CENG 355 Report checklist

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?
   Yes, a proposal report has been submitted and accepted.

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

3. Is the Technology Report consistent with the Proposal (as approved and with the comments and suggestions made by the proposal reviewer)?
   Yes, it is consistent with our original proposal.

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

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, they are included in the above order.**

8. Is there a signed Declaration of Authorship?
   No, we have decided to leave Declaration of Authorship unsigned as the document will be publicly available on the internet through the Github repository.

9. Is the report dated?
   Yes, it includes the data of when the various sections were written as well as other useful dates.

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

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11. Is there a Title Page?
    Yes.
12. Is there a Table of Contents?

    Yes, it can be found on page 8-11

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, we tried our best to keep the page breaks on odd numbered pages as required.

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

    Yes, executive summary is located on page 6 and the introduction is on page 13

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

    Yes.

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

    Yes, there is a conclusion located on page 51 but not a recommendation

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

    Yes, there are references on page 53

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?
   Yes, it informs them about the subject they are going to read.

2. Does the Abstract or Executive Summary provide a brief overview of the report in approximately 75 to 100 words?
   Yes, it does in 162 words

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

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4. Does the Introduction state the reason the work was undertaken? What is the industry, organization or context? What is the problem?
   Yes, it does state the reason of undertaking the work. The project pertains to the Lumi Monitor project which is run by 3 students from Humber college. The problem is many parents don't have facilities to track optimal conditions for their children, which is precisely what our product intends to do.

5. Does the Introduction cover the scope of the report? What is included and /or admitted, and what procedures are used?
   Yes, the report introduction covers the general subject idea and it introduces the sensors used by group members and a variety of hardware and software aspects of the project to bring it as one end product.

6. Do the headings and subheadings in the Body adequately and accurately describe the section or subsection content?
   Yes, they give a detailed description of the information presented underneath.

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, it includes enough details to make a duplicate of the product.

8. Does the Body include recent research findings?
   Yes.

9. Does the Body include results/data from the study?
   Yes, it includes variety of results from our studies.

10. Are illustrations, tables, diagrams and charts clearly drawn, labelled and numbered?
    Yes, in fact the diagrams and figures are numbered using the figure label

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, we tried to be as affirmative as possible.

12. Are the References/Bibliography complete? All materials referenced in the TR should be represented in the list of References/Bibliography.
    Yes, the references are complete as a list in page 53.

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13. Do the Appendices support the study? Do the Appendices include substantiating data and calculations? Extraneous material should not be included.
    Yes, the appendix section of the document contains an integrated code for two of the sensors which we got to work before the pandemic.

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

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, appropriate acronyms and terms are properly defined and the report language is easy to understand.

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, there is a consistent third person tone in the report.

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, there is a proper grammar usage throughout the report.

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, all the work of external authors is referenced.

Report Content

1. Are the Problem Statement and Hypothesis significant to the current state of the field/industry?
   Yes, they are significantly aligned to the technology field.

2. Is the Methodology scientifically sound?
   Yes, the project contains methods backed up with evidence in technological context.

3. Are the engineering technology and applied science principles used in the Methodology and Analysis appropriate to the subject area?
   Yes, they apply to the engineering technology domain.

4. Are the Data and/or Results complete?

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Yes, there is complete data/result backing of app testing in android studio as well as results produced from combining the sensors and other hardware components.

5. Have the Mathematical formulae been applied appropriately?
   Yes, they have been applied correctly in temperature measurements and light level readings in the python code for the sensors.

6. Are the Mathematical calculations done correctly and accurately?
   Yes, there are precise math readings produced from the sensors when displaying the light levels in the given environment as well as temperature readings.

7. Are the Illustrations/Diagrams/Charts technically correct?
   Yes, the chart displays for temperature and humidity are displaying correctly when retrieved from firebase.

8. Is the Analysis of the results correct?
   Yes, it is based on our research of what the correct light levels are for a variety of light conditions, the output from the light sensor is correct, and so is the output from the temperature sensor and microphone components of the project.

9. Is the Analysis complete?
   No, due to the pandemic situation we still have to analyze connecting the hardware and software components together.

10. Are the Conclusion(s), and if applicable the Recommendation(s), free of discussion, explanation and opinion?
    Yes, it comes straight to the point on ending the report on the project.

11. Do the Conclusion(s), and if applicable the Recommendation(s), relate to and resolve the Problem Statement and/or Hypothesis?
    Yes, the conclusion relates to the problem statement and gives a closing statement on resolving the issue through the product.

12. Are the Conclusion(s), and if applicable the Recommendation(s), logical? **Yes, they give a logical perspective to the end user of the product.**

13. Does the report make a contribution to the industry/field of study?
    Yes, it does make a contribution to the technology domain as well as the industry pertaining to infant safety products.

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4.0 Results and Discussions

We would like to state that our prototype is not as perfect as we would have wanted it to be. The major problem was due to the outbreak of COVID-19 which affected each and everyone in one way or another. Fortunately, we had already soldered our components onto our printed circuit board and were able to pull readings from our sensors using the RPI. However, we were unable to get a hold of the enclosure due to campus closure and some of our components were with different group members at that time. We have also definitely improved our knowledge and skills on both the software and hardware side of things during the development of this project. Another major skill learnt was troubleshooting which is one of the key components to get a project to work as required. For example, during the combination of our sensors, we had an issue where one sensor could only run Python and the other could only work with Python3. Moreover, as we are not experienced programmers, we also found out that dedicating time to reading online documentation on a piece of software/hardware could be incredibly helpful to help us understand better. We are confident that the set of skills we have acquired during this project development will help us in our careers in the future.

5.0 Conclusions

The Lumi Monitor IoT capstone project was developed to address the issue of parents wanting the best conditions for their children. During the course of this semester, we have managed to design, develop and integrate both the hardware and software aspects of what the solution is according to us. To achieve our goal, we divided the worl load amongst three different group members and worked together to come up with the Lumi Monitor project which tracks the temperature, humidity, light levels of the infants surrounding environment as well as offers a full duplex communication line between the parents and child.

The next step for this project would be firstly, to implement a visual interface for the parents to physically keep an eye on the baby in its room as well as maybe add a servo motor-controlled aeration device (e.g. Fan) inside the room which would automatically regulate the temperature and humidity whenever the set levels are exceeded. Moreover, concerning mass production of this particular project would be actually easily feasible provided all the components are widely available. For example, an essential need for this mass production to be possible would be unrestricted access to a laboratory/factory that specializes in making PCB as well as soldering companies. Also, with the help of industrial sized 3D printers, the amount of time required to produce a large number of enclosures would not be that impactful on the process. Given the ability, we would most likely implement error checking at each and every stage of the manufacturing process to make sure no stones are left unturned.