The Mottier Innovation Challenge in Systems Engineering

Submission 6

1. Project Title
IOT Dishwasher

2. Please list team members, denoting department and undergraduate/graduate student
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3. Please list contact information for the team (email, phone number)
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4. What are you trying to do? Articulate your objectives using absolutely no jargon.
Our team's objective is to design a dishwasher that can be activated via voice command through the use of an app, wireless speaker (Amazon Echo Dot), and an AI voice assistant (Amazon Alexa). This intuitive, hands off approach will allow consumers to seamlessly move to their next task. More importantly, we want to take advantage of the fact that the price of power fluctuates throughout the day. Therefore, we want to predict the future price of power in order to activate the dishwasher at an optimal time to save the consumer on the operation cost of the dishwasher.

5. How is it done today, and what are the limits of current practice?
While certain high end Wi-Fi enabled household appliances do exist they are still far from being ubiquitous in every household. In addition, the concept of IoT technology is still in its infancy and still gaining traction as a growing market. One limit on the current practice is the internet data cap. An appliance constantly connected to the internet will consume a large amount of a data plan. In addition the voice command feature of the dishwasher will not be able to operate in a household that has no access to the internet. In addition, compared to the Wi-Fi enabled dishwasher by General Electric does not have the capability to calculate the optimal time to start the rinse cycle of the dishwasher.

6. What's new in your approach and why do you think it will be successful?
Our dishwasher will be successful due to its innovative capabilities to activate whenever the user wants, but it will also calculate the best time to activate the rinse cycle and allow the consumer to save on daily operating costs.

7. Who cares? If you're successful, what difference will it make? What are the risks and the payoffs?
Everyone will care about the capabilities that this new generation of appliances will bring to the average American household. If our project is successful in its capability to be mass produced as well as being a commercially successful product; the benefits it would have would be numerous. Individually, people would save money on their power bills by operating their dishwasher when the price of power is at the most optimal. From a much larger perspective, our concept of a smart dishwasher would play a great role by reducing the stress on the power grid by activating appliance during non-peak hours of power usage. The success of our project would be a proof of the IoT concept that could lead to a chain reaction towards a development of a much wider variety of Wi-Fi enabled appliances that would also include: washers, driers, heating and A/C units. One of the risks is that our appliance may not sell well with the public and end up seen as a commercial failure. However, the payoffs

are too numerous to not pursue this project because it can go as far as revolutionizing how people interact with their daily household appliances in the future.

8. How much will it cost? How long will it take? What are the midterm and final "exams" to check for success?
A single, portable smart dishwasher could cost as little as $300. Our project may take as much as a month or two until it is completed. The "exams" to check for success would be to check if the hardware, code, and result all align by creating test cases to ensure the objective has been met.