Assignment M2:

Needfinding Plan Execution for FaceID Redesign

Cleo Zhang

yzhang3761@gatech.edu

***Abstract—*** This study reports the raw results from the needfinding plans established in the M1 assignment for the FaceID redesign - surveys, participant observation and interviews. By analyzing and summarizing the findings of the plans, we want to understand users' needs and apply that in the redesigning process as we advance.

# 1 NEEDFINDING EXECUTION 1: SURVEYS

## 1.1 Execution and raw results

We first started the surveys to collect broader data of how users think about the existing FaceID interface, which also helped us identify the study scope we want to focus on in other needfinding techniques (for example, needfinding plan 3, interviews). The survey questions can be viewed in *Appendix 8.1: Survey questions.*

To execute this needfinding plan, I developed an online questionnaire with all the prepared questions. Then. I shared the questionnaire link on my social media and asked my friends to help spread my questionnaire to more potential participants. To encourage even more participants to answer the questionnaire, I also offer all participants to win a ten-dollar gift card for the Apple Store. Below are the raw results of each question from the survey.

1. Most participants’ age is between 19 and 34;
2. Answers are evenly distributed among two genders;
3. Most iPhone users enable the FaceID feature on their device;
4. Only about half of the participants are using the contactless payment feature with the FaceID - the responses concentrate around the "1 - 3" and "4 - 6" options;
5. Security and buying habits are popular reasons for people not using FaceID to pay;
6. Most users enable the FaceID for convenience - one of the participants mentioned that they prefer the TouchID to avoid typing in passwords;
7. Answers to these questions are almost evenly distributed among all provided options;
8. Responses to this question are distributed among provided options;
9. few participants reported being very satisfied with the FaceID feature.

## 1.2 Key takeaways

From the raw results listed above, we see that the FaceID interface is not yet penetrated to all the iPhone users, and only half of the users are using FaceID to pay because they are concerned about the security issue of FaceID, and they still prefer the traditional way of paying (for instance, using credits cards to pay). Most participants enable FaceID for convenience, and if users are using FaceID to pay, it can happen on any shopping occasion. Age-wise, the younger generation is more open to and used to pay by FaceID.

Also, we can conclude that external elements, like people around the user, can affect the experience of using FaceID - we probably want to figure out how those elements affect which part of the user experience when using FaceID. Since very few users are satisfied with the FaceID feature, we want to understand what makes them unsatisfied.

## 1.3 Bias control

An Apple Store gift card was used to promote the survey to attract more participants, eliminate confirmation bias, and have unbiased survey results. Distributing the survey online through social media is a low-cost and effective method, with high penetration of potential participants.

# 2 NEEDFINDING EXECUTION 2: PARTICIPANT OBSERVATION

## 2.1 Execution and raw results

To understand users’ thinking process under the contactless payment context, I went grocery shopping as a regular FaceID user. Below is the execution process and the notes I was taking along the way.

* I went to the grocery store near my apartment, and I first saw that wearing a mask is mandatory to enter the store - so I put my mask on;
* The store is jam-packed, and I did not want to take my mask off while shopping;
* I headed to the cashier to pay after I finished my shopping - people were queuing; I wished I could pay and leave sooner to reduce the chances of covid infections;
* After I scanned all the products, I held my phone close to the terminal to detect the payment request, adjusted my face trying to fit in the camera, and expected to complete the transaction instantly. However, my phone failed to recognize my face because of the mask;
* I fumbled to find a way to type in my password and tried to pay again because I was worried if the people behind me became irritated about me taking too long to pay;
* Holding the phone and typing in the password while packaging the products were not easy; I felt it took longer to complete a transaction than paying by physical credit card; I was a bit annoyed because I intended to save time when enabling FaceID for contactless pay;
* I then left the store and walked back home.

## 2.2 Key takeaways

The FaceID user experience can be affected by multiple factors - the interface design itself, the physical environment and even the user's mental status. Given that masks are required in public areas now, using FaceID to pay is not as efficient as before the pandemic.

User's cognitive resources can be overloaded when the FaceID interface cannot recognize the face when paying. The reasons are: (1). The anxiety level can go up if the payment process takes longer while other customers wait in the queue to pay; (2) multi-tasking is challenging as users need to select the option to pay by password, type in the password, proceed with the payment while packaging their order. Optimizing the cognitive resource allocation can be a good start to redesign the existing FaceID interface.

## 2.3 Bias control

To better control the observer bias and not over-value personal perspectives, I invited another person with a different personality to participate in this needfinding plan and take notes along the way. Then, we compared the notes and exchanged the findings.

# 3 NEEDFINDING EXECUTION 3: INTERVIEWS

## 3.1 Execution and raw results

Executing interviews can help us receive direct feedback from users and understand their thorough thinking process. We first developed the interview questions based on the findings from surveys and participant observation before the interview; We then invited some iPhone users with FaceID enabled to participate in the discussion in a quiet meeting room.

The interview questions primarily focus on what makes paying by FaceID slow and why users are not satisfied with the existing design of FaceID, but we started casual questions to build trust with participants and make them feel comfortable to answer the questions.

## 3.2 Key takeaways

Most users mentioned that they liked FaceID because it offered an efficient way to authenticate the payment and saved their time; however, wearing masks makes FaceID not that anymore. Some participants wanted to have the TouchID back as they believed the TouchID probably fit better in the current pandemic circumstances. Most participants show their need for FaceID redesign to better copy with mask-wearing.

## 3.3 Bias control

We interviewed with a neutral attitude and open-ended questions to reduce the risk of convergent thinking. We tried to make the process more like a face-to-face conversation than an official interview, so participants felt free to share their thoughts.

# 4 DATA INVENTORY

## 4.1 Who are the users?

iPhone users with FaceID enabled who are familiar with contactless payment. From the survey questions 1 and 2, we can see the needfinding results are relatively independent of participants' genders, and people aged from 23 to 30 are more likely to use FaceID for their day-to-day purchases - at grocery stores, shopping malls and others (from the survey questions 7).

## 4.2 Where are the users?

Shops and stores. From interview question 1 and survey question 7, even though the shopping occasions are different, the transaction process is more likely happening in an indoor environment than outdoors. Before I started the participant observation plan, I could not immediately think of an outdoor shopping occasion.

## 4.3 What is the context of the task?

Standing at the cashier and looking to pay. From participant observation, I experienced a whole shopping cycle, and using FaceID to pay is the last step to complete the shopping. From the answers to interview question 2, quite a few participants mentioned that they usually let the cashier know how they pay while having their digital wallets ready.

From survey question 8 and interview question 3, we see that multiple factors (for example, internet speed, mask-wearing and surroundings) can affect a user's experience with FaceID under such shopping context, which also means the user's cognitive resources are shared with those factors.

## 4.4 What are their goals?

To complete the transaction and pay for the order. When participants described how they used FaceID to pay (interview question 2), they usually stopped after seeing the requested transaction was approved on the terminal. From the participant observation notes, an alternative (password typing) is needed to accomplish the goal of completing the transaction.

## 4.5 What do they need?

They need an iPhone with FaceID enabled, a payment terminal that allows them to tab the phone, and an iPhone camera to recognize their faces. From the answers we collected for the survey question 5, FaceID not supported on their iPhone is one of the reasons why they do not use this feature for their daily shopping.

## 4.6 What are their tasks?

They need to physically have their digital wallet ready, cognitively know how to proceed with contactless payment using FaceID, and socially complete transactions as soon as possible to avoid other customers waiting too long in the queue.

## 4.7 What are their subtasks?

To complete a contactless payment, interview question 2 provides detailed insights - having the device ready, adjusting the face to be detectable to the camera, tab the digital wallet to the terminal, wait till seeing the approved notification on both terminal and iPhone.

# 5 DEFINING REQUIREMENTS

Requirements derived from the needfinding plans are as follows:

1. If a face cannot be detected, the FaceID shall promote a more straightforward way than a popup to let the user type in passwords to pay;
2. FaceID should allow users to pick which authentication way they want to use if necessary;
3. Users should be able to easily navigate between using FaceID and typing in a password on the screen;
4. Such feature should be novices friendly and easy to be picked up;
5. The overall time spent on contactless payment should not be longer than directly typing in passwords to pay;
6. No Extra cost.

We consider functionality, usability, learnability and accessibility when stating the above requirements, and we will be using these requirements to evaluate the interface going forward.

# 7 CONTINUED NEEDFINDING

For the future interactive needfinding plans, we want to involve more specific metrics to help us further understand the users and better evaluate the interface we develop.

Evaluating the existing face recognition feature from other platforms can be a good strategy as we can probably leverage the existing data with metrics that FaceID can align with. For example, Google Pay has enabled face recognition for contactless payment as well. The analysis, experiments and surveys on this feature can potentially provide valuable insights to help redesign the existing FaceID interface.

# 8 APPENDICES

## 8.1 Appendix: Survey Questions

1. What is your age? 19 - 22, 23 - 26, 27 - 30, 31- 34, 35 - 38, 39+.
2. What is your gender at birth? Female or male.
3. If you are an iPhone user, do you have FaceID enabled on your device (i.e. unlock the screen or log in to the bank apps by looking into the camera instead of typing in passwords)?
4. How many times per week do you use FaceID for contactless payment if you are an iPhone user? 0, 1 - 3, 4 - 6, 7 - 9, 10+.
5. If your answer to the previous question is 0, please provide the primary reason you do not use FaceID for your transactions.
6. If you have FaceID enabled, why do you choose it over typing in a password to complete the payment? More straightforward to use, more convenient, more secure, or others (let the participants fill in the answer).
7. Where do you usually use FaceID for contactless purchases? Let the participants fill in the answer by shopping malls, grocery stores, farmer's markets, or others (let the participants fill in the answer).
8. When using FaceID to proceed with the payment, what do you think can affect your experience? Physical environment (indoors or outdoors), people around, the FaceID UI design, internet speed, or covid-19 pandemic.
9. On a scale from 0 to 10, how satisfied are you with the FaceID interface? 0 stands for not satisfied at all, and 10 means very satisfied.

## 8.2 Appendix: Interview Questions

1. If you use FaceID to pay, where do you usually use it?
2. What do you usually do when you use FaceID to pay?
3. Have you experienced any difficulties while using FaceID? Please describe.
4. Are you satisfied with the FaceID interface? Why or why not?
5. If your answer is no from the previous question, can you think of any possible improvement?