides which help to read it, **so I can** easily read the x-ray result without anyone's help.

[Epic] **As a patient, I want to** see an overview of all the clinics near me and available time slots, **so I can** quickly find one and make an appointment whenever I need.

- [User Story] **As a** patient, **I want to** be able to fill in my medical information online before the appointment, **so I can** have a faster and simpler check-in process after I arrive at the clinic waiting for the appointment.
- [User Story] **As a** patient who has suffered from cardiovascular and cerebrovascular diseases, **I want to** make an appointment to a nearby clinic as fast as possible, **so I can** seek medical treatment in time when I have symptoms.

[Epic] **As a radiologist, I want to** perform diagnosis more accurately in a timely manner, **so I can** improve healthcare services provided to my patients and potentially save more lives.

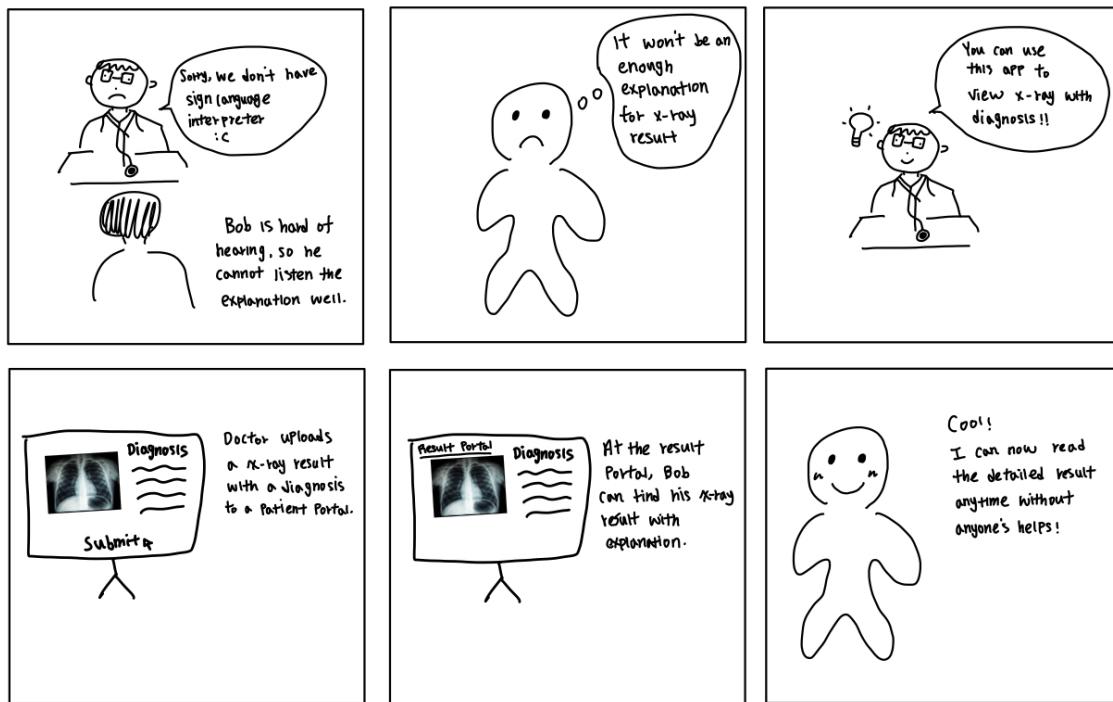
- [User Story] **As a radiologist, I want to** be able to use technologies at the intersection of radiology and AI engineering, **so I can** combine state-of-the-art advancements of the fields to further improve aspects of medical AI.
- [User Story] **As a radiologist, I want to** be able to have a high-level view of how AI comes up with medical reports, **so I can** adjust my workflow when integrating AI-powered software into my clinic (or even decide when I should use medical AI software).
- [User Story] **As a radiologist, I want to** be able to have full control over AIs (or at least be able to correct errors generated by the AIs), **so I can** still apply my domain knowledge obtained during professional training and deliver accurate diagnosis to my clients.

[Epic] **As a patient, I want to** know about any new information that is presented by the doctor as soon as possible, **so I can** take care of my health accordingly.

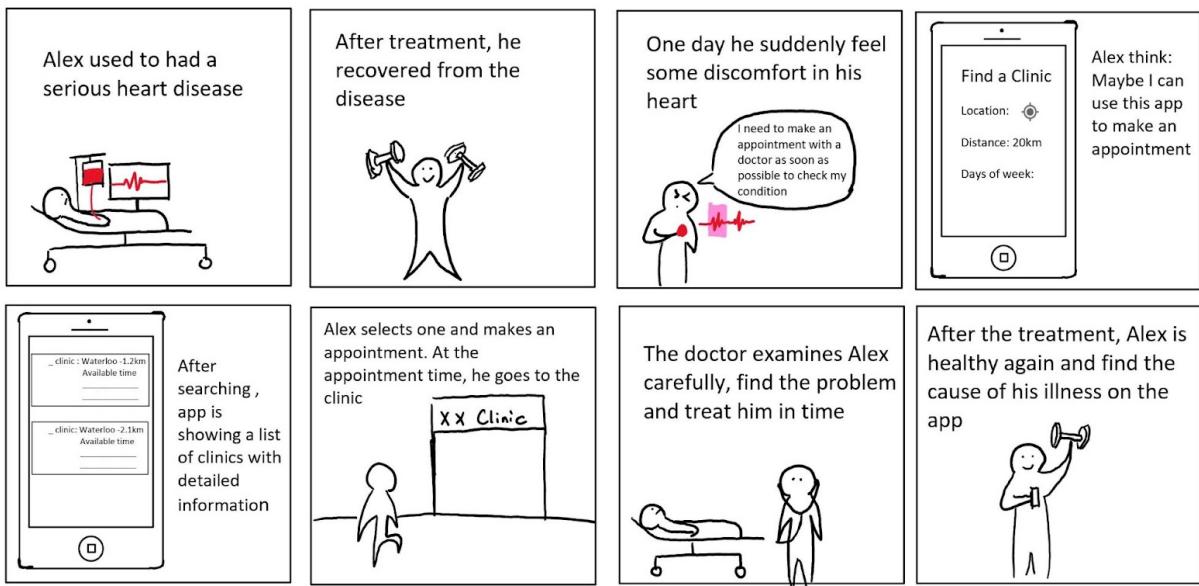
- [User Story] **As a patient, I want to** know immediately when my x-ray results come in, **so I can** know if my bones have healed
- [User Story] **As a patient, I want to** know immediately when the doctor updates my profile, **so I can** find out what medications I have been prescribed.

## Storyboarding

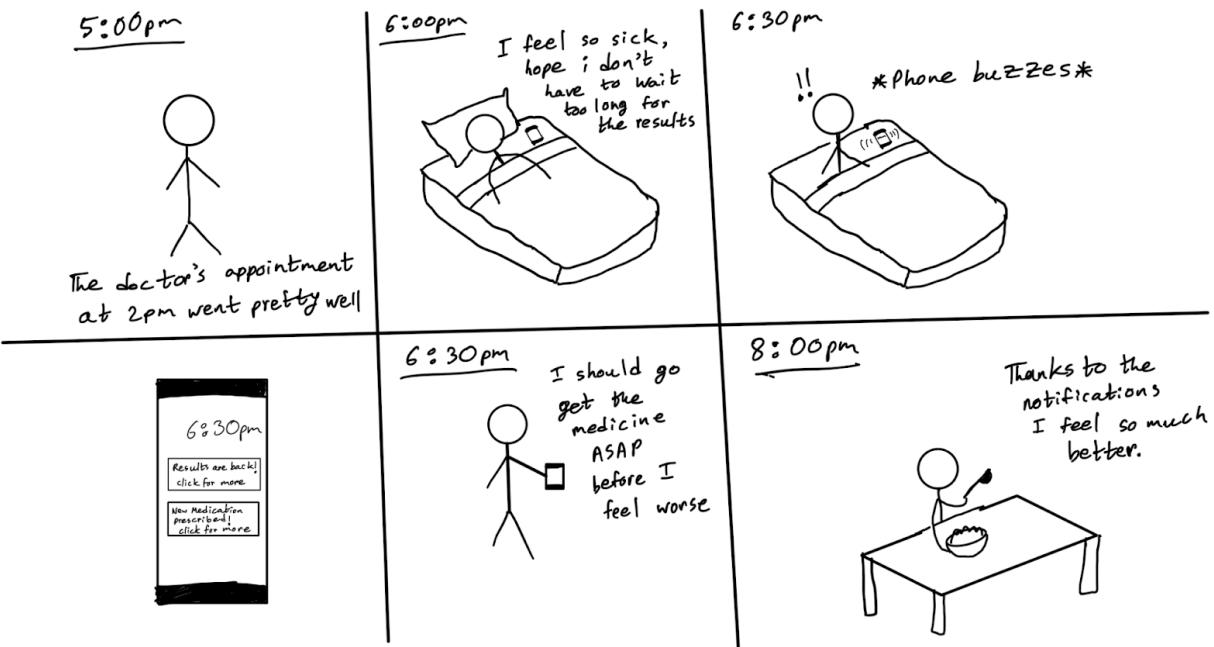
### Artifacts



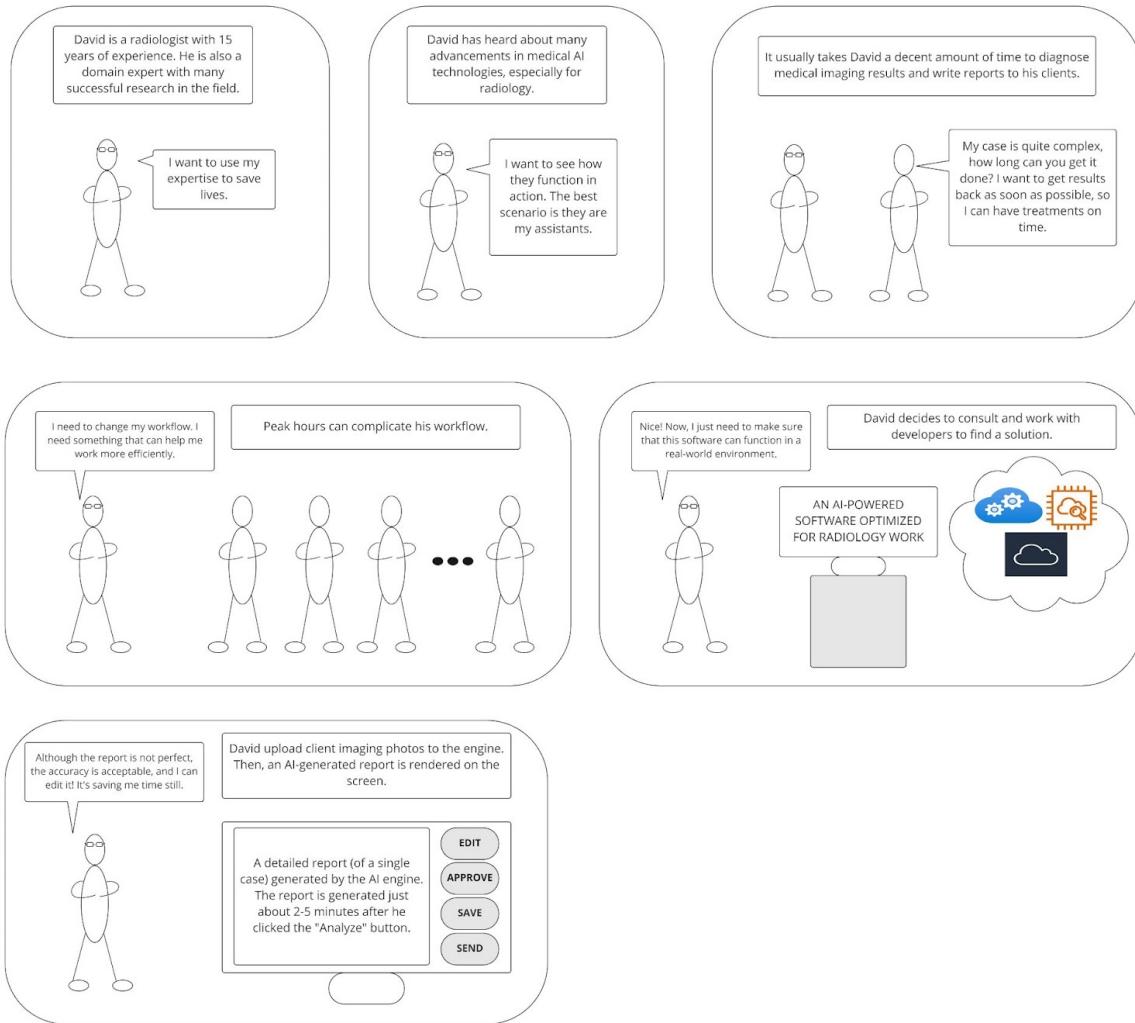
*Storyboard 1: hard of hearing patient get written diagnosis with x-ray images*



Storyboard 2: Patient with heart diseases history quickly made an appointment



Storyboard 3: Patient gets notified of their results and the medication they are prescribed which helps them get better faster.



*Storyboard 4: A radiologist uses AI software to help diagnose diseases and write reports back to his patients.*

## Writeup

While creating the user stories and storyboards we learned how the features we discussed in last week's deliverable can come in handy when aligned with the needs of the user in each story. We learned how to accommodate different users with different needs. In each User Epic, we see that the needs of the user are distinct. For example, patients who are hard of hearing may need to see a written report, and people may want to be able to track their medical history whenever they want. The appointment scheduling feature comes in handy for people who want to quickly find a clinic, make an appointment and save time when they go to their appointment. The real-time notification feature is very useful for users who want to be in touch with any new information about changes to their health, medication, diet, etc which might be updated by the

doctor at any instance. With our app, they will get notified immediately, and instead of waiting they can immediately take appropriate action.

As we dived into the drawing part for the story boards we started to get a sense of how the UI might look like. The interactions the user might have and the buttons or gestures they might use to navigate through our app and how they see the output provided after a transaction is complete. This will help us during our future deliverables when we have to actually come up with sketches, crazy 8 ideation and the initial app layouts. Without these specific user stories we would not be able to think from the perspective of the user for whom we are designing this app. Our goal is to attract the attention of the user and user stories are the best way to understand what grabs their attention.

## Team Contribution

- Elman Reasat contributed by User Epic and Story, Storyboard and Writeup
  - Minqi Xu contributed by User Epic and Story, Storyboard
  - Yixin Yang contributed by User Epic and Story, Storyboard
  - Yeeun Park contributed by User Epic and Story, Storyboard
  - Daniel Phan contributed by User Story (for radiologist), Storyboard
- 

## #6 Activities

DUE MONDAY NOV 7

[ Grade: 5/5 ]

## Team Discussion

### Attendance

- Minqi Xu
- Yeeun Park
- Yixin Yang
- Elman Reasat
- Daniel Phan

### Meeting Minutes

60 minutes on November 5th.

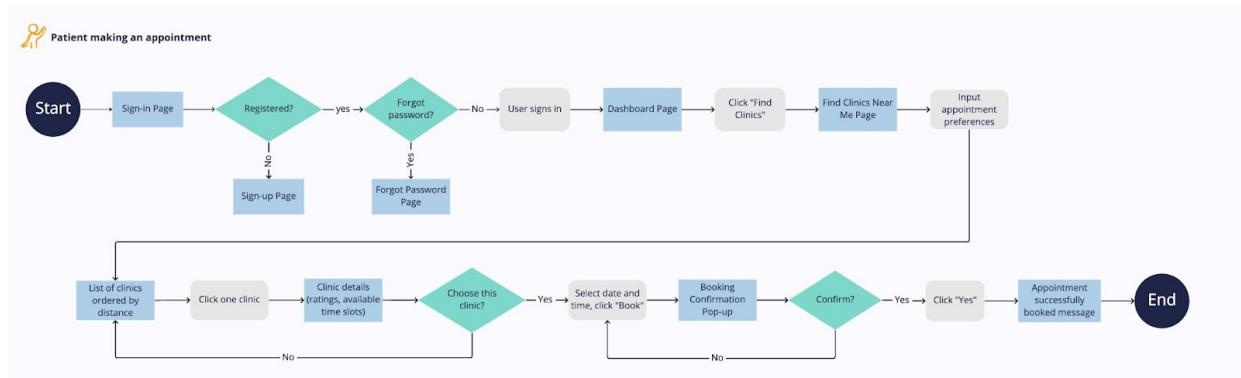
60 minutes on November 6th.

On November 5th, we discussed the work that we should do this week (for both design document and critique). Also we figured out some miro and figma issues and started working on the user flow and wireframes.

On November 6th, we discussed the ideas for the design critique and worked on writing it. Also, we reviewed the user flows and wireframes one more time before uploading.

## Patient making an appointment

### User Flow



Before accessing the dashboard page, users should sign in. If they are able to access the dashboard page, they can find clinics near me at the toolbar, and view the lists of the clinics around the users. Once they click the clinic, they can see the details, and are able to select date and time for the appointment. If they confirm the appointment, they successfully book an appointment.

### Sign-up Page



### Create an Account

A wireframe of a 'Create an Account' form. It contains three input fields: 'Email\_address@123.com', 'Password', and 'Type password one more time'. Below the fields is a 'Sign up' button.

## Sign-in Page



### Log-in



Email\_address@123.com

Password

Forgot password?

Sign in

Create Account

## Reset Password Page



### Reset Password

## Reset your password

Email\_address@123.com

Type email one more time

Send reset link

## Dashboard Page

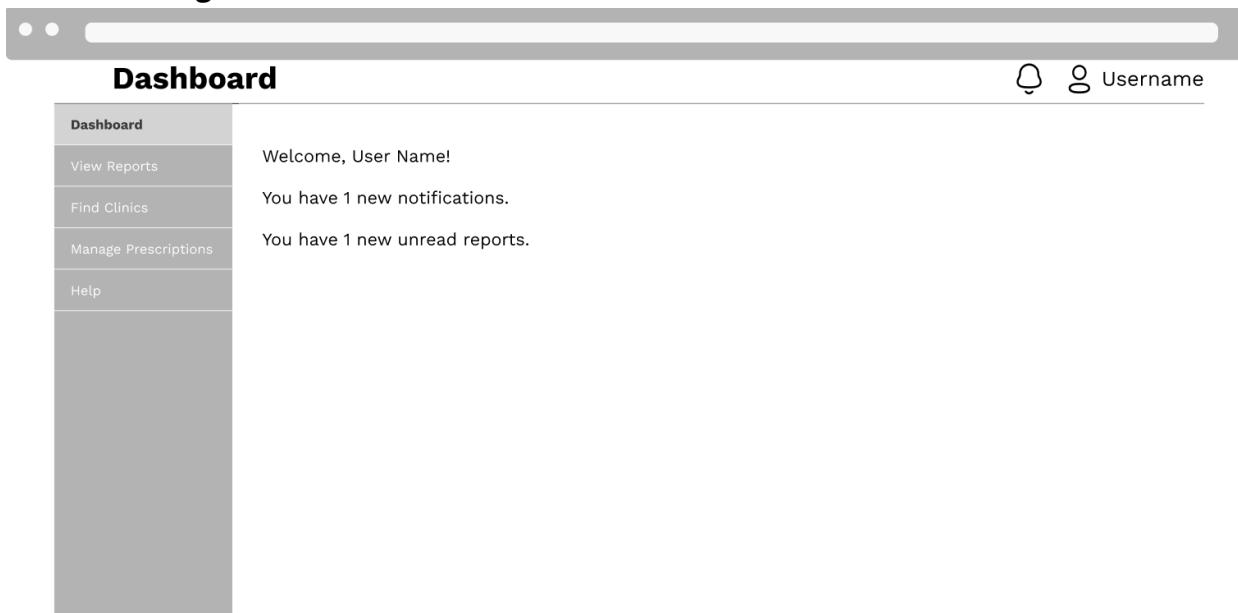
● ●

### Dashboard

Welcome, User Name!

You have 1 new notifications.

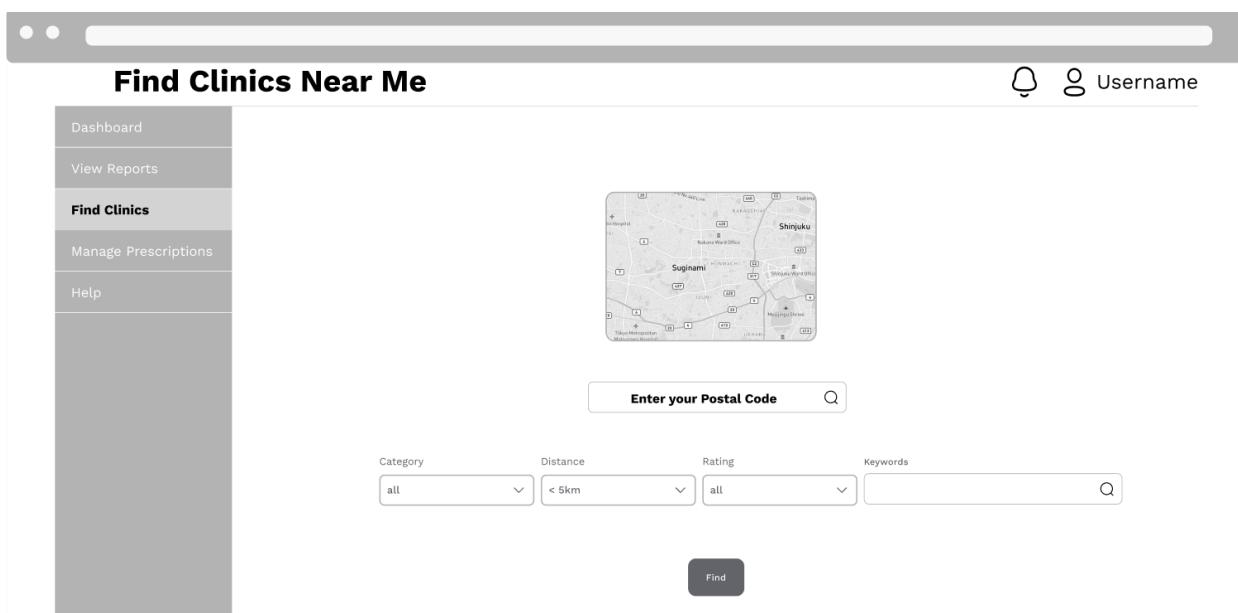
You have 1 new unread reports.



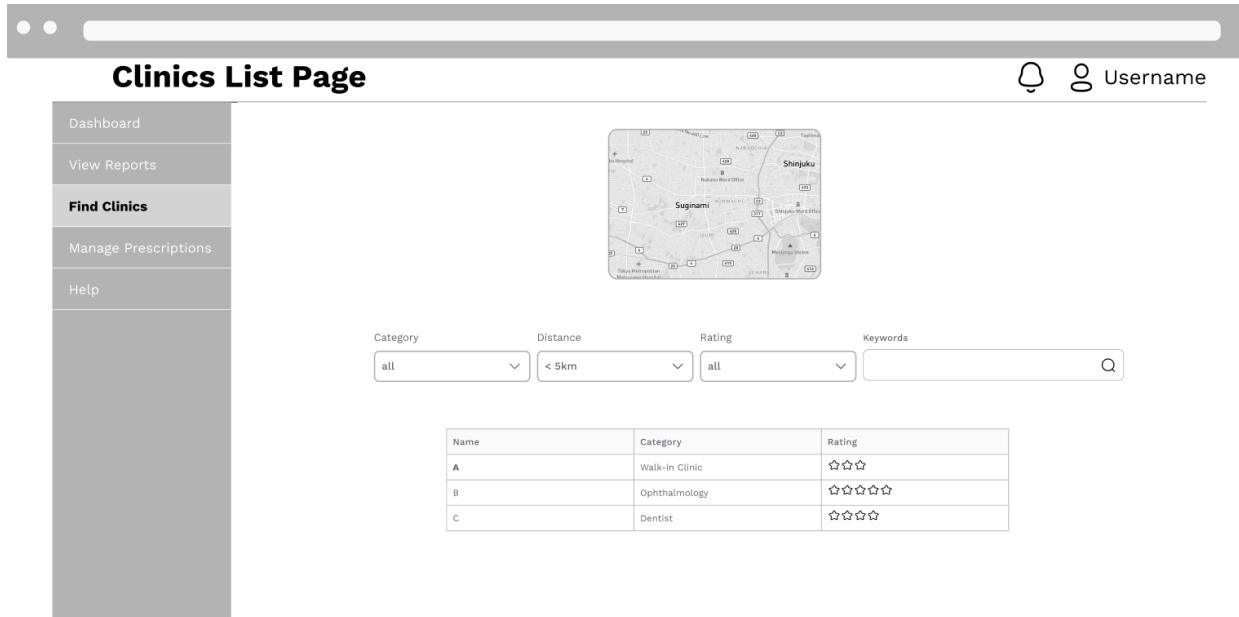
## Find Clinics Page

● ●

### Find Clinics Near Me



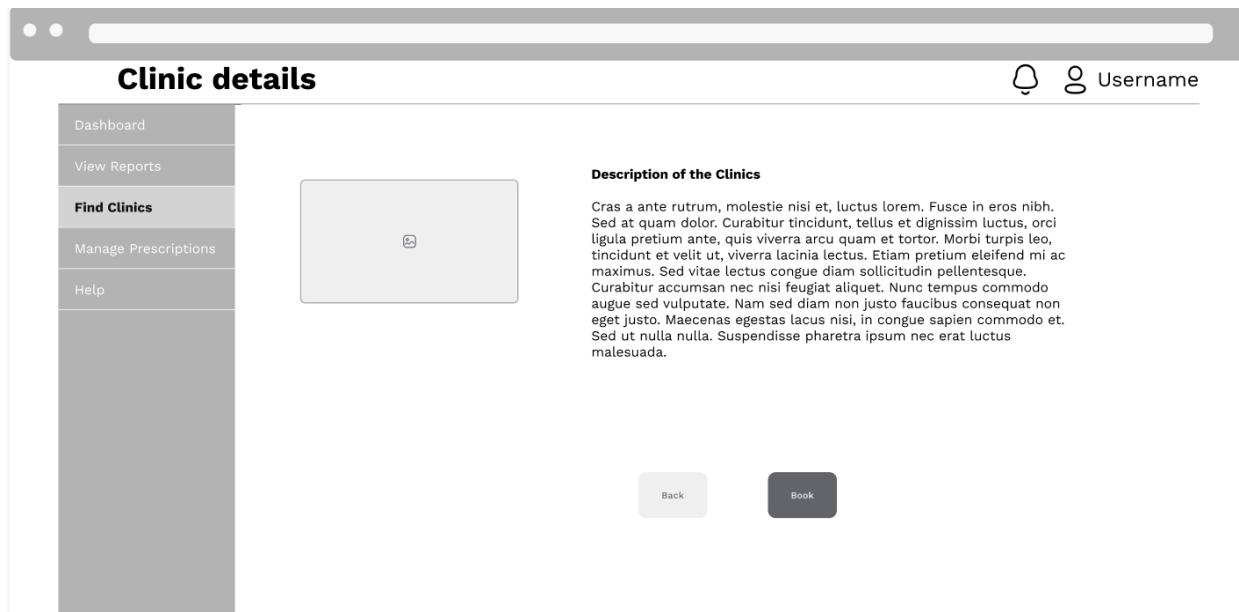
## Clinics List



The Clinics List Page interface features a top navigation bar with three dots and a search bar. On the right, there are icons for user profile and 'Username'. A sidebar on the left contains links: Dashboard, View Reports, Find Clinics (which is bolded), Manage Prescriptions, and Help. The main content area includes a map of Shinjuku and Suginami districts in Tokyo, search filters for Category (all), Distance (< 5km), Rating (all), and Keywords, and a table of clinics:

| Name | Category       | Rating |
|------|----------------|--------|
| A    | Walk-in Clinic | ★★★    |
| B    | Ophthalmology  | ★★★★★  |
| C    | Dentist        | ★★★☆   |

## Clinic details



The Clinic details interface shows a top navigation bar with three dots and a search bar. On the right, there are icons for user profile and 'Username'. A sidebar on the left contains links: Dashboard, View Reports, Find Clinics (bolded), Manage Prescriptions, and Help. The main content area displays a placeholder image for the clinic's logo, a 'Description of the Clinics' section with placeholder text, and two buttons at the bottom: 'Back' and 'Book'.

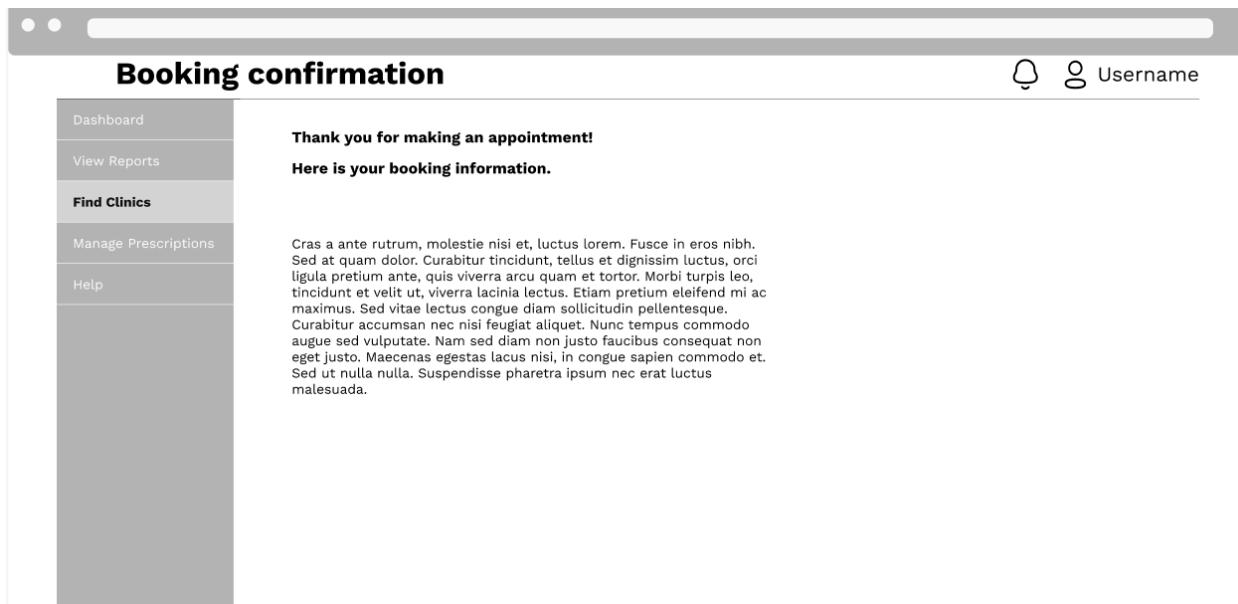
## Select Detail (Date + Time)

This wireframe shows a user interface for selecting a date and time. On the left is a vertical navigation bar with links: Dashboard, View Reports, Find Clinics (which is selected), Manage Prescriptions, and Help. The main area has a title 'Select Detail' and a section titled 'Clinic Name'. Below this are two dropdown menus: 'Date' (with options Nov 1, Nov 2, Nov 3, Nov 4, Nov 5) and 'Time' (with options 11 am, 12 pm, 1 pm, 2 pm, 3 pm). A central 'Book' button is located below the dropdowns.

## Select Detail with confirmation pop-up

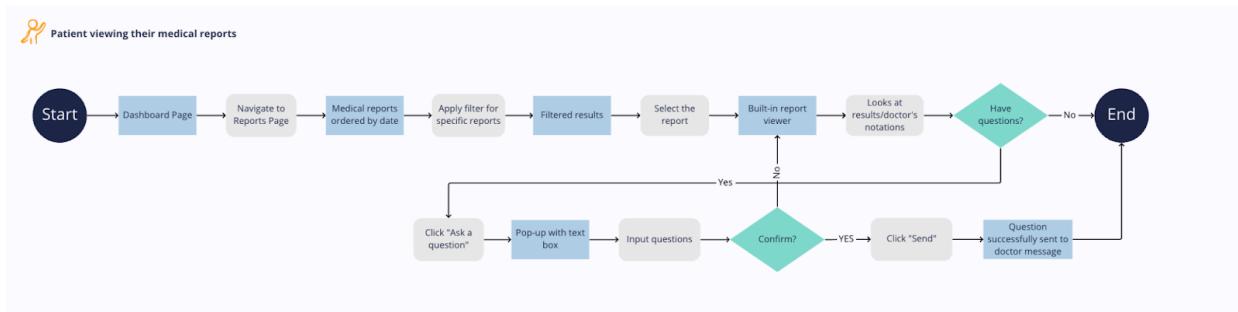
This wireframe shows the same interface as above, but with a confirmation pop-up overlay. The pop-up contains the message 'Are you sure to continue to make an appointment?' with 'No' and 'Yes' buttons. The 'Book' button is visible at the bottom of the main page area.

## Booking confirmation



## Patient viewing their medical reports

### User Flow



User flow showing the steps a patient would do to view their medical reports

## Dashboard Page

The screenshot shows a web-based application interface. At the top right, there is a user profile icon and the text "Username". On the left, a vertical sidebar contains the following menu items:

- Dashboard
- View Reports
- Find Clinics
- Manage Prescriptions
- Help

The main content area displays the following messages:

- Welcome, User Name!
- You have 1 new notifications.
- You have 1 new unread reports.

## Report Page

The screenshot shows a web-based application interface. At the top right, there is a user profile icon and the text "Username". On the left, a vertical sidebar contains the following menu items:

- Overview
- View Reports**
- Find Clinics
- Manage Prescriptions
- Help

The main content area features a search/filter section with four dropdown fields labeled "Category", "Date Range", "Dropdown", and "Keywords", each containing the value "all". To the right of these fields is a magnifying glass icon. Below this is a table with four columns and three rows, each containing the value "----". The columns are labeled "Date", "Category", "Header", and "Header".

| Date | Category | Header | Header |
|------|----------|--------|--------|
| ---- | ----     | ----   | ----   |
| ---- | ----     | ----   | ----   |
| ---- | ----     | ----   | ----   |

## Filtered Result

View Reports

Overview

View Reports

Find Clinics

Manage Prescriptions

Help

Category: X-Ray Date Range: Last 3 months Dropdown: all Keywords:

| Date | Category | Header | Header |
|------|----------|--------|--------|
| ---- | X-Ray    | ----   | ----   |
| ---- | X-Ray    | ----   | ----   |
| ---- | X-Ray    | ----   | ----   |

## Report detail page

View Reports

Overview

View Reports

Find Clinics

Manage Prescriptions

Help

Cras a ante rutrum, molestie nisi et, luctus lorem. Fusce in eros nibh. Sed at quam dolor. Curabitur tincidunt, tellus et dignissim luctus, orci ligula pretium ante, quis viverra arcu quam et tortor. Morbi turpis leo, tincidunt et velit ut, viverra lacinia lectus. Etiam pretium eleifend mi ac maximus. Sed vitae lectus congue diam sollicitudin pellentesque. Curabitur accumsan nec nisi feugiat aliquet. Nunc tempus commodo augue sed vulputate. Nam sed diam non justo faucibus consequat non eget justo. Maecenas egestas lacus nisi, in congue sapien commodo et. Sed ut nulla nulla. Suspendisse pharetra ipsum nec erat luctus malesuada.

Cras a ante rutrum, molestie nisi et, luctus lorem. Fusce in eros nibh. Sed at quam dolor. Curabitur tincidunt, tellus et dignissim luctus, orci ligula pretium ante, quis viverra arcu quam et tortor. Morbi turpis leo, tincidunt et velit ut, viverra lacinia lectus. Etiam pretium eleifend mi ac maximus. Sed vitae lectus congue diam sollicitudin pellentesque. Curabitur accumsan nec nisi feugiat aliquet. Nunc tempus commodo augue sed vulputate. Nam sed diam non justo faucibus consequat non eget justo. Maecenas egestas lacus nisi, in congue sapien commodo et. Sed ut nulla nulla. Suspendisse pharetra ipsum nec erat luctus malesuada.

Ask a Question

## Report detail page with Ask question pop-up window

## View Reports



Username

- Overview
- View Reports**
- Find Clinics
- Manage Prescriptions
- Help



Cras a ante rutrum, molestie nisi et, luctus lorem. Fusce in eros nibh. Sed at quam dolor. Curabitur tincidunt, tellus et dignissim luctus, orci ligula pretium ante, quis viverra arcu quam et tortor. Morbi turpis leo, tincidunt et velit ut, viverra lacinia lectus. Etiam pretium eleifend mi ac maximus. Sed vitae lectus congue diam sollicitudin pellentesque. Curabitur accumsan nec nisi feugiat aliquet. Nunc diam non justo faucibus consequat non eget justo. mmodo et. Sed ut nulla nulla. Suspendisse pharetra



### Ask a Question

Donec non mauris diam. Nullam tincidunt enim est, et tempor odio malesuada at. Nulla ornare, sapien id vestibulum cursus, magna enim euismod nibh, ac fermentum est velit ac tellus. Aenean in eros sit amet ligula dictum commodo. Nulla erat turpis, hendrerit sit amet eleifend quis, suscipit varius velit. Donec

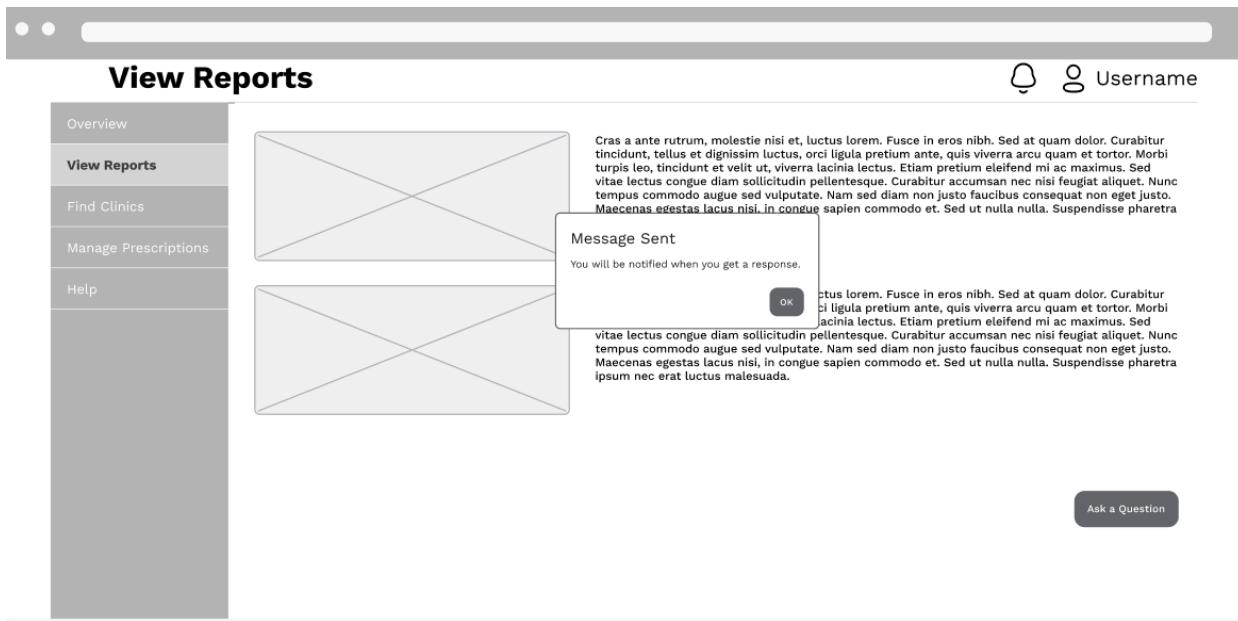
Suspendisse id mattis dolor. Pellentesque eu est tincidunt sapien semper porta. Ut in nunc tincidunt vitae sapien. Morbi vitae quam et lacus scelerisque dictum nec eget arcu. Donec feugiat laoreet sodales. In nec enim fringilla sapien dapibus vulputate. Morbi viverra odio quis metus scelerisque id tempor arcu egestas.

[Cancel](#) [Send](#)

. Fusce in eros nibh. Sed at quam dolor. Curabitur etium ante, quis viverra arcu quam et tortor. Morbi us. Etiam pretium eleifend mi ac maximus. Sed p. Curabitur accumsan nec nisi feugiat aliquet. Nunc diam non justo faucibus consequat non eget justo. mmodo et. Sed ut nulla nulla. Suspendisse pharetra

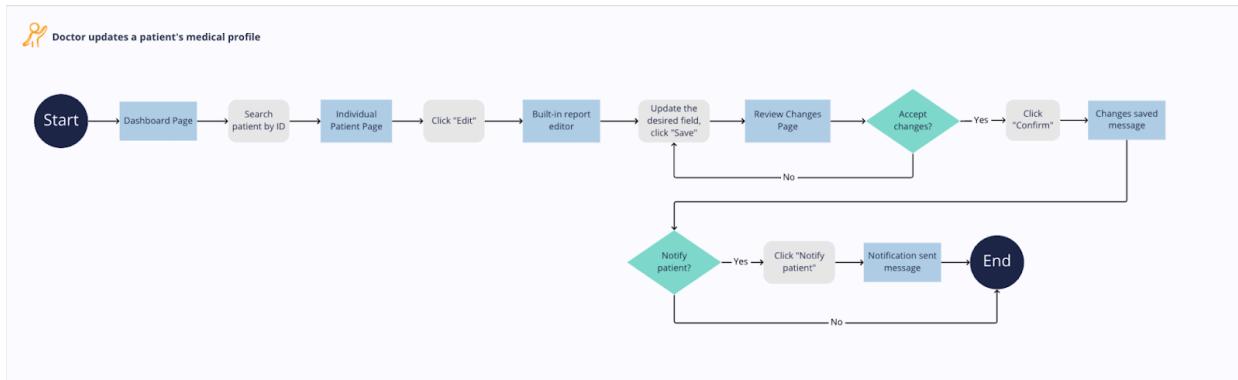
[Ask a Question](#)

## Report detail page with message confirmation pop-up window



## Doctor updates a patient's medical profile

### User Flow



User flow showing what a doctor needs to do to update a patient's medical profile

## Dashboard Page

The dashboard page features a sidebar on the left with a dark grey background and white text. The sidebar includes a user icon and the text "Username". The main content area has a light grey background. It contains a circular placeholder icon, two square placeholders with an 'X' inside, and a bar chart with several bars of varying heights. Below these are a search bar labeled "Search Patient" and a table with columns for "Patient ID", "Patient Name", "Summary", and "Header".

## Search Patients page

The search patients page follows a similar structure to the dashboard. The sidebar on the left has a dark grey background and white text, including a user icon and "Username". The main area has a light grey background. It includes a search bar labeled "Search Patients", four dropdown filters labeled "Category", "Date Range", "Dropdown", and "Keywords", and a table with columns for "Date", "Category", "Header", and "Header".

## Patient's profile page

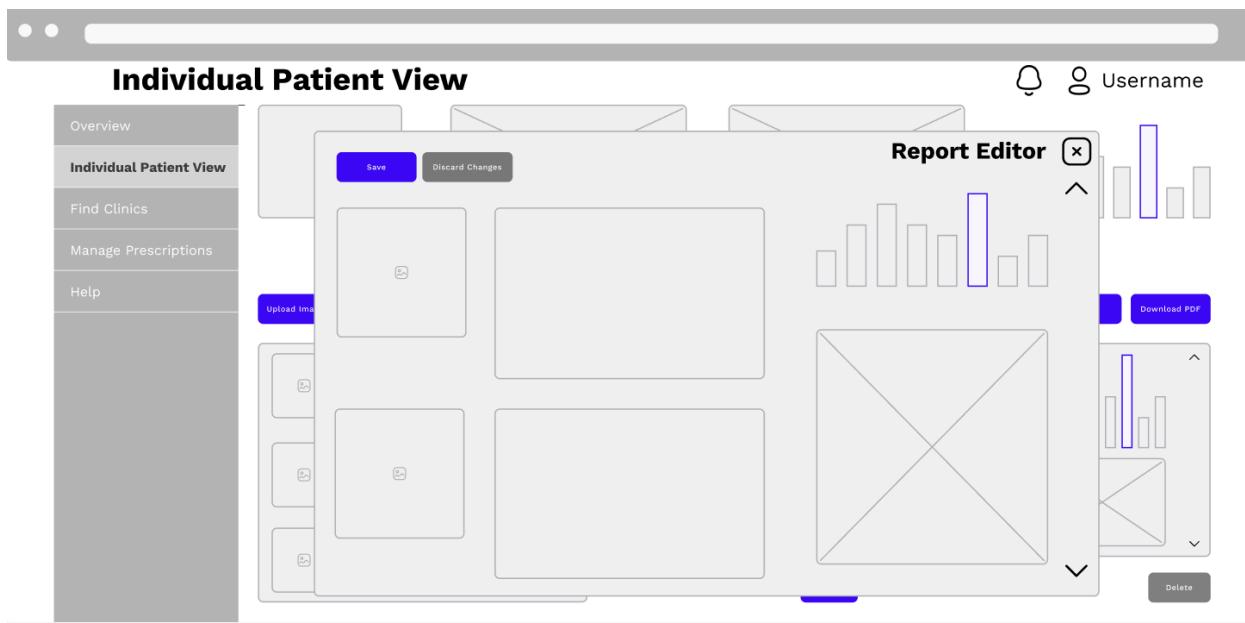
The wireframe illustrates the 'Individual Patient View' interface. On the left is a vertical sidebar with the following menu items:

- Overview
- Individual Patient View** (highlighted)
- Find Clinics
- Manage Prescriptions
- Help

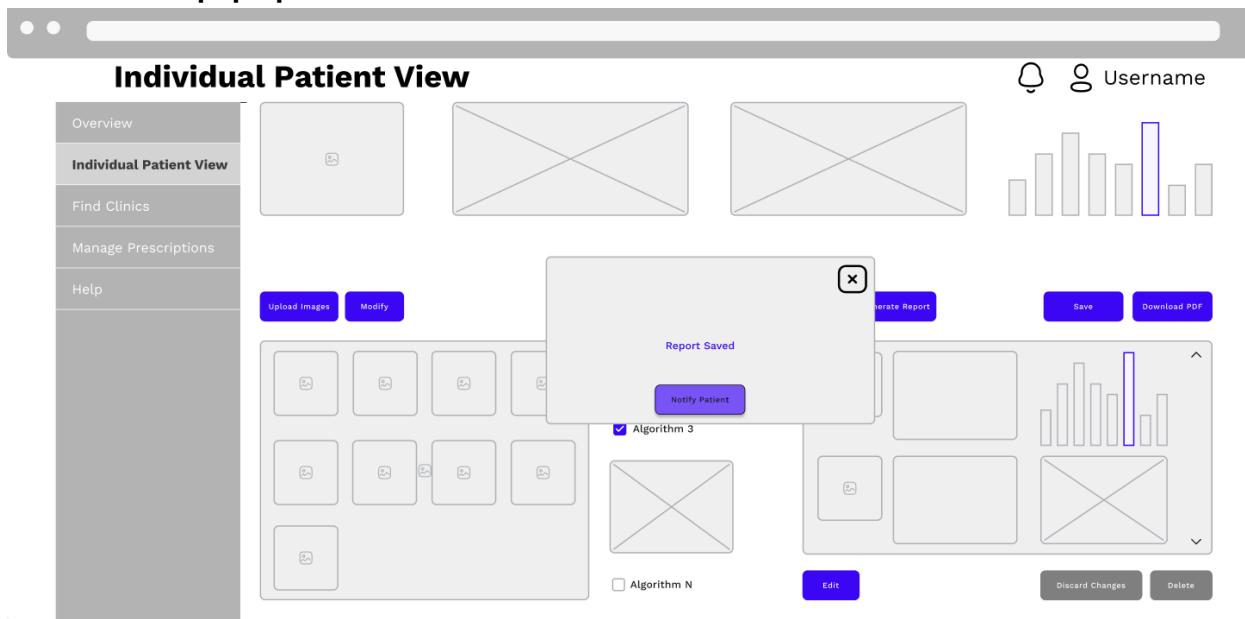
The main content area features:

- A placeholder circular profile picture.
- Two large rectangular boxes, each containing a large 'X' symbol.
- A bar chart consisting of several grey bars, with one bar highlighted in blue.
- A header bar with icons for notifications and user profile, and the text 'Username'.
- Search filters: Category (dropdown), Date Range (dropdown), Dropdown (dropdown), and Keywords (input field with a magnifying glass icon).
- Action buttons: 'Edit' and 'Add New Diagnosis'.
- A table with columns: Report Name, Category, Date, and Header. Each row contains four entries of '\*\*\*\*'.

## Review changes page

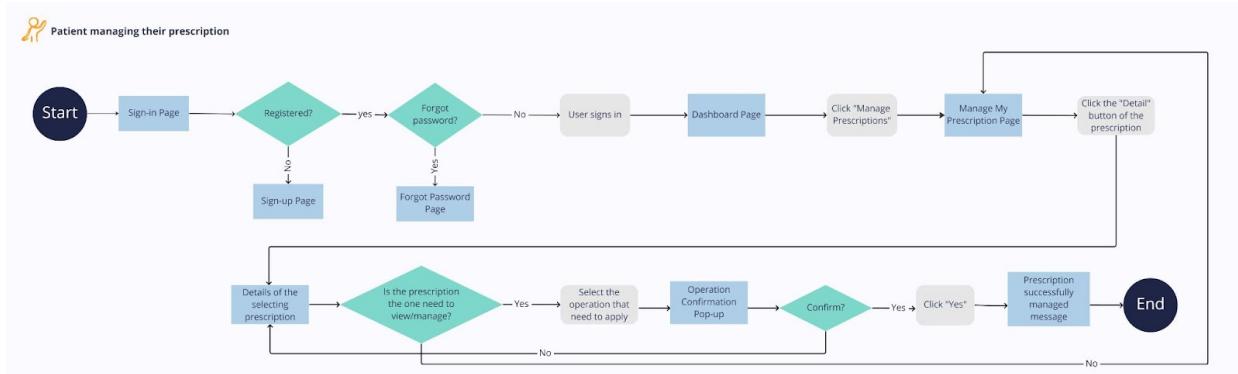


Confirmation pop up window



# Patient managing their prescription

## User Flow



User flow showing a patient managing their prescription

## Sign-up Page

The sign-up page features a header with three dots and a progress bar. Below the header is a 'Sign-up' button. The main section is titled 'Create an Account' and contains three input fields: 'Email\_address@123.com', 'Password', and 'Type password one more time'. At the bottom is a 'Sign up' button.

## Log-in Page



**Log-in**

---



[Forgot password?](#)

[Create Account](#)

## Forget Password Page



**Reset Password**

---

**Reset your password**

## Dashboard Page

The screenshot shows a web-based dashboard interface. On the left is a vertical sidebar with a light gray background and a thin black border. It contains the following navigation links:

- Dashboard
- View Reports
- Find Clinics
- Manage Prescriptions
- Help

The main content area has a white background. At the top, it displays a welcome message: "Welcome, User Name!". Below this, there are three notifications:

- You have 1 new notifications.
- You have 1 new unread reports.

## Manage My Prescription Page

The screenshot shows a web-based prescription management interface. On the left is a vertical sidebar with a light gray background and a thin black border. It contains the following navigation links:

- Dashboard
- View Reports
- Find Clinics
- Manage Prescriptions
- Help

The main content area has a white background. At the top, it displays the title "Manage My Prescription". Below the title, there are three prescription items, each represented by a rectangular box with a large 'X' through it. To the right of each box is a detailed description of the prescription and a small blue "Detail" button.

**Prescription 1 Details:**

Cras a ante rutrum, molestie nisi et, luctus lorem. Fusce in eros nibh. Sed at quam dolor. Curabitur tincidunt, tellus et dignissim luctus, orci ligula pretium ante, quis viverra arcu quam et tortor. Morbi turpis leo, tincidunt et velit ut, viverra lacinia lectus. Etiam pretium eleifend mi ac maximus. Sed vitae lectus congue diam sollicitudin pellentesque. Curabitur accumsan nec nisi feugiat aliquet. Nunc tempus commodo augue sed vulputate. Nam sed diam non justo faucibus consequat non eget justo. Maecenas egestas lacus nisi, in congue sapien commodo et. Sed ut nulla nulla. Suspendisse pharetra ipsum nec erat luctus malesuada.

**Prescription 2 Details:**

Cras a ante rutrum, molestie nisi et, luctus lorem. Fusce in eros nibh. Sed at quam dolor. Curabitur tincidunt, tellus et dignissim luctus, orci ligula pretium ante, quis viverra arcu quam et tortor. Morbi turpis leo, tincidunt et velit ut, viverra lacinia lectus. Etiam pretium eleifend mi ac maximus. Sed vitae lectus congue diam sollicitudin pellentesque. Curabitur accumsan nec nisi feugiat aliquet. Nunc tempus commodo augue sed vulputate. Nam sed diam non justo faucibus consequat non eget justo. Maecenas egestas lacus nisi, in congue sapien commodo et. Sed ut nulla nulla. Suspendisse pharetra ipsum nec erat luctus malesuada.

**Prescription 3 Details:**

Cras a ante rutrum, molestie nisi et, luctus lorem. Fusce in eros nibh. Sed at quam dolor. Curabitur tincidunt, tellus et dignissim luctus, orci ligula pretium ante, quis viverra arcu quam et tortor. Morbi turpis leo, tincidunt et velit ut, viverra lacinia lectus. Etiam pretium eleifend mi ac maximus. Sed vitae lectus congue diam sollicitudin pellentesque. Curabitur accumsan nec nisi feugiat aliquet. Nunc tempus commodo augue sed vulputate. Nam sed diam non justo faucibus consequat non eget justo. Maecenas egestas lacus nisi, in congue sapien commodo et. Sed ut nulla nulla. Suspendisse pharetra ipsum nec erat luctus malesuada.

## Prescription Details Page

The screenshot shows a web application window titled "Prescription details". On the left is a vertical sidebar with links: Dashboard, View Reports, Find Clinics, Manage Prescriptions (which is bolded), and Help. The main content area has a large placeholder image box with a camera icon. To its right is a "Description of the Clinics" section containing placeholder text. At the bottom are four buttons: Back, Delete, Hide (which is highlighted in dark grey), and Archive.

**Description of the Clinics**

Cras a ante rutrum, molestie nisi et, luctus lorem. Fusce in eros nibh. Sed at quam dolor. Curabitur tincidunt, tellus et dignissim luctus, orci ligula pretium ante, quis viverra arcu quam et tortor. Morbi turpis leo, tincidunt et velit ut, viverra lacinia lectus. Etiam pretium eleifend mi ac maximus. Sed vitae lectus congue diam sollicitudin pellentesque. Curabitur accumsan nec nisi feugiat aliquet. Nunc tempus commodo augue sed vulputate. Nam sed diam non justo faucibus consequat non egestas justo. Maecenas egestas lacus nisi, in congue sapien commodo et. Sed ut nulla nulla. Suspendisse pharetra ipsum nec erat luctus malesuada.

Back Delete Hide Archive

## Operation Confirmation Pop-up

This screenshot is identical to the one above, but it includes a central modal dialog box. The dialog contains the text "Are you sure to Hide this description?" with "No" and "Yes" buttons. The "Yes" button is highlighted in dark grey, indicating it is the active choice.

**Description of the Clinics**

Cras a ante rutrum, molestie nisi et, luctus lorem. Fusce in eros nibh. Sed at quam dolor. Curabitur tincidunt, tellus et dignissim luctus, orci ligula pretium ante, quis viverra arcu quam et tortor. Morbi turpis leo, tincidunt et velit ut, viverra lacinia lectus. Etiam pretium eleifend mi ac maximus. Sed vitae lectus congue diam sollicitudin pellentesque. Curabitur accumsan nec nisi feugiat aliquet. Nunc tempus commodo augue sed vulputate. Nam sed diam non justo faucibus consequat non egestas justo. Maecenas egestas lacus nisi, in congue sapien commodo et. Sed ut nulla nulla. Suspendisse pharetra ipsum nec erat luctus malesuada.

Are you sure to Hide this description?

No Yes

Back Delete Hide Archive

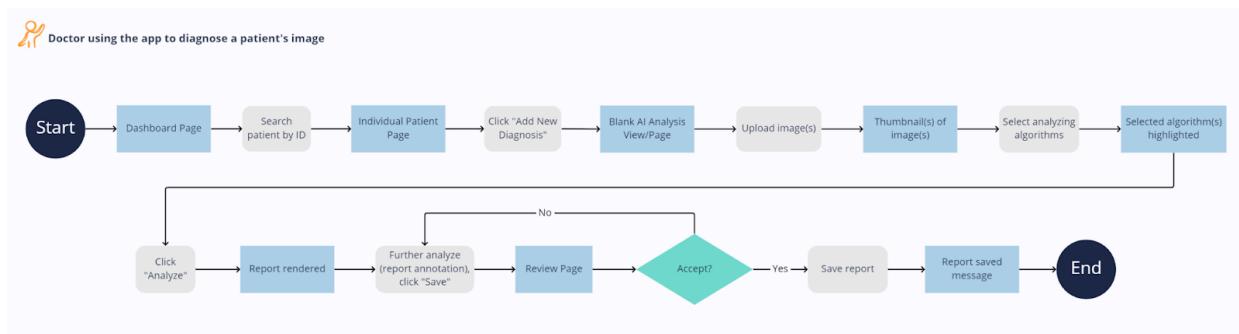
## Manage My prescription Page with Operation Success Message

The prescription has been successfully hidden.  
If you want to view hidden prescription, please switch on the "show hidden prescription" option in the account setting

Cras a ante rutrum, molestie nisi et, luctus lorem. Fusce in eros nibh. Sed at quam dolor. Curabitur tincidunt, tellus et dignissim luctus, orci ligula pretium ante, quis viverra arcu quam et tortor. Morbi turpis leo, tincidunt et velit ut, viverra lacinia lectus. Etiam pretium eleifend mi ac maximus. Sed vitae lectus congue diam sollicitudin pellentesque. Curabitur accumsan nec nisi feugiat aliquet. Nunc tempus commodo augue sed vulputate. Nam sed diam non justo faucibus consequat non eget justo. Maecenas egestas lacus nisi, in congue sapien commodo et. Sed ut nulla nulla. Suspendisse pharetra ipsum nec erat luctus malesuada.

Detailed

## Doctor using the app to diagnose a patient's image

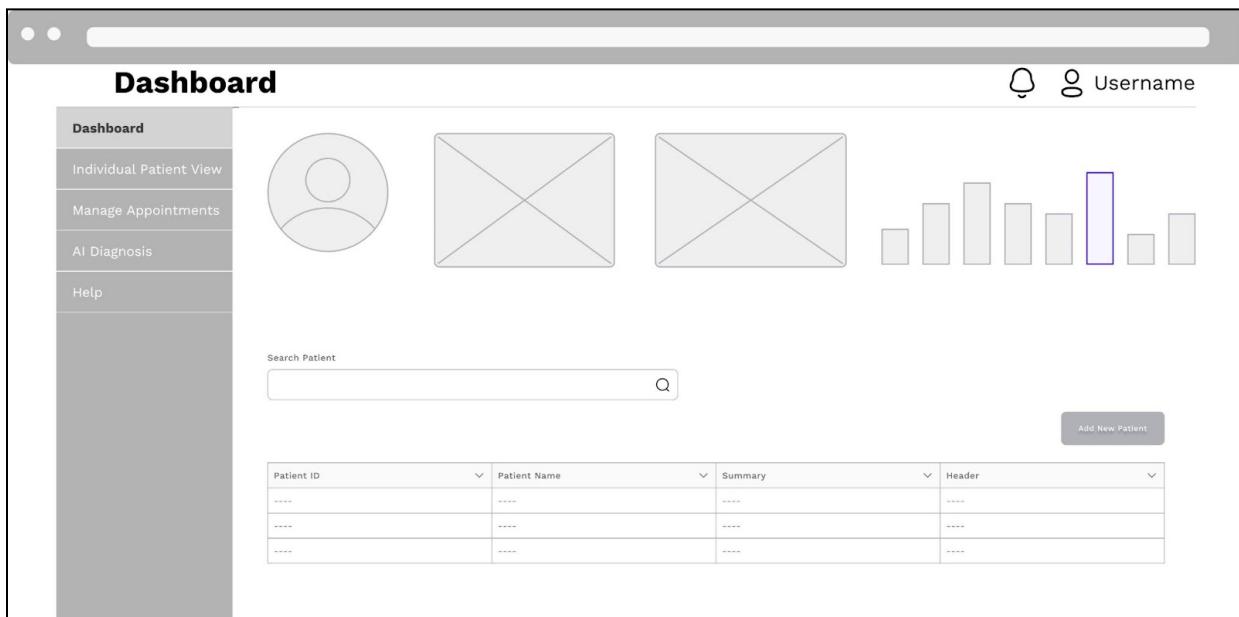


From dashboard, a doctor can search for the patient who he wants to perform AI diagnosis for by entering some information related to that client (ideally the client ID because it's unique), and the system will find and relevant clients. Then, the doctor can simply clicks on the record associated with the client, which then redirects him to the corresponding "Individual Patient View".

The doctor then click "Add New Diagnosis", which then redirect him to a blank "Individual Report View." Inside the same page, he can upload the images (clicking "Upload" or simply drag images into the associated regions).

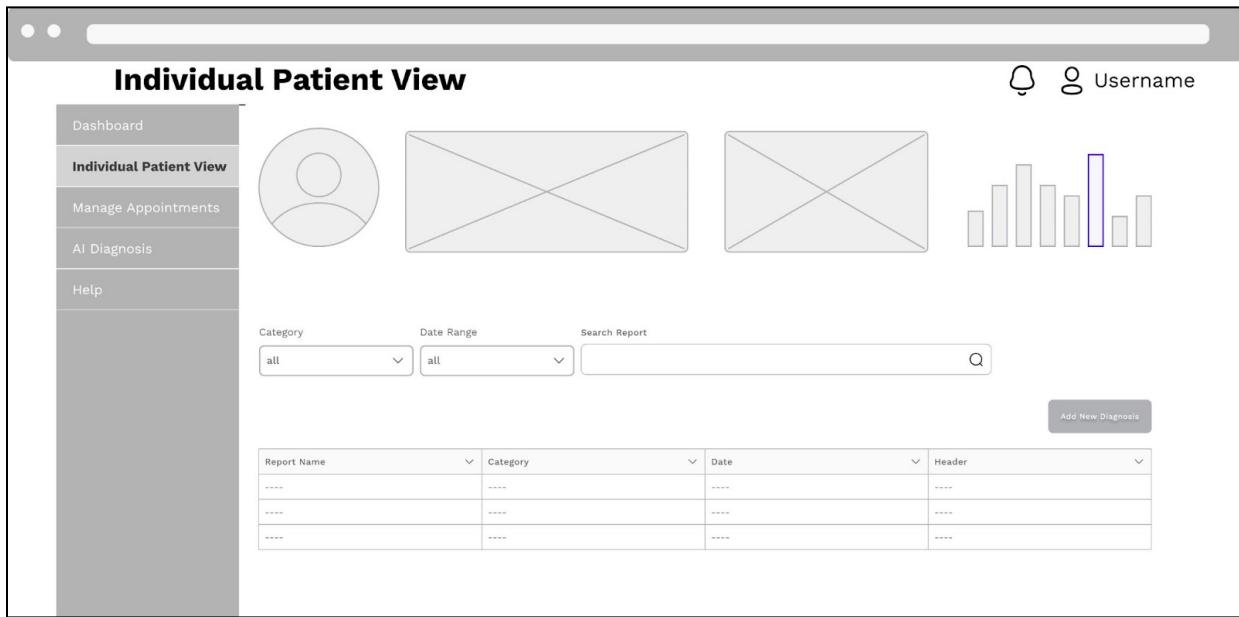
Then, he can select the algorithms through which will be applied to be (at this point, the doctor should know how to use the AI analysis process through reading manual, prior discussions with the team, and proper training as required by the ministry). Then, an AI-generated report will be rendered, and the doctor can then edit it to his preferences before saving.

## Doctor's Dashboard Page



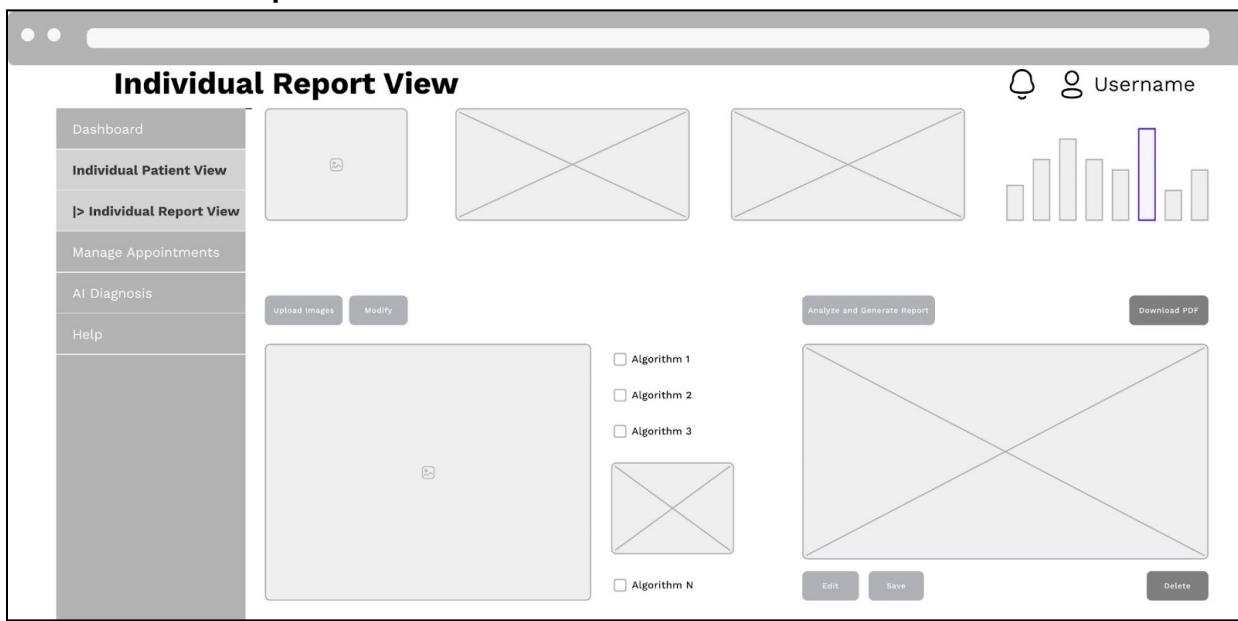
The dashboard page features a sidebar on the left with a dark grey background and white text. The sidebar includes links for Dashboard, Individual Patient View, Manage Appointments, AI Diagnosis, and Help. The main content area has a light grey background. At the top right is a user icon and the text "Username". Below the sidebar are three circular icons: a user profile, a square with an X, and another square with an X. To the right of these are several small bars of varying heights. A search bar labeled "Search Patient" with a magnifying glass icon is positioned below the sidebar. A "Add New Patient" button is located to the right of the search bar. Below the search bar is a table with columns for Patient ID, Patient Name, Summary, and Header, each containing three rows of placeholder text ("----").

## Individual Patient View

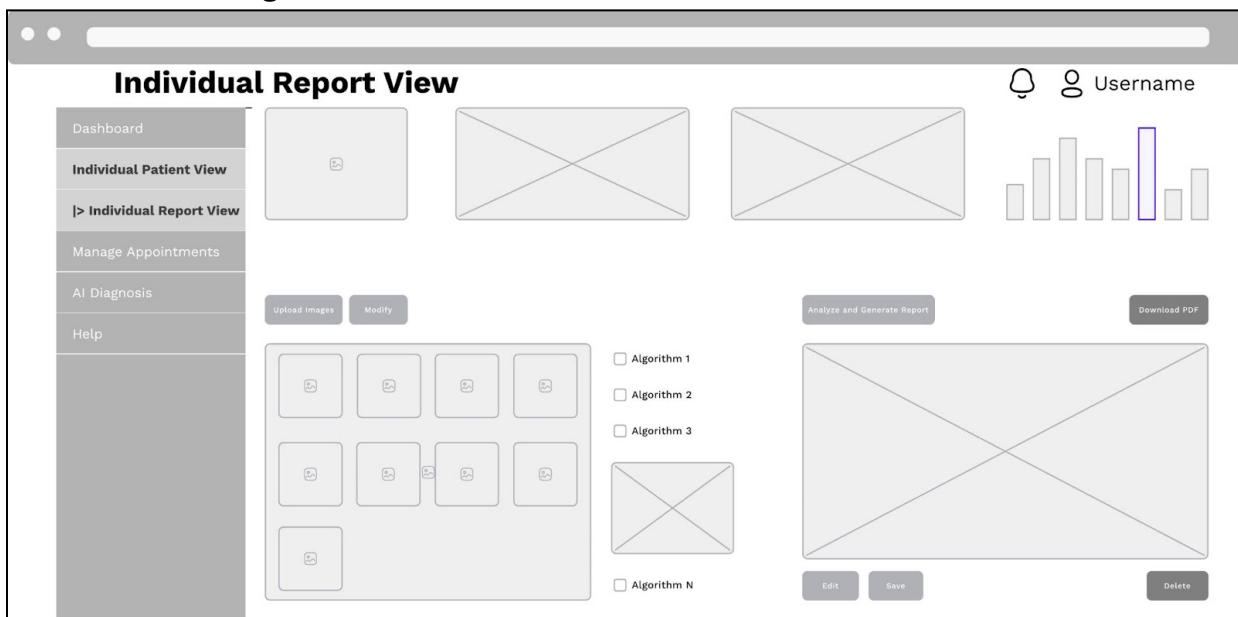


This page is similar to the dashboard but specifically for individual patient viewing. It has a sidebar with a dark grey background and white text, identical to the dashboard. The main content area has a light grey background. At the top right is a user icon and the text "Username". Below the sidebar are three circular icons: a user profile, a square with an X, and another square with an X. To the right of these are several small bars of varying heights. A search bar labeled "Search Report" with a magnifying glass icon is positioned below the sidebar. A "Add New Diagnosis" button is located to the right of the search bar. Below the search bar is a table with columns for Report Name, Category, Date, and Header, each containing three rows of placeholder text ("----").

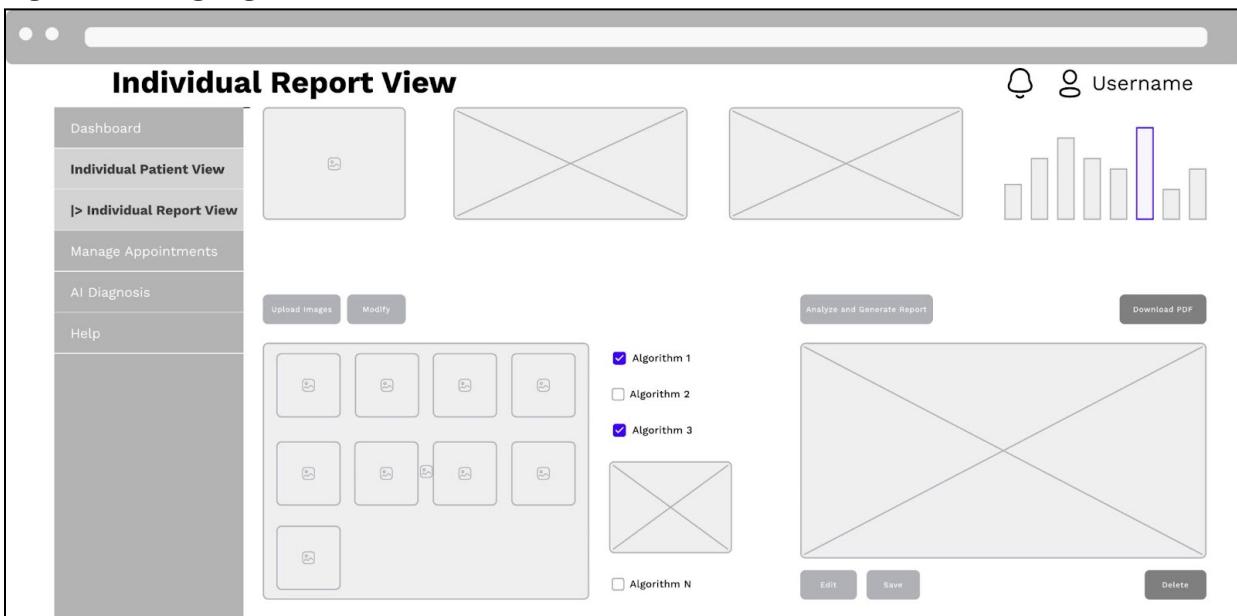
## Blank Individual Report View



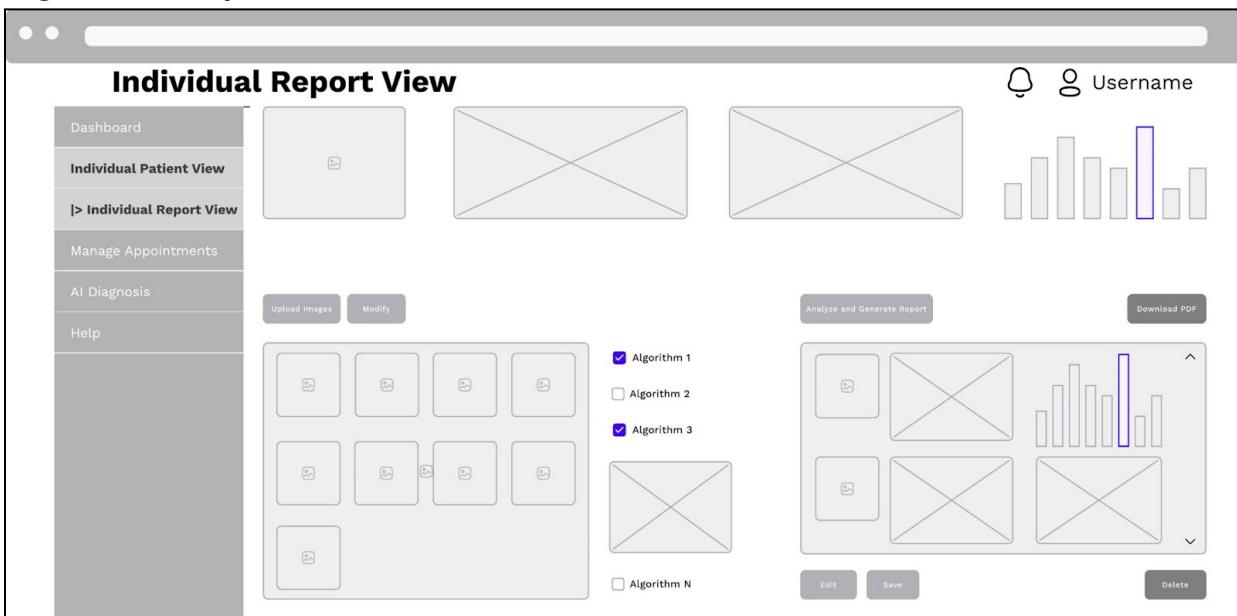
## Thumbnails of Images



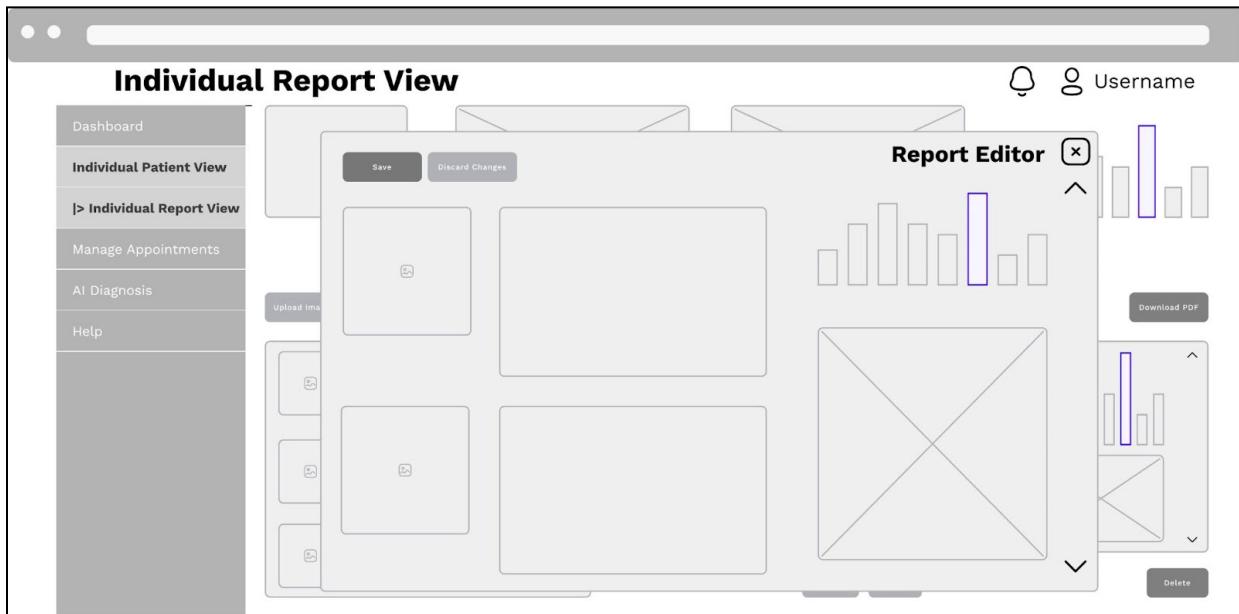
## Algorithms Highlighted/Selected



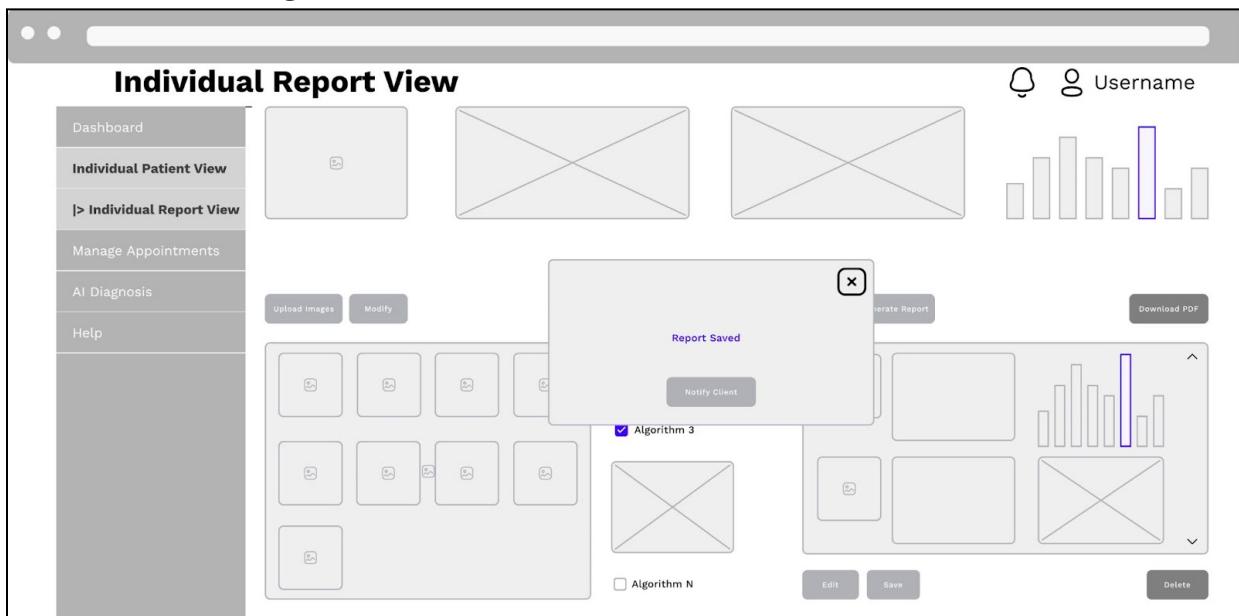
## AI-generated Report Rendered



## Doctor Further Analyze Report



## Confirmation Message Sent



## Team Contribution

- Minqi Xu contributed by UserFlow4 and corresponding Wireframes
- Yeeun Park contributed by UserFlow1 and corresponding Wireframes
- Elman Reasat contributed by Wireframe
- Yixin contributed by UserFlow 2 3 and Wireframe 2
- Daniel Phan contributed by UserFlow5 and Corresponding Wireframes

---

# #7 Activities

DUE MONDAY NOV 14

[ Grade: 5/5 ]

## Team Discussion

### Attendance

- Minqi Xu
- Yeeun Park
- Yixin Yang
- Elman Reasat
- Daniel Phan

### Meeting Minutes

30 minutes on November 12th.

100 minutes on November 13th.

On November 12th, we decided on two user flows to prototype and discussed the design critique response to divide it up.

On November 13th, we worked on the paper prototypes and interactive wireframes for the two user flows we selected and finalized the critique responses together.

## Paper Prototypes

### Artifacts

Paper Prototypes of Patient Scheduling an Appointment

# Welcome!

Your Email

e.g. user@gmail.com

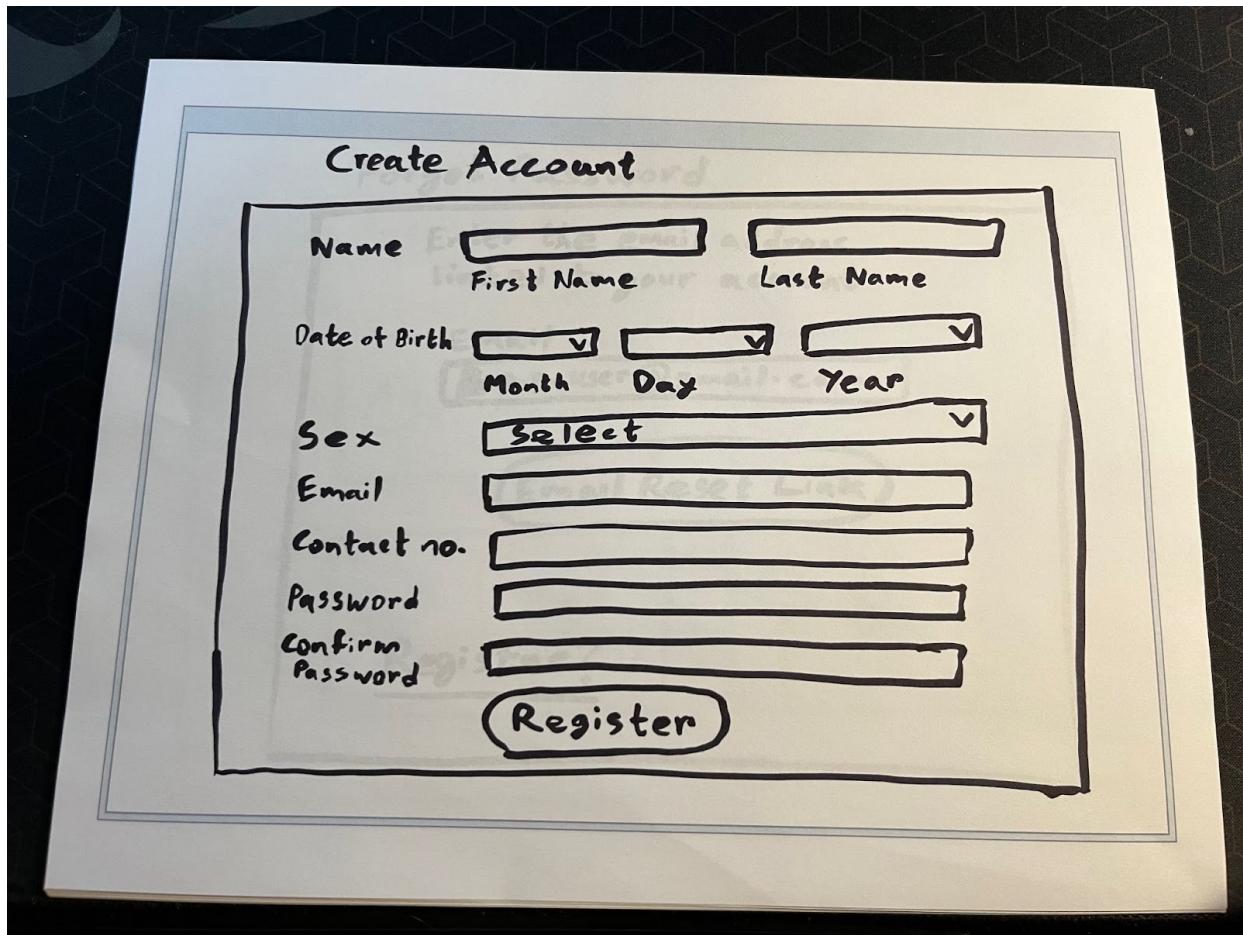
Your Password

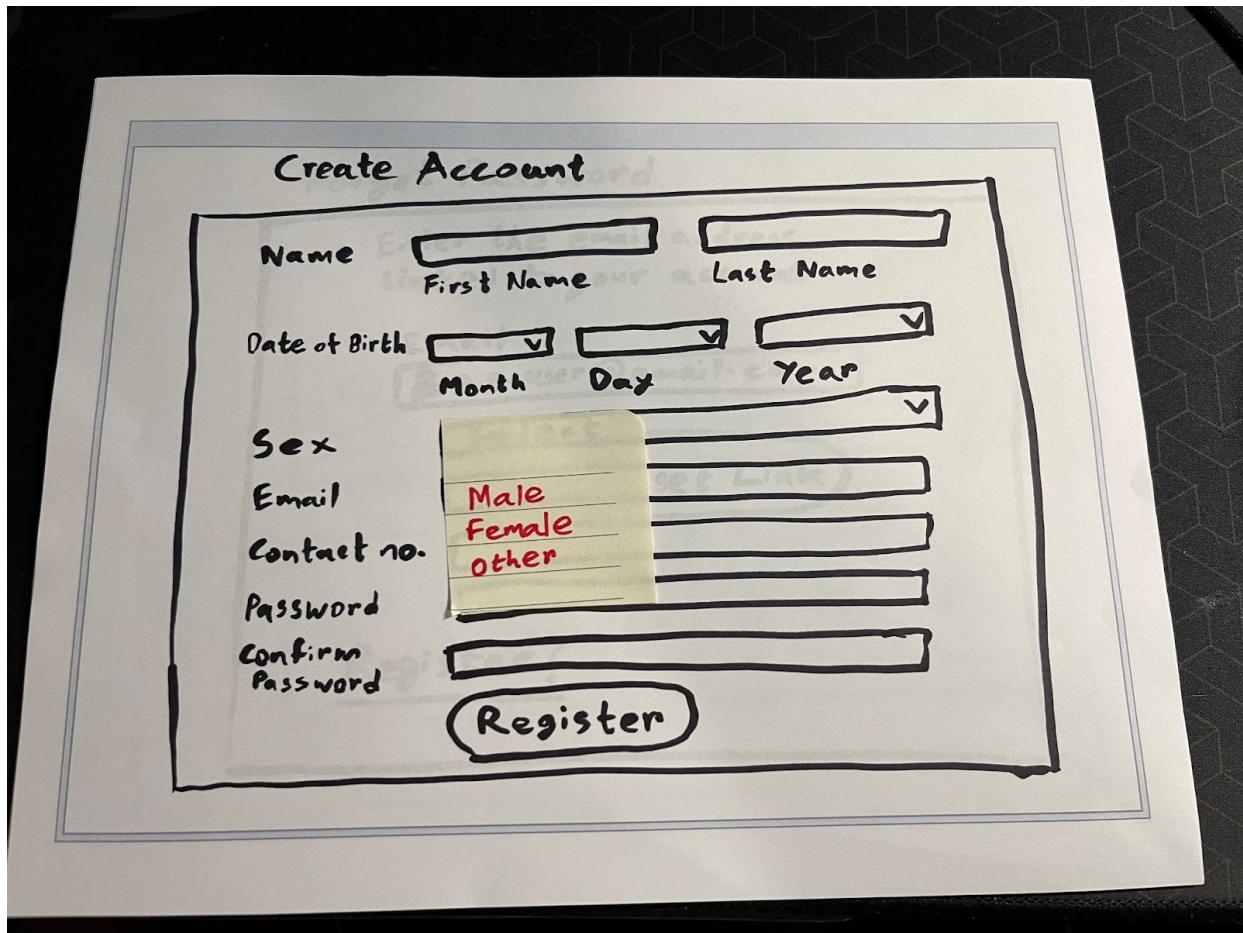
e.g. 123HelloWorld

Forgot Password?

Sign in

Register?





## Create Account

Name

First Name

Last Name

Date of Birth

| Month | Day | Year |
|-------|-----|------|
| Jan   | 01  | 2022 |
| Feb   | 02  | 2021 |
| Mar   | 03  | 2020 |
| Apr   | 04  | 2019 |
| May   | 05  | 2018 |
| June  | 06  | 2017 |
| July  | 07  | 2016 |
| ✓     | ✓   | ✓    |

Sex

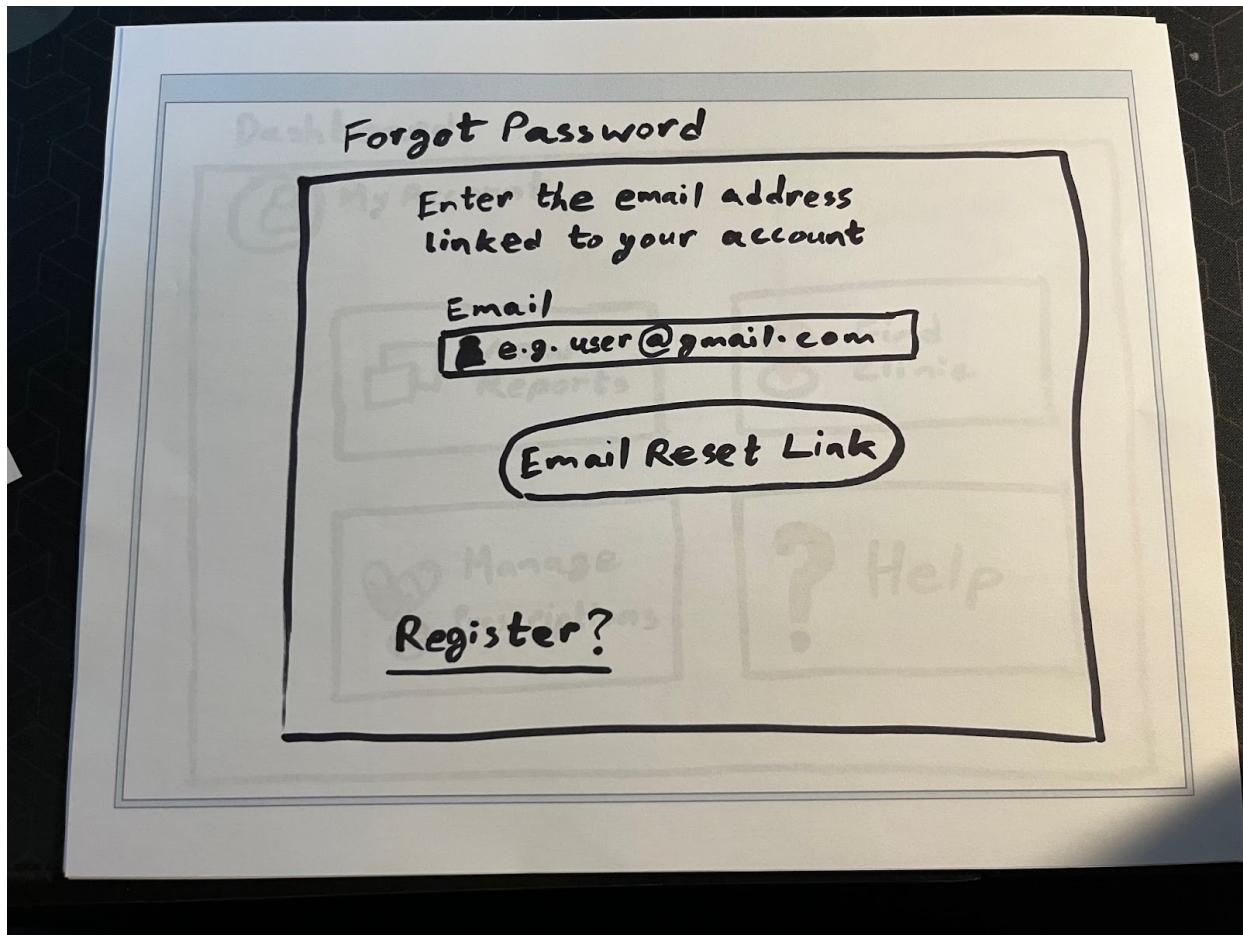
Email

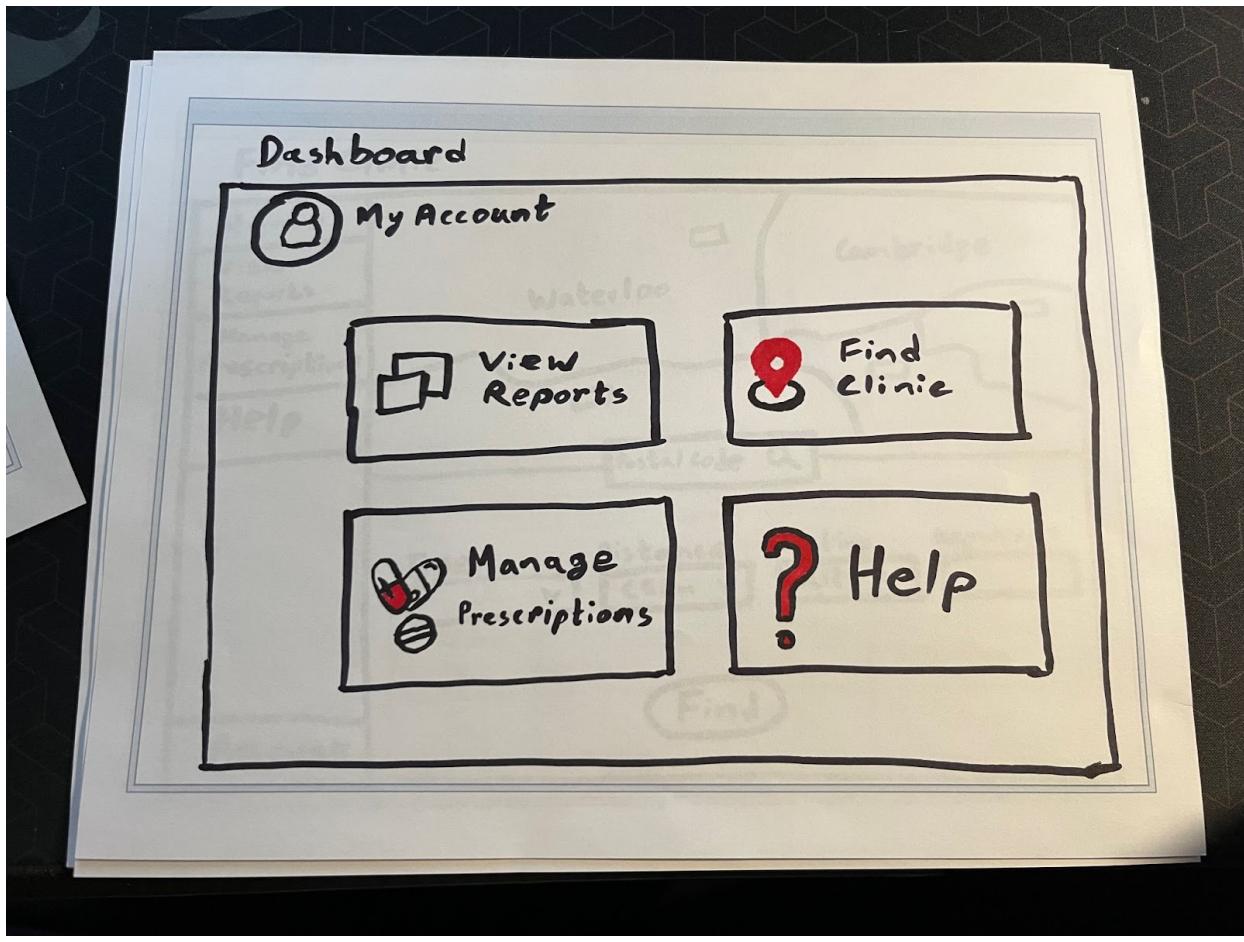
Contact no.

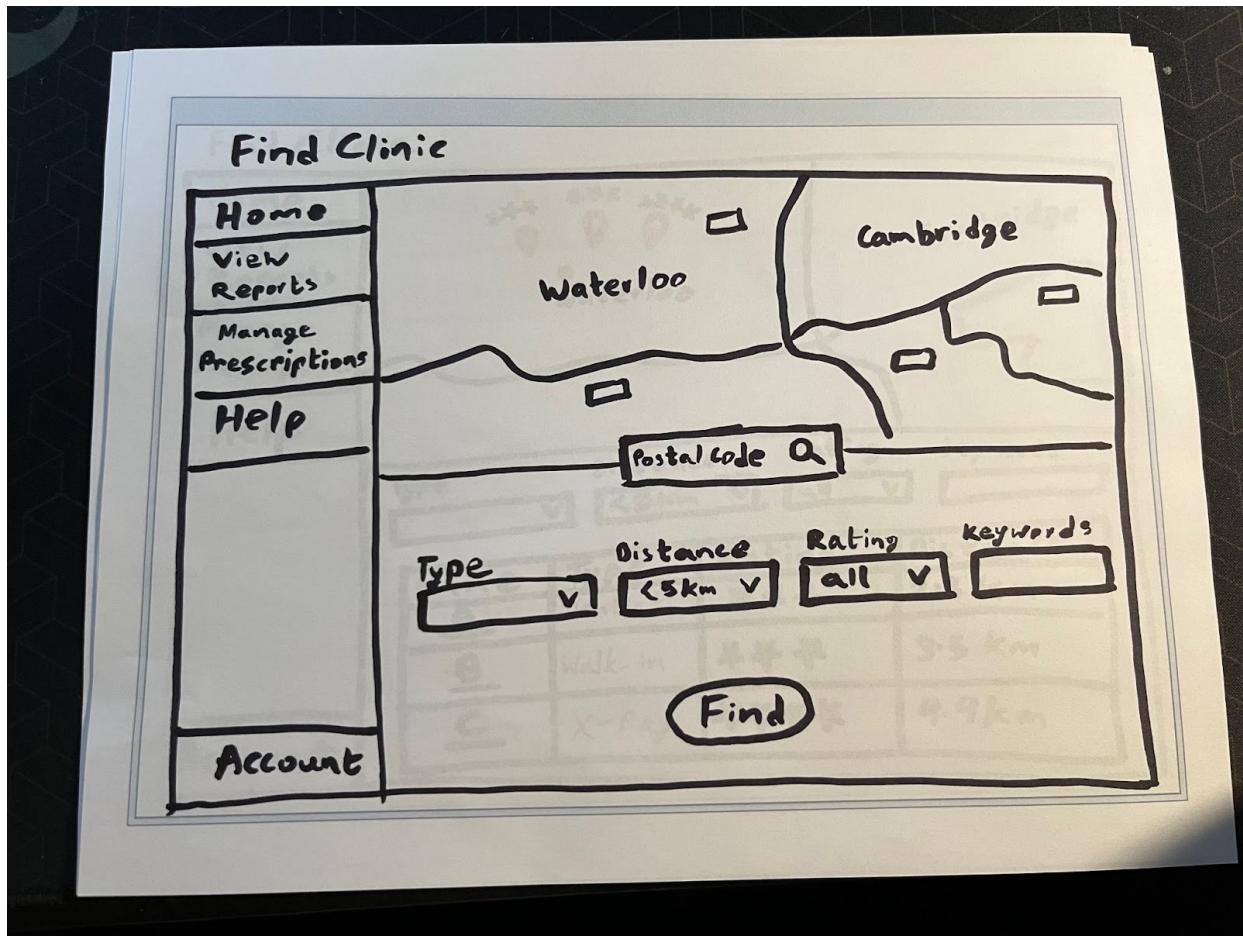
Password

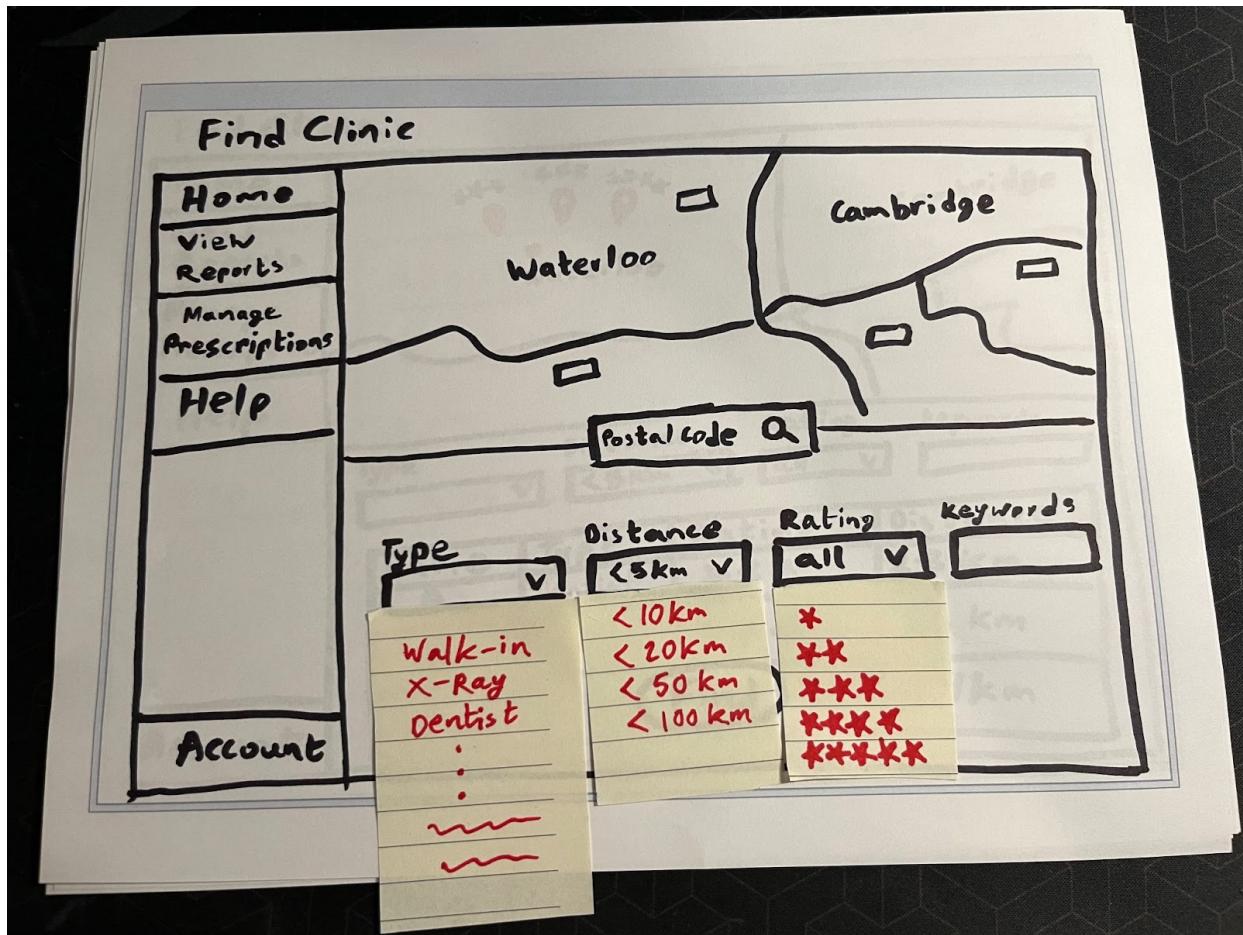
Confirm  
Password

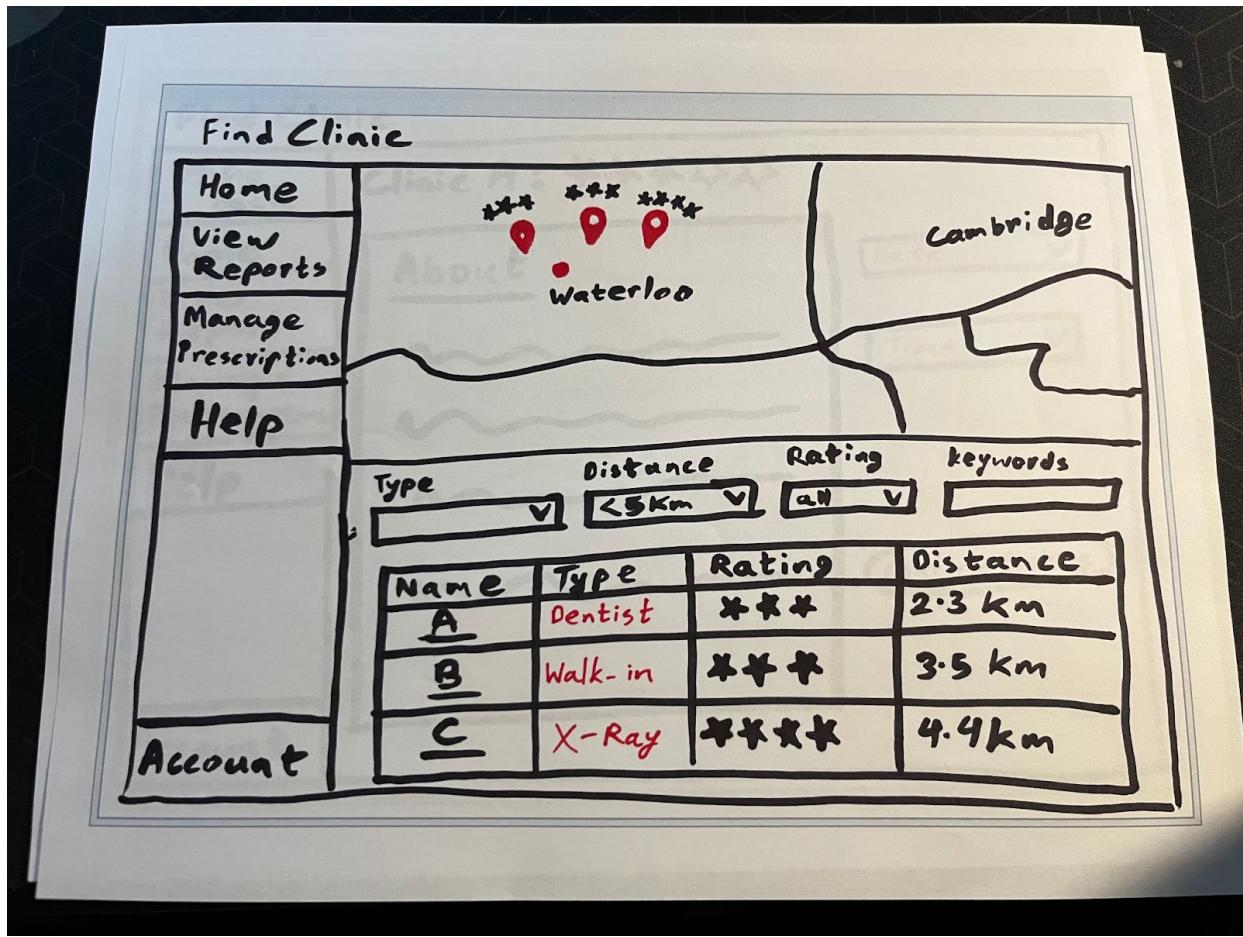
Register

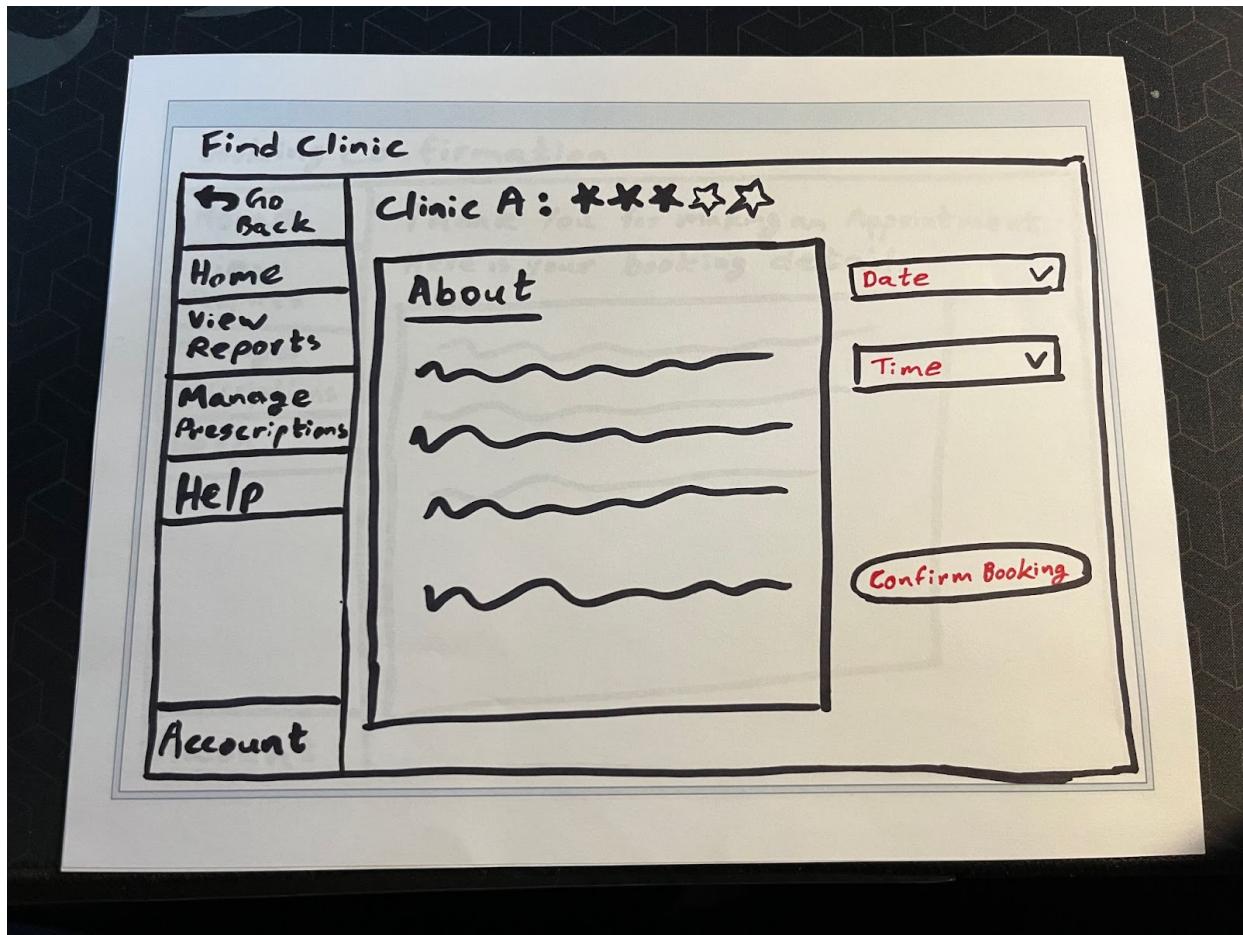


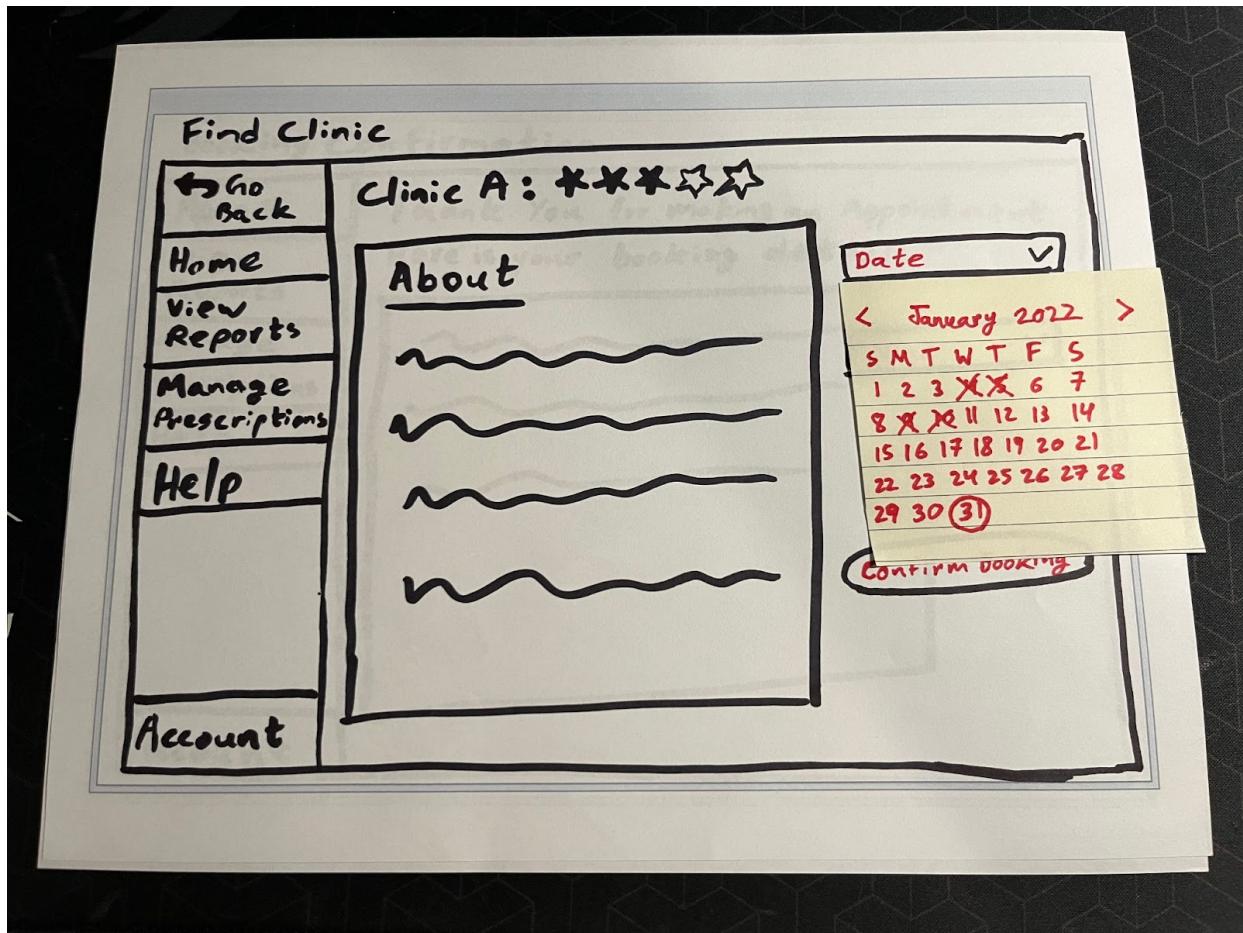


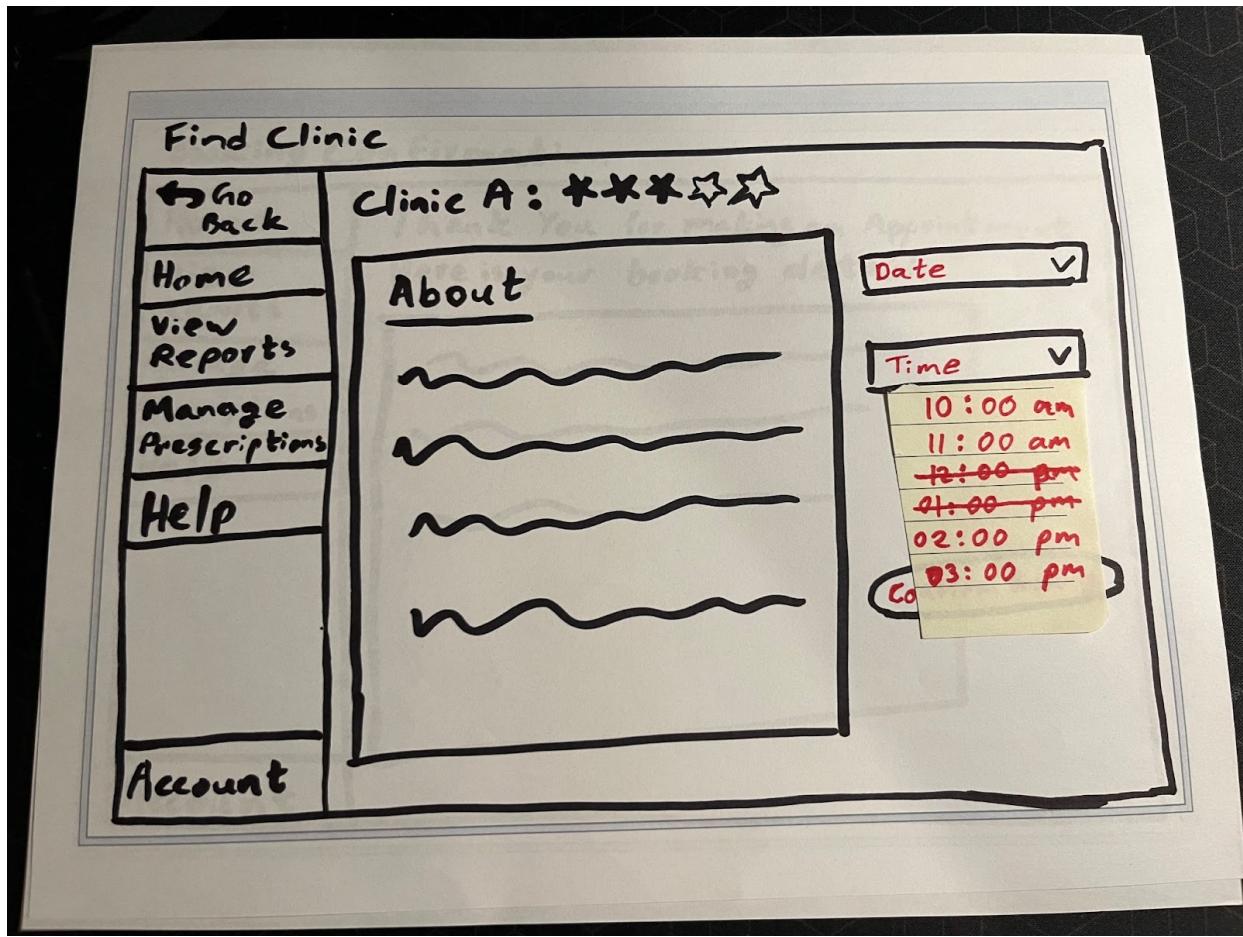


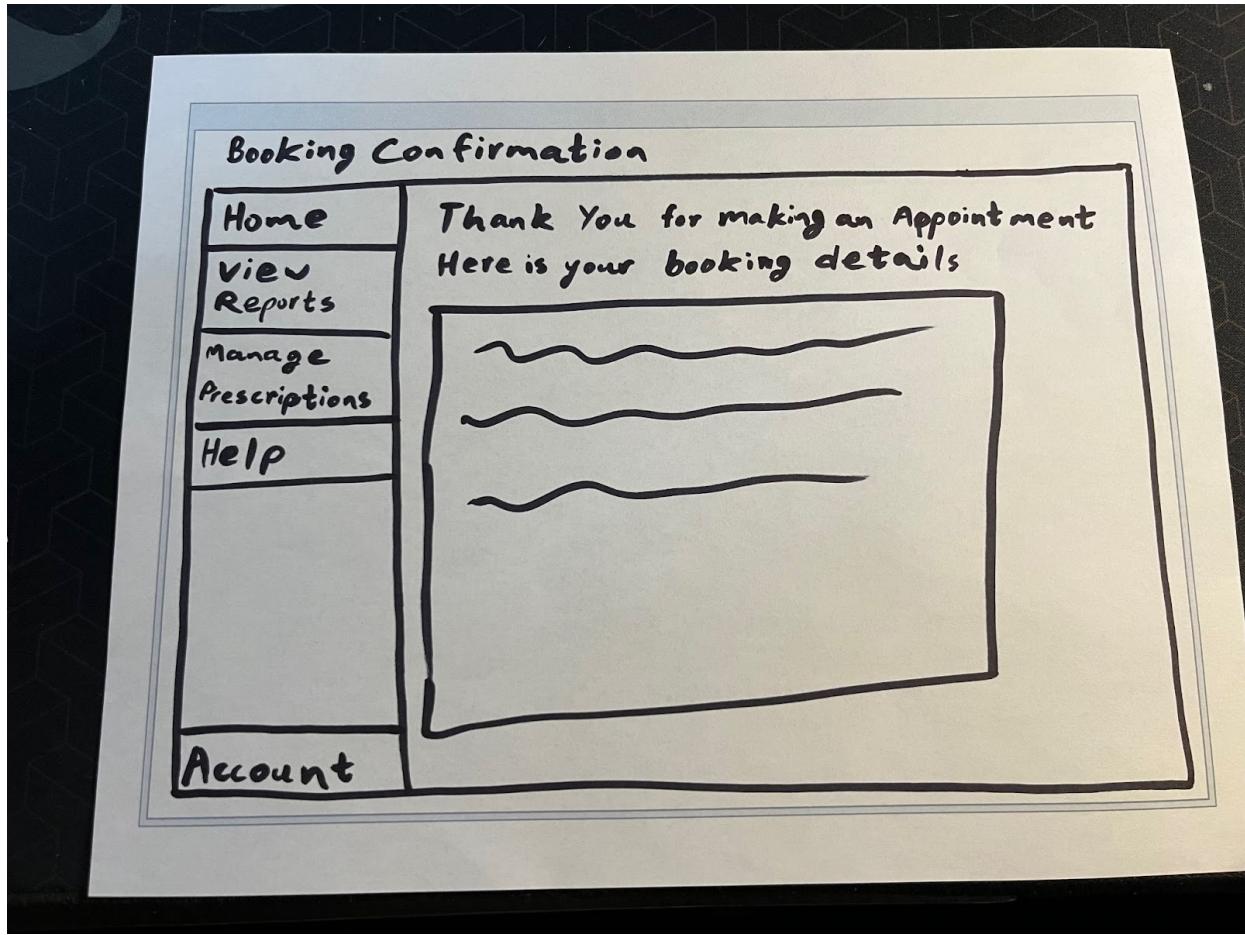








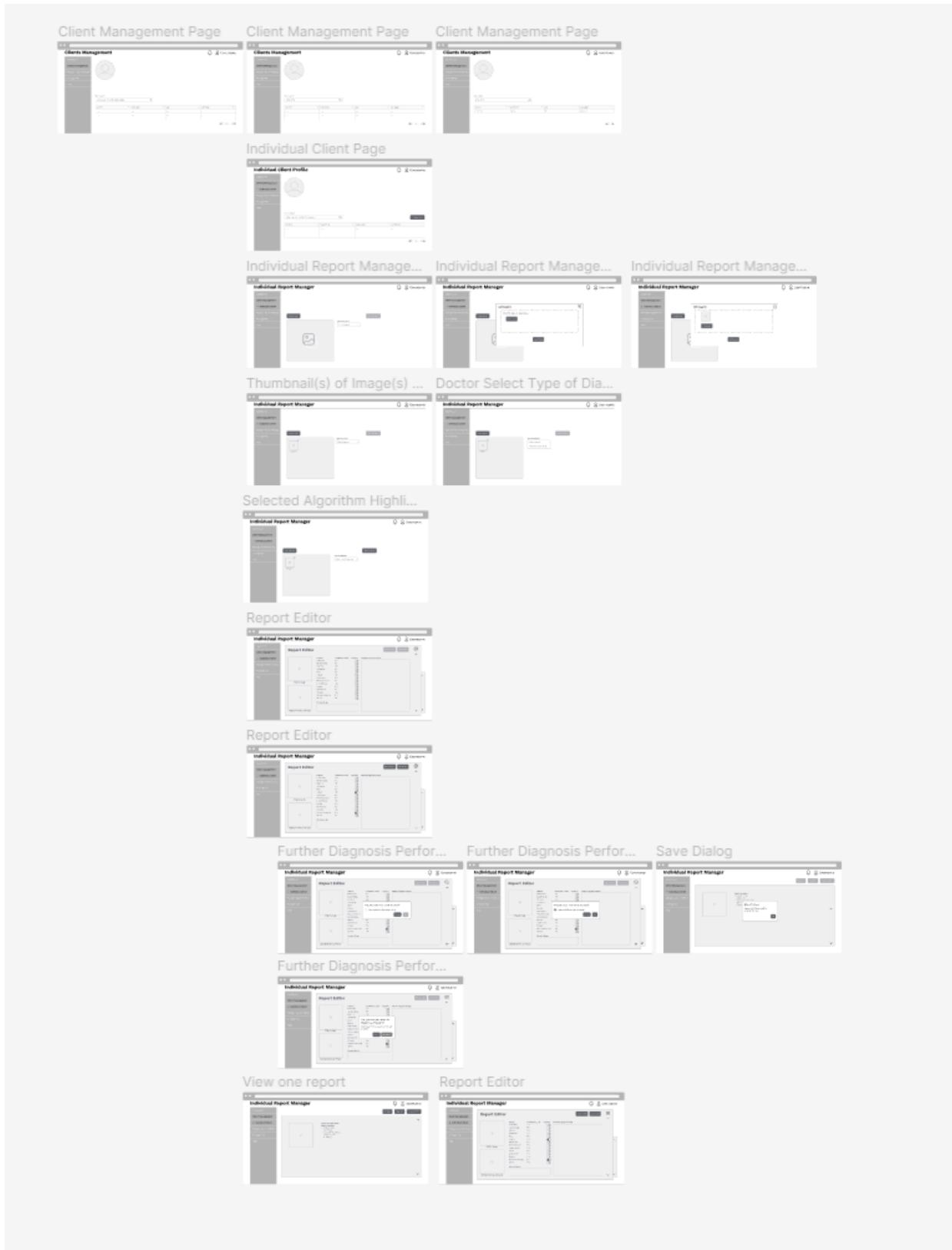




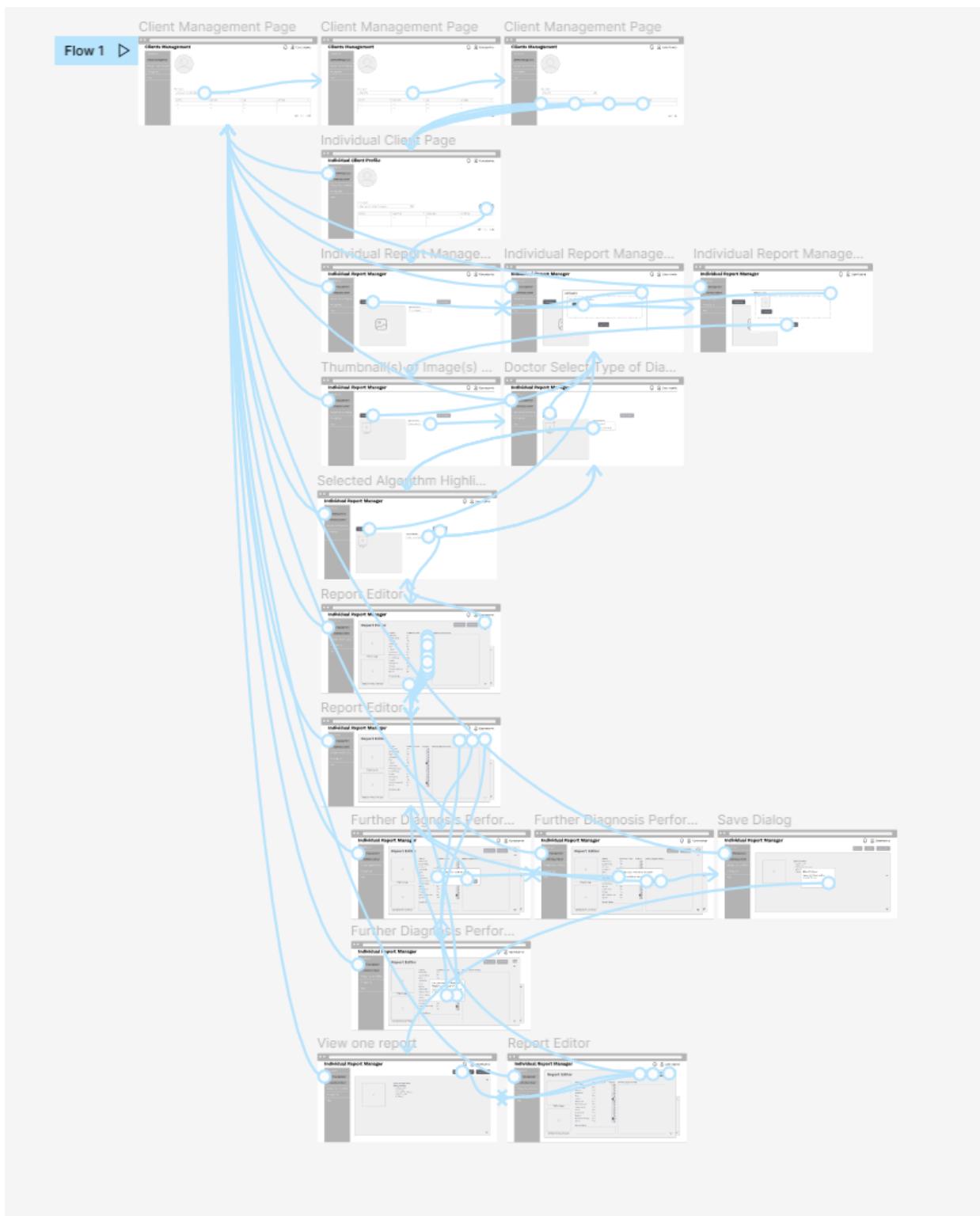
**Link to Figma Low-Fidelity Prototype:**

<https://www.figma.com/file/w6sHFNZxFakKZ9vN4GeCO2/Wireframes?node-id=296%3A9007>

**Page:** Prototype of Doctor Making AI Diagnosis (Interactive)



*Figma's Low-Fidelity Prototype Frames*



## *Wiring of Frames*

## Writeup

We decided to create a “Patient schedule an appointment” paper prototype and “Doctor making AI diagnosis” a low-fidelity wireframe prototype. The reason that we choose Doctor making AI diagnose user flow to a low-fidelity wireframe prototype is this is a main functionality of our application and would require more steps that are harder to portray on paper. Additionally, we thought the patients would use scheduling an appointment function a lot of times while using our app, so we decided on this user flow for a paper prototype as there are a lot of decisions to make throughout the process which might be trickier to handle. For making a prototype, we refer to our wireframes from last week. The paper prototype was drawn directly on paper together with some stickers for on-screen pop-ups (self-explained in the definition) and the low-fidelity wireframe prototype was created using Figma (frames and the links to make them interactive).

The “doctor making AI diagnosis” feature starts from the “Client Management Page”. From there, a doctor can type in anything to the client search tool (ideally the unique client ID), click search, and records of matched patients will appear in the table just below the search bar. Then, clicking on a record will navigate the doctor to the “Individual Patient Page”, where the doctor can manage all information and reports (associated with that one single client). Then, to generate a new report, the doctor can click on “Add New Diagnosis”, and the doctor will be navigated to a new blank “Individual Report Manager”. From there, the doctor can upload an image (or images, the results of individual images will just simply stack up), select the type of AI diagnosis to be performed, and click generate report. Then, a pop up showing the report editor will appear, allowing the doctor to further analyze and edit the AI-generated results. There will be confirmation dialogs along the way, guiding the doctor. There are also signifiers for buttons: dark gray for clickable and light gray for unclickable (or not approved). Regarding the reasonability of the design, the AI-generated report is designed based on Rajpurkar et al’s work. Rajpurkar et al developed an AI-algorithm to detect 14 different kinds of diseases [1].

After making the prototypes, our vision of the prototyped features becomes clearer. Before, the perspectives about the features were quite abstract (from the user flows and high-level descriptions); creating the prototypes required us to add in more details and be more specific. This is a stepping stone towards a full-fledged user interface.

## References

1. CheXNet: Radiologist-Level Pneumonia Detection on Chest X-Rays with Deep Learning.  
Retrieved from <https://arxiv.org/pdf/1711.05225.pdf>

## Team Contribution

- Elman Reasat contributed by Paper Prototype
- Minqi Xu contributed by low-fidelity wireframe prototype
- Yixin Yang contributed by low-fidelity wireframe prototype
- Yeeun Park contributed by write up
- Daniel Phan contributed by low-fidelity wireframe prototype, write up

---

# #8 Activities

DUE MONDAY NOV 21

[ Grade: 5/5 ]

## Team Discussion

### Attendance

- Minqi Xu
- Yeeun Park
- Yixin Yang
- Elman Reasat
- Daniel Phan

### Meeting Minutes

2 hours on Nov 15th

2 hour on Nov 19th

1 hours on Nov 20th

On Nov 15th, we created a script for facilitator, interview questions, scenario, and we finished our mock evaluation.

On Nov 19th, we sorted out this week's deliverables and conducted the two user evaluations and assigned work to each member.

On Nov 20th, we logged the key findings and discussed potential redesigns based on the user evaluations.

## Protocol

### Goals

1. Identify and immediately patch functional issues, such as:
  - The "infrastructure" of the website (how pages, tabs, and pop-ups are linked together).
  - The flow of the website. That is, the website should allow the user to use it without prior experience.
2. Further improve both prototypes, especially in terms of usability.

3. Identify additional directions to which the application can be expanded into.

### User Tasks

1. Book an appointment through the application
2. Perform AI-powered Diagnosis and create a report

### Team role assignments

- Facilitator : Daniel Phan
- Observer: Minqi Xu, Yixin Yang
- Technician: Yeeun Park

### Order of prototypes

We decided to do the paper prototypes (Book an appointment) first, then the low-fidelity wireframe prototype (Perform AI-powered Diagnosis and create a report). Because the paper prototype will give participants more indication that the evaluation procedure will mainly focus on testing the usability of the app features, so users may pay less attention to appearance design.

### Statement to verify you used the consent materials

We have shown the participant information letter and consent form to the participants and obtained their consent and signatures.

### Session Preparation Checklist

- Environment
  - Light
  - Table
  - Chair
  - Spacious location with sufficient airflow
- Prototypes
  - Paper prototype
  - Figma low-fidelity wireframes prototype
- Masks
- Laptop sufficiently charged with necessary software opened
- Phone/Timer/Watch

### Observational Methods

We tell the users to think out loud upfront and during the whole process. We observe if the participants show any confusion or hesitation when they look at the interface and look for the next action, and after they select an action. We will also compare if they did anything

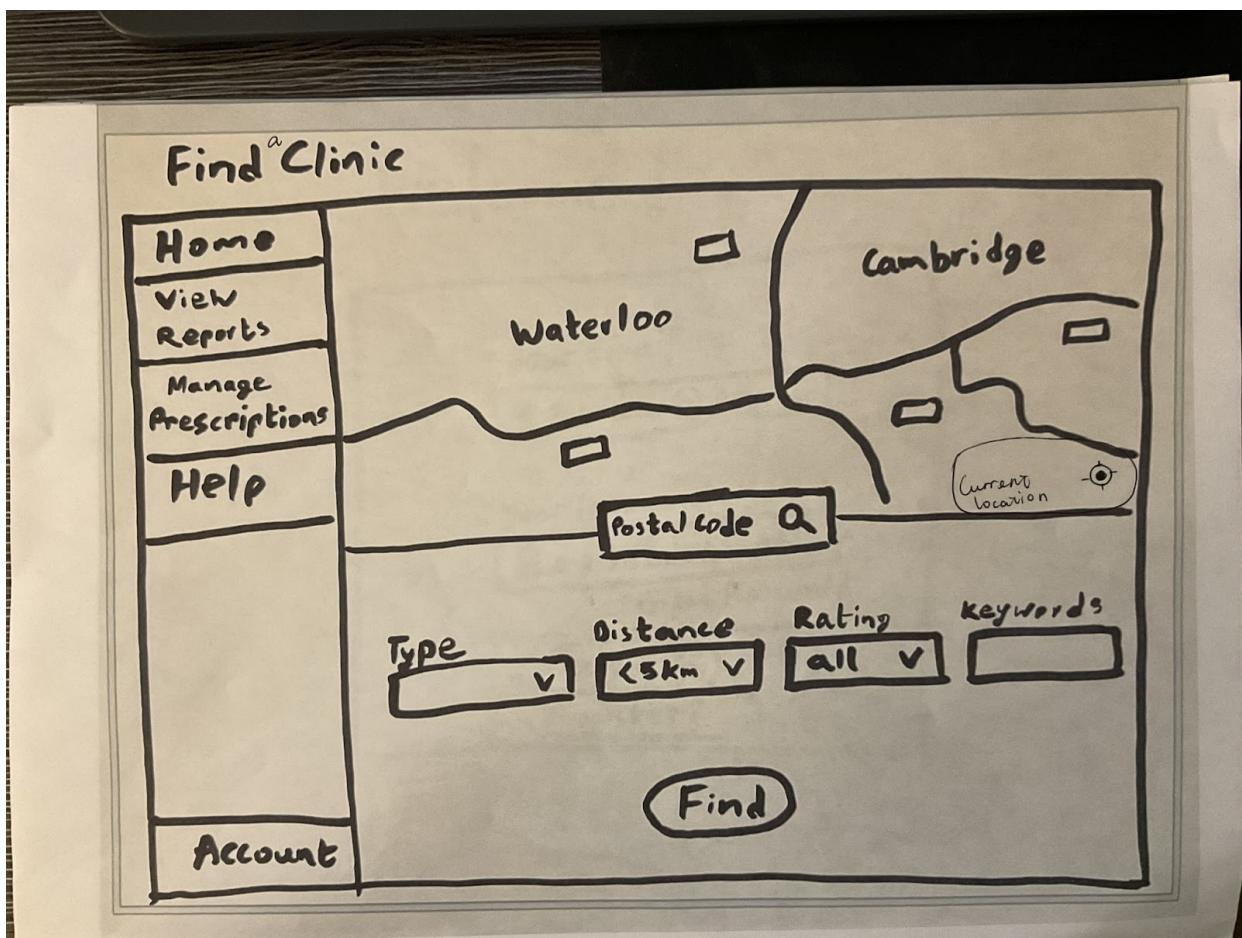
unexpected. At the end of the evaluation, we ask them about the part they feel confused and some follow-up questions.

## Interview Questions and Facilitator Script

### Scripts

## Paper Prototype

### Revisions



A current location button is added into the map, by clicking this, information of current location will be automatically input.

### Wizard guide

For the functions that are under construction, if users interact with that, a not finished page will be shown to the user. (All options which does not mentioned below are considered to be under construction)

### Welcome page

- If the user clicks on sign in directly, nothing will happen.

- If the user clicks on sign in after typing in the email and password, the Dashboard page will be shown.
- If the user clicks on Forget Password?, the Forget password page will be shown.
- If the user clicks on Register?, the Create Account page will be shown.

#### Create Account page

- When the user clicks on Month/Day/Year, a list of options for date will be shown.
- When the user clicks on Sex, the list of options for sex will be shown,
- If the user clicks on Register after they fill in all the fields, the Welcome page will be shown.

#### Forget Password page

- If the user clicks on Email Reset Link without filling email, nothing happens.
- If the user clicks on Email Reset Link after filling email, the welcome page will be shown.
- If the user clicks on Register?, the Create Account page will be shown.

#### Dashboard page

- If a user clicks on Find Clinic, a Find Clinic page will be shown.
- Otherwise, a no finished page will be shown.

#### Find Clinic page

- If the user clicks on the Home button, the Dashboard page will be shown.
- When the user clicks on type/distance/rating. The corresponding list will be shown.
- After selecting from the lists, the Find Clinic (with filter results) will be shown.
- If the user clicks on a specific clinic, the Clinic Detail page will be shown.

#### Clinic Detail page

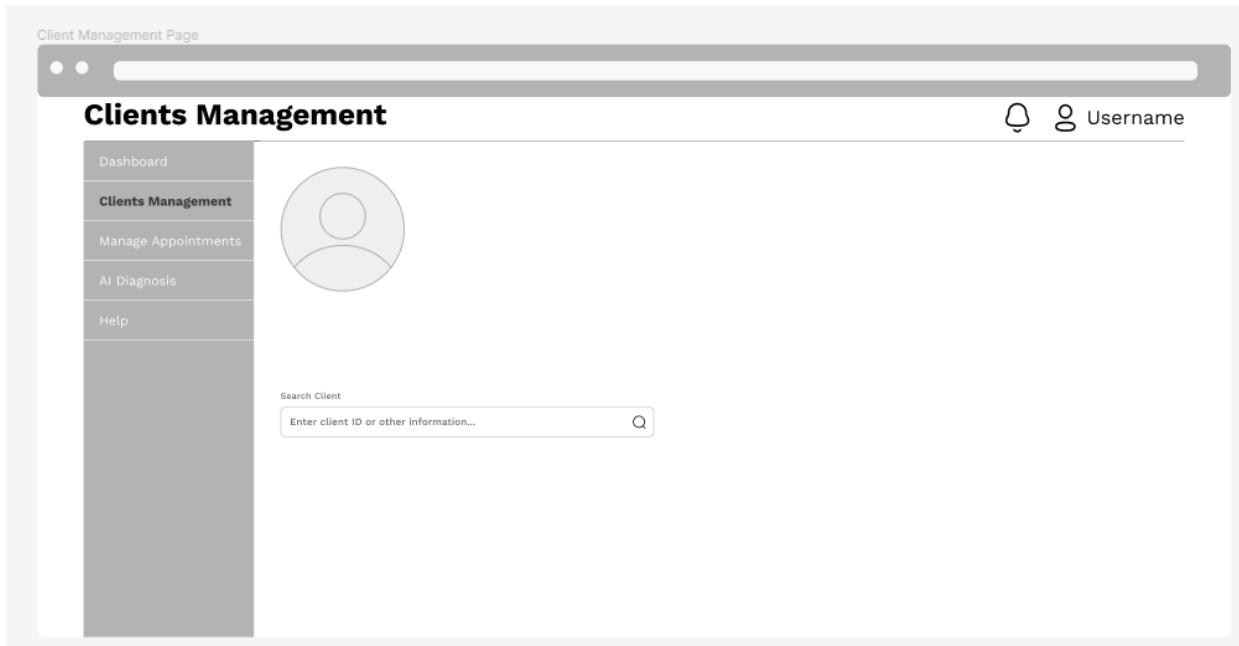
- If the user clicks on Go Back, the Find Clinic (with filter results) will be shown.
- When the user clicks on Date, the calendar will be shown.
- When the user clicks on Time, the list of time slots will be shown.
- If the user clicks on Confirm Booking without selecting the date and time, nothing happens.
- If the user clicks on Confirm Booking after selecting the date and time, a Booking Confirmation page will be shown.

#### Booking Confirmation page

- If the user clicks on Home, the Dashboard page will be shown.

## Low-Fidelity Wireframe Prototype

### **Revisions**



Removed the default clients table at client management page to prevent confusion at the beginning of the process.

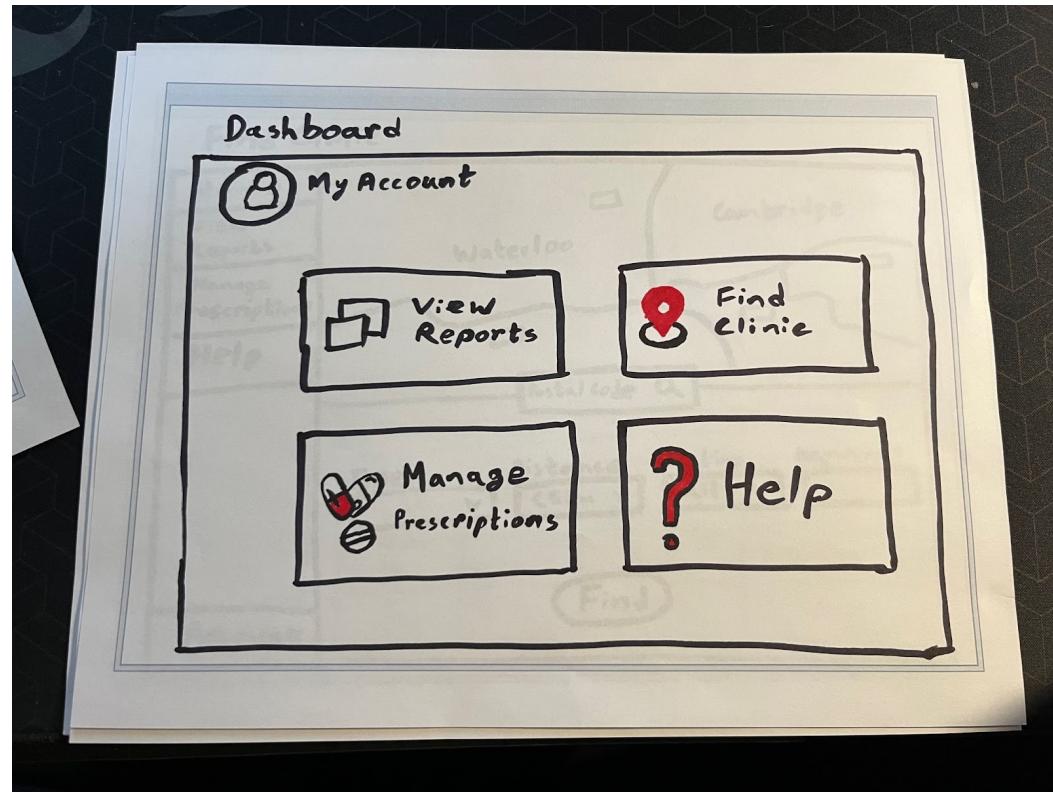
## Key Findings

### User Evaluation 1

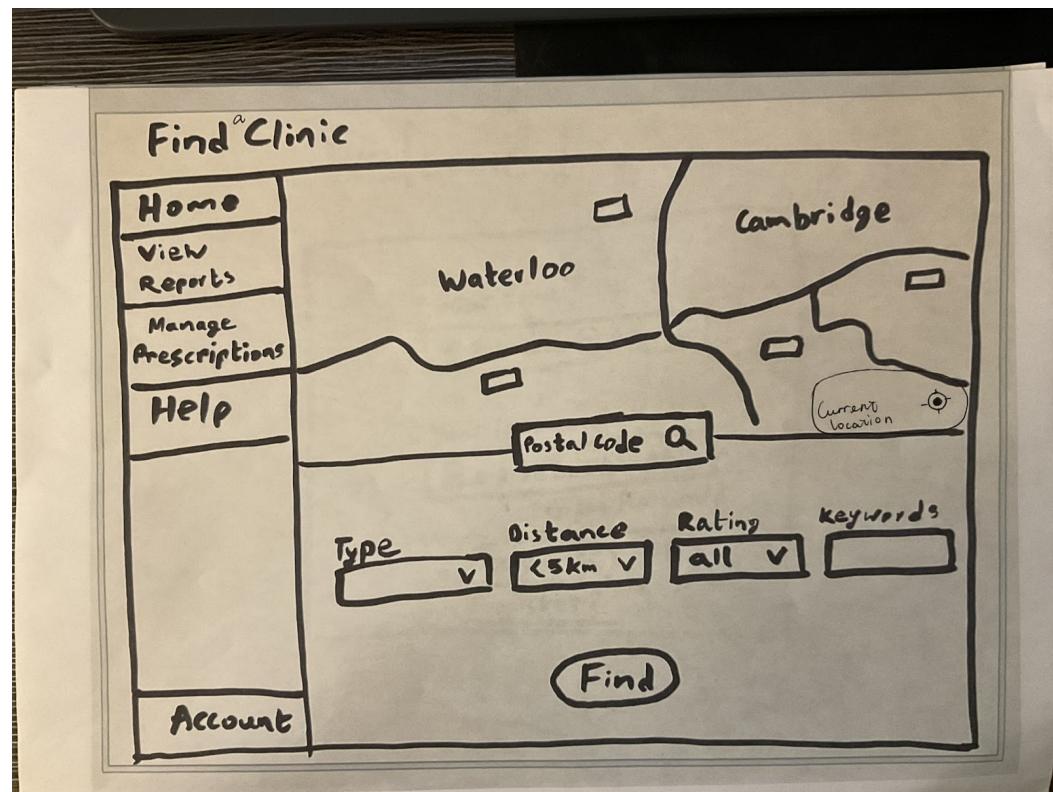
#### 1. Points of confusion and/or hesitation

##### Paper prototype

- P1 was a little confused that after he clicked “register”, the next page was the sign in page because there is no prompt saying he registered successfully.
- P1 recommended we use phone verification after registration to avoid system abuse.
- When P1 saw the dashboard (showing options like view reports, find clinic, manage prescription, ...), he was curious how people can use these features without a health card because our registration process did not ask anything about health card or insurance.



- When P1 looked at the "Find a clinic" page, he asked if there was a way to search for the location instead of entering the postal code.



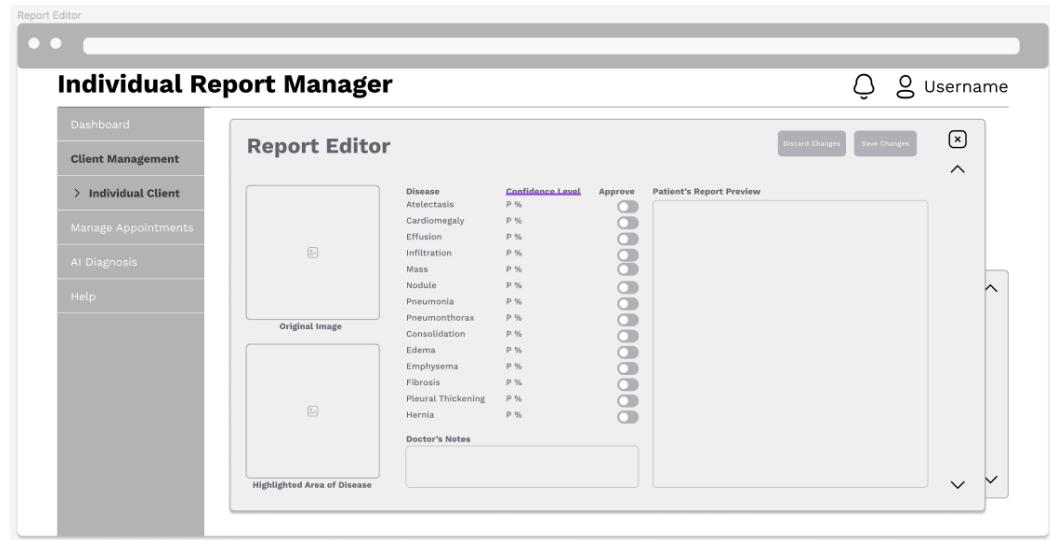
- After P1 clicks “Confirm Booking”, he said he expected a review page listing all the details of the appointment he was trying to book, then should be able to click confirm from there, instead of the booking successful page.
- P1 was confused how he could go back and cancel the appointment he just booked.

#### Wireframe prototype

- On the individual client profile page, P1 was trying to click one of the report in the table because he thought he was supposed to edit a report

- P1 said he thought doctors do not need to upload the images themselves and the images should have already been uploaded to the system by technicians.

- P1 was confused about the report editor and said he didn't understand the contents shown here and said the doctor's notes box was too small. P1 also asked whether doctors can edit the final report because it looks like they cannot by using the interface.



## 2. Questions and responses

- What do you think about the rating feature? Do you think it is necessary?  
A: It is an important feature. I'll look at it when I want to find a clinic.
- What do you think about the difficulty of booking an appointment in this task?  
A: It is pretty easy and standard.
- What do you think about the “find a clinic” search feature? Do you think we should add more filters such as time?  
A: I think it is good. It has everything I need.
- Do you think it is necessary that: to generate a report, a doctor/radiologist will need to navigate to a patient profile first?  
A: I think it makes sense to associate reports with patients. I would recommend showing a list of pending actions/images to be analyzed on the dashboard because that is the most important thing doctors need to see when they log in and from there they can click one of the items and directly go to the report editor.
- What do you think about the flexibility of the Report Editor?  
A: It looks like the doctors don't have many choices like they can only choose to approve a couple of things and add notes. They should be able to edit the report however they want, even add annotations, etc.
- What do you think about a user feedback gatherer right after a doctor has finished using the AI report feature?  
A: I think it is not acceptable since it is a very serious application and could even be used under emergency situations.

## 3. Potential redesigns based on the findings

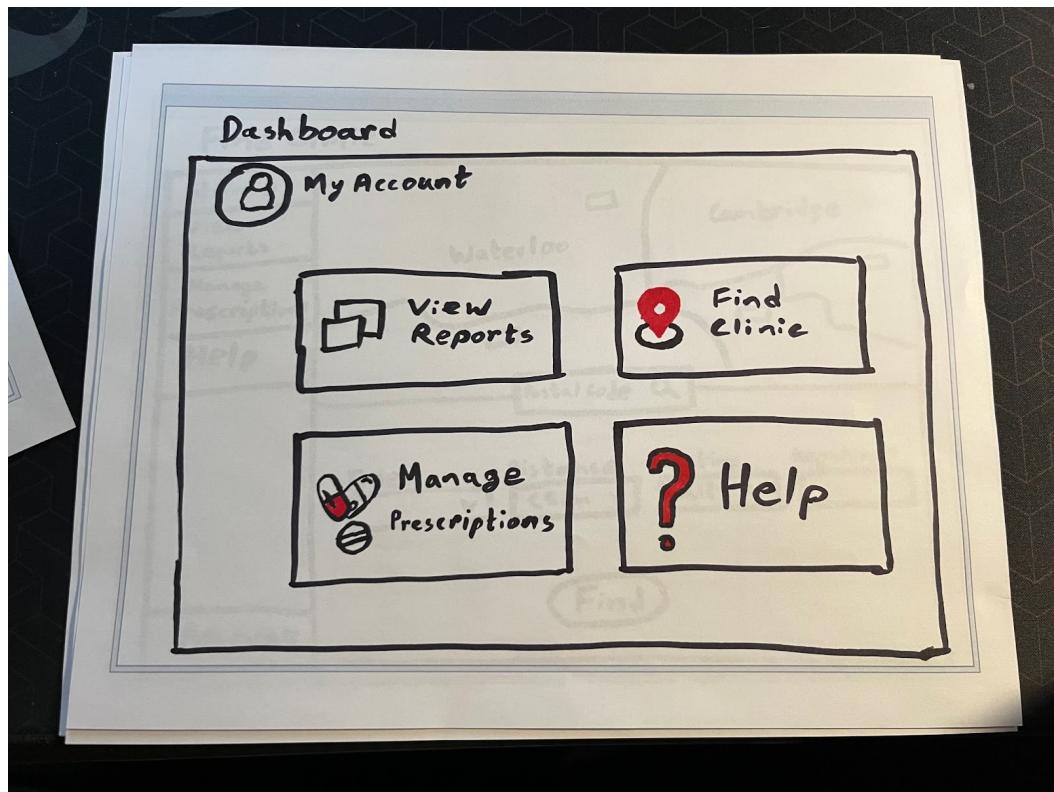
- Remind the users to verify their phone number if they have not done so.

- Change "Find a clinic" to "Manage appointments" and add a page showing the appointment history so users can edit the existing appointment and see the past appointment.
- Add a confirmation pop-up when users click "Book appointment" with appointment details.
- Gray out some features like view reports if users have not completed their profiles and provide important information to enable the features like health card number and remind users to complete their profiles when they signed in.
- In doctor's view, add a "Pending items/images" section on the dashboard
- Design a stronger report editor like adding an annotation feature, zoom in/out.

## User Evaluation 2

### 1. Points of confusion and/or hesitation

- P2 was confused at the "Find Clinic" button. P2 did not know that the "Book Appointment" functionality was linked to by the "Find Clinic" Button.



- P2 was confused by the "Approve" buttons in the report because they are located too close to each other.

| Report Editor |                    |                  |                                  | Patient's Report Preview |
|---------------|--------------------|------------------|----------------------------------|--------------------------|
|               | Disease            | Confidence Level | Approve                          |                          |
|               | Atelectasis        | P %              | <input checked="" type="radio"/> |                          |
|               | Cardiomegaly       | P %              | <input checked="" type="radio"/> |                          |
|               | Effusion           | P %              | <input checked="" type="radio"/> |                          |
|               | Infiltration       | P %              | <input checked="" type="radio"/> |                          |
|               | Mass               | P %              | <input checked="" type="radio"/> |                          |
|               | Nodule             | P %              | <input checked="" type="radio"/> |                          |
|               | Pneumonia          | P %              | <input checked="" type="radio"/> |                          |
|               | Pneumothorax       | P %              | <input checked="" type="radio"/> |                          |
|               | Consolidation      | P %              | <input checked="" type="radio"/> |                          |
|               | Edema              | P %              | <input checked="" type="radio"/> |                          |
|               | Emphysema          | P %              | <input checked="" type="radio"/> |                          |
|               | Fibrosis           | P %              | <input checked="" type="radio"/> |                          |
|               | Pleural Thickening | P %              | <input checked="" type="radio"/> |                          |
|               | Hernia             | P %              | <input checked="" type="radio"/> |                          |
|               | Doctor's Notes     |                  |                                  |                          |

## 2. Questions and responses

- What do you think about the rating feature? Do you think it is necessary?
  - P2 believes it is ok to have the rating feature. However, P2 believes the rating feature is not necessary, and it can cause biases among customers.
- What do you think about the difficulty of booking an appointment in this task?
  - P2 thinks the overall experience is great (except from minor confusions), receiving 3.5-4 stars out of 5.
- What do you think about the “Find a Clinic” search feature? Do you think we should add more filters such as time?
  - P2 thinks the feature is great, and there are no functional changes to be done.
- Do you think it is necessary that: to generate a report, a doctor/radiologist will need to navigate to a patient profile first?
  - P2 thinks it's fine to have the doctors navigate to the client profile first to generate the report (associated with that individual client). P2 thinks can help doctors arrange data better.
- What do you think about the flexibility of the Report Editor?
  - P2 thinks the flexibility of the Report Editor is sufficient.
- What do you think about a user feedback gatherer right after a doctor has finished using the AI report feature?
  - P2 thinks it's redundant. It can be a source of annoyance.

## 3. Potential redesigns based on the findings

- Rename the “Find Clinic” button to “Find Clinic / Book Appointment”.
- Change the radio buttons in the report to check boxes and add more spacing in between. Another way is to move the 2 images to the top and convert the table with the radio buttons to 2 separate tables with more spacing.

## Team Contribution

- Yeeun Park contributed by script, mock evaluation, protocol
  - Yixin Yang contributed by mock evaluation, user evaluation 1 writeup
  - Minqi Xu contributed by script, mock evaluation, protocol
  - Elman Reasat contributed by morale support
  - Daniel Phan contributed by script, mock evaluation, user evaluation 2 writeup
- 

## #9 Activities

DUE MONDAY NOV 28

[ Grade: 5/5 ]

### Team Discussion

#### Attendance

- Minqi Xu
- Yeeun Park
- Yixin Yang
- Elman Reasat
- Daniel Phan

#### Meeting Minutes

60 minutes on Nov 22, we discussed the high-fidelity prototype and started to create the layout, components and interactive flows.

40 minutes on Nov 26, we chose the Dashboard page to do mockups and discussed what should be included in this page. Then we assigned 3 mockup creation jobs to 3 members.

60 minutes on Nov 27, we voted for the final mockup, and wrote the creative brief and final mockup justification. Then we finished the design system and assigned the high-fidelity prototype work to members to work on it individually.

### Visual Design

#### Creative Brief

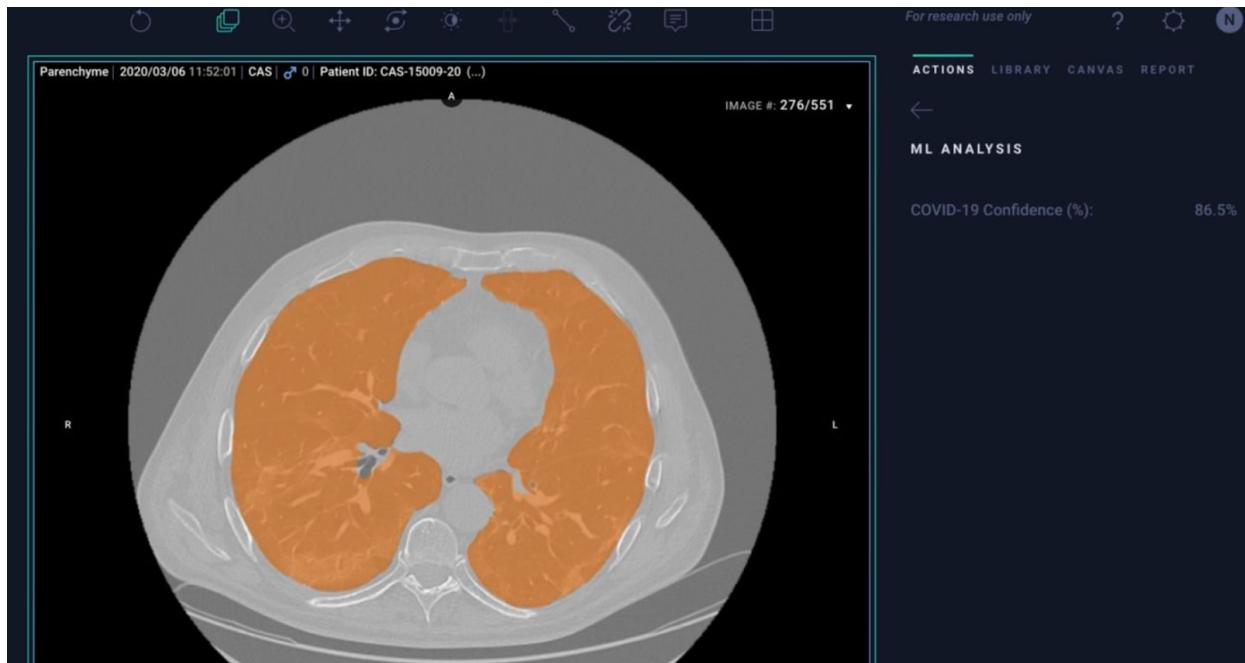
The platform is a solid “bridge” connecting the three core parties: radiologists, patients, and AI-powered software. It will help radiologists free up time and resources to focus on more complex tasks. Moreover, it is a medium for them to use AI-powered software and manage AI-generated results efficiently (alongside client information and other data). As such, patient

experience will potentially be improved (alongside built-in features for clients such as appointment booking and report viewing).

The target users are radiologists who want to use AI-powered software to perform diagnosis and radiology patients. The doctors want an efficient piece of software that can generate accurate results in a timely manner and allow them to manage client information and reports. The patients want something to help book appointments as well as manage diagnoses and prescriptions more conveniently.

Since the product is related to health which a lot of people care about, the design should be professional. Moreover, especially for patients, even though the product is used at any age, a large proportion of user's age should be high. Thus, the design needs to be simple and clean to reduce difficulty of using the website.

Some existing competitors are NVIDIA and Aterys's embedded systems for medical imaging (from [1]) or Lunit INSIGHT's solution for AI-generated reports for Chest X-ray (from [2]). In general, they are built with the purpose of wiring AI-related operations to an intuitive user interface.



*Nvidia and Altery's solution [1]*



*Lunit INSIGHT's solution [2]*

#### *External Resources*

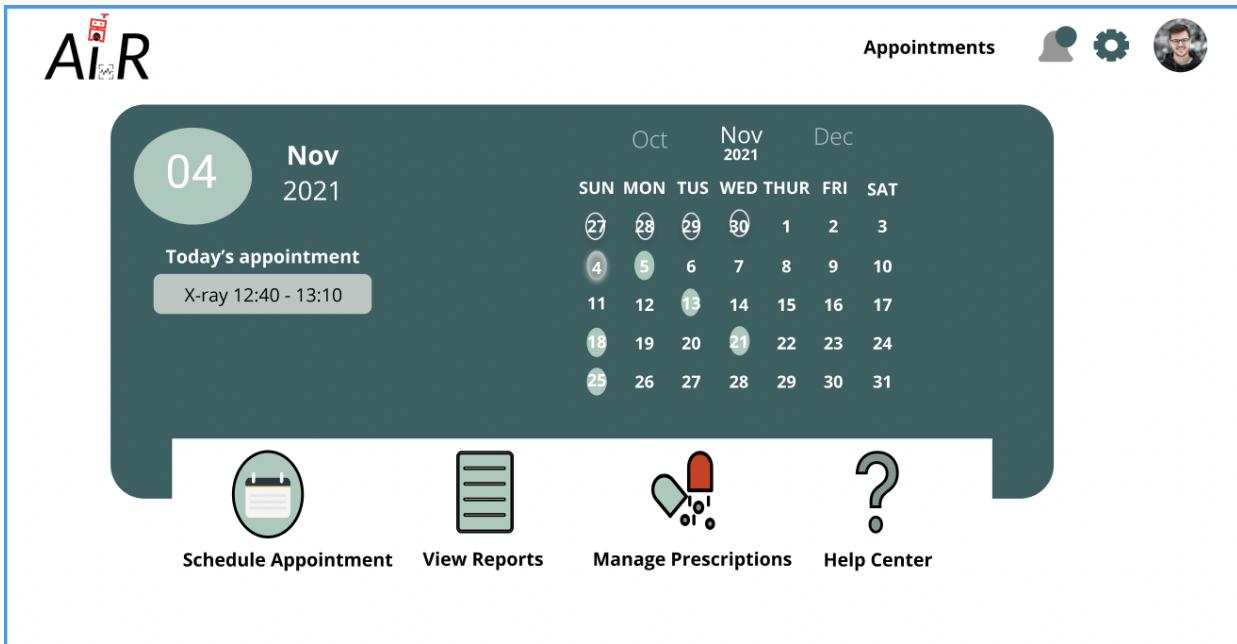
[1] Taking AI to Market: NVIDIA and Arterys Bridge Gap Between Medical Researchers and Clinicians. Nvidia. Retrieved from

<https://blogs.nvidia.com/blog/2020/06/26/arterys-marketplace-nvidia-clara-ai/>

[2] Startup Lunit Uses AI to Help Doctors Prioritize Patients with COVID-19 Symptoms. Nvidia. Retrieved from <https://blogs.nvidia.com/blog/2020/08/12/lunit-insight-cxr/>

#### **Visual Design Mockups**

[Mockup 1](#)



Mockup 2

**AiR Dashboard**

**Upcoming Activities**

- Schedule Appointment
- View Reports
- Manage Prescriptions
- Help Center

**2022**  
◀ November ▶

| Su | Mo | Tu | We | Th | Fr | Sa |
|----|----|----|----|----|----|----|
| 30 | 31 | 1  | 2  | 3  | 4  | 5  |
| 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 1  | 2  | 3  |

**November 2022 Saturday**

**SCHEDULE**  
12:40 - 13:10 X-Ray

**Appointments**

[View All](#)

**Activities** | **Notes**

**X-Ray**  
Activity: Medical imaging  
124 Crescent Dr.  
Dr. Robert Wayne

**Next Day**

**Doctor's appointment**  
Activity: Follow up  
233 Westpark  
Eileen Naz

Mockup 3

Dashboard-AiR

# AiR Dashboard

Today

Upcoming Activities

- Schedule Appointment
- View Reports
- Manage Prescriptions
- Help Center

04 Nov 2021

DON'T FORGET ABOUT ACTIVITIES

SCHEDULE  
12:40 - 01:10 X-Ray

CALENDAR

| SUN | MON | TUS | WED | THUR | FRI | SAT |
|-----|-----|-----|-----|------|-----|-----|
| 27  | 28  | 29  | 30  | 1    | 2   | 3   |
| 4   | 5   | 6   | 7   | 8    | 9   | 10  |
| 11  | 12  | 13  | 14  | 15   | 16  | 17  |
| 18  | 19  | 20  | 21  | 22   | 23  | 24  |
| 25  | 26  | 27  | 28  | 29   | 30  | 31  |

Appointments

View All

Activities Notes

X-Ray

Activity: Medical imaging

124 Crescent Dr.  
Dr. Robert Wayne

Next Day

Doctor's appointment

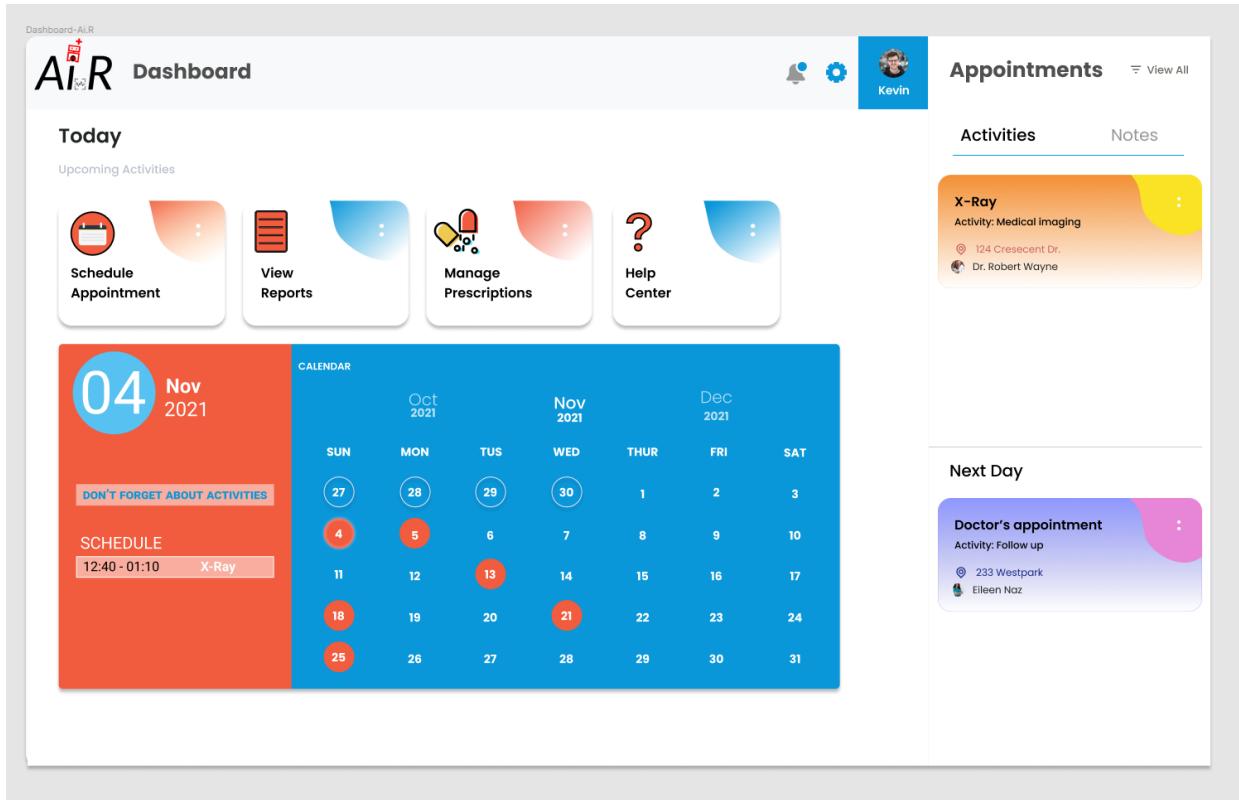
Activity: Follow up

233 Westpark  
Eileen Naz

The dashboard is designed with a clean, modern aesthetic. It includes a header with the 'AiR' logo and user profile information. Below the header, there are four main activity buttons: 'Schedule Appointment', 'View Reports', 'Manage Prescriptions', and 'Help Center'. The central feature is a large calendar for November 2021, with the 4th highlighted in red. To the left of the calendar, a red box contains a schedule entry for an 'X-Ray' appointment. On the right side, there are two sections for 'Appointments' and 'Next Day', each displaying a single scheduled activity with details like location and provider.

## Final Mockup

[Final mockup](#)



## Justification

This mockup was chosen as it displays the crucial aspects of our application in a simple yet attractive way to the end user. The design uses multiple design principles such as Perceived affordance with the gear icon indicating settings menu, the bell icon indicating notifications and the user profile picture indicating user account options without specifying directly what these icons do. It also has signifiers such as highlighted calendar dates indicating scheduled appointments and boxes that contain each application feature indicating they are clickable. The third design principle that is most prominent in this design is Feedback as the sidebar shows today's activities with location and the type of activity that is scheduled longside another tab that shows the user their upcoming scheduled activity for the next day so that the user is always up to date about their availability. The calendar also reminds them of the time and dates of future appointments.

## High-Fidelity Prototypes

### Design System

[Design system \(figma\)](#)

## Design System

### Design System

#### Colors



#### Typography

##### Roboto

Roboto

Roboto

Roboto

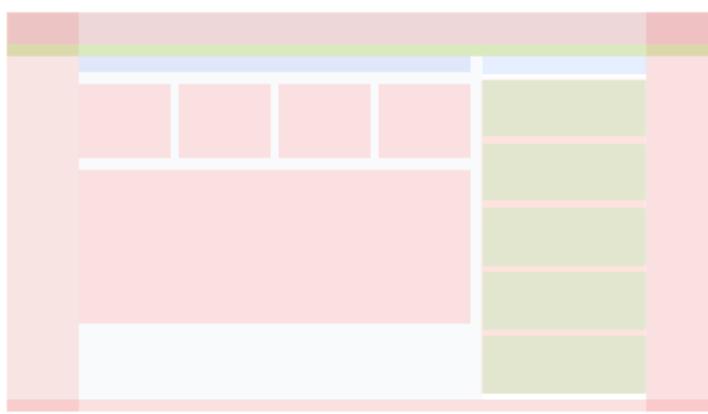
Roboto

Roboto

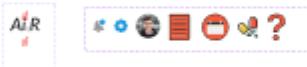
Roboto

Roboto

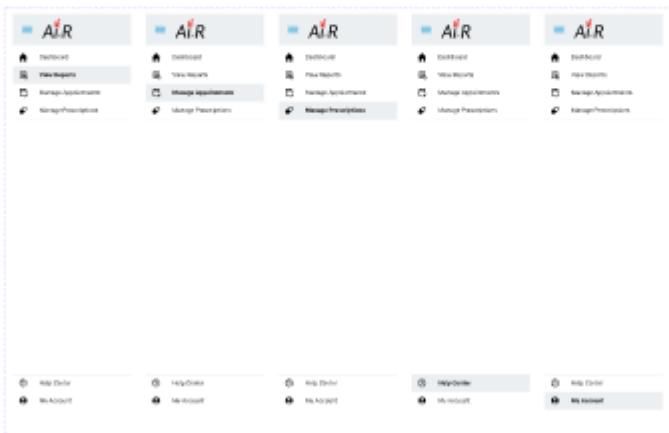
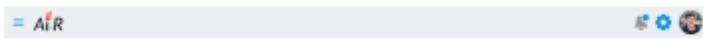
#### Layout grid



#### Common assets



#### Components

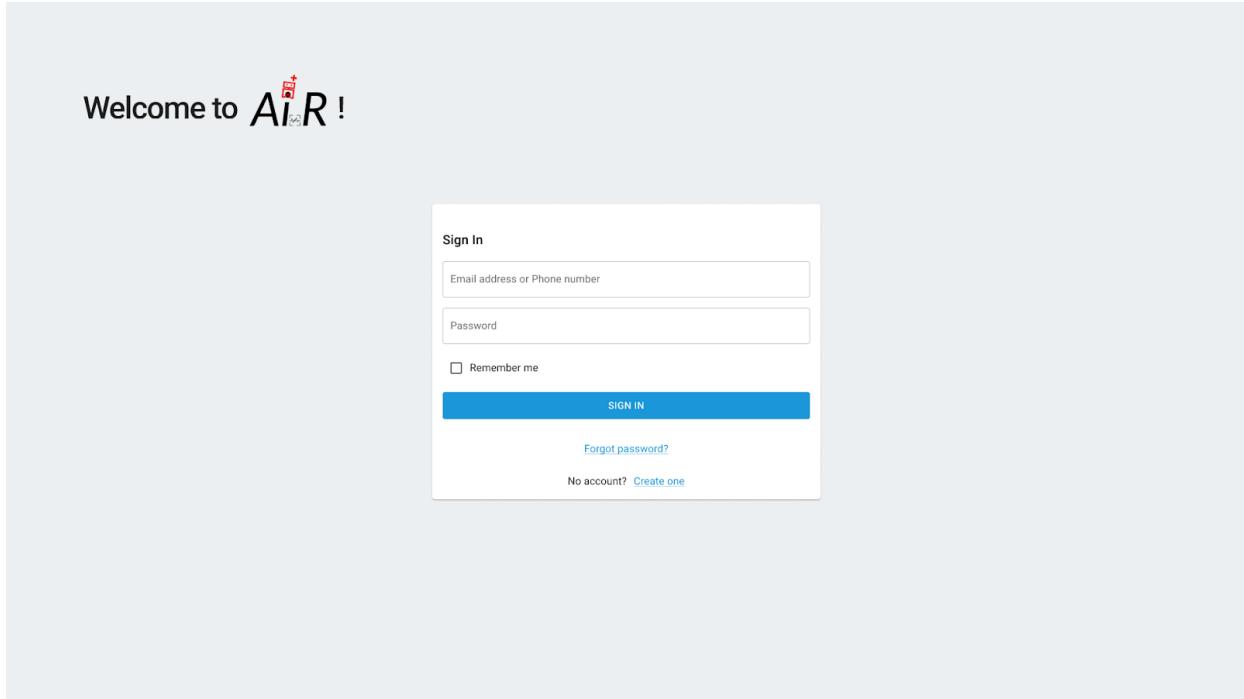


## Prototype

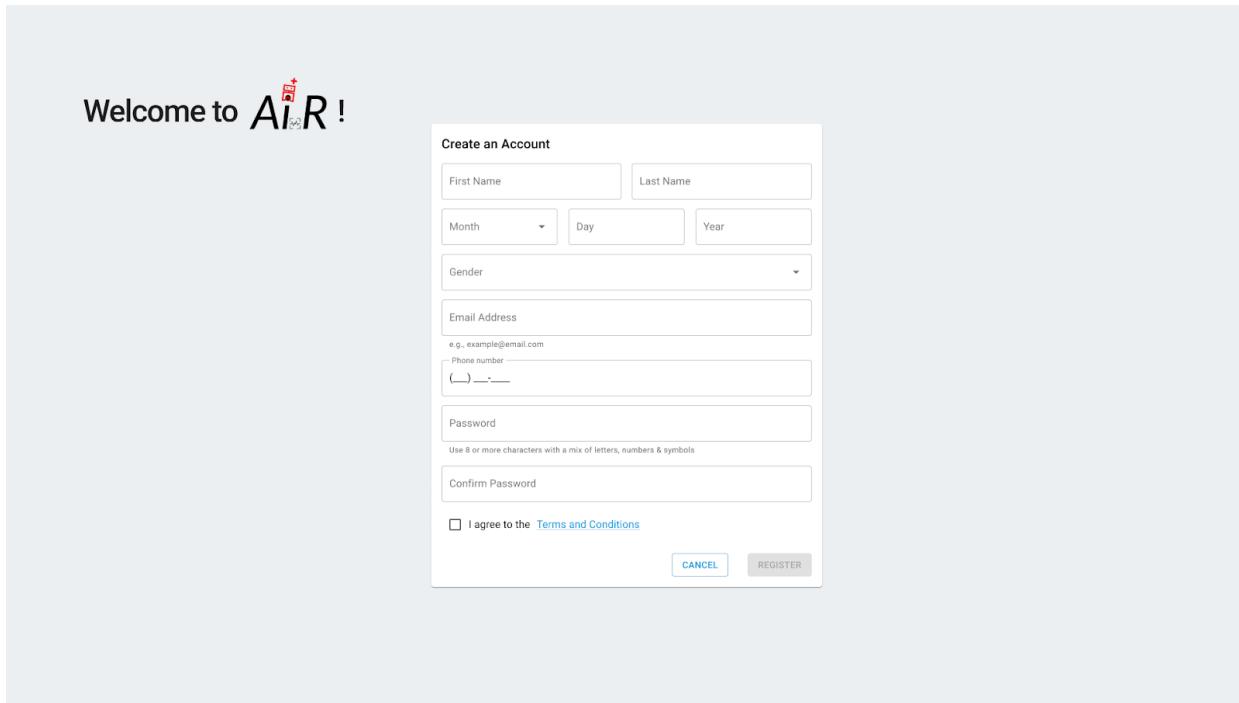
Appointment Booking Feature

[Appointment booking feature \(figma\)](#)

Sign in page



Registration page



Dashboard page

The dashboard page features a header with the AiR logo and user profile icons. Below the header, a greeting "Good morning, Kevin" is displayed. The main area contains four cards: "Manage Appointments" (calendar icon), "View Reports" (document icon), "Manage Prescriptions" (prescription bottle icon), and "Help Center" (question mark icon). To the right is a "Upcoming Activities" section with two items: an "X-Ray Appointment" on Nov 28 at 11:30 AM and a "Doctor's Appointment" on Nov 29 at 02:30 PM. At the bottom left is a "CALENDAR" view for November 2021, showing dates from 27 to 30 and 1 to 31. A red box highlights the date "04 Nov 2021" with the text "DON'T FORGET ABOUT ACTIVITIES" and a "SCHEDULE" entry for "12:40 - 01:10 Clinic A".

Appointments page

## Appointments

| Search                  |                         | Filter by date                             | BOOK A NEW APPOINTMENT |                      |
|-------------------------|-------------------------|--|------------------------|----------------------|
| Clinic, Address, etc... |                         | Last 30 days                               |                        |                      |
| Date ↓                  | Clinic ↑                | Address                                    | Physician              | Action               |
| 10/02/2023              | Waterloo Walk-In Clinic | 170 University Ave W, Waterloo, ON N2L 3E9 | Dr. Jane Doe           | <a href="#">EDIT</a> |
| 10/01/2023              | Waterloo Walk-In Clinic | 170 University Ave W, Waterloo, ON N2L 3E9 | Dr. Jane Doe           | <a href="#">EDIT</a> |
| 22/12/2022              | Waterloo Walk-In Clinic | 170 University Ave W, Waterloo, ON N2L 3E9 | Dr. Jane Doe           | <a href="#">EDIT</a> |
| 10/12/2022              | Waterloo Walk-In Clinic | 170 University Ave W, Waterloo, ON N2L 3E9 | Dr. Jane Doe           | <a href="#">EDIT</a> |
| 10/09/2022              | Waterloo Walk-In Clinic | 170 University Ave W, Waterloo, ON N2L 3E9 | Dr. Jane Doe           | <a href="#">EDIT</a> |
| 10/08/2022              | Waterloo Walk-In Clinic | 170 University Ave W, Waterloo, ON N2L 3E9 | Dr. Jane Doe           | <a href="#">EDIT</a> |
| 10/07/2022              | Waterloo Walk-In Clinic | 170 University Ave W, Waterloo, ON N2L 3E9 | Dr. Jane Doe           | <a href="#">EDIT</a> |
| 10/05/2022              | Waterloo Walk-In Clinic | 170 University Ave W, Waterloo, ON N2L 3E9 | Dr. Jane Doe           | <a href="#">EDIT</a> |

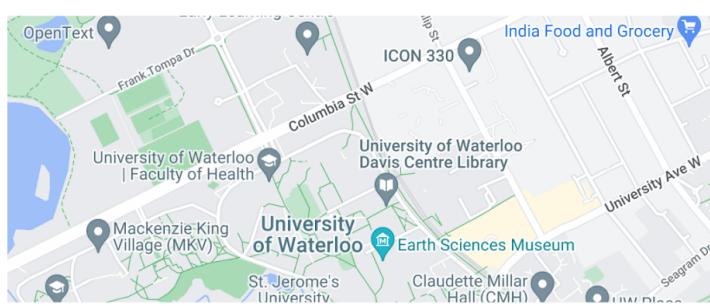
Rows per page: 8 | 1-8 of 12 | < >

## Book a new appointment (enter location)

1 Enter location      2 Select clinic      3 Select date/time      4 Review

Enter postal code: e.g., K1A0B1

Clinic Type: All      Distance: < 5 km      Ratings: All      Keywords:



GO BACK

## Book a new appointment (select clinic)

1 Enter location      2 Select clinic      3 Select date/time      4 Review

|                    |                    |                |          |
|--------------------|--------------------|----------------|----------|
| Clinic Type<br>All | Distance<br>< 5 km | Ratings<br>All | Keywords |
|--------------------|--------------------|----------------|----------|

Click row to see clinic details

| Clinic   | Type    | Distance ↑ | Rating |
|----------|---------|------------|--------|
| Clinic A | Walk-in | 1.2 km     |        |
| Clinic B | Walk-in | 1.2 km     |        |

Rows per page: 8    1-8 of 12    <    >

[GO BACK](#)

### Book a new appointment (select date/time)

1 Enter location      2 Select clinic      3 Select date/time      4 Review

**Clinic A**



Select a Date:

December 2021

|    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|
| S  | M  | T  | W  | T  | F  | S  |
|    |    |    |    |    | 1  | 2  |
| 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
|    |    |    |    | 30 | 31 |    |

Select a Time:

|                  |                  |
|------------------|------------------|
| 09:00 - 09:30 AM | 09:30 - 10:00 AM |
| 10:00 - 10:30 AM | 10:30 - 11:00 AM |
| 11:00 - 11:30 AM | 11:30 - 12:00 PM |
| 12:00 - 12:30 PM | 12:30 - 01:00 PM |

[GO BACK](#)    [NEXT](#)

### Book a new appointment (review)

The screenshot shows the AI R app's appointment booking process. At the top, there are three circular icons: a bell, a gear, and a user profile. The main content area has a header "Please confirm your appointment details:" followed by a summary of the booking information:

|                  |                                    |
|------------------|------------------------------------|
| Clinic:          | Clinic A                           |
| Address:         | 123 King Str, Waterloo, ON A1B 2C3 |
| Date and time:   | Dec 11, 2022 11:00 - 11:30 AM      |
| Reason of visit: | Headache                           |

At the bottom right are two buttons: "GO BACK" and "CONFIRM BOOKING".

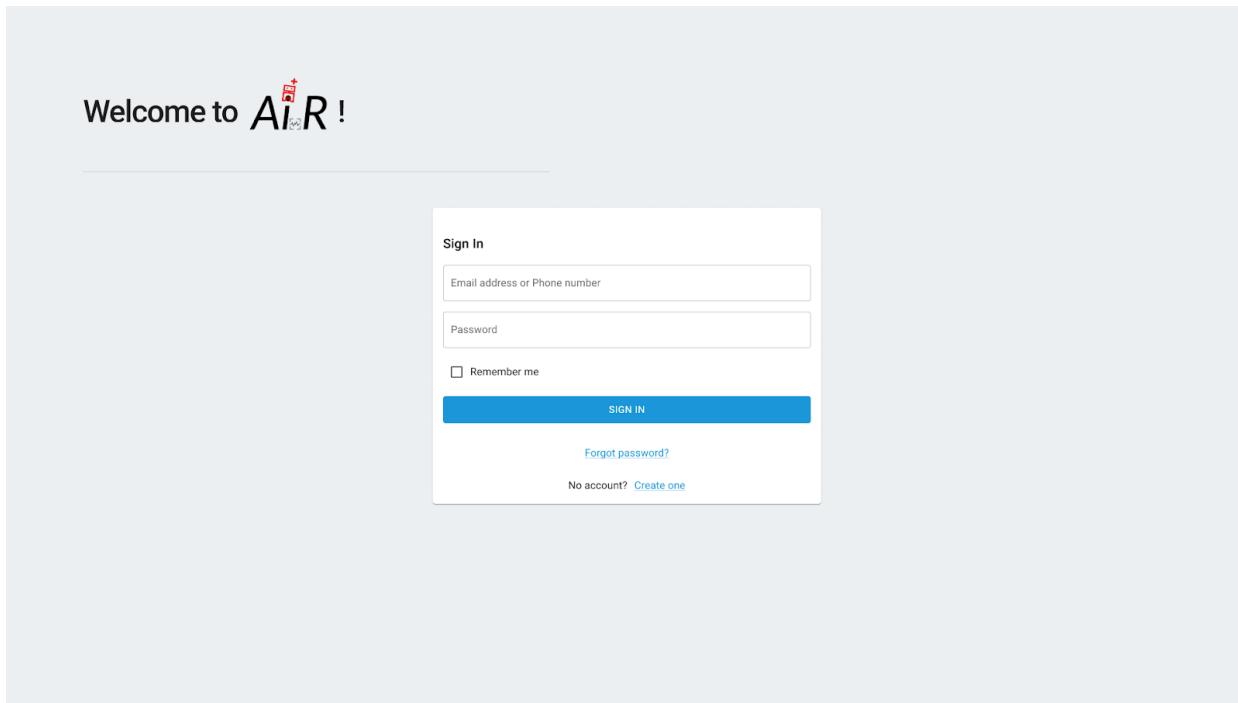
Book a new appointment (done)

The screenshot shows the AI R app's appointment booking process. At the top, there are three circular icons: a bell, a gear, and a user profile. The main content area has a header "All Set!" followed by a message: "A confirmation email has been sent to you with appointment details." At the bottom right is a blue button labeled "SEE MY APPOINTMENTS".

AI Diagnosis Feature

[AI diagnosis feature \(figma\)](#)

## Sign in Page



## Radiologist/Doctor Dashboard Page (Pending action directs to report editor)

A screenshot of the AiR dashboard page. On the left is a sidebar with icons for "Dashboard", "Manage Patients", "AI Diagnosis", and "Manage Appointments". The main area is titled "Pending actions" and shows a table with two rows of patient information. The table has columns for Patient, Date of visit, Image size, Exam Type, and Exam Date. The first row is for Jane Doe (Nov 21, 2022, 2 hrs, X-ray, Nov 21, 2022). The second row is for John Doe (Oct 28, 2022, 1 day, MRI, Oct 28, 2022). At the bottom of the table are pagination controls: "Rows per page: 10", "1-6 of 13", and navigation arrows. The top right of the dashboard has icons for a bell, a gear, and a user profile.

## Patient Management Page

Manage Patients

**Ai.R**

Dashboard

Manage Patients

AI Diagnosis

Manage Appointments

Help Center

My Account

Patients

Search: Q, Name, Patient ID, etc...

| Name     | Patient ID | Sex    | Age | Last Visited |
|----------|------------|--------|-----|--------------|
| Jane Doe | 23456789   | Female | 25  | Nov 21, 2022 |
| John Doe | 12345678   | Male   | 25  | Nov 21, 2022 |

Rows per page: 10 ▾ 1-5 of 13 < >

## Individual Patient Page

**Ai.R**

Patient details - Jane Doe

REPORTS VISITS PROFILE

Search report: Report ID, Keywords, ...

Filter by date: Last 30 days

SEARCH

Status:  Pending  Inspected

Type:  X-ray  MRI  CT  Ultrasound  Others

**Report #####-#####**

Diagnosis type: Chest X-ray  
Algorithm: Chest X-ray 14 Diseases  
Report Status: Pending  
Exam Date: 2022-11-21

**Report #####-#####**

Diagnosis type: Chest X-ray  
Algorithm: Chest X-ray 14 Diseases  
Report Status: Inspected  
Exam Date: 2022-11-21  
Inspection Date: 2022-11-25

**Report #####-#####**

Diagnosis type: Chest X-ray  
Algorithm: Chest X-ray 14 Diseases  
Report Status: Inspected  
Exam Date: 2022-11-21  
Inspection Date: 2022-11-25

< 1 2 3 4 ... 9 10 >

Individual Report Page (Un-inspected, appear at the first time when a doctor receives the report)

**Ai-R**

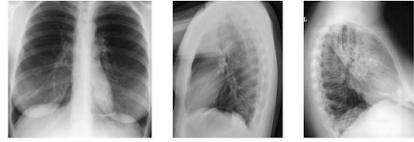
REPORTS VISITS PROFILE

Report details

Report #####-####

Diagnosis type: Chest X-ray  
Algorithm: Chest X-ray 14 Diseases  
Report Status: Pending  
Exam Date: 2022-11-21

INSPECT



| Disease      | AI Confidence Level | Doctor Approval          |
|--------------|---------------------|--------------------------|
| Atelectasis  | P%                  | Need Doctor's Inspection |
| Cardiomegaly | P%                  | Need Doctor's Inspection |
| Effusion     | P%                  | Need Doctor's Inspection |
| Infiltration | P%                  | Need Doctor's Inspection |
| Mass         | P%                  | Need Doctor's Inspection |
| Nodule       | P%                  | Need Doctor's Inspection |
| Pneumonia    | P%                  | Need Doctor's Inspection |
| Pneumothorax | P%                  | Need Doctor's Inspection |

## Blank Report Editor

**Ai-R**

REPORTS VISITS PROFILE

Report #####-####

Diagnosis type: Chest X-ray  
Algorithm: Chest X-ray 14 Diseases  
Report Status: Pending  
Exam Date: 2022-11-21

Images



← →

ANNOTATE

Doctor's Approval

| Disease                               | AI Confidence Level | Disease                                     | AI Confidence Level |
|---------------------------------------|---------------------|---|---------------------|
| <input type="checkbox"/> Atelectasis  | P%                  | <input type="checkbox"/> Pneumothorax       | P%                  |
| <input type="checkbox"/> Cardiomegaly | P%                  | <input type="checkbox"/> Consolidation      | P%                  |
| <input type="checkbox"/> Effusion     | P%                  | <input type="checkbox"/> Edema              | P%                  |
| <input type="checkbox"/> Infiltration | P%                  | <input type="checkbox"/> Emphysema          | P%                  |
| <input type="checkbox"/> Mass         | P%                  | <input type="checkbox"/> Fibrosis           | P%                  |
| <input type="checkbox"/> Nodule       | P%                  | <input type="checkbox"/> Pleural Thickening | P%                  |
| <input type="checkbox"/> Pneumonia    | P%                  | <input type="checkbox"/> Hernia             | P%                  |

Doctor's Notes

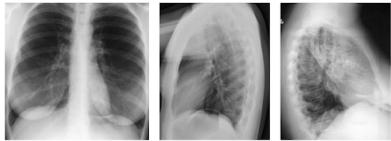
Type something...

DISCARD SAVE

Preview

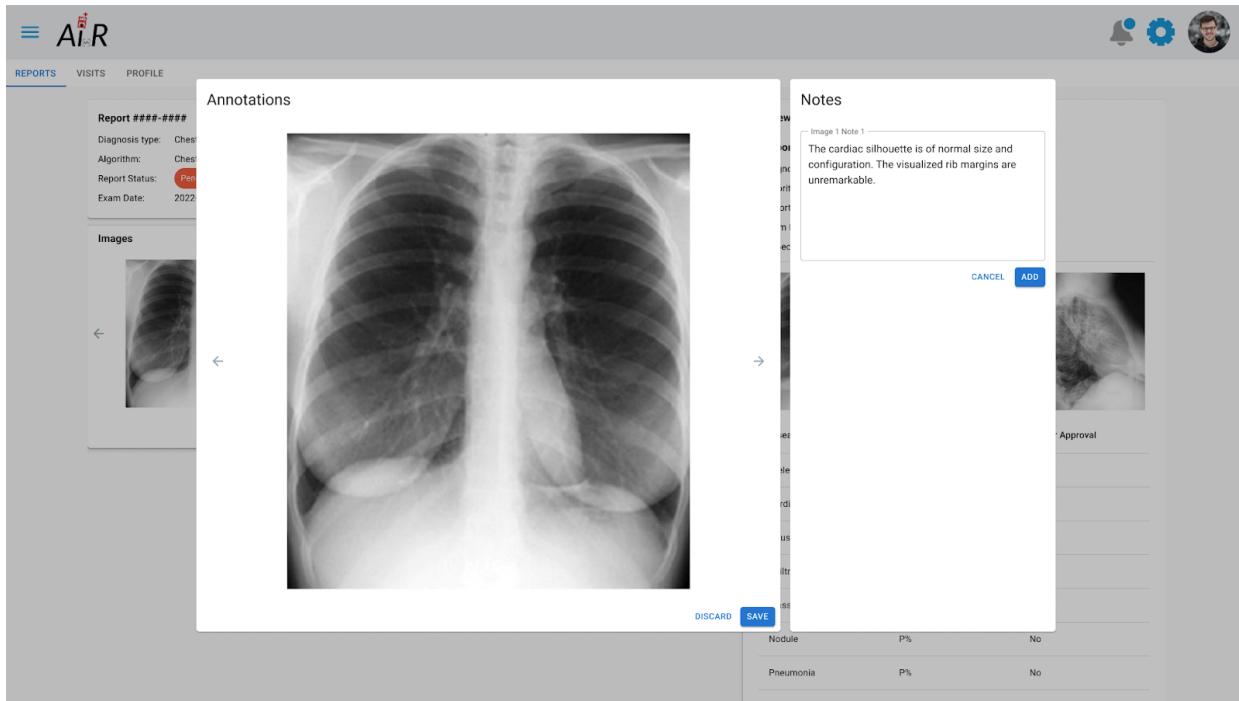
Report #####-####

Diagnosis type: Chest X-ray  
Algorithm: Chest X-ray 14 Diseases  
Report Status: Inspected  
Exam Date: 2022-11-21  
Inspection Date: 2022-11-25



| Disease      | AI Confidence Level | Doctor Approval |
|--------------|---------------------|-----------------|
| Atelectasis  | P%                  | No              |
| Cardiomegaly | P%                  | No              |
| Effusion     | P%                  | No              |
| Infiltration | P%                  | No              |
| Mass         | P%                  | No              |
| Nodule       | P%                  | No              |
| Pneumonia    | P%                  | No              |

## Annotate Feature



## Fully Edited Report

The screenshot shows the AI-R application interface with a "REPORTS" tab selected. The top bar includes navigation tabs: REPORTS (selected), VISITS, and PROFILE, along with user icons.

**Report ID:** Report #####-#####
 

- Diagnosis type:** Chest X-ray
- Algorithm:** Chest X-ray 14 Diseases
- Report Status:** Inspected
- Exam Date:** 2022-11-21

**Images:** A large central image of a chest X-ray. To its left is a smaller thumbnail image, and to its right is a dark sidebar.

**Annotations:** A large rectangular area containing the X-ray image. It includes a "DISCARD" button at the bottom left and a "SAVE" button at the bottom right.

**Doctor's Approval:** A table comparing AI Confidence Level and Doctor Approval for various diseases.

| Disease      | AI Confidence Level | Disease            | AI Confidence Level |
|--------------|---------------------|--------------------|---------------------|
| Atelectasis  | P%                  | Pneumothorax       | P%                  |
| Cardiomegaly | P%                  | Consolidation      | P%                  |
| Effusion     | P%                  | Edema              | P%                  |
| Infiltration | P%                  | Emphysema          | P%                  |
| Mass         | P%                  | Fibrosis           | P%                  |
| Nodule       | P%                  | Pleural Thickening | P%                  |
| Pneumonia    | P%                  | Hernia             | P%                  |

**Doctor's Notes:** A text box stating: "The patient has cardiomegaly, effusion, and mass. However, the system seems to miss hernia in the patient (the system predicted with low confidence level)."

**Preview:** A section showing the report preview with a "Report ID" of Report #####-##### and a "Preview" image showing three chest X-ray images.

**Doctor Approval:** A table comparing AI Confidence Level and Doctor Approval for various diseases.

| Disease      | AI Confidence Level | Doctor Approval |
|--------------|---------------------|-----------------|
| Atelectasis  | P%                  | No              |
| Cardiomegaly | P%                  | Yes             |
| Effusion     | P%                  | Yes             |
| Infiltration | P%                  | No              |
| Mass         | P%                  | Yes             |
| Nodule       | P%                  | No              |
| Pneumonia    | P%                  | No              |

## Save Dialog

**AIR**

REPORTS VISITS PROFILE

**Report #####-####**

Diagnosis type: Chest X-ray  
Algorithm: Chest X-ray 14 Diseases  
Report Status: Pending  
Exam Date: 2022-11-21

**Images**

ANNOTATE

**Doctor's Approval**

| Disease  | AI Confidence Level | Disease                                | AI Confidence Level |
|--|---------------------|--|---------------------|
| <input type="checkbox"/> Atelectasis             | P%                  | <input type="checkbox"/> Pneumothorax  | P%                  |
| <input checked="" type="checkbox"/> Cardiomegaly | P%                  | <input type="checkbox"/> Consolidation | P%                  |
| <input checked="" type="checkbox"/> Effusion     | P%                  | <input type="checkbox"/> Edema         | P%                  |
| <input type="checkbox"/> Infiltration            | P%                  | <input type="checkbox"/> Emphysema     | P%                  |
| <input checked="" type="checkbox"/> Mass         | P%                  | <input type="checkbox"/> Fibrosis      | P%                  |
| <input type="checkbox"/> Nodule                  | P%                  |  |                     |
| <input type="checkbox"/> Pneumonia               | P%                  |  |                     |

**Doctor's Notes**

The patient has cardiomegaly, effusion, and mass. However, the system seems to miss hernia in the patient (the system predicted with low confidence level).

**Save changes?**

I have carefully reviewed the report.

**CANCEL** **CONFIRM**

**Preview**

**Report #####-####**

Diagnosis type: Chest X-ray  
Algorithm: Chest X-ray 14 Diseases  
Report Status: Inspected  
Exam Date: 2022-11-21  
Inspection Date: 2022-11-25

Final View of The Inspected Report with Doctor's Notes at the end

**AIR**

REPORTS VISITS PROFILE

Report details

**Report #####-####**

Diagnosis type: Chest X-ray  
Algorithm: Chest X-ray 14 Diseases  
Report Status: Inspected  
Exam Date: 2022-11-21  
Inspection Date: 2022-11-25

**Images**

| Disease      | AI Confidence Level | Doctor Approval |
|--------------|---------------------|-----------------|
| Atelectasis  | P%                  | No              |
| Cardiomegaly | P%                  | Yes             |
| Effusion     | P%                  | Yes             |
| Infiltration | P%                  | No              |
| Mass         | P%                  | Yes             |
| Nodule       | P%                  | No              |
| Pneumonia    | P%                  | No              |

## Team Contribution

- Elman Reasat contributed by Mockup design, Final Mockup Justification, Logo Design
- Yeeun Park contributed by Mockup design, creative brief

- Yixin Yang contributed by High-Fidelity Prototype
  - Minqi Xu contributed by Mockup design, High-Fidelity Prototype bug fix
  - Daniel Phan contributed by Creative Brief, High-Fidelity Prototype
- 

## #10 Activities

DUE MONDAY DEC 5

[ Grade: 5/5 ]

### Team Discussion

#### Attendance

- Minqi Xu
- Yeeun Park
- Yixin Yang
- Elman Reasat
- Daniel Phan

#### Meeting Minutes

100 minutes on November 29, we finished the Heuristic Evaluation Worksheet and send it to others to evaluate our prototypes.

50 minutes on December 3, we finished discussing on the completed Heruistic Evaluation Worksheet and also discussed about the presentation.

50 minutes on December 5, we continued discussing and preparing the presentation.

### Heuristic Evaluation of High-Fidelity Prototypes

#### Background

Within the past two decades, there have been many great advancements in AI-powered software in radiology (and healthcare in general). Many algorithms were being developed with high performance and accuracy; however, at the moment, there are not a lot of available tools allowing healthcare professionals to experiment with those algorithms.

AMIRA is a platform for connecting radiologists, patients, and AI-powered software. All complex operations are wired into an intuitive UI, with the hope of helping improve both performance and accuracy.

Our application has two main user groups which are doctors and patients. It helps doctors to perform AI-powered imaging diagnosis and create a report based on the result. On the other

hand, the product gives an easy way for patients to book a doctor's appointment, view their reports, and manage their prescriptions.

We have three personas: Aron and Stephen who represent a radiologist and Elenor who represents a patient. Aron wants to reduce time to diagnose the imaging tests to manage his work life balance. Stephen not only would like to reduce time to diagnose the images, but he wants to improve radiology services to help the patients. In addition, Elenor needs the greatest treatments available as well as a quick response of the imaging diagnosis and the treatment for reducing time spent at the hospital.

## Prototype and Tasks

1. Patient side: *Book a new doctor's appointment.*

Suppose you get a headache and want to book an appointment at a close-by clinic as soon as possible. This is a web application that can help you do that.

[Patient: booking an appointment prototype](#)

2. Doctor side: *Perform AI-powered diagnosis and create a report.*

Imagine you are a radiologist working for a local clinic. You just received chest X-ray images of your patient, and you want to perform a diagnosis on those images. This web application will produce an AI-based report and you are going to do the further diagnosis and create the final report using this application.

[Doctor: inspecting an AI-generated report prototype](#)

## Completed evaluator worksheets

 [1-Heuristic Evaluation Worksheet](#)

 [2-Heuristic Evaluation Worksheet](#)

## Result Discussion

After the evaluation process, we were able to find some aspects of the application that needed to be improved. Regarding the issues, we found:

- Cosmetic: 3 issues
- Minor: 3 issues
- Major: 5 issues
- Critical: 1 issues

These issues are about the navigation and information management/display aspects of the system. Some of the suggestions by the evaluators can be made immediately like cosmetic issues. In addition, most of the major and critical issues are inside the AI-feature, creating the need for immediate improvements.

Some of the actionable ideas are:

- Create appropriate application name and logo

- Add arrows in the calendar (patient's dashboard) so users know how to get to the previous/next month
- Gray out dates that are not available when selecting date/time for the appointment
- Add hover effect for all the table rows to show that they are clickable
- Change "keyword" placeholder in the search box in the find clinic page to be more specific
- Fix final report to contain patient's information
- Add info boxes or hint pop-ups (upon hover) across the flow of the AI feature

## Team Contribution

- Elman Reasat contributed by Evaluation of other team (Team Butterflies), Plan
- Yeeun Park contributed by Plan
- Minqi Xu contributed by Plan
- Yixin Yang contributed by High-fidelity prototype refinement, Writeup
- Daniel Phan contributed by Plan, Writeup