

How to Write a Technical Report*

The publication of the technical details of developmental efforts related to the creation of a particular artificial device/product on the basis of established fundamental knowledge is made in the form of a technical report. While regular research papers have either only pure research content or both research and development (R&D) parts with an emphasis on the research findings, technical reports focus on the technicalities during the development process. Technical reports also have certain fundamental research elements which are rather limited and partially explored but can eventually be used in future studies. The editorial decision about the classification of a given manuscript as a technical report is made on a case-by-case basis. Both form and content of technical reports are discussed below.

Form of a Technical Report

A technical report typically consists of five up to eight two-column pages. Technical reports can be organized similarly to regular research papers as described in the article “How to Write a Regular Paper” in the 13(3) January 2010 issue of AU J.T to include the following items:

- title, not exceeding 75 characters;
- full name(s) of the author(s), with no title(s);
- affiliation and e-mail of the first author, and e-mail(s) of other author(s) with the same affiliation as the first author, if any (for other author(s) with other affiliation(s), if any, affiliation and e-mail should appear in a footnote);
- abstract (not exceeding 200 words but no fewer than 100 words);
- keywords;
- introduction, not exceeding one page, which provides an insight about the importance of the reported information for the practice;
- body of the report;
- conclusion;
- acknowledgements (optional);
- references; and
- appendix (optional).

However, technical reports may have some specific organization of the corresponding sections of the *body of the report* which may consist of several sections, depending on the technical work that has been done. The said body should be logical and systematic which can be accomplished with the use of a simple writing style and a proper technical terminology. The sections should contain coherent information to build up the subject matter in a logical way. The information that does not fit with the subject matter should be included in one or more Appendices.

Sample sections that may be put in the body of the report are listed below:

- technical background, including a literature review, describing the initial problem and its evolution, the basic requirements, and the known solutions;
- reasons and motivations for design choices;
- methods, proposed design or layout;
- basis, key aspects of realization;
- choice of set-up or measurement method;
- performance evaluation, comparison, discussion and analysis of obtained test results.

The readability is a major requirement when analyzing the language aspects of technical reports. The construction of concise and simple sentences with the use of short words and active verbs optimizes the writing process and allows the inclusion of more information.

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Content of a Technical Report

The description of models, methods and components which are used for the design of artificial devices must be precise and comprehensive. The purpose of the published matter is not just to report the creation of a prototype and claim a priority but also to allow its replication and testing by other professionals. Some practical criteria for the evaluation of submitted works are: applicability of the devices, optimal modular design, and reduced costs of implementation.

A technical work which covers multiple aspects of a given developmental effort and substantially exceeds the size limitations of a single contribution can split into two or more parts to be published separately. Sometimes, the research aspects of a study may appear in a regular research paper and the applied aspects of the said study may result in a technical report. Partial new improvements of an already published technical contribution can be summarized in an Addendum.

A section considering the balance between the independence and the interdependence of the factors involved in the performance of the discussed application is an essential part of a technical report. The said section also deals with a description of encountered unexpected problems, presentation of intermediate results, work in progress concerning less known factors, etc.

Technical reports may occasionally contain up to ten pages depending on the size of the graphical content. Large figures depicting complex block diagrams, flow charts and electric circuits can eventually span over an entire page provided that the figure details are clearly observable and also well explained in the corresponding sections. If a large technical illustration cannot be presented in a single graph, a modular approach is recommended. A simplified block diagram of the entire scheme is to be followed by additional figures showing the internal structure of each block. Crucial components and interconnections which are introduced for the first time by the author(s) should be emphasized and described in detail.

Instead of plotting a separate graph for a given data series, a joint presentation of several data series in a single graph is more appropriate for comparison and analysis. If some of the numerical ranges of the data series differ several orders of magnitude, a logarithmic scale for the corresponding axes is to be chosen.

A balance is required between the number of figures and tables and the textual content. An Appendix is added whenever there is a necessity to introduce series of figures or tables.

Although the mathematical content of an applied contribution is often limited to known formulae, the full or partial derivation of less known or new analytical expressions is sometimes needed. In such cases, the series of equations following to the final result should be conveniently given in a separate Appendix.

Technical reports considered for publication in the journal cover a wide range of topics which include, but are not limited to:

- developmental issues, sustainable development of the society through innovations and the establishment of a self-sufficient economy;
- technology management;
- biotechnology, elimination of poverty;
- health technology, life-saving devices, disease prevention, telemedicine;
- environmental issues, nature preservation;
- disaster management;
- new knowledge, education and technology
- information and communication technology (ITC);
- e-learning in science and technology;
- convergence from technology to cyberotechnology during the transition to knowledge-driven society, world peace.