Abstract

This Capstone Project addresses the problem of the inaccessibility of fast-food drive-thrus for Deaf and Hard of Hearing (HOH) individuals in the United States. This project involved following the design thinking process (empathize, define, ideate, prototype, test, and implement) to showcase how I identified a problem and arrived at a proof of concept. My goal was to understand the current ADA laws regarding restaurants, the experiences of customers who are Deaf/HOH at drive-thrus and assess ways barriers could be mitigated and design a potential solution which was tested for viability. This project was completed August – December 2023.

Problem Background

Problem: Drive-Thru services at fast food restaurants in the United States remain largely inaccessible to people who are Deaf and hard-of-hearing.

Background: A 2004 survey conducted by 6,400 Deaf/HOH individuals, found 78% of people encountered difficulties placing an order, while 42% of the people abandoned the task and left the line due to communication challenges ("The Case for Drive -Thru Access"). Most drive-thru intercoms are solely audio based, therefore inaccessible to people who are profoundly deaf or hard-of-hearing and who may have difficulty discerning spoken words (Boucher et al.). Additionally, the methods of communication may differ from person to person. Some people communicate via American Sign Language (ASL) while others write or speak their order.

I obtained responses from a survey I sent to 31 people, 22 participants were Deaf/HOH, while the remaining were related to or witnessed a Deaf/HOH person order from a drive-thru. The survey was sent out in both English and ASL. The age range of participants was 18–65+. Many of them favor using ASL, Spoken Language, or Simultaneous Communication in daily interactions, however while placing an order at a drive-through, customers tend to drive up to the window, type their order on their phone, or use pen and paper to interact with the employees. Most participants choose to speak their order but have difficulty hearing and understanding workers.

Acts of discrimination have been known to occur. A few participants reported being asked park to the side while hearing customers are served without issue. Unfortunately, some Deaf/HOH people must wait up to 20 minutes for their order. The long wait times are an issue for Deaf/HOH people at fast-food restaurants like Burger King, Taco Bell and KFC mainly because workers do not know how to interact with Deaf/HOH customers (Simmons).

Some workers refuse to serve Deaf/HOH people unless they enter the restaurant to place an order to prevent delays in the drive-thru line. The survey confirmed this has happened to 12 out of 31 participants. In two separate incidents, police were called on customers who were Deaf because they refused to move out of the drive-thru line (Henderson, "Deaf Woman Suing Burger King").

These acts of discrimination against Deaf/HOH people are inexcusable given The Americans with Disabilities ACT (ADA) which states all people including Deaf/HOH people have "the right to participate in all aspects of society" ("The Case for Drive -Thru Access"). This means services, such as fast-food joints including the drive-thru lines, should be accessible to Deaf/HOH individuals.

Project Solution

After defining the problem, I ideated ways to make drive-thrus more accessible to people who are Deaf/HOH. Based on background research, interviews and ethnographic studies of people who were Deaf/HOH who shared their experiences ordering food from a fast-food restaurant, I concluded that the following criteria must be considered when developing a proposed solution:

- Drive-thru system must be visual
- Order should be correct
- Ordering process should be quick
- Should be able to order from the drive-thru line as do hearing people (should not be treated differently)
- Hearing people also have trouble understanding the current audio-based systems

As a proposed solution, I redesigned the current drive-thru systems to be more visual.

Project Description

This project involved following a Traditional approach where tasks were followed sequentially start to finish. Utilizing the design thinking process (empathize, define, ideate, prototype, test, and implement), I identified a problem and designed a potential solution which was tested for viability.

Keeping in mind the premise of the ADA, as part of the background research I surveyed, conducted an ethnographic study, and observed a Deaf person order food from two different drive-thrus. This provided insight into some of the issues Deaf/HOH experience at drive-thrus and assess ways barriers could be mitigated.

Following the collection of survey responses, I followed up with five individual interviews, all of which were conducted via FaceTime, which was the preferred method of contact for all participants. Participants were a mix of Deaf/HOH and hearing individuals. My goal was to get a firsthand account of their experiences at drive-thrus. I used the data gathered to create affinity notes and a diagram based on common themes. The experiences, identities and qualities of the participants were incorporated into the personas. The personas were an aid to remind me who I am designing for.

Based on the data I collected, it led me to prototype a visual interface for a fake fast-food restaurant, RushedMealz. Figma was used to create a low-fidelity and high-fidelity prototype. Using the prototype testing feature on Figma, participants walked-through a series of instructions for a made-up scenario where they were asked to place an order, while I observed and took notes. The notes were used as areas of improvement for the second iteration of the prototype.

Project Results

A total of five people, consisting of both Deaf and hearing individuals, tested the first iteration of my prototype and filled out a 10-question usability survey to gauge the design and ease of use of the user interface. The following feedback and suggestions were provided for improvement and were considered in the second iteration.
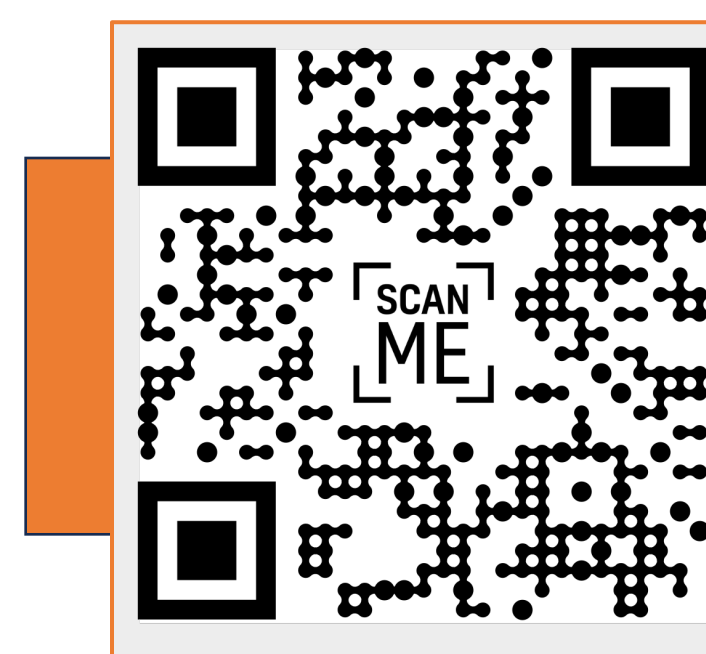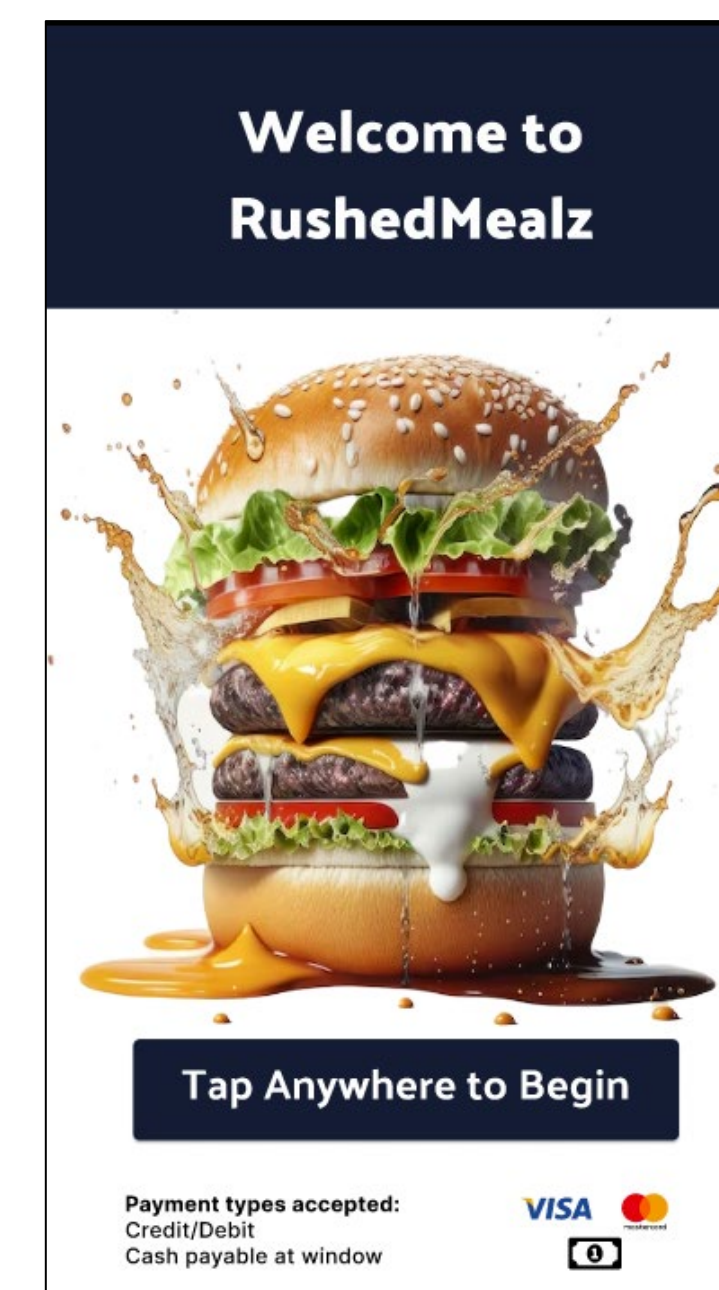
Issues
- Burger on opening screen is pixelated
- Layout consistent for the most part. Drink and Kid's Meal pages are not consistent with the rest of the user interface.
- Sometimes could not return to previous page making navigation difficult.
- Information was well organized but there was too much scrolling.
- Cannot click on certain items
- Color contrast issues
- Error were made when selecting "Chicken" & "Kid's Meal" due to the images being similar

Suggestions
- Add check boxes for specific things needed
- See all the drinks in one list

Positives
- Liked the 3D images of the menu items.
- All 5 participants felt confident using the user interface and felt it is a good addition to the current audio-based systems.

Welcome to RushedMealz

Tap Anywhere to Begin

Payment types accepted:
Credit/Debit
Cash payable at window

The second iteration of the prototype can be viewed by scanning the QR code on the left.

Lessons Learned

Current Project
- Time Management – things will always change so it is important to adapt quickly.
- Schedule Planning – project phases such as the prototyping phase was dependent on research, initial survey, interviews, affinity diagram and personas being completed. The project was a very linear process.
- Data collection and analysis – writing and analyzing both qualitative and quantitative data.
- Prototyping and testing using Figma.
- People will all have varying skill levels when using technology that must be accounted for when designing a prototype.

Redo Project
- Approach the project from a Hybrid standpoint (mix of Agile and Traditional Project Management types).
- Test the prototype using a bigger screen using the dimensions of the actual screen customers would use in real life.
- Test the prototype with more participants and test more often.
- 3D model menu items to be more realistic and add animations.

Next Steps

- Another round of prototype testing based on the second iteration.
- Iterate again if needed.
- Test prototype in a mock-scenario where people place an order using the user interface from within their car. This includes determining the height and distance needed to successfully operate the touch screen user interface.
- Follow-up investigating outdoor drive-thru touch screen systems that are weatherproof. Two vendors found.

Graphic from:
https://www.xenial.com/solutions/

Video Presentation

Acknowledgment

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