Reflection Report on MECHTRON 4TB6

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1   Changes in Response to Feedback

1.1   SRS and Hazard Analysis

1.2   Design and Design Documentation

1.3   VnV Plan and Report

1.4   Proof of Concept Demonstration

At this point of the project, the user interface application allowed the user to connect to the device, start and stop a test, and submit the collected test data to the database.

Upon completion of the demonstration, our team received valuable feedback on how we can increase utility in stored test data from the instructor and the TA after our POC demonstration. By changing the user interface to include test description fields for the user to convey the purpose of the test session and the ability to link a picture of the test setup used to generate data, the value of the data collected increased because users have additional information to contextualize the test data collected in the past.

1.5   Revision 0 Demonstration and Testing Session with McMaster Formula Electric

After implementing the feedback from the POC demonstration, our team prepared a Revision 0 iteration of the project after spending time in design, manufacturing, and testing. The Revision 0 iteration met all required technical elements of the envisioned solution.

Upon completion of the demonstration, our team received feedback from the instructor and the TA on how we can improve the usability of the project

by optimizing elements of the user experience. In scenario's where the user must adjust the Arduino code to match a new test setup with new sensors, our team changed the interface such that the user interacts with a guided test setup interface that abstracts Arduino code generation. Whereas in the previous implementation which was challenging for the user, they were expected to directly interact with Arduino code we developed to adjust lines of code to reflect the new test setup.

1.6 Testing Sessions with McMaster Formula Electric

Soon after the Revision 0 demonstration, our team worked with the cooling system members of the McMaster Formula Electric team to gain valuable insight on additional areas of improvement. Notably at this point of the project, the implementation was identical to the Revision 0 demonstration.

Upon completion of the cooling system testing sessions with the Formula Electric team, we received feedback on how the project's portability can be improved. A main concern our team noted from a member of the cooling system was the relatively large form factor of the Revision 0 implementation. It was noted that the member found the device difficult to integrate the device into the benchtop testing setup due to its size. As a result, our team reduced the area of the PCB and the 3D printed enclosure to accommodate the need for a device with a smaller form factor.

1.7 Revision 1 Demonstration

After implementing the feedback from the Revision 0 demonstration and testing session with McMaster Formula Electric, our team prepared a Revision 1 iteration of the project after spending time in design, manufacturing, and testing. The Revision 1 iteration represents a finalized version of the project that met all required technical elements of the envisioned solution and had additional features to support user experience optimization.

Upon completion of the demonstration, our team received final comments on how we can educate McMaster Formula Electric members effectively and efficiently about our product from the instructor and the TA. By creating an educational training video on what typical device and user interface operation looks like, members of the McMaster Formula Electric team can quickly integrate our project into their workflows.