Department of Electronic and Telecommunication Engineering

University of Moratuwa

Preliminary Design Report

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This report is submitted as a partial fulfillment of the module

EN2160 – Electronic Design Realization

16th of June 2023

Content

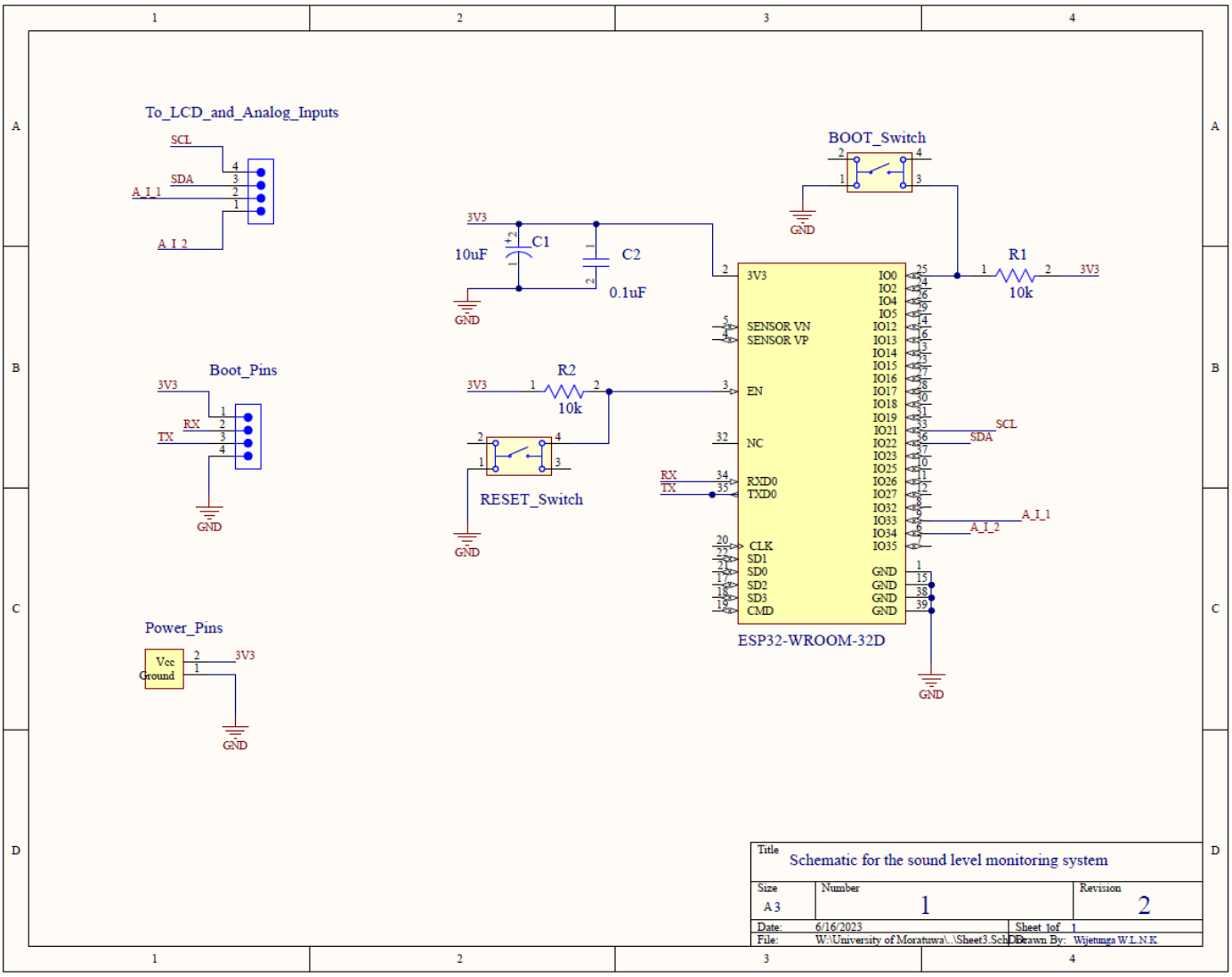
1. Introduction

- During the preliminary design phase, designers typically create sketches, diagrams, or computer-aided design (CAD) models to visualize and communicate their ideas.
- They consider factors such as performance requirements, user needs, technical feasibility, budget constraints, and safety considerations.
- The goal is to establish a solid foundation for the subsequent detailed design phase by evaluating different design alternatives, identifying potential issues, and refining the overall design concept.

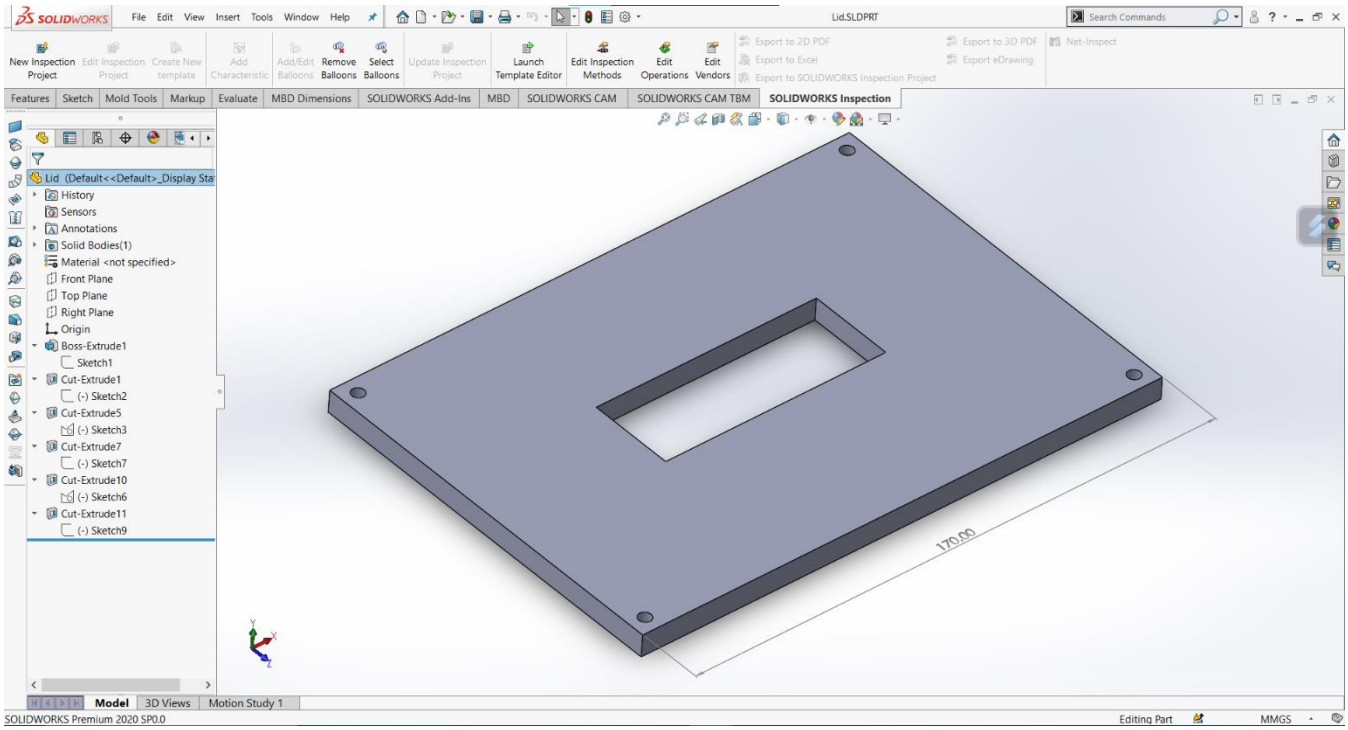
2. Implemented Design

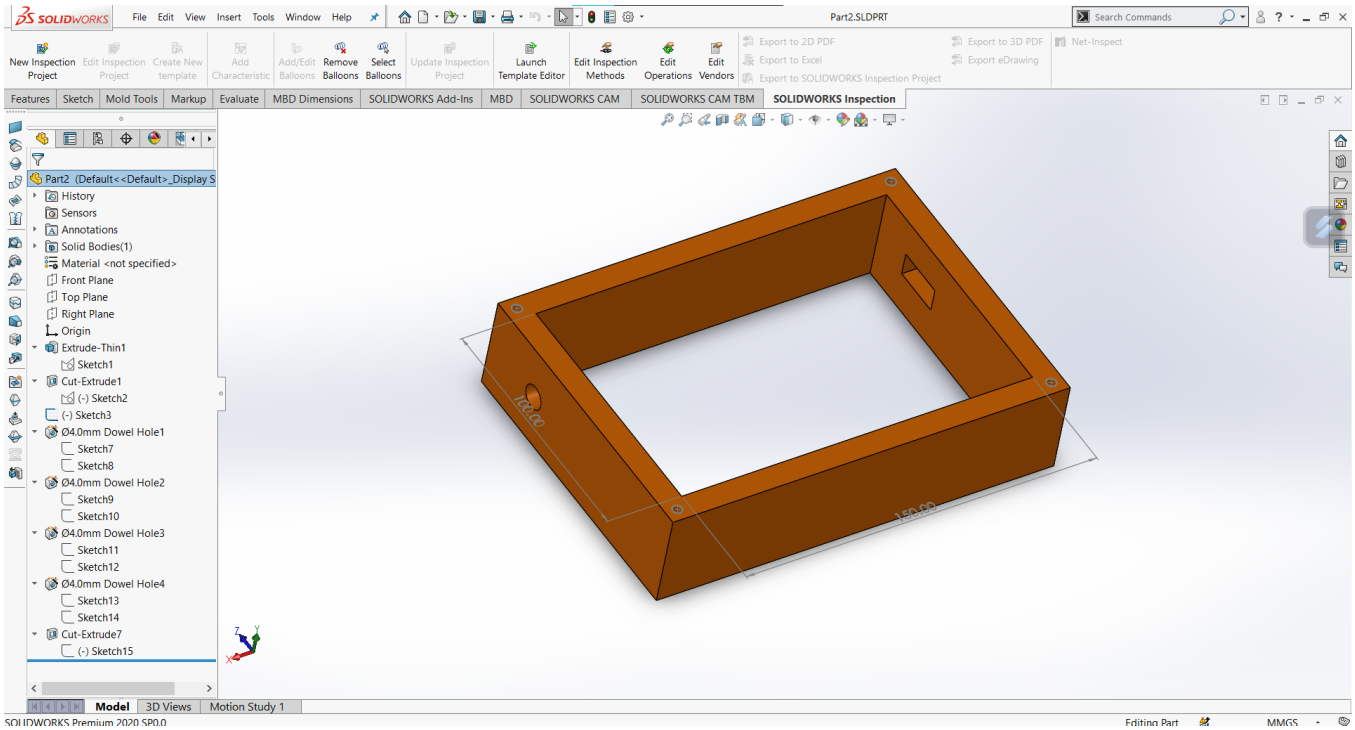
- The schematic and the SOLIDWORKS design of the implemented design are as follows.

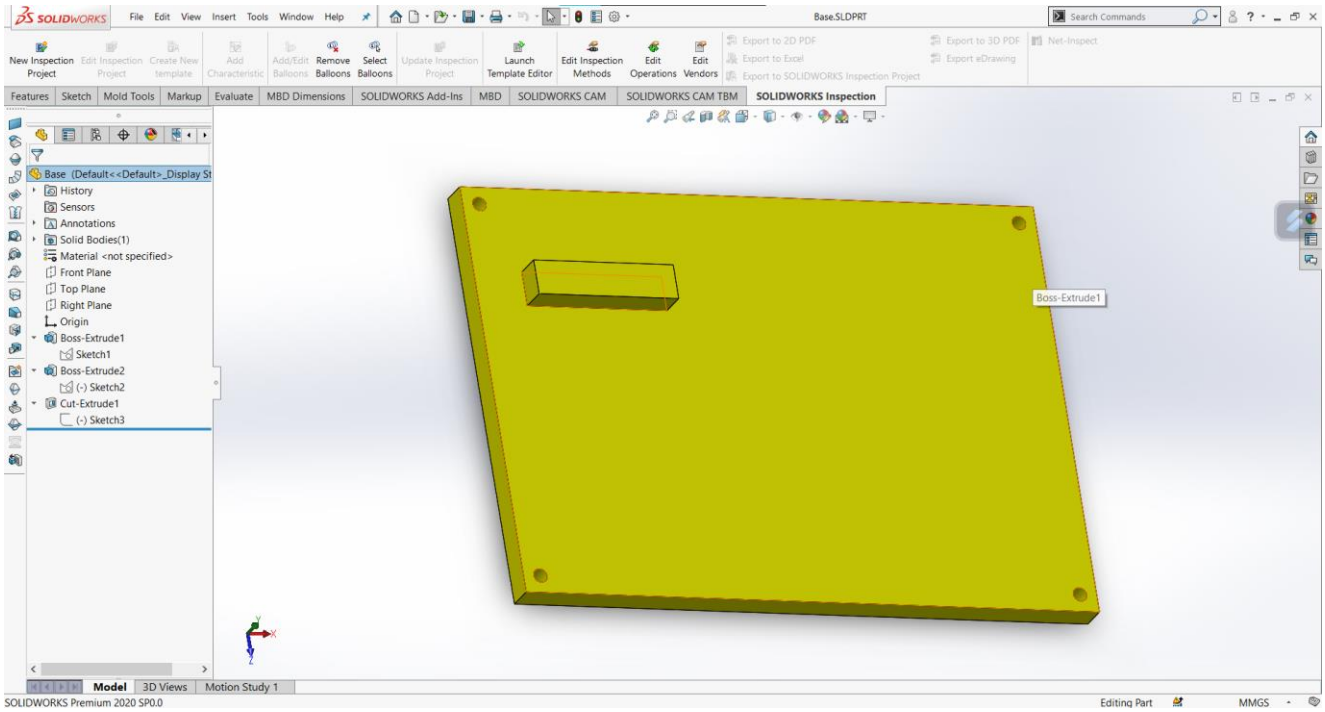
i. Schematic of the Implemented Design



ii. SOLIDWORKS Design of the Implemented Design



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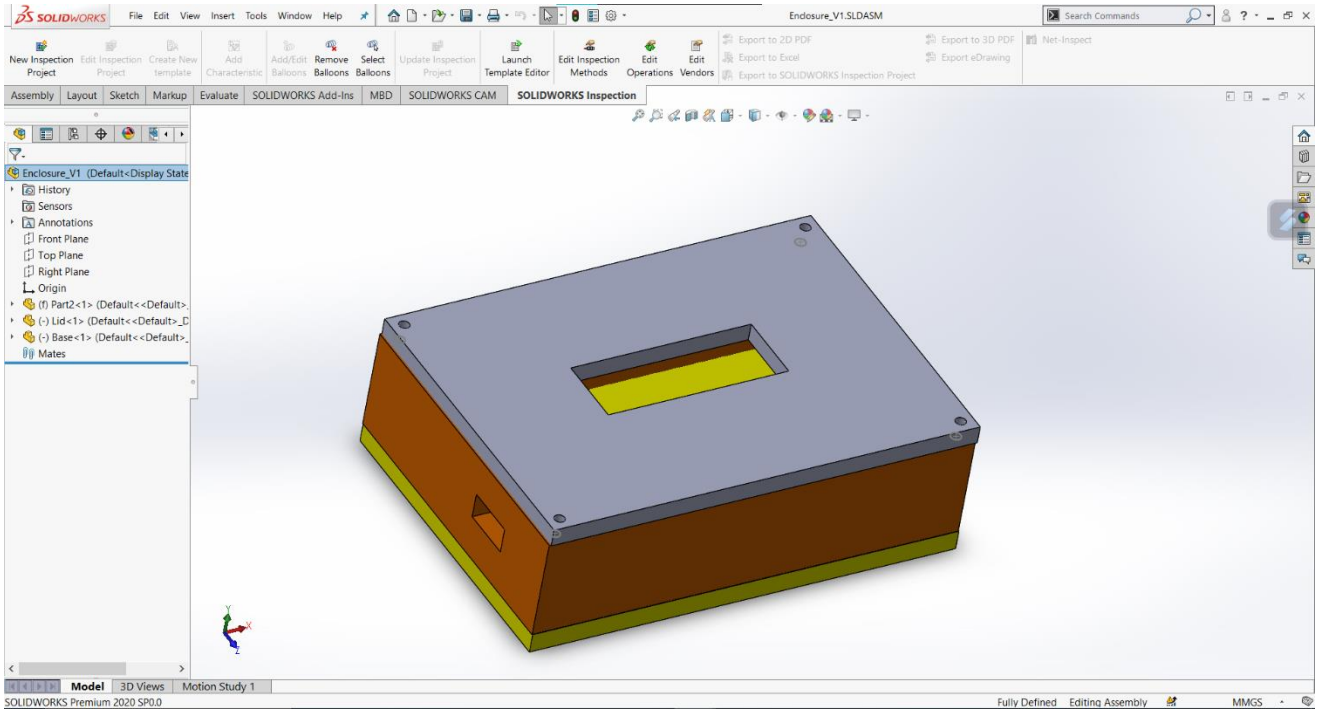
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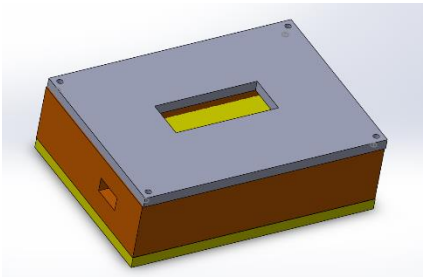
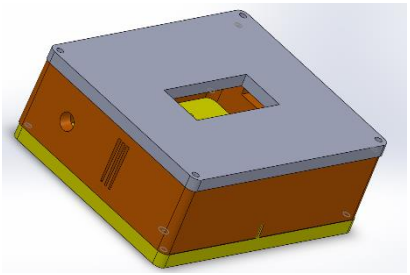
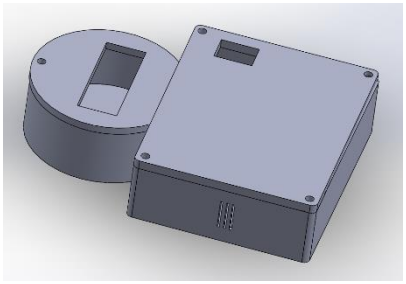
3. Problems and Improvements



1st Iteration



2nd Iteration



Improved Design

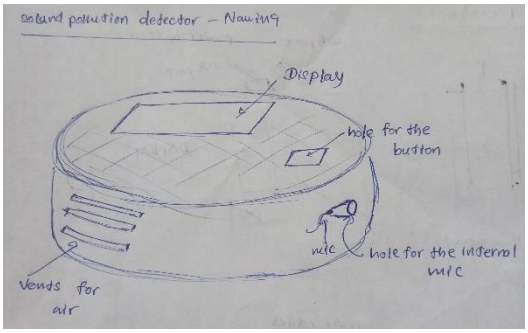
i. Problems identified by you considering the course contend delivered by Prof. Jayasinghe

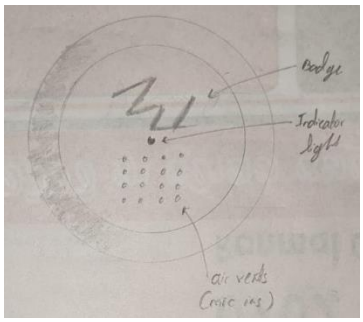
- The first iteration of the enclosure design of the product had a simple box shaped design.
- Considering the course content covered, it was clear that the design was highly unattractive and does not have an aesthetic view.
- Afterwards it was redesigned by adding curves and fillets to make it more attractive and appealing.

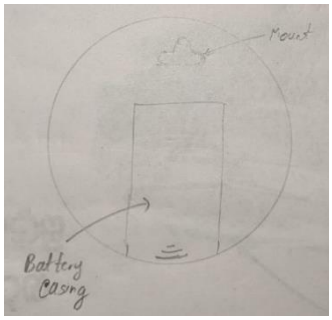
- The first iteration of the product did not have any draft angle, so it was not mouldable.
- With reference to the course content covered, draft analysis was done to all the parts and made everything mouldable.

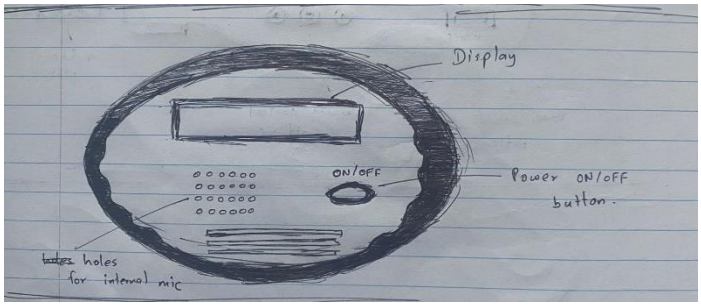
ii. Problems/Improvements identified/proposed by members of the group.

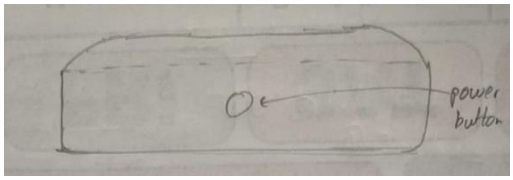
- From the group members, it was recommended to change the appearance of the product just like in the course content and several sketches were drawn (As conceptual designs) to get an idea on an attractive and appealing appearance for the product.











- The idea of adding **Bluetooth connection** to the device in addition to the Wi-Fi connectivity was suggested by one pf the group members. The justification for this was sometimes it is easy to use and implement Bluetooth connectivity rather than using Wi-Fi specially in a smaller physical area.

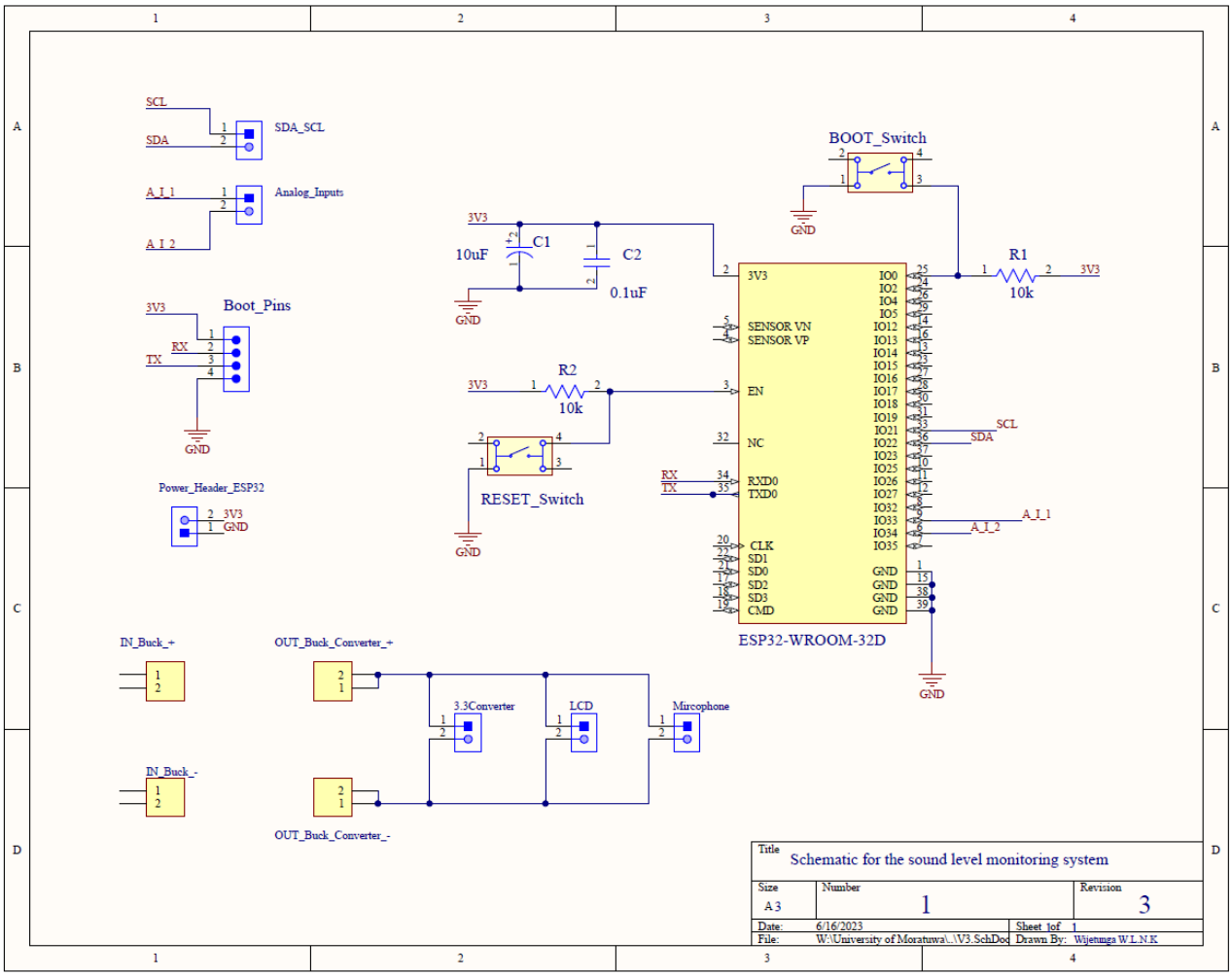
- Upon analysing the PCB, the group members suggested to design the PCB such that the power supply modules are placed inside the PCB. The justification they gave was that by doing so, the space can be saved inside the enclosure and the number of wires used can be reduced.

iii. Problems/Improvements identified/proposed by users.

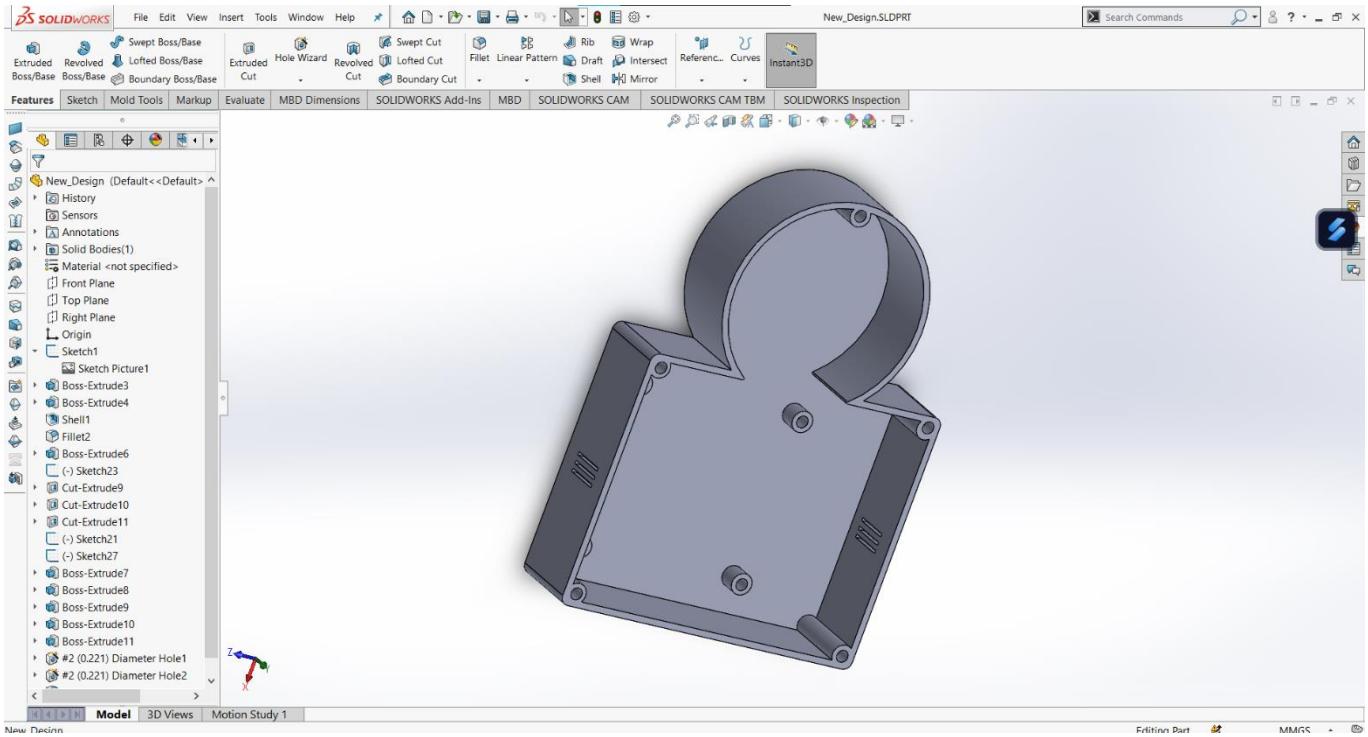
- The users were pleased when they heard that the device can be used as an IOT device.
- It was highly recommended by the users to include a way to connect to the device via Bluetooth just like the colleges suggested.
- It was recommended to improve on the design of the product which they found unattractive.

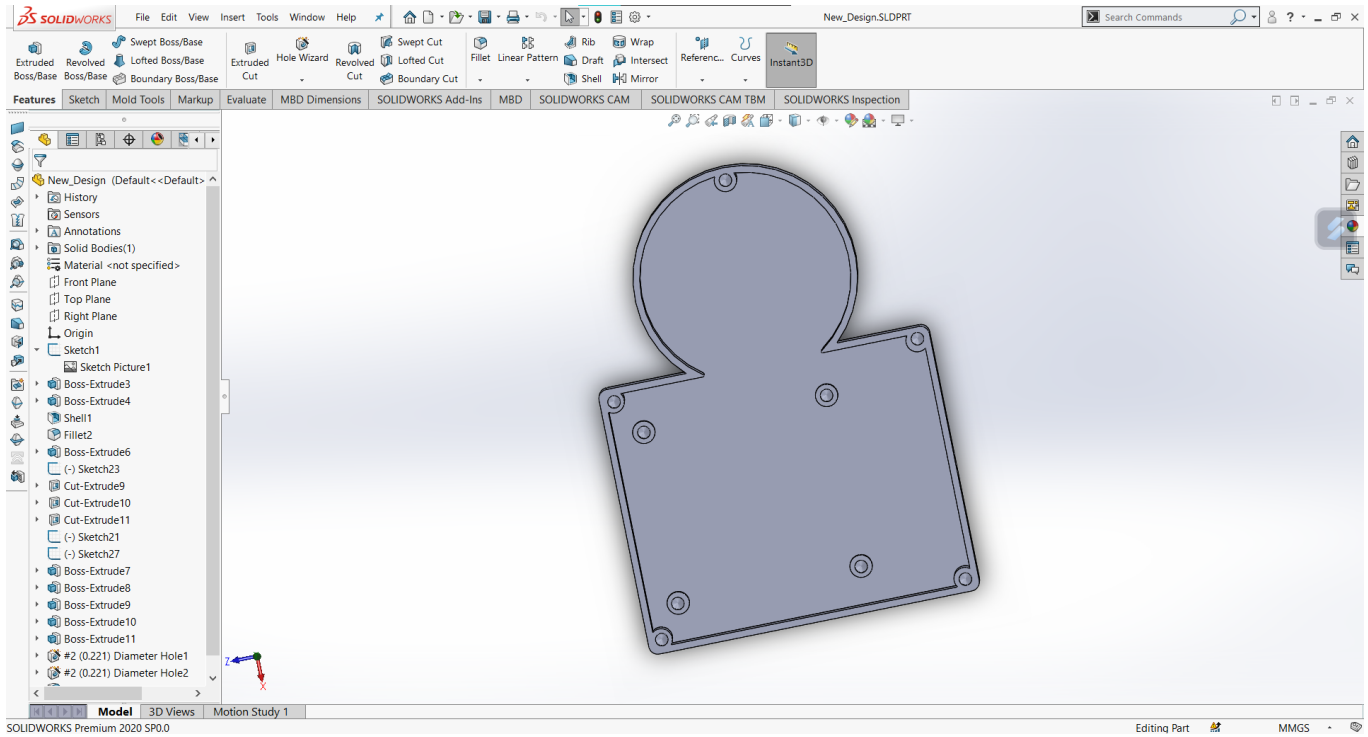
4. Improved Design

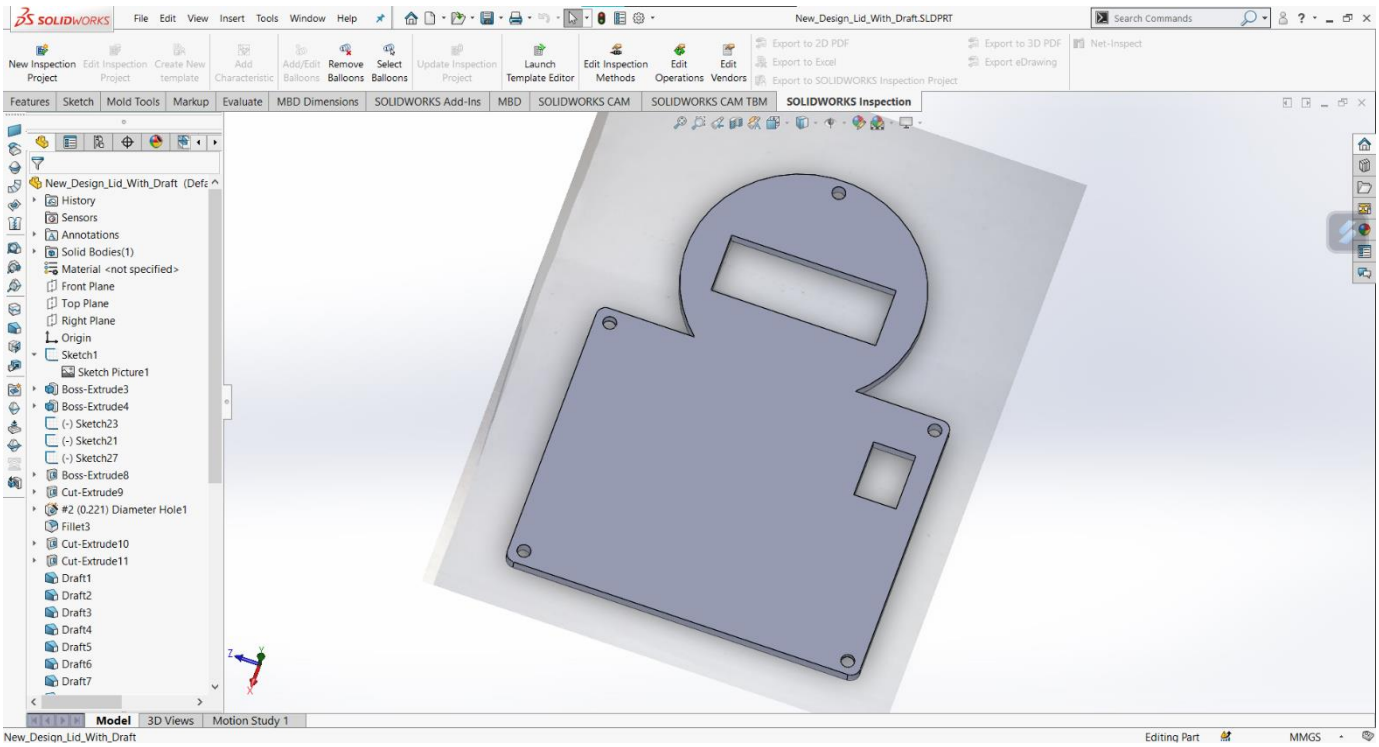
a. Schematic of the improved design



b. SOLIDWORKS Design of the improved design



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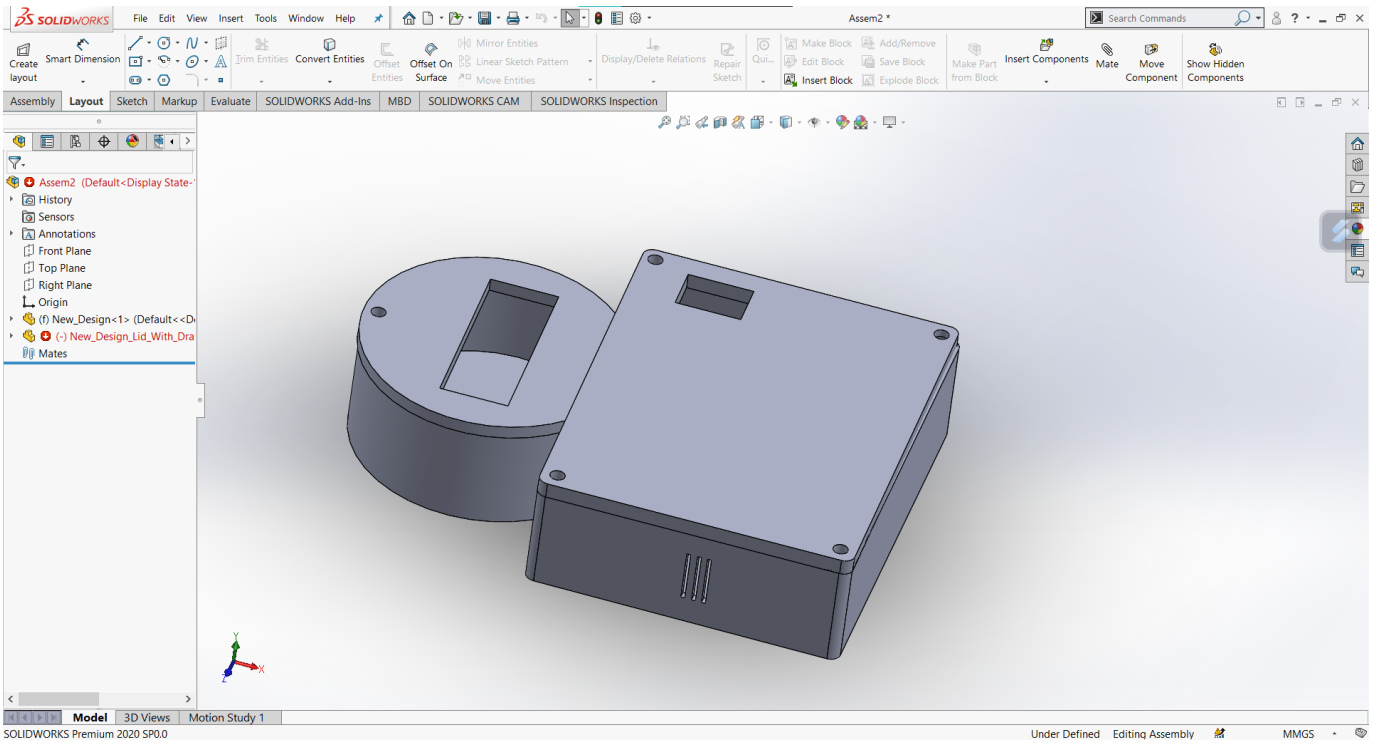
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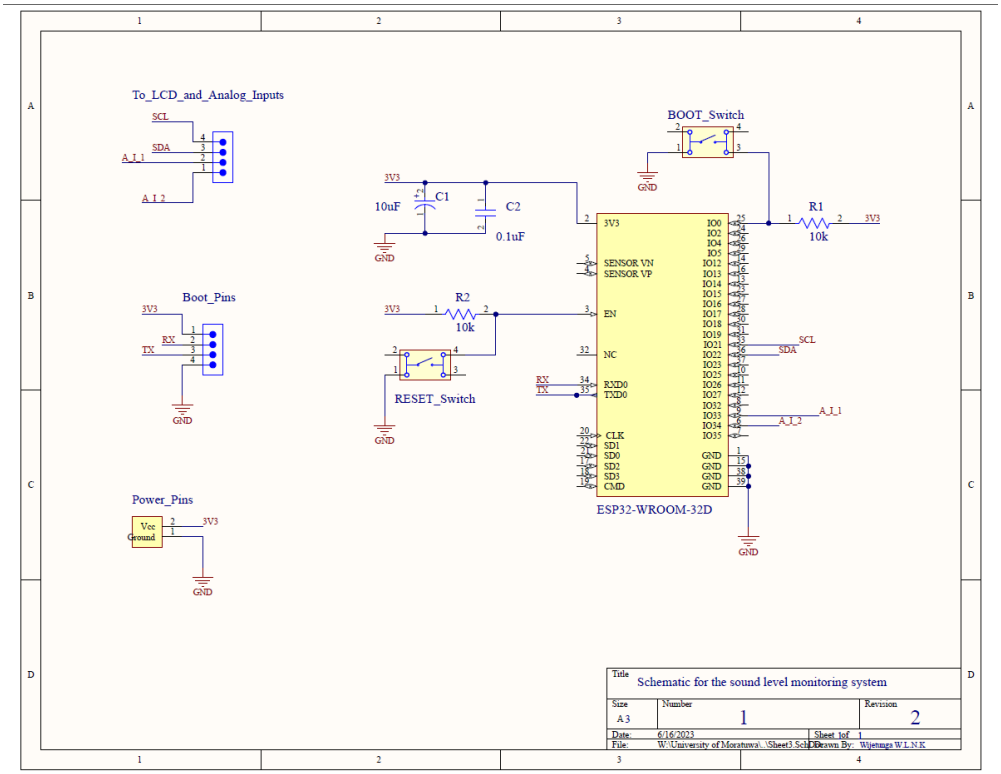
5. Side by Side Comparison of the Designs

I. Schematic



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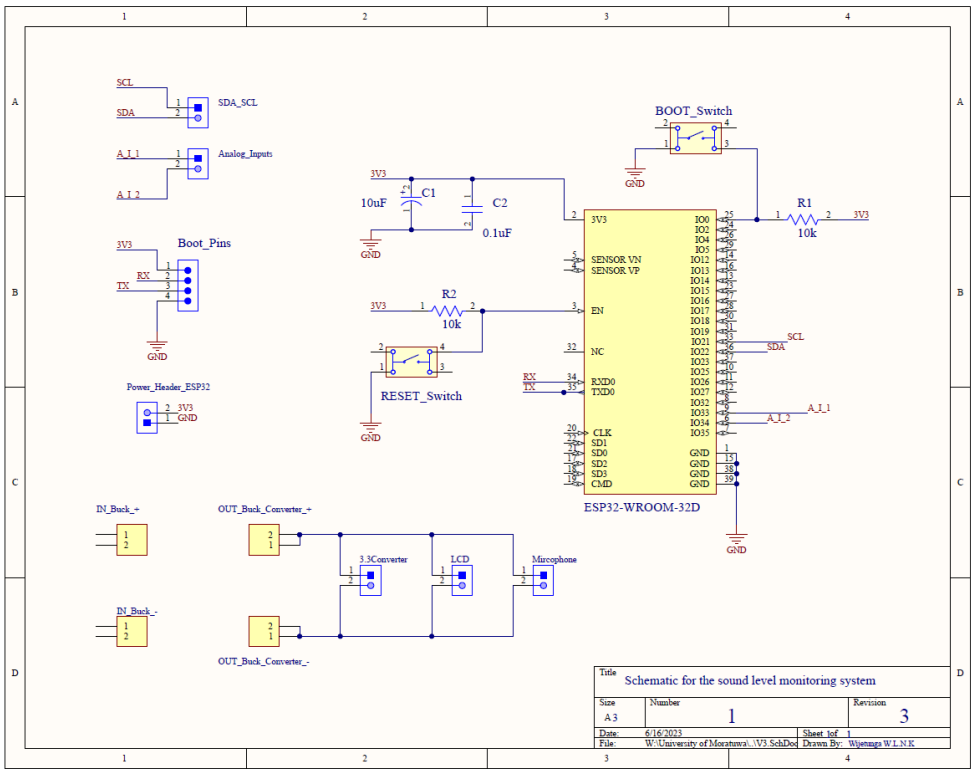

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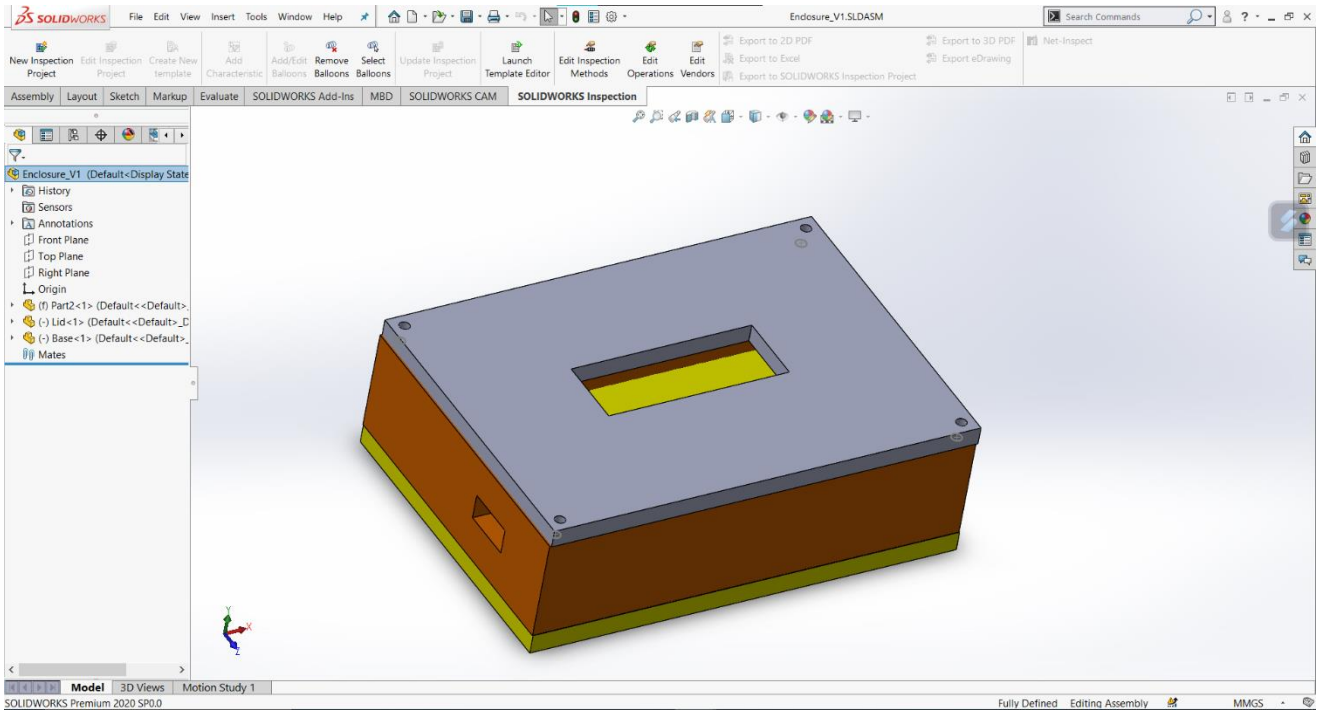
II. SOLIDWORKS Design



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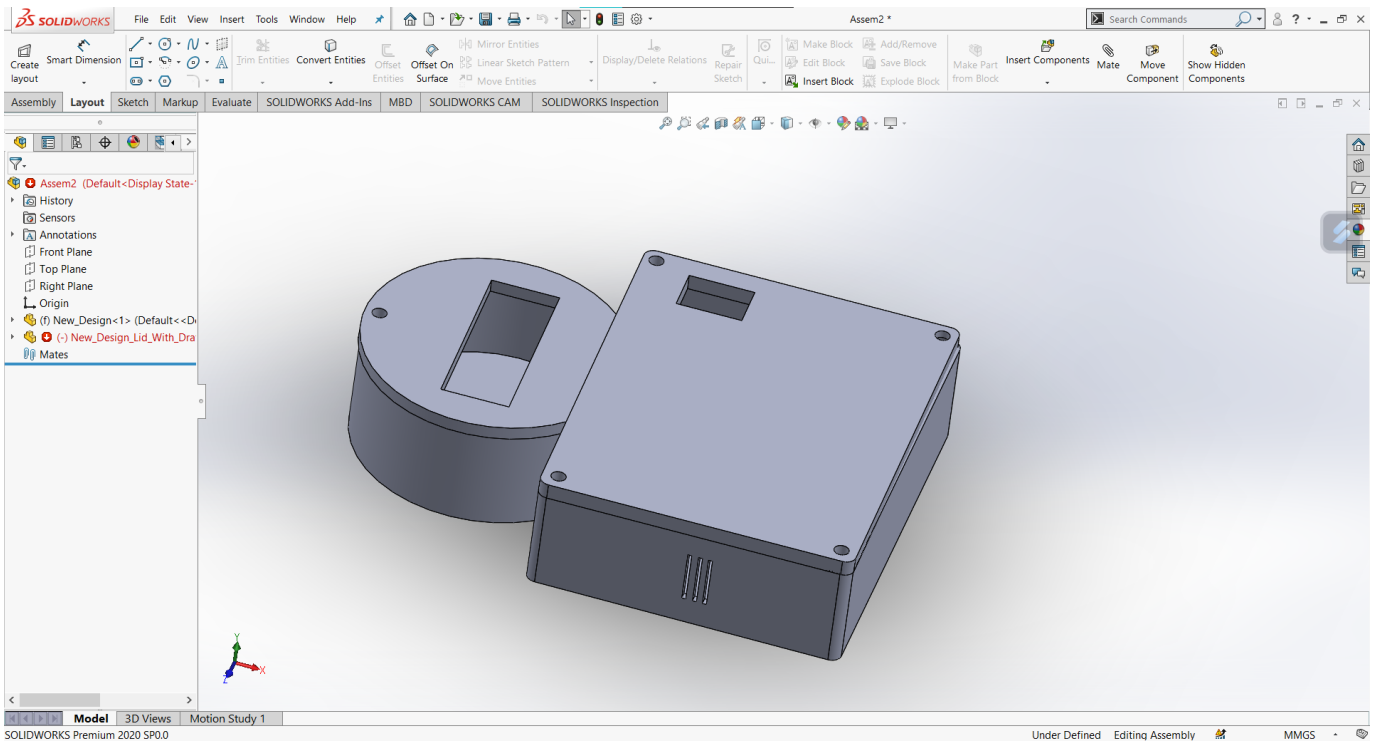

Improved

References

[1] Engineering Design Centre, Department of Engineering, University of Cambridge, “Inclusive Design Toolkit,” [Online]. Available: http://www.inclusivedesigntoolkit.com/GS_overview/overview.html. [Accessed 3 6 2023].