

Assignment 1 - Design Brief:
The Return to Campus,
Discover and Define

LE/EECS 3461 Section N User Interface

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Observations, Ideas, and Problems

Probe

For our probe, we wanted to get to know our users and try to paint a picture of their experiences since coming back to in-person classes, giving us insight into the kinds of problems we can look into.

We gave them a questionnaire. We wanted to give them something to interact with questions that would inspire them but make them feel any pressure.

Here are the questions we asked:

- Are you a student living on campus or do you live at home?
 - This is an important distinction because each comes with its own problems as well as similar ones, similar ones would affect the widest range of users
- On a scale of 1 to 10 how well do you know the facilities on campus?
 - 1 – I get lost
 - 5 – I only know the ones relevant to me
 - 10 – If you told me somewhere on campus I would most likely know how to get there
- If you drive, is parking convenient for you?
- Where do you usually go in between classes? If applicable, are those places often full or busy
- What have you struggled with the most since classes went back in person?
- What part of your student experience has benefitted from classes going back in person?
- What benefits were there before classes went back in person?

Once we got the results from the probe, we saw that the average number for how well people knew campus was 4.6. Meaning that users on average knew the buildings and facilities relevant to them. So if they have to go to a building they are unfamiliar with they could struggle.

It gave us an idea of what problems we could start looking into. Later we conducted contextual interviews and brainstorming sessions. We would look at the similarities from all 3 requirement discovery techniques to help us define a problem our application can work to solve.

Contextual Inquiry

A member of the design team had connected with a real user interacting with their own environment. The following is the data and realization the member had during their experience with the user:

“I spent time with a group of students, one of them was an international student who came back to campus after winter break, after spending a semester in his home country. As I was spending time with these guys, we spent almost half an hour just trying to find a place to sit in the Bergeron Center. We couldn’t spend time in any of our rooms due to COVID restrictions, the student centers were also closed. We realized how limited our knowledge of campus was, where we could just sit. This is especially bad in the middle of the day when people are in between classes. This lack of knowledge most likely extends to most other students. For example: Most engineering students probably only think of the Bergeron center as a place to do work and be around their peers, which is why it is so often full.” – Member of design team

We noticed an overlap with this issue to the concerns that the probe brought up. This interaction between the user helped us to gain insights to the possible problems we could define.

Brainstorming

Money:

- Gas, parking, and other transportation fees
- Money can be saved for tuition, textbook, or other essentials as many students are in debt or financially unstable during school or after graduation

Time:

- Remote learning eliminates the need to travel to campus for classes
- A long time is spent to go back and forth from home to campus and living on campus costs money
- Traffic can cause students to be late for class
- The time spent to travel could have been beneficial for students such as more time for studying, doing assignments, and coming to class on time
- Some students have classes back-to-back and need to hurry to the next class
- Some students do not have a good sleep schedule or want to come to class while others want to study for tests and do assignments, benefitting from recorded lectures that are no longer available if classes are in person
- Recorded lectures also provide options for rewind and the increase of volume and video speed which all save time learning the material
- Need to wake up on time if they are taking public transit
- People are lazy

Social:

- After spending a couple of years learning remotely, many students do not know campus well
- Some students have never been to campus before because of remote learning
- Do not know locations like student services, inside school buildings, and other resources, making it harder to traverse and operate through campus
- Some students may have social anxiety or develop online habits from being remote for so long
- Not comfortable with life on campus such as in person tests and labs, interacting with classmates, and traveling to different locations

After our brainstorming sessions, we noticed that one major overlap within our discovery phase was that students have trouble with not only finding buildings, but navigating the interiors of those buildings as well. These students either have not been to campus in a long time or never been to campus at all.

Opportunities, Enhancements, Current Interactive Systems, and User Needs

A commonality between the data of coming back to campus is unfamiliarity. Students have problems with finding the location of their next destination, routes to take, and the possible undiscovered areas that are available to them. There are existing interactive systems that are accessible by users such as YorkU Maps¹ and Google Maps². Useful information is given to the user such as building locations and names, 360-degree view, opening hours, reviews, and pictures.

Once arriving at a desired location, for example a lecture hall, a student will have a more difficult time to navigate while inside the building like where their class or the nearest washroom is located. Other areas and buildings have many more interior or hidden services available that are not on the map like study rooms, labs, lounging areas, food and commodity stations, parking spots, and libraries. A wide range of resources, buildings, and rooms that are made open to students can be overwhelming, easily forgotten, and hard to find.

This provides an opportunity for design by allowing the interior of school areas to have a routing system and map that is similar to existing systems which are made only for the exterior. The overall usability of existing systems needs to be improved in all aspects. Ranging from the effectiveness of providing directions, efficiency of travel time, safety of knowing where to go, utility of routing and naming resources, and finally the learnability and memorability of locations and pathing throughout the interior of campus.

By following the design principles, these usability goals can be achieved and fixed. For example, enhancing the visibility of interior school areas and services, making the consistency of interior guidance match the features supplied by existing exterior interactive mapping systems, and providing more affordance to the many school locations and resources available to students. If these aspects are improved in a system, it will become more usable, useful, and used by users.

In the end, addressing the opportunities that the current interactive systems lack can improve the user's cognitive processes like attention, perception, memory, learning, reading, planning and decision making. An improved system not only helps the vulnerable group of returning students and staff after remote learning, but new prospective students, staff, and visitors to the university.

Current interactive systems:

YorkU Maps¹: <https://map.concept3d.com/?id=1200#!s/?ct/29093,29100>

Google Maps²: <https://maps.google.com/>

User Profiles, Personas, and Scenarios

User Profile 1 (Collection of Characteristics for a typical user)

- ≈18-24 years old
- International Student who has been in their home country for some time before returning to York
- Lives on residence
- Familiar only with the facilities that are relevant to them
 - On the questionnaire – maybe a 5/10 or a 6/10. Signifying that they are only familiar with buildings they have previously been to.
- Has class in the mornings and afternoons. Meaning a lot of downtime in the middle of the day
- Gets confused by building codes
- Would be able to find how to get to buildings, but has trouble navigating the inside. Also finds the maps in the inside of buildings confusing.

Persona for User Profile 1

An international civil engineering student who lived on campus for her first year and spent the next two years learning remotely in France. By the time she comes back to York, she will only remember a few places like the quad, york lanes, the subway station, and can vaguely remember some of the buildings she had class in her first year.

Name: Georgette Age: 22

Goals:

- Have the ability to find buildings by their building codes
- Be able to locate the resources inside of buildings such as bathrooms and lecture halls
- Find the entrances of buildings and rooms inside
- Become familiar with campus again
- Have an effective use of time

Bio: Now that Georgette is taking 4th year courses, she is taking classes in buildings she has never been to before. Her only guide is her schedule, which only contains the code of the building, not the name. She wants to spend as little time in the day in her room, as there are too many distractions in there. She wants to be as productive as possible in between her classes.

Scenario for User Profile 1

Georgette lands in Toronto from France the night before her classes start. By the time she gets back to her room, she is too exhausted to look at her schedule and plans on doing it in the morning. She wakes up the next morning and sees that her first class is located in VH C. She recognizes immediately that this must be Vari Hall, lecture hall C. She remembers Vari Hall well and is able to get there with ease. Although she comes here all the time, she has never actually had a class in this building. She sees that there is a map of the inside hanging on the wall, but she always gets confused by those so she doesn't even bother to look at it. She asks someone for directions and they tell her that it is on the second floor. After going up the stairs and looking around for a bit, she sees a sign that points to a classroom.

After her class she checks her schedule again to remind herself what class she has next. In 3 hours she has a lecture in "ACE", she has never had a class there but knows that "ACW" means Accolade West, so she deduces that it means Accolade East. She now has to pass the time for 3 hours. Being an engineering student, she immediately thinks of going to the Bergeron center, however there is no room because many students also go there in the middle of the day. She can't sit in Vari Hall because that space is often full as students from all different departments converge there.

Frustrated because she can't think of many other places to go, she heads back to her room, the one place she did not want to go because she knows she won't be able to focus and get any schoolwork done there.

It's time for her to start heading to her class in Accolade East, she does not know where the building is so she pulls out her phone and types in the building name on Google Maps. She is able to get to the building just fine following the directions, however, when she tries to open the first door she sees, it is locked. She's starting to get worried, as her class is starting soon and she does not know where the other entrances are. She runs around the building and finally finds a door that is open and she goes in. Now she has to find the correct room. She can tell from the room number that she needs to go one floor down, jogging at this point, because she is running out of time. She eventually finds the room with barely a minute to spare.

She has one more class that day, she looks at her schedule and it says the building is called "DB". She can not think of a single building that matches that code. Her best friend who she was just in class with tells her that she can download an app made specifically for helping people at York get around. The best part is, she can simply enter in building codes and the app and the building is found for her. In addition to that she is shown where the entrances are. The app works similar to other map apps, so she is able to quickly learn how to use it. She only has 10 minutes to get to her class in the Dahdaleh Building, but thanks to the app she is able to get inside the building before her class starts.

User Profile 2 (Collection of Characteristics for a typical user)

- Domestic Student
- Commutes to York daily
- Second year student that has only learned remotely
- Has not been to campus before
 - On the questionnaire – 1/10 familiarity with the campus

Persona for User Profile 2

"I have never been to campus before and plan to use Google Maps to help me get around. I do not see any of my classes on the map of the campus and I'm a bit worried. Hopefully I can figure it out when I get there."

Name: Timmy Age: 20

Personality: Introvert, shy, frequently checks the time, and hates getting lost.

Goals:

- Be early for class
- Have an easier time to get to class
- Become more comfortable around campus grounds

Frustrations:

- Being late for class
- Not knowing where to go
- Current systems do not tell me where my class is

Bio: Timmy is a second year student. They have never been to campus before and hope that their journey goes as smoothly as possible. Timmy tends to get nervous easily and wants to avoid social interaction, such as asking for directions, because they are shy. Timmy wishes that the current map application that they are using allows them to see a map of the inside of each campus building so that they know exactly where to go. The current application only shows the route to each building but not the rooms inside. Because of this, Timmy hopes that they will not be late for classes and get lost, especially for their first in-person class ever.

Scenario for User Profile 2

Timmy has been learning remotely for the past 2 years and it is their first time coming to campus. Timmy feels nervous and anxious as the university looks like a very big place. The packed schedule that they have with many classroom locations does not help either.

Timmy is currently using Google Maps to find where their first class is. On their schedule, they see that their User Interface class is located at ACW 004. At first, they look through the map, but can not find "ACW". Timmy then realizes that it stands for Accolade West and proceeds to head to the building. Timmy enters the building and checks their watch. They have 9 minutes left before class starts. Timmy begins to panic because they are surrounded by unknown hallways and rooms that they have never seen before. Above all else, Timmy does not know where the room ACW 004 is located.

The system allows users to enter a class location and then generates a path to both the exterior and interior of the building, directly leading to the doors of the classroom. The system eliminates the confusion, struggles, and mindless wandering for a user to find their destination and also provides the estimated time to reach it.

Timmy remembers about a new application that has the ability to map and route the inside of a building to a specific classroom. Timmy opens the app on their phone and enters the room name into the system. The system creates a direct path leading to their classroom and notifies Timmy that it only takes 2 minutes to walk to their class. Timmy is thankful for this feature, and now feels more comfortable and less nervous. Timmy proceeds to follow the path to their class and successfully finds an open seat left.

After a long while, the class begins to conclude and Timmy realizes that they have a back-to-back class. At first, Timmy panics once again, but then goes to their phone and enters the name of their next class into the system. Timmy feels reassured as the system has generated another path directly leading to their next classroom and can calmly relax before the class ends.

Establishing Requirements

Volere Requirement Specification Template

The Volere Requirement Specification Template³ specifies fundamental characteristics of problems, helping identify possible and important attributes to its solutions. The functional requirements cover essential operations of the system while the non-functional requirements define the constraints of the system. Each requirement contains useful information to clearly outline the dynamic properties of the system.

The structure of the requirement shells is based on section 9 of the Volere Requirement Specification Template³ website.

Functional Requirement

9. Functional Requirements

Requirement #: 1	Requirement Type: 9	Event/Use Cases #: 1, 2, 3
Description: The system will route to and display the user's location and its related area(s), leading them every step of the way.		
Rationale: The user needs a clear direction that leads directly to and gives precise guidelines on every level of the location.		
Originator: Design team		
Fit Criterion: The system will ensure that users will receive directions when entering a general name or specific name to a location.		
Customer Satisfaction: 5	Customer Dissatisfaction: 5	
Priority: High	Dependencies: 2, 3	Conflicts: 11, 13
Supporting Materials: Probe, Contextual Inquiry, Brainstorm, Page 6 of Design Brief		
History: Raised by design team on March 4		

Online Source:

Volere Requirement Specification Template³:

Volere Requirements Specification Template. (2019). Retrieved from Volere.org website:

<https://www.volere.org/templates/volere-requirements-specification-template/>

Requirement #: 2	Requirement Type: 9	Event/Use Cases #: 1, 2
Description: The system is able to receive descriptive actions that describe what a user wants.		
Rationale: A user may not know the area well and therefore may not be able to provide names to locations.		
Originator: Design team		
Fit Criterion: The system will ensure that all valid inputs will receive recommendations for locations when entering a descriptive action.		
Customer Satisfaction: 5	Customer Dissatisfaction: 5	
Priority: High	Dependencies: 1, 3	Conflicts: 11, 13
Supporting Materials: Probe, Contextual Inquiry, Brainstorm, Page 6 of Design Brief		
History: Raised by design team on March 4		

Requirement #: 3	Requirement Type: 9	Event/Use Cases #: 1, 2, 3
Description: The system will contain information about the locations that users are familiar with when using existing systems.		
Rationale: Users may want to know information about the destination before, during, or after traveling.		
Originator: Design team		
Fit Criterion: The system will ensure that any relevant information that is useful about their destination is given to the user at all times.		
Customer Satisfaction: 3.5	Customer Dissatisfaction: 2	
Priority: High	Dependencies: 1, 2	Conflicts: None
Supporting Materials: Contextual Inquiry, Brainstorm		
History: Raised by design team on March 4		

Non-Functional Requirements

10. Look and Feel Requirements:

Requirement #: 4	Requirement Type: 10	Event/Use Cases #: 1, 2, 3
Description: The system will make users feel like they are using a standard application.		
Rationale: Some users have preferences with appearance and customizations, disliking certain areas of the interface.		
Originator: Design team		
Fit Criterion: The system will ensure that it will be uniform and general in order to match the comfort that the majority of users expect.		
Customer Satisfaction: 3.5 Customer Dissatisfaction: 2		
Priority: High	Dependencies: 5, 8, 10	Conflicts: None
Supporting Materials: Volere Requirement Specification Template Section 10		
History: Raised by design team on March 4		

11. Usability and Humanity Requirements:

Requirement #: 5	Requirement Type: 11	Event/Use Cases #: 1, 2, 3
Description: The system is easy to use, helps avoid confusion, does not require good interpretation skills, and attracts new users.		
Rationale: Users can become very frustrated when interacting with interfaces when they are new or do not remember how to use it.		
Originator: Design team		
Fit Criterion: The system will ensure that the majority of users will be successful in finding their destination, making them want to keep using the system for future locations.		
Customer Satisfaction: 5 Customer Dissatisfaction: 5		
Priority: High	Dependencies: 6, 7, 8, 10	Conflicts: None
Supporting Materials: Probe, Page 6 of Design Brief, Volere Requirement Specification Template Section 11		
History: Raised by design team on March 4		

Requirement #: 6	Requirement Type: 11	Event/Use Cases #: 2, 3
Description: The system will communicate to the user if a location is valid, invalid, or restricted by having unique interactions with each type of input.		
Rationale: Users may not know if their destination can be accessible or not.		
Originator: Design team		
Fit Criterion: The system will ensure that all possible interactions with the system provide a unique response or display to their query.		
Customer Satisfaction: 3	Customer Dissatisfaction: 3	
Priority: Medium	Dependencies: 1, 2, 7	Conflicts: None
Supporting Materials: Volere Requirement Specification Template Section 11		
History: Raised by design team on March 4		

12. Performance Requirements:

Requirement #: 7	Requirement Type: 12	Event/Use Cases #: 1, 2, 3
Description: The system will be able to find the user's destination in a timely manner.		
Rationale: Users can get frustrated when an application takes too long to respond.		
Originator: Design team		
Fit Criterion: The system will ensure fast routing that meets the majority of the user's expectation.		
Customer Satisfaction: 4	Customer Dissatisfaction: 4	
Priority: High	Dependencies: None	Conflicts: None
Supporting Materials: Brainstorm, Page 6 of Design Brief		
History: Raised by design team on March 4		

13. Operational and Environmental Requirements:

Requirement #: 8	Requirement Type: 13	Event/Use Cases #: 1, 2, 3
Description: The system can be used without any collaboration.		
Rationale: Users need a reliable source to get where they want to go without the need to interact with other users.		
Originator: Design team		
Fit Criterion: The system will ensure all users will be able to use the system by themselves.		
Customer Satisfaction: 4	Customer Dissatisfaction: 5	
Priority: High	Dependencies: 4, 5, 6, 10	Conflicts: None
Supporting Materials: Volere Requirement Specification Section 13		
History: Raised by design team on March 4		

14. Maintainability and Support Requirements:

Requirement #: 9	Requirement Type: 14	Event/Use Cases #: 1, 2, 3
Description: Locations in the system will be updated if changes are to happen.		
Rationale: Users may find a location that was altered or removed in real life and need to be aware of the changes.		
Originator: Design team		
Fit Criterion: The system will ensure that all locations will be up-to-date for the user to use appropriately.		
Customer Satisfaction: 3	Customer Dissatisfaction: 3	
Priority: Medium	Dependencies: None	Conflicts: None
Supporting Materials: Volere Requirement Specification Section 14		
History: Raised by design team on March 4		

Requirement #: 10	Requirement Type: 14	Event/Use Cases #: 1, 2, 3
Description: The system is easy to learn.		
Rationale: Users interact with a lot of applications and may be adjusted to using popular current systems.		
Originator: Design team		
Fit Criterion: The system will ensure that it is easy to operate to make users feel comfortable to use, as if they were new or using an existing system that they know.		
Customer Satisfaction: 4	Customer Dissatisfaction: 4	
Priority: High	Dependencies: 5, 6, 8	Conflicts: None
Supporting Materials: Volere Requirement Specification Section 14		
History: Raised by design team on March 4		

15. Security Requirements:

Requirement #: 11	Requirement Type: 15	Event/Use Cases #: 2, 3
Description: The system protects confidential locations that are not for public users.		
Rationale: There are locations that are private and not meant for regular users to be able to see or travel.		
Originator: Design team		
Fit Criterion: The system will ensure that an unauthorized user is treated as they expect.		
Customer Satisfaction: 4	Customer Dissatisfaction: 5	
Priority: High	Dependencies: 12, 13	Conflicts: 1, 2
Supporting Materials: Volere Requirement Specification Section 15		
History: Raised by design team on March 4		

16. Cultural and Political Requirements:

Requirement #: 12	Requirement Type: 16	Event/Use Cases #: 2, 3
Description: The system respects the association, data, and information of the locations.		
Rationale: Some locations are tied to history, cultures, and law, which must be acknowledged.		
Originator: Design team		
Fit Criterion: The system will ensure that all locations that are provided to users respect the standards and expectations of members, communities, and organizations.		
Customer Satisfaction: 3	Customer Dissatisfaction: 3	
Priority: Medium	Dependencies: 11, 13	Conflicts: None
Supporting Materials: Volere Requirement Specification Section 16		
History: Raised by design team on March 4		

17. Legal Requirements:

Requirement #: 13	Requirement Type: 17	Event/Use Cases #: 1, 2, 3
Description: The system respects the operations that occur within locations.		
Rationale: Locations contain many associations like people, companies, and businesses that have various legal rights and may not be aware of third-party operations.		
Originator: Design team		
Fit Criterion: The system will ensure that rules are followed appropriately, handled with care, and given active attention.		
Customer Satisfaction: 3	Customer Dissatisfaction: 4	
Priority: Medium	Dependencies: 11, 12	Conflicts: 1, 2
Supporting Materials: Volere Requirement Specification Section 17		
History: Raised by design team on March 4		

Use Cases

Use Case 1 (User and System Expectations)

Basic interaction between the user and the system.

User Intention:

- Supply a name to a location
- Find a specific location
- Obtain directions to the specific location
- Receive suggestions to locations of interests

System Responsibility:

- Request a location
- Direct the user to the location
- Help the user navigate to the specific location
- Offer suggestions for potential locations the user is looking for
- Make the user familiar with the location and what is around it

Use Case 2 (System Suggestions)

A user has no specific location in mind, but knows what they want to do such as eat, find a quiet place to study, purchase books, restroom, or use a computer.

Normal Course:

1. The system asks for a descriptive action.
2. The user provides a descriptive action.
3. The system checks if the descriptive action is valid.
4. The system displays a range of valid locations based on the descriptive action.
5. The system displays information of each valid location.
6. The user reads the information about the locations
7. The user selects one of the valid locations.
8. The system directs the user to the valid location.

Alternative Course:

- 3.1 If the name of the action is invalid:
 - 3.1.1 The system produces an error message.
 - 3.1.2 The system returns to step 1.
- 7.1 If the user selects more than one location:
 - 7.1.1 The system will deselect the previous selection and select the new one.
 - 7.1.2 The system returns to step 7.

Use Case 3 (Handling Exterior and Interior Areas)

The user has a location in mind and wants to find where their destination is located.

Normal Course:

1. The system asks for the name of the destination location.
2. The user provides the name of the location.
3. The system checks if the name of the location is valid.
4. The system directs the user to the name of the valid location.

Alternative Course:

- 3.1 If the name of the location is invalid:
 - 3.1.1 The system produces an error message.
 - 3.1.2 The system returns to step 1.
- 3.2 If the name of the location is a restricted area:
 - 3.2.1 The system produces a restricted area error message.
 - 3.2.2 The system returns to step 1.
- 4.1 If the name of the location is an exterior location:
 - 4.1.1 The system directs the user to the exterior location.
 - 4.1.2 The system displays the interior location.
- 4.2 If the name of the location is an interior location:
 - 4.2.1 The system directs the user to the exterior of the location.
 - 4.2.2 The system directs the user to the interior location.