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Supply Activity Logger Executive Project Summary

Purpose:

To produce the hardware and software components to monitor the conditions a shipment is subjected to, in order to give suppliers insight to prevent future product damage.

Audience:

The primary stakeholders and audience for this product would be employees of HP. This finished product should provide an easy and efficient way to monitor the shipping conditions of packages shipped to and from HP. This will aid in positive customer relations, quality control, and minimizing product losses/damages

Background Information:

HP and other companies have experienced numerous occurrences of unexplained product damage during shipment. Inspection of the damaged merchandise often does not explain what happened. There is an interest to solve this problem in order to find ways to prevent needless damage. In order to solve this conundrum, there needs to be a way to record what conditions a supply is subjected to during transit. This can be accomplished with a device that can record raw orientation, vibration, impact, temperature, humidity, and location data. This raw data will need to be stored, processed, and displayed in a user friendly environment.

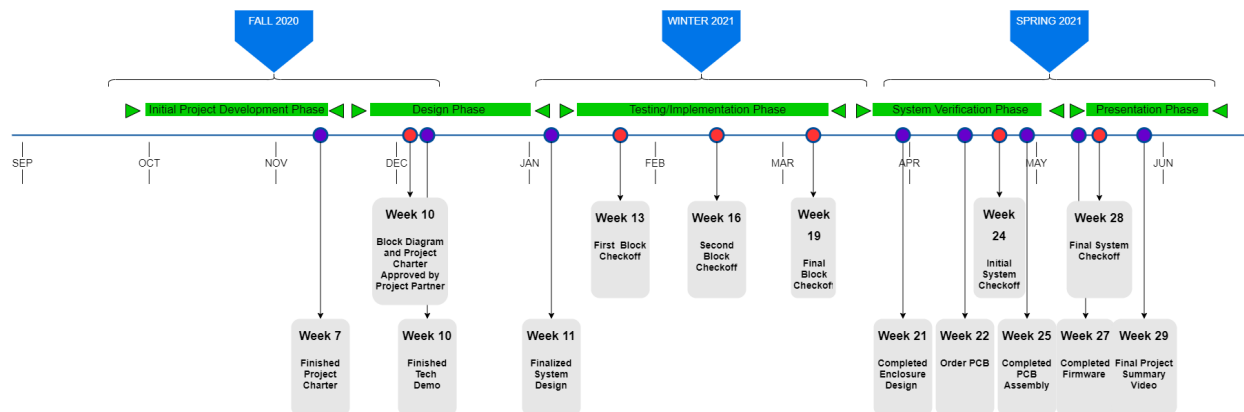
Development Process/Management:

The project will be carried out by the development team in tandem with the Project Partner. The development team will be split into subgroups: one hardware (ECE) team and one software (CS) team. The subgroups will work closely together for the duration of the project. The design process will take place over the course of Fall term. Once the designs are fleshed out, implementation and further testing will be continued during Winter term. During the beginning of Spring term, the project will undergo final validation required before the product is finalized. Over the entire course of development, communication between the development team and the Project Partner will occur in regular intervals. The project partner will assist the development team in any technical, manufacturing, and/or testing cases in addition to providing overall guidance on the project.

Results:

The final results of this project will give insight to HP as to why their packages are getting damaged throughout the supply chain. If significant evidence is found from our project that packages are damaged at certain points, then HP can use this information to reduce the number of damaged packages. If HP is able to reduce the number of damaged packages then there will be a positive reaction from consumers.

Timeline:



Key Lessons:

This project wasn't perfect or as successful as we would have hoped, but it is certainly not without its lessons. Notable challenges included unifying the programming library support and communication protocol between the sensors and the microcontroller, and achieving the prescribed low power state that we calculated on paper.

For future projects, support between components should be verified early, and said components should be secured as soon as possible so that supply shortages don't force component substitution, which can cause incompatibilities. In our case, this is precisely what happened: waiting too long to buy components forced us to make substitutions. Though these shouldn't have impacted the final design state in a perfect world, minor incompatibilities added up, and led to major issues when programming the board.

In terms of Key lessons, our team learned that planning and prototyping early are not to be discounted, since a full system mockup will quickly reveal any issues with the design. We also learned to not accept major design changes from the client late in the project's life cycle, as it will reduce time needed for testing and debugging.