How to Write a 6.033 Design Report

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March 2005
Why are you here today?

1. Proposal → report

2. Show you how a computer designer “thinks through” a design problem.

3. Explain what we look for when grading reports.
Why are you here today?

1. Proposal → report

2. Show you how a computer designer “thinks through” a design problem.

3. Explain what we look for when grading reports.
   - Proposal is not the report!
   - “A” on proposal may not = “A” on report
Steps in the Writing Process

1. Read comments on your proposal
2. Re-read the assignment
3. Make a priority list of design ‘fixes’
4. “Fix” your design
5. Write design description
6. Write introduction & conclusion
7. Write front & end matter
8. Double-check design specs
9. Clarify and refine report -- peer review!
10. Proofread
Step #1  Read comments on your proposal

- What information was missing or unclear?
- What was good?
- Can you build off existing design or do you need to “start from the ground up”?
You wrote:

“The master process cycles through all 1,000 cameras in a round-robin fashion, reading 2 seconds of data from each connection.”
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TA responded:

What happens if network congestion prevents a camera from responding?
What code implements this structure?
Re-read the assignment

Proposal did not address all aspects of the assignment:

- What’s missing?
- What about format? Document specs?
- FAQ & Proposal Feedback Guide
Step #3 Identify priorities

1. Make the system work.
   - Is part of the system undefined?
   - Can you actually build it?

2. System should continue to work under normal faults in transcoder or AI

3. Resilience to overload

Ω Performance
Fix your design!

Identify problem
↓
Fix design
↓
Simplify design
↓
Update schematic
Step #5
Write the design description

1. Uses Apache.
2. Operates in the MP [or MT] model.
3. Spawns a new thread to handle each request; each thread pulls a response from a shared pool of images.

Develop description from general to specific
Step #5
Write the design description

- Use section headings to show hierarchy of ideas
- Chunk information into readable sections
- Use figures, tables, and pseudo-code to illustrate concepts

Sections are organizing tool
Step #6
Write introduction

- State design purpose
- List specific design considerations
- State your approach to the problem

Each design problem has a consideration
1.0 Design Overview

The goal of this design is to provide . . . We accomplish this goal by . . . . We achieve fault isolation by . . Our concurrency model . .
Step #6

Write conclusion

Evaluate your design!

- Summarize design problems you solved,
- Identify problems in your design, &
- Justify why your design does not address these problems
5.0 Conclusion

Our Surveillance@Home design uses processes to . . . This design does not cope well with long term overload because . . . [explain why you did not address this issue]
Step #7 Write the front and end matter

- Executive Summary
- Title Page
  
  Title
  Your name
  ID#
  Recitation instructor
  Section time
  Date

- Acknowledgements
  - Anyone who helped you with design

- References
  IEEE style
Acknowledgements
Thank you to Professor Kaashoek and Chris Lesniewski-Laas for their suggestions on achieving fault isolation.

References
Step #8: Double-check design specs

- Ensures that you have not missed any design specs

  Identify problem
  ↓
  Fix design
  ↓
  Simplify design
  ↓
  Update schematic
Step #9: Refine, clarify, & peer review

- Give your report to a peer for review

- Refine writing:
  Writing tutors are available to help you.

- DP1 graded on writing & content:
  6.033 is CIM course
Proofreading Checklist

Did you chunk information into expected sections?

Executive Summary
Title Page
1.0 Design Overview
2.0 Design Description
3.0 Conclusion
Acknowledgements
References

Organize by function:
- Fault Isolation
- Resource Allocation
- Alternatives
Step #10 Proofreading Checklist

- Did you chunk information into expected sections?

Executive Summary
Title Page
1.0 Design Overview
2.0 Design Description Organize by Modules
3.0 Conclusion
Acknowledgements
References
Proofreading Checklist

- Did you number the pages?
- Is your name on every page?
- All figures/tables labeled & referenced in the text?
- All sources cited?
- Did you avoid:
  - naked “this”
  - “the reason is because . . .”
  - “the fact that . . .”
  - over-use of “I”
  - passive voice
- Did you proofread a printed copy?
Report Format

- 11 or 12 point font
- Single-spaced
- No more than 5,000 words, including executive summary
- Submit 2 copies
- Not stapled—paper clipped
Writing Help

- Model DP1 papers on 6.033 website
- Readings in your course packet
- Writing Center
- *Mayfield Handbook of Technical and Scientific Writing*

Writing Tutors available: make an appointment online
How do we grade DP1?

Technical staff:

1. Is the design described unambiguously?
2. Does the design achieve design goals?
3. Are your design decisions well justified?
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Writing Staff:
1. Is the report well-organized within and across sections?
2. Is it professionally presented?
3. Are text and figures integrated?
4. Is the writing clear? Edited prose?