WRITING A PROJECT REPORT

1. INTRODUCTION

Report writing is one of the tasks that all engineering students must encounter during their study or their work as professional engineers. Most students have some difficulties with the presentation of reports for laboratories, assignments, and projects. This brief note presents a summary of what a technical report should contain and how it would be assessed by academic staff.

2. GENERAL COMMENTS ON REPORT WRITING

The results of an engineering investigation should be presented to the promoter or reader (anyone for whom the report is intended) in the form of a written report. The style and form of this are at the discretion of the engineer and will vary according to the nature of the project. But it is of the utmost importance that the report be written in good and simple language and the subject matter so presented that it can be readily understood by the reader who may neither be able to appreciate the finer technical details nor have the time to absorb them. On the other hand the report must contain sufficient technical information to convince any other engineer to whom it may be refferred of its soundness. It is often found convenient to include technical subject matter in appendices to the main report or in a separate volume.

Report writing should be objective without exaggerating the value and originality of the results. The communication of ideas, facts, and results is required to present in a clear and concise manner. Basically the engineer should report what he has been asked to do, what he has done, and the conclusions he has reached. Many students write report for them selves but should consider the recipient of a report; interesting and imaginative writing can improve the readability of a report. Students should be encouraged to develop their own style of writing report but within formal guidelines such as those that follow. Remember that the contents (not the thickness) of the report is the most important part of that report. Do not try to put too much irrelevant materials in order to make your report thicker than neassary

3. REPORT LAYOUT

The following is a general guideline of what a report should contain.

3.1 Order of sections

In general a report should include and follow the order of sections outlined below :

- Title or title page with author(s), date
- Abstract
- Contents
- Introduction
- Main body of report made up of various sections depending on the report
- Conclusions
- References
- Appendices (optional)

Lists of symbols, diagrams or tables may be included if appropriate.

3.2 Order of importance of sections to reader

While all sections are important and necessary in a report, it is considered helpful to convey a likely order of importance so that a report writer can ensure that the reader is likely to gain the right impact of a report even if sections are read out of sequence. The order generally agreed to is :

- Abstract
- Conclusions
- Introduction
- Main body of report
- Title
- Contents
- References
- Appendices

It should be emphasized however that a perceived order of importance depends on why the reader is reading it, the prior knowledge and subject familiarity of the reader, and whether it is the reader's first or subsequent reading of the script.

4. REQUIREMENTS OF SECTIONS OF THE REPORT

4.1 Title

A title is a clear and concise statement which accurately specifies the subject matter in as few words as possible. Accuracy and brevity are a trade off but the title should be meaningful and self explanatory, if possible, to the general reader. A title page for a formal report should include the title, the author's (s') name(s) , the date, where the experiment was conducted, and why the report was written. For the case of a senior project, follow the project guide line for the format of the title page.

4.2 Abstract

An abstract is a concise statement of the topic addressed in the report and its significance, the objective of the work, the results obtained and the main conclusions or technical contribution. It must attract the brief attention of a skimming reader who will probably read this section of the report first.

The abstract should be written so that it can be read on its own in an abstracting journal. Consequently it should provide just enough information so that the reader knows whether s/he is the kind of reader the report is written for and hence decide whether the effort should be made to request the report.

4.3 Contents page

A contents page is a very ordered, numbered system conveying the main themes and ideas of a report. It helps to make the structure logical and clear in a reader's mind by showing the structure of the report via section and subsection headings, title and page number. It should be set out in the following form:

Table of Contents	*Page no.*
Chapter 1 Introduction	1
Chapter 2 Heading	x
2.1 Sub-heading	.
.	.
2.1.1 Sub-sub-heading	.
.	.
2.2 Sub-heading	.

.
.
.
References
Appendices
Appendix A
.
.

List of figures, tables, symbols are optional extras usually given Roman numeral page numbers preceding the first chapter (*Introduction*).

4.4 Introduction

An introduction describes the purpose of the report i.e. why it was written and why it is important. It provides a general development of the topic to be discussed in the report by leading into the specialist topic from the broader viewpoint. In this way it relates the topic to the rest of the field with which the broad base of readers are familiar.

In some cases it may be appropriate to provide a brief summary of the state of the art and the shortcomings of previous work in the area. Also a brief outline of the organization of the rest of the report can be included if there is not a contents list. A statement of the problem, its importance, and scope of the investigation should be presented here.

In preparing the introduction, the writer should not assume that the reader has read the abstract as this is independent of the report. Similarly, knowledge of the rest of the report should not be assumed in the development of the introduction.

4.5 Main body of the report

This heading refers to one or more sections which convey to the reader information on what the author has done. Here the writer can show his/her skill and originality by presenting the material of the report in an appropriate and meaningful organization. Sections of the report must be ordered in logical sequence to develop the subject matter, succeeding sections should be linked to preceding sections. If the section headings and sub-headings are well chosen, then the reader will get a good idea of the report's organization just by looking at these.

The organization of the main body of the report should have a flexible breakdown depending on the report type, e.g. with a formal laboratory report a theory and background section should provide all required theoretical development, not just a statement of a formula or an equivalent circuit.

Enough information and background theories should be included to bring the readers' education up to an appropriate minimum level in order that they can follow and appreciate later sections.

The author should begin this part with the methods or approaches that the solution is based upon, and reasons for adopting this method, alternative solutions considered with reasons for their rejection, details of investigation carried out and design criteria adopted. Basic assumptions and description of how an experiment was set up and carried out should be included in an apparatus or method or experimental procedure section. This is not just a list of apparatus or just block diagrams of the systems.

A results section should provide a description of the experimental results obtained and present them in tabulated or graphed form, either directly or in a modified form as required by

theory. Graphs or diagrams, rather than tables, greatly increase the assimilation of information and allow for a corresponding reduction in the number of words needed in the text.

A discussion or comparison with theory section takes the reader through the results and explains their significance in view of the theory and discusses the errors arising from this comparison. This is one section in which individuality can be expressed by bringing out the main aspects the author wishes to emphasize. The discussion section can be used to carry out the process of establishing the conclusions with references to the other sections of the report.

It is sometimes inappropriate to break down the body of the report into a *Method* section, then *Results*. It can be better to have a single section , e.g. *Experiment*, in which the method and results are set out in an expository fashion. This makes for easier writing and reading, and avoids having to flip back and forth between sections which logically must be interlaced.

With a major report, *Design and Implementation*, and *Suggestions for Future Work* sections may be appropriate.

4.6 Conclusions

An evaluation of the work performed and recorded forms the *Conclusions* of a report. This is not a detailed exposition but a summary of the main results and conclusions, with reference to the objectives of the work. Specific achievements made in the course of the experiment or investigation are related along with their significance and relationship to theoretical expectations and the broader context. Lengthy discussions or arguments to explain discrepancies should be carried out in previous sections.

If possible, specific conclusions should be presented in a way which emphasizes their generality and is comprehensive even without knowledge of the technical details of the report.

Nothing new should be introduced at this stage except may be to suggest where the report leads in the future. Recommendations for futher investigation may be summarized here.

4.7 References

References are authoritative sources of information used by the author in developing his/her argument; the sources of quoted material (text, figures, equations etc.) and the sources of information which could help a reader to the topic. They should contain sufficient information to trace them easily and rapidly in a library Redundant information should be included to allow a measure of mis-referencing.

Provided the reference information is complete, the order of reference information can be flexible. However, it is a good idea to use the standard forms. Each international journal insists on its on choice for paper submussions and these can provide useful examples, e.g. IEEE, IEE. A general form for reference material for a paper or article is: author(s), title, journal/source/publication, volume/issue no, date/year, page numbers. For a book this becomes author(s), title, publisher, date/year, page/chapter(optional).

For references given in this manner it is usual to number and list them in the order in which they are first referred to in the main text. They can then be referred to by the number enclosed in brackets, e.g.(15) or [15] either as a superscript or on the text line. An alternative form of referencing is by author and year, enclosed in brackets, e.g. [author, year]. If this method is used it is convenient to order the reference information by author and year also and to list the references in alphabetical order.

4.8 Appendices

An *Appendix* is used to include material information, reasoning, or analysis of some importance which is not absolutely necessary (critical) to an understanding of the main text and if included would interrupt the smooth flow of the main text. It contains supportive material which the serious reader might need for testing the arguments of the report; the enthusiastic

reader might need to extend the work reported, or the reader might not have access to in an average technical library.

Such material includes raw data, computer programs, technical or mathematical proofs of developments used in the main text, manufacturer's specification sheets of components, or detailed servicing and/or wiring components.

5. REPORT ASSESSMENT

Make sure that you do not have the following mistakes :

- Main body of the report is not in a logical sequence
- Circumlocutions
- Technical inaccuracy
- Misspelling
- Incorrect sentences
- Inconsistent use of technical terms
- Information introduced at the wrong point
- absence of references for equations, paragraphs, figures, or tables
- absence of referencing to figures in the text
- Unnumbered equations
- Untitled figures

6. CONCLUSIONS

One of the most important aspects of technical education is learning the ability to convey information in a clear, concise and convincing manner. At the heart of training for this role in professional life is the practice of report writing, conducted for laboratories, assignments and projects for undergraduate students.

This note has outlined the general requirement for the presentation of reports for laboratories, assignments, and projects. A summary of what a technical report should contain and how it should be prepared has been presented. It is hoped that the result is a better understanding and quality of report writing.

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