Guidelines for CSC/CIS Capstone Project Reports

Designed by

CSC Faculty

Department of Computer Science, Engineering Science and Physics

The University of Michigan-Flint

February 10, 2006 - Winter 2006

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Guidelines for CSC/CIS Capstone Project Reports

The following is a detailed explanation of the structure of a project report. This structure is appropriate for a design report and, therefore, all CSC/CIS Capstone Project Reports are to follow these guidelines.

General Guidelines

The final report is to be 15-22 pages in length; single-line spacing; 12 font size; Times New Roman; and submitted as a .doc, .pdf, or .ps file. It is expected that the final report will include most, if not all, of the following sections:

1. Cover Sheet
2. Table of Contents
3. Table of Figures and Tables
4. Abstract (Executive Summary)
5. Introduction
6. Review
7. Design Requirements/Details of Project
8. Results
9. Conclusion
10. References
11. Appendices

1. Cover Sheet

The cover sheet is to contain the following information. (See Appendix A for specifics.)

- Title of Design Project
- Names of Group/Team Members
- Supervisor (Name of Professor)
- Course number and title
- Date and Term
- Project Report Number

2. Table of Contents

The Table of Contents lists the sections and subsections, with their respective beginning page number. List the headings exactly as they appear in the report (use the same words and capitalization).

3. Table of Figures and Tables

The Table of Figures/Tables/Graphs lists all of the figures/tables/graphs within a report. The figures/tables/graphs are to be numbered consecutively and given a description title; this information, exactly as it appears in the report, is to be included in the Table along with the respective page number. Within the report, the number and title are to be positioned directly below the figure/table/graph.

4. Abstract (Executive Summary) (1-1.5 pages)

An abstract/executive summary provides key information, such that while reading the report, the reader has expectations which are fulfilled on a continuous basis. It is written as if the reader is totally uninformed about the project and not necessarily going to read the report itself. This report summary should contain all major points and have the following organization:

- Begin with the problem statement which consists of the organizational problem: purpose of capstone project, the context of the project, and the general technical problem(s) for the type of project you are doing (software prototype, hardware prototype, simulation, application program for a client, etc.),
- Follow with the more specific assignment which covers exactly what the project team was asked to do (an overview of the project goals), the technical questions/tasks, and perhaps, the hypothesis or solution,
- Next, state the overall purpose of the report, and
- Finish with the overall conclusions about the project including recommendations for improvements and their implications, subsequent action, and cost and benefits.

5. Introduction (1-2 pages)

The introduction serves to orient the reader to the report with an overview of the project and explanation of its objectives. It is to include the following:

- The problem: explain the particular problem addressed in the report
- The objective: state the assignment (what is needed to accomplish the task of solving the problem)
- The method of the report: describe the organization and structure of the report

6. Review (3-6 pages)

This section provides an overview of similar projects and provides background material. Discuss the context and history of the project by describing and explaining the question/issue/problem, how it has been handled and what work has been done in the past. Include literature search results for the overall problem and context rather than the options for component parts.

7. Design Requirements/Details of Project (7-9 pages)

This section covers what you did and why you did it!

- Specifications and requirements for the project: provide the detailed specifications that served as the basis for the project (interpretation of contest rules, customer requirements, desired features and how they determine or constrain size, velocity, response time, cost, weight, etc.). Consider aspects such as potential users, cost, safety, user-friendliness, performance, compatibility with other things, functionality, acceptance, convenience, capacity, misuses, legal issues, standards or codes, availability, materials, productivity enhancement, entertainment, technology, and design methods.

- Functional decomposition of the project: explain the major functions required by your design. Based on your specifications, specify goals for performance, reliability, cost, code size, manufacturability, safety, societal factors (human interface, environmental factors) and any other criteria relevant to the project. Figures and tables are necessary to supplement this discussion.

7.1 Feasibility Discussion (3-4 pages)

Discuss the literature search and explain how it provided options and justification for your approach to the overall design of components and methods used in each functional part. Be certain to cite all of the literature used in your discussion. The following factors can be used to assess feasibility of your project:

- Economic - effect on the economy in the past, possible cost of project development, cost of materials, target cost if project is marketed
- Environmental - influence on the environment in the past, possible effects for future developments
- Sustainability - product life cycle, future markets
- Manufacturability - material availability, use of off-the-shelf vs. custom components, special needs for hostile environments
- Technical - relevant technical risk factors and overall risk rating of the project.
- Ethical - uses that could cause harm to society, ethical issues that someone working on this topic might encounter.
- Political - relationship of this topic to political issues

7.2 Final Implementation (4-7 pages)

Describe the project and its functions: include diagrams, smaller code examples, and figures in the body of the text, and refer to any large engineering drawings, listings, etc. in the appendices.

You might organize the implementation presentation by functional groups. Also, discuss and present the calculations used in the design of the project in the relevant subsections (summarize repetitive calculations in tables).

8. Results (2-3 pages)

In this section, based on the preliminary design, present the estimated performance of the project followed by the actual performance results. Next discuss these results by comparing the actual with the estimated performance and explain the discrepancies. Suggestions for design changes that would improve the performance of your project should be made. Also, use figures/tables/graphs to show relationships, when appropriate.

9. Conclusions (1-2 pages)

Restate the problem that gave rise to the project, summarize the main points and the approach that was taken. Summarize the design performance, recommend improvements that could have been made in the scheduling and planning, explain subsequent action or pose specific questions for investigations. Finally, discuss the lessons learned.

10. References

All sources of information in the report are to be referenced within the report and listed in a bibliography. The references are to be in alphabetical order by author, then numbered consecutively. Once numbered, the reference number [in brackets] is inserted within the report, at the end of the source. Resources include published article, book, technical journal, World Wide Web page, conference (See Appendix B for examples and explanations).

11. Appendices

The Appendix is comprised of items which do not comfortably fit into format of the report: oversized drawings/tables/graphs, detailed computations, computer-generated data. Label each appendix category sequentially as A, B, C etc; the page number format should be as A-1, A-2, etc.

Appendix A

Project Title (font size 16)

Submitted by:

Group Members (Font Size 12)

Supervised by:

Name of the Professor (Font Size 12)

Presented to

Department of Computer Science, Engineering Science and Physics

In Partial Fulfillment of Requirements

Course number and title (Font Size 12)

The University of Michigan-Flint (Font Size 14)

Date and Term (Font size 12)

CSC/CIS – CP-Course#- - 06-Number

Appendix B

The format for listing different types of references is given below which is generally the *Chicago Manual of Style* documentation system. Note the use of italics and quotes. (Within the bibliography, remember to number the references after first having alphabetized them by author; the number [in brackets] is used within the report to identify the source).

Books:

Last name of author(s) and first name or initials, or name of organization, *Title of book (in italics),* Edition (if applicable), Place of publication (city), Name of publisher, Year of publication, First and last page of reference

Example:

S. M. Hemmingsen, *Soft Science.* Saskatoon: University of Saskatchewan Press, 1997, pp. 27-52.

A. Rezi and M. Allam, "Techniques in array processing by means of transformations," in *Control and Dynamic Systems,* Vol. 69, *Multidimensional Systems,* C. T. Leondes, Ed. San Diego: Academic Press, 1995, pp. 133-180.

Periodicals

Last name of author(s) and first name or initials, or name of organization, Title of article in quotation marks, *Title of periodical in full and set in italics,* Volume, number (and if available, part), First and last pages of article, Date of issue.

Examples:

G. Liu, K. Y. Lee, and H. F. Jordan, "TDM and TWDM de Bruijn networks and shufflenets for optical communications," *IEEE Transactions on Computers,* vol. 46, pp. 695-701, June 1997.

J. R. Beveridge and E. M. Riseman, "How easy is matching 2D line models using local search?" *IEEE Transactions on Pattern Analysis and Machine Intelligence,* vol. 19, pp. 564-579, June 1997.

From the INTERNET

First and Last name of Author(s), "title of entire work", electronic address, date document accessed.

Examples:

Computational, Optical, and Discharge Physics Group, University of Illinois at Urbana-Champaign, "Hybrid plasma equipment model: Inductively coupled plasma reactive ion etching reactors," December 1995, http://uigelz.ece.uiuc.edu/Projects/HPEM-ICP/index.html.

D. Poelman (dirk_poelman@rug.ac.be), "Re: Question on transformerless power supply," Usenet post to sci.electronics.design, July 4, 1997.