

Interface and Experience Design
6930 - Victor Ribeiro Cardoso
Assignment 2a - Paper Prototype Usability Test Document



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Executive summary

This report, in continuation of the process to analyse the best app according to the user's needs, is the results from a test performed on a paper based prototype. We focused on comprehending the user experience and interaction with the paper prototype.

For this report we follow the following methods:

- **Card Sorting**

With the help of Optimal Workshop website we managed to write down our site map separated in cards. Each card represented one page of the app that was thought of in the previous assignment. After, we asked 5 users to organize how they would better fit the card in groups. The results of this test gave us the possibility to change our site map according to users needs and expectations.

- **Survey questionnaires**

Using Google forms we were able to collect user consent for recording and analyzing the data gathered. The surveys were also important to narrow our users' target. Making sure the people who do the test were the ones that we aim to achieve with the app was really important.

- **Paper Based Prototype**

After card sorting, we drew the pages of the app with low fidelity and used Marvel App software to connect the screens. Then, we were able to test the prototype and gather information from the tests we made using the low fidelity prototype.

It was possible to identify some issues or better ways to approach some steps. Few of those were:

- Home Page missing
- Extra shot button missing
- Cart a bit confusing

User group overview

We have done the test with 5 different users of the following profile:

Age

5 responses

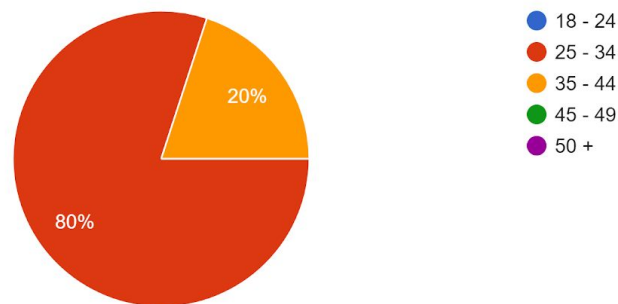


Image 1: Profile age - Source: author

Our target group is young workers in between 20 to 45 years old where our 5 people tested were exactly in this group. 80% were between 25 to 34 years old. And 20% in between 35 to 44. Narrowing the age was important for the tests to make sure we are analyzing data with the highest fidelity with the group we aim to achieve.

How regularly do you drink coffee from a Café?

5 / 5 correct responses

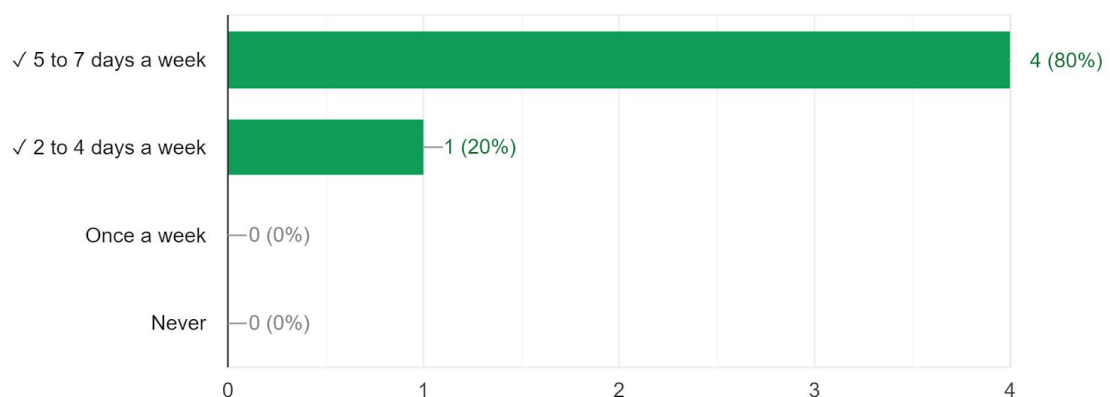


Image 2: Profile coffee drinking regularity - Source: author

Moreover, we also focused on people that drink coffee out of their house, in a coffee shop, at least 4 times a week. That is because our app is focused on people that will get their regular coffees in the physical store instead of

making the coffee at home. In this sense, our testers were 80% drinkers of coffee from a Café more than 5 days a week and only 20% in between 2 to 4 times a week.

Have you ever used an app to order coffee?

5 / 5 correct responses

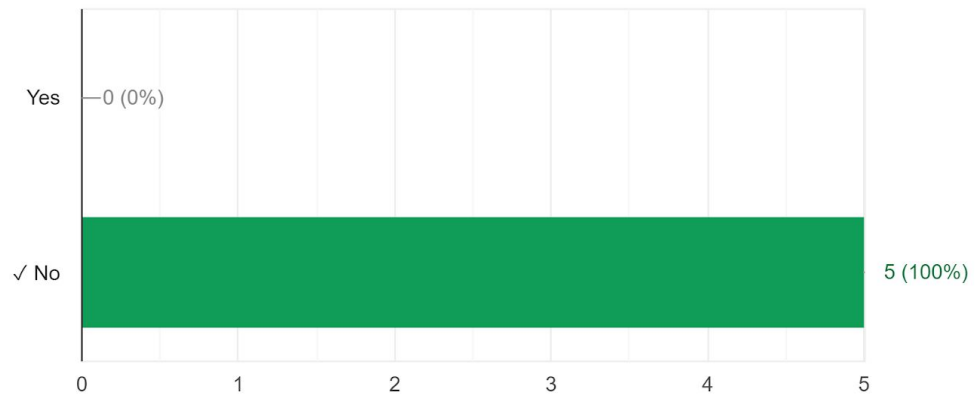


Image 3: Profile used app for order coffee - Source: author

Finally, our target is to focus on people that have not used that kind of solution before but are open to new solutions and technologies. That is because they are a gap that we believe we need to fill and deliver a different solution for their daily life. With the app we will be able to introduce them a new way to have their coffee and also get some special offers. Our results showed that 100% of our testers have never used an app to order coffee.

Overview of tasks

The tasks created were focusing to make it possible for evaluation of the usability through the app here proposed. They were clear and made with the purpose to bring a context for the user and made them test the main features of the app. In this sense, we were able to evaluate if what is being proposed has an intuitive and friendly environment for the usage.

Task 1 - Order a latte with one sugar

- You are going to work.
- You want a coffee on the way.
- However, you know it is a busy time and you could lose time in lines.
- And you want just to pass by the coffee shop chosen and get your order.

Task 2 - Find your Rewards, also find out if the store you want uses recycling cup

- You become a regular shopper.
- You want to find out if you have some special offer or have accumulated enough points for your free coffee.
- You also want to make sure that your favorite store is using a recycling cup or eco friendly.

Task 3 - Go to your cart and delete one coffee from your order

- Your friend has asked you to bring a coffee as well.
- You have put through the coffee but he sent you a message saying he/she does not need it anymore.
- You want to delete your friend coffee from the cart and pay for just yours.

Testing results

Informational Architecture

As continuation of the process, we used the card sorting technique to analyze the features of the app and create the informational architecture of the app. The results of the card sorting made possible for us to build a new application map, which we follow for the paper based prototype.

With the results and our proposed app we found four main features connected:

- Order
 - Easy steps to order coffee
 - Saved favorite orders to make it easy for future orders
 - Location settings
- Account
 - Rewards collecting
 - Payment preferred method
 - Special Offers
- About
 - Store Information
 - Contact Us
- Home Page
 - Easy presentations of the main features

Card Sorting

According to the previous process we have made (target users, personas, journeys maps and user flow) we came up with 22 cards that would represent the features of the app. In this sense, we asked for 5 testers to organize the cards according to their intuition. It was important for the users doing the test to understand that there were no right or wrong question, so that they could organize in the way they believe it was most intuitive for them.

In the images followed we will show the results of the card sorting and how it helped us to come up with the new organization of the app map.

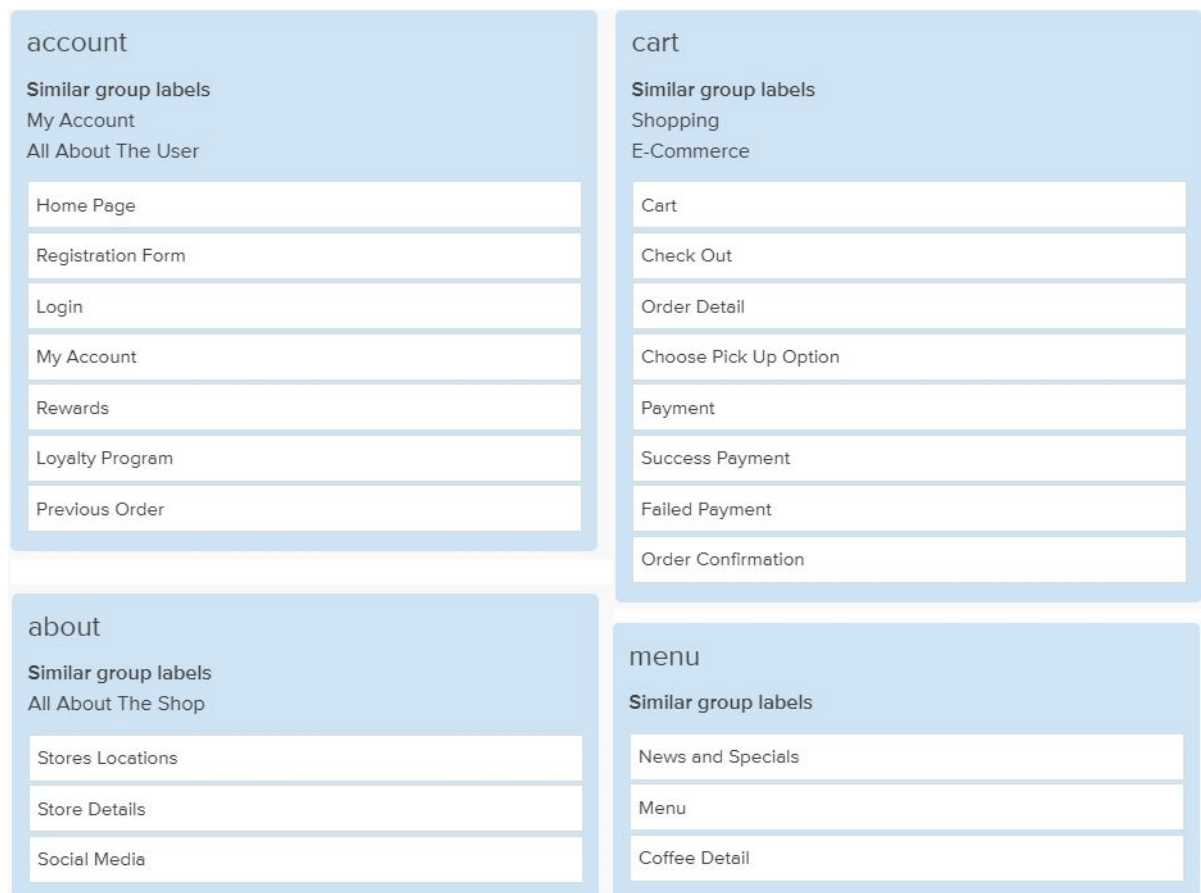


Image 4: Cards sorted by similars result - Source: OptimalWorkshop

The image above is called Participant-Centric analysis (PCA) and shows how different testers agreed most strongly with others. The image is a merge of the strongest similarities for the card sorting that were done. The PCA is a good starting point to how we could do better our app flow. As we can see, 4 main groups were narrowed from our more than 20 cards.

Registration Form																				
100	Login																			
100	100	My Account																		
60	60	60	Loyalty Program																	
60	60	60	80	Rewards																
0	0	0	20	40	Payment															
0	0	0	0	20	80	Check Out														
0	0	0	0	20	80	80	Success Payment													
0	0	0	0	20	80	80	80	Failed Payment												
0	0	0	20	0	60	80	60	60	Cart											
0	0	0	20	0	40	60	40	40	80	Order Detail										
0	0	0	40	20	60	40	40	40	60	80	Choose Pick Up Option									
0	0	0	20	0	40	40	60	40	60	80	80	Order Confirmation								
0	0	0	20	0	20	20	20	20	40	60	60	60	Coffee Detail							
0	0	0	20	0	20	20	20	20	40	40	40	40	80	Menu						
0	0	0	0	0	0	0	0	0	0	0	0	0	40	60	News and Specials					
0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	40	Store Details				
0	0	0	20	0	0	0	0	0	20	20	20	20	40	40	20	80	Stores Locations			
0	0	0	0	0	0	0	20	0	0	0	0	20	0	0	40	60	40	Social Media		
40	40	40	20	20	0	0	0	0	0	0	0	0	0	20	40	40	20	20	Home Page	
40	40	40	20	20	20	20	20	20	20	40	40	40	60	40	20	20	20	0	20	Previous Order

Image 5: Cards sorted by similarity Matrix- Source: OptimalWorkshop

The similarity Matrix above gathers the most closely related cards along the right edge of the table. Potential groupings can be considered with the darker clusters. For example, "Payment" and "Check-Out" are 80% gathered together. Also "Login", "My Account" and "Registration" are 100% grouped together. On the other hand "Social Media" and "Previous Order" would be 0% grouped together. Important to remember that those results are all according to our testers.

Best merge method

The best merge method often performs better than the actual agreement method when your study has fewer participants. It makes assumptions about larger clusters based on individual pair relationships.

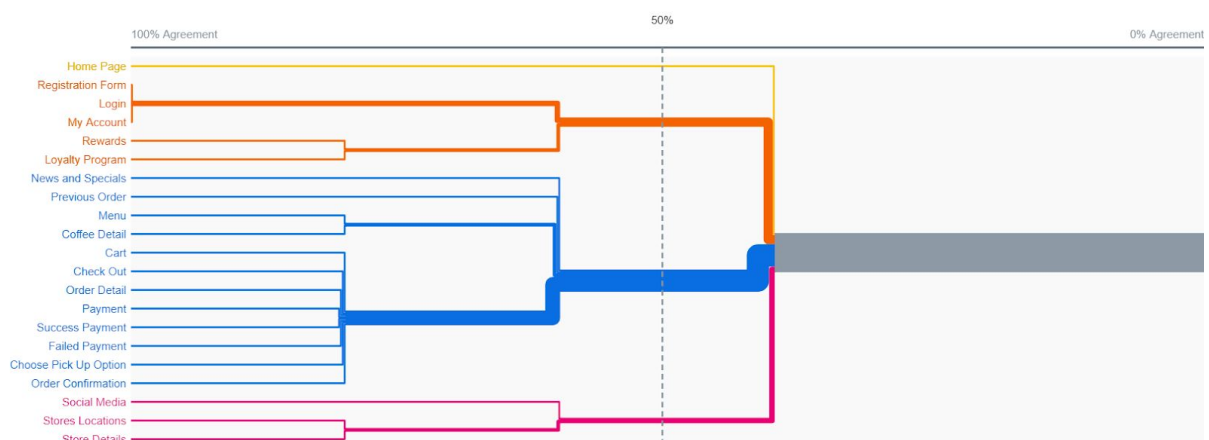


Image 6: Cards sorted by Best Merge- Source: OptimalWorkshop

The image above is a dendrogram that shows in proportion how the tester agreed with each other. That image clearly identifies four main groups that were differentiated in 4 colours: yellow, orange, blue and pink. It also sums up what we have seen in the previous tables. Analysing them helped us to come up with the main 4 features that we grouped our new app map: Home Page, Account, Orders and About. More about those features in the following part.

Application map

According to our new research with card sorting, we created a new map for the application. That map will be focused mainly on our 4 main features. The pages connected to the main ones are easily expanded, updated or deleted according to the need of the app. They four main ones are:

Home Page

In that page it will give fast access but also be able to implement some basic instructions where the user can get used to the app environment.

Account

In that page it will be focused on the user's information. Some examples are their rewards, favorite stores and drinks and also saved payment methods.

Orders

Here the user will be able to make the order process, including payment. Here it will also have the story of the order that the user has already made.

About

That page will be mainly for the company information. Some examples are Store information, contact the company as well other information the company finds necessary to add.

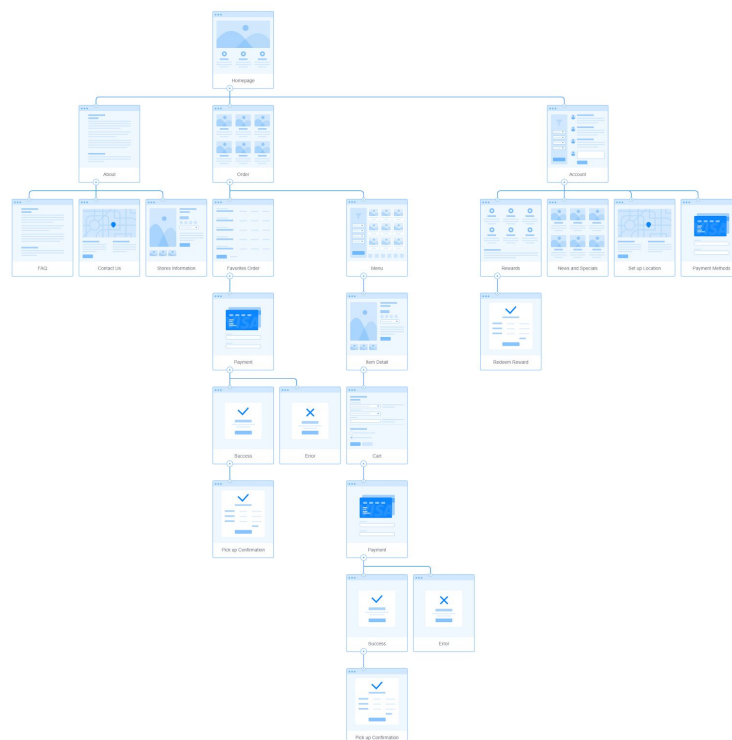


Image 7: App Map - Source: author

Prototype Outline

With the app map created we finally made the Paper Based Prototype. That method allowed us to draw basic wireframes with low fidelity, by hand, to represent our app. With the draws we took pictures of each screen and added it to a software called Marvel App. That app was important to create a connection between images adding links in specific places in the picture and , when clicked, sending to the proper page. That made it possible to create a function, low fidelity, app that could be tested with real users and collect information from their interaction while testing it.

The link for the paper based prototype is the following:
<https://marvelapp.com/prototype/5d1b2ii>

For the prototype we used the following draws:



Image 9: Paper Based Prototype - Source: author

Bugs

There was no recurring bug on the prototype.

Testing results

The following tables will show the tasks with information that were gathered while each user did the tasks asked. To find task's videos, go to appendices C.

Task Number: 1					
Overview: - Order a Latte with one Sugar - Main objective of the app, order a coffee					
	User 1	User 2	User 3	User 4	User 5
Completed	Yes	Yes	Yes	Yes	Yes
Duration	2 min	1 min	1 min	2 min	2 min
Clicks	15	9	12	10	11
Mistaps	6	0	3	1	2
Path Taken	<ul style="list-style-type: none"> - Pick Location - Menu - Specifications - Cart - Payment - Pick up Confirmation 	<ul style="list-style-type: none"> - Pick Location - Menu - Specifications - Cart - Payment - Pick up Confirmation 	<ul style="list-style-type: none"> - Pick Location - Menu - Specifications - Cart - Payment - Pick up Confirmation 	<ul style="list-style-type: none"> - Pick Location - Menu - Specifications - Cart - Payment - Pick up Confirmation 	<ul style="list-style-type: none"> - Pick Location - Menu - Specifications - Cart - Payment - Pick up Confirmation
Pain Points	<ul style="list-style-type: none"> - Could not find a proper button for Extra Shot - More coffee option 	No pain points reported	Dealing with more orders	Home page missing	Not presented
Key User Comments	"Could it have a more clear Homepage"	No comment reported	<ul style="list-style-type: none"> - "It was very intuitive" - "Maybe a filter for choosing store" 	<ul style="list-style-type: none"> - Really Nice - Routes could be easier presented 	No comment reported
General Comments	"Could save credit cards"	Liked it, and would use it.	<ul style="list-style-type: none"> - order more than one coffee easier (an add button) 	<ul style="list-style-type: none"> - Saved routes could be an option - Favorite coffees and store saved - save a credit card 	No comment reported

Table 1: Task 1 review - Source: author

As the testers were not used to the app environment or even the idea of the paper prototype and how it worked, they were a bit confused about what they were supposed to do. However, after explaining that it was a prototype and they could click in the draws representing a button they felt more confident and started to play.

In the first task some of the users were confused about the main page being directly the one to pick up location. However, they all completed the tasks and after they made the first click they kept going and had easy navigation through the app. That brought us that “picking a store” as the main page was not the best idea, so we will need to implement a Home Page with more basic layout to introduce the user in the app. The following steps were really intuitive for all, but it was missing some features like an “extra shot button”.

Task Number: 2					
Overview: - Find your Rewards (points) and also Find out if the store you are buying uses recycling cup					
	User 1	User 2	User 3	User 4	User 5
Completed	Yes	Yes	Yes	Yes	Yes
Duration	1,5min	2min	2min	2min	2,5min
Clicks	4	4	5	4	8
Mistaps	0	0	1	0	4
Path Taken	Menu Rewards Menu Store Info	Menu Rewards Menu Store Info	Menu Rewards Pick Location Menu Store Info	Menu Rewards Menu Store Info	Menu Rewards Menu Cart Coffee Specification Menu Store Info
Pain Points	Home screen missing	No pain point reported	Confusing to find specific information	No pain points reported	Did not realize there was a Store Info
Key User Comments	"Really nice"	No specific comments to report	- Recycling cup could be easier found	"Cool"	"I have not find it at first, sorry"
General Comments	No specific comments to report	No specific comments to report	A filter could be interesting	No comment reported	"Maybe a specific place for the Info"

Table 2: Task 2 review - Source: author

Task 2 the users were more familiar with the app and found it intuitive to find the Rewards. However, some of the users have reported some opinions like creating a filter for the setting up the location and having a better location for the store information. The users also reported that a home page would make the app look more simple.

Task Number: 3					
Overview: - Make changes in your CART deleting one coffee from it.					
	User 1	User 2	User 3	User 4	User 5
Completed	Yes	Yes	Yes	Yes	Yes
Duration	1min	2min	2,5 min	1min	2min
Clicks	3	7	9	3	6
Mistaps	0	4	6	0	3
Path Taken	- Menu - Cart - Delete	- Menu - Cart - Menu - Coffee - Menu -Cart - Delete	- Menu - Cart - Menu - Coffee - Menu - Order -Menu -Cart - Delete	- Menu - Cart - Delete	- Menu - Cart - Menu -Cart - Menu - Cart
Pain Points	No pain point reported	-Thought the cart a bit confusing	- Home Page missing - Could have easier cart access	No pain point reported	Did not find the delete button easy
Key User Comments	No specific comments to report	"cart could be in a better place"	"How to delete it?"	No specific comments to report	No specific comments to report
General Comments	No specific comments to report	"cart could be in a better place"	"I did not see it!"	No specific comments to report	"That was the draw fault"

Table 3: Task 3 review - Source: author

For task 3 some users had difficulties finding the cart or making the change. That may represent the need to change the organization of the app. However, it was also interesting to see that some of the users had difficulties not necessarily because of the organization, but because of the draws or missing more loyal images in the prototype. As the paper based prototype is a low fidelity prototype, that might be solved in the future with more realistic pages. Moreover, we also will take those information for the next steps and make possible changes.

Overview of issues

After doing the test with the paper based prototype using the Marvel App, we could identify few issues and classify them to their severity (minor, major, severe or catastrophic). According to our test there were no catastrophic issues, but 1 Severe, 1 Major and 4 minor. All the issues will be thought and fixed in the best way possible in the next prototypes.

The issues are the following:

- **Home Page : Severe**
 - Users 1, 3, 4 and 5 find the homepage as the set up location not intuitive.
 - The homepage should be clearer and more basic
- **Cart : Major**
 - The way information was presented might have caused difficulties.
 - Finding the cart could be more intuitive in different places.
- **Extra Shot Button : Minor**
 - User 1 could not find a button for an extra shot.
- **Previous Orders and/or Favorite Order : Minor**
 - User 4 reported a difficulty to find favorite orders.
 - It was recommended that we create a separate part for Favorite order and other for the previous orders.
- **Location set up : Minor**
 - User 3 and 4 thought the set up location could have a different page and not be asked every time it started an order.
- **Payment Method : Minor**
 - User 1 and 4 reported that a saved payment method would be interesting to have and would facilitate the process.

We follow the follow explanation for the issues ranked:

Minor	Major	Severe	Catastrophic
Find an issue but still be able to finish the task. Little or no frustration reported.	Find an issue causing small frustration, still completed the task.	An issue caused large frustration. It needed help to complete the task.	Task not completed and big frustration.

Table 4: Issue ranking - Source: Hayashi, D. 2019

Post Questionnaire results (survey/ feedback)

When the user has finished their test, it was asked to fill out a questionnaire with specific questions about the test.

For the questions "how easy it was...", it was only given 3 options: easy, difficult or medium. With that we could understand how intuitive, or not, the user thought about the app proposed.

The results were the following:

How do you find doing the Task 1 (Ordering a Latte with one sugar)?

5 responses

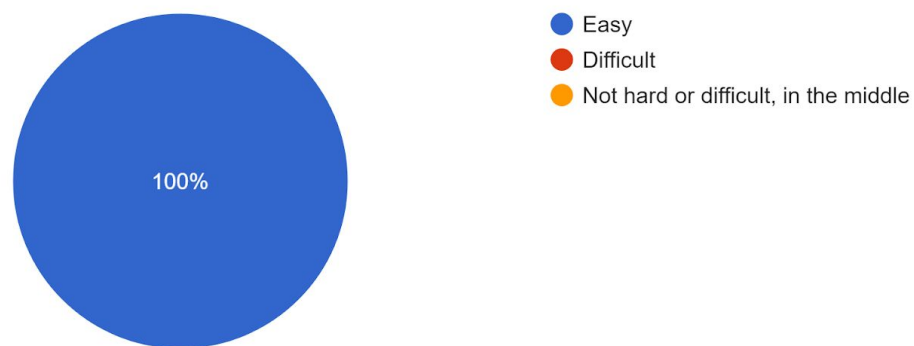


Image 10: questionnaire question 1 - Source: author

How do you find doing the Task 2 (Find your rewards)?

5 responses

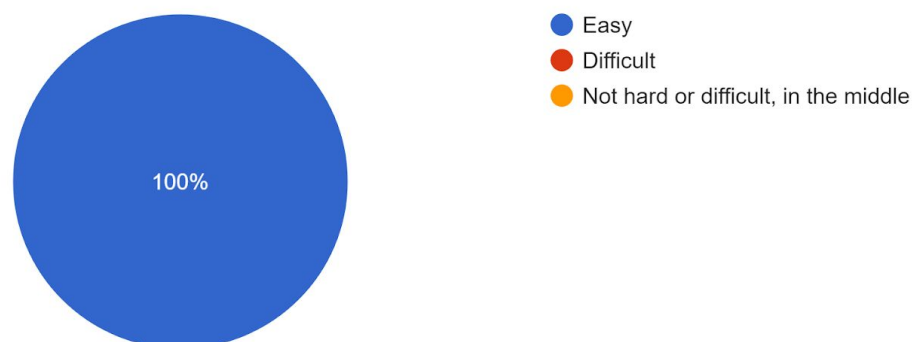


Image 11: questionnaire question 2 - Source: author

How do you find doing the Task 3 (Make changes in your CART deleting one coffee from it)?

5 responses

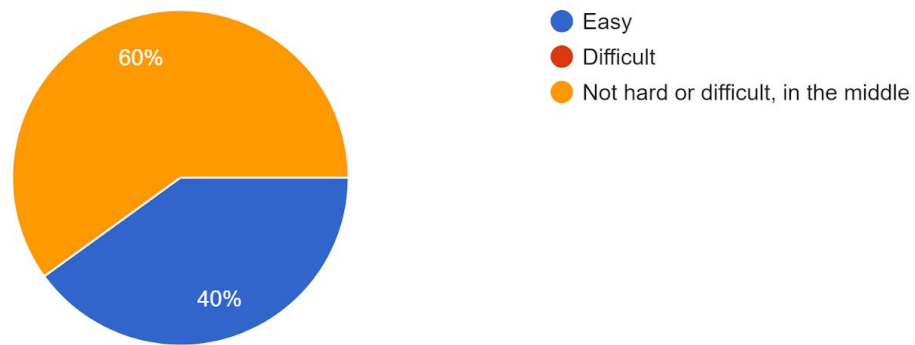


Image 12: questionnaire question 3 - Source: author

How do you find doing the Task 4 (Discover if the store you are shopping from uses Recycling Cup)?

5 responses

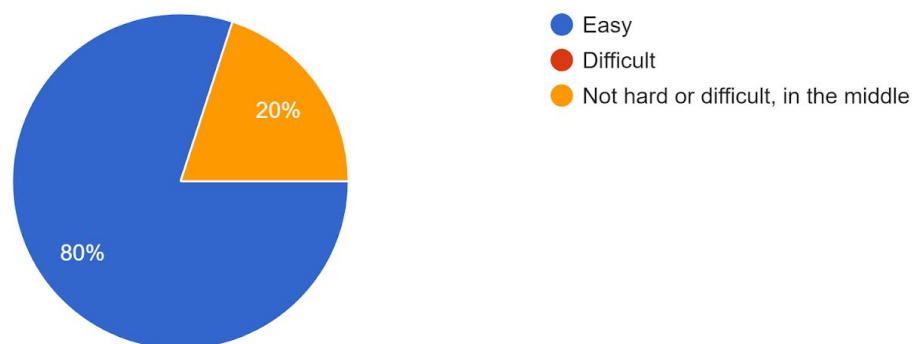


Image 13: questionnaire question 4 - Source: author

Do you have any comment about the app?

5 responses

- It was very intuitive
- No, only what we spoke about while doing it
- excellent app idea
- I thought the app was easy to navigate
- Home page could be different.

Image 14: questionnaire question 5 - Source: author

Would you add or delete anything from it?

5 responses

- no
- Would add a filter in the screen where I am searching for coffee shops (filter by: price, reviews, sustainable practices, vegan, etc)
- No
- Add a Home page, add location recommendation (also route), use card saved to save time during shopping.

Image 15: questionnaire question 6 - Source: author

For the post questionnaire we separated the task 2 in 2 different tasks so we could understand better which were the difficulties or not in detail. With that said, we can see in the results that Task 1 (ordering a coffee with specifications) and Task 2 (Find your Rewards) were considered easy. That means they were intuitive to be completed.

For Task 3 (Make changes in the cart) 60% of the user has answered that the task was in the middle of difficulty. That means we need to change some organization of the related pages. Some pain points reported were the Home Page missing where they could not go back to find the basics or the cart being a bit confusing to understand. However, as the prototype was a low fidelity, some draws might not have been as clear as the user expected. For example, User 5 found it difficult to understand the draw in the cart as being its order or not.

Overview of the results

The tests here helped us to understand our users targets and how they feel about the app proposed. With those activities, card sorting and paper based prototype, we were able to narrow the need of the user and come up with better organization as well future solutions for the application. The card sorting brought us the chance to make a new application map and the prototype tasks made us realize some issues (related in the table below).

Minor	Major	Severe	Catastrophic
1.EXTRA SHOT button 2.ORDERS - previous or favorites 3.LOCATION set up 4.PAYMENT method	5.CART design and location	6.HOME PAGE missing	

Table 5: Issues results - Source: author

The issue number 6, considered severe, we will need to review how the home page will be designed. We considered it as severe because the user reported a large amount of frustration to not have one. In the prototype we had as the main page the setting up the location for the pick up of their coffee. However, to fix the issue, we will review how the home page will be presented and fix the set up location place.

Issue number 5 is about the cart design and location. We considered it as a major issue because it causes few frustrations for 2 users and it's an important feature for the app to be understood for the user. To fix it we will need to revisit the cart design and how to access it to make it more intuitive.

Issues 1 to 4 are considered minor because they were small details and they did not translate as big frustrations. The users reported all of them as an addition, as they could solve the problems related in easier ways as well. To fix those issues we will quickly add what is needed and reorganize pages to make it more intuitive.

Finally, those tests were important to get qualitative and quantitative data to correct issues in the app proposed. Doing that before the final prototype will save time and costs for the project.

References

Marvel App, 2020. Accessed by: <https://marvelapp.com/>

Optimal Workshop, 2020. Accessed by: <https://www.optimalworkshop.com/>

Hayashi, D. 2019. Assignment 2a - Paper Prototype Usability Test Report -
Academy of Information Technology (AIT)

Appendices

A. Paper Prototype

Link for the connected Paper based prototype in MarvelApp:

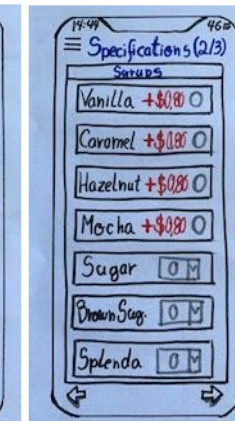
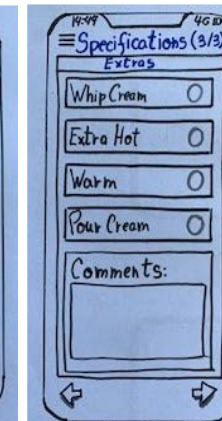
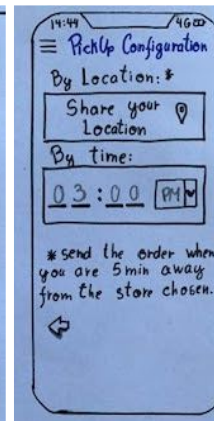
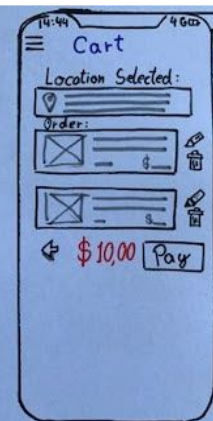
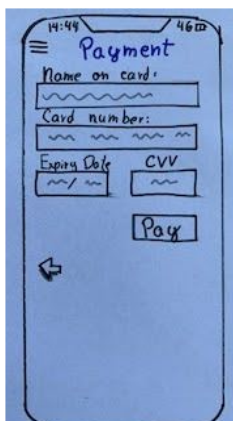
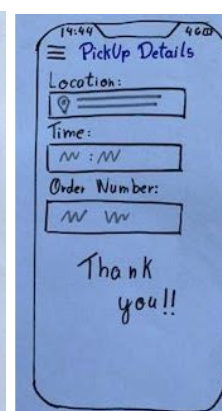
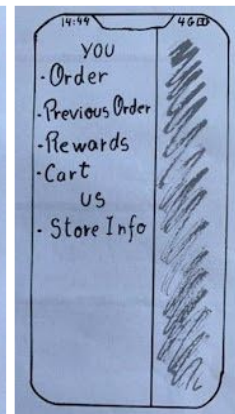
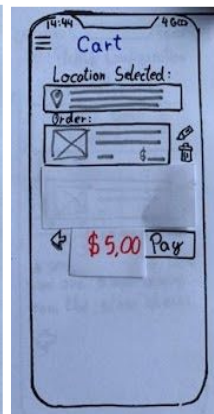
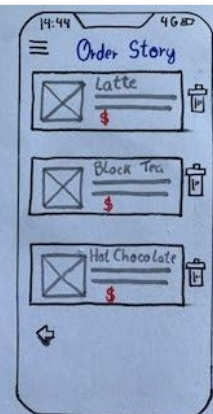
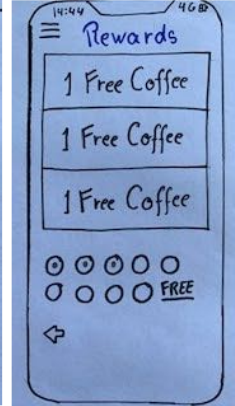
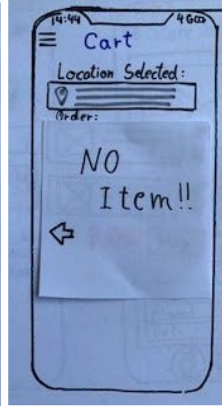
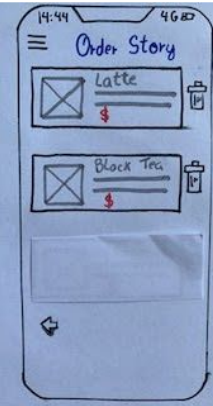
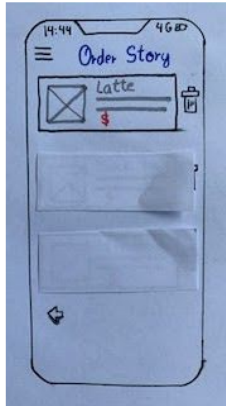
<https://marvelapp.com/prototype/5d1b2ii>

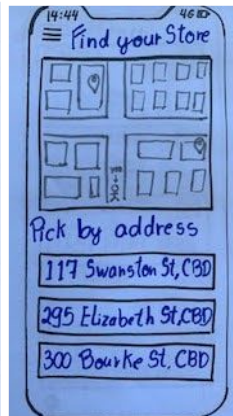
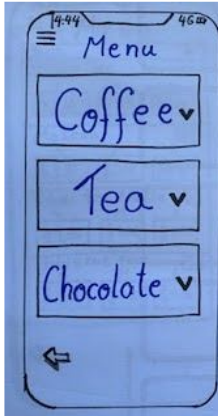
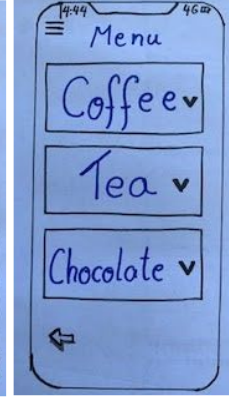
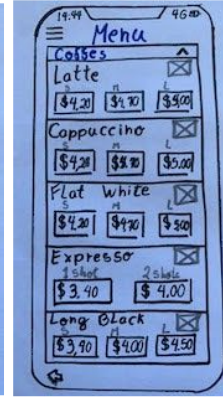
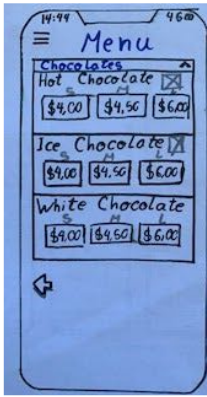
Link for google document with all files:

https://drive.google.com/drive/folders/1zeTHem_noSG-NRthH-vDikVqvPAg_oWv?usp=sharing

Above, the photos of the draws:







B. Documentation from the test

B1. Script

Hi,

I am Victor Cardoso and I am studying UX and UI design for my bachelor degree in IT at AIT. I am developing a smartphone application for Coffee Mobile Order. The app focuses on ordering a coffee through the app so the user can skip lines, schedule drinks at the time desired and also make big orders.

For this test it was created a paper prototype with low fidelity, as it is in the first stage of the project. In this sense, to understand how intuitive the app is proposed, we are going to test it with real possible users (you).

The test will be recorded, but not your face, only the paper (or computer) while you are doing the tasks asked.

- User fill the Consent Form in google

We are going to give you a main scenario and with that we will give you 3 tasks to be completed. I will not be able to tell you what you need to do to complete the task, but I can help with any doubt during the test to clarify some task that might not be well comprehensive. However, there is no right or wrong answer, just feel free to click where you feel like to complete the tasks.

I will start recording.

- Start Recording
- Give Scenario
 - You are going to work and you want to grab a coffee on your way. However, you know it is a busy time and you don't want to lose time in a line. In this sense, you will use this Coffee Mobile Order app to skip the line and have your coffee on the time you want.
- Give TASK 1
- Give TASK 2
- Give TASK 3
- Stop recording

Ask the user to fill the Post Questionnaire. After ask if they have any comment or opinion about the prototype.

Thank the participant.

B2. Consent form and Questionnaire

Both, consent form and questionnaire, were made by using google form:

Consent Form and pre questions:

https://docs.google.com/forms/d/1VbxJnBOvqFHX2C8LXKnMrnRa01aEj_1dfHTy24Bd4ag/edit?usp=sharing

Pos Paper Based Prototype Test Questionnaire:

https://docs.google.com/forms/d/1IA_GFTmlt_BU3UFtpF8ytLzO4l6ugVpayY9NwjL4tFw/edit?usp=sharing

Link for google document with all files:

https://drive.google.com/drive/folders/1zeTHem_noSG-NRthH-vDikVqvPAg_aWv?usp=sharing

C.Videos

The videos are available in the following shared google folder:

https://drive.google.com/drive/folders/1zeTHem_noSG-NRthH-vDlkVqvPAg_oWv?usp=sharing