MediRecords

CSE 440 Section AB

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Team

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Problem and Solution Overview

You are in a foreign country and accidently ate peanut sauce that you are severely allergic to. With language barriers, no one to ask for help, and no other options, what do you do? This is where MediRecords comes in. With MediRecords, we are aiming to address the problem of travelers with existing medical conditions finding difficulty receiving professional treatment when visiting foreign countries. Our proposed solution is an easy to wear, inconspicuous necklace which contains information on all of the traveler's medical records. The medical records are all held through the form of a USB drive within a necklace, and is protected via biometric security, namely fingerprint scanning. The user can easily take out the USB and give it to medical staff at a hospital, who can then verify the information in a language and format of their choosing. Such information would allow the user to easily get prescriptions and/or assistance for their respective health conditions.

Design Research Goals, Stakeholders, and Participants

For the purpose of this class, we focused on using a blend of interviews and directed storytelling. We chose this style of conducting research because a one on one style interview would give us very detailed information about specific problems that we would need. Sending out a survey would allow us to capture data from a wide variety and number of people, but it wouldn't give us the level of detail needed to be useful for our purposes. We felt that the increased quality of data would be preferable to the more widespread but lower quality nature of information from surveys. Directed storytelling allowed us to give our participants the ability to give responses to situations that they have not been in before. This was especially useful to us, since we were not able to find interviewees that exactly matched the demographic that we were aiming for.

First, we conducted an interview with a 20 year old male participant. This participant is a student at the University of Washington that suffered from Crohn's Disease. This interview was conducted in person. Next, we interviewed a 21 year old female who does not have any pre-existing health conditions, but traveled abroad quite often. This interview was conducted online, via instant messaging. Finally, we interviewed an elderly female that suffers from anemia. This interview was conducted in person.

Given that our target population (travelers experiencing health conditions) was very narrow and niche, we chose to interview people who matched our demographic partially, and then synthesizing that data. For example, our first and third participants had health conditions, but did not travel as often as we had hoped. Meanwhile, our second participants did not have any existing conditions, but traveled frequently. By combining their answers and finding common patterns in the data, we were able to paint a rough picture of what someone who truly met our target demographic would experience.

Some potential stakeholder for this project include doctors and travel agencies. Since doctors are on the receiving end of our product, we see the mutual benefit of doctors providing input on how they want the medical records to be shown. Travel agencies could also endorse this design as part of a way to travel in a safer manner. Unfortunately, we were unable to interview any doctors or affiliates of any travel agencies within the scope of our design research. Given more time, we hope to expand our interview demographic.

Design Research Results and Themes

For our design research, we found people through our social networks and mostly interviewed people that we were not close with, to prevent biased answers. For all of these interviews, we followed the same question script that we drafted prior to conducting the interviews. From our female student interviewee, we learned the difficulty of travelling with feminine hygiene in mind. This is unique to women, as men do not need to carry pads/tampons with them while travelling. In general, all interviewees noted the difficulty of carrying getting medicine/health products through airport security, whether it be the weight/size or the legality of possessing such medicine in other countries. Carrying these products was an issue regardless of domestic or international travel. Though our interviewees shared similar issues, they were all unique in the types of conditions they had as well as traveling habits. While getting a sense of different conditions and how they can be seen following a similar template in terms of procedural actions, this research helped us come to the observation that in the case of medical emergency internationally, they would inevitably face the same if not very similar challenges.

After conducting interviews with our participants and gathering data, we noticed that the collected research amongst interviewees shared common themes. As we sought to understand obstacles in the way of travelers with medical conditions and specific medical histories, our interviewees showed previous experience with facing said obstacles (communication issues through language barriers, unfamiliarity with foreign medical practices, policies, and procedures, issues with carrying medications for extended periods of time/through airports, and unforeseen circumstances) and/or have little to no idea as to what they would do in the case of a medical emergency during international travel. Regardless of travel experience, the need for access to medical records was emphasized, as diagnostics/treatment for their conditions rely on previously noted treatment, medicine, irregularities, and other crucial information relayed in one's medical record. That being said, the ability to communicate efficiently will foreign medical professionals also proved a challenge, as even the latest in translation apps often will often yield mistranslated words and sentences, especially medical-specific terminology. Lastly, interviewees stressed issues with medicine traveling for extended periods of time. This includes medicine going bad when exposed to different temperatures (some specifically requiring refrigeration), expiration dates, and even a refill. When a refill is needed, more challenges can be faced while looking for ways to receive medication, much like receiving treatment in itself.

Task Analysis

1. Who is going to use the design?

People with health conditions traveling abroad.

2. What tasks do they now perform?

They tend to either refrain from traveling often, or deal with their respective conditions in their own way without external assistance.

3. What tasks are desired?

Being able to travel without fear and have confidence in medical staff being able to quickly identify their health conditions.

4. How are the tasks learned?

The tasks are learned when the user inputs their data into our design.

5. Where are the tasks performed?

The tasks are performed likely in a hospital, or at the scene of an accident/place where the user needs medical assistance.

6. What is the relationship between the person and data?

The data collected through our research represents personal experiences as well as dilemmas and worries that the people we interviewed have experienced at one point within their lives.

7. What other tools does the person have?

In the context of our problem, they have translation applications, as well as possible telltale symptoms of their condition.

8. How do people communicate with each other?

Users are able to communicate their medical conditions and records via our design to medical staff.

9. How often are the tasks performed?

The tasks are performed whenever medical staff treat the user.

## 10. What are the time constraints on the tasks?

It depends on the health condition of the user, ideally these tasks would be completed as soon as possible.

11. What happens when things go wrong?

If our design is unable to effectively convey the necessary medical information, medical staff will have to perform their own diagnosis, or wait for records to be imported in from the user's hospital.

Proposed Design Sketches - "3x4"

Wearable Necklace
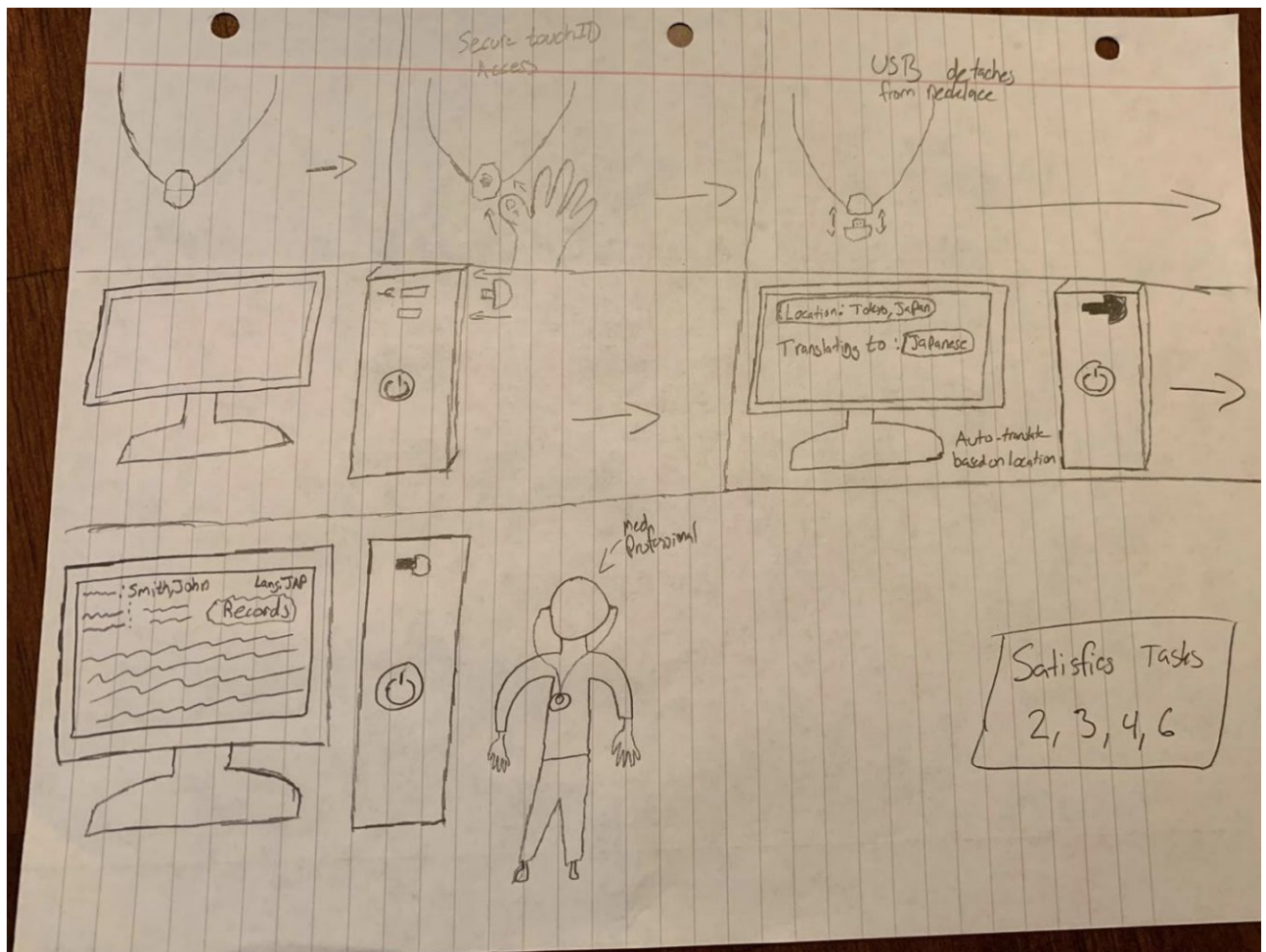
We designed a necklace that could simply be worn around your neck at any time. The idea of this design was too fulfill the following four tasks: ease of communication with medical officials, contain all medical records on the go, have all the records be concealed and safe, and be a lightweight easy design that can be carried anywhere. Through this design, due to its aesthetic look of a necklace, you never have too worry about forgetting it anywhere. Through the USB contained within the device, all medical records are stored and accessible to medical officials, as seen in the storyboard above. Finally, all the USB's data is safely secure. due to the biometric sensor placed on the front.

Smart Watch
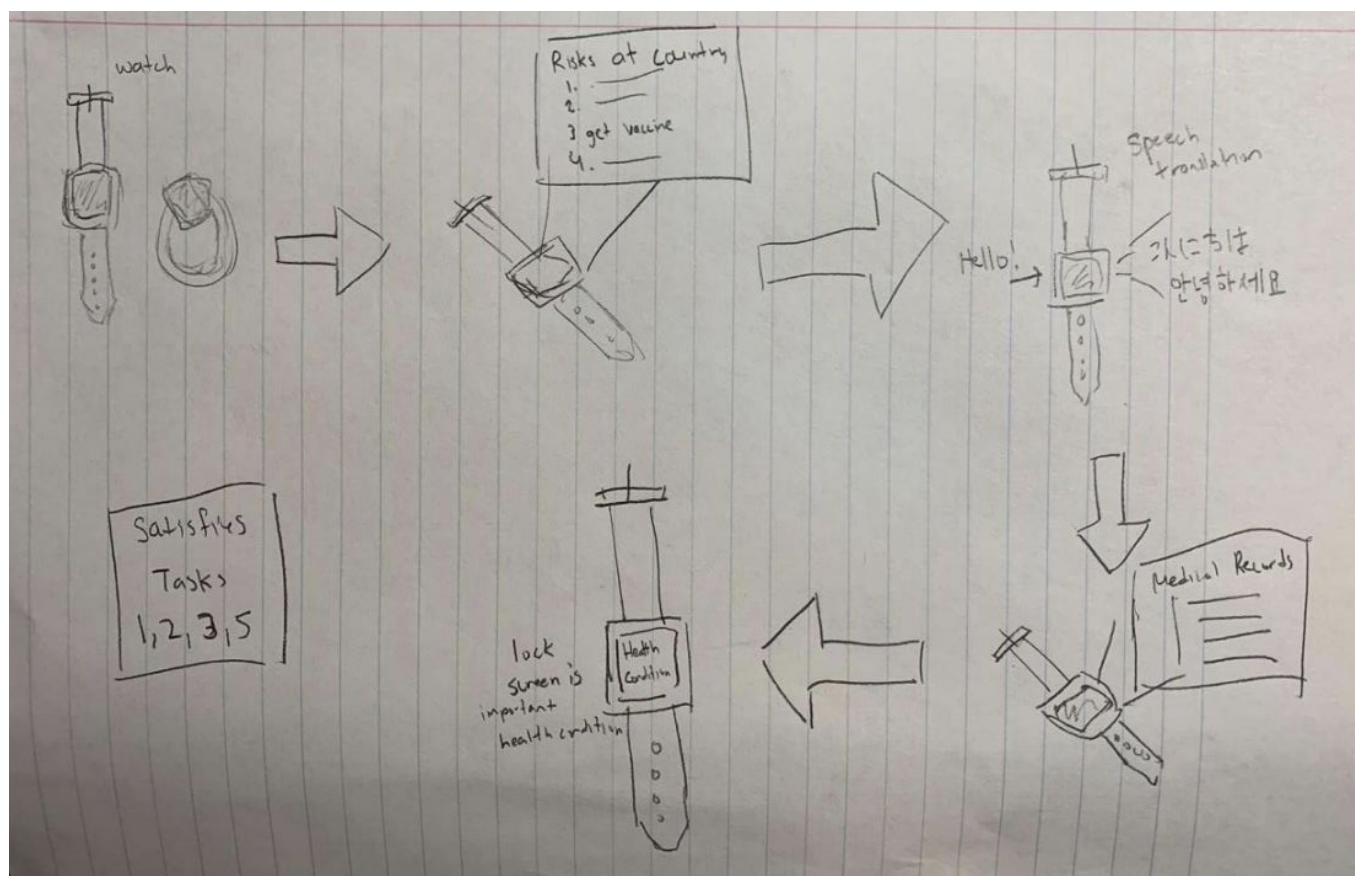
In this design, we decided to take the approach of making the device something that many people are getting quite used to -- smart watches. Through this design we were able to achieve many of the tasks we decided to worked towards, including but not limited to: forecasting possible risks at the country you plan to travel to, helping communicate with local officials, containing all the users medical records, and make health conditions immediately obvious whenever needed. As seen on the storyboard above, whenever the user plans to travel to destination, the watch instantly conveys to

them based on their medical history and the possible health issues with traveling to that place. This is all happening all while still being able to hold your records and convey the needed information whenever requested.

Fanny Pack
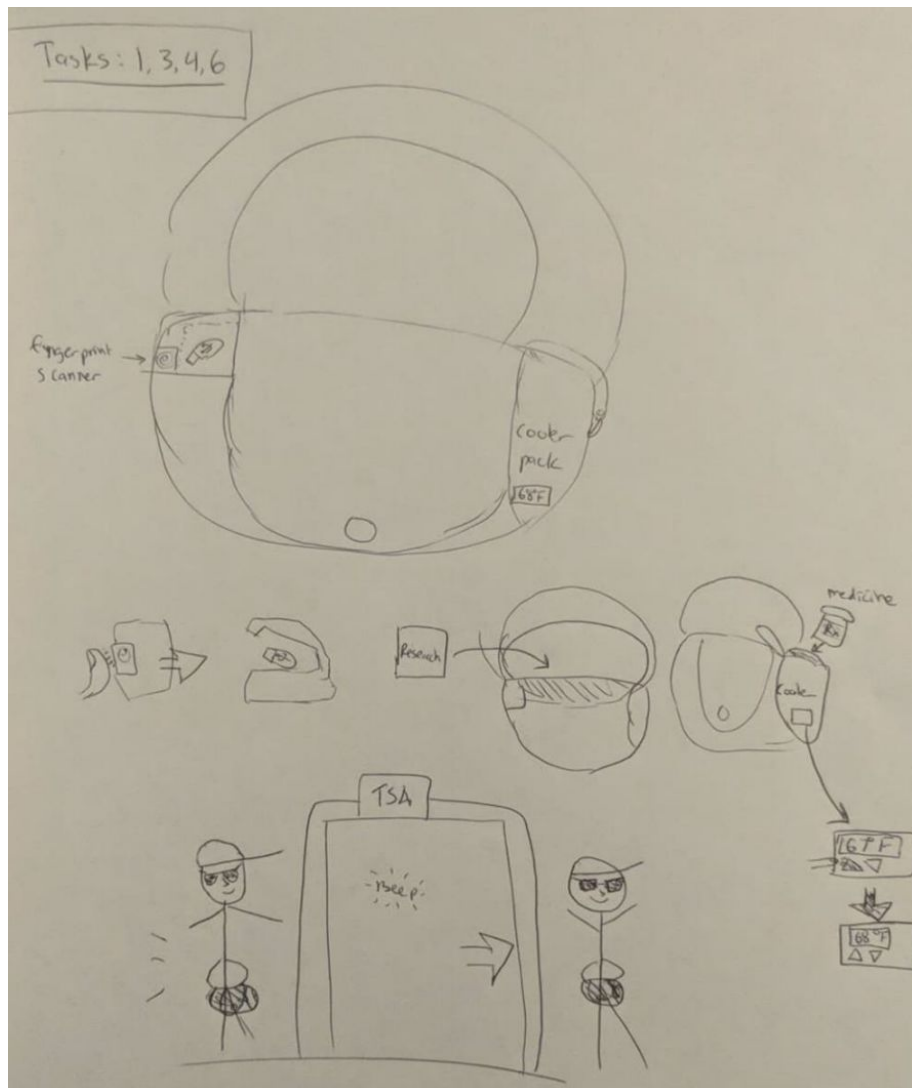
Through this design, we decided to expand our horizon, where rather then only focusing on medical records, we also focus on helping the user with there current medical needs. As seen in the storyboard above, through this "fanny pack" design, we are able to store temperature sensitive medication with ease in order to help the patient during their travel. Aside from doing so, we also offer a design that is still easy to carry around as well as still containing your medical records.

Selected Design

Through our intense screening process and discussing through all our designs as a team, we ended up deciding that the necklace design would be best suited for what we are trying to accomplish. We felt that through this design, we were able to effectively touch on all the tasks that we were trying to do in the best possible manner. We felt that a life sized prototype of this design would allow the user to use it with ease, without ever having it feel clunky in anyway.. While something like a fanny pack might get in the way in different scenarios and a watch might replace something already sitting on your wrist, a small necklace can always fit, never needs to be taken off and can always have the necklace concealed under a shirt/garment.

Written Scenarios - "1x2"

Medical History

Consider a middle aged woman named Karen with a severe nut allergy (Figure 1). She is flying to a foreign country which just so happens to have many foods which contain nuts. Not only is this country plagued with nuts, but also contains many pathogens that Karen is not immune to. Startled upon learning about this fact, Karen decides to go to the hospital to receive her immunization shots. Also, Karen brings along her medical necklace. Once at the hospital, Karen receives her shots and sees her doctor. Karen wants to have her nut allergy on file so that if she were to accidentally eat some nuts, she could go to the foreign hospital and explain her situation quickly. So, Karen unlocks her necklace with her fingerprint and hands it over to her doctor to update. The doctor fills her file with her medical conditions, as well as her immunization records. Now, Karen is ready for her vacation!

Language Translation

Karen is flying to South Korea (Figure 2). She brings her insulin pen with her just in case she accidentally comes into contact with a nut, but her pen is tragically lost by falling out of her bag during the flight. Upon arrival, Karen realizes her pen is gone, but the plane has already disappeared. She must find a new pen in this country, or risk literal death. She goes to the nearest hospital as soon as she can, and walks up to the front desk. She tries to make the motion of stabbing an epipen into her leg, but the receptionist frowns, not understanding. Karen then realizes she has our design, and takes out her USB by

scanning it with her finger, and inserts it into her laptop. She pulls up her medical records, and translates them to the appropriate language. She points to the area where "Nut allergy", but is now translated to Korean. The receptionist, now understanding, quickly calls in a doctor who can speak English. Karen and her vacation is saved!
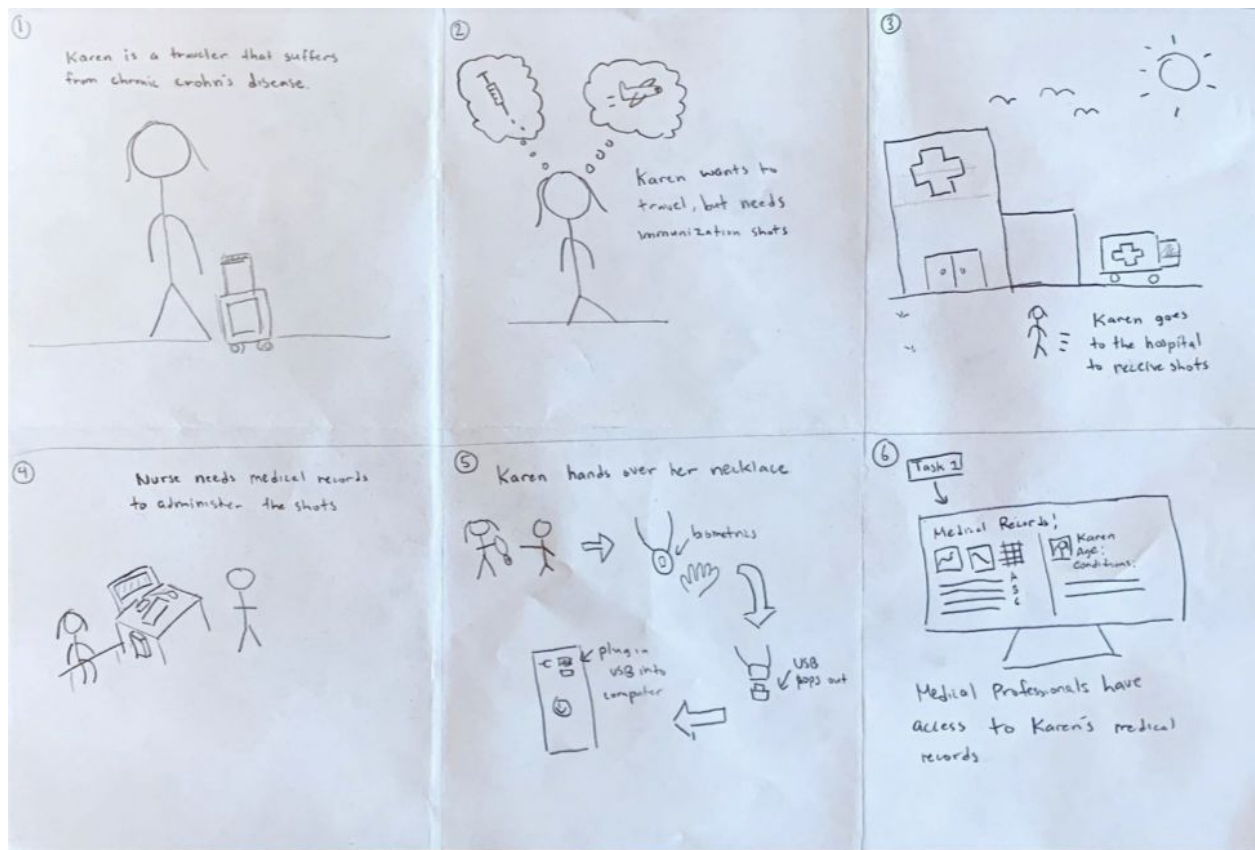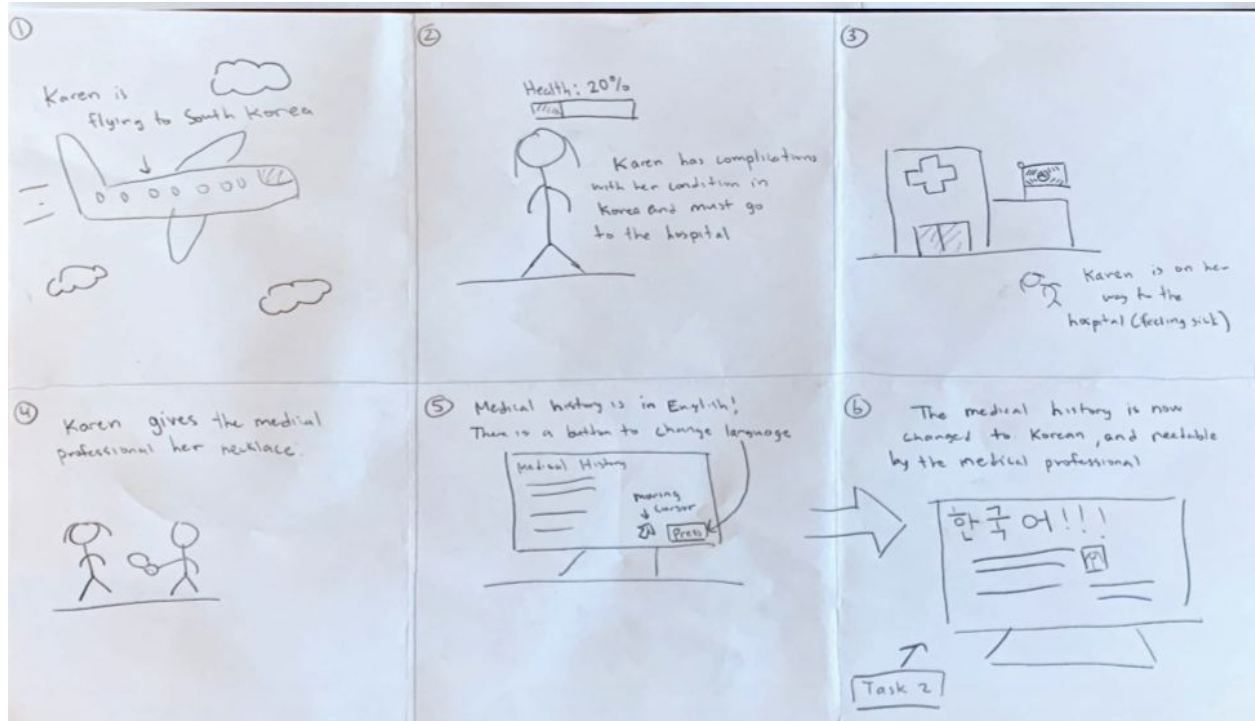
Storyboards of the Selected Design

Figure 1: Medical History

Figure 2: Language Translation