**Group 9 - Deliverable D**

| Idea # | Name | Explanation of idea |
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| 1 | M. Dolan | Using a microcontroller and an ultrasonic scanner, the ultrasonic scanner would be pointed at the VR station. If someone is using the VR station, the ultrasonic scanner would pick up on this and relay it to the ROSS software, informing people that the station is in use. The software could also include a queue list for people who want to use the station next, as well as a timer to indicate how much time is left for said person. |
| 2 | G. Israpilov | Improvising on idea number 4 and 5, rather than using university student ID the database uses the makerspace users for more convenient interaction. Once the print is done, an algorithm will copy information onto the SD card, regarding the success of the job. A staff member will then place the card back into the database; a second algorithm will create a report of the print job and generate an email to the makerspace user. The email will inform the user of completion of the print and whether it was a success or error |
| 3 | M. Puma | An interactive map using the ROSS dashboard as the UI. The map will be located on a computer at the entrance into the CEED building. The student will select which room they are looking for from the list, the screen will then display the floor #, the opening, closing time of that facility, and if the facility/ room is in use at the moment or booked. The student can easily book a room if needed or see contact information or links to any websites that correspond to the room. The software will also display a ‘what's happening today’ option that contains all of the activities that are being offered in the CEED facility that day. The map will also act as a map giving instructions on how to find each room, and what is required to enter that room. (ex, closed toe shoes, student ID, etc). |
| 4 | M. Puma | Using a raspberry pi with a camera, create a QR scanner that connects to a computer in the Makerspace through USB. the computer will have the ROSS software with a simple UI (See photo below), that allows the student to enter their ID as well as choose whether they are signing out or returning a SD card. They will also have to input the amount of time they should require for their print, to ensure that the makerspace will still be open when the print is complete. Each SD card for the 3D printers will be tagged with an individual QR code that designates the SD card # and its corresponding 3D printer. When a student wants to sign out a 3D printer for use they will have to input their student ID and scan the SD card they are using. |

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| | | The scanner will log that card as signed out, record the 'start' time of the print and mark the printer as in use, on an online database that connects to the Makerspace website. When the print is finished the student will remove the SD card from the printer and return it to the computer. Selecting return card and then scanning the QR on the SD card again using the raspberry pi. The card will be logged as 'returned', the student will then be prompted to answer a few questions, such as how did the print turned out, did the printer perform as desired, any issues to report. This will allow the ROSS software to record potential issues with machines. The student will then be free to go.<br><br>This system will allow the makerspace to keep track of how many printers are in use, as well as relay that information back to the students on the makerspace website to avoid wait times.<br><br>The ROSS software will also record the times, the student number of the user and other data collected to a text file, allowing the makerspace to collect data on which printer has been used the most, which students are using the printers the most, the amount of time the printers are used for, the busiest times of day the printers are used, and other information.<br><br>Notes: The system can be designed in a way that does not allow a student to sign out more than one 3D printer at a time. |
| 5 | M. Puma | Similar to my other idea (Seen in 4), except with the difference being instead of the students interacting with the computer, one of the makerspace staff members being in charge of scanning and inputting the ID of the student. This method would still allow data to be collected as well as the # of printers in use to be logged, except reducing the amount of trust between the system and the student, since a staff member will be able to ensure the student is entering correct information as well as returning the card as soon as they finish printing. This idea would be better for ensuring that the makerspace is being used properly, but does requires a staff member. |
| 6 | D.Coco-Bassey | Using The infrared motion sensor to count the amount of people in a room. On one side of the door could be devices that produce Infrared ray on the other side there would be a device which could detect the rays. Two rays side by side to each other will be beamed to the opposite side of the door the sensor on the other end can then detect if the beams are broken. If the beam closer to the inside of the room is broken first it can be taken as someone has left the room on the other hand if the beam closer to the |

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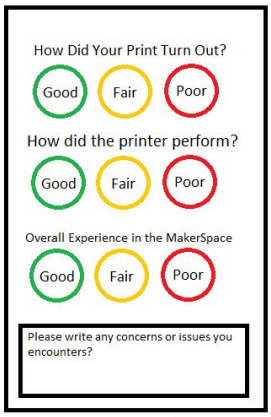
| | | outside is broken first it can be considered that someone has entered the room. It can then relay this information so that its displayed on a ROSS dashboard which can then be put on a website. This would help track the amount of people in a space at a given time |
| 7 | D.coco-Bassey | Similar to idea 6 but this time using ultrasound. Each device would have a receiver and an emitter. It would work by constantly calculating the time it takes for the waves to bounce back if there is a change it would indicate a person walking by. Once again there would be two sensors and whichever one is altered first would indicate if someone left or not. |

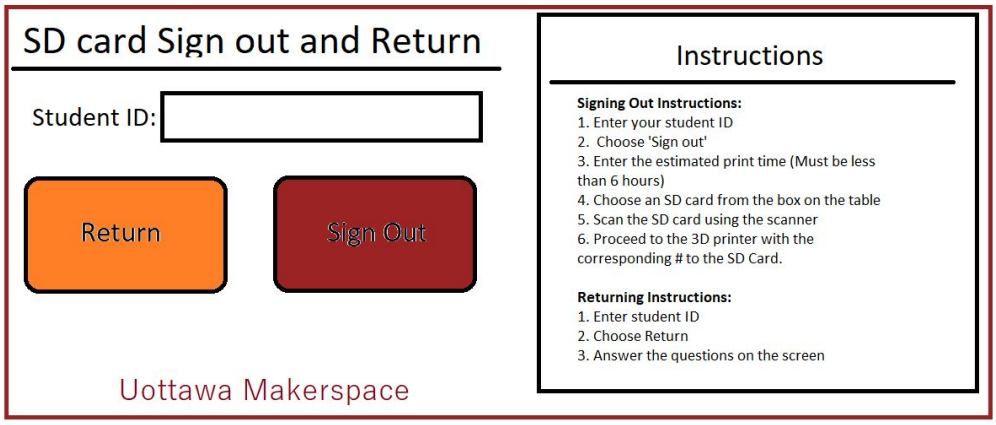
**Agreed uponed idea: 4**

*See Project Ideas document*

UI example (Idea 4)




*Return Window*




*Main window*