**Final Report for**

<Descriptive Project Title>

Sponsored By

<Sponsor Name>

Version <S19>

<Month, Date Year>

Prepared by

<Name (Discipline)>

<Name (Discipline)>

Project Engineer <Name>

Chief Engineer <Name>

# Executive Summary

To Do: The Executive summary is a condensation of an entire report and must be short; try to keep it no more than one page. Focus on the objective(s) and the benefits of the project, the major points of your design and validation, and recommendations. It is neither an introduction nor an outline (table of contents) of the report. Hence, it should not contain phrases such as “This report presents …” and “Our main results are described in chapter 1”.

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# Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Date | Name | Reason for Changes |
| 1.0 |  |  | Initial document. |
|  |  |  |  |
|  |  |  |  |

# Glossary

To Do: Your final report is reviewed by people both in the field and outside of the field. Define all the abbreviations, acronyms, and terms required to interpret your final report properly. Examples of abbreviations that have two or more commonly used meaning are as follows:

* ATM – Asynchronous Transfer Mode or Automated Teller Machine
* UPS – Uninterrupted Power Supply or United Parcel Services

For any unfamiliar abbreviation, write the full name followed by the abbreviation in parentheses the first time it is mentioned in the report.

# 1. Introduction

To Do: Introduces your project. You must cover just enough in this section to fully understand the identified customer needs and semester objectives presented next.

Examples:

* Major customers’ needs and/or problem to be addressed. Present detailed customers’ needs in an Appendix.
* The history behind the project for an on-going project
* Justification (motivation and/or benefits) for pursuing the project (worth for solving or improving)

Add appropriate subsections if necessary.

# 2. Project Objectives & Semester Objectives

To Do: This section contains both long term objectives and the planned semester objectives and the corresponding deliverables. Provide a bullet list of the objectives for this semester. Focus on final outcomes, not intermediate steps. Do not include task assignments in this section. The objectives should be understandable by themselves. However, you can follow the objectives with a statement of scope to clarify what you planned to do (in scope) and that you planned not to do (out of scope).

# 3. Technical Background, Assessment of Relevant Existing Technologies and Engineering Standards

To Do: Present adequate additional background information and benchmarking to identify the engineering problems (requirements) you will solve to satisfy the customer needs. (What technology exists or is needed to solve the problem?)

Present industry and de facto standards that are relevant to your project. Some of these standards become design constraints. Examples of things that might be applied to your project are found in:

https://designlab.eng.rpi.edu/edn/projects/capstone-support-dev/wiki/Standards

If competitors’ products were reviewed, state design targets identified the assessment process also.

Where appropriate, refer to the previous final report(s). Make sure to provide correct in-text citations that refer readers to References. (See References also.) This section is also the place to summarize your patent search if applicable.

Reuse and revise the material from the corresponding section in the Preliminary Design Document.

# 4. System Requirements and Design Constraints

To Do: Identify overall project requirements and the requirements of each of the subsystems. Identify interfaces between subsystems to help clarify the requirements of each subsystem. (What engineering problem are you solving?)

For any requirement or constraint derived from a stand or regulation, make sure to cite it.

Revise and update the corresponding section from your Preliminary Design Document.

# 5. System Concept Development

To Do: Present the system concept that the team ultimately developed. Help the reader visualize the system concept by using appropriate drawings/diagrams, such as sketches, system schematics, circuit diagrams, and UML diagrams. Describe the significant criteria that lead to concept selection, alternate concepts that were considered, and design trade-offs

Where appropriate, refer to the previous final report(s). For the remaining concepts considered, provide appropriate pointers, such as the section in your Preliminary Design Document.

# 6. Design Analysis

To Do: Present the methodology and analyses used in coming up with a well-defined structure for the selected concept and major results. If the methodology is based on prior published work, cite the reference instead, with additional appropriate comments.

Examples of analysis techniques include:

* Technical/mathematical modeling
* Simulation
* Quick prototype and experimentation

# 7. Final Design and Engineering Specifications

To Do: Present the final design, including the detailed design, with appropriate diagrams/drawings with design values. Describe the critical design parameters. Where applicable, address manufacturability and cost issues and include details in an Appendix. Similarly, organize and place large data tables and/or a set of detailed diagrams/drawings in Appendixes.

# 8. System Evaluation

To Do: In this section, present data and experiment results that objectively show how well your final design met the requirements (may also be presented in subsystems). Discuss the results, make clear conclusions and recommendations for future steps.

Note that the reader should be able to reproduce the test results. Provide detailed procedures, equipment, and settings used for the tests in an Appendix.

# 9. Significant Accomplishments and Open Issues

To Do: Discuss the evaluation results in terms of the final design. Describe significant accomplishments compared to your objectives. If you did not meet all objectives, or if you accomplished something that was not in your plan, explain why. Report planned tests that were not performed as open issues. If uncertainties remain, they should be pointed out also. If your results were not completely successful, state why the chosen approach (concept) is not viable or limited. (Unsuccessful results are useful in eliminating unproductive effort by allowing future design teams to learn from your mistakes.)

Make recommendation for design changes or modifying requirements/specifications as needed. This section is also the place to suggest future enhancements based on lessons learned from this project.

# 10. Conclusions and Recommendations

To Do: Bring together, concisely, the conclusions to be drawn. Your conclusions must be supported by the material presented in the previous sections. Recommend next steps.

# References

To Do: The references must list all published information sources, including electronic documents that are directly quoted or used to support your discussion or equation. **All references must be cited at the appropriate points within the report text.**

For MS Word, use Citations & Bibliography that is available under the References tab and generate this section automatically.

If you plan to prepare this section by hand, the following formats are recommended because you will not have to renumber citations when a new item is added to your paper.

* Single author: [*Author’sLastName*, *Year*]
* Two authors: [*Author’sLastName1* & *Author’sLastName2*, *Year*]
* Three or more authors [*FirstAuthor’sLastName*, et al., *Year*]

This list of references uses the alphabetical order. For more information, see Citing Sources in
<https://www.commd.rpi.edu/resources/>

Important Notes

To Do: This section contains helpful information. Study the following notes, and delete this section.

* Subsystem Requirements, concepts, analysis, and section are typically done for each subsystem at a time.
* Present a system overview before describing subsystems. Explain the overall system, its major subsystems, and their relationship. Sometimes this is most effective in the introduction, sometimes in the system requirements section, and sometimes both. Choose the most appropriate section(s) according to the nature of your project.

# Appendix A: Customer Requirements

To Do: (Mandatory) Present the complete set of customer (system) requirements. Organize the requirements according to appropriate types. Assign a unique ID to each requirement. If your project focuses on a subset of the customer requirements, present them as either “in scope” or “out of scope.”

Feel free to change this section title, such as Product Specifications or Validation of System Requirements, according to the nature of your project.

# Appendix B: System Evaluation Plan

To Do: (Mandatory) Provide a detailed test plan, including procedures, equipment, and settings used in the tests.

# Appendix C: Ethical and Professional Responsibilities

To Do: (Mandatory) You developed a new system (technology) and solved a given engineering problem. Your solution could affect the world beyond the technology (immediate scope of your project). Complete the following table by briefly describing your thoughts on how your work affects the issues. Similarly, briefly describe how you made engineering decisions and to deal with these issues. Examples of actions are shown in the table. Delete examples and add your thoughts and actions to the table. If you already addressed the issue in a previous section, you only need to reference the section. If you do not think that a particular issue does not apply to your project, explain how you came up with the conclusion.

|  |  |
| --- | --- |
| Issues | Ethical and Professional Responsibilities |
| Global | * EU-based users can use our web tool. Our design met some of the European Union GDPR (General Data Protection Regulation). For more information, see Chapter 4 System Requirements.
 |
| Economic | * Although the cost of the product was slightly increased, sustainable materials were used in the design to protect the environment. See Chapter 6. Design Analyses.
 |
| Environmental | * An energy efficient design concept was chosen. See Chapter 5 System Concepts.
 |
| Societal | * The product was developed for elderly persons to improve the quality of their lives, and many users have some physical limitations. We included requirements according to accessibility guidelines. See Appendix A.
 |

# Appendix D: User Manual

To Do: (Optional) Present the procedure to operate your prototype. Make sure to include all safety-related instructions.

# Appendix E: Cost Analysis and Manufacturability Analysis

To Do: (Optional) Provide cost estimate to manufacture the product (system) you designed. Do not confuse it with the cost of building a prototype. Perform make-buy analysis on critical system elements. For projects working on mass-produced products, present manufacturability issues.

# Appendix F: Expense Report

To Do: (Optional) Summarize your expenses as a Table as needed.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Quantity | Unit Price | Subtotal | Shipping |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Total |  |  |  |

# Appendix G: List of Manuals and Other Documents

To Do: (Optional) To assist future teams in reusing the components used in the prototype, list all manuals came with the components and any other useful documents available. Make sure to submit the listed documents with your final report.