The Structure of a Scientific Report

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A scientific report typically consists of the following sections:

  .. Abstract

1. Introduction

2. Related Work

3. Theory *or* Methods

4. Implementation

5. Results

6. Discussion *and/or* Conclusion

  .. References

The *abstract* is a short summary (preferably less than 500 words) of the contents of the report.

The *introduction* defines and motivates the problem (what is the problem? why is it interesting?), and it may be used to build an hypothesis in order to initiate the solution process. It should also contain the objectives of the report (how do you intend to handle the problem?).

The section about *related work* is used to identify what is already known, and, in addition, it is sometimes used to state what the authors did that is different from what is known. Sometimes related work is described in the introduction.

The section concerning *theory* or *methods* is used to describe possible solutions and to decide on the best one.

The section about *implementation* is not always present. It is typically used if some extra information is needed to implement the theory in practice, or if some particular algorithm or hardware gives a speed-up with respect to finding the solution.

The *results* section is essential. This is where you describe the outcome of your efforts. Here you complete the best solution, test it, and list the results.

The report ends with a section called one of the following three: "Discussion and Conclusion", "Discussion", or "Conclusion". The difference is subtle, but the point is that you should state whether you reached the objectives of the report or not (did you solve the problem?). In a *discussion* you mostly reflect on your theory, implementation, and results. In a *conclusion* you recapitulate how the problem, which was defined in the introduction, was solved in the report (this should be done in a way so that you can read the introduction and conclusion alone and get a good idea of the report contents). It is also good practice to provide a short assessment of the quality of the presented solution (self-criticism). The last section is also often used to state if the solution enables new applications, and if the authors intend to investigate such new applications, or if they intend to improve the work in other ways in the future.

The section called *references* is simply a list of the books, articles, papers, web pages, etc. used in the process of writing the report. There should be a number or other identifier for each reference such that they can easily be referred to in the main text of the report.