
Chapter 6. Research Proposals

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When are you ready to write a research proposal?

It is not wise to rush into writing a proposal unless you are sure that you have a research goal that is feasible and suitable for your interests and background. To check this, make sure that the following statements are true for you:

- I am familiar with related research in this area
- I have a good understanding of the steps that will be involved in achieving these goals
- I have the ability to successfully conduct each of these steps
- I am sufficiently motivated and enthusiastic about all the steps in this project
- I am convinced that the results of this research will be useful to others

Research proposal structure

A research, thesis, or grant proposal usually comprises the following sections:

1. **Title.** Give a meaningful title that summarises your planned research project.
2. **Executive summary.** Describe the project and its importance in about 250 words.
3. **Research goals.** Give short- and long-term goals, and their significance, explaining what difference your research output will make to current theory and practice. List the main research questions you are asking, and if anyone else has said the problem/task is important to study, then say so. While you cannot know what your research outcomes will be, give an indication of what outputs and results you envisage.
4. **Existing research.** Review the current knowledge in the field. and include your own past research to show your familiarity and competence in the subject. Make sure it is clear how your research differs from what already exists, and how it relates to this.
5. **Methods and experiments.** These should be outlined in sufficient detail to show that they are feasible and suitable. Assess the difficulty of your goals and describe previous experience you have with similar goals, methods or experiments. Consider what risks exist and how you will minimize these. Show that you already have a plan for evaluating your research outputs your work will be wasted if you do not know how you can evaluate your success or goal achievement.
6. **Timetable.** List major tasks and their expected completion dates.
7. **References.** In a thesis proposal, this should include papers you plan to read and an annotated bibliography for those you have already read, showing that you can group these papers into suitable categories and are aware of the key articles in the field.

Additional material

If the financing of the research is an issue, a budget must be included. Itemise what will be required, with cost estimates and motivation. Every such item must be essential to the viability of the work, and you must explain clearly why this is so. (Note: this section is omitted in a thesis proposal)

Where applicable, attach CVs of researchers and supporting documents from your own or any other institution wishing to be involved as collaborator or funder.

Depending on the type of proposal, a draft table of contents for the final report can be a concise yet detailed outline of what is envisaged. This is more suitable for projects of fixed, short-to-medium scope - a Masters thesis is a good example.

Grant/funding proposals

In order to convince funding bodies that your research proposal deserves an appropriate research grant, you will need to show that

- the problem being addressed is important
- you have the experience and ability to solve it within time and budget

This can be done in the following way:

1. Your research problem can be shown to be important by showing that it is likely to lead to new discoveries within its field or to have substantial impact on other fields. Show that it has the potential to contribute to better understanding of the field, and where applicable, that it can help to achieve an extrinsic industrial or sociological goal through improved technology. If your research is capable of facilitating the distribution or effectiveness of science education, this should also be explained.
2. Your suitability for the work will be rated according to your recent research performance, the soundness of your research proposal (including the methods and approach you plan to follow) and the adequacy of resources you will have at your disposal (according to equipment and people available and budget requested).

Help in writing a proposal

To help you write a research proposal (or any other research article), first work out how you would explain your project to someone who is not a Computer Scientist, or at the very least to a Computer Scientist who has no knowledge of your area of specialization (e.g. AI or databases). This will bring to light any hidden uncertainties or fuzziness in your own thinking; it will make it easier to explain complex aspects of the work in a more understandable way; and it will prepare you for those occasions in the future when you will indeed be required to discuss the work with people outside your discipline (potential clients, sponsors, employers, end-users, sources of useful data, etc.) Some general guidelines on describing research ideas can be found in the section on Research Writing.