Deliverable F

Group 8

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1. Introduction

This deliverable is focused on the creation and construction of our first prototype. This prototype will serve as a stepping stone to lead to future prototypes and eventually our final design. To have a basic proof of concept of this prototype, within this deliverable we will identify the prototypes objective, its stopping criteria, our plan for it, a document analysis and results of the prototype. Additionally, photos will be included as proof of our prototype and code. This deliverable will include feedback from clients, however, as we do not have a way to contact our clients before submitting this deliverable, we will use the feedback from a potential user, Katherine Hall.

2. Objective

The objective of this prototype is to determine if the design will be able to display if a machine is in use. The design of the prototype will depend on the code written on dashboard. The code should determine if the machine has power and then display if the machine is in use if they do.

3. Stopping Criteria

The stopping criteria is the criteria which needs to be met so that we can stop testing the prototype and deem it acceptable. It is necessary to have stopping criteria to make our testing as efficient as possible, as it will ensure us that our prototype is successful without spending more time than is necessary. In the case of our prototyping, that would be to have a prototype which is able to do the following:

- Register Barcode (Either by manual input or RFID scanner)
- Access list of student IDs and training for each student ID (Internet/local)
- Relay activating when the user's student ID does not have proper training on file

4. Plan/Procedure

Create code in DashBoard that simulates receiving an input message from the relay indicating whether there is electricity flowing through the machine, then

sending an output to the relay either allowing or not allowing electrical current to the selected tool.

- If it does not equal, then it is a false
    - Displays ‘NO’ to in use
- If it equals, then it is true
    - Displays ‘YES’ to in use

5. Analysis and Results

The code written on dashboard states that if input is True (i.e. if electricity is detected), then it is displayed on the user interface that the machine is in use. When the prototype was first created, there was difficulty receiving the input as the raspberry pi has not been connected. The prototype was then altered to have the input received from a check button on the interface for testing. There was then a problem in terms of getting the boolean value of the parameter for the check button. This was later resolved, and the dashboard interface functions as required. It met the objective of the prototype and the stopping criteria was reached.

6. User Feedback

Due to us not having a meeting with the client until after this deliverable we have decided to use input from a potential user. The user identified is Katherine Hall. Katherine’s comments involve making it simpler, so users do not have to find their MakerRepo card each time they’d like to use a machine. She suggested a fingerprint scanner instead of a raspberry pi. While this is a good idea, we are unable to implement it in these prototypes due to high costs. It would also require more setup and room for error. We would have to initially match up each person’s fingerprint to their card which would take significant time. There may also be users who decline to have their fingerprints taken. There would be significant error within Brunsfield as fingers may not be clean or the fingerprint scanner may become dirty making it unusable. Overall, the identified user liked the idea and thought it was a great way to restrict machines from people who do not have the proper training.

7. Basic Proof of Concept

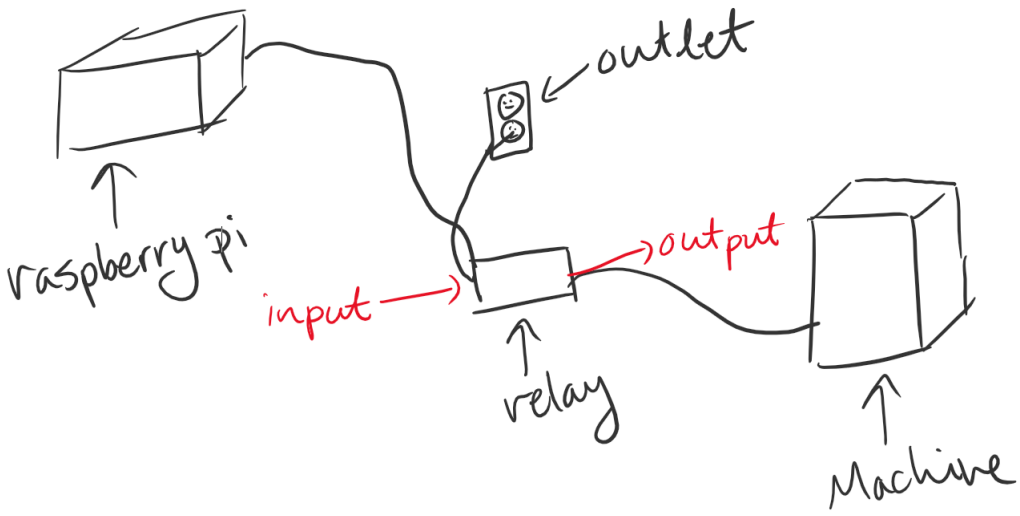

Figure 1:Sketch of Prototype

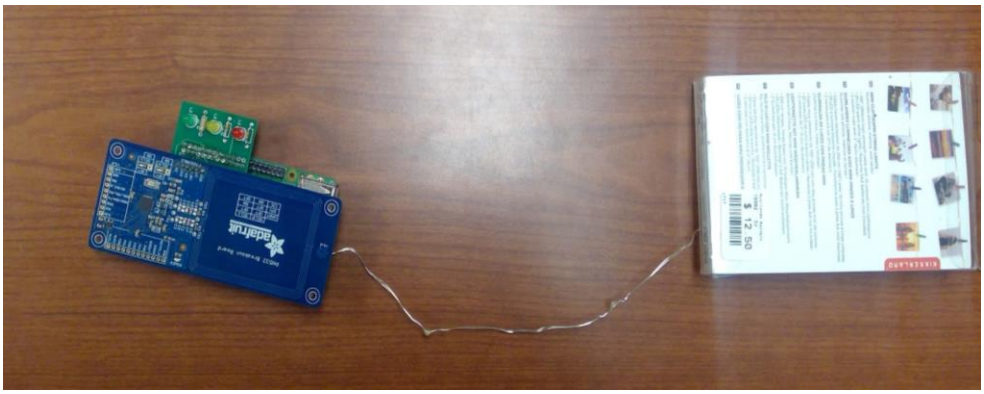

Figure 2: First Prototype

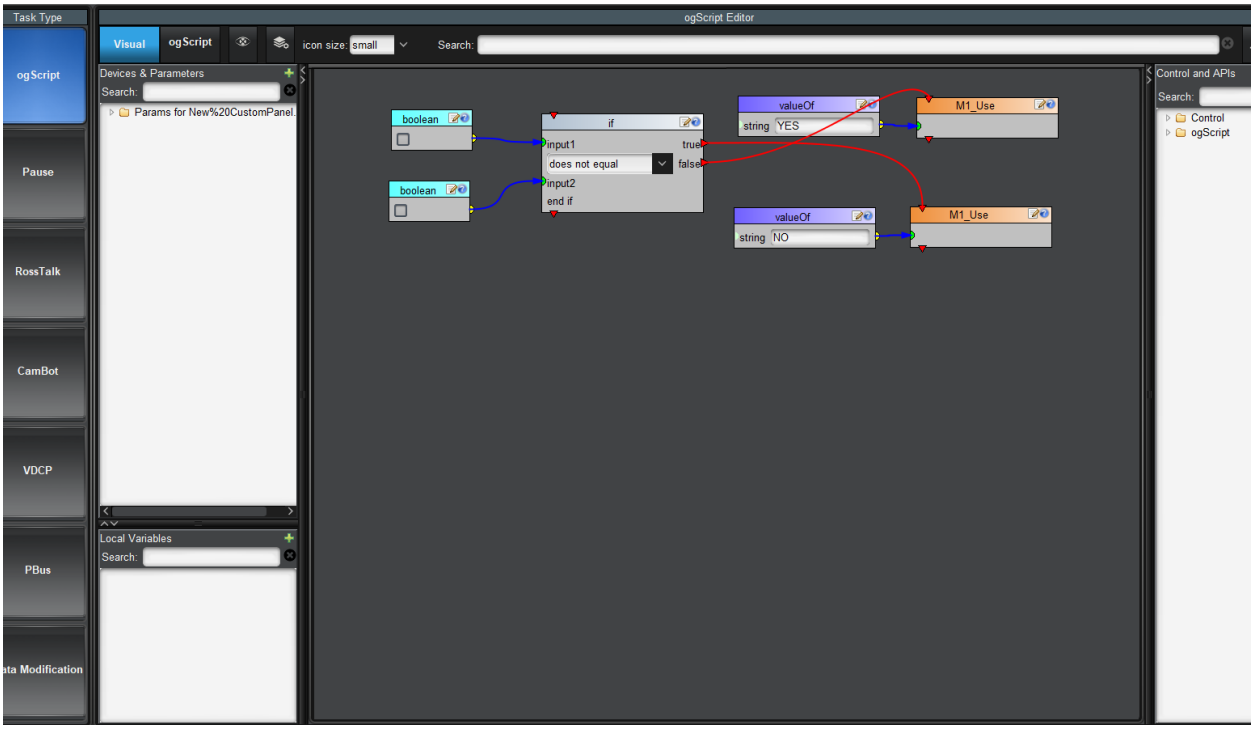

Figure 3: Photo of Prototype's Code

8. Conclusion

Within this deliverable we have provided photos of our prototype and code, identified the stopping criteria as well as the plan and procedure. The analysis shows that the code had to be altered to receive data from a checkbox within the dashboard to simulate the raspberry pi. This will be altered again for future prototypes to enable the raspberry pi to connect. The user feedback provided great ideas for future designs and prototypes, but these ideas are not applicable to current designs and restrictions. Due to these being identified and provided, we can conclude that we have provided a basic proof of concept of our prototype. This basic proof of concept will be suitable to provide as a basis for future prototypes and eventually the final design.