



IE 477 – IE 478 Systems Design

Suggested Contents for the Final Report

Last Revised on October 15, 2023

The Final Report (FR) will be submitted in the end of the Spring Semester. FR is the report of a project that took several months, with several “candidate” industrial engineers on board. We expect that the report should reflect this work, as well as to be a starting point for another team to start new projects. Therefore, we expect that you write everything clearly, concisely, and properly. Please, **DO NOT** describe the approaches you have just thought about it, or any approach that is totally irrelevant to your final proposed approach. Of course, during your analysis if you have worked on alternatives and finally selected one of them you must mention those alternatives (preferably a brief summary), as well as why you have not considered them further; this is very important as it is simply an account for an engineering work, with identification of a problem and how you solved it.

At this time it is a good idea to recall the criteria for the success of any project:

1) System design

- Model development and validation
- Consideration of alternatives: Extent to which the team demonstrated critical thinking in the design processes including scenario and/or what-if analyses
- Model usage for changing environments
- Creativity: Extent to which the team developed a novel solution to the design problem while still achieving a functional design
- Technical competencies: Extent to which and validity of the technical aspects have been used properly, including methods, tools, and techniques.

2) Success of the design

- Attainment of project deliverables: Extent to which the goals of the project and end-user specifications have been met.
- Benchmarking: A comparison of the current and proposed system should be provided along with a cost/benefit analysis.
- Implementation and system integration: Extent to which the proposed system is successfully implemented and integrated into the existing system – if not applicable, then a detailed implementation plan and a pilot study may be provided.
- End-user evaluation and assessment: A written statement from the industrial advisor(s) evaluating the project.
- Impact on the organization: Effect of the proposed system on the organization (financial impact, simplified operations, etc) – in terms of performance measure(s) used in validation as well as other performance measures.
- Global and societal impact: As an additional consideration, if applicable.

Considering these criteria, FR should contain the all but one section that you had in your SPR, with an optional Appendix at the end. Once again, you will need to:

- Extend some of these sections with the new work you have performed.
- Update the sections as needed (shorten, update with new information if available, rewrite for completeness)

You may always refer to the suggested contents of the previous reports as these documents have more detailed explanations to the sections that are not expected to require much change in this report.



While making changes in your reports, do not keep any information that was once relevant to your project but now totally irrelevant. Your project reports are not a place to log the historical changes you had throughout two semesters. If one wishes to track your changes, they could browse through your earlier reports.



*Please follow the instructions described in the document called “**Report Format**” while preparing your report. **Make sure that neither the format information nor the below description affects the way that you select the section titles that you use in your text. We expect you to select those to reflect your project work rather than being generic.***

The report is expected to include the following information - here presented in mainly eight sections for convenience:

1. **Description of the System:** No update expected.
2. **Current System Analysis and Problem Definition:** No update expected.
3. **Review of Resources:**
 - A. **Relevant Work in the Literature:** No update expected.
 - B. **Engineering Standards and Regulations:** No update expected.
4. **Proposed Solution Strategy:** No major updates expected, although rewriting always helps. There may be some incidents where you need to update the material, as well. Especially check if the following updates may be needed: minor updates to your approach (as need observed during the implementation phase), validation.
 - A. **Critical Assumptions:** No update expected.
 - B. **Major Constraints:**
 - i. **Company Regulations or Restrictions:** No update expected.
 - ii. **Relevant Engineering Standards:** No update expected.
 - C. **Objectives:** No update expected.
 - D. **Solution Approach:** During the pilot study, there may be some minor updates to your approach. Update this section accordingly.
 - I. **Conceptual Model:** Update if needed.
 - II. **Mathematical Model(s):** Update if needed
 - III. **Solution Method:** Update with the results you obtained from your model(s).
 - E. **Verification:** Update if needed.
 - F. **Validation:** Update if needed.
5. **Outcome and Deliverables:**
 - A. **Outcome:** Update if needed.
 - B. **Deliverables:** You should finalize your deliverables and your deliverables should now be ready to be used in a production environment.
 - C. **Benchmarking and Benefits to the Company:** Update if necessary.
 - D. **Implementation Plan and Pilot Study:** Have the details of the implementation plan and pilot study. Also, present the results and feedback from the pilot study, how you responded to them and provide updates to the implementation plan (if changed).

- 6. Conclusion and Future Work:** Provide a brief summary of your contributions to this project along with any potential future work that could be built on this project. These might be a different version of this problem under a different set of assumptions, constraints, or a different solution strategy for the same problem that you thought could be promising but did not have time to test.
- 7. References:** Update if needed.
- 8. Appendix:** Update if needed. Note that this is the FR. For each section in the Appendix (or each Appendix titled independently), make sure that you have an understandable presentation of the material without the need for a reader to refer to the main text. Tables and Figures should have titles, and explanations on how to understand them should be available.