# Amanda Long
Second Factor Authentication Usability Testing and Benchmarking

Overview

As part of an initiative to increase online account security, as well as the client's perception of increased online account security, Company Z has created a two-factor login authentication process. When clients login to their accounts on their primary devices (a desktop or laptop computer for this study) they will receive an "intervention" asking them to complete the login process with their mobile phones. Company Z wanted to know if clients could complete this two-factor process, and where pain points might arise. Prior usability testing of this Second Factor Authentication (SFA) process was done with the first SFA prototype and scores for CES, SUS, NPS, and visual desirability were collected for future benchmarking purposes. The team then created a second SFA prototype and conducted usability testing and benchmarked the results against the performance of the first prototype.
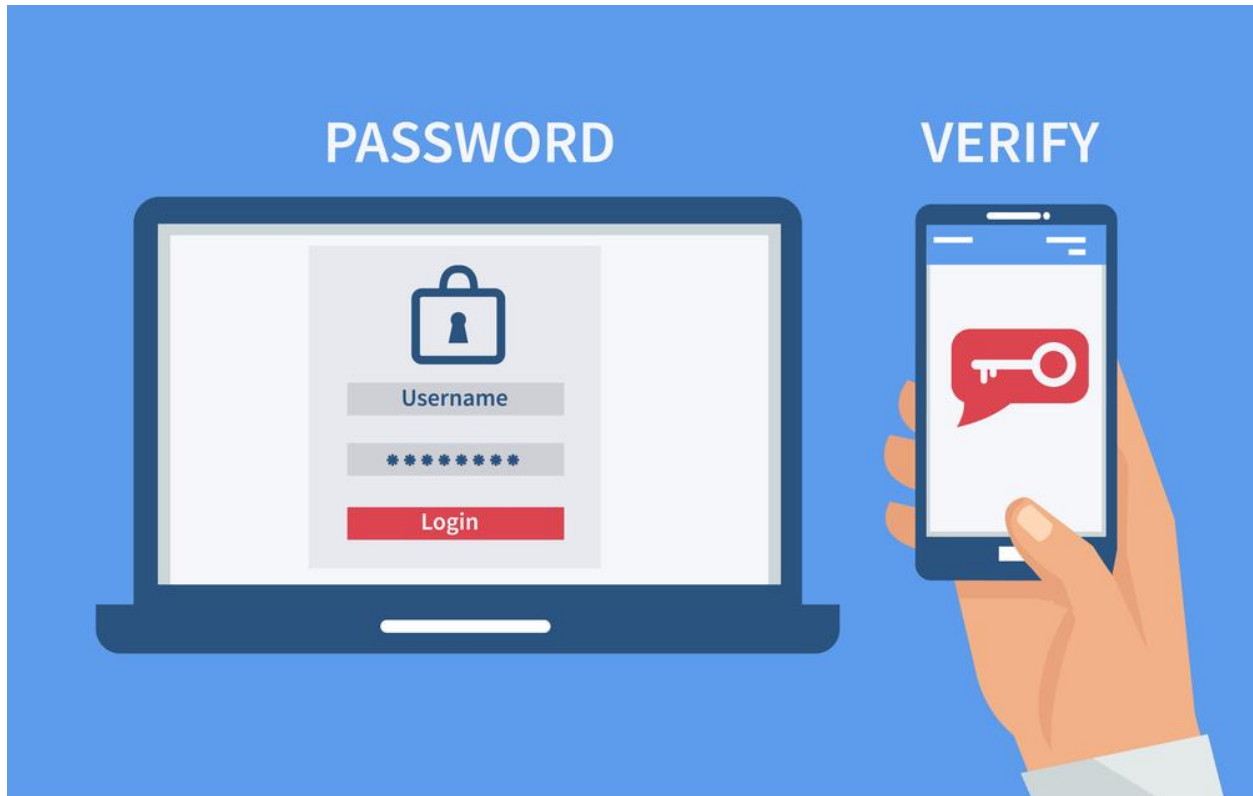
The first SFA prototype performed poorly. The average success rate for tasks was under 50% and its SUS score was a mere 43%. Participant comments mirrored these stats, and the prototype received a negative net promoter score. Research analyzed and synthesized the test data and presented it to the team. Design was then tasked with creating a new prototype. This case study focuses primarily on the second prototype.

I am a UX Researcher at Company Z. As such, I was responsible for creating screeners and protocols, scheduling and interviewing participants, usability testing, synthesizing data, and reporting my findings to my cross-departmental team. The primary focus of this research was usability testing and benchmarking the new prototype's performance compared to the earlier prototype.

Problem Definition

Online account security is a high priority issue for Company Z as is the clients' perception of online account security. As such, a user-friendly Second Factor Authentication process is a necessity. The team wanted to know if users understood what was happening during the "intervention" phase, if they could complete the process, if they had encountered a two-factor authentication login before, what their preferred methods of login/authentication were, if they thought that this process improved security, which format (animation or static diagram) was more effective in communicating the next steps, and if the new prototype would outperform the old one.

My goal was to conduct various usability tests on the new prototype (click tests, navigation tasks, task completion, surveys, SEQs, SUS, etc.) to identify usability issues. My measure of success was identifying usability issues, getting the measures for the benchmarking comparison between the new prototype and old one, better understanding the users' thought processes and mental models of two-factor authentication, determining if the animation or static diagram was a better method of communicating next steps, and getting user feedback. I shared my findings with the team, made suggestions for improvement, and will test the third prototype at some point in the future.

Audience

The target users for this study were people who manage their financial accounts online.

Team/Role

I took the lead on the research for this project and I was responsible for creating screeners and protocols, scheduling and interviewing participants, usability testing, synthesizing data, and reporting my findings.
I was however, extremely lucky to work with a very talented team. They are:

- **Hans:** UX Researcher

- **Nick:** UX Designer

- **Christina:** UX Designer

- **Lisa:** Product Owner

- **Jason:** Product Owner

Constraints

I encountered several constraints with this project. Because the results were going to be benchmarked, I needed a larger than normal number of participants (150) and recruiting took a while. I also ran into difficulty with the quality of some of the participants. I used UserZoom for recruiting and on occasion you will get a participant who rushes through the test as quickly as possible without putting any thought into the answers. To correct for this, I performed a statistical analysis on every participant's SUS responses to eliminate the "straight liners."

Design Process

My first step was to meet with my team to confirm the research questions and goals. Once this was done, I began creating a screener. I broke my participants into two groups: Company Z clients (50) and Company Z prospects (100). I screened out anyone under 25, and those who did not own smartphones. I also required that they had checked their finances online within the past 6 months, and could not work in the financial industry. Then I created the protocol and the test in UserZoom, using click tests so I could get heat maps of where users were clicking as they navigated through the SFA process. I also used questionnaires, ratings scales, and navigation tasks. I made sure to randomize the order of the questions so as to eliminate order bias. After testing it on several of my co-researchers, and after tweaking it a bit, I launched the study.

After the results came in, I exported the SUS scores to my excel program to weed out the bad participants. I excluded them from the data, and recruited other participants to fill their spots. Once I was happy with the quality of participants, and satisfied that my data was clean, I got down to analyzing and synthesizing the data so I could present meaningful insights to the team. I designed a PowerPoint presentation including the heat maps from the test and the many charts and graphs I had designed to convey participant sentiment or performance, and how the metrics had changed from the first round of testing. I wish I could include them in this case study – I believe that it's better to show than to tell – but they are the property of Company Z. Finally, I presented my findings to the team, answered questions, and made a few design recommendations for their consideration.

The main takeaways from this project were:

- It takes users time to shift their attention to the mobile phone and recognize the correct next step in the Second Factor Authentication (SFA) process.
- The SFA process has 'good' scores in terms of success rate, CES, visual desirability, NPS, SUS, and perceived improvement in security. Each of these metrics has improved since the previous test.
- 45% of participants had similar SFA login experience, and 70% expected to be logged in on both the computer and the mobile app after the process.
- 6% of participants are not interested in using the SFA login, but the rest would predominantly set it up on the mobile phone (89%). 81% of those who are interested think it's important to see a preview of which device the SFA process will be sent to.

- Text (SMS), email, and biometrics are the secured login methods that participants are most interested in.
- The animation of the SFA process outperformed the diagram. 72% of participants were able to determine the correct next step after watching the animation, whereas only 55% could do the same after viewing the diagram. Participants also preferred the animation (54%) over the diagram (27%).

Opportunities for optimization:

- Incorporate the animation of the SFA process into the next prototype.
- Consider working with a content strategist to clarify language on the "intervention" screen.
- Consider incorporating another animation that draws users' attention to their phones and alerts them that the next step will take place there.

Retrospective

I enjoyed working on this project. The insights I gave my team will enable them to make a better design. I also got to report an across the board improvement of metrics, which made the team very happy!

Steps:
- Identify areas/concepts to be tested
- Create screener
- Create usability test protocol (script)
- Recruit and schedule participants
- Interview participants
- Synthesize/analyze data for insights
- Compare current test results to prior test results for benchmarking
- Present findings

Deliverables:
- Presentation of findings

Methodologies:
- Recruiting
- User interviewing
- Usability testing - task completion, learnability, surveys
- Evaluative research
- Data synthesis
- Presentation of findings