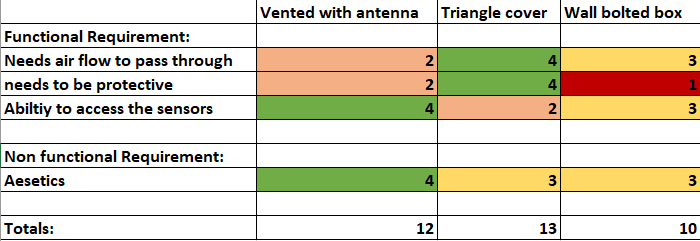
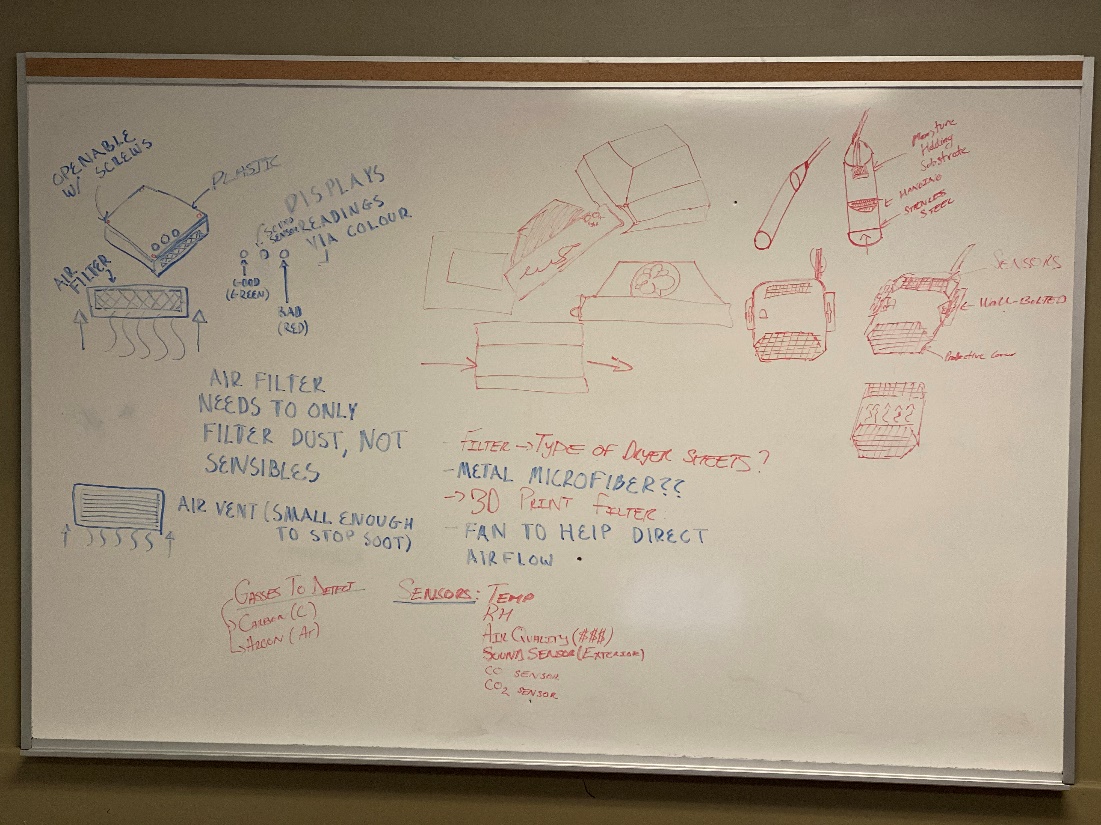
***INTRODUCTION***

***Group 20***

For this deliverable, our team had to bring several ideas/concepts to the meeting. From these various concepts, the team narrowed down the ideas from these concepts to three fully functionally solutions. The team pitched the final ideas on the whiteboard pictured below and continued to build upon them. To evaluate the options, we utilized a selection matrix and attached it below. Then following the concept choosing the team described their ideas below and then proceeded to construct one final concept from the best ideas that were pitched and discussed. The final concept was decided upon and described at the end.

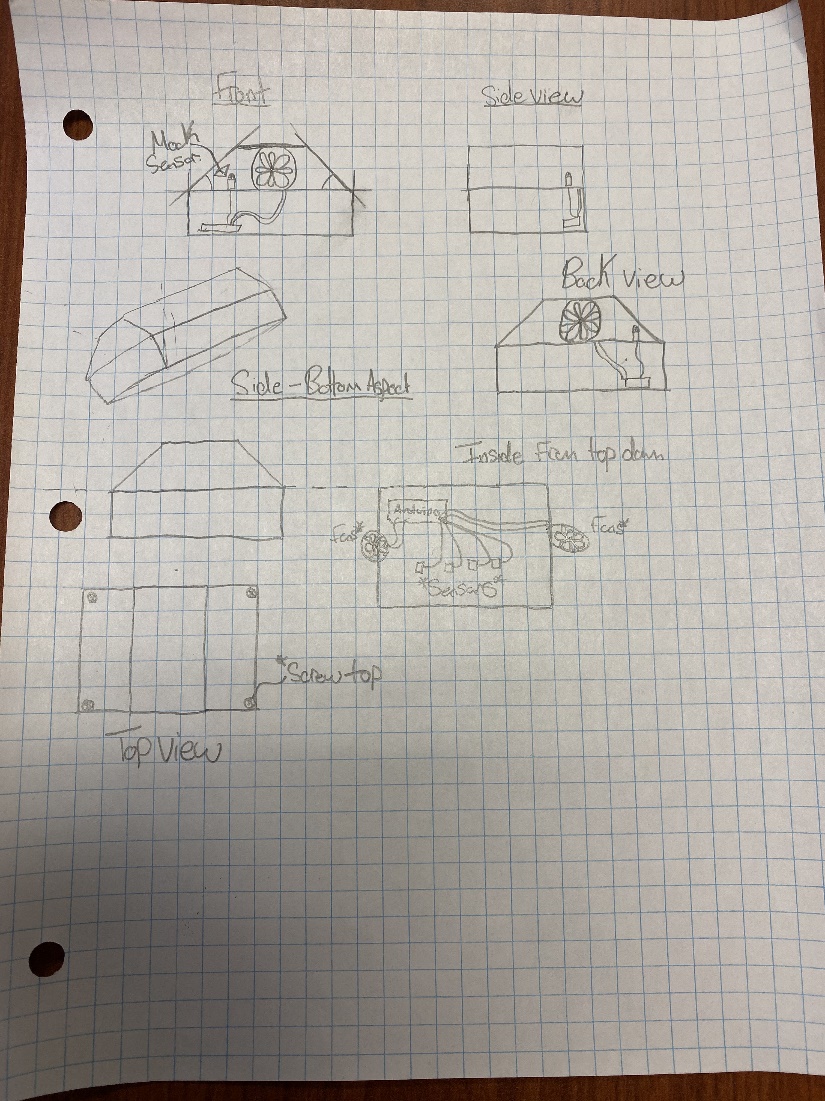




Design idea: (Center section – Eric Pitts 300108476)

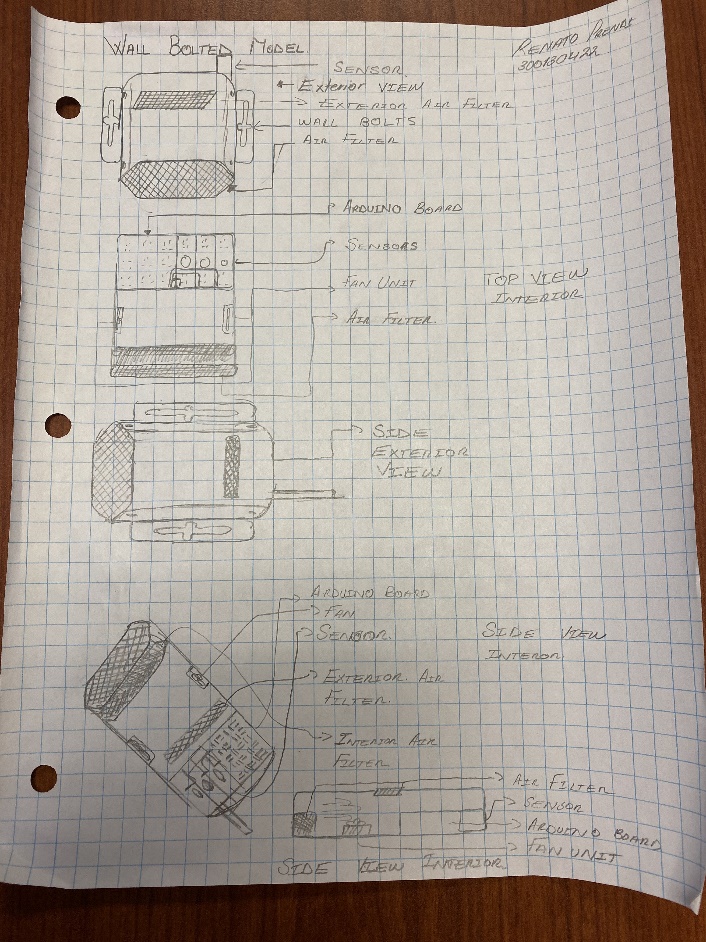
The design idea has a square box with an ‘ingot’ like open top to allow air to come into the module. The design is a holding container for all the sensors and the Arduino board, the top will have 2 fans on it to push air into the sensors for a proper reading. The box will have a power port and a light on it to show it is operational. This idea will be fecund to the wall at an appropriate height to allow for proper readings from all the sensors. This design idea will have a sound sensor on the outside of the container to allow for a readout of the noise in the room. This idea will have a WIFI enabled Arduino to allow our sensor module to send its readings to a readout using Ross Videos Dashboard.

This model is ideal for a ventilation system, it will have fans pushing and pulling the air through it, with a small ventilation system to stop the large particulate to stay away from our sensors. The top of this idea would have screws holding the top on, this way the sensors would be accessible without having to break into the box.



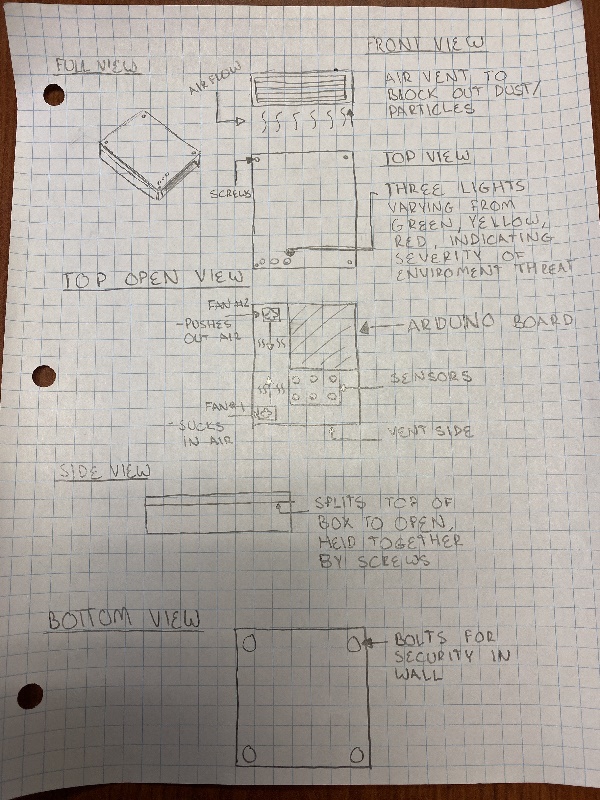
Wall Bolted Model: Renato Prendi 300130422

This model has its filtration surrounding the bottom portion of the box which then leads to all the sensors mounted inside the box. The box itself is made from plastic (3-D Printed), while it has an antenna which reads the significant measurements signaling it to its designated program (Dashboard). Information will be sent via antenna or WIFI signals with an Arduino board sensor (implemented in the model). This model is designed to be attached on the surroundings of a workplace; thus, the plastic will be sturdy. This model will be screwed on walls or workplaces making it immovable and intact. To fully open the box small screws are on the edges on the box to allow the client to do so. The space inside the model between the filtration system and the sensors will allow the air to flow with fans attached to the opposite sides of the box. The model will be powered by batteries, with a lastly longevity.



Plastic box model: Nicholas Guimond –Student #0300146682

This environment sensor will include a temperature, RH, Air Quality, Sound Sensor(potentially), CO and CO2 sensor and an Arduino board. This design will be a simple box concept made of plastic. Preferably a 3-D printed box model for mass sales. The box has a removable top which is secured to the box via screws. This way the design allows for the user to maintain the environment sensor should a problem arise. On the exterior of the box, the design includes three dots of which two will display green, yellow, red light. This display is used in tandem with the dashboard program which will also display the state of the room. The next feature of this prototype is the main attraction, an air filter or very tight air vent as to not tamper with the quality of the air or exclude any of the environment variables we are sensing for. The vent is explicitly for only allowing airflow in for the sensor to read and process, the intent is not to tamper with the proper readings. In addition to this vent there will be two fans used to move air in and out of the sensor for readings and keeping the sensors/ board clean. The model will be screwed into place from the ceiling to ensure its own safety and effectiveness. The intent of the screws and plastic being used for this model is to cut down on unnecessary weight, while also providing a fair amount of protection to the sensor. The environment sensor will be mounted to the wall with bolts to ensure its placement on the wall. This would involve drilling which may need to be approved.



FINAL CONCEPT/CONCLUSION

This concept was derived from our best features from the top three designs we decided upon. The team came together and brainstormed further to get a very strong concept. One idea that was pulled in from the three concepts was the need for fans. The idea was brought further when the team decided to use two fans in the concept, one fan to pull in air to the sensors and the other fan at the other end of the design to push the air out. This system will allow for easier airflow over the WIFI-enabled Arduino board to prevent dust from settling, while also keeping the interior of the system clean. The fans will be behind plastic vents used to keep major particles from entering the system. The sensors in our system will be placed in their own environment that will allow them to read the actual environment of the room. The exterior of the system was decided on to be a basic box style made from 3D printed plastic. One side will be a large vent which will be used to bring in air for the sensor’s environment, while keeping large particles out. The box will be openable so it will be maintainable for the user in case of any failures. The box will be attached to the wall through 3-M tape (High grade durable tape made, commercial grade tape). The team decided the environment sensor will need to attach to wall on the low side to read the gasses needed as many are dense and should fall. Furthermore, the three lights were kept on the design to indicate to the user the status of the room. This will be displayed through the color scheme green- yellow - red. Green indicating safe, yellow being moderate danger, red being the danger display. This will be correlated to the Dashboard for its final display. On the interior of the design the team also decided to place the sensors and Arduino in line with each other. This keeps the design basic and easy to understand for users when/if maintenance is needed, it allows more accessibility for powering the device through a port from the outside. This is the final concept our team has come to; it is the design will be using as we move forward from this process.

