Deliverable E

Project 17

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GNG1103

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The staff, students, and community that use the CEED space need an interactive system in order to time and inventory manage more efficiently.

Our team has been able to collectively agree on a solution that we feel meets the user's needs. After a very insightful meeting with the clients, it was obvious that the clients were drawn particularly towards one of our solutions as they stated that it is more valuable to them resource-wise. Therefore, it has been decided that we will pursue solution 2. This solution fits best with our original problem statement, it will create an interactive system for the users (managers,staff, and space users) that will allow them to manage their time and inventory in a more efficient way.

The second solution will be more of an interactive website for the users of the Makerspace. The website will display a dashboard, created by Ross Video, which will include an interactive map with lots of information. The interactive map will show a map of the Makerspace area and where all the inventory is. When a user would like to know more information about certain inventory in the lab, they can click on it and information will pop up. This information will include what this machine does and how to safely use it. Furthermore, the bigger machines in the lab, such as 3D printers, will have their vacancy displayed. Originally, if a user is using a machine, then they must press a button to notify the Dashboard that it unavailable. However, after speaking with CEED space managers we decided to automate this instead of needing someone to press the button. We will be pursuing the option of motion sensors to sense and alert when a machine is unavailable. An additional feature could be to have a timer that displays the remaining time that the Makerspace is open for. This will allow users to know how much time they have left to work on their projects.

To ensure the success of our project, a project schedule is needed. This helps the team prioritize and equally distribute tasks, allowing each member to be responsible for their given task. It also helps the team manage time effectively as the list also entails how long a task will/ should take to do. So that we are able to make the deadline for our first prototype, below lists the tasks needed to be done by individuals as well as the time allotted for that specific task. As well, listed below there is a list of significant project risks followed by the course of action we plan to take to reduce the impact of the problem.

Additionally, there is a list of expected expenses for our project. Given our target spec of a one hundred dollar budget, it is critical for the team to collect enough equipment needed while also ensuring that the budget is kept.

Tasks to complete:

TASK	DESCRIPTION	START	FINISH	PRIMARY PERSON RESPONSIBLE
Find a website builder we like	Prototype I	Oct. 20	Oct. 24	Isabelle
Gather materials	Prototypes I and II	ongoing	----->	Group responsibility.
Test sensor placement	Sending signals to arduino when machines are in use, prototype II	Oct. 27	Nov. 7	Rehana
Drawing circuit diagrams	Plan for circuit routings to and from the machines	Oct. 20	Oct. 31	Rehana
Test wifi connection with dashboard	Arduino board testing, part of prototype II	Oct. 27	Nov. 7	Alec
Create a very simple dashboard	Creating expected input and output parameters, prototype I	Oct. 20	Oct. 31	Alec
Create a very simple website	Interactive map, capable of uploading from dashboard, prototype II	Oct. 20	Nov. 7	Evan
Test website compatibility with dashboard	Uploading dashboard controls to website, prototype III	Nov. 7	Nov. 17	Isabelle
Testing dashboard compatibility with existing sign-in	Uploading sign-in info to dashboard, prototype III	Nov. 7	Nov. 17	Alec

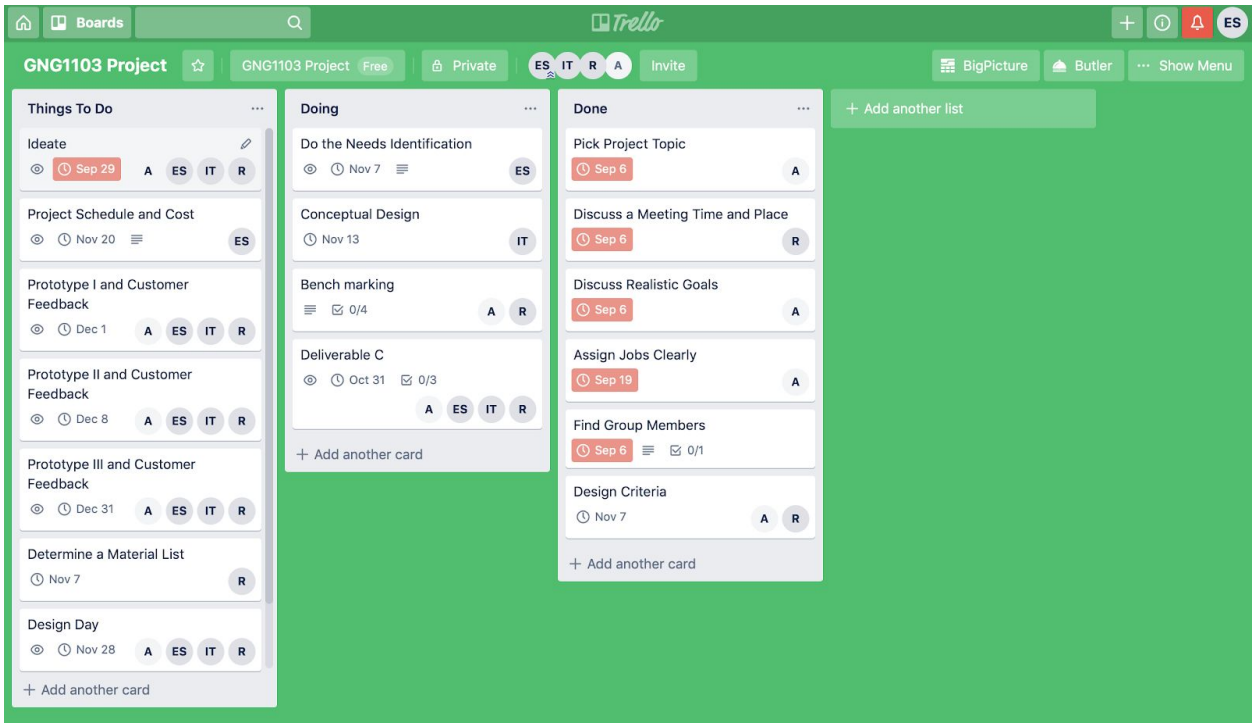
Finalizing dashboard program	All parameters and paths set, dashboard fully functioning, prototype III	Nov. 7	Nov. 21	Group Responsibility.
Finalizing website	Website displays data from dashboard, prototype III	Nov. 7	Nov. 21	Evan

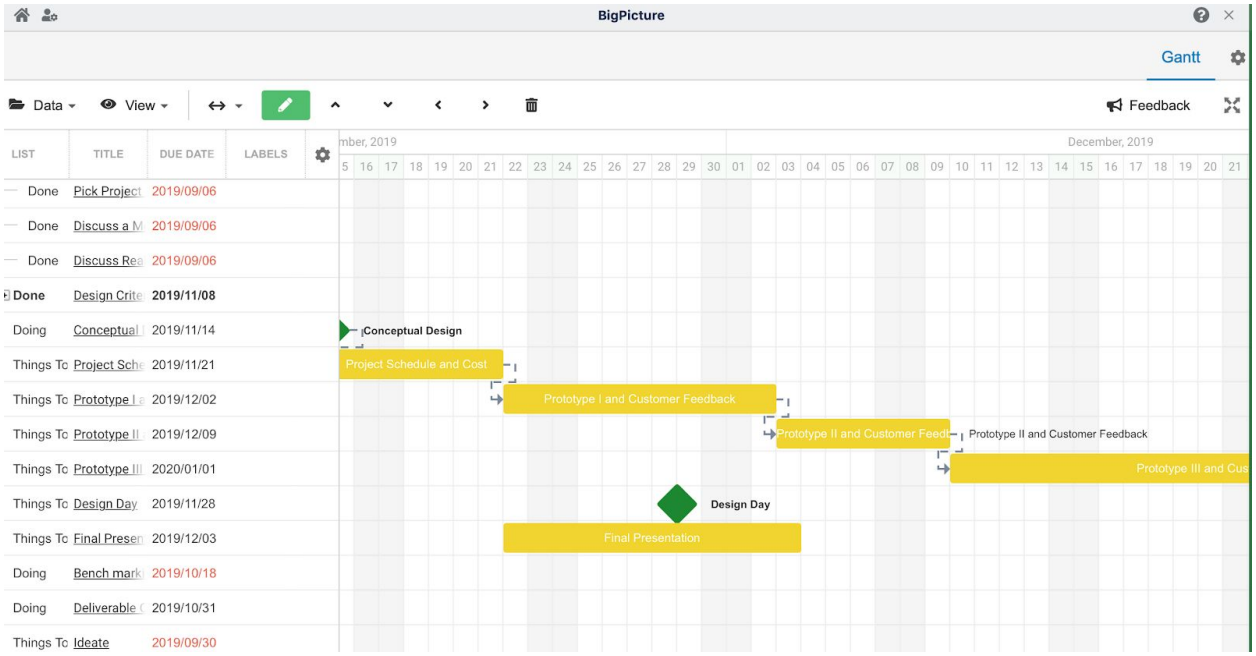
Prototype I: Prototype I will be a basic model of the dashboard with simple input/output parameters. Prototype I will also include diagrams of the circuit routings for the machine sensors.

Prototype II: Prototype II will be a model of the machine vacancy sensors to test their capabilities of monitoring a machine and uploading the data over the local wifi network to a laptop.

Prototype III: Prototype III will be a fully functioning model of the solution complete with a dashboard program, receiving data from the machine vacancy sensors as well as the sign-in/sign-out system.

Gantt Diagram:





Contingency plans:

RISK	COURSE OF ACTION
The wifi connection between Dashboard and motion sensors failing to work.	We will need to make a very basic prototype of dashboard (having it do only what is absolutely necessary) in order to test whether or not the connection of the sensors will work over wifi and how far the receiver can be from the sensors to successfully pick up signals.
The dashboard failing to be able to be compatible/ usable on a website.	We can use this same basic version of our dashboard in order to test if it will be accessible on our website.
The motion sensors picking up motion from more than one machine/being distracted by other things in motion.	Placement of the sensors. We will need to test and adjust the placement of the sensors in order to establish the best possible placement of them. To do this we will need to physically go into the space and take the time to set up and test each sensor we plan to put in.
A part is broken.	We have left some money out of our budget

	in the case that we run into a problem where a part needs to be replaced.
A part does not work as we expect it to.	We can also use our backup remainder of the budget to purchase a new type of machinery to an extent if needed. We are also only ordering one of everything to begin with in order to create the first prototypes. This will ensure that all parts work before going in and buying more of that piece for our final product.

Expected expenses:

- Arduino wifi board: $22.38: https://learn.sparkfun.com/tutorials/esp8266-wifi-shield-hookup-guide/all
- Jumper wires: $1.00 for 10: https://makerstore.ca/shop?olsPage=products%2Fjumper-cables-per-10
- The cost of putting up a website: Free https://www.wix.com
- Motion sensors for the 3D printers/ machines : $14.64 ea.: https://www.robotshop.com/ca/en/parallax-mini-pir-motion-sensor.html?gclid=EAIaIQobChMI_vH75Mej5QIVAdbACh1IEg2WEAYYBiABEgK9zPD_BwE

TOTAL COST:

One Arduino wifi board	$22.38
Twenty Jumper Wires	$2.00
One Website	$0.00
Four Motion Sensors	$58.56
	$82.94

This left-over will allow us some “risk room” incase anything goes wrong.
We have a small amount of money left incase something needs to be replaced or something does not work as we expect it to and therefore needs to be changed. Also, tax and shipping rates may vary.