Writing a Research Proposal

This document offers some guidelines for writing a research proposal. The operative word in that sentence is 'guidelines' since there is no unique way to write a research proposal. The actual format depends upon the research area, the problem to be investigated, and the preferred style of the institution or author. However, there are certain features that are common to all guidelines. Not surprisingly, these features are also relevant to writing the thesis at the end of the research.

1. Structure of the Research Proposal

A typical Research Proposal contains the following sections perhaps using different headings.

- Title
- Abstract
- Introduction
- Literature Review
- Methodology
- Expected Results
- References

Let's look at what goes into these sections.

1.1 Title

Decide on a title right at the outset. The title may change any number of times as the study proceeds but it describes at a point in time what the research is about and its scope (what it covers and what it doesn't). For example, the title:

> *A Study of the Role of Telehealth in New Zealand*

tells the reader that the research area is telehealth but the scope of the study is focused on, if not confined to, New Zealand. Another alternative is to devise a title that describes a functional relationship between a dependent and an independent variable. Thus:

> *The Effect of Rainfall on the Sugar Concentration of Grapes*

clearly identifies sugar concentration as the dependent (response) variable and rainfall as the independent (predictor) variable and gives a strong indication of how the study will proceed by measuring these two variables and investigating their relationship.

A third example:

> *Criteria for Selecting a Programming Language*

Is not a good title since it doesn't indicate what we are using the programming language for (no scope). The selection criteria could well differ depending on whether we are developing databases, an on-line teaching package, or some other artefact.

The title should be only long enough to be informative. Sometimes this means attaching a subtitle. For example:

> *Telehealth in New Zealand: Current Practice and Future Developments Arising from High-speed Broadband*

These examples reveal that a good title is accurate, concise (short), informative, and defines the scope of the research. Note also that only the first example contains a phrase such as '*A Study of…*' or '*A Research Investigation Concerning…*'. Such phrases are rarely necessary and can be left out especially if the title is getting too long. Make every word earn its place.

Refer constantly to the title of your study as you undertake the research. It will remind you of what you said you were going to do. It will tell you if you are wandering off message or prompt a change if a revised scope requires it.

1.2 Abstract

This section is essential for a thesis but less so for a Research Proposal, especially if the Proposal is only a few pages long. Its purpose is to capture the essence of the study in a few, short sentences or a paragraph. It should state the research problem, the reason for the study, the research question(s) (or hypotheses), and a brief description of the methodology (sample sizes, techniques, analytical methods).

Here is a possible Abstract for the last title example.

> *This study reviews the literature to discover the application of telehealth in several countries and compares the experience with current practice in New Zealand. The review also covers advances in the development of broadband technology and its potential for the future of telehealth. Finally, an on-line survey of 50 New Zealand health professionals will be conducted to determine their opinions on telehealth and the combined results used to predict how services might develop in this country.*

1.3 Introduction

The Introduction provides the background or context for the research, states its purpose, and lays out clearly the problems to be studied and the research questions. The key to a good Introduction is to keep the focus on the important issues. It´s an overview so don´t try to include everything; leave detail to the later sections. You want to demonstrate the significance of your research work so cite the work of past (historical context) and present (current context) researchers and show how your contribution will build upon this body of knowledge. Your contribution might add new knowledge, address unsolved problems, or perhaps confirm or disprove some previous assertion.

Using our programming example, previous but superficial work may have concluded that a certain language was superior to SQL for database queries whereas your proposal could be for a more detailed study that will test the validity of this conclusion more thoroughly.

The purpose or aim of a study gives rise to a high-level research question and it is common (although not essential) practice to resolve this question into two or three sub-questions that will focus the work. Thus, taking the role of telehealth project as an example, the research question and sub-questions to be answered might have the form:

Research question: What is the main role of telehealth in New Zealand?

Sub questions
- What factors determine this role?
- Is the role different in other countries?
- Will the current role remain the same in the next ten years?

Some supervisors prefer the sub-questions to be stated as testable hypotheses, for example:

Hypotheses:
- The availability of a broadband infrastructure is the most important factor affecting the role of telehealth in New Zealand
- Telehealth in New Zealand differs from other countries because of government policy
- There will be no change in the role of telehealth over the next ten years

Hypotheses can be more specific than questions and that is sometimes useful. Whatever the choice, state the purpose, research question, and sub-questions/hypotheses very clearly and ensure that the project addresses them all.

Here are the key elements of a typical Introduction.

- State the research area and the research problem (purpose of the study)
- Show its context and why the research is worth doing
- Set the boundaries of your research (scope)
- Provide definitions of key concepts
- Briefly describe the major issues you will address
- State the research questions you propose to answer and any hypotheses you will test
- Indicate briefly the type of results you expect (theories, relationships, predictions, facts)

1.4 Literature Review

See also the document on writing a Literature Review. The Literature Review has two aims. Firstly, and pragmatically, you use it to demonstrate to your potential supervisor that you have a sound knowledge of your intended field, its theoretical foundations, and the main conclusions reached by previous researchers. Secondly, you marshal the evidence from this survey to expose the gaps in knowledge or understanding and the questions you want to address. In short, the review is directed to showing the novelty and value of your proposed work and how it extends previous work and leads to the research questions posed in the Introduction.

Therein lies the key. The review is not just a list of any publication that has even the slightest relevance to your field but one that identifies the seminal papers, the key researchers, the topical issues, and the unanswered questions. Write a story based on a theme or thread. At its simplest, the theme could be chronological describing how the field has developed or it could focus mainly on current views and arguments of interpretation. The theme approach will also allow you to integrate the outcomes of previous studies and suggest directions in which the field might develop or build the weight of evidence for a particular interpretation.

The Proposal will have fewer references than the final thesis but it is still important to avoid a purely descriptive approach such as ‘Bloggs et al (1996) showed X and Smith (1997) showed Y’. You need to read the articles carefully and decide their good and bad points. Then you can say something like ‘Using a resolution of ±10 mm Bloggs found X but in her experiments, Smith used instruments with ± 5 mm resolving power so that her result of Y is likely to be the more reliable’.

Make sure that a good proportion of the studies you cite are recent (within the last five years say). A Reference list in which all of the entries are more than 10 years old suggests either that there is no longer any interest in the topic or that you have discovered something important in a field that was thought to have been worked out.

Finally, make sure that you have a varied range of sources. A list consisting only of URLs of Internet sources will not impress. Neither will a predominance of newspaper articles or marketing and trade journals. You need to cite scholarly, credible articles from reputable journals or conference proceedings. The odd reference to newspaper article can show currency, however.

1.5 Methodology

The Methodology section describes the research design, ie how you intend to answer the research questions. The section is often quite short but very important because the results outlive the project and they may be used by another researcher who needs to know how they were obtained. The thesis should describe the methodology in sufficient detail to allow another researcher to repeat your experiments but the Proposal needs less detail.

The Methodology section covers any equipment or other resources used, the data collection, any organisation or grouping of the data, the techniques used to analyse the data, and the presentation and interpretation of the results (remember the Proposal is written before you have any results). The

level of detail should be sufficient for a reader familiar with the field to confirm that you have sufficient data to apply statistical methods of analysis if these are appropriate or some other approach if not. The description should also show how you have avoided bias. For example, if you wanted to find the percentage of New Zealanders who were of Maori descent, you would want to collect data from all over New Zealand rather than just from South Auckland.

The research supervisor will want to know that you have chosen an appropriate qualitative or quantitative method for analysis. Say why this method is chosen but leave the detailed rationale for selection to the thesis.

Many IS/IT projects use surveys to determine attitudes or preferences. In this case say why you are selecting a survey, describe how you will administer it, eg face-to-face, written questionnaire, web survey etc, and why this mode is a preferred choice, and whether and how you need to obtain ethics approval. The design of questions for surveys is a skilled task but the details can be left to the thesis. Just comment in the Proposal that the questions will be carefully designed to capture features (say what they are) important for the research.

The Methodology section is probably the best place to indicate how long the project will last and to present a schedule for the individual tasks, data collection and analysis and, of course, writing up the work including the all-important discussion of the results. The section is also a good place to indicate any limitations or constraints on the project that you aware of, for example, many survey projects have difficulty in finding a large enough population to justify significant statistical analysis.

1.6 Expected Results

You are conducting a research project so you may find unexpected results and certainly at the Proposal stage you have no data or results. However, you will have a good idea of what sort of results you want, or will obtain, whether you are designing and building a software package (features and performance) or conducting a survey from which questions produce the numbers of people preferring one option or another. Hence, this penultimate section, although short, shows the reader (supervisor) that you have thought about the probable results and you have designed the data collection, experiments or surveys, and selected analytical techniques to optimise their production.

1.7 References

The last section contains references to those publications that are seminal to your research field and are the basis for your work. The strategy here is to demonstrate to your supervisor that you have recognised the key research papers so you need to evaluate and prioritise. You want no more that ten or so good references in the Proposal, the full treatment can come in the Literature Review in the thesis.

2. Writing Style

Everyone has a personal writing style determined by the language they write in, their experience, and their preferences. Nevertheless, there are elements of style that separate an excellent Proposal or thesis from a good example and from a bad one. Here are some writing tips that raise the reading quality of any Proposal.

- *Sections*: Divide your document into numbered sections and subsections so that you, and the reader, can see how related ideas are grouped together and separated from other groups. Sections are containers for different ideas so ensure that the ideas from one container don't spill over into the next. Also, make sure that that the sequence of sections is logical and the flow of ideas is progressive (see Continuity below). Try not to go deeper than two subsection levels, eg *Section 2.3.1.* If you get more sublevels, eg *Section 3.4.5.3*, then the chances are that you need to regroup the ideas and reorganise the text.

- *Paragraphs*: If you look at a history or social science book you will often find paragraphs with multiple sentences and ideas that span a page or so. That isn't good practice in technical writing because the ideas get confused and the logic behind them gets lost. The reader must be able to grasp the points at first reading. Hence, paragraphs in technical writing are usually constructed to group related ideas and data into three to five sentences. That's not an instruction but a useful guideline. Only use a single sentence paragraph if you want to emphasise a point strongly.

- *Sentences*: A sentence contains at least one subject, one verb, and one object. That's a minimum requirement but try and avoid too many ideas in a sentence. Long sentences are difficult to understand and frequently lead to ambiguity. The number of commas, defining dependent clauses, or other punctuation marks (excepting full stops) is a give away. For example, compare the sentences starting Section 1.6 with the following alternative.

  > *You are conducting a research project so you may find unexpected results, and certainly at the Proposal stage you have no data or results, but you will have a good idea of what sort of results you want, or will obtain, whether you are designing and building a software package (features and performance), or conducting a survey from which questions produce the numbers of people preferring one option or another, and so describing the type of results you might expect tells your supervisor that you have designed the data collection, experiments or surveys, and selected analytical techniques to optimise their production*.

  It contains the same ideas as in the three previous three sentences but the effort in reading it is distracting and the points carry less weight as a consequence.

- *Continuity*: This is one of the most important ways to raise the quality of your Proposal. Continuity means ensuring a logical flow of ideas that builds a story and progresses through coherent arguments to a satisfying conclusion. How then to progress from one section to another since sections separate ideas? Sometimes the flow is obvious, for example, if you are using sections to discuss the steps in constructing a model. In this case, continuity can be assumed. If the text is switching from one set of ideas to another, however, and the sections represent a discontinuity in ideas, then use a connecting sentence or sentences to alert the reader to the change. You want to prevent the reader asking '*Why does this section end here and a new one start*?'. A typical sentence to achieve this effect might be, '*In this section we have looked at why the C++ language is a good choice for graphics programming. In the next section we explore its limitations in this and other areas*'.

- *Minimise use of the passive tense*: A sentence that uses the passive tense reverses the subject and object. Thus 'I write a Proposal´ becomes 'A proposal is written by me'. Excessive use of the passive tense sounds clumsy and boring when there are several reversals in a sentence. The introductory comments on paragraphs above provide a good example from this text. Compare the 'active' tense format there with:

  > *If a history or social science book is looked at you will find a page or so is spanned by paragraphs with multiple sentences and ideas.*

This sentence just doesn`t sound right and therein lies some good advice. Say the written sentence to yourself. If it sounds right it probably is stylistically right too and easy to follow.

- *Use of the word: 'this'*: Consider the following two sentences:

  > *The risk decreases with the length of time but the impact increases. This is an important point.*

  Which is the important point; the decrease in risk or the increase in impact? Using 'this' by itself after a sentence that has two or more alternative ideas is a recipe for confusion. If there is any

possibility of ambiguity, use 'this' with its appropriate subject, eg *'This increase in impact raises an important point.*

Here is another example in which an unqualified 'this' in a single sentence causes confusion. Compare these sentences with the version starting paragraph 4 in section 1.6 of these guidelines.

> Many IS/IT projects use surveys to determine attitudes or preferences. In this case say why you selected a survey, describe how you administered it, eg face-to-face, written questionnaire, web survey etc, and why **this** was a preferred choice, and whether and how you obtained ethics approval.

What does ´this´ in the second sentence refer to? . It could be any one of five alternatives. Inclusion of ´mode´ narrows the choice to the three different survey modes as intended. Outside of this sub section these guidelines contain 24 occurrences of 'this' and 21 of them attach the noun.

Similar problems can arise using the word 'it' without clarifying what it (!) refers to.

- *Format*: The format of your Proposal, that is the font type and size, heading style, the line spacing, and margins etc are often prescribed so that all you have to do is follow the instructions. Where there are no guidelines, common sense and experience are good guides. Most Proposals look good with a 12 pt font size and double line spacing or 11pt on 1.5 line spacing. This document is set in 10 pt Arial on 1.15 line spacing.
  There is a wide choice of fonts but bear in mind that for long documents with smaller line spacing or a 10 pt font, a serif font (strictly typeface) such as 'Times New Roman' is easier to read than a non-serif font such as 'Arial' or 'Helvetica'. This is because the serifs or hooks at letter ends lead the eye across the page. Headings can be distinguished from text by being on a line by themselves, using bold or italic fonts perhaps a point size larger than normal text, or by colour as in this document. At all costs avoid fancy fonts like 'Comic Sans MS' or *'Chancery'*. They don't work in long documents. If you want to experiment or individualise your reports then consider 'Gill Sans MT' or 'Calibri' amongst the non-serif variety or 'Garamond' or 'Century Schoolbook' amongst the serifs. If you want to be really 'posh' then ponder 'Baskerville Old Face'.

Prof Tony Norris
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Related Sources

- Victoria University of Wellington, Writing a Research Proposal, http://www.victoria.ac.nz/postgradlife/downloads/%20Research%20Proposals%20(i).pdf
- Birmingham City University, 1.07 How to Write a Research Proposal http://www.ssdd.bcu.ac.uk/learner/writingguides/1.07.htm
- McGranaghan M, Guidelines on Writing a Research Proposal http://www2.hawaii.edu/~matt/proposal.html
- Wong P T P, How to Write a Research Proposal http://www.meaning.ca/archives/archive/art_how_to_write_P_Wong.htm
- Mitchell A, Writing a Good PhD Proposal http://www.findaphd.com/student/study/study-33.asp