

The Formal Technical Report

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Outline of Talk

1. The Elements of a Technical Report
2. Detailed Structure of a Technical Report
3. Approaching Writing Task, Style Issues
4. Technical Aspects of Writing

1. The Elements of a Technical Report

- Title and Abstract
- Table of Contents and Nomenclature
- Introduction and Analysis
- Experimental Equipment and Procedure
- Results and Discussion
- Conclusions, References, and Appendices

2.1 Title of the Technical Report

- Consists of seven to eight well-chosen words.
- Goal is to give clear understanding of the content.

2.2 Abstract (Summary)

- Should not be written until all other parts completed.
- Only one or two paragraphs (250-300 words).
- Stated in simple declarative sentences.
- It *must* stand alone from the report.

2.3 Table of Contents

- Lists each section heading along with page in report.
- Does not include Table of Contents and Abstract.
- Followed by a list of illustrations and a list of tables.

2.4 Nomenclature

- Alphabetic list of all symbols used (first Latin, then Greek).
- Separate list for extensively used acronyms and abbreviations.
- Acronyms and abbreviations must be spelled out at their first appearance, e.g., fast Fourier transform (FFT).

2.5 Introduction encourages to read on

- Describes motivation: why is your work important?
- Provides background: what is the context of your work?
- Ends by describing what follows in the sections.

2.6 Analysis = underlying mathematical basis

- Derivation from well-known basic relationships to the specific formulas used to handle and interpret the data.
- Quote readily available results from the literature.
- Be self-contained, reader should not consult other sources.

2.7 Experimental Equipment and Procedure

- Schematic overview of the experimental equipment, description of algorithms and software used.
- Open to peer review: experiments can be reproduced by someone familiar with the general area.
- Poor quality of tables and pictures may destroy report!
- Every table and picture must have clear caption, i.e.: legend for column headers and coordinate axes.
- Never include tables or pictures not mentioned in the text.

2.8 Results

- Present answers obtained from experiments, referring to tables and pictures, inform about the analysis of the data.
- Assume some readers will jump immediately to results section.

2.9 Discussion

- Summarizes results, separating the new from the “as expected”.
- Compares with similar investigations, pointing out strong points and the limitations of our work.
- Provides interpretation of the results, progressing logically, starting with what is known first, and then what is new second.

2.10 Conclusions

- Concise statements of your results and discussion.
- Clean synthesis without further explanation.

2.11 References

- [1] W. Strunk and E.B. White. *The Elements of Style*. Fourth Edition. Longman Publishers, 2000.

2.12 Appendices

- Side issues or (output of) lengthy calculation, for example: print out of Maple worksheet or MATLAB output.

3. Approaching a Writing Task, Style Issues

- Who will read what you are writing?
- Multiple authors: pass text around and discuss your changes to arrive at a neutral, uniform narrative flow.
- Technical writing is direct, concise, and clear.
- Read, revise, read, revise, read, revise...

4. Technical Aspects of Writing

- The typesetting environment:
 - Microsoft products are germane in business and industry.
 - \LaTeX is standard for mathematical typesetting.
 - Know how to include graphical results in your documents.
- Writing by hand versus typing on computer:
 - By hand: focus on ideas and content.
 - On computer: fast itemizing, attention for layout.
 - In any case, use of spelling checker is mandatory!