Sociotechnical Synthesis

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By

Hieu Le

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

Signed: _____Hieu M. Le_____ Date: ____11/22/2020____

Hieu Le

Approved: _____Date:_____

Dr. Richard Jacques, Professor of STS, Department of Engineering and Society

Level I Requirements

Introduction:

My technical project is about designing a portable, low-cost, durable, solar-powered fan to be used primarily in developing countries. We created this product to be affordable, to withstand everyday use, to be easy to repair and maintain, and most importantly, to provide cold air to those around it efficiently. We designed it primarily for outdoor use and is intended to provide simultaneous charging and cooling, where cooling is defined as the redistribution of air directly and autonomously induced by the fan.

The capstone project was a success. The project came together nicely, and it worked in the end. However, there was an unease feeling and a deep disappointment that I couldn't shake it off, "No one would buy this product. It's so impractical," I told myself. But why? We designed it to be easy-to-use, highly durable, and, most importantly, practical. So what went wrong during the design process? I set out to look into what factors make a design useful and ethical. My STS research project on the technical topic is about the design process. There are three main topics I want to go into detail about what a good engineering design process looks like, the idea of becoming an engineer-sociologists, and non-users matters.

Separate Concise Summaries of the Two Projects:

My thesis's technical portion produced a solar power fan. Solar-Powered Electronic Cooling In Any Location, or The S.P.E.C.I.A.L Project, is a portable, low-cost, durable, solar-powered fan to be used primarily in developing countries. The project touches on many aspects of engineering, from research to design to testing and debugging. The other options on

the market are either too high priced, with several unnecessary features that drive the cost upwards, or so inexpensive that there is no durability, and the product isn't worth repairing when it inevitably breaks. The affordable models are also designed such that the fan cannot be on while the solar panel is charging the battery, and the battery cannot be charging while the fan is on. The product we designed only provides feature aspects required to provide cold air without regular means of electricity. It allows our product to be more affordable than the majority of the quality, solar-powered fans on the market

In my STS research, I found that an adequate engineering design process should include defining the problem, gathering pertinent information, generating multiple solutions, analyze and select a solution, test and implement the solution. My research also covers the idea of engineer-sociologist and non-users. An engineer-sociologist is accountable for his/her creation and how it affects society. The design process must include non-users because they have their effect and be affected by design. It is ethical to learn and be aware of what our system could affect someone, even those who have never used it.

Conclusion

I believe the two projects complement each other nicely. I learned a tremendous amount both on engineering technical and ethical sides of them. In some way, I wish I could've learned about the STS concepts before or during the time I was doing my technical project. However, I am grateful to know about it and enrich my future designs to be more adequate and ethical. A system should be efficient and market-ready, but also, it has to be socially proper and well thought out about who might get affected by it.

Acknowledgments

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I also like to thank Professor Toluwalogo Odumosu for introducing me to the Science Technology and Society concept. It has opened many doors for me, especially when it comes to how to design ethically. I learned that I could not just think in a narrow path in engineering; I have to broaden my mindset and put more thoughts into who might be benefiting from and negatively affected by my creations.

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