

Writing a Design Report for Interactive Hardware and Embedded Computing

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Abstract—A design report is an essential artefact that serves as comprehensive documentation of a project / design. It is important to document a design thoroughly, especially if you have been commissioned to do a project. The abstract is a quick description of what the design problem is and how the proposed solution solves the design problem. It should be brief and easy to read with very little jargon or presupposition of prior knowledge of the design problem.

Index Terms—design, report, computer science, CS 807

I. INTRODUCTION

THE introduction provides any background to the design problem that may be necessary for a reader to understand the design problem in the first place. It may not be required if the design problem can be explained easily without any background information – but this is unlikely. Again, avoid using jargon and acronyms without defining them (this would actually be the optimal time to do so if absolutely necessary).

II. PROBLEM DEFINITION

The problem definition is your understanding of the problem. This is sometimes given to you by the person who commissioned you. Often, a client will not know what they want / may give you conflicting or confusing goals. It is up to you to articulate clearly and concisely what the problem is *as you understand it*. Simply copying and pasting something that was given to you by the client is not enough. The worst case scenario is that you will misunderstand the problem and thus provide an inadequate design. Generally, the client will clarify for you the problem before this happens.

III. DESIGN DESCRIPTION

A. Overview

Once you've come up with your design solution, this is where you will describe it in brief. Give a summary of the design and how it works, but do not go into too much detail. A surface-level description is all that is required in the overview. Include a drawing (or CAD mock-up) of your solution that shows all the essential components, but no pictures; a picture gives too much detail and you are only trying to convey the most important design decisions at this point.

B. Detailed Description

This section is where you will discuss your design in high resolution detail. Give block diagrams, sketches, CAD and schematics here as well as a detailed description of how the device fits together and how it solves the problem.

C. Use

This section is a user-manual of sorts. Describe how a user might work with your solution to achieve the goal outlined in the design problem. This section does not need to be particularly long, but it should be very specific in the intended utilization of the design solution.

IV. EVALUATION

A. Overview

The evaluation section is where you detail the evidence for your design solution. The overview summarizes the approach that you took in your evaluation. The overview should discuss, in brief, what sort of methods were used to test the solution. Did you make a number of prototypes and choose the best one? Did you do a series of prototypes that built on the failures of the previous designs? Did you run some sort of a simulation? Did you have a focus group? These details should go here.

B. Prototype

This is an overview of the prototype in the form that it was tested. Here you should highlight the features of the prototype and discuss parts that may differ from a final solution. You may feature a picture here, but reserve the detailed pictures (different angles, etc.) for the appendix.

C. Testing and Results

Detail how you tested the device against the requirements outlined in the problem definition. You do not need to state how the solution stood up to these tests – this is merely a discussion of the tests themselves and a justification for the design of said tests.

D. Assessment

Once the tests have been performed, give an honest assessment of how your solution held up in the face of those tests. Did it break? Was it completely functional? What were the strengths and weaknesses? Perhaps the design is a good solution for a different use-case than what you've envisioned?

E. Next Steps

Now that you have a design that has been described in detail and evaluated, what are the next steps to move the project forward? Perhaps this is the end product. Perhaps there are some improvements that can be done and a new prototype can be built. It is very likely that you won't actually revisit

this design in the future so it is very important that you give a detailed description of what needs to be done next so that someone who picks up your project down the line might be able to have an idea of where to start.

V. CONCLUSION

Here's where you sum-up what you designed, why you designed it, how it was tested and whether it worked. Keep it brief. This is a reminder to the reader of what the original goal was and it serves to bring the whole project into focus.

APPENDIX A DIAGRAMS AND PICTURES

Any extra diagrams and pictures go here.

APPENDIX B SOURCE CODE

The source code that YOU WROTE goes here. If you didn't use your own code, you need to reference that fact in the design description.

REFERENCES

- [1] H. Kopka and P. W. Daly, *A Guide to L^AT_EX*, 3rd ed. Harlow, England: Addison-Wesley, 1999.