

Final Report

Course: CPSC 481

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Date: June 24, 2018

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Executive Summary

One major problem patients face is waiting in a walk in clinic until their name is called. There does not exist any mechanism where a patient can check in from home and view the real-time status of their appointment.

We did preliminary research on staff and patients in a walk in clinic on the current patient processing/waitlist methods and on whether such a system to alleviate this problem would be helpful using interviews and observation. Key findings showed both patients and staff agreed that some form of a waitlist and check in application would be helpful.

Our walk-in clinic application has a three-component design. The first component is called the display client. It is a simple interface that displays information to the patients that are waiting in the walk-in clinic. It will be viewable from a large monitor in the clinic so that patients can easily see it. The second component is called the receptionist client. It is a desktop application that allows the receptionist to manage the waitlist and control how the whole system behaves. It will be installed on the receptionist's computer. The final component is a mobile application. Its basic purpose is to allow patients to check in to walk-in clinics from their mobile phones before they arrive. All applications also contain other features such viewable clinic hours and favourites. Low-fi prototypes were made using Balsamiq and Hi-fi prototypes were made using Axure.

A heuristic analysis on the applications revealed problems such as consistency across applications, lack of clarity in text choices, missing features, and lack of more in depth error recovery tools for end users. However all of the applications excelled in how simple and straightforward they were to use and the aesthetics and minimalist designs they employed.

User testing was done with 4 participants in individual 1 on 1 sessions and recorded using Camtasia. Some issues identified in the receptionist application were: difficulty with expected features when adding patients such as an automatic text field, the "add patient" field option not closing after a patient is entered, bugs when adding a patient with no name that causes a manually entered patient to be deleted, confusion with icon meanings, and unimplemented features such as themes were also an issue. For the mobile client the users found text hard to read, confusion whether check-in options needed to be completed, and difficulty in navigation to favorited clinics. Overall the users said they had a positive experience with the application and that the simple design of the applications made it easy to use.

The waitlist applications fill a significant need to improve the experience of both patients and walk in clinic staff. Both Lo-fi and Hi-fi prototypes were made, the latter which was successfully analyzed, and tested. Although key improvements need to be made to the applications the overall feedback was positive. The next steps are to: fix bugs, implement features, and fix readability. After this we will retest and re-evaluate our applications.

Introduction

Waiting in line can be a frustrating experience. It can be even more frustrating when you're sick. Patients across North America often face long wait times to see medical professionals. Walk-in clinics, especially those in population dense areas, can have wait times that prevent patients from seeing a doctor for hours. Thus, our project idea is a system specifically for targeting the problem of walk-in clinic wait list times and overall waitlist efficiency.

Design Problem

Our system is designed to address a number of problems, the primary problem being the frustration that long/ambiguous wait-times cause. The lack of transparency with the waitlist and the lack of feedback on the process can lead to the escalation of hostilities between patients and staff. To add to this at most walk-in clinics patients have to check-in in person and have to wait in the clinic because if they are not present when their name is called their name will be put on the back of the list. Patients can't wait in a more comfortable environment like their homes since they have no way of knowing where their name is on the list, and the estimated time it will take before their name is called. This creates a negative experience especially for a patient who is already sick. We want to solve this problem and allow patients to check-in, and monitor their status from the comfort of their own home. We hope that this will lead to a better patient experience and thus resultantly a more pleasant environment for the staff.

User Research and Findings

Research Methods

1. Interviews
2. Observation/ Fly on the wall

Justification for Methods

The Interview and Fly-on-the-wall methods complement each other nicely. The former is an “Ask” method, whereas the latter is a “Look” method. Additionally, each method has individual benefits, as described below:

Interview

1. We chose to use short open ended interviews because we believed that the detailed qualitative information that we received from this method would help us better understand all of the different stakeholders and how we could address their various needs.
2. Gives the interviewees the chance to bring up key points on the design issue that the interviewer did not think of.
3. Gives us a more direct and personal understanding about the design issue.

Fly on the Wall

1. We chose passive observation to observe processes not mentioned in the interviews (We get to see what people actually do within real contexts and time frames, rather than accepting what they say they did after the fact)
2. Low cost/effort to get qualitative data
3. Provides minimal bias and influence from the researcher
4. This can be done at any place

Summary of Research Methods

Interview

An interview consists of a formal meeting between two people, where questions are provided by the interviewer, for the interviewee. This procedure is designed with a specific purpose, to obtain information, qualities, attitudes, wishes, etc. from the interviewee. One of the most common types of interviews for this, is the structured interview, which follows formal procedure where the interviewer will ask predetermined questions. The interviewer has to make sure that the questions are open ended, and cover as much topics from the information that is desired from the interviewee.

To conduct the interviews, we visited a walk-in clinic and introduced ourselves as University of Calgary students that were working on a class project to help improve

the experience of patients and staff for walk-in clinics. We interviewed three patients and a receptionist. A doctor was not available to participate.

Questions for Patients

1. Do clinic wait times bother you? If so, what specifically about them bothers you?
2. Would you be interested in a mobile app or website that allows you to check in to a clinic from home? What features would you be interested in if we made one?
3. What information is important to you before you go to a clinic / while you are at the clinic?

Questions for Receptionist

1. Please describe some of your daily tasks, and explain how patients are matched with doctors and how the waitlist works, and any troubles you face daily that could perhaps be addressed
2. Do you think an App with a visualized waitlist would be beneficial to you and what features would you like to see?

Receptionist Interview

She said she was responsible for adding patients to her office's current system to be seen by the available doctors, getting the patient's file ready before they were seen by the doctors, scheduling appointments, completing tasks for the physicians, helping with administrative work, and answering phone calls. They use 2 lists. One for walk-ins and one for scheduled appointments. They also used an application called Medimap.ca where they enter the time it takes to see each patient so average estimates can be given. However when a client asks how long it will take they don't quote the data since it is often off and clients get upset if the wrong time is quoted.

She said that some of her key annoyances were:

- Patients continuously asking for their place in line
- Receiving phone calls asking for the hours of the clinic and how busy it is
- Aggression from patients that are mad about their wait times

She said that an application could be very beneficial however it must be very simple to use so that she doesn't have to dedicate extra time to using it on top of her already heavy workload, and it needs to always be working so that it's not a hassle to use i.e. no freezes and still working when the internet is down

Patient 1 Interview

Note: all the patient interviews have been anonymized to protect their privacy.

This patient is an older gentlemen. We asked him if it bothers him that he has to wait to see a doctor. He replied that he doesn't mind waiting for small amounts of time but that it can be a little frustrating once the wait-times start becoming longer. We asked him if there is anything specific that bothers him about the wait. He complained that the process of checking in and waiting lacks transparency. He said he would like to know approximately how long it will take for him to see a doctor for a given visit, but that clinic staff don't share this information.

The patient does not own a smartphone, so he didn't think a smartphone application would be of any use. He thought he might find a website a little useful, but said that he was more concerned about his experience in the clinic itself. He thought it would be great if the waiting list information was visible and updated to everyone sitting in the clinic. When asked what information is important to him, he said the only information he would like aside from the waiting times would be which doctors are in on a given day.

Patient 2 Interview

This patient said her main complaint was that wait times are too long. For her, going to a walk-in clinic means spending a significant portion of her day waiting at the walk-in clinic when she could be doing other things. As a result, she only goes when she feels it is really necessary. She couldn't schedule an appointment with her family doctor on short notice so the walk in clinic was her only option. She strongly disliked waiting and was afraid to go home and come back since she didn't want to miss having her name called and have to wait even more.

She said she was interested in an application where they could check-in from home. She said it would be nice to be able to monitor her wait time from home and come in when it is her turn. She expressed that she didn't like waiting in the clinic with sick people. She listed wait times, clinic busyness, and general clinic information, such as clinic hours as the information that is important to her.

Patient 3 Interview

This patient said he rarely goes to the walk-in clinic. He said he wasn't bothered by the wait times because "that's just how clinics are." However, he did concede that it would be nice to know his place in line.

He said the app sounds like a good idea but that he would only use it if it was convenient because of how little he goes to walk-in clinics. When asked about what

information is important to him, he mentioned that when he was deciding what clinic to go to he picked one that was close to him and had a good rating. He also said clinic busyness would have been nice to know so he could pick the clinic with the shortest wait.

Fly on the Wall

This method consists of observing and recording the behaviour of the participants' activities within its context. This allows us to secretly collect information just by looking and listening, separating the researcher from any direct involvement. This minimizes bias and researcher influence on the data collected. However there is a limit to the understanding of the researcher about the participants, since this method does not allow the researcher to follow up on the participants' experience. Being discrete and taking notes are the key to a successful observation. Trying to blend in will help the researcher minimize any unnatural behaviour from the participants, which helps create more valid data.

A team member sat in the clinic for approximately 30 minutes and observed the behavior of patients and staff. When a person walked in the receptionist asked them if they were in for an appointment or walk in. After that she asked them if it was their first time there. If they said yes she handed them a form to fill out and asked for their alberta health card number. If the patient answered no she asked them to write down their name on the list and to have a seat. The list had areas for the client to fill out: a box for reason of visit, is this a WBC case, phone number, and address.

Observing the patients waiting in the clinic, the team member observed that most of them were on their phones or reading. A nurse would come out and call a name and that person would get up and go into the doctor's office. If the person did not respond the nurse called out the name multiple times, crossed out the name and called the next one. The receptionist answered phone calls and told people which doctors were on, how busy the clinic was, and the hours of the clinic. There was one incident where a patient walked in after his name was called. The receptionist said he would have to wait all over again so he stormed off and out of the office. There was a "abuse of staff will not be tolerated" sign posted on the receptionist's desk.

Reflection on Research Methods

Regarding our research methods, our choice to use interviews proved to have benefits and drawbacks. Considering the benefits, we were able to gather detailed responses from three different types of patients, which was highly beneficial to our understanding of how different patients would use the system. Our interview with the receptionist was also very insightful, and we feel that the level of detail we got from

her responses would have been difficult to gather from a more indirect research method, such as a survey. That said, we were not able to sit down with anyone and have a formal interview. When our team member went to the walk-in clinic, the receptionist was on duty and couldn't provide a longer interview like we would have hoped. Likewise, the patients we interviewed were sick and waiting to see the doctor. So while we think our choice of using interviews was the correct one, given the chance we would have tried to schedule a couple formal interviews with people that could have talked longer. Another drawback of using interviews in this case was that they limited the size of the pool of users we gathered research data from. A survey would have been helpful in this regard, especially because it could have been quickly distributed to many people to gather a larger amount of data.

Our use of Fly-on-the-Wall observation was positive overall. We were able to gather observational data in a non-intrusive way, which ensured that our presence at the clinic didn't affect the data we recorded. Moreover, we were able to draw some insights into how the process of checking in to a walk-in clinic works, the roles that receptionists and nurses play in the process, and what receptionists are currently doing to manage wait times. The primary problem with this method was the time constraints the team was under. Our team member was only able to observe the clinic for approximately half-an-hour, limiting the amount of data he was able to collect. Had we had more time, we could have spent hours in the clinic gathering more data about user-scenarios and small things that would make our system more useful. It also would have been ideal if we had visited multiple clinics, as it seems likely that the check-in process varies to some extent for each clinic.

Design and Justification

Our walk-in clinic application has a three-component design. The first component is called the display client. It is a simple interface that displays information to the patients that are waiting in the walk-in clinic. It will be viewable from a large monitor in the clinic so that patients can easily see it. The second component is called the receptionist client. It is a desktop application that allows the receptionist to manage the waitlist and control how the whole system behaves. It will be installed on the receptionist's computer. The final component is a mobile application. Its basic purpose is to allow patients to check in to walk-in clinics from their mobile phones before they arrive, although it has other features that enhance the user experience.

Justification for Three-Component Design

We opted to go with a three-component design for several reasons. First, in our research we found that patients and receptionists were becoming frustrated because patients had no way of knowing how long their wait would be. Thus, we designed the display client to relay this information to patients and make the whole process more transparent. Additionally, we decided that the receptionist client was necessary because: A. Some patients will not use the mobile application and will simply walk into the clinic, making it necessary for the receptionist to be able to manually add people to the waitlist, and B. The receptionist is the most logical choice for an administrator who will control certain aspects of how the system behaves (i.e. inputting information about which doctors are on-duty). Finally, the inclusion of the mobile client was obvious, as the original intent of the system was to allow patients to check in to a clinic from anywhere. Since most people have smartphones, we opted to create an application for mobile.

Display Client Design & Justification

The display client is designed to be visible to all patients in the clinic via a monitor. It displays important information to the patients. This information includes the list of people in line, wait times, the list of doctors on duty, how busy the clinic is, the name of the clinic, and the time & date. The layout of the elements on the display remains static; the only thing that changes is the information itself (i.e. a patient is added to the waitlist, a doctor is set to “off duty,” etc.). At the bottom of the display is a “news ticker.” This is a small bar that displays static or scrolling text. The receptionist can customize what the news bar displays, including a news feed or a custom message. The display client is designed to have a very simple interface so that patients are able to get necessary information without being overloaded. In particular, we made the decision to include doctor status after talking to a gentleman who mentioned that he is only comfortable with a specific doctor at the clinic. We also made the decision to include the news ticker because: A. we saw patients on their phones as they were waiting, and B. we realized that it would be helpful to the receptionist to be able to display custom messages to the patients in the clinic. Our main objective when designing the display client was to have a clean interface that would be helpful to patients.

Receptionist Client Design & Justification

The receptionist client consists of two main pages: a homepage that allows the receptionist to manage the clinic waitlist, as well as a settings page that enables the receptionist to control certain application parameters. The homepage displays the

waitlist to the receptionist and allows them to add and delete patients from the waitlist, as well as move patients up and down the list. This feature gives the receptionist ultimate control over the waitlist, which is necessary for several reasons. First, some patients may choose to check in to the clinic in-person, meaning the receptionist needs a way to manually add patients to the list. Similarly, some patients may choose to leave the clinic, requiring them to be removed from the waitlist. Thus, the receptionist needs to be able to delete patients from the list. Finally, the receptionist needs a way to change the order of patients on the list, in case a situation arises in which one patient needs priority over another.

The homepage also has a notification bell at the top of the page that alerts the receptionist when a patient has checked in to the clinic. This was intended to be a simple, non-intrusive way to alert the receptionist to new check-ins. It allows the receptionist to see the notifications without obscuring the rest of the page. Finally, a settings icon allows the receptionist to open the settings page.

The settings page offer the receptionist the ability to control system parameters. These are broadly organized under the application, clinic information, doctor information, and news bar headings. Application settings concern how the display client appears, including its colour scheme, layout, and font size. Clinic information includes clinic-specific information, such as address and office hours. Doctor information relates to the doctors at the clinic and their schedules. Finally, news bar controls what information is displayed on the display client's news ticker. A help menu is also accessible from the settings page. We chose to design the settings page this way to provide a central location for all the settings/parameters in the application. Our thinking was that by centralizing all the settings, it would make the receptionist client more intuitive to use.

Mobile Client Design & Justification

The mobile client is designed for the android smartphone platform. It utilizes Google's material design style so as to be aesthetically pleasing and consistent with other application on the system. It may be broadly divided into several primary workflows: signing up / logging in, editing account information, finding a clinic, viewing a clinic, checking in to a clinic, viewing/cancelling a booking and saving a clinic.

When the user first opens the application they are presented with three options: sign up for an account, log in to your account, or skip sign-up (essentially the lazy sign-in ui pattern). The sign-up option guides the user through creating an account with the application; the user can use email, google, or facebook to create an account. Log in guides the user through signing in using an existing account. This process is similar

to the sign-up option but saves the user having to enter personal information. Lastly, the user can opt to skip in the sign-in process. In this case, the user does not create an account, simply entering some personal information and then proceeding to the rest of the application.

We decided that we wanted an account system so as to better facilitate features such as favourite clinics, most recent clinics, and to allow the user to switch between devices. Moreover, an account system allows repeat users to quickly sign-in to the app without entering all of their personal information every time. We opted to include the ability to sign in with Google and Facebook to make the process more efficient for power users. However, we also recognized that sometimes users would want to use our application without the inconvenience of creating an account. Therefore, we decided to include the option for users to skip creating an account and simply enter the necessary personal information.

Once the user has signed in, they have the option to edit their personal information. The user accesses the edit screen using a sandwich menu accessible from most screens in the application. From here, the user can alter their personal information and submit their changes. The rationale behind this feature was that it was very possible that a patient could misenter their personal information, and thus a way to correct mistakes is necessary.

The user can then find a clinic. A list of all the clinics in the system is presented to the user. The user can sort by parameters such as clinic rating and proximity. The list is also searchable. We included these features to make it easier for the user to find clinics that are relevant to them. Once the user finds a clinic they like, they can view its information, waitlist, and the doctors that are on duty. A picture of the clinic is included to provide a connection to the real world for the user. If they want to check-in to the clinic, the user clicks the check-in button and fills in the information in the pop-up that opens. Once they successfully submit, a screen appears indicating that they have successfully checked-in

From here, the user can view their current booking, with the option to cancel. We decided to provide the option for users to cancel from both the current booking screen and the clinic's information page for greater efficiency and versatility. Alternatively, the user can add the clinic to a list of their favourite clinics. Again, the user can do this from both the current booking screen and the clinic's information page. The list of favourite clinics is viewable from the "My Clinics" screen. We decided to add this feature so that users don't have to remember their favourite clinics, but can simply view and recall them.

Heuristic Evaluation and Findings

The following list of heuristics highlights how our system performed under the scrutiny of a heuristic evaluation.

1. Visibility of System Status

The mobile application clearly uses headers on each page (sign up, find a clinic, etc.) to show the user where they are. On the mobile application, when the user checks in to a clinic, a message is displayed indicating that the user successfully checked in to the clinic and the clinic is added to the user's Current Booking screen. In the settings for the receptionist's client, each of the section headers are highlighted based on which section is currently selected so that the user can always know which section they are currently on.

Regarding negatives, the sandwich menu that the user uses to navigate most of the application does not indicate to the user which page they are currently on (though headers are provided on the pages themselves. No indicators are provided anywhere in the app outside of the "Current Booking" screen to indicate that the user is currently checked into a clinic.

2. Match Between System and the Real World

Icons such as a gear and tool icon for settings or a bell icon for notifications are used to help the user relate functionality of the application with the applicable items. For the receptionist client features such as themes in the settings menu actually show a color preview. In the mobile application the real pictures of the clinics are shown further connecting the application to the real world. On the mobile application, hearts and stars are used to indicate favourite clinics and clinic ratings, respectively. This iconography is intuitive because it matches real world concepts.

Some of the iconography in the mobile app is not intuitive (specifically, the icons used in the sandwich menu, where a 'home' icon is used to represent the "Find a Clinic" page). Few attempts are made in the mobile application to use metaphor to make the interface more intuitive; the interface is presented in the form of lists of text.

3. User Control and Freedom

For the receptionist client the user can add new patients manually, delete patients, move patients around on the waitlist (not implemented), edit patient information (not

implemented), and change various settings associated with themes (not implemented), and text. Note a few buttons are dead/not working since they were not implemented due to time constraints. On the mobile application the user can easily move between states and edit things such as their favorites lists. The applications do not allow full control such as importing your own themes or changing the layout since we believe the tradeoffs i.e. losing a recognizable interface is not worth the perceived benefits of giving the users more control. Also deleting favorite clinics from the mobile application or deleting patients on the waitlist for the desktop application can not be undone. This is a major oversight since a user could accidentally delete this information and there is no way to quickly get it all back. An additional problem is that the user can currently only have one clinic saved in “My Clinics.” This lack of undo functionality is also an issue in the receptionist’s client where the receptionist might accidentally remove a patient from the list.

4. Consistency and Standards

The mobile application uses standard Android iconography for things such as settings, and search functions. The theme for the mobile application is unified under Android’s Material Design and no item has a duplicate meaning. The same can be said for the receptionist application with the exception in style choices to adhere more of a desktop environment instead of a mobile/touchscreen one. The settings for the receptionist client also includes a menu bar to select various settings section which is standard in many desktop applications.

Although consistency is preserved within applications, the same is not true between applications. An example is a wrench icon being used to represent settings in the mobile application compared to a gear icon being used to represent the same thing in the receptionist desktop application. Going forward we will try to bridge this divide and make the applications more consistent across the various components.

5. Error Prevention

When signing up for a new account the application does not allow the user to continue without filling out the required information. Moreover, when the user is about to cancel their appointment, the app notifies them and asks them if they are sure they want to cancel. Also the design of both the mobile and desktop applications are simple, streamlined, and there is appropriate spacing between buttons reducing accidental clicks. However in the desktop application, there is currently no mechanism to prevent blank patient or doctors names for the various data entry; this functionality may be useful since blank names are almost never intentional.

6. Recognition Rather than Recall

There are multiple parts of the different systems that allow users to quickly recognize and access the information or settings that they need. On the mobile application the pictures of clinics are added so a user can quickly recognize a clinic they are familiar with. There is also a favorites list, and “my appointment” for the mobile application. These elements allow the user to access clinics easily without having to remember clinic-specific information, such as name or address.

The mobile client does not provide a list of most recently visited clinics. This would have been a helpful addition that would allow users to recognize which clinics they recently visited rather than remembering their names. The mobile application also does not provide a map-like interface that allows users to find clinics on a map. Again, this would reduce the amount of information that the user has to remember.

7. Flexibility and Efficiency of Use

The mobile application has a lot of functionality. Always visible menus allow users to quickly find different information such as which doctors are on, clinic information, and/or appointment information. For the mobile application, certain functionalities are flexible in the sense that users can access them from multiple screens. Namely, this includes the favourite clinics functionality, which can be accessed from both a clinic’s information page and the “Current Booking” page. Users can navigate back and forward between pages for optimal efficiency. The receptionist client has a more simplified layout, but again, the interface was designed to make navigation quick and efficient.

The mobile app provides very few shortcuts for increased efficiency. That said, the application is quite simple, and therefore most tasks only require two - three clicks to accomplish. On the receptionist desktop client, it may have been useful to include keyboard shortcuts for more advanced users to increase the efficiency of their workflow. Again, we justified omitting this functionality because of the simplicity of the overall app, but it may have been useful nonetheless.

8. Aesthetic and Minimalist Design

All features are designed to be simple and easy to access. With exception of the news ticker on the clinic display, all the information in each application is relevant. The news ticker adds more functionality to display client at the expense of relevance, but it can be removed or customized by the receptionist to be more relevant. Each component utilizes space well without being cluttered. The mobile application

provides sorting and searching functionality on the clinic select page to help users manage the data available from that screen, simplifying the experience. The mobile application makes use of material design to ensure that it is aesthetically pleasing and minimalistic. Small touches such as different colours for different wait times and the use of a heart icon that becomes red when a clinic is in your favourites make the mobile application more aesthetically pleasing.

While the mobile app select clinic page has a lot of information on it, it provides the aforementioned sort and search tools. The “My Clinics” page however, does not provide these tools, meaning the page could quickly get cluttered with more clinics being added.

9. Help users Recognize, Diagnose, and Recover from Errors

In the signup phase for the mobile application, if the user doesn't enter the required information into a field, a message will tell them the specific information they are missing so that they can fill it out correctly. Also on the mobile app, if you are not checked in and you view the “Current Booking”, it will tell the user that they must check in first, thereby allowing them to recover from this erroneous situation. Unfortunately, for the edit information and sign up pages on the mobile app, every field requires that the user enter information directly into a textbox. If the information is wrong, the app does not alert the user that the information is wrong and will not be able to help the user fix the erroneous information.

10. Help and Documentation

The receptionist's desktop client currently includes a “Help” section within the settings component which offers a centralized area for referencing help-related information. This documentation also includes a link to our GitHub page to view more documentation and to view and add to the issue tracker. Furthermore, the mobile app includes a walkthrough for first-time users so that they can more easily learn how to use the application.

In terms of negatives, the mobile client does have a placeholder section for “Help”, but this is not currently populated due to time-constraints. Furthermore, it would be helpful for the user if the documentation was a little more spread out instead of just having a centralized section for documentation - for example, having mini help links throughout the system to elaborate on various workflow. Moreover, receptionists are unlikely to be familiar with GitHub and are unlikely to derive much benefit from it.

User Testing and Findings

We conducted user testing on four independent participants within varying technical expertise. The general purpose of the system and its components was explained to the participants. Participants were then asked to conduct specific tasks (listed below). After successfully completing the tasks, users were then asked some questions about how intuitive it was to complete the task, if there was anything that stood out as especially unintuitive, and what improvements could be made to help them get the tasks done better. All interactions were recorded on Camtasia.

Tasks

Receptionist Client

1. Add a patient to the list
2. Remove a patient from the list
3. Change the colour theme of the application
4. Change the clinic hours on Monday

Mobile Client

1. Sign up for an account using email
2. Find the closest clinic and check in to it
3. Cancel current booking
4. Find the clinic "Safeway" and add it to your favourite clinics. Find the favourite clinics screen.

Glen

- Receptionist Client
 - Adding a patient was very intuitive. When opening the dialogue box to add a patient, there was some confusion as to whether the field was selected. Suggest having the cursor automatically show up in the field when you open the box.
 - Deleting a patient was pretty easy. Participant wasn't sure which icon did what, suggested tooltip over each icon that tells you what it does
 - Changing theme: Easy for him to open settings, find the setting for theme. His complaint was that he didn't know if the change to them actually occurred when he clicked the theme.
 - For changing clinic hours, participant he had some difficulty figuring out what he had to click to change the hours. Moreover, the same issue

with not knowing whether his changes had been applied was present.
Overall, very intuitive

- Overall, found the application simple and easy to use. He wasn't too sure what the bell icon was for, he thought it might be for alarms. Otherwise, he thought it was very intuitive.
- Mobile Client
 - Found sign-in with email process intuitive, no immediate issues
 - Walkthrough was very confusing. User didn't know what was going on or what it was trying to do. Thought he had to click all the buttons to make the walkthrough proceed
 - Checking-in to the closest clinic near you
 - No problems with overall process. User did not opt to use sort to organize by proximity. One complaint was that it was difficult to make out the decimals in the clinic distances.
 - Cancelling booking: No problems, very simple task
 - Adding a clinic to favourites: This task was unfortunately compromised as the clinic in question was already added to favourites from a previous test run. However, the steps that the user followed to add the clinic to favourites were all correct up until it was revealed that the clinic had already been added to the favourites, which suggests that the process is quite intuitive. He also said that the heart icon is intuitive because it is universal to most applications. Moreover, the user had a little trouble finding favourite clinics afterwards. His one suggestion was that there be a home screen from which all features are accessible. He said that you assume that everything is accessible from the menu, but that it would be more intuitive if there was a home screen.
 - Overall very intuitive, but the walkthrough was definitely a sore spot

Renee (Receptionist)

- Receptionist Client
 - Found adding a patient very intuitive, no problems with it
 - For deleting a patient, found the process very intuitive. She said that the system she already uses at work has very similar functionality to it is intuitive for her. That said, she had to take a moment to figure out what to do, perhaps suggesting we could use better labelling.
 - She was able to very easily change the theme, although she wasn't sure if she successfully changed the theme or not. Some extra feedback is necessary.
 - Found it very easy to change clinic hours. Again, some feedback is necessary to indicate that the changes successfully occurred. She also

indicated that her system uses a more detailed, grid-style layout that allows greater configuration of clinic times.

- Overall, had very few issues with the application. It took her a moment to figure out how to exit the settings page to return to the main window, but nothing that would cause frustration.
- Mobile Client
 - Had no trouble signing up for an account with email
 - For finding and checking in to the clinic that was closest to her, she had some trouble. She made use of the sort feature, but it was not obvious to her that the sort actually worked. She also could not read the font for clinic distances, and so accidentally picked the wrong clinic.
 - The rest of the process was very intuitive for her
 - For cancelling her current booking she had no significant issues.
 - Had some difficulty adding “Safeway” to her favourite clinics. She was able to figure out how to do it, but only after clicking around a bit. Even after successfully adding it to her favourites, she wasn’t sure if she was successful. She said that she was uncertain about the ‘heart’ icon for favourites; text might be more helpful. She also had some difficulty figuring out where her favourite clinics were stored.
 - Overall, not too many problems with mobile application, but some notable issues that we will have to take into consideration in fixing design issues.

Beauty (Physician)

- Receptionist Client
 - Deleting a client was very simple no complaints
 - Adding a client was very simple, noticed that she started typing after she clicked add client but had to click the text box to enter the patient name
 - Easily navigated to the settings and choose the appropriate setting (although it currently doesn’t do anything)
 - Changed hours easily
 - Like that interface was simple to use but suggested perhaps making the interface a bit more visually pleasing
- Mobile Client
 - Found signing up through email easy and standard
 - Found finding nearest clinic more difficult because she had a hard time reading the text. Decimals were not easy to see (ended up picking wrong selection)
 - The check in and cancel options were found to be simple and intuitive, no complaints

- Finding a favourite clinic was a bit more difficult. Initially she went to my clinics and expected a search bar where she could find clinics, went to find clinics next and favorited clinic
- She was able to navigate easily to favorited clinics
- Suggested changing favourite symbol from heart because it is more associated with likes than favourites, to something more clear

Lally (Non-Tech User)

- Receptionist Client
 - Said deleting patients was easy, however noticed that she deleted the text in the textbox of the patient then pressed delete
 - When adding the patient she pressed add patient, added a blank patient, then edited the patient name through the text box, pressed add patient again and a bug occurred where two blank patients were added
 - Changing the settings was easy and intuitive
 - Changing the clinic hours was simple
 - Had no additional feedback
- Mobile Clinic
 - Found Sign up as straight forward
 - When asking to add the nearest clinic, she looked like she was squinting and chose the wrong one, also didn't use sort by proximity feature
 - Struggled with check in as she didn't know which fields she needed to fill out, adding optional fields on all data may help alleviate this problem or perhaps even simplifying this form
 - Found the clinic and added it to her favourites however had difficulty navigating to her favourite clinics screen, couldn't find the back button
 - She said that she is used to an iPad and more familiarity with the application may make it easier to use

Recommendations for Next Iteration of Design

For the next iteration of our design, we intend to primarily focus on addressing common suggestions and complaints associated with our system revealed during our user testing. Many users suggested possible features for the next iteration that could make the system more usable. Some users also complained about bugs that should be fixed to improve the overall experience. The following is a list of common suggestions and complaints along with our plans to address them:

Receptionist Client

- When you enter a name in the “Add Patient” dialogue and press submit, the dialogue box does not automatically close. We will automatically close this dialog box in the next iteration.
- There is a bug when adding a patient that allows empty fields to be inserted for patient names. This bug will be fixed in the next iteration.
- When adding a patient, the patient name textbox does not have focus by default. The next iteration will add focus by default.
- Confirmation message should appear when deleting patient from list. This feature will be added in the next iteration.
- For settings pages, there should be a button or a dialogue or something that the user either clicks or that alerts the user that the changes they’ve made have actually been applied. This confirmation in the form of a toast notification will be added in the next iteration.
- Some indicator should be given so that it is more obvious how the user changes the information for clinic/doctor hours. A brief explanation on the page will be provided in the next iteration.

Mobile Client

- There were a few suggestions made regarding the walkthrough functionality, namely that the walkthrough
 - Should have more detailed messages so that the user actually knows what’s going on
 - Should clearly state that it is a walkthrough
 - Should not require the user to interact with the UI elements to progress through the walkthrough.

In the next iteration, we will include “next” and “back” buttons with additional informational messages to make this more clear.

- Often the back buttons in the app blend with the background. The next iteration will increase the contrast between the back buttons and the rest of the page to make them more visible.
- The font for the “Find a Clinic” screen makes clinic distances with decimals hard to read. The next iteration will include a more readable font.
- A home screen would be useful to aggregate all the app’s features in one page. This feature will be implemented in the next iteration.
- Currently, all options in the check-in page are required fields. The next iteration will make all the less-important fields optional so as to expedite the process.

- One suggestion was to rename “My Clinics” to “Favourite Clinics” to make the purpose more clear. This will be changed in the next iteration.
- When adding a clinic to “My Clinics”, feedback such as a toast notification would be useful to indicate that the action was successful. This will be added to the next iteration.

Display Client

- For privacy reasons, the last names of patients in the display client should be removed. This will be implemented in the next iteration.

Conclusion

Our research of walk-in clinic patients and staff done via interviews and on site observation showed that a need for our walk-in clinic wait-list application exists. It also provided us with a unique insight that helped us ideate. We thought of a three component design consisting of: an in clinic display client viewed by patients and staff, a desktop client to be used by the receptionist, and a mobile application to be used by patients to check-in and monitor their status remotely. Through brainstorming and using Balsamiq we were able to create a Lo-fi prototype. From this Lo-fi prototype we created a more interactive Hi-fi prototype in Axure. After building our prototypes we went into the evaluation and testing phase of the design process. A heuristic analysis of our applications showed us that the applications had a simple to use and aesthetically pleasing minimalistic interface. However improvements needed to be made to text readability, consistency across platforms, and functionality. Our user testing recorded on Camtasia confirmed what we had discovered in our heuristic evaluation but also showed us the existence of unknown bugs in the receptionist client, and other botherations that could be improved upon such as text used for distance of the clinics in the mobile client, and functionality or processes that were missing across applications. After taking this feedback seriously our next steps are to correct these errors so that we can iterate, improve upon, and re-evaluate our designs so that they can be released in the future.