

GNG1103
Technical Report

Interactive Ceed Map

Submitted by

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Abstract

Throughout this paper, the team will discuss the different needs and specifications posed by the client. In addition to that, it will give an overview of what the CEED client tried to portray in the two meetings we had with him/her and how it was interpreted and further analyzed. This analysis includes different conceptual designs created by each group member, and the outcome and collaboration of all those designs to give a global concept. Overall, this paper will go over what the team has extracted from his interaction with the CEED client and what the team has come up with regarding the problem/solution

Table of Contents

Introduction.....	6
Tackling the posed problem.....	6
Need Identification and Product Specification Process.....	6
Conceptual Designs	8
Analysis of Group Design	16
Conclusions and Recommendations for Future Work.....	18
Bibliography	20

List of Figures

Mohamad's interpretation	10
Ken's interpretation	12
Jason's interpretation #1	13
Jason's interpretation #3	14

Jason's interpretation #2
14

Zach's interpretation #1
14

Zach's interpretation #2
15

Alex's interpretation #1
16

Alex's interpretation #2
16

Alex's interpretation #3
16

List of Acronyms

Acronym	Definition
CEED	Centre for Entrepreneurship & Engineering Design
SD	Secure Digital
STEM	Science-Technology-Engineering-Mathematics
ETC	Estimated Time of Completion

[illegible]

Introduction

Tackling the posed problem

Following both meetings with our clients (the CEED space managers), the problem was clear to our team; the space required a method to check the availability of the machines, store SD cards, manage the traffic in the STEM building, and inform the users about the time left until the end of the day.

Tackling this issue would bring great benefit to the customer as well as the CEED space user. It would ensure and maintain a smooth overall workflow. In addition it will ensure that the CEED space user is fully satisfied with the service they are receiving.

Globally, fulfilling this project would bring the overall CEED space(MakerLab and Brunsfield) one step closer to being the ideal work environment.

As mentioned below, the variety of the issues being tackled in one project is certainly going to make it stand out from the crowd and into the spotlight. In addition to that, the way the problem is being tackled in this project creates a friendly, customizable, and easy-to-learn UI interface which ensures easy integration into the workplaces.

Need Identification and Product Specification Process

Problem Statement:

Both lab management teams of CEED require a method to control traffic, manage time and an organized hub of information about the availability of resources in the area that is accessible to those not physically present in the space. In Addition to a method to store sd cards. Table 1:

Need Identification and Product Specification Process

Interpreted needs	Functional Requirements	Non-Functional Requirements	Design Criteria
People knowing the amount of people and the number of machines available will allow them to gauge if there is space for them or not	Flow of traffic can be monitored with the map. The number of available machines can be monitored on the map.	Colour coded for convenience.	Indication of foot traffic
Show availability of machines in Makerspace. Method to keep track of SD cards	Clear indication of available machines.	Colour coded for convenience	Able to track availability of machines
Map system to help users find the appropriate space.	Map has a guidance system to plot a path to the appropriate space.	Colour coded for convenience.	Search Bar
Clear indication of how much time remains before Makerspace is closed.	Show time accurately and specific to that day.	Look appealing	The map should have a timer.
System to submit complaints / suggestions.	A system where complaints/suggestions can be submitted.	Easy user interface	A complaint/suggestion system
hotspots revealing prime hours and other statistics	-show traffic in different times of the day -colour coded	user friendly	user and/or staff can view prime hours and organize their work on that basis

Target Specifications

Due to our projected idea being software based we were unable to determine physical target specifications for our project. We did however decide that our focus for a target specification would be based on the accessibility, navigability, simplicity and user-friendliness of our project. We would like our project to be able to be easily accessed by all CEED space users, easy to navigate, with a simple to use and easily understood user interface. In addition to that, it will be under the specified budget of \$100, as most of it is software based.

Conceptual Designs

Below are the different concepts posed by each team member regarding the issue at hand:

Mohamad Ali Jarkas:

- 1-The UI can have multiple tabs as shown in the pictures below.

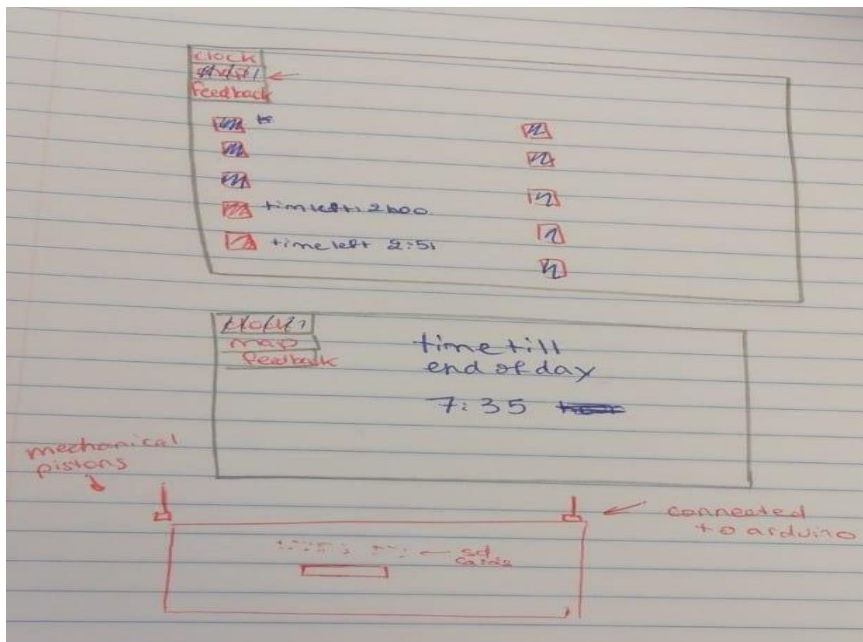
It includes a map, the time till the end of the day, and a tab where users can give direct feedback.

2- When a person views the map, different colour coding appear: blue referring to available, and red to taken. Hence a user can have a full idea of the availability beforehand.

3- Regarding the SD cards, he suggested that after a person rents a machine, a drawer will pop out revealing the sd cards.

4- Two different versions of the map be available, one wirelessly, and one locally. That is so people don't spam the renting feature and rent out the whole thing for a day.

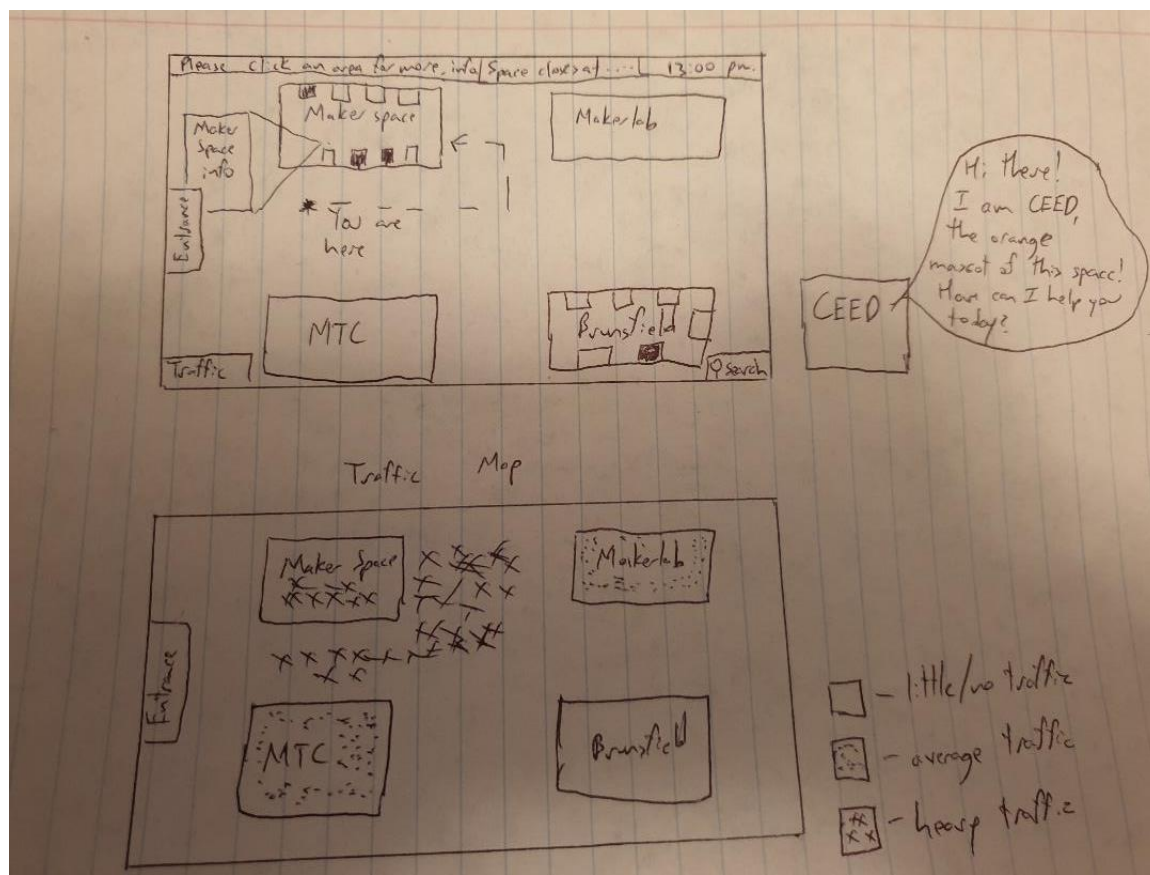
5- As an incentive, using the renting feature will: a- give the user sd cards b- ensure the user that a machine is available before stepping into the lab.



Mohamad's interpretation

Kenneth Yu

1. Introducing a colour coded tracking system on traffic for the ground floor to indicate to users how busy certain areas of the CEED spaces are at a given time. Red would indicate an area with heavy traffic, amber would indicate an area of average traffic and green would indicate areas with low traffic. This colour coded system could also be used for the availability of resources in each specific space by using red as in use/taken and green as available.
2. In order to help orientate persons to the schematics of the CEED space and to help them get from one place to the next, we could use the map and place a line that gives them directions from the entrance of the building to a relevant CEED space. This could be predesigned so that if someone presses a directions tab they could see a line that would appear according to which space they are trying to get to.
3. A search bar could be an alternative to my 2nd design point in order to locate where in the building a specific CEED space can be found, along with information about the resources available in each space.
4. A mini-introduction/information tab to give users and visitors an idea of what each space inside the STEM building is used for. A planner of current and upcoming activities could be included in this information tab to inform both visitors from the community and regular users about the activities available.
5. A digital clock in the top right corner of the map that also shows the closing time of the CEED spaces.
6. A mascot character on the map that acts as a guide on how to use the interactive map, similar to the Office Assistant that used to be in Microsoft Office

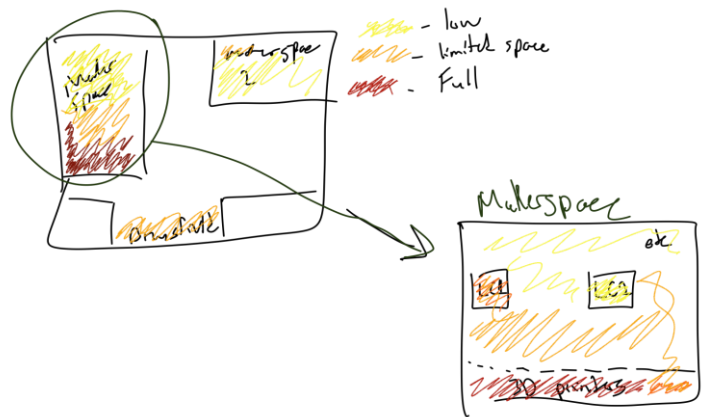


Ken's interpretation

Jason Gonzalez Pulido

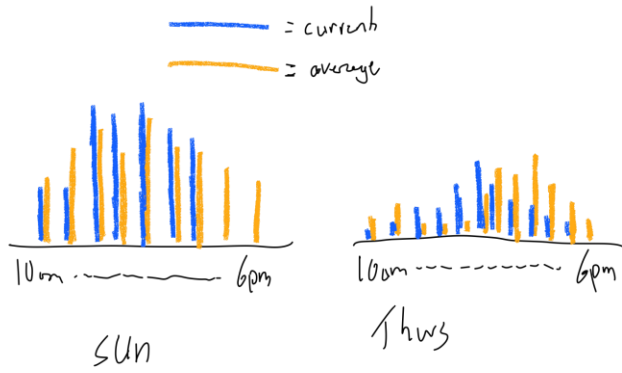
1. Hotspot zones showing current traffic/usage of machines in specific areas. Along with zoomed in availability per machine available at request.
2. Input end of the system kept very simple with little inputs. Those being, which machine is being used, ETC.

3. Output show something like above along with time left in the day at certain CEED space, live video feed for real view of how many people are there/machines actively being used.

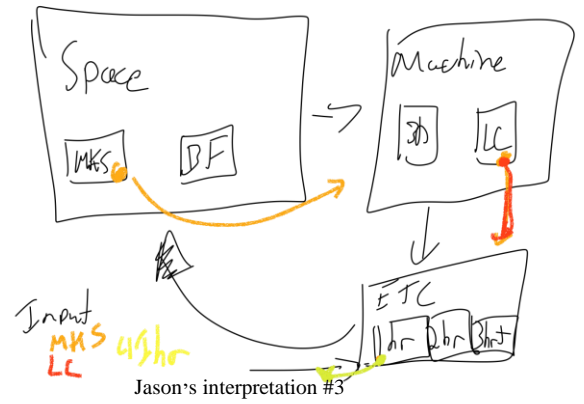


Jason's interpretation #1

4. Weekly and hourly traffic graphs, similar to google maps.
5. Time remaining in day clock on output end to see if the user could even get there with time to do what needs to be done.
6. Live feed to have a more accurate view of current people in the space as well as a quick look at machines and it's possible the map might not be as quickly updated.
7. Contact us support number to ask quick questions or even connect video feed to CEED volunteer to answer any queries.

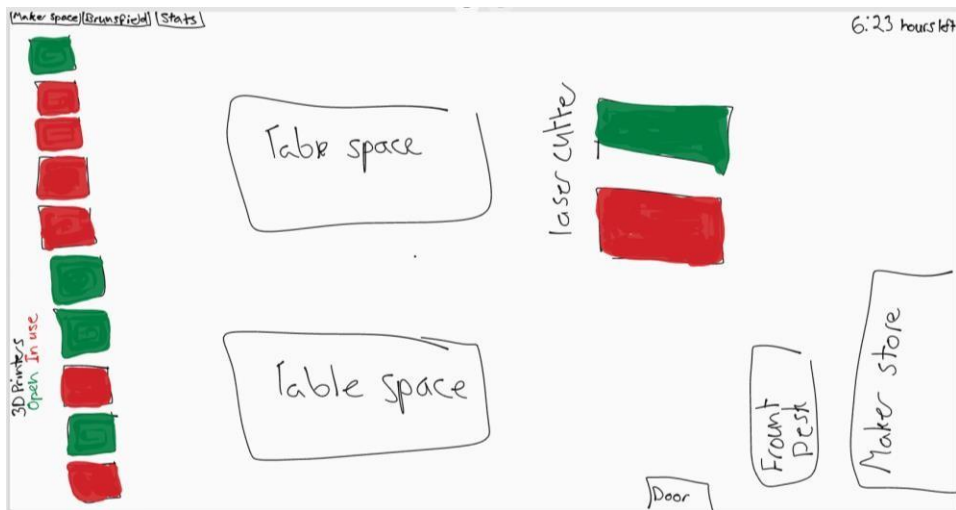


Jason's interpretation #2



Jason's interpretation #3

Zach Shields



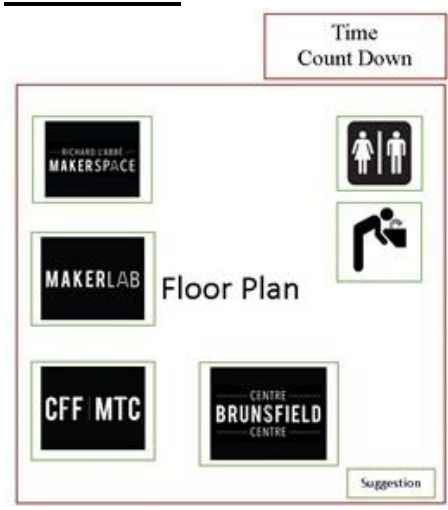
Zach's interpretation #1

Day	Average # of People	Time	Average # of People
Monday	25	9am	2
Tuesday	24	10am	4
Wednesday	26	11am	3
Thursday	20	12pm	5
Friday	20	1pm	6
Saturday	0	2pm	8
Sunday	40	3pm	6
		4pm	4
		5pm	3

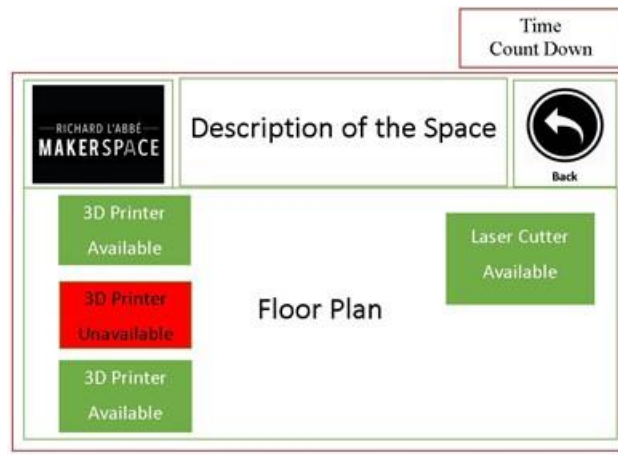
Zach's interpretation #2

1. There would be the main computer at the door of each CEED space that would be running the software that people would enter what piece of equipment they are using.
2. This would be streamed onto a web site that anyone could access from their computers at home. This way they would be able to tell if the space was too busy or full for them to work on their project in the space.
3. There would also be the clock in the top right corner as seen in the picture that shows how much time is left until the space you are looking at will close.
4. There will be a tab for each space that will give an outline of where everything in the space is located and what machines are in use.
5. There will also be a tab with statistics. This will allow the person to plan from home when the best time will be for them to go in and use machines without a wait.
6. The red colour tells you that the machine is in use and the green colour tells you that the machine is open

Alex Vandici



Alex's interpretation #1



Alex's interpretation #2



Alex's interpretation #3

1. Map home screen is an overview of the STEM first floor with CEED spaces highlighter.
After 1 minute of inactivity the map will go back to the home screen,
2. Users can click on bathroom or water fountains to be given directions too said spaces.
3. Users can also click on CEED spaces to bring them to a screen that gives an overview of the space.
4. This overview of the space has colour coded machine availability. A description of the space along with how busy the space is. Users can also click on an available machines to sign it out.

5. Also a fixed clock in the corner. Users can click on it to expand them to a screen which gives them a schedule of the operating hours for an average week. This screen will also alert the user if the space is going to be closed soon for a holiday or maintenance.
6. Main screen also has a suggestion tab in bottom right which will bring users to a forum.

Analysis of Group Design

In order to decide on what concepts to use we decided on a rate and vote system where each member rated each concept they liked best. A discussion followed where we discussed the pros and cons of each one, and which features of each concept we believed fulfilled our design criteria best. The group decided to move forward with the following concepts:

1. An interactive map with several features to fulfill various needs of the CEED space that will orientate them to time and place inside the facility.
2. A colour coded system to show the availability of resources in each space and to give an indication of the level of activity in and around each CEED space.
3. A clock that indicates time and the amount of time left before each CEED space closes.
4. A method to direct users towards a wanted space to act as a guide so users and visitors do not get lost, and to limit any traffic in the entrance of the CEED space.
5. Method to store statistical information and display it to give users a reference for when the spaces are busiest.

Points 1,2 and 3 were already discussed in previous meetings and agreed upon because they directly relate to the clients' interpreted needs and concerns. Fulfilling various needs of the CEED space with the use of a unified tool would be both convenient and efficient for our clients. The colour coded system would make it easier for users to use the product by introducing a visually simple method of recognising the availability of machines and the level of activity around it. Different tabs would be used for traffic control and availability in order to avoid any confusion with the colours used.

With regards to point 4, a method to direct users to a space would limit the number of people getting lost and confused when coming to the CEED space. This would also have an effect on foot traffic inside the building as people will spend less time stand still then looking around and trying to orientate themselves to figure out where they need to go. The group however believed that the main challenge with trying to implement this would be our limited knowledge and experience with Ross software. To elaborate we were not entirely sure that we could gain enough knowledge and expertise with the software quickly enough to be able to implement this feature to a high enough standard. This will be revised during prototyping to be able to gauge where we are with trying to implement this concept.

Point 5 will have to be revised because while the team felt strongly about this concept, we also recognised a lack of data currently available for us to effectively incorporate this feature into our interactive map. We recognise that this would take some time to gather but believe that this would be a very effective feature to include as seen in the way Google incorporates statistical

data into their searches. It would give users a good frame of reference for the most convenient times for them to come to use the spaces and resources that would be available at different times.

Hence, the points discussed correlate to what was mentioned in the problem statement, and were laid out and compared on a basis that aimed for something that will be of use to both spaces.

Conclusions and Recommendations for Future Work

To conclude, throughout this deliverable we have seen that communication is key to a more cohesive work flow and group dynamic. Following individual idea generation, we had to come together to choose the best ones through what was best for the client. Using previous design criteria as well as functional and non-functional requirements, we were able to narrow down the more ideal and realistic ideas and concepts. It was clear from the start that sharing opinions led to more detailed analysis of ideas and how they fit with our clients' needs. Furthermore, openly discussing these ideas and taking in feedback and notes allowed everyone to see that no one is out to get each other, in fact we are all a team and really want what is best for everyone on it. After reaching the agreed upon concepts, we are now able to think ahead and on an actual fabrication of these ideas. We are now able to really visualize something and think about how to get started on a prototype.

Overall, communication played a key role in completing this deliverable, and it also gave us insight into the final report and the standards that should be kept. Moving forward we have a better idea of what we are going to try and accomplish. There is also more unity within the group and confidence to speak your mind, knowing that there will not be any criticism of ideas, only

constructive feedback. This deliverable not only strengthened our team cohesiveness, but our ideas as well.

Bibliography

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