**Final Report for**

<Descriptive Project Title>

Sponsored By

<Sponsor Name>

Version <F20>

<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”.

# Contents

[Executive Summary 2](#_Toc49323101)

[Contents 3](#_Toc49323102)

[List of Figures 4](#_Toc49323103)

[List of Tables 5](#_Toc49323104)

[Revision History 6](#_Toc49323105)

[Glossary 7](#_Toc49323106)

[1. Introduction 8](#_Toc49323107)

[2. Project Objectives & Semester Objectives 9](#_Toc49323108)

[3. Engineering Tools and Methods 10](#_Toc49323109)

[4. Technical Background, Assessment of Relevant Existing Technologies and Engineering Standards 11](#_Toc49323110)

[5. System Concept Development 12](#_Toc49323111)

[6. Customer Needs and Engineering Design Requirements 13](#_Toc49323112)

[7. Design Analysis 14](#_Toc49323113)

[8. Final Design and Engineering Specifications 15](#_Toc49323114)

[9. System Evaluation 16](#_Toc49323115)

[10. Significant Accomplishments and Open Issues 17](#_Toc49323116)

[11. Conclusions and Recommendations 18](#_Toc49323117)

[References 19](#_Toc49323118)

[Appendix A: Initial Deliverables and Dates 21](#_Toc49323119)

[Appendix B: System Evaluation Plan 22](#_Toc49323120)

[Appendix C: Ethical and Professional Responsibilities 23](#_Toc49323121)

[Appendix D: User Manual 24](#_Toc49323122)

[Appendix E: Cost Analysis and Manufacturability Analysis 25](#_Toc49323123)

[Appendix F: Expense Report 26](#_Toc49323124)

[Appendix G: List of Manuals and Other Documents 27](#_Toc49323125)

# List of Figures

# List of Tables

# 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. Write 2-4 paragraphs to state the following issues:

* Who is the project sponsor?
* Who is the customer?
* Major customer needs
* What is the problem that the team is going to solve?
* The history behind the project for an on-going project
* Why is it important for the sponsor to solve the problems? (What is the sponsor’s motivation to solve the project?)

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 bulleted lists of the objectives for the overall project and for this semester. Introduce each list with a paragraph stating the purpose of the list. In both cases, 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).

**Project Objectives and Customer Payoff**

Write a clear statement of the overall project objective and what the benefit to the sponsor (customer) will be once the overall project is completed.

**Current Semester Objectives**

Write a clear statement of the project scope for this semester. What are the valuable results that the team will produce and deliver to the sponsor (customer) in the semester? These should include commitments by your team and should be project-specific, not generic. Occasionally, to avoid misunderstanding, you may state out of scope items, i.e., things you will not do, as needed.

Example:

* In Scope: Developing an Android smart phone application.
* Out of Scope: Developing an iOS version.

# 3. Engineering Tools and Methods

To Do: Translate the semester objectives into engineering problems and provide specific information on the technical aspects of how the team will solve them. Do not present the generic design process because teams are expected to follow that. Make this specific to your particular project. Do not present your team’s management approach as all teams should use good project management techniques.

# 4. 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.

# 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. Customer Needs and Engineering Design Requirements

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.

# 7. 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

# 8. 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.

# 9. 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.

# 10. 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.

# 11. 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://info.rpi.edu/comm-d/resources](https://exchange.rpi.edu/owa/redir.aspx?C=0KMr5DDEtxWT3shKoEIiNRgRk00D2fYmjDagUry7oZgSoWyZS-zXCA..&URL=https%3a%2f%2finfo.rpi.edu%2fcomm-d%2fresources)

**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: Initial Deliverables and Dates

To Do: (Mandatory) Deliverables are used to determine whether or not the semester goals are met, and to set the overall project schedule. List specific high-level project deliverables that will be provided to your sponsor, not tasks, with the delivery dates. Include intermediate deliverables as needed. For example, preliminary versions of software can be released. Typically six to eight deliverables (milestones) are adequate for summarizing your project results. Do not include course items, such as the mid-term report. Dates reflect a good first approximation of the project schedule.

|  |  |
| --- | --- |
| **Deliverable** | **Date** |
|  |  |
|  |  |
|  |  |
|  |  |

# 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 these 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 do not think that a particular issue does not apply to your project, explain how you came up with the conclusion.

|  |  |  |
| --- | --- | --- |
| Issues | Impact, 1(low) – 5(high) | Description of Impact |
| Public Health, Safety, and Welfare |  | * Our system design results in nominally higher emmissions rates than other alternatives, however the faster processing times results in lower total emmissions.
 |
| 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.
 |
| Cultural |  | * This design facilitates in-depth, non-contact examination of fragile artifacts, enhancing our understanding of previous civilizations
 |
| Social |  | * Our product provides opportunities for families to communicate in nonvel ways when they can’t otherwise be together, enhancing family bonds.
 |
| Environmental |  | * 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.
 |
| Economic |  | * Providing a cost-effective means to to convert otherwise low-value wood to valuable fuel supports forest economies by providing additional income to landowners and the forestry industry in general
 |

# 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.