Richard Olechna

EE 449 – Computer Interfacing

Dr. Robert Spalletta

Final Project Report – Foginator

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i. Project Performance:

a. Technical Milestones:

This project consisted of specific goals to be met within a six-week span. The technical goal of this project was to troubleshoot the existing greenhouse and implement new materials to achieve a fully autonomous and adaptive greenhouse. Specifically, the greenhouse was found not operational due to faulty oxygen and carbon dioxide sensors. With this, the troubleshooting goal was partially completed. The next task was to either fix the existing sensors, or find alternative solutions. The readings from the sensors are crucial to create an optimal environment for a specific plant. The sensors installed were producing inaccurate readings that deemed impossible for a controlled situation. For example, the oxygen sensor would read 6% oxygen in an arbitrary room, whereas the normal levels for oxygen lie around 20%. Unfortunately, this was a similar case for the carbon dioxide sensor. Even with extensive research and timely variations of code and circuitry, both sensors were deemed defective. This experimenting and research delayed the project by a week. The only alternative solutions were to purchase higher quality and more expensive sensors. However, the prices would surpass the projects budget. Therefore, this milestone/goal is considered partially completed.

Another technical milestone of this project was to implement a spectrometer in order to monitor the absorption of light by a plants leaf. Unfortunately, this sensor is programmable by C, C++, or C#. All of which, lie outside my skill set. Already a week behind schedule from the other sensors, it was deemed unreasonable to learn a new programming language as the deadline began to approach. This milestone is considered incomplete.

b. Learning Objectives:

On top of the technical milestones, there were also learning objective goals that were to be met. These goals consisted of finding the main issue with the existing greenhouse, learn to troubleshoot and experiment, and use project management skills throughout the life of the project. All objects are considered completed. I was able to locate the source of complication within the greenhouse and confirm this source through experimentation. Throughout the life of the project, I had to manage my time wisely and keep organized. This was done by utilizing project tools such as Gantt charts and Pert charts.

This project's current state is inoperable and incomplete, leaving a hypothetical customer generally unsatisfied.

ii. Administrative Performance:

This project did not require a highly active administrative personnel due to the materials left from the previous project managers. However, the administrator provided an excellent background of project management and was readily available to give advice for direction of the project. The administrator also provided valuable insight on sensor control and troubleshooting techniques.

iii. Organizational Structure:

This project was assigned to simulate a real life project within a classroom setting. I believe the organizational structure of the project helped as a whole by creating a productive and operational environment. This organization provided a defined timeline and projected goals that were to be reported weekly for the class and instructor. This discussion created incentive and motivation for the students to complete their projected goals. This discussion also allowed for students to receive new ideas or advice from

fellow students listening from an outside perspective. All of these aspects provided an accurate simulation of working in the industry.

iv. Team Performance:

This project only consisted of one member responsible for meeting the provided technical and learning objectives. This project would have had a better chance of completion if the workload was spread evenly throughout a bigger team. Thus, increasing the efficiency and overall completion of all the project milestones/goals.

v. Techniques of Project Management:

A few techniques of project management were utilized throughout the life of this project. For example, a Work Breakdown Structure (WBS), Pert charts and Gannt charts were all implemented to enhance my understanding of project management and overall organization skills. The WBS was a useful tool that allows for planning a list of tasks in order of importance. Once the list is completed, it is important to estimate an amount of time needed for each task to be completed. This information can now be expressed visually by utilizing the Pert and Gannt chart tools in Microsoft Project. These tools help organize and allow easy rearranging in case of task delays or unexpected road blocks. I believe these useful project management tools improved my overall organization and increased my chances of project success.

vi. Benefits to the Organization and the Customer:

Overall, this project met all the learning objectives for the class, even though the technical aspects were partially completed. This project implemented the use of an Arduino microcontroller that was required to control a variety of sensors. This project utilizes electrical, mechanical and computer engineering aspects, optimizing the

simulated experience for an individual in an industry. Not only has my engineering skill set improved, but this greatly strengthened my project management skills simultaneously. These skills are applicable not only in the classroom, but in the real world as well.