

Results and Discussions

Our system is one of the first of its kind to implement a majority of the necessary features of a greenhouse monitoring system. This system goes above and beyond to achieve features and requirements that make managing a greenhouse a little easier; and provides peace of mind knowing that the health of your plants is taken care of. Our next steps will involve further improving upon the physical designs/components, updating and maintaining the code/database, as well as preparing a plan for moving this system into production for client purchase. Like most prototypes ours is not perfect, there are a few things we could most certainly change in future makes and models in regards to software and hardware. For being a first-round prototype though, we feel like we did an excellent job at outlining and defining the key issues and addressing those issues in an innovational way. Our hardware; things like the enclosure and small greenhouse model were done exceptionally well in outlining how this system would look in a real-life sized greenhouse environment, which allowed us to visualize how we could incorporate our project into real life scenarios. The software side of the project addressed the issues we planned to eliminate by seamlessly incorporating a mobile application with the physical device. Although, there are many changes and updates to be made to the code to allow for a more frictionless experience we were pressed for time near the end of the term and wanted to make sure we had a working finished prototype. As a team we certainly learned a lot especially in regards to working with a group and dividing tasks evenly and fairly as to make sure not one person was contributing more than the others. We learned more in regards to hardware production

for things like cases and enclosures by going one step higher than what was required and building a small-scale greenhouse to incorporate all of our components together to allow users to see what a finished system would look like. We learned how to incorporate smaller devices together to create one larger IoT device by the use of a database, development platform, and a mobile application. In the end we feel that we demonstrated our exceeded learning in all these topics to create our finished prototype that helps visualize a greenhouse monitoring system. Our finished system was better than what we originally set out to accomplish which was a huge achievement for our group. We all really enjoyed working on this project together and are extremely happy with the finished outcome, although the prototype isn't perfect, we are keen in continuing to upgrade and update our system to better accommodate an ever-updating world we live in and to bring the best system we can to greenhouses everywhere.

Conclusions

In regards to mass producing our prototype, we have all the required files and documentation to rebuild all the key components such as the PCB, the enclosure, and even the small-scale model. With this information it would be easy to reproduce these components at a larger scale to eventually be sold. For testing the finished products, we would use a test bench with an up to date development platform with all the required code to run the system as well as a mobile application able to connect to that development platform. We would make sure all the sensors and effectors were working the way they were supposed to before moving on to the next system for testing. This would allow us to weed out the broken or malfunctioning products to make sure no bad systems were out in the world. Any system that didn't meet requirements would be disassembled and recycled back into production as parts for newly produced systems. This way of production would change based on the amount of systems we plan to make and the demand for our systems as this way of testing and quality control would work for mass producing say 100,000 units at a time. We would update this quality control system by making everything automated so newly fabricated systems get tested by machines before the assembly process is completed allowing for faster and more efficient product tests.

Pre-screening Checklist:

1. Has a Proposal for a Technology Report been submitted and accepted and a copy of the approved proposal included in the Technology Report?

No, we have not submitted a copy of our proposal to OACETT officially.

However, the proposal was submitted and approved by Prof. Medri at the beginning of the semester. It has been included in the report.

2. Has the Technology Report been submitted within one year since the proposal was approved?

No, since we have not submitted an official proposal to OACETT yet.

However, the final report to Prof. Medri is within one year.

3. Is the Technology Report consistent with the Proposal (as approved and with the comments and suggestions made by the proposal reviewer)?

Yes our report is consistent with our proposal, yet again our proposal has not been submitted

4. Is the Technology Report typed, double-spaced and justified left?

Yes

5. Has a 12 point Arial, Univers, or similar Sans Serif font been used?

Yes

6. Is the body of the report a minimum of 3,000 words?

Yes

7. Are the components included and in the following order: Title Page; Declaration of Authorship; Approved Proposal; Abstract/Executive Summary; Table of Contents; Lists of Illustrations/Diagrams; Body of the TR; Conclusion(s), and if applicable Recommendation(s); Bibliography/Technical References; and Appendices?

Yes

8. Is there a signed Declaration of Authorship?

No, because we are not posting our signatures online to our repository

9. Is the report dated?

Yes

10. Is the Technology Report current? (The Technology Report should be less than 5 years old.)

Yes

11. Is there a Title Page?

Yes

12. Is there a Table of Contents?

Yes

13. Does the Table of Contents correctly reflect the Components: Headings, Illustrations/Diagrams and Appendices?

Yes

14. Are the pages numbered with appropriate page breaks?

Yes

15. Is there an Abstract/Executive Summary and Introduction?

Yes

16. Does the body of the report contain Section Headings?

Yes

17. Are there Conclusion(s), and if applicable, Recommendation(s)?

Yes

18. Is there a Bibliography with appropriately cited Technical References?

Yes

Report Mechanics and Structure Checklist:

1. Does the Title, in ten words or less, inform readers of the precise subject matter contained in the TR?

A title should be concise and include key words for indexing.

Yes

2. Does the Abstract or Executive Summary provide a brief overview of the report in approximately 75 to 100 words?

Yes

3. Does the Abstract or Executive Summary summarize the Conclusion(s), and if applicable, the Recommendation(s)?

Yes

4. Does the Introduction state the reason the work was undertaken? What is the industry, organization or context? What is the problem?

Yes

5. Does the Introduction cover the scope of the report? What is included and /or admitted, and what procedures are used?

Yes

6. Do the headings and subheadings in the Body adequately and accurately describe the section or subsection content?

Yes

7. Does the Body include information regarding the methodology?

Does it indicate materials, equipment and procedures used and why they were selected over alternatives? Is there sufficient detail so that that the methodology can be duplicated by others?

Yes

8. Does the Body include recent research findings?

Yes

9. Does the Body include results/data from the study?

Yes

10. Are illustrations, tables, diagrams and charts clearly drawn, labelled and numbered?

Yes

11. Is each Conclusion, and if applicable, each Recommendation, stated in a separate paragraph and in a positive way?

Conclusions should not be qualified with “it seems”, “probably”, “it may be”, or other words that dilute the strength of the conclusion.

Yes

12. Are the References/Bibliography complete? All materials referenced in the TR should be represented in the list of References/Bibliography.

Yes

13. Do the Appendices support the study? Do the Appendices include substantiating data and calculations? Extraneous material should not be included.

Yes

14. Is the spelling correct? Has either the Canadian or USA spelling system been used consistently through the TR?

Yes

15. Is the language free of jargon?

Are acronyms properly introduced? Are abbreviations appropriate and correct? Can someone without specific expertise in the field read and understand the TR?

Yes

16. Is the same voice (I, one, person, etc.) used consistently throughout the Technology Report?

There should not be any switching from third person to first person or vice versa.

Yes

17. Do the grammar and punctuation follow normally accepted rules of use?

Use Ron Blicq's text Technically Write or a similar grammar reference as a guide.

Yes

18. Are thoughts and illustrations/diagrams/charts that do not belong to the writer properly identified and footnoted in the text?

Are quotations indicated correctly? Are the authors referenced in footnotes and/or reference list?

Do they include the author's name, the title of the article/book, the date of publication, and the publisher?

Yes

Report Content:

This section evaluates the quality of the work completed when addressing the problem statement/hypothesis. Fulfillment of these criteria leads to a TR that makes a contribution to the field under study.

1. Are the Problem Statement and Hypothesis significant to the current state of the field/industry?

Yes

2. Is the Methodology scientifically sound?

Yes

3. Are the engineering technology and applied science principles used in the Methodology and Analysis appropriate to the subject area?

Yes

4. Are the Data and/or Results complete?

Yes

5. Have the Mathematical formulae been applied appropriately?

Yes

6. Are the Mathematical calculations done correctly and accurately?

Yes

7. Are the Illustrations/Diagrams/Charts technically correct?

Yes

8. Is the Analysis of the results correct?

Yes

9. Is the Analysis complete?

Yes

10. Are the Conclusion(s), and if applicable the Recommendation(s), free of discussion, explanation and opinion?

Yes

11. Do the Conclusion(s), and if applicable the Recommendation(s), relate to and resolve the Problem Statement and/or Hypothesis?

Yes

12. Are the Conclusion(s), and if applicable the Recommendation(s), logical?

Yes

13. Does the report make a contribution to the industry/field of study?

Yes