Context and background

As a student at the University of Michigan, myself and my peers navigate campus and the city of Ann Arbor on a day-to-day basis. This includes finding classes, dorms, dining halls, etc. that are essential to student living. Enrolling in SI 422 – Needs Assessment and Usability Evaluation, I worked in a team of 3 to investigate the navigational process of students on the University of Michigan campus to design a Wayfinding App catered to their specific needs.

The goal of our research project was to **identify the biggest challenges that students face in finding what they need (e.g., classes, services, food) on campus and designing a Wayfinding app to address those challenges to make navigating easier for students.**

This project was completed in a team of 3 students, including myself, over the span of 9 weeks (broken up into 9 corresponding assignments) in Winter 2023. We were supervised and evaluated weekly by our Graduate Student Instructor (GSI) and Professor throughout lectures and discussions during this time.

Team Members

- Professor – Jackie Wolf (jgjwolf@umich.edu)
- GSI – Lynette Li (lynettee@umich.edu)
- Researcher – Aayana Anand (aayana@umich.edu)
- Researcher – Adam Vaas (avaas@umich.edu)
- Researcher – Sam Dannug (sdannug@umich.edu)

Schedule

- Week 1/Assignment 2: Interview Guide
- Week 2/Assignment 3: Research Plan
- Week 3/Assignment 4: Interview Questions
- Week 4/Assignment 5: Data Collection
- Week 5/Assignment 6: Coding Qualitative Data
- Week 6/Assignment 7: Affinity Diagramming
- Week 7/Assignment 8: Survey Design
- Week 8/Assignment 9: Survey Analysis
- Week 9/Assignment 10: Deliverables

Process, Methods, and Data

Our team used an iterative process. Each assignment gradually built on aspects of the research project, with the final assignment covering deliverables and hypothetical next steps.

Week 1/Assignment 2: Interview Guide

Developed semi-structured interview guide, discussing inclusion/exclusion criteria and participant recruitment plan following six-phase structure as outlined in Goodman et al.'s Ch. 6 (pp. 129-130). This included the Introduction and Wrap-Up sections of the interview. ***Ultimately, our inclusion criteria included being a student at the University of Michigan-Ann Arbor attending in-person classes, meetings, activities, etc.***

Week 2/Assignment 3: Research Plan

Decided on final deliverables of a ***Storyboard*** *and an* ***Experience Map*** *in addition to personas for our research project. Developed Deep-Focus section of our Interview Guide, involving a spatial mapping activity where participants draw a map of campus based on their own perceptions and experiences. Facilitated thorough discussion on mitigating cognitive biases as a team during the exercise.*

Week 3/Assignment 4: Interview Questions

Developed interview questions based on Spradley's five kinds of descriptive questions (pp. 49-53). Our final questions included a mix of Grand tour questions, Mini-tour questions, Example questions, Experience questions, and Native-language questions. Facilitated thorough discussion on mitigating cognitive biases as a team during the exercise.

Week 4/Assignment 5: Data Collection

Scheduled our interviews using an interview tracker to prepare for data collection. All researchers had an equal workload between facilitating and interviewing. Each interview was around 30 minutes. Each interview had an attached set of detailed notes and a debrief session with at least 2 researchers. These notes were supplemented by transcriptions provided by ***Otter.ai****. Participants were chosen based on personal contacts of the researchers.*

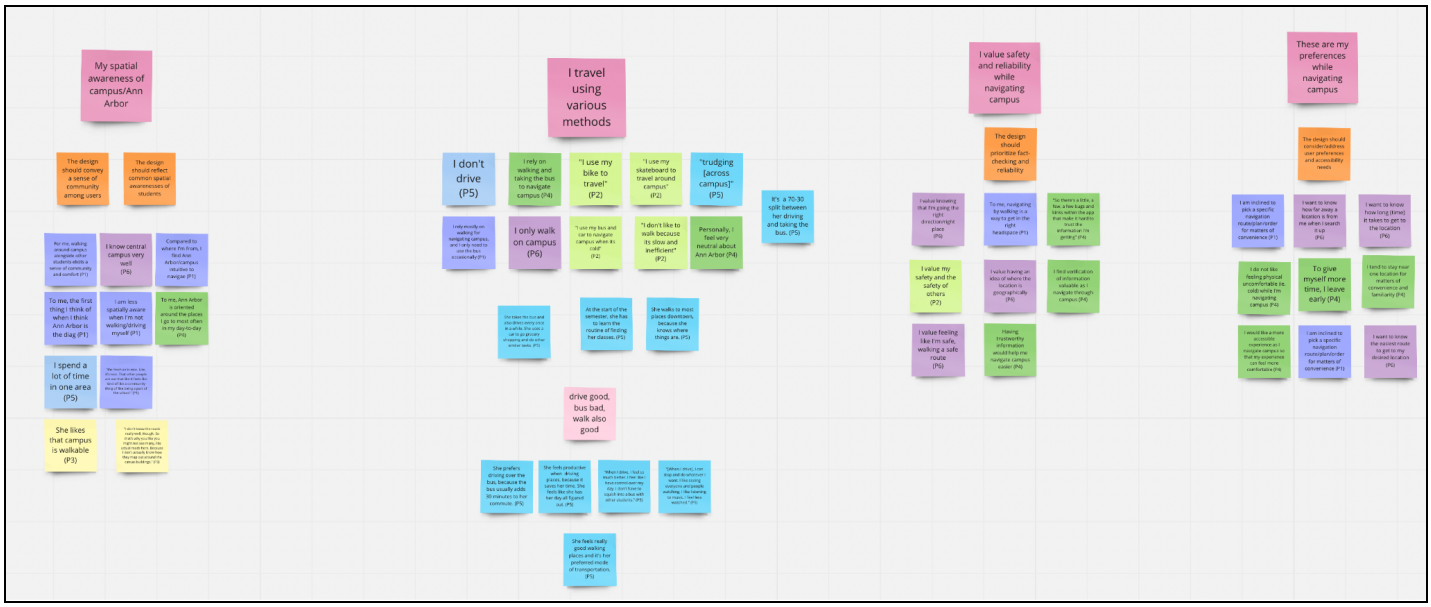
Week 5/Assignment 6: Coding Qualitative Data

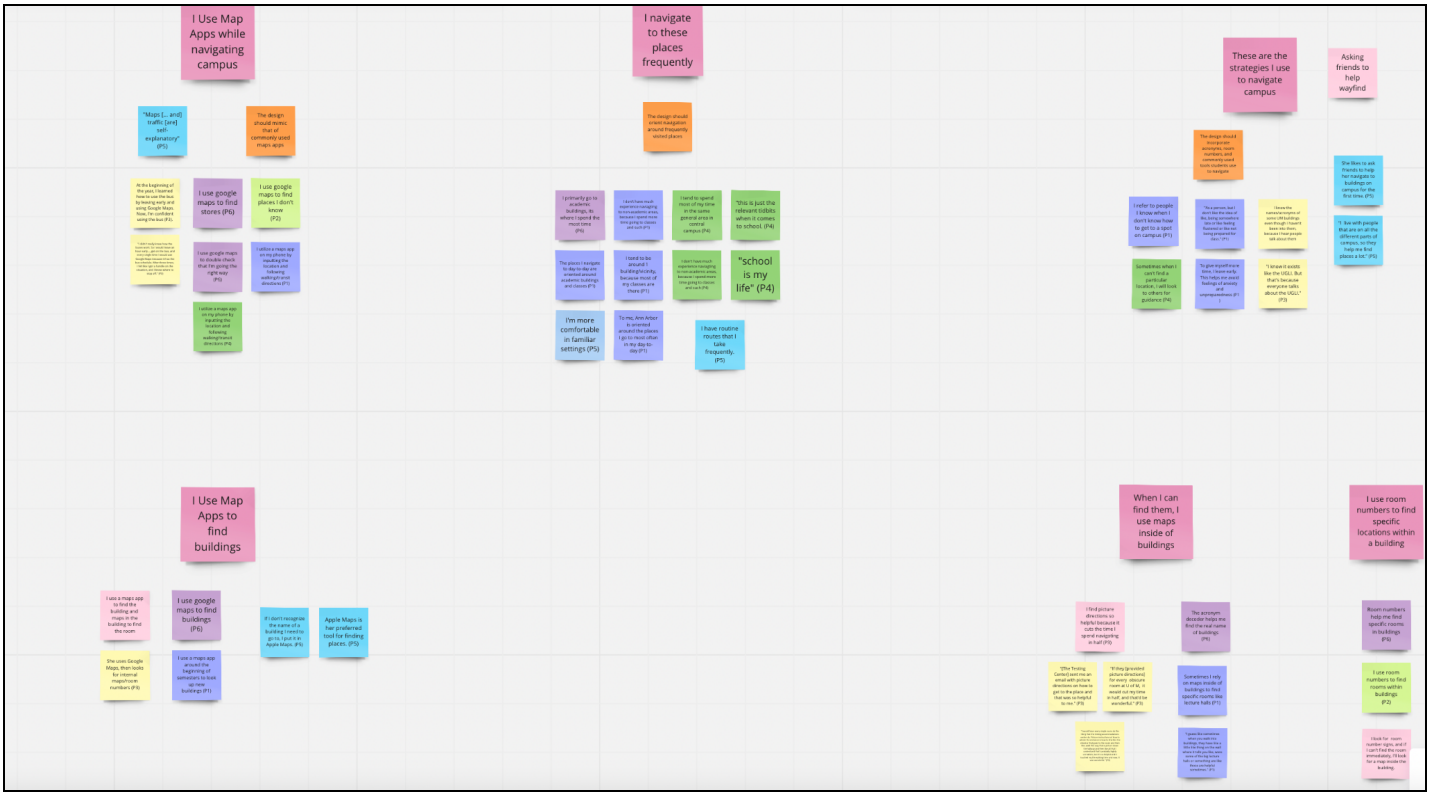
Read interview notes from beginning to end, including observation notes and any images produced during the activity (e.g., photos, drawings, collages). Each researcher was responsible for an equal amount of interview notes/transcripts and coding. Codes were written in 1st person via ***Google Docs*** *and used to culminate insights about participants directly from the interview data.*

Week 6/Assignment 7: Affinity Diagramming

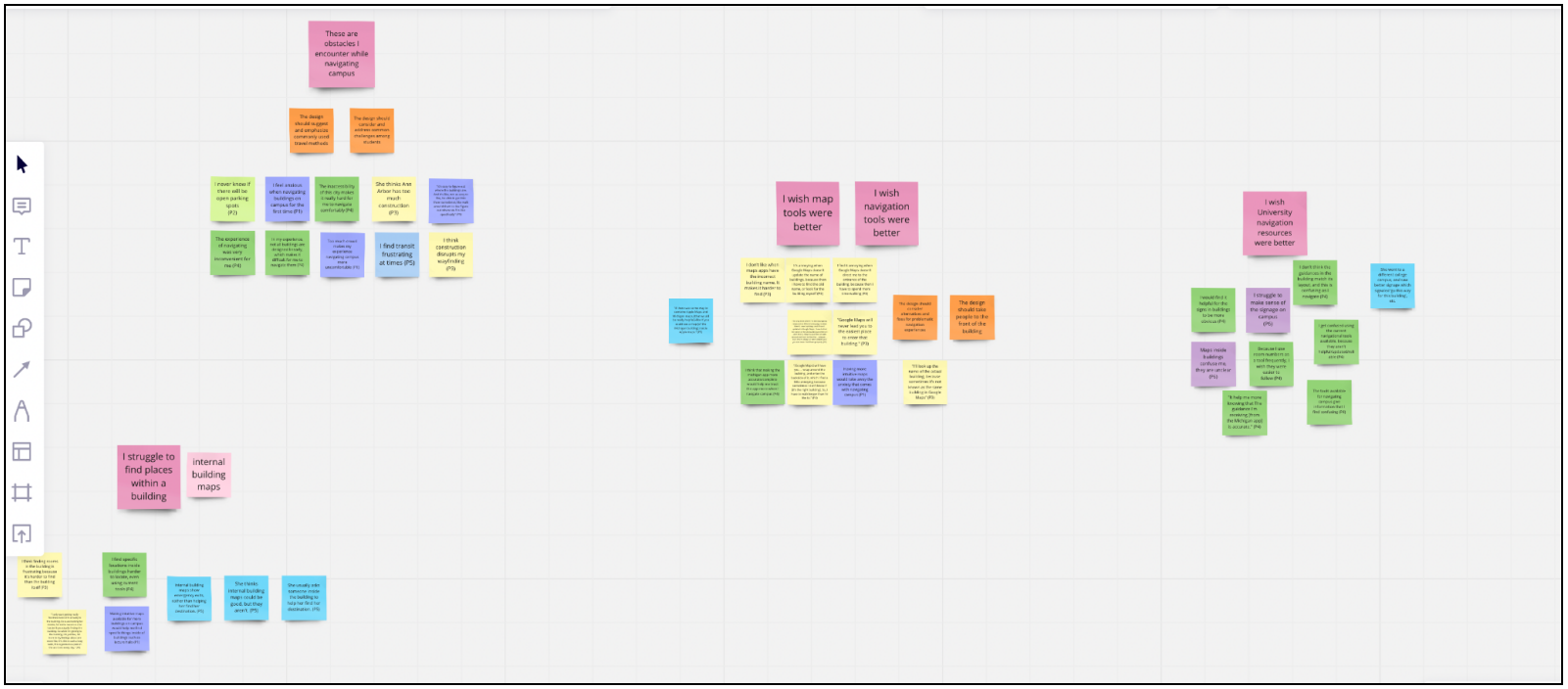
Transferred all interview data together into an affinity diagram created using ***Miro****. Used a sticky-note system with headings denoting various codes from the previous assignment. Populated the headings with a combination of direct quotes from the*

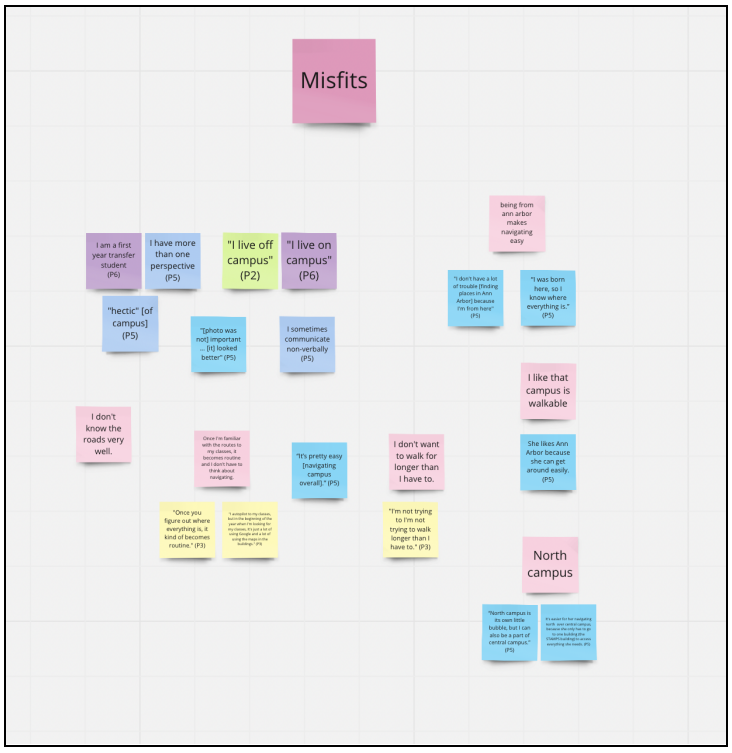
interview data. Facilitated thorough discussion on mitigating cognitive biases as a team during the exercise.





Aayana Anand (aayana@umich.edu)





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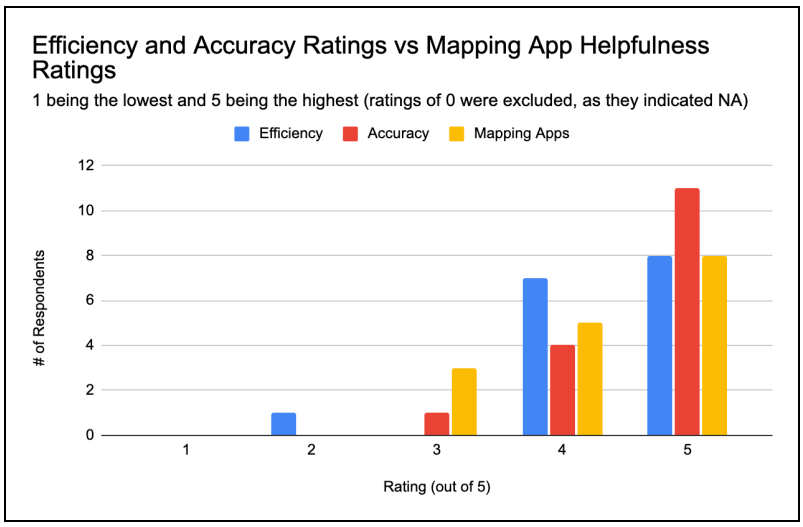
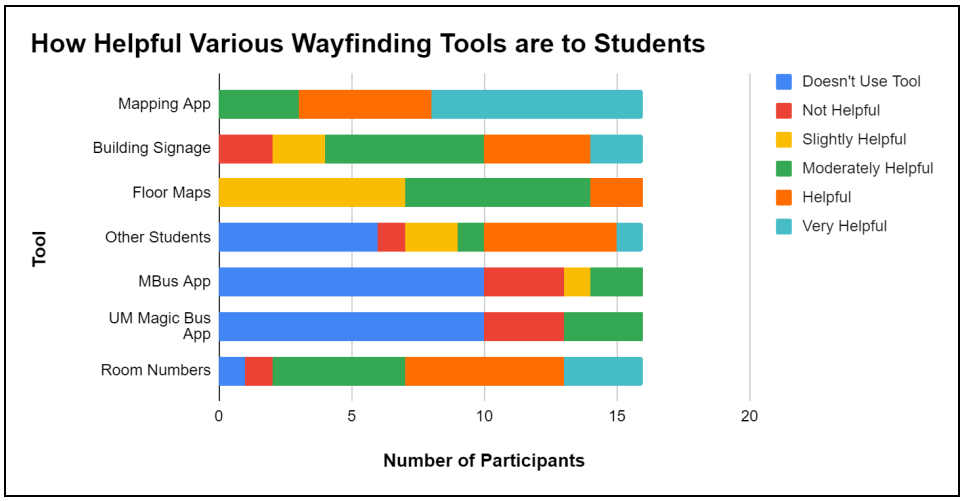
Week 7/Assignment 8: Survey Design

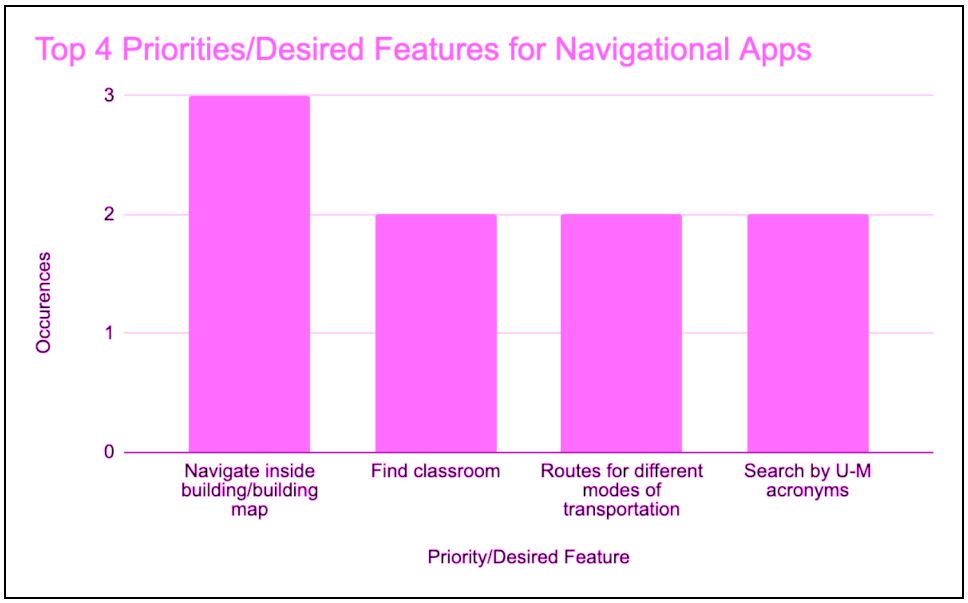
*Developed a survey using **Google Forms** to obtain survey data in addition to data already collected from interviews. Our survey contained a mixture of open and close ended questions. **The goal of the survey was to expand on the interview data and confirm/deny insights collected up to that point.** Our participants/respondents were 15 students, some from our class cohort and some outside of the class. Each of our respondents, regardless of whether or not they were in the class, met the inclusion criteria to qualify for our project.*

Week 8/Assignment 9: Survey Analysis

*As a team, we analyzed all of the data together and ranked our strongest findings. Each team member was responsible for a unique finding from the data that combined multiple questions. Each team member was also responsible for a visualization of their findings created using **Google Sheets**.*

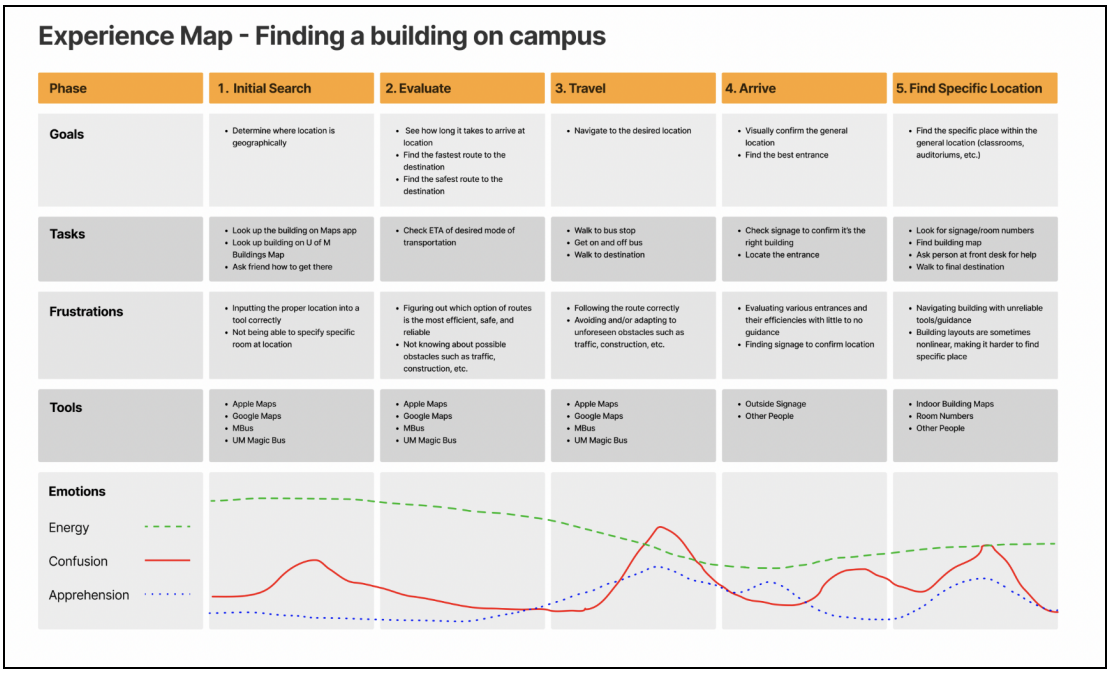






Week 9/Assignment 10: Deliverables

*Highlighted the most important insights gained from interviews and survey by creating a set of deliverables containing **2 personas (experienced student vs inexperienced student), 1 storyboard (future state), and 1 experience map (current state).** The personas were created using **Microsoft Powerpoint**. The storyboard was created using **Notability**. The experience map was created using **Figma**.*



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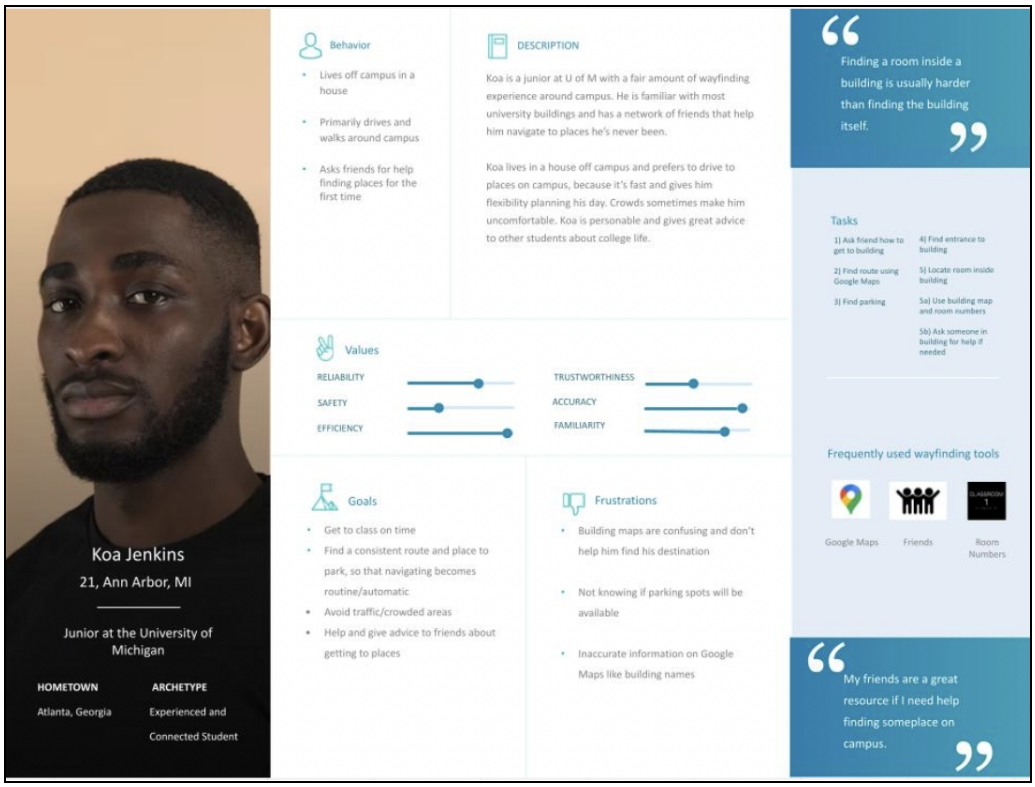
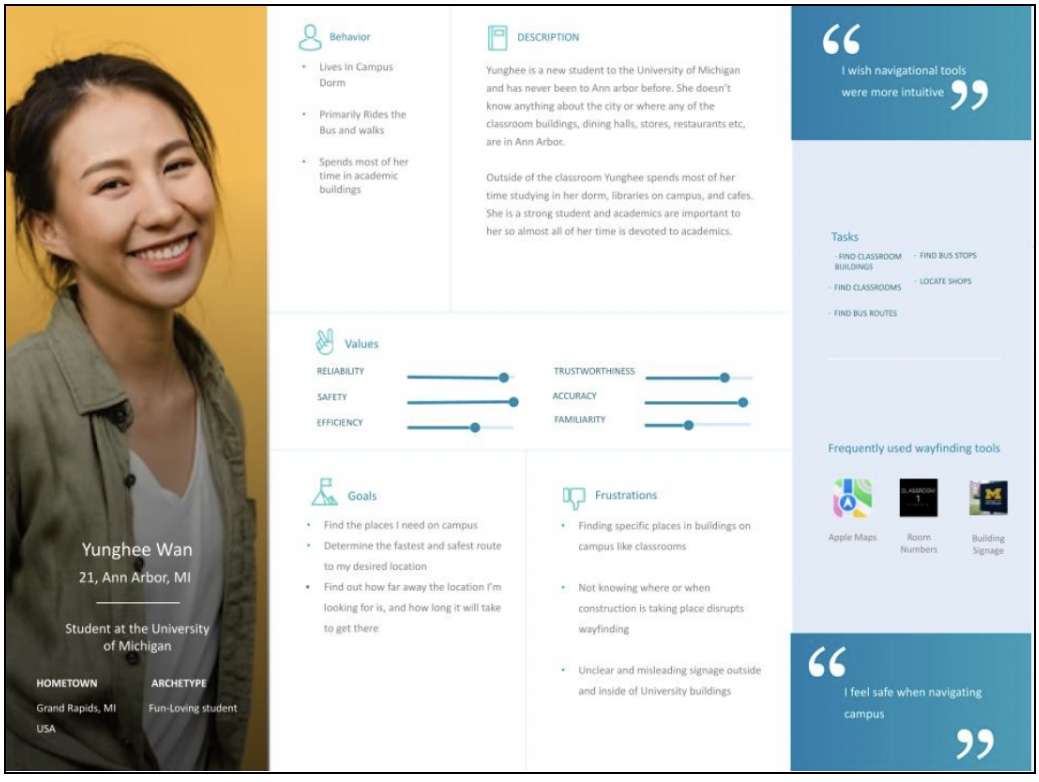
UM Wayfinding App
Aayana Anand, SI 422 (Needs Assessment and Usability Evaluation)

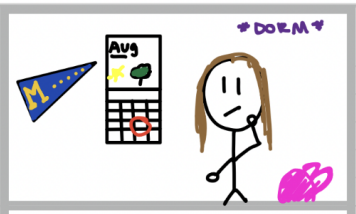

Koa Jenkins
21, Ann Arbor, MI
Junior at the University of Michigan
HOMETOWN
Atlanta, Georgia
ARCHETYPE
Experienced and Connected Student
Behavior
Lives off campus in a house
Primarily drives and walks around campus
Asks friends for help finding places for the first time
DESCRIPTION
Koa is a junior at U of M with a fair amount of wayfinding experience around campus. He is familiar with most university buildings and has a network of friends that help him navigate to places he's never been.
Koa lives in a house off campus and prefers to drive to places on campus, because it's fast and gives him flexibility planning his day. Crowds sometimes make him uncomfortable. Koa is personable and gives great advice to other students about college life.
Values
RELIABILITY
SAFETY
EFFICIENCY
TRUSTWORTHINESS
ACCURACY
FAMILIARITY
Goals
Get to class on time
Find a consistent route and place to park, so that navigating becomes routine/automatic
Avoid traffic/crowded areas
Help and give advice to friends about getting to places
Frustrations
Building maps are confusing and don't help him find his destination
Not knowing if parking spots will be available
Inaccurate information on Google Maps like building names
Finding a room inside a building is usually harder than finding the building itself.
Tasks
1) Ask friend how to get to building
2) Find route using Google Maps
3) Find parking
4) Find entrance to building
5) Locate room inside building
5a) Use building map and room numbers
5b) Ask someone in building for help if needed
Frequently used wayfinding tools
Google Maps
Friends
Room Numbers
My friends are a great resource if I need help finding someplace on campus.


Yunghee Wan
21, Ann Arbor, MI
Student at the University of Michigan
HOMETOWN
Grand Rapids, MI USA
ARCHETYPE
Fun-Loving student
Behavior
Lives In Campus Dorm
Primarily Rides the Bus and walks
Spends most of her time in academic buildings
DESCRIPTION
Yunghee is a new student to the University of Michigan and has never been to Ann arbor before. She doesn't know anything about the city or where any of the classroom buildings, dining halls, stores, restaurants etc, are in Ann Arbor.
Outside of the classroom Yunghee spends most of her time studying in her dorm, libraries on campus, and cafes. She is a strong student and academics are important to her so almost all of her time is devoted to academics.
Values
RELIABILITY
SAFETY
EFFICIENCY
TRUSTWORTHINESS
ACCURACY
FAMILIARITY
Goals
Find the places I need on campus
Determine the fastest and safest route to my desired location
Find out how far away the location I'm looking for is, and how long it will take to get there
Frustrations
Finding specific places in buildings on campus like classrooms
Not knowing where or when construction is taking place disrupts wayfinding
Unclear and misleading signage outside and inside of University buildings
I wish navigational tools were more intuitive
Tasks
- FIND CLASSROOM BUILDINGS
- FIND CLASSROOMS
- FIND BUS ROUTES
- FIND BUS STOPS
- LOCATE SHOPS
Frequently used wayfinding tools
Apple Maps
Room Numbers
Building Signage
I feel safe when navigating campus

Scenario: Navigating Campus on the 1st Day of the Semester

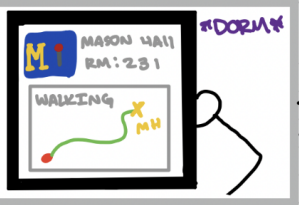
Persona : Yunghee

Emotions Values Behavior Goals Tools Frustrations

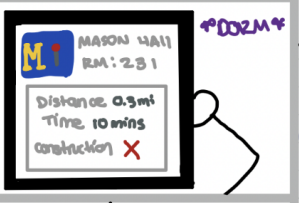


Yunghee is new to Ann Arbor and UM. She's nervous about navigating campus for the first time. She isn't sure where to find accurate, trustworthy information about safe & efficient routes to classes, libraries, cafes, etc.

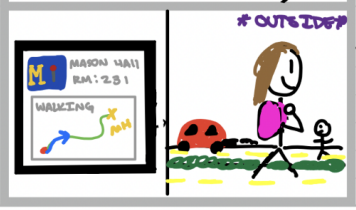
Yunghee decides to download the UM Wayfinding App.



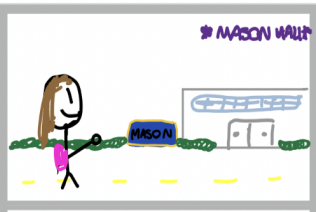
Yunghee needs to first navigate to her class in Mason Hall. She inputs "Mason Hall" and the room number into the app and selects walking directions.



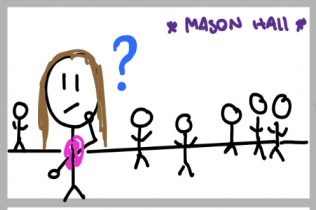
The app gives her information about how to walk to Mason Hall from her dorm, including information about distance, timing, and construction.



Yunghee follows the directions and begins walking. She finds the app helpful since it closely mimics Apple Maps, which she frequently uses. She feels less nervous and more relaxed.

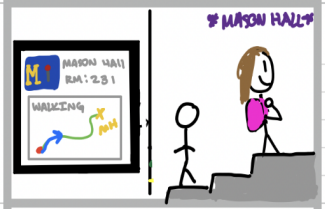


When Yunghee reaches Mason Hall, she uses building signage to confirm that she has reached the correct place. She feels confident and affirmed.

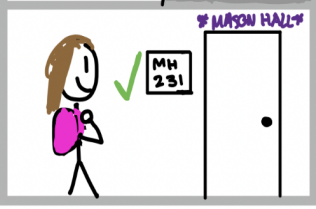


When Yunghee goes inside, she doesn't know where the specific classroom is located. She begins to feel nervous again.

Yunghee checks the wayfinding App again. The app gives her specific directions on how to navigate within Mason Hall itself.



Yunghee follows the app's directions. She begins to feel relaxed again.



Yunghee makes it to her final destination. She verifies her location using the room numbers outside of the classroom. She feels confident and affirmed. She feels relieved to have made it to class safely & efficiently.

Outcomes

Our deliverables captured both the current and future states. We used the experience map to capture the current state. Because the experience map captures the current state, it includes the positive and negative aspects about students' current navigational experiences on campus. This involves all of the pain points we collected and observed throughout our research, including lack of building maps, unclear/nonlinear building layouts, etc. This also involves some of the positive and routine influencers in the students' navigational experiences, including the use of a mapping app to navigate to a main building or location. By addressing the positive and negative aspects about students' current navigational experiences on campus, our current state experience map is helping us answer what the biggest challenges students face are as they navigate through campus. It helps us organize these challenges throughout the general experience of a student by placing them in different stages: Initial Search, Evaluate, Travel, Arrive, and Find Specific Location. To better understand these stages and challenges, we supplement the experience map with tasks, emotions, and tools to better understand what is driving the challenges and progressing the general experience.

As for our future/ideal state, we model that using our storyboard deliverable. Having a deliverable to represent the current state gives us an idea of the pros and cons of current navigational experiences. Those pros and cons help give us an idea of how we can design our app to shape the ideal state, which we model in our storyboard. Keeping current pain points and challenges in mind, we designed our storyboard so that it would capture an ideal situation where those pain points and challenges were mitigated through the use of our app. In the storyboard, we model a student using our app as they go through the real-life experience of navigating campus, highlighting the goals, motivations, and tasks involved. In the stages of the experience when the student would face a challenge, such as not knowing how to navigate within a building, they are able to use our app to solve the problem and reach their final destination. With regards to our research question, our storyboard helps answer this question in a complimentary way by demonstrating how the navigational challenges, which we have successfully identified, can be resolved to improve the overall experience of navigating campus.

Next Steps

If given more time and more resources, there are some steps our team might take to continue our work so far.

Conduct More Thorough Research

Because of the constraints of being college students in a college class, the amount of time and resources our team had to conduct UX research according to typical professional standards was less than normal. Under normal circumstances, our team would have likely conducted a larger survey and a longer interview with more participants. We would have also recruited from a random, more representative sample to get more reliable results. We would have also been more iterative in our research than we already were, because we'd have more time to make alterations to our design, research methods, etc. Essentially, collecting better data and expanding on the work we've done so far would set us up for success to launch a real app in the future that truly captures the needs of an average student.

Build a Functional Prototype

Considering that our research was all about designing a mobile app, we would have been able to design a real prototype if given the time and resources to do so. Having a functional prototype would allow us to utilize methods like A/B Testing, Preference Testing, Usability Testing, etc. It would also allow us as researchers to begin understanding the front-end development and design of the app.

Generalize our Research Outside of UM

From our research, our team has discovered some critical insights on student navigation for our Ann Arbor campus. For example, we discovered an association between the likeness/familiarity of commonly used mapping apps and the values of reliability. This told us that students find mapping apps reliable, informing us that designing our wayfinding app similarly would likely appeal to students. Having these insights in our toolbox, we have the ability to share our knowledge and conduct similar studies across campuses across the country. If we wanted to reach out to the greater communities of college campuses, we could conduct similar studies across randomly selected residents of college towns or metropolitan areas.