



Report writing

4. Writing technical reports

The function of technical reports

In industry, technical reports are used to communicate technical information. This information assists in decision making; for example, in the purchase of equipment, or finding solutions to technical problems. Technical reports are objective, and while they may include considerations of costs and other related factors, these are not the focus of the report. An important consideration when preparing technical reports is the audience and purpose of the report: for example, to brief managers, or to provide background research for technical supervisors. These factors determine the degree of technicality of the language and concepts involved.

At university, technical report writing is a frequently used assignment format in faculties of engineering and in the applied sciences. This is because the assignment tasks require students to draw theory and real world situations together, and to present the information in a structured and accessible format.

The structure of technical reports

Reports utilise headings to divide information into sections. The headings help the reader to locate relevant information quickly. Below are some guidelines for structuring your report.

Title page

This front page should contain the following information

Name of Faculty or Department

Name of Subject

Name of Project

Name(s) of Student(s), Student ID No(s), Contributions (%)*,

Signature(s)

Name of Tutor/Supervisor (if applicable)

* Include percentage of contribution of each student - for group reports only.

Abstract or executive summary (on new page)

The abstract or executive summary provides a summary of the report's essential information and usually is about 100 to 200 words in length.

The abstract should summarise:

- background problem and purpose of report,
- brief details of the approach, procedure and/or methods,
- important results and/or findings,
- major conclusion(s).



1. Overview



2. Writing laboratory reports



3. Writing accounting and finance reports



4. Writing technical reports

Learning objectives

This module will help you to:

- understand the generic function and structure of reports
- understand how different types of reports and their audiences influence the structure and style of the report
- set out the information in your report
- refer to any tables and graphs in your report in an effective way
- use appropriate grammatical structures



Executive summary

The operation of garden taps can pose a difficulty for many tap users. This report describes and evaluates the range of possible design solutions this team has generated. The team identified a lack of commercially available solutions to the problem and subsequently designed three alternative solutions. Evaluation of the alternative solutions identified the tap handle extension, named “Easy Tap”, as the optimal solution to the problem. This tap handle extension consists of a channel-type attachment, onto which a vertical tube is joined, which in turn supports a larger handle that is over twice the length of the existing tap handle. ‘Easy Tap’ is able to slide onto the existing tap handle, its over-size handle providing a greater torque-moment for the user that overcomes the difficulty of operating the tap. A commercial evaluation suggests that “Easy Tap’ will not only be a possible design solution to the problem but will also be a commercially viable solution to the problem.

*background problem and purpose of report
brief details of the approach/method
important results and/or findings*

major conclusion

Table of contents (on new page)

This should include:

- (a) all section headings and subheadings - numbered and worded exactly as they appear in the report,
- (b) page numbers for all sections.

List of figures (optional, on new page)

This list is used mainly for reports containing numerous figures. It includes the figure number, caption and page number, ordered as they appear in the text.

List of tables (optional, on new page)

This list is used mainly for reports containing numerous tables. It includes the table number, caption and page number, ordered as they appear in the text.

Nomenclature (optional)

Where symbols are used extensively, a list of symbols and definitions should appear at the beginning of the report. If there is no list, symbols should be defined in the text when first used.

Introduction

This section gives the reader the necessary background information. Depending on the type of project/report, the Introduction can include:

- (a) statement of the problem(s) and description of main aim(s) and objective(s),
- (b) review of previous work/research and relationship to current project,
- (c) explanations of terminology if necessary
- (d) method(s) of approach,
- (e) indications of scope and limitations of the study,
- (f) outline of material presented in rest of report.

Excerpt from main section of a report

2.1 Design solutions

The design team generated 3 possible solutions. Two of these designs are of the add-on tool design, comprising identical attachment mechanisms, with different handle designs. The third design incorporates a redesign of the tap operating mechanism.

2. 1.1 Design A:

This design is of the extension type, a larger, extended handle that solves the design problem by providing the user with a larger turning moment. The larger handle means that the user has to exert less force to create the required turning moment to operate the tap, since torque is equal to force multiplied by perpendicular distance. The larger handle is also easier to grasp than the standard tap handle, reducing the painful strain on the user's hands.

This extension slides over the tap handle via a length of channel, allowing the device to be taken from one tap to another by the user. The extension is also light in mass, simple to construct and inexpensive to make (see Figure 2.3 for details of the basic design)

Conclusion

The conclusion(s) of a report must be related to, and resulting from, the material which appears in the report. The Conclusion must not introduce any new material. Quite often present tense is used. For example: "*the cement tested in this project is a good candidate for the dense-phase mode of pneumatic transportation*".

Conclusions quite often read by managers before the main text of the report and hence, should summarise the main points clearly. This section also may include:

- (a) reference to original aim(s) and objective(s) of report,
- (b) application(s) of results,
- (c) limitations and advantages of the findings,
- (d) judgement/evaluation of the author(s).

Conclusion

"Easy Tap' is suitable for all outside taps throughout Australia, as is suits tap handles with a diameter of less than 18 mm at their widest point. Provided users do not overtighten the tap valve; this solution successfully eliminates the difficulty of operating an outdoor garden tap. The solution is economically viable, due to its simple construction and the use of inexpensive materials and construction methods. An approximate cost of \$2.64 has been estimated for materials, thus a retail price in the \$5 to \$10 price range is envisaged. This price would cover joinery, painting, shipment, packaging, marketing, and labour costs and would provide a reasonable profit margin.

reference to aims and objectives

"Easy Tap" satisfies all of the restrictions as described in section 1.3, and satisfies the outcomes described in section 1.6. The tap handle extension; which has been named "Easy Tap";

advantages of the findings

is a light, manoeuvrable, durable and inexpensive solution. The "Easy Tap" successfully eliminates the difficulty of operating an outdoor tap, regardless of the tap's condition, the user's strength, the original handle size and the environmental conditions. "Easytap" is a possible and commercially viable solution for this design problem.

authors' evaluation of the design

Recommendations

If required, recommendations should emerge from the conclusions of the report. This section is important to those who must act on the findings. Recommendations also may include suggestions for further work.

References

All references to other authors or texts cited during the report must be listed in this section. Check with your tutor for any Faculty guidelines on referencing formats.

Appendices

If needed, appendices can be used to provide repetitive or lengthy information (eg figures/tables of results, statistics, lengthy derivations of equations, maps, drawings, letters, specification or data sheets, computer program information). Each separate appendix should be lettered (Appendix A, Appendix B, Appendix B1, Appendix B2, Appendix C, etc).

Grammatical features of technical reports

Technical reports are formal, objective and should be logically developed. We have included some examples to highlight how you can achieve a suitable style through the choice of particular grammatical structures.

The design team *constructed* 2 prototypes: design A and design B. Construction of the prototypes *was achieved* using a hand angle grinder, a gas equipped MIG welder and a metal cutting saw. The materials used in construction were those *specified* in the economical evaluation. After construction, the 2 prototypes were tested on a number of outdoor taps, and were both found to successfully *eliminate* difficulty in operating the taps. The slide-on channel fitting worked *exceptionally well*, *providing* a secure fit to the tap while being easy to attach and remove. The estimated handle sizes were correct, while the overall *dimensions* and *masses* of the 2 designs were also correct.

Phrases such as 'the design team' instead of the pronoun 'we' help to create impersonal and more formal language

The use of passive constructions such as 'the prototypes were tested' creates a more formal and less personal feel to the language. Notice how **informal** the style would be if the writer had said 'we tested the prototypes'. It is also information that doesn't need to be stated: readers would assume that the writers carried out the testing.

Use of discipline specific terminology

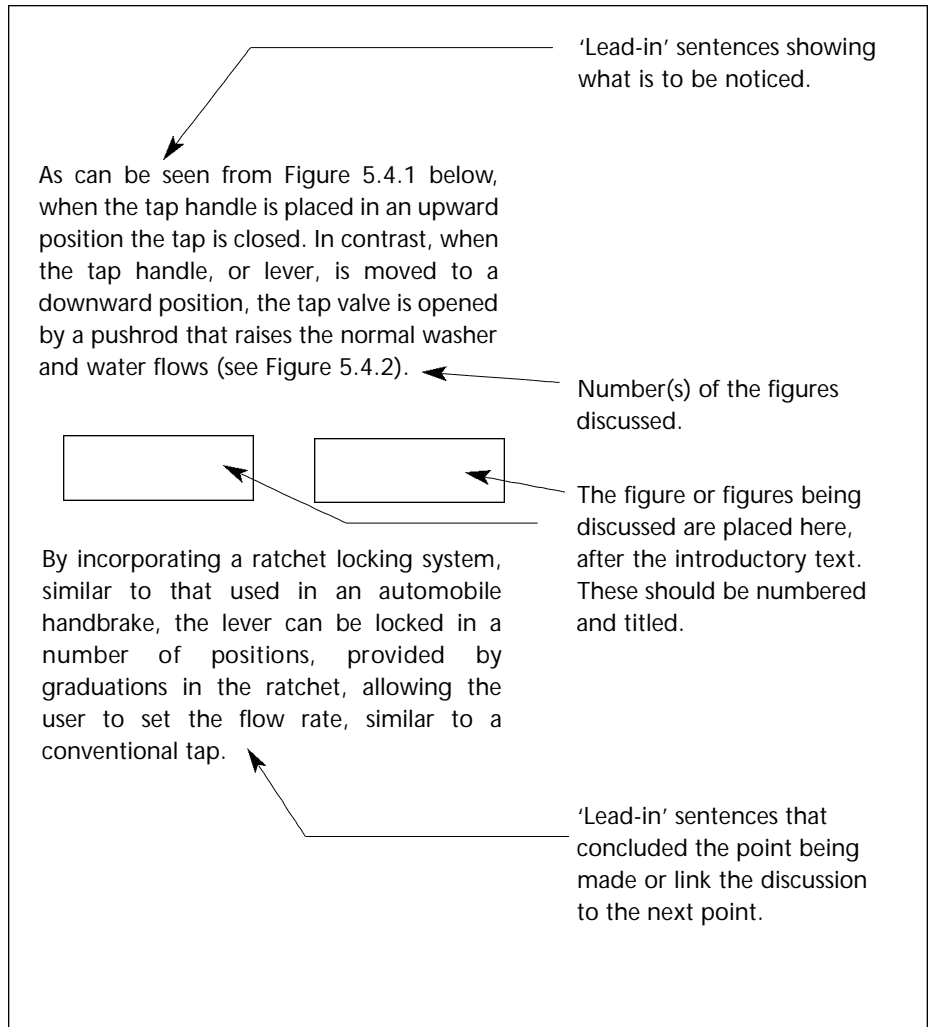
Example

This design is of the extension type: a larger, extended handle that solves the given problem by providing the user with a larger turning *moment*. The larger handle means that the user has to *exert* less *force* to create the required *turning moment* to operate the tap, since *torque is equal to force multiplied by perpendicular distance*. The larger handle is also easier to *grasp* than the standard tap handle, reducing the painful strain on the user's hands.

Most disciplines have terminology that identify that discipline. This writer has used terms and phrases that suit the discipline of engineering and its technical nature.

Including visuals, graphs and tables in the report

All visuals that are included in a report should be explained and referred to in the main body of the report. A useful way to do this is to lead into the visual by telling the reader what to focus on and then lead out of the visual perhaps by linking the important point that was illustrated to the next salient point. For example:



Learning development

Learning Resource ♦ Learning Resource ♦ Learning Resource ♦ Learning Resource ♦ Learning Resource

Note

This material has been adapted from *Report Writing Guidelines for ENGG154 Engineering Design and Innovation*, developed by Jan Skillen, Peter Wypych and Kim Draisma, University of Wollongong.

Reference

Winckel, A and Hart, B (1996), *Report Writing Style Guide for Engineering Students*, Faculty of Engineering and Flexible Learning Centre, University of South Australia.