Aaron Loichle Homework 2

Engineering Design 6 Due: February 4, 2013

Wi-Fi Plant Sensor

The proposed product is a Wi-Fi enabled plant moisture sensor. The product would be placed into an indoor potted plant, and sense the moisture level of the soil in the pot. The product could be programed for a certain moisture threshold, and when the soil moisture falls below the preset threshold an LED would begin to blink, and the product would send an email to the user via and embedded Wi-Fi connection. Additional, features could include soil PH reading, and hours of sunlight incident on the plant per day. Using these figures one could perform statistical analysis of the growing conditions to issue and health report of the plant. This report could then be sent to a user's inbox or accessed through a mobile device app.

The potential Impact of the produced would be largely to engage users further into their hobby. Interested parties would be anyone who is growing plants and wants access expert help, or reliable metrics on the health of their plants.

It is difficult to gauge the population size of plant owners, but we can show that there is market demand because a similar product was released in Switzerland last year. A company named Koubachi released a Wi-Fi plant sensor last June. According to their blog Apple began to carry the product in its European stores only six months later (Kurmann). Now the product is carried on Apple's US website ("Apple Store…"), and the Koubachi sensor won a Reddot design award this year.

We can further prove that there is market demand because a company named Bitponics raised $23,662 through a Kickstarter campaign in June of 2012(Kumar). The product Bitponics designed was

personal growing assistant, which logged relevant growing information in hydroponic gardens, and transmitted the information to a site where users could share data results. The Bitpoincs project focused on hydroponic plants, so I believe there is rooms to do another Kickstarter complain to fund a soil-based product.

After researching the idea it is surprising to see how many other plant sensors have been developed recently. The most serious competition is from a product called the Parrot Flower Power, which was featured at the CES this year. The Parrot Flower Power won the CES 2013: Hot Stuff Award ("Parrot…"). The Parrot Flower Power is well designed and implemented. To compete with this product we would have to over deliver features of a new product, or undercut the price.

Although several plant sensors have been developed in the past two years I believe there is room in the marked for another product. Bitponics successful Kickstarted campaign shows that there is money available for the development of this type of product. Apple carrying Koubachi's sensor so quickly shows that there is a market, and the awards given to the Koubachi, and Parrot sensor show that there is interest in this type of product. Perhaps that best way to market a new product would be to combine a sensor with automated watering, and artificial light into one standalone product which could be sold as a complimentary product as opposed to a competing product.

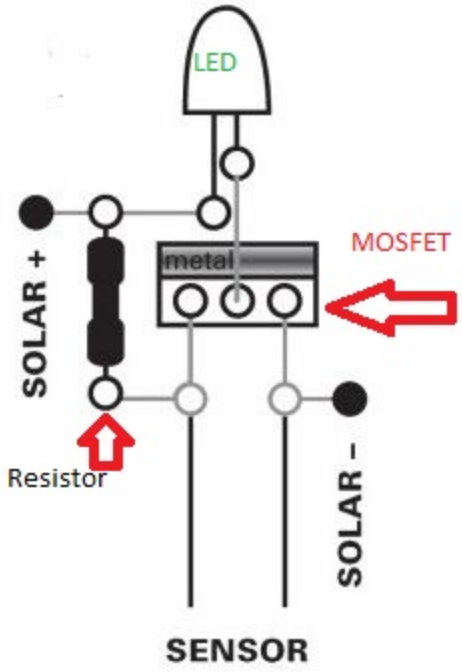
We can analyze the feasibility of a WiFi enabled plant sensor by looking at the idea from the perspective of the three main stakeholders: the user; the client; and the designer.

From the perspective of the **client** the main drawback of the product is that we are looking at a two year time table to see a finished product. This is not beneficial because we will lose market share because we will not be the first product to market. However, the product will benefit from the good press and awards won by current proposed plant sensors. The current generation of plant sensors will

build awareness of the product, and if we can offer our product at a competitive price, or better aesthetic design it is possible to be competitive with the first release of plant sensors. Also, we will have time to see if customers gravitate to Bluetooth enabled sensors, or Wi-Fi enabled sensors, and adapt our product accordingly.

From the perspective from the **user** we hope to offer a smaller better designed Wi-Fi plant sensor. Neither of the current plant sensors proposed for market has a contemporary look. The Parrot Flower Power Bluetooth sensor is modeled to look like a twig, and the Koubachi Wi-Fi plant sensor looks like the head of a golf club. There is a hole in the market for a user that cares as much about the form of the product as the function of the product. If we can offer a product in a brushed aluminum case with functional Wi-Fi interactive features that will be very attractive to users. Also, a large part of the novelty of the product we offer is that it can communicate with you through email, so you can be anywhere and receive updates. The Parrot Flower Power sensor uses Bluetooth, so you have to be very close to the sensor for it to communicate with you.

Finally, from the perspective of the **designer** we see that the product is attractive because there is a large possible consumer base, and having seen the successful Kickstarter campaign run by Bitponics. We see that there are independent sources of funding for similar projects. This is a major bonus because the initial design of the prototypes of the project can be funded putting us in a strong position when we go to manufacturing. Further there are rudimentary designs for plant sensors available that only require a MOSFET, and inexpensive components to assemble. Below a wire diagram or a simple sensor (“Thirsty Plant”):



The above sensor relies on relatively inexpensive parts. The most expensive part is the MOSFET which retails for under three dollars at Radio Shack. The valued added in the project comes from interfacing the sensor with a WI-FI transmitter to communicate the soil status. The product is further enhanced by enclosing it in a brushed aluminum case which is light weight and corrosion resistant.

This project has a lot of **strengths**. It can be assembled using off the self-components. All of the components for the sensor are commercially available. Based on a cursory Google search a Wi-Fi transmitter can be purchased for about $25. The only thing that has to be custom made for the project is the code, which will run on an embedded microprocessor that will have to be selected. Further, we would be able to create an iPhone app to communicate with the sensor.

There are several **weaknesses** this product faces. First and most obvious is that there are already two similar products that are on, or approaching the market now. Also, it will be two years before we can realistically have this product on the market.

Even though there are similar products currently on the market. This product offers substantial **opportunity** because we could modify the sensor from just a plant sensor into a complete growing system. We could make a planter that included automated watering and artificial light. This product would appeal to anyone would has problem with the care of their plants, or people whose plants do not do well in the winter because of reduced sunlight hours.

Threats to this product are obvious. Although this product can be assembled from off the shelf components – there are already two well designed and well-funded products on the market. We would have to compete with these products, but if we can get even a percentage of the market it could be very lucrative.

Works Cited

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