Smart Band

by

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1 Introduction/Background

This document gives a summary overview on the current project status as well as a, schedule overview, expenditures, and possible remediation. The engineers at Smart Trak Solutions is working on building a prototype device, the Smart Band, which is an intelligent wearable wristband. Smart Band is designed to be used with the user's smart phone and will act as a personal safety device. Capable of detecting emergency event, Smart Band is an ideal secondary response emergency device. The user can customize the mobile application and can send notifications to the user's emergency contacts should an emergency event occurs.

2 Schedule Overview

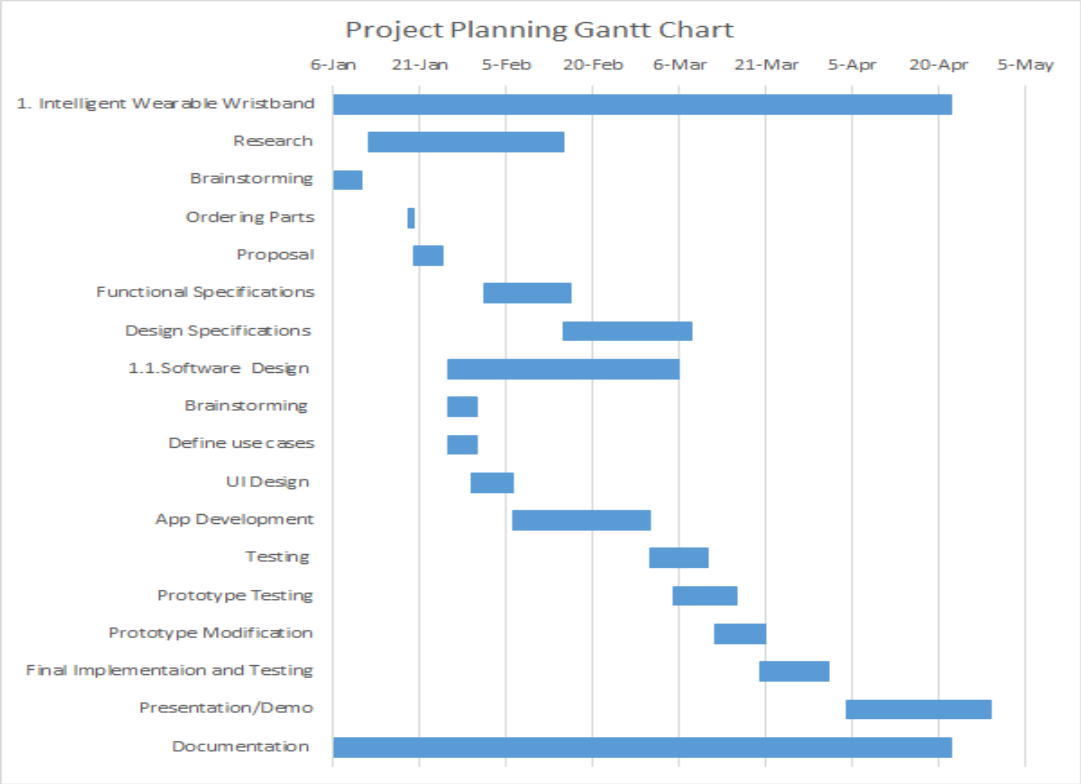

Figure 1. Originally proposed schedule

The project has deviated significantly from the original schedule found in our proposal due to an issue with ordering parts from our original supplier. Fortunately, the original schedule was quite ambitious and allocated a substantial amount of time for testing. The UI Design should have been completed by February 7th, however this was only accomplished last week. App Development and testing, which are currently underway, should've been completed by March 1st and March 8th respectively. Fortunately, Prototype Testing and Modification, which were processes that were included in the original schedule aren't necessary as we are using a smart wearable that is already built and commercially ready for our implementation. Prototype Testing and Modification should have been completed by March 21st and was instead used for UI and App Development. Final Implementation and Testing was to take place from March 20th to April 3rd, we have decided to use this time for developing, implementing and testing our fall detection application. Since our demonstration isn't until April 8th, we have an additional 5 days to implement and test our software.

3 Financial Overview

Item	*Price*
Angel sensor	$348.25
Microsoft band 2	$559.98
Subtotal	$908.23
ESSEF Funding	-$315
Total Cost	**$593.23**

Table 1. Current financial expenditure

Smart Trak Solutions has received a total of $315 from the ESSEF for our capstone project. So far we are over budget and the extra funding has been provided by one of our group member. Due to manufacturing delays, the original vendor could not deliver their product on time, thus we have decided to find alternative solutions given our time constraint. Currently we have decided to move development onto the Microsoft band 2 and thus we have purchased two additional bands for development purposes. Once the testing phase is complete and the refund has been finalized, we expect our final cost to be $279.99.

4 Progress Overview

Members of Smart Trak Solutions have been meeting and discussing regularly to update one another on our progress and collaborate on project documentation and software development. Fortunately, no fabrication is needed as we have opted to use a prebuilt band to implement our software onto. A Microsoft Band 2 has been selected and acquired for Smart Trak Solutions to develop on. Currently, a working Android application based off of Microsoft's Band 2 SDK has been created. After extensive research for a sufficiently reliable wrist mounted fall detection algorithm, we have decided to use a method developed by researchers from the Swiss Federal Institute of Technology [1]. Given the experimental data and threshold values determined by the researchers, we have designed a pseudocode algorithm that is to be transferred into Java and integrated into the current application we have developed. The graphical user interface for the app has been developed first and there is a basic function for collecting acceleration data along the X, Y and Z axis. We plan to use this application over the following week to collect experimental data in order to determine numerical thresholds for various falling orientations. These experimental values, determined by us, are to be used if the threshold values obtained from Swiss researchers are insufficient for our hardware.

5 Remediation

The project is behind schedule, however due to our omission of building and designing hardware, the only steps left are to convert the current pseudocode into Java for the existing application and test. If all members collectively work together on these tasks over the next week and a half, a working demonstration should be possible. Original plans for having software on the wearable to display additional information has been postponed and may be omitted if not enough time is available. The main focus right now is to get the fall detection and emergency alert functions working on the mobile phone application. Many issues can arise from the final software implementation and extensive debugging and tweaking may be needed to ensure that a sufficiently accurate and usable device is created. Should any unforeseen problems arise, our members are willing to dedicate an extra 10-15 hours, on top of the current workload, over the next 11 days.

6 Summary/Conclusion

In closing, the development of Smart Band is currently behind schedule and slightly over budget. Once the development phase is complete, the final budget will conform to our original expected cost expenditure. The remaining 2 weeks will be spent finalizing the fall detection algorithm and the accompanying mobile application. The engineers at Smart Trak Solutions is determined to deliver a functional prototype by April 8th 2016.

References

[1] https://pdfs.semanticscholar.org/a02b/dbc0efa6e00dc5baad716eef4cf06cad0f24.pdf