

## **WebClinic**

### **Task Analysis and Design Sketches**

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### **Problem and Solution Overview**

Forty-nine million Americans lack health insurance [4]. Every year, there are about 45,000 deaths from lack of health insurance [3], which is an estimate of about two and a half times higher than in 2002 [5]. The eroding health care “safety net” is largely to blame for this substantial increase in deaths [5] [1]. The health care “safety net” is a loosely organized collection of hospitals and clinics that provide charity care [1]. Eight-six percent of those in “safety net” settings are low income, and sixty-four percent are ethnic minorities [2]. This project aims to increase the quality level of health care among the poor and ethnic minorities by designing a web application that allows patients to communicate their illness to a volunteer medical professional and receive an accurate diagnosis and treatment plan at no cost.

### **Task Analysis Questions**

#### **Who is going to use the system?**

The application is designed for people seeking help on minor health-related issues, although it especially serves the uninsured, low-income, and immigrants. The application will also be used by doctors to provide medical diagnoses and advice.

#### **What tasks do they now perform?**

According to our contextual inquiry, there have been a variety of approaches that people use at the first signs of illness. We primarily focus on those unable to see a doctor in a typical clinic setting with insurance. Uninsured and low-income people can ultimately be driven to see a doctor, but without insurance they end up paying a lot of out-of-pocket money (as we found out with Sarah, one of our interviewees). Other alternatives for dealing with illnesses include consulting online medical information references (such as WebMD.com) and searching for related information to their symptoms. At worst, patients merely endure their symptoms as long as they can without seeking help.

#### **What tasks are desired?**

The uninsured and low income people do not see a doctor regularly because they are unable to afford the costs. These people desire a way to receive a medical diagnosis and treatment plan (at a low or free cost) that does not require hospital care. Additionally, immigrants (like our interviewees Lei and Guiling) who do not speak English, or are not yet comfortable interacting with American doctors, prefer to be treated by someone of their own language and culture. They need a way to be matched up with doctors of similar backgrounds when seeking medical help.

### **How are the tasks learned?**

WebClinic is designed as a web application. Use of WebClinic will require basic technical computer skills (e.g. using a keyboard, a mouse) and internet connectivity. For new (patient) users, WebClinic will walk the patient through creating an account, logging in, and populating his or her profile with general information. A simple, minimalist layout should also make it easy for users to get started creating a new case, with all necessary fields designated on the page. Once a doctor has replied to the patient's query, inbox notifications will remind the patient to read the doctor's reply to the question and get started on treatment.

### **Where are the tasks performed?**

All WebClinic tasks can be performed at home on the computer, or wherever there is public computer and internet access.

### **What's the relationship between customer & data?**

All the personal profile data that the patient user provides is private and inaccessible to any other person except for the doctor reviewing the case. A patient may additionally choose to divulge details of previous cases to the doctor (for reference for the current case), but only with explicit permission. Doctors, like in any other healthcare setting, are prohibited from sharing patient information with anyone else except the other doctors reviewing the case. Patient privacy is a primary concern in WebClinic and safeguards will be implemented to prevent any compromised patient data.

### **What other tools does the customer have?**

Users can avail themselves to other online resources such as WebMD.com and FamilyDoctor.org, as well as any physical health care "safety nets" such as publicly subsidized hospitals and clinics.

### **How do customers communicate with each other?**

Patients communicate with doctors by submitting health cases of their symptoms. Doctors communicate with patients by reviewing each case and following up with a diagnosis or further questions. No other communication channels between patient users themselves are open. However, doctors can also communicate with each other in WebClinic's doctor-only forum, as well as comment on or verify suggested treatment by other doctors.

### **How often are the tasks performed?**

For the patient, a person creates new cases when s/he is feeling ill and needs a diagnosis and treatment plan from a doctor. Doctors can answer queries whenever s/he has time to dedicate. The frequencies of any performed task will depend on the users.

### **What are the time constraints on the tasks?**

Patients do not have any time constraints on their tasks (creating new cases). Doctors, however, are required to answer any "taken" queries within approximately one week. Any proposed diagnose and treatment must also be verified by three other doctors within this time frame.

### **What happens when things go wrong?**

When a patient makes an error making a profile of their illness, s/he can edit their profile to correct it. There is also the possibility that a doctor may misdiagnose the patient and prescribe incorrect treatment. To avoid errors with diagnosis, we will have three doctors per case to verify that the original diagnosis and treatment plans are appropriate. This is designed to be a safeguard against liability issues and potential malpractice suits.

## **Current Versions of Tasks**

- **Task 1: Creating a new User Profile:** Create a new WebClinic user profile that includes your name, gender, date of birth, and information about past illnesses or medical conditions. Set your preferred language and click "Submit".
- **Task 2: Create a new case:** You already possess a WebClinic account but are now suffering from an unknown ailment with several symptoms, including physical symptoms. After logging in to WebClinic, create a new case listing your symptoms and upload images that are relevant to your physical ailment. Finish creating a new case by verifying your information and click "Submit".
- **Task 3: Check on your previously submitted case:** Having submitted a case a couple of days ago, log-in to WebClinic and read your WebClinic e-mail response from a WebClinic doctor regarding your submitted case. Reply to the doctor by

using the WebClinic e-mail system and answer the question that the doctor asks you.

## **Storyboards for Interface Designs**

### **Storyboard 1**

#### *Inline UI Design*

This storyboard focuses on all of the features being inline (not drilling into another page), with an understanding that this may impact the cognitive load since there are multiple features on one page. For example, on the “Create a case” page there are the “Create a case” features, the news features, and the user profile features. The inspiration for this storyboard is simplicity, with the focus on trying to not look like a medical application. Task 2 is described for this storyboard.

Task 1 Focus

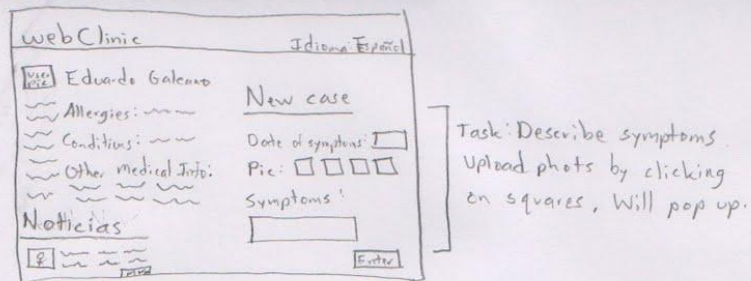
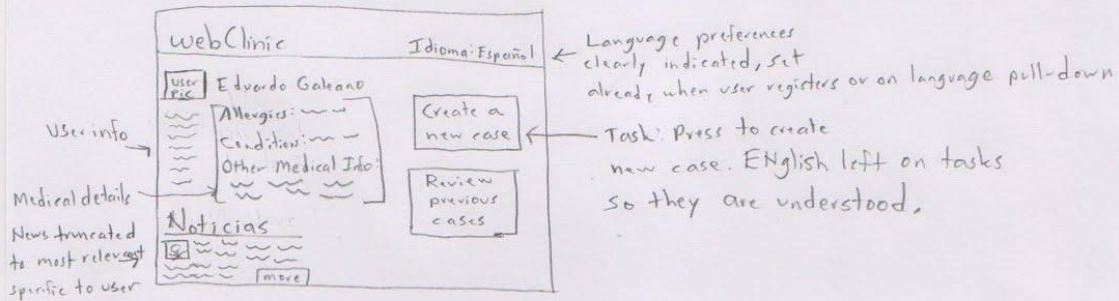
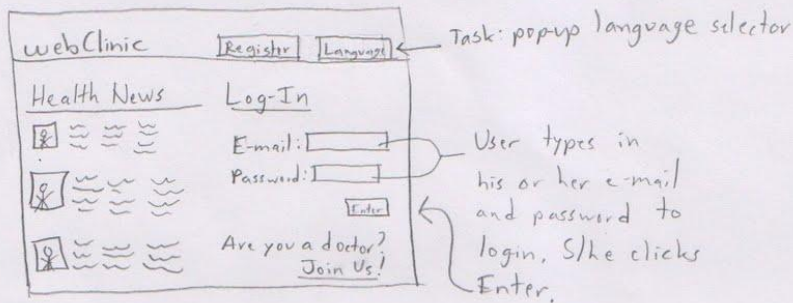


Figure 1 Inline UI

## Storyboard 2

### Discussion-driven UI

The unique feature in this storyboard is the email system. It is designed in a discussion board format, when users check their WebClinic e-mail, they can see their original cases on the top and doctor's replies on the bottom with the doctor's name and picture. When using WebClinic, users may lack a feeling of personal interaction with doctors, and the purpose of this design is to make users feel more personally connected with doctors when using Webclinic e-mail. Storyboard 2 is a flow chart of a user logging in, creating a new case and checking e-mail on WebClinic.

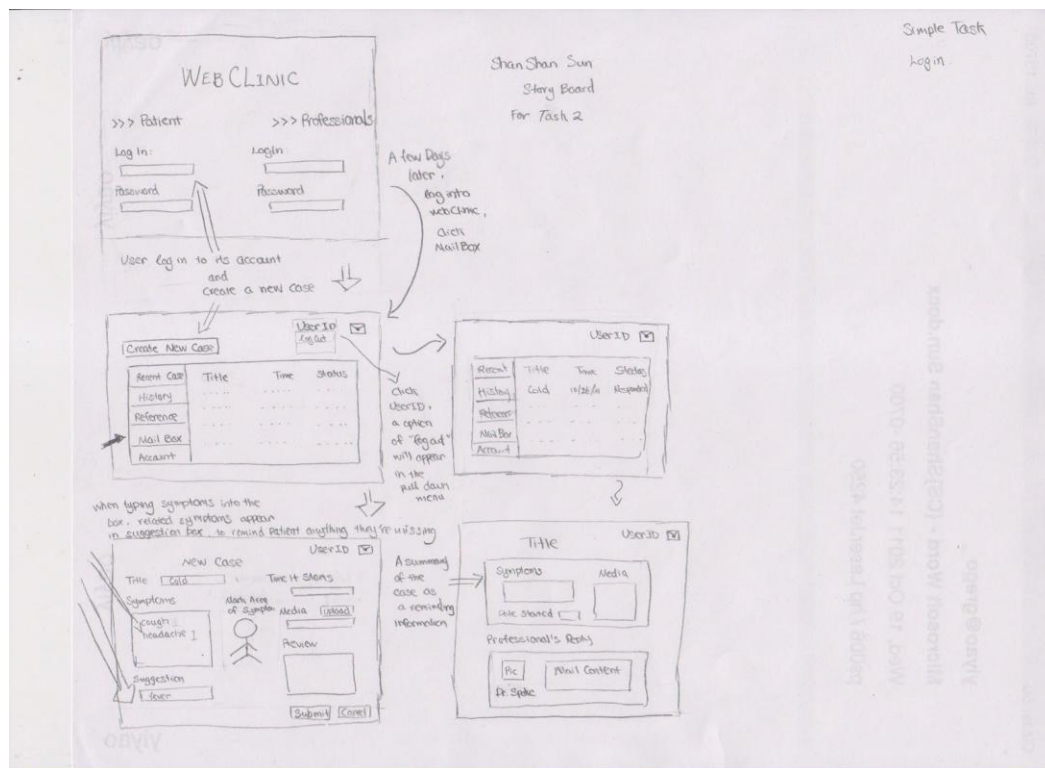


Figure 2 Discussion-driven UI

### Storyboard 3

#### *Wizard-inspired UI*

Mimicking a Wizard UI, this storyboard presents to the user a step-by-step structure in creating a new case. Similar to installing new software on a computer, the user is taken through a step by step process to accomplish a specific task. This UI takes the “wizard” idea and shows how users can go through the process of creating a new case in WebClinic. As seen below, each “step” includes inputs on the left side and explanations/details on the right.

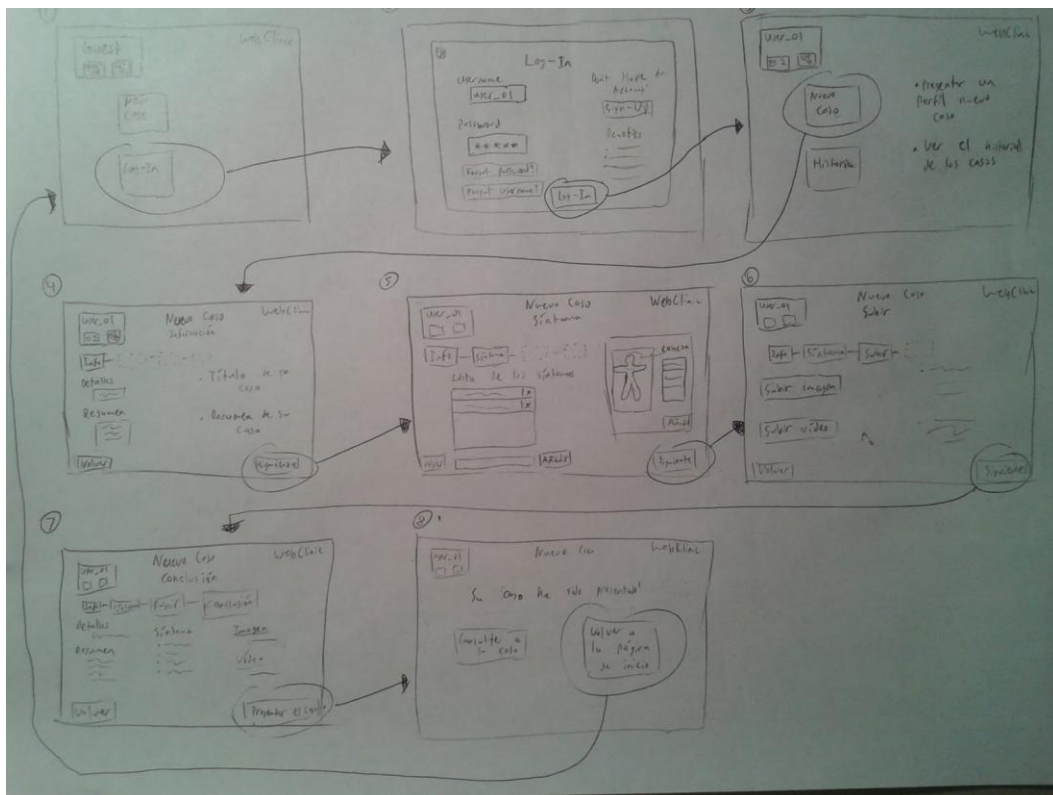


Figure 3 Wizard-inspired UI

#### Selected Interface Design

The interface design we selected focuses on context-of-use, simplicity, effective visible language, and consistency. Although our chosen interface is similar to storyboard #1, we added a navigational menu to improve user workflow.

## **Reasoning for selected design**

Our selected design does not look like a medical web application. We focused on a design that is approachable and friendly, lessening the seemingly daunting task of explain a medical condition. We were inspired by Mint.com, a website that helps people improve their financial lives by setting personal budgets, categorize transactions, among other features. Mint.com is approachable and trustworthy, two principles that we aspire to include in our design.

### *Approachable*

The contextual design of our UI was based on our contextual inquiry, when we visited our users in their homes. We believe it is best to distance WebClinic from belonging in a medical office, so that users can more easily identify with it in their own homes. This is done by providing users with their own profile on the site and allowing them to add information, such as medical history and other information such as allergies to their profiles. We also want to communicate simply, for example, when a user creates a new case (explaining a condition), we communicate that s/he can do it in only three steps.

Note: Although users are adding information about themselves, WebClinic is *not* a social networking site where other users can see each other's profiles. Only doctors can view patient profiles. Additionally, the user-interface is simple, affords clear and specific screen real estate for effective visible language, and is consistent throughout the entire interface.

### *Trustworthy*

When a user registers to become a WebClinic member, we want him or her to understand exactly what WebClinic will do to ensure their safety and security. When a user creates a new case, we will emphasize our site security in a fun and friendly way so that users aren't deterred from using the website.

## **Functionality Summary**

### *Register (Figure 4)*

This functionality button is on the main screen of the UI. We decided to have the user click "Register" on the screen so that they are taken to a registration page. We want to clearly explain what WebClinic is and isn't, so that we can avoid liability issues and make the user feel safe and secure while using the website. User registers their name,



date of birth, password, among other features. This information is preloaded onto the user profile page.

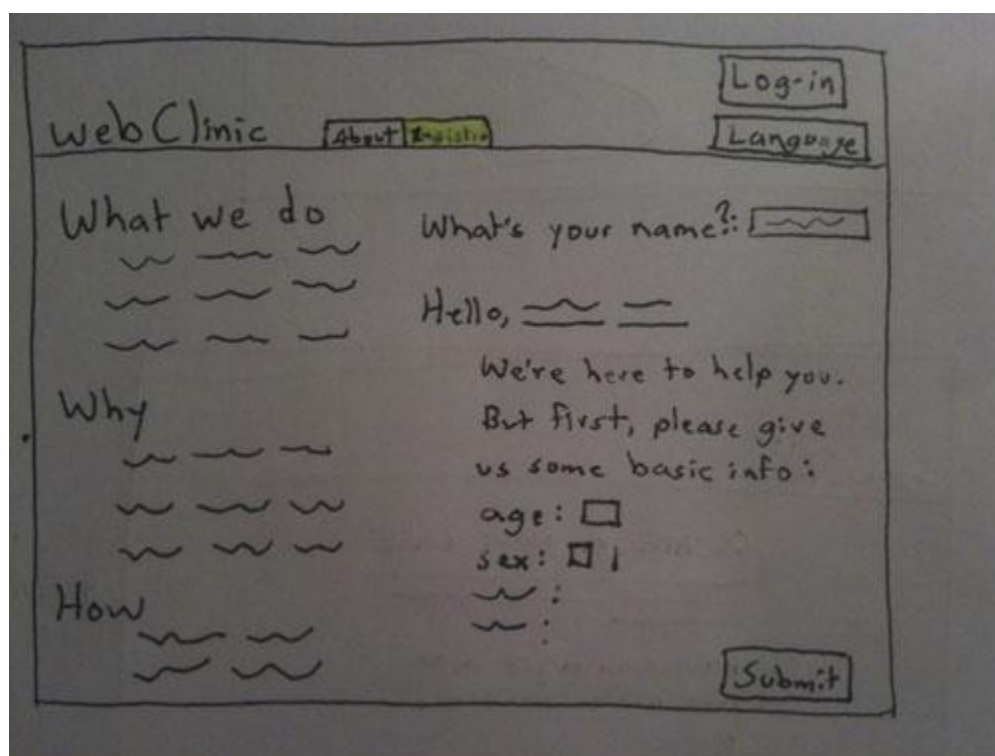


Figure 4 Registration UI

### *Choose a language*

A user can choose his or her default language in the registration page, but can change the language anytime on any page. This feature allows the user flexibility because many of our target users are ethnic minorities.

### *Read about (Figure 4)*

A user can click on the “About” tab on the navigation menu and learn about basic information about WebClinic and what it can provide users.

### *Read news (Figure 5)*

A user can read health news (most popular news and recent news) on the main page. When the user logs in, the health news provided will be selected from keywords that correspond to words and terms in the user profile’s page. This may worry some of our users that we may be invading their privacy by making health news user-specific, and

we will have to do further research to better understand how to encourage users to see the value in user-specific news information.

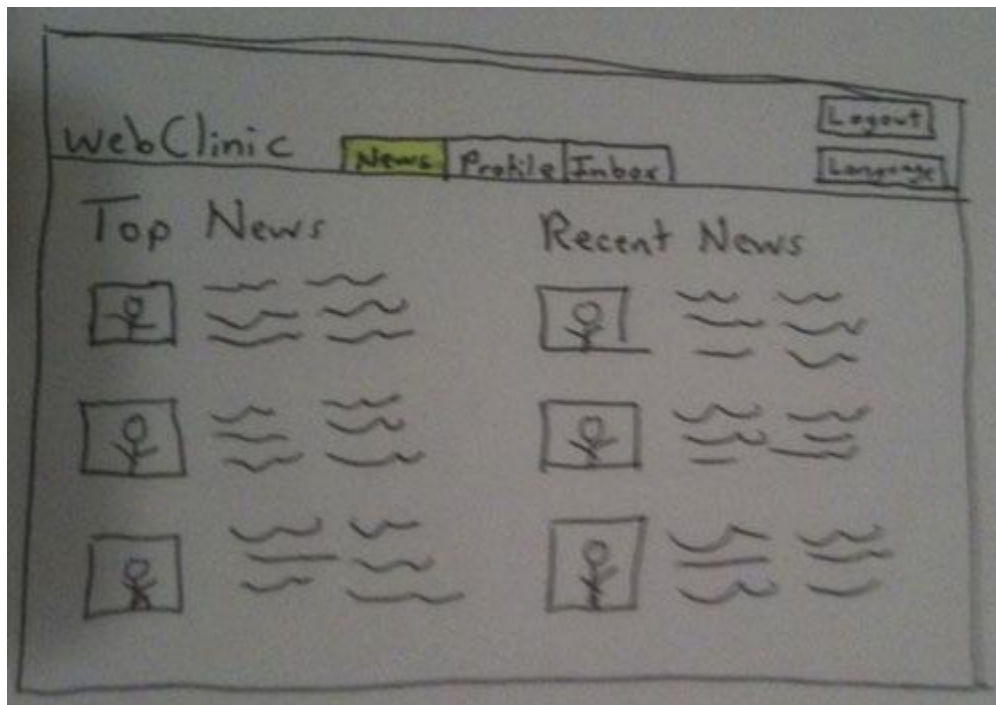
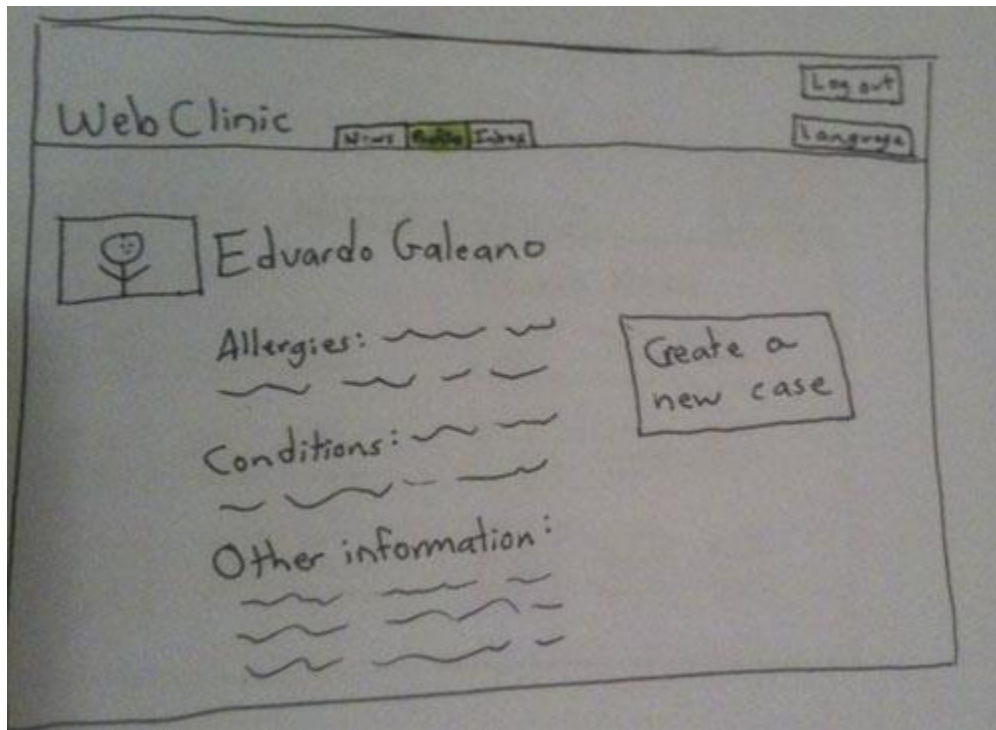


Figure 5 News UI

### *Read user profile (Figure 6)*

A user can read only their own user profile. Profiles of the doctors that will be helping them will be added at a later design stage. In the profile, a user can edit their information and read the information that was preloaded from the registration page.



**Figure 6 Profile UI**

### *Upload picture (figure 7)*

A user can upload a picture on their profile page so that they can personalize their WebClinic experience. Users will also use the upload picture feature when they create a new case, uploading a picture of a rash or a cut that a doctor may need to see. Users can upload a picture by clicking on the square. The pictures are automatically thumbnailed in the square, but can be made larger simply by clicking on them.

### *Create a new case (figure 7)*

A user can create a new health case in this feature. This feature is accessed by clicking on the “Create a new case” button on the user profile page.

First, we will explain this to the user:

“When you make a new case, we’ll only share it with our team of medically certified team of doctors. On this page you can create a new case, it’s as easy as 1, 2, 3:”

1. When the symptoms first began (radio buttons to ensure easy of use)
2. Describe their symptoms, and any other information that may be relevant to the medical professions.

3. Upload pictures if the sickness or ailment has a visual component.

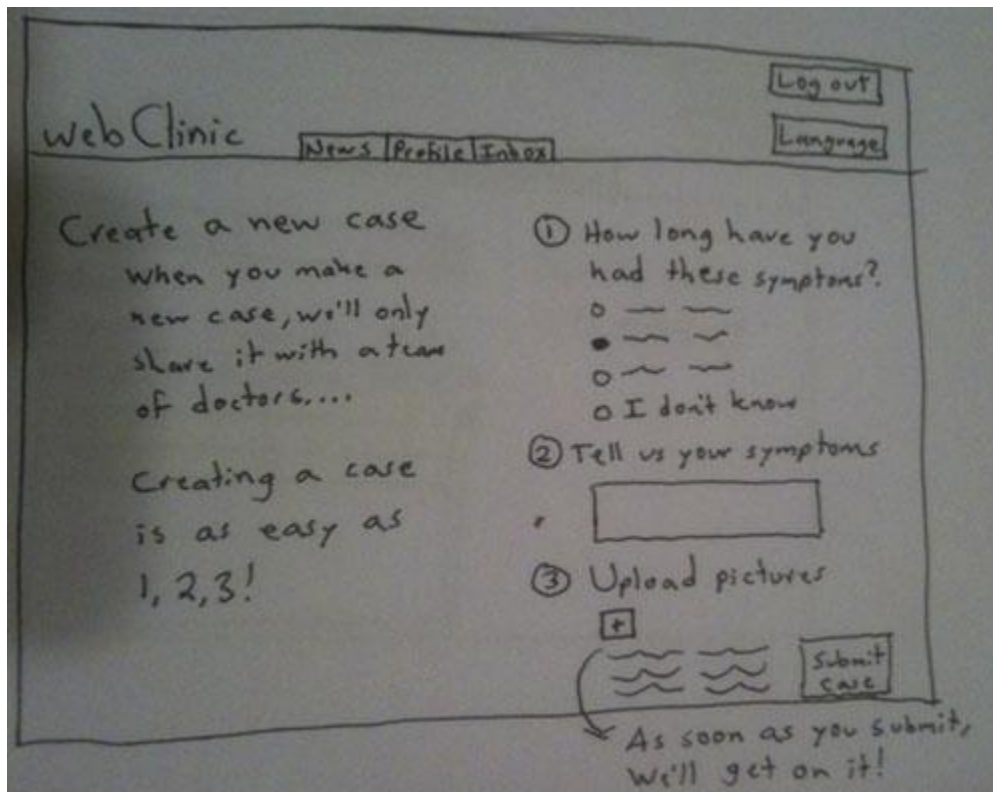


Figure 7 Create a new case UI

*Review cases/Inbox (figure 8)*

A user can review his or her health history and view mail from doctors. The cases listed are ordered by date. To access a history, s/he should click on the case in the Inbox (located in the navigation menu). In the inbox, a user can also compose mail.

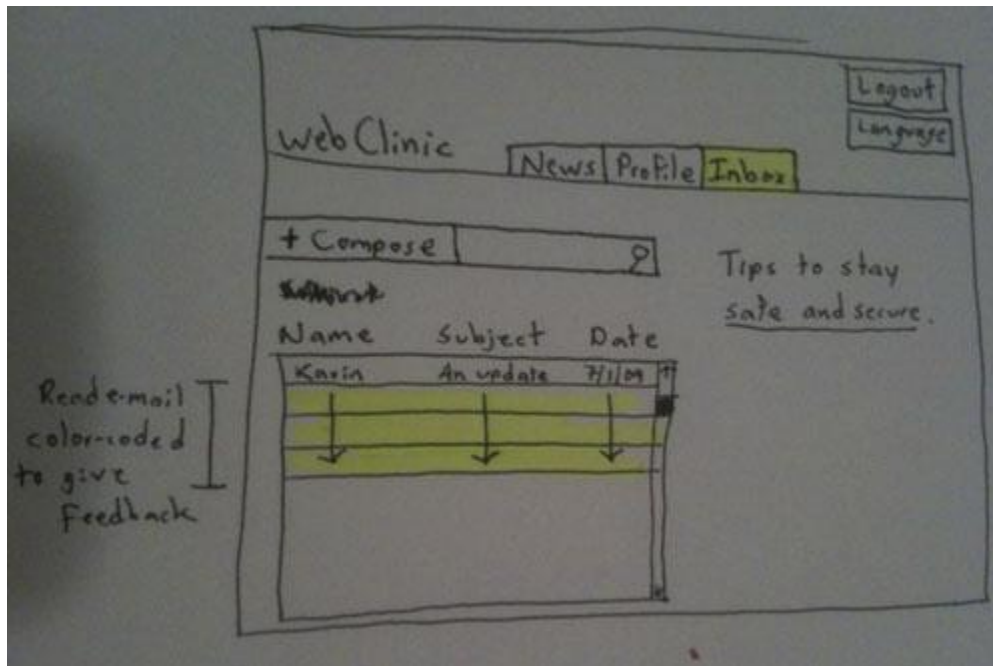


Figure 8 Inbox UI

## Interface Description

The UI we selected is simple, because in our contextual inquiry we found that most of our target users are too busy to bother with a feature-packed interface. We were inspired to choose a UI that communicates an effective visible language, which focuses on organizing a clear conceptual structure for the user. Since our target users may not be well educated or busy, we want to make sure the design places distinct emphasis on how the website is structured. This means all of the items in the navigational menu are “view” items, while create a case is an “action” item.

All of the screens in the UI are consistent, since our users are busy we want them to repeatedly use the website if there is a need.

Note: No back buttons are provided on the user-interface because they are expected to have this button already on their browser.

## Scenarios Corresponding to Tasks

### Scenario 1: Creating a WebClinic profile

Francisca, 24, is an immigrant resident, having only moved to the United States recently.

Her first language is Spanish and she does not speak much English. In the event that she gets ill, Francisca would prefer to speak with a Spanish speaking medical professional, but she doesn't know any in the area. Upon hearing about WebClinic's multilingual support, Francisca decides to create a profile on WebClinic. When she opens the website for the first time (in English by default), she sees the language option on the top of welcome homepage. She selects her preferred language as Spanish. All text on the website is now presented in Spanish. Next, Francisca continues by clicking the Register button. She reads about how WebClinic works, and fills out the form with her name, gender, date of birth, information about past and current conditions, her email and new password, language preference, and submits this information.

Having just created her WebClinic account, she is now brought to her newly populated profile page. Francisca notices a blank default photo is currently assigned to her profile; she clicks on the default photo to upload her own photo. She also notices a news tab on her profile page and clicks on it also. With all the text in Spanish, Francisca finds it easy to interact with WebClinic and access a wealth of health resources whenever she logs in.

### **Scenario 2: Creating and submitting a new case**

Lenny, 42, is a middle-aged man who works long, stressful hours at work every day. He has noticed some minor chest pains recently. A while ago Lenny suffered a heart attack, and is now taking some medications. He is not sure if these current chest pains are temporary or if they're a sign of something more serious, but does not want to go through the trouble of setting up a doctor appointment.

Lenny remembers that he has previously created an account on WebClinic, so he logs onto his account. Logging in brings him to his personal home page. Lenny clicks on his "Profile" tab. In his profile, he clicks "Create a new case". He is now brought to the Create a New Case form. Following the question fields, Lenny indicates how long he's experienced these chest pains. In the symptom box, he enters his symptoms (aided by autosuggest) and describes his past heart history. He also takes a photograph of himself and marks the area where he feels the pain, and uploads this photo to the form. After verifying all the information, he submits his case. WebClinic assures him that his case will be reviewed quickly.

### **Scenario 3: Following up on doctor's reply on submitted case**

Kelly, 35, is a middle-class citizen of modest income. She was injured recently on a rock climbing trip and sprained her ankle. Even though she rested for a few days, she notices that her foot is discolored, swelling, and still in pain. Kelly finds that she's unable to put any pressure on this foot and it is hampering her ability to move or do work.

However, she has no health insurance and no way to pay the medical bill, if she were to visit a doctor. Because of this, Kelly has used WebClinic to receive advice for her sprain.

Kelly has now just received an email notification from WebClinic letting her know that her submitted case has been reviewed by a doctor. So she logs on to WebClinic again and clicks the "Inbox" tab. The new unread reply is listed at the top and Kelly opens it. The doctor has further questions about her foot. Kelly starts writing a reply to this conversation and sends her response. Kelly marvels that WebClinic's mailbox system is similar to her usual email account and finds it easy and secure to use.

## **Works Cited**

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17. Sept. 2009. PNHP. 19 Oct. 2011.

<[http://www.pnhp.org/news/2009/september/harvard\\_study\\_finds\\_.php](http://www.pnhp.org/news/2009/september/harvard_study_finds_.php)>.



## Appendix:

Early sketches and a feature list:

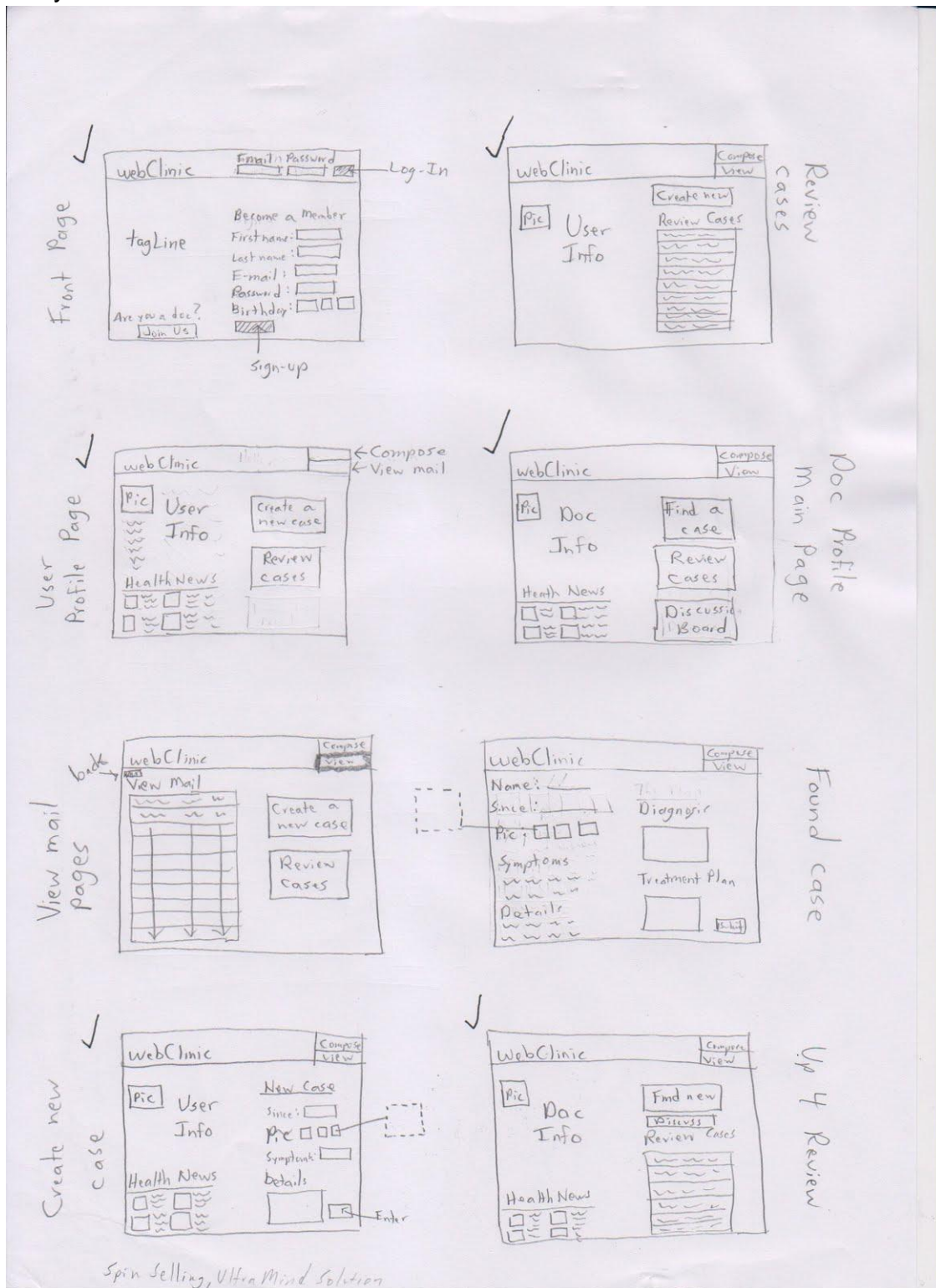


Figure 9 Early sketch, Inline design



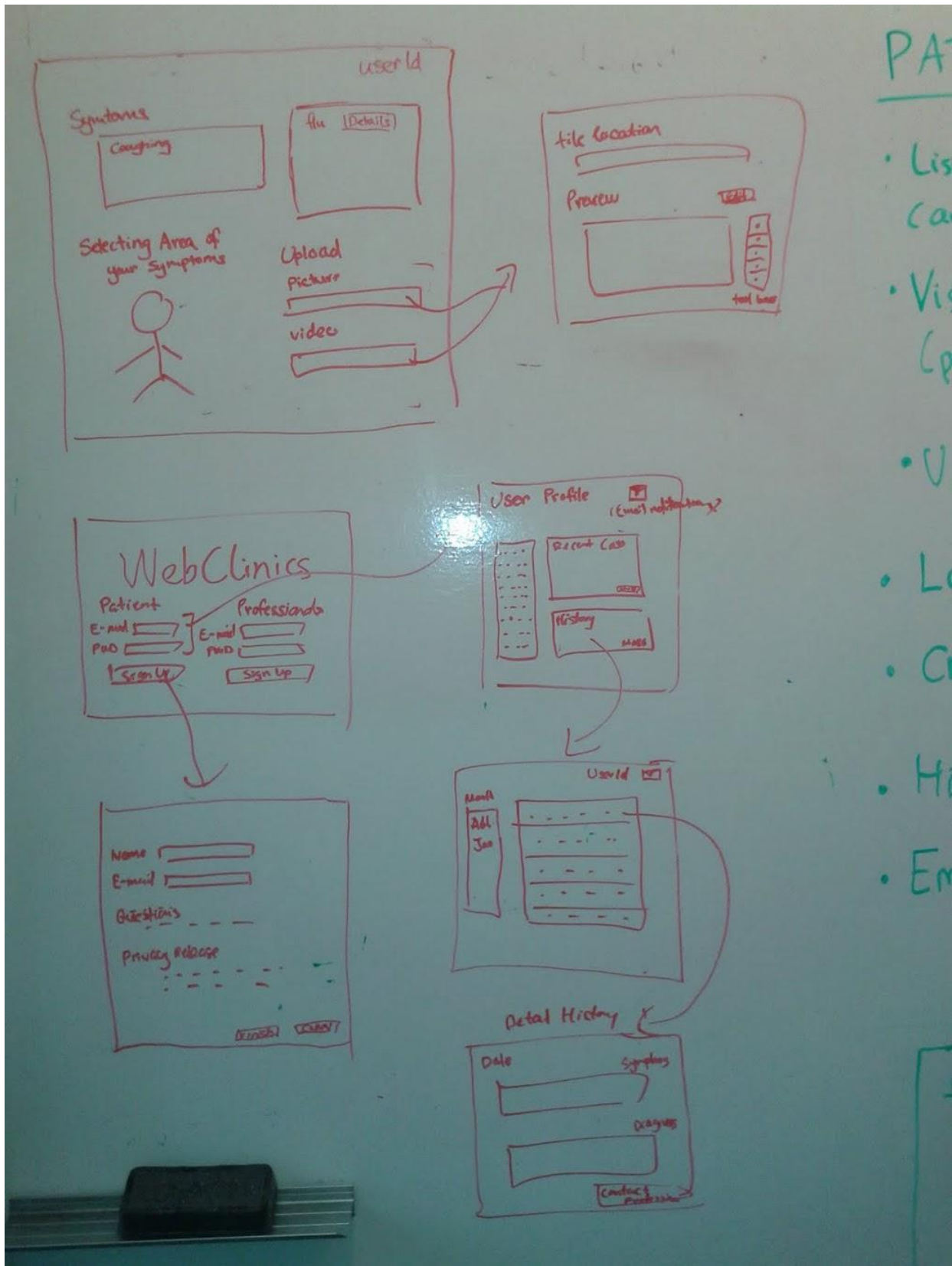


Figure 10

ual diagram like WebMD  
(ck region of body)

pload photos/video

login system (tied to email)

Create profile

history of cases

Email notification system

| My History |      | Search |
|------------|------|--------|
| Title      | Date | Doctor |
| -----      | 1/1  | -----  |
| -----      | 1/1  | -----  |
| -----      | 1/1  | -----  |
| -----      | 1/1  | -----  |
| -----      | 1/1  | -----  |

Next >

Create new case

Add Symptom:

|                  |        |   |
|------------------|--------|---|
| headache         | C...   | + |
| swelling of foot | callus |   |
|                  | corns  |   |
|                  | cough  |   |

Introduce region photos

Upload photos:

BROWSE

leg.png

foot.png

Upload videos:

BROWSE

Allow past history to be viewed?

SUBMIT

Welcome

Logout

Current Cases

NEW!

My history

Create new Case

Figure 11

# PATIENT

- List of symptoms to choose from (auto suggest?)
- Visual diagram like WebMD (pick region of body)
- Upload photos/video
- Login system (tied to email)
- Create profile
- History of cases
- Email notification system

Figure 12