Team Scrubs - Part 4

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I. Description of Evaluation Techniques

To evaluate the Scrubs application, we put it through a full testing plan where users were given benchmark tasks to accomplish as well as surveys to obtain feedback. Our testing plan followed the initial requirements of our application where we wanted to limit the number of screens, support countries all across the globe, the app to be secure, and allow quick editing and viewing within Scrubs. Below we listed all of the benchmark tests and surveys for each requirement, as well as the user base that underwent the evaluation techniques.

Users of our Testing Plan

For our benchmark testing we had a total of **42** participants, where they mostly consisted of our close friends, roommates, and family members. Almost all of our close friends and roommates are students of Georgia Tech, so they are relatively between 19-22 years old and pretty familiar with traveling and technology. Our family members consisted of parents and siblings, where the parent's exposure to technology was not as in-depth as our siblings, roommates, or friends. In a more advanced testing plan one might point out that our participant pool was not very diverse and does not accurately reflect the population of the app's user base. The Scrubs team completely agrees, but due to time constraints and resources, we had to execute our testing plan on people nearby that were available. A company with unlimited resources would test an app like Scrubs on users with diverse backgrounds in traveling, countries of origin, and exposure to technology. We acknowledge that this is definitely the best way to go about it, but for the purposes of this class and project we used family members, friends, and roommates.

Limited Number of Screens

The first requirement was to limit the functionality of the application and the interface to make the experience as simple as possible. In the requirements we wanted all major actions taken by the user to be accessible from any screen in three clicks or less. The initial evaluation plan for this was to test all the major actions of the application like creating a profile, adding a trip, updating personal documentation, and editing contact information. To evaluate the truth behind this, we had the user start in three areas of the application: the login page, profile page, and trips page. In each of these starting points we asked them to perform one of the core actions. By evaluating the user performing these actions we can measure the amount of clicks and the overall time it takes to

navigate the application. An outline of the overall evaluation and detailed action sequences by the user are below.

Three starting points of the benchmark tests:

1. Login Page
2. Profile Page
3. Trips Page

From one of the three starting screens of Scrubs, measure the amount of clicks to perform the following actions:

1. Changing the current name from the contact information on their profile
2. Creating a new trip to Brazil within the next 3 months
3. Deleting any of the current emergency contacts
4. Adding a new immunization record
5. Updating their current doctor's telephone number

*** Note: When we say complete an action, we really mean navigate to the screen where that would occur. Because we just have a prototype and not the app fully built out, we want to see how they get to other pages in the interface.*

After each user was tested on these tasks from every starting point, the amount of clicks was recorded to complete each action. We then had user take a questionnaire measuring their experience on completing the goal within the *Scrubs* interface. The questionnaire is show below.

Simplicity of Screens Survey

1. Were you able to navigate to the task in three touches/clicks from all starting points?
2. If not, which starting point gave you trouble in completing the task in three clicks?
3. Which starting point seemed the easiest to navigate from?
4. Which core action was the simplest to complete?
5. Did you see anything about the interface that seemed unnecessary?
6. Were you able to find your task or a similar prompt in the app?
7. Any thoughts on the overall layout of the application?
8. If you weren't able to navigate the interface in three or less touches/clicks, what distracted you from the objective? Curiosity? Confusion? Similar naming for actions?

The results of the questionnaire and also the amount of clicks in the benchmark tests were used to evaluate the interface of Scrubs. Limiting the number of screens was a core requirement of our application, and this part of the evaluation plan was dedicated solely to it.

Support Countries across Globe

Another core requirement would be to provide support for a majority of the countries across the globe. The evaluation plan of this metric is easy as we can calculate the ratio of countries we support in a continent to the total amount of countries in the continent. We obviously need to make special metrics for continents like Australia and Antarctica, which are huge regions with no smaller countries. For those continents and also Oceania, we will define a metric on supporting 75% of the populated regions. Because massive regions of these continents and countries are uninhabited due to weather or other constraints, we will only look at the populated regions. From the regions that are populated, the necessary bar will be 75%, which is the same as North America, South America, Europe, Africa, and Asia. Our evaluation metric is defined more clearly below.

Evaluation metric formula for continents including North America, South America, Europe, Africa, and Asia:

> **Ratio** = number of countries or regions that Scrubs supports / total number of countries or regions in that Continent
>
> Goal: **Ratio** >= 0.75

This metric is a great way to measure our breadth, but we also developed a plan to evaluate supporting the regions that are popular travel destinations. For example, we wouldn't want to support Kazakhstan, while meeting our 75% goal, but neglect to provide medical requirements for India. Therefore, our ultimate goal is to support every country possible that has defined medical requirements. If that's not possible for some reason due to monetary or legal constraints, a rating system should be used to evaluate our current support of the world. This rating system would take into account the nation's population, transportation system, global economic influence, and amount of visitors. We decided to then survey participants asking them their home country, what destinations they visit frequently for vacation and work, and what nations they would like to visit. We are hoping that this rating system will give us insight on the most popular destinations that should be a priority for Scrubs to support. We have provided our survey below detailing how to gage which countries need to be supported.

Global Support Survey

1. Where is your national citizenship?
2. Have you ever left that nation/region?
3. Do you travel internationally for work, pleasure, or both?
4. What are your top three travel destinations for work?
5. What are your top three travel destinations for pleasure?

6. What are three places you would visit if money was not an issue?
7. What five nations/regions do you hear about most in the news, social media, and from entertainment?

From this survey, we can measure if *Scrubs* is supporting the globe that is beneficial to it's customer base. The participants from this section will be biased because they are fellow students and from this region, but for an international application this would not meet expectations. They should be uniform based on their country/region of origin, race, and average income.

Security

One of the most important aspects of our application is making sure our customers are comfortable providing their confidential information to *Scrubs.* To evaluate our security measures, the actual working prototype (with a backend and database) would have to be extensively tested and stressed. This however is beyond the scope of our class, but we can still very much evaluate the security of Scrubs user-interface.

Right now, we currently require a username and password to log into the application (which is pretty standard), and also a PIN number or a fingerprint ID. This PIN/fingerprint is used to give a third level of security to one's identification, and also provide access back into the application if it stays stagnant for more than a minute. To evaluate this strategy, we thought that feedback from potential users would be helpful on deciding if they would find the PIN security more comforting. Below is the questions used in the survey, but we really want to measure the level of comfort for the user. The amount of lockout time from the application can also be adjusted (like the iPhone lock settings) if the user wants it after five minutes, or maybe every time they open Scrubs.

Scrubs Security Survey

1. Are you comfortable giving an application access to your health records, social security, and contact information?
2. Does requiring a PIN/fingerprint ID on top of a username and password make you more at ease storing your personal information?
3. If so, how long would you want to be locked out before Scrubs prompts for your PIN/fingerprint?
4. Is one minute of inactivity annoying for you to re-input your PIN/fingerprint? If so, what would be your preferred time of absence?
5. If you are still not comfortable revealing your personal information to Scrubs, what level of security would you feel comfortable with?

This survey allowed our team insight into the customer's overall comfort level providing their pertinent medical and personal information. We then collected the results from the

survey questions and took that into consideration when making design decisions about whether to use the PIN feature, and how long the standard lockout should be for Scrubs.

Quick Editing & Viewing

The last requirement we had was quick editing and easy viewing of the data within Scrubs. Evaluating this included some research experiments of having the user interact with Scrubs in a stressful or distracting environment. These included the user performing an action while walking on campus between classes and a timed situation to complete an action. I have given both tests below that measured the participant's ability to perform an action within Scrubs during a stressful situation. In a perfect scenario one would avoid bias in the user's ability to handle technology in timed environment by getting participants from a variety of backgrounds and chosen at random. However, because of limitations from time and travel, we gaged these experiments on our roommates, friends, and family members.

Update Emergency Contact Information while walking on campus between classes:

1. Give the participant a starting point on campus, reasonable time limit, and ending place to finish (usually walk between finished and next class)
2. User must complete the task on *Scrubs* and reach their next class before it starts
3. Have the user complete the survey below about their experience

Make an account and add a new destination under Trips within five minutes:

1. Participant starts with a freshly downloaded version of the app on their phone
2. They are given a record already in the system to add to their profile under immunizations
3. Must complete this task in five minutes
4. Have the user complete the survey below about their experience

Scrubs Stress Tests Survey

1. Were you able to complete your task in the given time frame?
2. How stressful or stretched for time did you feel when trying to finish before reaching your next class or in under 5 minutes?
3. If so, what made navigating to the action difficult within the interface?
4. What was simple about using the interface?
5. Do you think you could complete the task while navigating through an airport or in another similarly stressful situation?

The evaluation is important because it measures the metrics under stress and time constraints to see if these actions are simple. The results from the survey and the two

experiments were used to gage and adjust if the interface properly allowed quick editing and viewing.

Summary

When evaluating our prototype, we wanted every core requirement to be extensively tested. We used a combination of benchmark tests and also surveys to gage potential users on each of the requirements. The data collected has been posted below in the document and has led to significant design modifications for Scrubs.

II. Evaluation Techniques Discussion & Rationale

Going beyond just the details of the evaluation plan, this section we will analyze why we chose the benchmark testing and surveys for each core requirement. Scrubs is an application aimed to solve a problem in a very specific market, and our core requirements were shaped around that. We therefore sculpted our benchmark tests and questionnaires for our 42 users so that each core requirement could be adequately evaluated. Below contains the details behind the rationale for our testing strategy for each requirement.

Users of our Testing Plan

The rationale behind choosing our friends, roommates, and family was simply due to the time and resource constraints. We had to test our prototype through the testing plan above and Part 3 in a very short amount of time, while we were on Thanksgiving break. Therefore, we thought it would be easy to have our family members go through the user testing, and also our roommates and close friends that we see on daily basis. We would have liked to have a more uniform sample of users that would accurately reflect the customers of Scrubs, but the situation did not allow for it. We are aware though if Scrubs was a product being released into the market, the user base for testing would have to be global and have a diverse background in traveling and technology.

Limited Number of Screens

For this core requirement, we really wanted to see if we were using the minimum amount of space for the users to complete their actions. Because Scrubs will be used while traveling, we really wanted to maximize the simplicity behind the application. Therefore, all of the survey questions and benchmark tasks from this section are geared towards measuring this goal.

First, let's assess why we chose to measure the number of clicks. Clicks on an interface is a very quantifiable way to measure the levels of depth between features in an application. If one wants to see the *distance* from A to B in an application, the amount of clicks by the user to perform this transition finds the answer. Of course, this is assuming that the user in question is not getting help or has a previous bias that would help him or her navigate the interface in fewer clicks. Clicks were chosen as a quantifiable way to measure the distance from common functions in the application.

We then not only wanted to measure the distance from the home screen, but every key area of the application for the user. Therefore, we chose the Login, Trips, and Profile pages to start the click test from.

Finally, we wanted to give the users in the benchmark tests actual challenges that they would face if using Scrubs while traveling. We first wanted them to just change their name on their profile, so we could measure the inline editing capabilities of Scrubs. After this, we asked them to do more advanced things like create an upcoming trip and adding an immunization record, arguably the most complicated tasks within Scrubs. These were tested as well to see if the most complicated action sequences could be completed by most users in under three clicks. Our goal was to diversify the types of actions so that they would expand across all aspects of the interface.

We also learned a lot with the benchmark tests we used for the amount of clicks test. The first thing is that the users easily learned after performing the action sequence from one starting point so it was almost no use to have them do it again from a different section of the application. We should have just picked one starting point, because most users when starting in a different place just navigated back home and re-used the same path from the first time. We did not consider this at all when trying to evaluate the amount of clicks from three starting pages in the app. We either should have just stuck with one starting page, or developed new tasks that the user needed to do while in Scrubs. Diversifying the tasks that the user needed to complete would have given a more accurate count for the amount of clicks needed to reach key areas in the app. However, the feedback from the questionnaire was very positive for questions that were direct and clear. Some of the open-ended questions resulted in vague answers, which really depended on the personality of the user. However, when we asked specific questions about aspects of the interface we were able to obtain very helpful feedback.

Support Countries across Globe

The rationale behind this requirement was very simple: we need to have a global product because our user base will hopefully be global as well. The ratio we calculated as supporting 75% of the nations in a continent would indeed support our requirement. We

could have done just the majority (over 50%) of nations or populated regions in a continent, but this seems to be the bare minimum. Therefore, our benchmark task was to evaluate supporting a greater figure, more as a goal that hopefully we can reach.

This task is hard to evaluate firstly because it completely depends on implementation, and this class only mocks the actual product. Therefore, we had to scrape the databases and online health information providers such as TravelSmart and the CDC to see if we could meet the metric. However, our rationale was that if we can support the majority of our users across the globe, we would actually create a universal health traveling companion. We also used the survey to make sure we weren't just supporting the majority of nations, but the most popular destinations. In the survey we chose the first few questions to understand the context of the user, where their home nation would indicate a lot about their cultural and travel preferences. We then wanted to see if they could ever be a potential user of Scrubs, by asking if they left their country of origin for travel. Question three went right along with two, gaging the wealth of the user and the kind of traveling they most often do, whether it's for business or pleasure. After understand some of the user's background, we wanted the survey to really focus on the most frequent and desired destinations. The last few questions ask for the top preferences of travel for work and also dream vacations. We did this to see the most desired locations on earth so that we can support those nations, but most importantly we must support countries that are frequently visited.

Overall, the goal of supporting 75% of a region was a high benchmark that is really out of our control. There are amazing resources online, but we have no say on the constant legalities changing for each individual nation. Even though it seems unpractical for our application to meet this benchmark, it still seems like a great goal if Scrubs was actually implemented as an application. The questionnaire proved to be extremely helpful, and part of the reasoning was that none of the questions were vague in any way. We asked very clear questions about their past experience with traveling, and gave the three responses for their dream or frequent destinations. This helped guide the users and narrowed down our results into a more manageable format. We learned that in future surveys and questionnaires we should give respondents a ballpark figure or example response, and make sure the question is direct.

Security

The rationale behind this design was to gage if users were comfortable sharing their critical information with Scrubs. We wanted to be sure with our current design using PIN/fingerprint ID and also a username and password that it would make our users feel secure. Therefore, we devised a testing plan to rate our current security in the eyes of potential users.

We really were only able to ask a survey to the users because our application is not implemented. If Scrubs was actually built out, we could have done major testing for a number of use cases. However, since we only have mockups, we wanted to gain the user's perspective on how the interface helps with the overall security of the application. The first question was just an introduction to the person's comfort with the technology, so we asked in general about sharing their medical information with an external application. After that, we asked specifically about Scrubs and how to improve its current security measures. We really wanted to gage if the PIN/fingerprint ID login made a significant difference to the user. We also wanted to measure how long the average person feels comfortable leaving their phone unlocked. Finally, if the user would never share their pertinent medical information with Scrubs, we wanted to know why? From this question we were trying to gage new features for the application that would enhance security and make people more comfortable using it.

Overall, we definitely benefitted from the feedback of users with the survey. Because the question were very pointed and required binary-type answers, we were able to get clear results. We also learned too though that security comfort of information is completely a personal thing. We could have made Scrubs the most secure application in the world and still had feedback that they customers would never share their personal information with Scrubs. We tried to capture the majority of responses for this section because the philosophies of sharing private information varies by a lot from person to person.

Quick Editing & Viewing

Lastly, we devised a testing plan to make sure that Scrubs allowed quick and easy access and editing. This was one of the core values of the application because users would be traveling while using the application. When traveling, no one has time to waste on trying to understand a complicated interface, especially when viewing from a mobile device. Therefore, the rationale behind this testing plan was the timed benchmark tasks and also a survey of feedback.

The first benchmark task was used to replicate navigating a crowded airport or unfamiliar city, like actual users of Scrubs. Walking on Georgia Tech's campus between classes and making changes on your phone can actually be quite difficult if the task takes complete focus. Therefore, we wanted to make sure editing contact information within Scrubs was so simple that you could multitask while doing it. We picked editing the emergency contact information because it's a critical function of the app, and it also should happen quite frequently.

For the second benchmark task, we wanted to gage how long the initial setup for a Scrubs account would take. We also added in creating a new trip, as this action should be frequent among the users. No one wants to download an app that takes a lot of

overhead to set up, so we wanted the Scrubs experience to be lean and only require things that are necessary. Creating a new trip should also be a fairly easy task, as most of the details come later like checking your medical records and immunizations. Therefore, we created this task to see if users were able to do this in a five minute time frame, which seems to be an average time currently to setup a new account.

We learned many things from the benchmark tests. For the task while walking through GT's campus, this was very hard to gage and control. All of our users took different paths across campus as their schedules were unique, so it was really hard to compare the data results. Some of the participants had heavy traffic while completing the task, while others walked by almost no one so it didn't really matter. After completing this test, the team learned that it should have been done in a controlled environment, so that the results could have been compared. Because the walk wasn't uniform in any way, it was very hard to take away how easy it is to edit information within the application.

Because the second task was a little more uniform, the results were more useful and had greater implications. We could actually take away that some of the participants struggled completing the task within the 5 minute time frame. It was helpful to see each user make a profile and add a new trip when they knew they were under a constraint. This test was uniform because we weren't relying on any external dependencies that could have given users different experiences. After performing the two benchmark tasks of this section, we learned that having a controlled environment for user testing is critical in order to have accurate data.

We finally finished our evaluation plan for testing quick editing and viewing by giving the participants a survey after the benchmark task. In this survey we emphasized how stressful the task was to complete, and if they didn't finish, what would have helped them complete it. We also wanted to know the best and worst thing about the interface. We thought these questions were good because if someone did not complete the task, they probably had a definite reason for what stopped them. We wanted to identify the frustrations in the interface and thought these questions would bring that forward. In the last question, we collected feedback about trying to complete these same tests navigating in a crowded airport, which is a very possible use case for Scrubs. The questionnaire taught us to build each question onto the next, and to never overload one question with too much detail. Gently prompting the user with short answers that build on each other reach our feedback expectations more often than a long-worded and complicated question.

Summary

Each of our tests and surveys played a critical role in the evaluation of Scrubs. We wanted to stress test our app and find design flaws so that they can be improved. In the

next sections below, we elaborate first on our testing and survey data, and what implications that had on the final design of Scrubs.

III. Description of Results from Evaluation

Total Number of Clicks Test

In this survey, we tested the users' on the core functionality of the application. In three tests, we quantified the user's ability to navigate the application and complete a given task.

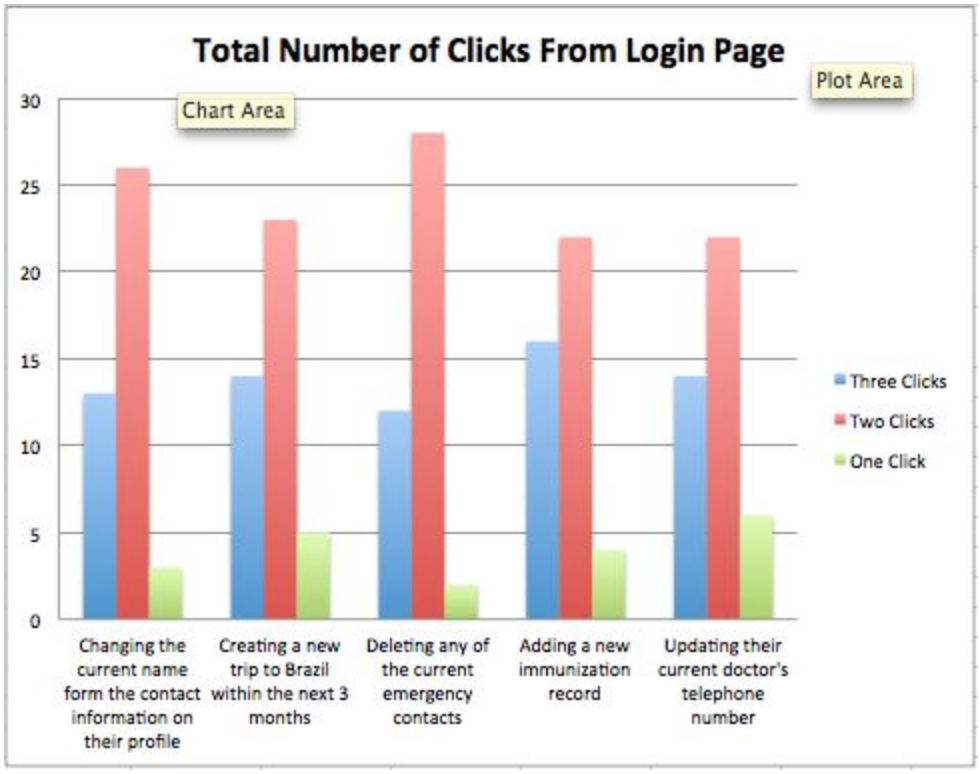


Figure 1 is the above graph. It shows the total number of people who needed between one and three clicks to complete five tasks from the login page.

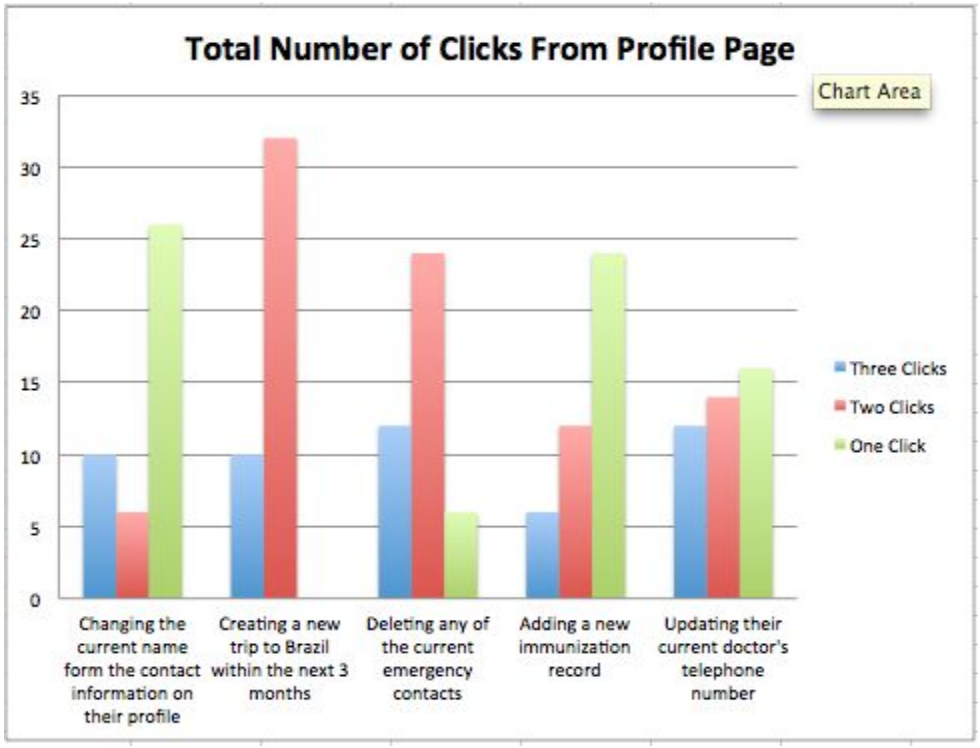


Figure 2 is the above graph. It shows the total number of people who needed between one and three clicks to complete five tasks from the profile page.

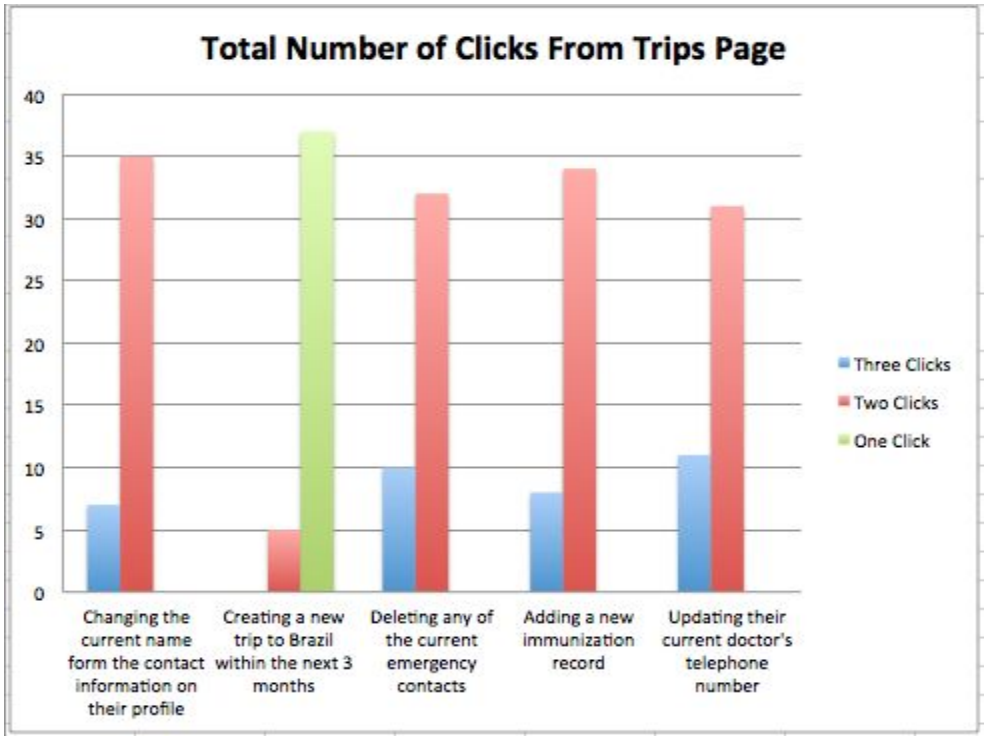


Figure 3 is the above graph. It shows the total number of people who needed between one and three clicks to complete five tasks from the trips page.

Simplicity of Screens Survey

Everyone was able to navigate to the task within three touches/clicks

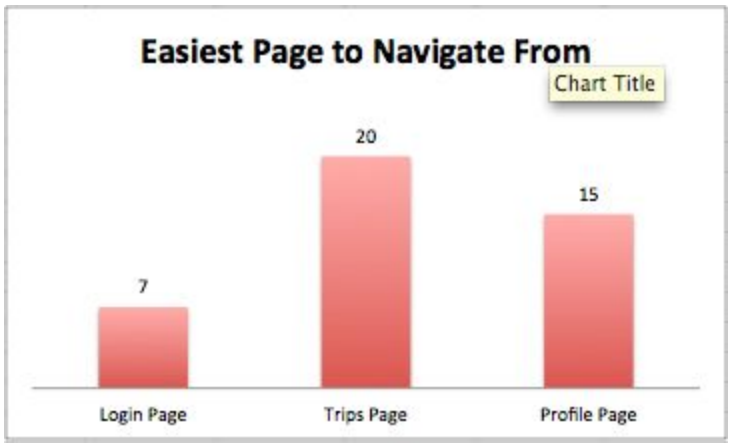


Figure 4 shows which page was the easiest to navigate from while trying to complete the five tasks described in figures 1-3.

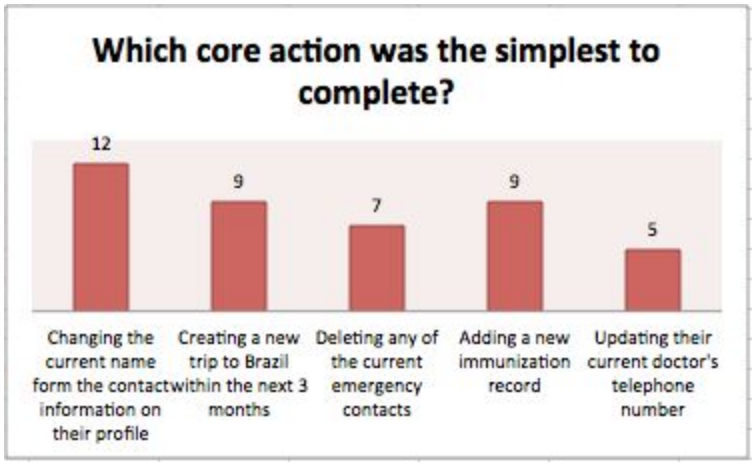


Figure 5 shows which task was the simplest to complete regardless of the starting point.

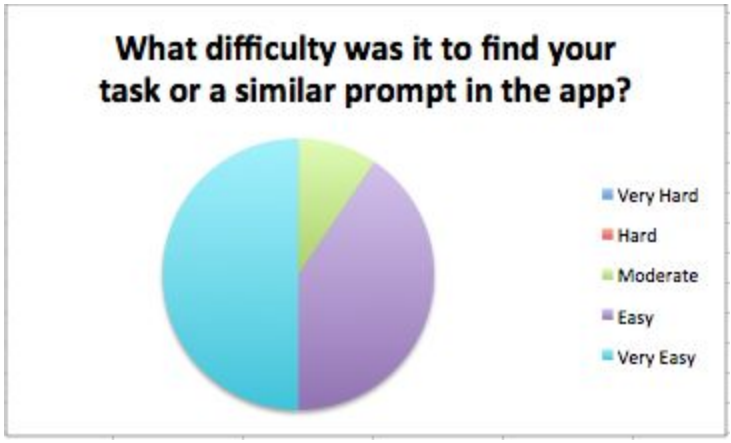


Figure 6 visual explains the difficulty of completing the tasks given.

Any thoughts on the overall layout of the application?
Highlights:
Very clean, and crisp design! Good Job.
The layout made it so easy to navigate.
The layout was superb but knowing exactly where to edit your information might be a challenge.
Layout made navigation pretty simple, I was able to go anywhere I was test in a matter of two touches or less and I only use my smart phone for the basics.
There is so much information available with a single touch.

Figure 7 highlights feedback from the open ended questions from the survey.

Scrubs Security Survey

In this section, we tested the users for quantitative data to help us further understand security concerns about the application contain important personal and medical information. Below you will see two graphs and one table highlighting the feedback we received from our users.

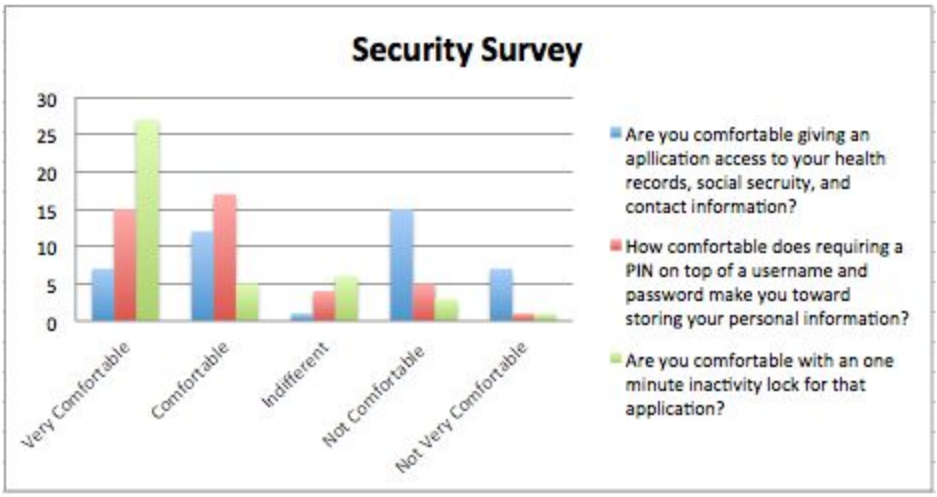


Figure 8 shows the comfortability level of our tested users regarding three important security aspects.

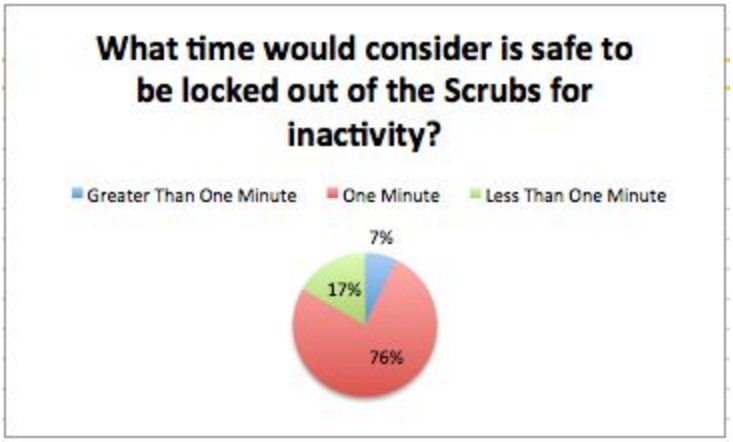


Figure 9 is a pie chart explaining whether users felt about a given time parameter for a lockout due to inactivity.

If you are not comfortable recealing your personal informatin to Scrubs, what level of secruity would you feel comfortable with?
Highlights:
That seems like a lot of very personal information to have in one place.
The PIN makes me feel a little safer, but I am one of those people who doesn't have a password to open my phone, and it makes me umcomfortable.
I am just one of those people that doesn't want all my info in one space.
I like the concept of extra secruity, what would make me more comfortable would having to actually login everytime using only a biometric. Take a picture of yourself, or speak into the device.
I don't think there needs to be addictional secruity, but I still worry if someone would be able to access my data.

Figure 10 is the exact same as Figure 7 except it highlights a different question and the most important feedback we received.

Stress Test Survey Results

We wanted to be able to determine if our app was usable in on-the-go situations and felt a stress test would best determine our apps feasibility in that area.

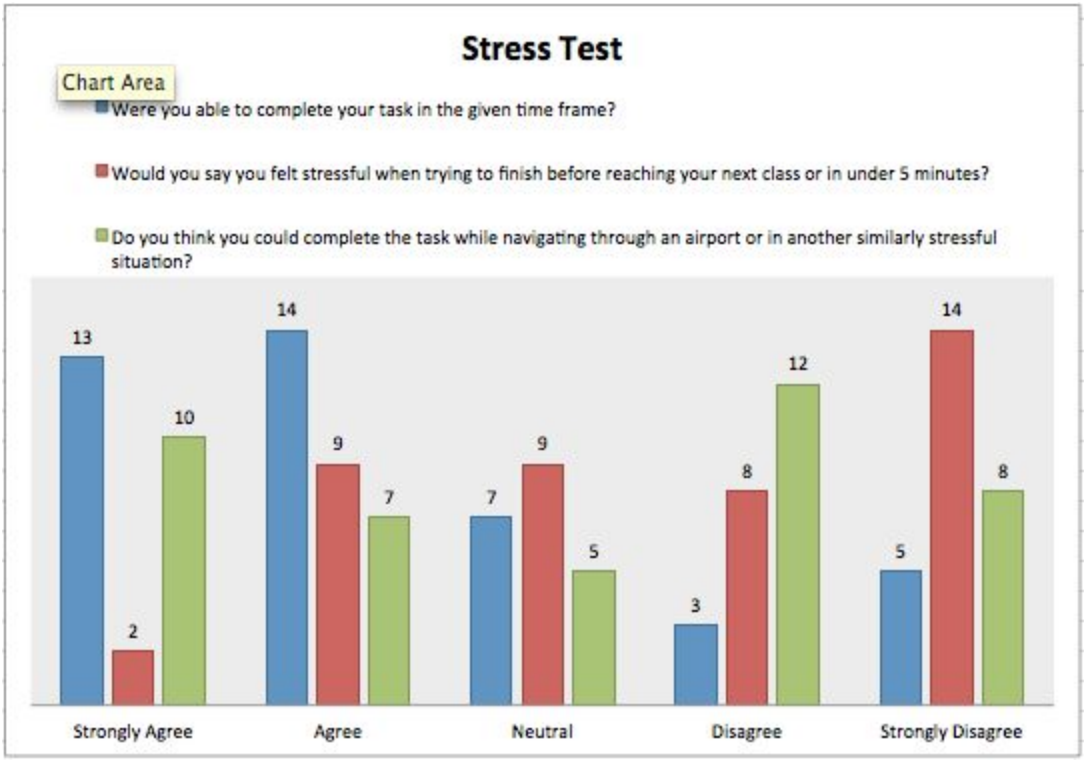


Figure 11 displays information regarding the user's ability to complete the task and whether they agreed or disagreed with it.

What was simple about using the interface?
Highlights:
The navigation bar really helped after I created my account.
The bar on the bottom with the Trip icon made this test for easy to complete
I think the overall layout of the design is set up in a way that makes it very simple to use.
I felt like I had used the app before, the layout was spectacular.
There wasn't too much going on, and it only took a few moments to familarize myself with the app.

What made navigation to the action difficult within the interface?
Highlights:
Not being familiar with the app made it difficult to use but the navigation bar helped once I became familiar with the layout.
Having to write things in on my phone while I was walking made it very difficult to complete the task.
Typing everything on my phone while being preoccupied with something else made this more challenging than it needed to be.
I think the small space while adding everything and walking, I found myself stopping a few times to fill something out.

Figure 12 highlights two open ended questions from the survey and displays the information and easily disguisable layout.

Global Support Survey

We wanted to make sure our app had a global impact, we felt it was best to survey our users indepthly about a few subjective and objective questions regarding international travel.

Where is Your National Citizenship?	
USA	20
China	7
India	6
Pakistan	2
Brazil	5
Canada	1
Nigeria	1

Have You Ever Left that Nation/Region?	
YES	NO
23	19

What 5 nations/Regions do your hear about most in the news, social media, and from entertainment?	
France	12
Russia	10
Syria	7
China	4
USA	9

Do you travel internationally for work, pleasure, or both?		
Work	Pleasure	Both
18	9	15

Figure 13 shows the information we gathered from our global survey concerning international travel.

Top 3 Destinations for Pleasure		Top 3 Destinations for Work		Top 3 Destinations Regardless of Money	
New Zealand	7	India	6	France	9
Rome	7	China	4	London	7
France	4	England	3	Bora Bora	3

Figure 14 displays the top results for three questions (headers) we outlined in the original survey.

IV. Analysis & Discussion of Results from Evaluation

Limited Number of Screens

It is important to note that the number clicks here describes how long it took the user to arrive at the screen where these five task would happen.

Figure 1 describes a scenario beginning at the login page and navigating to another page where one of the five task can be completed. The data appears to be normally distributed, letting us know that all the users should be able to complete any of the task within 2 clicks. This is due to the heavy emphasis we placed on designing an user-centered layout.

Our second scenario begins at the profile page and it is represented by Figure 2. As we can see the data is much more diverse than the previous figure. This is because the users are already beginning on one of the main screens used by the app. The data reinforces our conclusion from described by Figure 1. However, some of users were able to complete the task in one click, which could mean the users are experience recognition as they become familiar with the app. This lets us know a little more about what the our testers are thinking.

The last situation is depicted in Figure 3 and one can instantly see a difference from the previous two figures. The results being incredibly high could be contributed to users recognizing they are beginning on the trips page and some of the task require you to be on this specific page. Additionally, they know the layout, and are familiar enough to know where to go in order to change profile information or doctor’s information.

While the gradual increase in our users ability was not intentional when creating this type of survey, it was a successful byproduct of the experiment. We were testing the core functionality of the system and the simplicity of its layout. Because of the layout we were

able to see improvement in the user cognitive ability to recognize a task and complete it in lesser time than in the first experiment. This lets us know our application takes advantage of the recognition, rather than recall when user our simple, yet efficient layout.

Simplicity of Screens Survey

After the users finished the Limited Number of Screens test, we gave them questionnaire to gauge the difficulty of using the application.

Figure 4 is a easy to understand bar graph visually showing which page was the easiest to navigate from while completing the task. The trips page and profile page were the easiest and this can be contributed to the fact the users were already in the app at a major screen instead of the login page.

Figure 5 is very similar to Figure 4, except it is concern with which one of the five task was the easiest to complete. Changing your name was the easiest to perform. This is because it is the most personal item within the whole app. Your name is your identity. However, creating a new trip and updating the a new record were both tied for second place. This adds credibility to the overall layout and more specifically the layout of these pages being a hierarchical design.

When we designed Scrubs, we had one main concept in mind, simplicity. Figure 6 shows that none of the users found navigating through our app was difficult, but rather it was very easy. The main highlights from this survey out outlined in the last figure of this section. Which describe the overwhelming support for the design and how beneficial it is to the user's experience.

Scrubs Security Survey

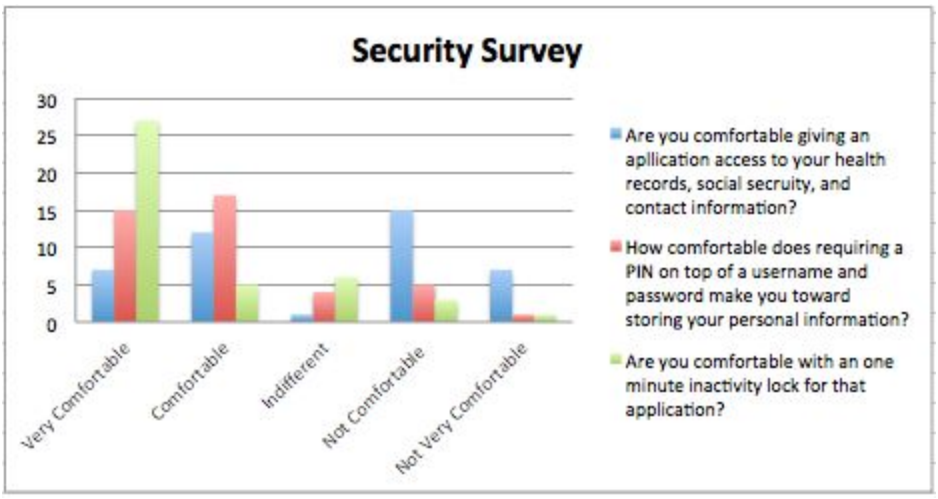


Figure 8 is a simple to read bar graph that describes how comfortable people are with the security measures we have. We found most people were comfortable with the inactivity lock and the inclusion of the pin as a security measure. People were split with putting their medical records on file on their phone.

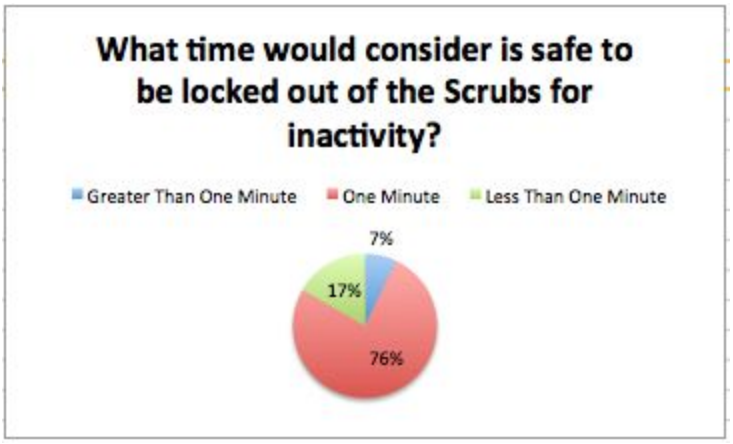


Figure 9 is a pie chart used to determine how long the users would like until the inactivity lock appears. Most users agreed that one minute was the desired time until the screen locks.

If you are not comfortable recealing your personal informatin to Scrubs, what level of secruity would you feel comfortable with?
Highlights:
That seems like a lot of very personal information to have in one place.
The PIN makes me feel a little safer, but I am one of those people who doesn't have a password to open my phone, and it makes me umcomfortable.
I am just one of those people that doesn't want all my info in one space.
I like the concept of extra secruity, what would make me more comfortable would having to actually login everytime using only a biometric. Take a picture of yourself, or speak into the device.
I don't think there needs to be addictional secruity, but I still worry if someone would be able to access my data.

Figure 10 is a table that shows people's feedback about our security measures as a whole. People seemed to be nervous about their information being in one location. Many people felt our measures were adequate but still felt uncomfortable with their information being on the app.

Stress Test Survey Results

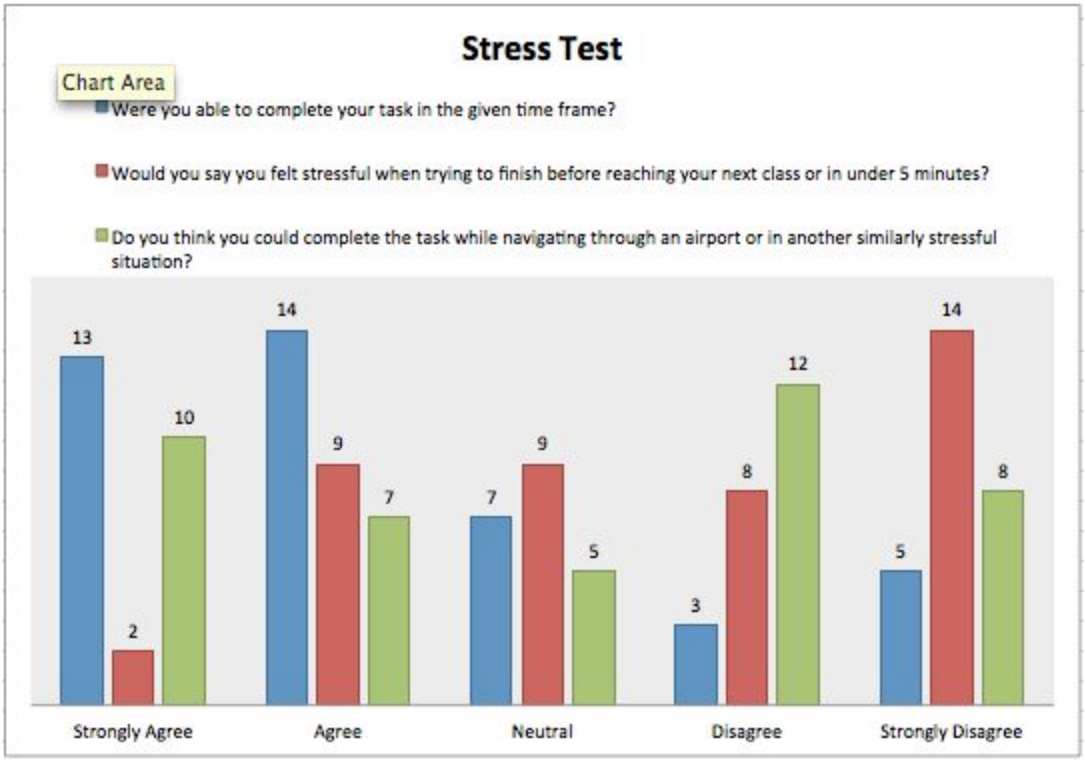


Figure 11 is a bar graph of the stress test. A majority of users were able to accomplish their task in less than five minutes. The users also did not feel stressed when working with the app, however they seemed split when determining whether or not they would be able to successfully use the app in a stressful scenario.

What was simple about using the interface?
Highlights:
The navigation bar really helped after I created my account.
The bar on the bottom with the Trip icon made this test for easy to complete
I think the overall layout of the design is set up in a way that makes it very simple to use.
I felt like I had used the app before, the layout was spectacular.
There wasn't too much going on, and it only took a few moments to familarize myself with the app.

What made navigation to the action difficult within the interface?
Highlights:
Not being familiar with the app made it difficult to use but the navigation bar helped once I became familiar with the layout.
Having to write things in on my phone while I was walking made it very difficult to complete the task.
Typing everything on my phone while being preoccupied with something else made this more challenging than it needed to be.
I think the small space while adding everything and walking, I found myself stopping a few times to fill something out.

Figure 12 is a table that shows people's responses to two separate questions that determined what the user found easy and difficult to use about the app. The users were able to use the interface because it matched their conceptual model. However they found it difficult to use while multitasking.

Global Support Survey

Where is Your National Citizenship?	
USA	20
China	7
India	6
Pakistan	2
Brazil	5
Canada	1
Nigeria	1

Have You Ever Left that Nation/Region?	
YES	NO
23	19

What 5 nations/Regions do your hear about most in the news, social media, and from entertainment?	
France	12
Russia	10
Syria	7
China	4
USA	9

Do you travel internationally for work, pleasure, or both?		
Work	Pleasure	Both
18	9	15

Figure 13 is a table of the global support survey. From the global support survey we were able to see the data for people traveling. It shows us there is a clear market for our product.

Top 3 Destinations for Pleasure		Top 3 Destinations for Work		Top 3 Destinations Regardless of Money	
New Zealand	7	India	6	France	9
Rome	7	China	4	London	7
France	4	England	3	Bora Bora	3

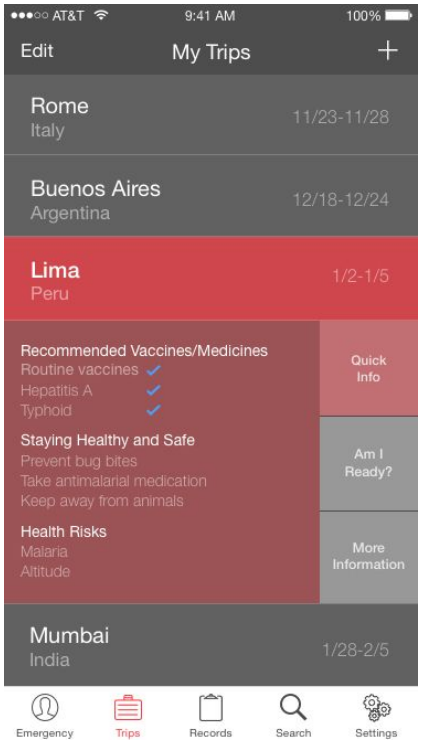
Figure 14 shows the top results for travel questions asked. This shows us certain nations we should focus on in our app. For instance France, England, India, and China should be major locations of emphasis.

V. Implications of Results for the Design

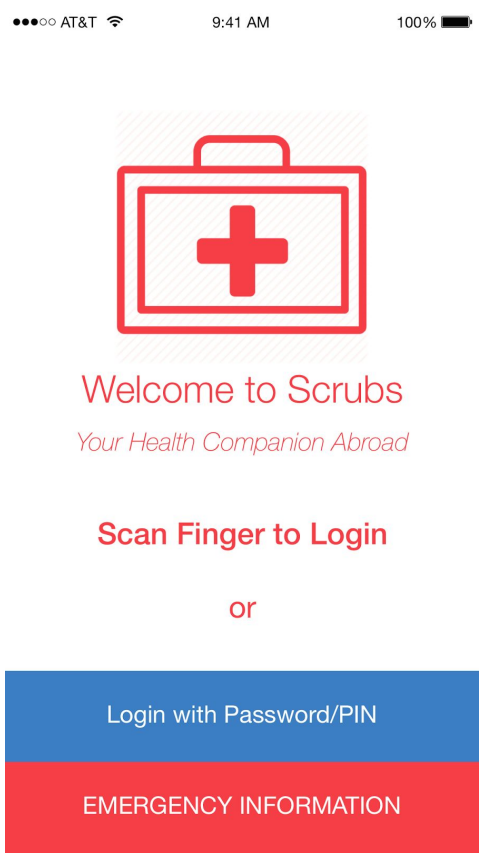
We were able to draw that our design as a whole was liked by the users, however there are areas for improvement in the design. One of the flaws we found in the feedback was that for the emergency medical ID a stranger will not think to check the user's phone for their medical ID. We will solve this by allowing the user to choose between a wristband to wear that tells whoever is attempting to assist the user to check the user's phone, or the user will have a symbol on their driver's license similar to the organ donor symbol that tells people to check the user's phone. We feel as though many users were able to successfully navigate the app in a quick amount of time as determined by the stress and simplicity tests. We did feel as though we should make the text larger to allow the users to work faster and with fewer errors. We feel as though we were relatively successful in creating a design with adequate amount of screens to accomplish all tasks quickly and accurately. Due to the survey we were able to discover that one minute was the preferred time to activate the lock screen. We also determined that many users were uncomfortable with placing their medical records on their phone so we will allow users to keep their information off of their phones and leave them on the mobile app. The global surveys told us that there is a definite market for our app. Many people do travel often enough that they would use our app. We also have a basis for the nations to focus on so when developing our app we could begin with countries to focus our information gathering on. Our design will also focus on giving the user the option to place their medical records on their mobile app. This is due to many users being uncomfortable with having their information on the phone.

VI. Description of Prototype Design Improvements

Through our testing, we found many areas that we could improve in our design. These areas included the visual design of many elements such as the font size. One issue some of our testers had was that they felt the size of the font in some submenus was hard to read. Viewing the interface on different hardware devices validated this issue as the font quickly looked too small on larger devices. Thus, we increased the weight and the size of the font on the problematic menus. After making the changes, it is clear that all of the text on the screen is much easier to view now.



Another improvement we made on our prototype after testing involved the actual usability of the application. We noted some users being a little confused about what “Access Ashley Johnson’s Medical ID Card” meant on the lock screen of the application. This was problematic because we intended this button to be universally understood as an Emergency button. Thus, we decided to change the text of the button to “EMERGENCY INFORMATION” so that users immediately know how to access this critical information in emergencies. Now, it is apparent to a third party regardless that during an emergency, they should click on this button for more information.



A more general issue that arose through our testing was the idea that a third party would not know to look at the user's Scrubs app to check for their emergency information in emergency situations. Thus, we decided the best way to solve this discrepancy would be to indicate on a wristband or official document such as a license that the user's emergency information is stored on their phone. This will look like an icon of the Scrubs logo with a small description prompting third parties to check the user's cell phone for more information. This will enable any third party to quickly know exactly how to retrieve more medical information about the user.

VII. Project Poster Presentation

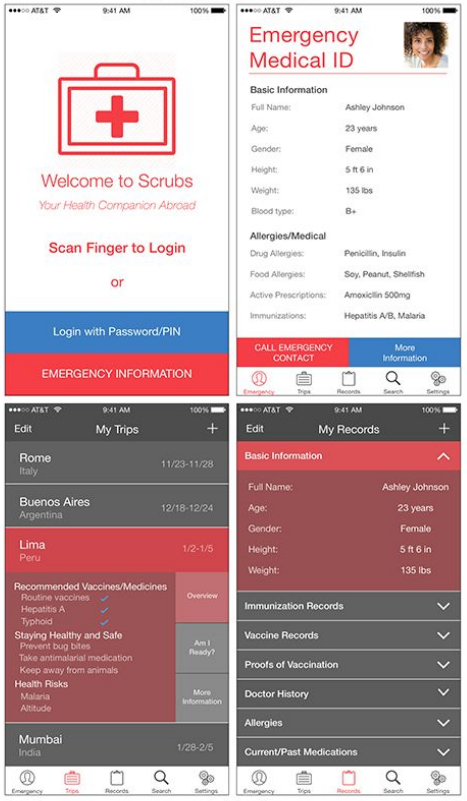
Scrubs

Your health companion abroad.

What is Scrubs?

Scrubs is mobile application that enables frequent international travellers access to their health information abroad, as well as view medical requirements and tips for their destinations. Having access to your medical information abroad has proven to be lifesaving in many emergency situations. Due to many countries having poor health conditions, it is crucial to follow traveler requirements and guidelines.

Application



Top Left: This is the login screen for returning users. Here, a user can login with their finger or a third party can access the user's emergency information directly. Top Right: This is the medical ID card for a user where they or a third party can view crucial medical information or call the emergency contact. Bottom Left: This is the screen where users manage their trips and can view recommended medical advice for each destination. Bottom Right: This is where a user can manage and view all of their medical records.

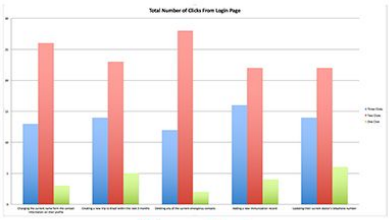
Evaluation

We evaluated the Scrubs application based on four core requirements: Limited number of Screens, Supporting Countries across the Globe, Security, and Quick Editing/Viewing. We had **42** participants in benchmark tasks and questionnaire for each of the categories. Most of the participants were friends, family, or roommates.

Simplicity Test

From login screen of Scrubs, measure the amount of clicks to perform the following actions:

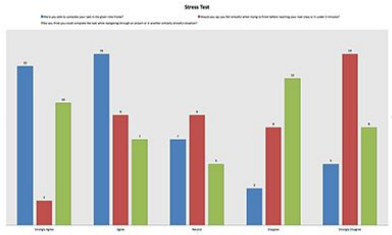
1. Changing the current name from the contact information on their profile
2. Creating a new trip to Brazil within the next 3 months
3. Deleting any of the current emergency contacts
4. Adding a new immunization record
5. Updating their current doctor's telephone number



Stress Test

Make an account and add a new destination under Trips within five minutes:

1. Participant starts with a freshly downloaded version of the app on their phone
2. They are given a record already in the system to add to their profile under immunizations
3. Must complete this task in five minutes
4. Have the user complete the survey below about their experience



Stress Tests Survey

1. What was simple about using the interface?
   - The navigation bar really helped after I created my account.
   - The bar on the bottom with the Trip icon made this test for easy to complete
   - I think the overall layout of the design is set up in a way that makes it very simple to use.
   - I felt like I had used the app before, the layout was spectacular.
   - There wasn't too much going on, and it only took a few moments to familiarize myself with the app.

2. What made navigation to the action difficult within the interface?
   - Not being familiar with the app made it difficult to use but the navigation bar helped once I became familiar with the layout.
   - Having to write things in on my phone while I was walking made it very difficult to complete the task.
   - Typing everything on my phone while being preoccupied with something else made this more challenging than it needed to be.
   - I think the small space while adding everything and walking, I found myself stopping a few times to fill something out.