SHMAP Research Report 2

Kirsten Bannan
Laura Brent
Sarah Bruno
Dawa Sherpa
Sam Spurlock
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EXECUTIVE SUMMARY

SHMAP is a mobile application that provides locations of store products on a digital map which can be easily accessed on a smartphone. The app features multiple companies with numerous store locations that users can choose from. Our report highlights the problems and questions that our team researched, the methodology, our findings and results, analysis, and recommendations.

In order to research how end-users would use SHMAP, our team constructed a usability test on the prototype of the mobile application as well as a test on our promotional video. Our SHMAP usability test consisted of eight participants and took place inside the Lebanon Valley College Barnes & Noble Bookstore. Four of the participants acted as our control group, where they looked for four items without using SHMAP. This data was compared to our other four participants who used SHMAP to find the same four items.

Our promotional video test consisted of four participants who watched our three minute video and responded to seven post-test questions concerning the value of SHMAP and most attractive and least attractive parts of the video. Participants were also asked to compare the video to the SHMAP style guide to ensure brand consistency.

Based on our research, we found that there is a learning curve when users search for items on SHMAP. Once they figure out how to orient themselves, users understand how to use the mobile application. After Task 1, the control group and SHMAP group found items at about the same rate, with the SHMAP group finding items a few seconds faster on average. After testing the promotional video, we found that most participants thought the video was long, so we will need to make adjustments to the length of our video.

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INTRODUCTION/BACKGROUND

SHMAP, a mobile application, provides locations of store products on a digital map which can be easily accessed on a smartphone. The application was developed to allows users to search for items in two different ways (search and departments listing) and then visually displays the item's location on a map.

To ensure that our design affords these capabilities, we ran usability tests in a real-life setting (the College Store). The primary goal of our testing was to determine how users will use the app in the store and ensure that our search and location functionalities work. In total, we tested eight participants who are representative of our secondary audience - end users. Four participants were in the control group and completed the tasks without SHMAP and four participants were in the SHMAP group and used SHMAP to complete their tasks. The control group completed four tasks, while the SHMAP group completed five. After testing was completed, we analyzed the results, developed a report of our findings, and will now make any further changes to improve the functionality and usability of our app.

Purpose

The purpose of our test was to evaluate the following elements of the app: search bar, locations screen, and tone/language. Since the main goal of SHMAP is to increase the efficiency of shopping trips, we also evaluated the overall efficiency/perceived efficiency of the app through the use of a control group to determine if the app is successful. After we collected and analyzed our data, we made recommendations for the team to move forward and implement into the app.

Additionally, we tested our promotional video and style guide. To ensure users understand the value proposition of our promotional video, we had users watch the video and respond to a series of post-test questions about understanding SHMAP's messaging. Users also compared the video's voice to our style guide to ensure brand consistency. To view the promotional video post-test questions see **Appendix H.**

Scope

The Blondes & Brunettes group performed a usability test on the mobile application SHMAP. The test covered important areas of the app including the location screen, search bar, and tone/language. The group gathered quantitative data through metrics including errors, time on task, and task completion, and qualitative data through post-test and post-task questions.

The group also tested our promotional video and style guide to ensure that our brand is comprehensive and representative of our product. The group gathered qualitative data through seven post-test questions.

After gathering the data, we will now consider the results and make any necessary changes to improve the usability and overall experience of our app.

Size

We conducted a usability test with eight different participants from our secondary audience, end-users in a real-life setting (the College Store). Half (4) of the test group completed the test using the SHMAP app and completed five test tasks. The other half completed four test tasks on their own. Each user was asked one follow-up question after each task. After the tasks were

completed, the user took a post-test. The post-test consisted of a System Usability Scale and additional questions. Each usability test took approximately 10-15 minutes.

The SHMAP promotional video was also evaluated by four different participants. After the participants watched the video, they answered seven post-test questions.

PROBLEMS TO SOLVE

As a complex system, SHMAP has to solve problems for multiple audiences, including our end users and the companies that we will work with.

We conducted testing to identify issues related to the functionality of the SHMAP mobile application, specifically the search functionality, location services, and the language. We gathered data on these areas through metrics such as errors, time on task, post-test and post-task questions. We will be determining if our app is navigable and user-friendly.

In addition to the specific functions, we needed to examine how efficient our app actually is overall. The goal of SHMAP is to decrease the amount of kinematic and cognitive load needed to locate items in a store. If using our app, increases the amount of load needed, then it is not successful. We examined the efficiency through time on task and perceived time on task.

We also evaluated our promotional video. Since our video will be used as a promotional tool and shown to potential backers, we needed to ensure that the video was representative of our brand and informational. If users don't get a good sense of what our brand is and what our product does after watching the video, then it is unlikely that they will back/download/purchase, our product.

METHODOLOGY

The methodology section includes the methods our group used to test the SHMAP app as well as a description of the participants who took part in the usability test.

SHMAP Usability Test

Methods

For our testing, we utilized traditional usability testing to ensure that SHMAP's features meet the standards of our users late in our development process. We chose to conduct a traditional usability test because we wanted to observe how our test subjects utilize SHMAP in stores. Because SHMAP will be primarily used while shopping within retail stores we immersed our test subjects into this setting for our usability test. To ensure that SHMAP increases efficiency when shopping, we compared four users who used SHMAP against four users who searched for items without any assistance. The four users who performed the test tasks without using SHMAP are referred to as our control group. If we would have utilized a survey or online method, we would not have been able to test the full functionality of SHMAP, such as physically finding the item in the store once the test subject searches for it within the app.

Before tests were conducted, we used a screener to ensure that our test subjects were representative of our audience. For our tests, a moderator was in the store with the user as they progressed through the test. They informed the user of each task as they completed them but did not provide any guidance that would influence the user. They asked follow up questions after each task and after the completion of the test. Additionally, we monitored the user's actions by

recording them with a mobile device and cameras, for data analysis. We administered a post-test to gather any additional qualitative data.

Users

For our usability test, we used test subjects that fall into our secondary audience/user group (see persona in **Appendix A**). Our secondary audience consists of users who:

- Regularly shop at small to medium sized stores
- Own a smartphone
- Are between the ages of 20 and 50
- Have a desire to decrease their shopping time

For our testing, we gathered eight participants. Four participants completed our test without the use of a location device or other app (control group) and four participants completed the test while using SHMAP. We decided on the number eight, because we wanted to have an equal number in each group and with four participants in each group, we are able to identify 75% of our problems.

To gather participants, we recruited members of the college community over the age of 20, from Lebanon Valley College. Since we sampled from such a small population and a small age range, there may be a sampling bias. To ensure that the users we tested were representative of our audience, we had them answer a screener. Below are four questions that we used as a screener:

- What is your age? (Any age between 20 and 50)
- Do you own a smart-phone? (Must be a yes)

- How often do you go shopping (in-store) in a month? (Can't be never)
- On a scale of 1-5, with 5 being very desireable, how desirable is it for you to decrease your shopping time (spend less time in the store)? (Above a 1)

Participants

CONTROL GROUP:

	Subject 1	Subject 2	Subject 3	Subject 4
Gender	Female	Female	Female	Female
Age	18-24	25-34	18-24	18-24
Smartphone?	Yes	Yes	Yes	Yes
Shopping	Once a week	5-9 times	Once a month	Once a month
Desired Time	4	4	4	5

SHMAP GROUP:

	Subject 1	Subject 2	Subject 3	Subject 4
Gender	Female	Male	Female	Male
Age	18-24	18-24	18-24	18-24
Smartphone?	Yes	Yes	Yes	Yes
Shopping	Once a month	Once a month	Once a month	Once a month
Desired Time	5	4	5	5

Test Tasks, Goals, & Metrics

The main goal of our usability test was to gain information on how users interact with the SHMAP mobile application. We were interested in seeing how the users would actually use

SHMAP in real life, as we had some preconceived notions of how it would be used, but no evidence to support those ideas. We evaluated the following features of our SHMAP: search, location screen, efficiency, and the language.

In order to ensure that SHMAP increases the efficiency of a shopping experience, we compared two groups: SHMAP users and the control group. The SHMAP users completed tasks using the SHMAP application and the control group completed tasks using a traditional shopping experience without any assistance.

SHMAP USERS

In order to test the usability our app, we developed five tasks based on our research questions. The three users who completed the test with the SHMAP app used the application to complete all of the tasks we provided. Our success metrics for the test were - if three out of four test subjects that use SHMAP complete all test tasks without any critical errors and if the time-on-task and qualitative data indicates that the app helped users be more efficient. We defined critical errors as a situation where a user is unable to complete the task. After each location task we asked the user how long it took them to complete the task. This allowed us to see if they felt the 'shopping trip' was efficient with the use of SHMAP.

CONTROL GROUP

In order to test the efficiency of the app, we created a control group that completed tasks two through five without the use of the SHMAP application. To complete the item location tasks, the users were given the name of the item and shown a picture of the item. While they searched for

the items, we observed them and took notes on how they searched. After each location task we asked the user how long it took them to complete the task. This allowed us to compare how efficient they felt their 'trip' was to the reported efficiency of the SHMAP users.

TASK 1 (SHMAP GROUP ONLY)

Research Question: Can users easily select a location?

Task: Choose the Lebanon Valley College Barnes & Nobles Location from the location screen

Metrics: Errors

Element(s) we tested: Location Screen

TASK 2 (BOTH GROUPS)

Research Question: How do users use SHMAP? Do they use search or departments?

Task: Find the Casemate Prints Collection Murra Coral iPhone 5s case. Once you find the item return to us.

Metrics: Time on Task, Errors

Element(s) we tested: Navigation/Search

TASK 3 (BOTH GROUPS)

Research Question: How do users use SHMAP? Do they use search or departments?

Task: Find the Retro Brand Mock Twist long-sleeve T-shirt. Once you find the item return to us.

Metrics: Time on Task, Errors

Element(s) we tested: Navigation/Search

TASK 4 (BOTH GROUPS)

Research Question: How do users use SHMAP? Do they use search or departments?

Task: Find the EOS Summer Fruit Lip Balm. Once you find the item return to us.

Metrics: Time on Task, Errors

Element(s) we tested: Navigation/Search

TASK 5 (BOTH GROUPS)

Research Question: How do users use SHMAP? Do they use search or departments?

Task: Find the Navy Reverse Weave Hoodie. Once you find the item return to us.

Metrics: Time on Task, Errors

Element(s) we tested: Navigation/Search

After all of the tasks were completed, we administered a post-test. Both the SHMAP group and Control Group first completed a System Usability Scale (SUS) to evaluate their experience with SHMAP or searching for items without any assistance. After the SUS was completed, we asked them four additional post-test questions:

- If you were to use this app, which search method would you be most likely to choose?
- On a scale of 1 to 10, with ten being highly recommend, how likely would you be to recommend this app to someone?
- Out of the following phrases, which do you prefer? (Item cannot be found)
- Out of the following phrases, which do you prefer? (Search bar placeholder)

The control group answered questions three and four only.

Promotional Video & Branding Usability Test

In order to ensure our promotional video was informational and representative of our brand, we ran a second usability test. The methods, users, participants, goals, and metrics of the promotional video test will be discussed below.

Methods

For the usability testing of our video and branding, we asked participants to watch the SHMAP promotional video, answer seven post-test questions, and compare the video to our style guide. Before the test began, we utilized a screener to ensure that our test subjects were representative of our audience. A monitor explained the test and read the test script to each participant (please see **Appendix G**) and we also had a team member record participants watching the video so we could analyze reactions while they watched.

Users

For the usability test of the SHMAP promotional video, we utilized test subjects that fall into our secondary audience/user group (see persona in **Appendix A**). Our secondary audience consists of users who:

- Regularly shop at small to medium sized stores
- Own a smartphone
- Are between the ages of 20 and 50

- Have a desire to decrease their shopping time

For our testing, we gathered four participants. We decided on the number four, because we are able to identify 75% of our problems.

To gather participants, we recruited members of the college community over the age of 20, from Lebanon Valley College. Since we sampled from such a small population and a small age range, there may be a sampling bias. To ensure that the users we tested were representative of our audience, we had them answer a screener. Below are four questions that we used as a screener:

- What is your age? (Any age)
- Do you own a smartphone? (Must be a yes)
- How often do you go shopping (in-store) in a month? (Can't be never)
- On a scale of 1-5, with 5 being very desireable, how desirable is it for you to decrease your shopping time (spend less time in the store)? (Must be above a 1)

Participants

	Subject 1	**Subject 2**	**Subject 3**	**Subject 4**
Gender	Male	Female	Male	Male
Age	18-24	18-24	18-24	18-24
Smartphone?	Yes	Yes	Yes	Yes
Shopping	Once a week	Once a week	Once a month	Once a month
Desired Time	4	4	3	5

Goals & Metrics

The main goal of our promotional video testing was to ensure participants understood the value of SHMAP after watching the video. We were interested to see if participants were interested in the video and found SHMAP to be credible. Finally, we wanted see if participants thought the promotional video fit well with the SHMAP brand.

In order to achieve our goals, we had participants watch the promotional video and then respond to seven post-test questions. To view the SHMAP promotional video and branding post-test questions, please view **Appendix H**.

FINDINGS & RESULTS

SHMAP Usability Testing

We conducted eight usability tests with four members in our SHMAP group and four members in our control group. The data we collected from each task includes: time on task, perceived time on task, number of errors, type of errors, and task completion. Errors were either categorized as minor or major. Minor errors are errors that they could easily recover from, while major errors are errors that either caused them to have to quit the task or instances where they didn't complete the task. After completing the tests, we separated the data by task and furthered analyzed the results.

Data

For our usability testing, we tested a control group and the SHMAP group.

CONTROL GROUP

The control group consisted of four females ranging from age 21 to 31 who own a smartphone. All participants go shopping at least once a month. Two participants go once a month, one participant goes five to nine times a month, and one participants goes once a week. The participants are also interested in decreasing the amount of time they spend in a store. When asked how desirable it is to save time in a store on a scale of 1 to 5, with 5 being very desirable, three participants rated it a four and the fourth rated it a five.

SHMAP GROUP

The SHMAP group consisted of two females and two males from age 18 to 24 who own a smartphone. All participants go shopping once a month. They are also highly interested in decreasing the amount of time they spend in a store. When asked how desirable it is to save time in a store on a scale of 1 to 5, with 5 being very desirable, three participants rated it a five and the fourth rated it a four.

TASK 1

	Subject 1	**Subject 2**	**Subject 3**	**Subject 4**	**Subject 5**	**Subject 6**	**Subject 7**	**Subject 8**
Group	Control	Control	Control	Control	SHMAP	SHMAP	SHMAP	SHMAP
TOT	n/a	n/a	n/a	n/a	0:11	0:07	0:18	0:13
# of errors	n/a	n/a	n/a	n/a	0	0	0	0
Type of error(s)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Complete?	n/a	n/a	n/a	n/a	Yes	Yes	Yes	Yes

For the first task, selecting a location, we only had the SHMAP group perform this task because the location screen is a feature of SHMAP. All four users were able to successfully complete the task without any errors. The average time on task was 12 seconds.

TASK 2

	Subject 1	**Subject 2**	**Subject 3**	**Subject 4**	**Subject 5**	**Subject 6**	**Subject 7**	**Subject 8**
Group	Control	Control	Control	Control	SHMAP	SHMAP	SHMAP	SHMAP
TOT	0:32	0:53	0:36	0:39	1:41	3:20	1:12	2:17
Perceived Time	0:40	3:00	0:30	0:40	0:30	3:00	0:15	2:00
# of errors	0	0	0	0	0	0	0	0
Type of error(s)	n/a	n/a	n/a	n/a	Minor	Minor	n/a	n/a
Complete?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

All eight participants completed the second task, and six out of eight completed the task without any errors. Participant #5 (SHMAP group) encountered a minor error when they didn't realize that they needed to click the "SHMAP That" button to find their item. Participant #6 (SHMAP group) encountered a minor error when they entered the item name wrong and received an error message. The average time on task was 0:40 for the control group and 2:07 for the SHMAP group.

TASK 3

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8
Group	Control	Control	Control	Control	SHMAP	SHMAP	SHMAP	SHMAP
TOT	1:24	1:02	1:05	0:56	0:52	1:28	0:42	0:58
Perceived Time	3:00	3:00	1:30	3:00	0:50	2:00	0:10	0:30
# of errors	0	0	0	0	1	0	0	0
Type of error(s)	n/a	n/a	n/a	n/a	Minor	n/a	n/a	n/a
Complete?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

All eight participants were able to complete the task, with only one individual encountering a minor error. Participant #5 (SHMAP) encountered a minor error when they read the map the wrong way which caused them to go to the opposite side of the store. The average time on task was 1:06 for the control group and 1:00 for the SHMAP group.

TASK 4

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8
Group	Control	Control	Control	Control	SHMAP	SHMAP	SHMAP	SHMAP
TOT	0:44	1:29	0:39	0:15	0:26	1:06	0:35	0:52
Perceived Time	1:00	4:00	0:40	0:20	0:10	1:00	0:20	0:30
# of errors	0	0	0	0	0	0	0	0
Type of	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

error(s)								
Complete?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

All 8 users were able to complete task 4 without errors of any kind. The average time on task was almost even, with the control group averaging 0:46 and the SHMAP group averaging 0:45.

TASK 5

	Subject 1	**Subject 2**	**Subject 3**	**Subject 4**	**Subject 5**	**Subject 6**	**Subject 7**	**Subject 8**
Group	Control	Control	Control	Control	SHMAP	SHMAP	SHMAP	SHMAP
TOT	0:54	0:24	0:13	0:27	0:32	0:33	n/a	0:15
Perceived Time	1:00	1:00	0:12	0:40	0:07	0:30	n/a	0:15
# of errors	0	0	0	0	0	0	1	0
Type of error(s)	n/a	n/a	n/a	n/a	n/a	n/a	Major (SHMAP)	n/a
Complete?	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

Seven out of eight users were able to complete the task without any errors. Subject #7 (SHMAP) encountered a major error, which left her unable to complete the task, when she placed a space after the text in the search bar which prevented the select statement from presenting the desired results. The average time on task was 0:29 for the control group and 0:26 for the SHMAP group.

Post-Test/SUS

At the end of each test, we had the participant fill out a series of post-test questions and a System Usability Scale (SUS) questionnaire.

Post-Test

To get a better look at the post-test responses, we divided the data up by question.

QUESTION ONE

To better determine how SHMAP would be used by consumers, we asked the participants in the SHMAP group to select the option that best describes how they would use SHMAP. The results were split evenly with two participants saying that they would search for items before going to the store and two participants saying they would search for items one at a time.

QUESTION TWO

To get a sense of how satisfied the participants were with the app, we asked each participant in the SHMAP group to give the SHMAP application a net promoter score. The ratings were: 7, 8, 9, and 10. The participants who gave it a 7 or 8 are categorized as passives and the participants who gave it a 9 or 10 are categorized as promoters. To calculate our net promoter score we subtracted the percent of detractors (0) from the percent of promoters (50%) to get a net promoter score of 50%.

QUESTION THREE

To get a better idea of what type of language/personality we should use, we asked the participants to select the phrase they prefered for the “item cannot be found screen” from a list of five options. All participants in the control group selected option A - “SHWELP, looks like we cannot find that item.” Two participants in the SHMAP group also selected option A, while two participants selected option B - “That item is not on our shelves.”

QUESTION FOUR

To get a better idea of what type of language/personality we should use, we asked the participants to select the phrase they prefered for our search bar from a list of six options. The control group was semi-divided with their answers. Two participants selected “SHWAT can we help you find?”, one participant selected “Let’s Search!”, and the last selected “Lemme find it for ya…” In the SHMAP group, two participants selected “SHWAT can we help you find?,” one selected “What do you want?,” and the last selected “Tell me what you want, what you really really want…”

SUS Results

To make our testing even, we had both groups complete a System Usability Scale at the end of their test.

CONTROL GROUP

The control group used the SUS to evaluate their use of the bookstore. The average SUS score was a 72.5. During the testing, there was a high amount of confusion due to the fact that the scale said “website” so the data may not be entirely representative of their true feelings.

To calculate the score for each user, we totaled their responses and multiplied that number by 2.5. The highest rating was a 87.5 and the lowest was a 62.5. The other scores were 65 and 75.

In addition to looking at the overall scores, we looked at the average score for each question. The highest scoring question was question 9, “I felt very confident using this website (system),” with an average score of 3.5. The lowest scoring question was question #6, “I thought there was too much inconsistency in this website (system),” with an average score of 2.5. To view all of the data please see **Appendix F**.

SHMAP GROUP

The control group used the SUS to evaluate the SHMAP mobile application. The average SUS score was a 73.1.

To calculate the score for each user, we totaled their responses and multiplied that number by 2.5. The highest rating was a 82.5 and the lowest was a 65. The other scores were 70 and 75.

In addition to looking at the overall scores, we looked at the average score for each question. The highest scoring questions were question 3, “I thought this website was easy to use” and question 7, “I would imagine that most people would learn to use this website very quickly” with an average score of 4.5. The lowest scoring question was question #10, “I needed to learn a

lot of things before I could get going with this website" which received a one from all four participants. To view all of the data please see **Appendix F**.

Promotional Video & Branding Usability Test

After having four participants watch our promotional video, seven post-test questions were answered. Below, the data will be shown.

Data

Below are the results for each of the seven post-test questions.

QUESTION ONE:

On a scale of 1-5, with 5 being very interested, how interested were you while watching the SHMAP Promotional Video?

Participant:	**Answer:**
Subject 1	4
Subject 2	5
Subject 3	3
Subject 4	3

QUESTION TWO:

Based on this video, what is the value of SHMAP?

Participant:	**Answer:**
Subject 1	"Taking difficulties out of shopping. Less

	thinking, less time, easier trip all around."
Subject 2	"To help you cut down on your time in a store."
Subject 3	"Provides guide, easy access to locations of products within particular stores."
Subject 4	"I don't really know app prices. Maybe $1-2, you want something that people will go for while accounting for hassle with stores."

It appears that Subject 4 did not understand the question; where as they believed that “value” was equal to the worth of the SHMAP mobile application.

QUESTION THREE:

What was the most attractive/interesting part of the video?

Participant:	**Answer:**
Subject 1	"Comedic relief. Always nice when I actually chuckle when watching an ad/video."
Subject 2	"When the music changed and Teddy to sprint to the pasta."
Subject 3	"Interview-style explanation of SHMAP's function/interface during later half."
Subject 4	"The demonstration was fun. Explanation was quality."

Each of the subjects had a different favorite part of the video. Majority of the subjects enjoyed some sort of comedic relief.

QUESTION FOUR:

What was the most disinteresting part?

Participant:	**Answer:**
Subject 1	"The explanation may have been a little long. I felt the promo and brief intro explained enough, so the extra was a lot less interesting."
Subject 2	"The second girl explaining the app."
Subject 3	"Opening skit."
Subject 4	"The explanation was long, need to be more concise -- which I think is totally doable."

Majority of the subjects believed that the video was too long, specifically the explanation.

QUESTION FIVE:

Based on the promotional video, on a scale of 1-5, with 5 being high understanding, how well do you feel as though you understand what SHMAP is?

Participant:	**Answer:**
Subject 1	5
Subject 2	5
Subject 3	4
Subject 4	4

As our main goal was to ensure that each participant understood what SHMAP was, this shows that we accomplished the main goal of our video.

QUESTION SIX:

Based on the promotional video, on a scale of 1-5, with 5 being high trust, how well do you feel as though you trust the SHMAP brand?

Participant:	**Answer:**
Subject 1	4
Subject 2	5
Subject 3	4
Subject 4	4

QUESTION SEVEN:

On a scale of 1-5, with 5 being the two fit very well, how cohesive do you think the promotional video fits with the style guide? (For this question use the style guide provided.)

Participant:	**Answer:**
Subject 1	4
Subject 2	5
Subject 3	5
Subject 4	4

ANALYSIS

To get a better sense of our data and determine how to move forward, we analyzed the data and picked up on a few trends.

Usability Testing

Finding #1 - Learning Curve

One trend we noticed during our testing is that the user's efficiency generally improved over time. When looking at time on task, it is easy to see that the SHMAP group's times went down after the first or second task. Users didn't need much help with the search functionality, but more so with orienting themselves. Since the map is just composed of representative aisles, it may be difficult to tell what is where unless you take note of the entrance. Multiple users took extra time before searching for the task to orient themselves. One participant seemed fairly confused until she scrolled a little bit and saw the entrance sign. The same user had a minor error on the second task when she went to the wrong side of the store because she had the map backwards.

Finding #2 - Time on Task vs. Perceived Time on Task

Since one of the main goals of SHMAP is to make the shopping experience more efficient for users, we focused a lot on the time on task metric. We timed both the control group and the SHMAP group from when they received the item name and image to when they returned to the moderator. We also asked them to tell us how long they thought it took them to find the item. The SHMAP group's average time for the first task was much higher than the control group's, but every person in the control group thought that locating the item took them longer than it actually did and everyone in the SHMAP group thought the opposite. For example, participant #2 in the control group took 0:53 seconds and they thought it was three minutes and participant #3 in the SHMAP group took 1:12 and thought it was 0:15. The remaining tasks were fairly close

in time, with only one to three seconds separating the tasks. However, the perceived time trend continued on.

This points to one of two things. SHMAP participants either felt as though they were still being efficient even with having to type the item into the app and/or they didn't count the time that they were searching on the app as a part of their search time. Regardless of the reason, the fact that the average times were very close shows that even with the added work of using an app, the users in the SHMAP group were able to find the items more efficiently than they would have if they were searching on their own.

Finding #3 - Search vs. Departments

One of the main goals of our usability testing was to observe how the participants use the SHMAP mobile application. We were interested in seeing how the users would actually use SHMAP in real life, as we had some preconceived notions of how it would be used, but no evidence to support those ideas. Instead of instructing the user to use the search bar or departments list for task two through five, we left it fairly open to see which option the user would select and if it would change from task to task. All users utilized the search bar for tasks two through five. They all went right to the search bar and no one clicked on the departments menu button. We still plan to have both a search bar and departments list in the app, but this discovery shows us that most users will most likely use the search bar to find items, so we need to ensure that it is not only functional, but powerful.

Finding #4 - Search Functionality

As mentioned in the previous finding, all SHMAP users used the search bar to find the desired items, which allowed us to see our search functionality in action. While it works fairly well, we noticed a few issues. Multiple users ran into issues (one major), when they had an error in the product name. One user had an extra space at the end of the product name and it didn't bring up the item. Another participant reported that it did not work for him when he didn't type out the full product name. There is also an issue with the search button. Occasionally, users had to press the search button twice in order to pull up the results. These findings show us that we may need to increase the functionality and power of our search bar in the future.

Finding #5 - Display of Aisles

Another map-related problem that we encountered was the interpretation/display of the aisles. Right now, we have one map figure representing both sides of an aisle. This caused some confusion on task two where users were searching for the Casemates iPhone 5s case. The fixture that the item was located on has items on both sides. Multiple users went to the wrong side and spent time searching for it there before finding the case on the other side. The users also had a similar issue when finding the chapstick because they went to the opposite end of the aisle/shelf and walked right past the item. One user commented on the SUS that there could be "a better pinpoint location of the item."

Promotional Video & Branding Usability Test

Finding #1 - Understanding of SHMAP

As mentioned above, our main goal of the testing of our promotional video and branding was to ensure that subjects understood what SHMAP is just by watching the video. Subjects 1, 2, and 3 clearly understood the value of SHMAP in question two. It appeared that Subject 4 did not quite understand what the question meant, as they associated “value” with “money.” To further ensure subjects understood SHMAP, subjects answered question 5. Each subject responded with a 4 of above (out of a scale of 5, with 5 being a high understanding) with how well they understood SHMAP. Additionally, each subject responded with a 4 or above (out of a scale of 5, with 5 being high trust), with how well they trust SHMAP. Because of this, we believe that our group executed the value of SHMAP well within the promotional video.

Finding #2 - Length of Video

Three out of the four of our participants commented on the length of the video, indicating that it was too long. Subjects 1, 2, and 4 all mentioned that the video was too long when answering question four. Subject four said, “The explanation was long, need to be more concise -- which I think is totally doable." These findings show that we should decrease the length of our video, particularly in the explanation portion in the last half of our video.

Finding #3 - Most Attractive Portion of Video

Each of our four participants had a different favorite portion of the video. In question three, Subject 1 and 2 selected a “comedic relief” portion of the video as the most attractive portion.

Subject 3 and 4 both seemed to enjoy the later half of the video with the explanation. As our group was deciding whether or not to split the video into two separate videos (one with the skit and the other with the explanation), the feedback of the video showed that certain participants enjoyed different portions. Because of this, we will not split the video to ensure different audiences are intrigued while watching our video.

RECOMMENDATIONS

Based off of our usability testing on the SHMAP app and video, we have analyzed our data and have made recommendations for SHMAP. Based on the data we received we will need to alter elements of our promotional video, such as the length and make adjustments to the structure/design of our layouts within our app and improve our search functionality.

Due to some confusion with our map layout, we feel we will need to make changes to the layout in the future. Users were confused with two-sided aisles and long aisles, so we need to find a way to make that distinction clear. In the future we will still light up the corresponding aisle, but separate aisles into two sides and/or add the side of the aisle to the list of information that is shown when the user hits “SHMAP That”. It also appeared that our entrance/exit button wasn’t as prominent as it should be for orientation purposes, so we will need to make it more visible in the future.

We would also like to improve the functionality of our search bar. The search bar will most likely be the main method of searching so it needs to be powerful and make the experience easy for the consumer. We will work towards creating a more efficient select statement that allows for

extra characters or small changes to a product name. With those measures in place, we can better account for user error. We will also conduct more research and examine our code to determine why our search button function isn't seamless.

Additionally, we will be decreasing the length of our promotional video. While it is important to have a number of different elements in our video for promotional and financial reasons, we need to consider the length of the video. In our video test data, multiple users thought it the video was lengthy and sections, particularly the explanation at the end, could be cut down. Moving forward, we will what elements to cut out/down to shorten the length without removing any of important messages.

APPENDICES

- Appendix A: Persona
- Appendix B: Screener
- Appendix C: SHMAP Post Test
- Appendix D: Control Group Post Test
- Appendix E: Test Scripts
- Appendix F: Usability Test Data
- Appendix G: Video Script
- Appendix H: Video Post-Test

Appendix A: End-User Persona - Cal Davis

Cal Davis is a white, 21-year-old male, college student. Cal is a busy full-time college student who makes weekly trips to the store to pick up products he needs. Cal has a very busy schedule since he is taking 6 classes and has to practice every day for the tennis team. He already has to make time to study for his classes, complete homework, and complete other activities that pertain to his college lifestyle. In his free time, Cal enjoys attending sporting events and playing Dungeons and Dragons. He owns an iPhone 7, and like most people his age, he keeps up with the latest technology

Taking a weekly trip to the store is difficult for Cal to fit into his busy schedule. He hates wandering around the store to find the items that he needs. He can never find someone to assist him and gets easily frustrated with how much time he wastes searching for individual items out of the large inventory. Even though Cal goes to the same store every week he gets easily overwhelmed by the amount of products available and ends up leaving without products he needs because he doesn't have enough time.

The ideal shopping experience for Cal would be:
Cal drives 15 minutes to the store in order to pick up items that he needs. He pulls out his iPhone and looks up the first product that he needs on a mobile app. He immediately goes and picks up that product and then types in the search for his next product. Cal's shopping experience takes only 15 minutes because he was able to locate his desired items within a matter of seconds. Cal checks out of the store and heads back to school to make it to the basketball game on time. He is relieved that his shopping experience was so simple and fast.

Quotes:
"Trying to find all of my items on my own is a waste of time because I am not sure where everything is. I am very busy with homework and I just want to get in and out as quickly as possible."

"Shopping isn't my ideal 'free time' so being able to get that over and done with makes me able to fit in activities that I actually like to do, such as playing Dungeons and Dragons."

Appendix B: Screener

1. **What is your age?**
    a) 18- 24
    b) 25-34
    c) 35-44
    d) 45-54
    e) 55 or older

2. **Do you own a smartphone?**

    _____

3. **How often do you go shopping (in-store) in a month?**
    a. Never
    b. Once a month
    c. Once a week
    d. 5-9 times a month
    e. 10-15 times a month
    f. More than 15 times in a month

5) **On a scale of 1-5, with 5 being very desireable, how desirable is it for you to decrease your shopping time (spend less time in the store)?**

    _____

Appendix C: SHMAP Post-Test

1. **If you were to use this app, which method would you be most likely to choose?**
    a. Search for items before going to the store
    b. Search for multiple items in store at a time
    c. Search for one item at a time

2. **On a scale of 1 to 10, with ten being highly recommend, how likely would you be to recommend this app to someone?**

    _____

3. **Out of the following phrases for the "item cannot be found screen", which do you prefer?**
    a. "SHWELP, looks like we cannot find that item."
    b. "That item is not on our shelves."
    c. "That item took the "in" out of our inventory."
    d. "More like an OUTventory. lol . We don't have it."
    e. "Guess you are saving some money today because we don't have that item."

4. **Out of the the following phrases for the search bar placeholder, which do you prefer?**
    a. "SHWAT can we help you find?"
    b. "What do you want?"
    c. "Let's take a gander…"
    d. "Let's search!"
    e. "Tell me what you want, what you really really want…"
    f. "Lemme find it for ya.."

Appendix D: Control Group Post-Test

1. **Out of the following phrases for an "item cannot be found screen," which do you prefer?**
    a. "SHWELP, looks like we cannot find that item."
    b. "That item is not on our shelves."
    c. "That item took the "in" out of our inventory."
    d. "More like an OUTventory. lol . We don't have it."
    e. "Guess you are saving some money today because we don't have that item."

2. **Out of the the following phrases for a search bar placeholder, which do you prefer?**
    a. "SHWAT can we help you find?"
    b. "What do you want?"
    c. "Let's take a gander…"
    d. "Let's search!"
    e. "Tell me what you want, what you really really want…"
    f. "Lemme find it for ya.."

Appendix E: Scripts

SHMAP SCRIPT

Introduction:

“Hi, welcome. Thank you for coming.”

“I’m [name]. I am a member of a capstone group at Lebanon Valley College who is creating a start-up company called SHMAP. Our company is in the process of creating an app that features a shopping location service which would allow you to easily search for items and view them on a digital map. This is [name], who will be observing what we are doing today. We’ve brought you here to see what you think of the app, what seems to work for you, what doesn’t, and how you interact with certain elements of the product.”

“We are going to be video recording what happens here today and taking notes, but it is for analysis only. It will only be seen by members of the testing team and our professor, Dr. Jeff Ritchie. During the testing it is important to remember that we are testing and evaluating the system, not you.”

“The testing we are going to do today will go like this: We will provide you with a scenario and task, which you will then complete with the SHMAP app. After each task we will ask you a question that relates to the task you just completed. While completing the tasks, we would like you to “think aloud” as best as you can. We’d like you to speak your thoughts as often as you can. Just narrate what you’re doing, sort of as a play-by-play, telling us what you’re doing and

why you're doing it. After all of the tasks are completed, we will ask you some follow up questions. Are there any questions?"

"Now I'd like to read you what's called a statement of informed consent. It sets out your rights as a person who is participating in this kind of research. As a participant in this study: You may stop at any time, ask questions at any time, or leave at any time. Your answers are kept confidential. Are there any question before we begin?"

"Now I'd like you to complete a couple of tasks with the SHMAP mobile application. Work just as you would normally, narrating your thoughts as you go along. Please indicate when you are done with a task."

Test:

For the following scenarios, imagine that you are taking a trip to the store to find a few items that you saw online.

Scenario 1: Imagine that you are relatively new to the area and you don't know where the closest Barnes & Nobles bookstore is. Use SHMAP to choose the closest location.

- Follow-up: "How long do you believe it took you to find that item?"

Scenario 2: Once you are in the store, you decide to look for your first item. Using SHMAP, locate the Casemate Prints Collection Murra Coral iPhone 5s case. Once you have located the

item, please bring the item back to us. (Hand Test Subject Product & Images paper. Once they receive it - start timing.)

- Follow-up: “How long do you believe it took you to find that item?”

Scenario 3: For your next item, locate the Retro Brand Mock Twist long-sleeve T-shirt. Once you have located the item, please bring the item back to us. (Hand Test Subject Product & Images paper. Once they receive it - start timing.)

- Follow-up: “How long do you believe it took you to find that item?”

Scenario 4: Using SHMAP, locate the EOS Summer Fruit Lip Balm. Once you have located the item, please bring the item back to us. (Hand Test Subject Product & Images paper. Once they receive it - start timing.)

- Follow-up: “How long do you believe it took you to find that item?”

Scenario 5: Using SHMAP, locate the Navy Reverse Weave Hoodie. Once you have located the item, please bring the item back to us. (Hand Test Subject Product & Images paper. Once they receive it - start timing.)

- Follow-up: “How long do you believe it took you to find that item?”

“This concludes the end of the test. We will now have you take a post-test that asks you about your experiences during this test. Once again, there is no wrong answer. The information we collect will be not be attached to your identity in any way. Thank you for participating in the test. Do you have any questions or comments on the project?”

CONTROL GROUP SCRIPT

Introduction:

“Hi, welcome. Thank you for coming.”

“I’m [name]. I am a member of a capstone group at Lebanon Valley College who is creating a start-up company called SHMAP. Our company is in the process of creating an app that features a shopping location service which would allow you to easily search for items and view them on a digital map. This is [name], who will be observing what we are doing today. We’ve brought you here to see how you go about finding a variety of items in the Lebanon Valley College Bookstore.”

“We are going to be video recording what happens here today and taking notes, but it is for analysis only. It will only be seen by members of the testing team and our professor, Dr. Jeff Ritchie. During the testing it is important to remember that we are testing and evaluating the system, not you.”

“The testing we are going to do today will go like this: We will provide you with a scenario and task, which you will then complete. After each task we will ask you a question that relates to the task you just completed. While completing the tasks, we would like you to “think aloud” as best as you can. We’d like you to speak your thoughts as often as you can. Just narrate what you’re doing, sort of as a play-by-play, telling us what you’re doing and why you’re doing it. After all of the tasks are completed, we will ask you some follow up questions. Are there any questions?”

“Now I’d like to read you what’s called a statement of informed consent. It sets out your rights as a person who is participating in this kind of research. As a participant in this study: You may stop at any time, ask questions at any time, or leave at any time. Your answers are kept confidential. Are there any question before we begin?”

“Now I’d like you to complete a couple of tasks. Work just as you would normally, narrating your thoughts as you go along. Please indicate when you are done with a task.”

Test:

For the following scenarios, imagine that you are taking a trip to the store to find a few items that you saw online.

Scenario 1: The first item you decide to look for is the Casemate Prints Collection Murra Coral iPhone 5s case. Please locate the item and bring the item back to us. (Hand Test Subject Product & Images paper. Once they receive it - start timing.)

- Follow-up: “How long do you believe it took you to find that item?”

Scenario 2: For your next item, locate the Retro Brand Mock Twist long-sleeve T-shirt. Once you have located the item, please bring the item back to us. (Hand Test Subject Product & Images paper. Once they receive it - start timing.)

- Follow-up: “How long do you believe it took you to find that item?”

Scenario 3: Please locate the EOS Summer Fruit Lip Balm. Once you have located the item, please bring the item back to us. (Hand Test Subject Product & Images paper. Once they receive it - start timing.)

- Follow-up: “How long do you believe it took you to find that item?”

Scenario 4: Please locate the Navy Reverse Weave Hoodie. Once you have located the item, please bring the item back to us. (Hand Test Subject Product & Images paper. Once they receive it - start timing.)

- Follow-up: “How long do you believe it took you to find that item?”

“This concludes the end of the test. We will now have you take a post-test that asks you about a few elements of the app we are developing. Once again, there is no wrong answer. The information we collect will be not be attached to your identity in any way. Thank you for participating in the test. Do you have any questions or comments on the project?”