

# Course: Research Method in Software Engineering

## **WEEK 11-** Preparing a Research Proposal

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# **Week 11.** Preparing a Research Proposal

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1. Overview of research proposal
2. Planning a research proposal
3. How to address limitations in research proposal?
4. Common mistakes to avoid in proposal writing

# Learning Outcome

- Define the meaning of research proposal
- Identify the skills required to design a research proposal
- Understand how to organize research proposal
- Understand how to address limitations in research proposal
- Describe the common mistake when writing a proposal

# 1. Overview of research proposal

## Research Proposal

- A research proposal describes what we will investigate, why it's important, and how to be conducted in our research.
- The format of a research proposal varies between fields.
- It must be carefully planned, described, inspected, and, in nearly every instance, approved by others.
- In general, a research proposal aims to convince a dissertation committee or a fund that a specific project makes sense.

### A Research Proposal Answers the Following Questions:



- ? What will I study?
- ? Why is it important?
- ? How will I do the research?

Fig. [https://custom-writing.org/blog/wp-content/uploads/2020/12/research\\_proposal\\_1.jpg](https://custom-writing.org/blog/wp-content/uploads/2020/12/research_proposal_1.jpg)

[1]. Scribbr, Research Proposal | Definition, Purpose, and Examples, Shona McCombes, October 12, 2022. <https://www.scribbr.com/research-process/research-proposal>

## Research proposal aims

- **Relevance**→ Show the reader why the project is interesting, original, and important.
- **Context**→ Demonstrate our comfort and familiarity with the field. Show that we understand the current state of research on the topic.
- **Approach**-→ Make a case for the methodology. Demonstrate that we have carefully thought about the data, tools, and procedures necessary to conduct our research.
- **Achievability**→ Confirm that a project is feasible within the timeline of the program

[1]. Scribbr, Research Proposal | Definition, Purpose, and Examples, Shona McCombes, October 12, 2022. <https://www.scribbr.com/research-process/research-proposal/>

## Skills Required for a Research Proposal

- These necessary skills are grouped into three categories for better understanding:
  - **Subject knowledge and research skills.** A proposal offers anyone the chance to show the familiarity with existing research trends and mastery of the topic/subject matter.
  - **Critical thinking skills.** A quality example of a research proposal shows one's above-average analytical skills, including the ability to coherently synthesize ideas and integrate lateral and vertical thinking.
  - **Communication skills.** The proposal also demonstrates the proficiency to communicate our thoughts in concise and precise language.

[2]. Research.com, How to Write a Research Proposal, Imed Bouchrika, Oct. 13, 2024.

<https://research.com/research/how-to-write-a-research-proposal>

# 2. Planning a research proposal

A standard research proposal typically includes the following elements:

## Step-1: Title and Abstract :

- It should be a concise statement of the main topic and should identify the actual variables under investigation and the relationship between them.
  - Avoid words that serve no useful purpose. Example, the words “method” and “results” do not normally appear in a title, nor should such redundancies as “A Study of” or “An Experimental Investigation of” begin a title. Do not use causal language, example, “the impact of”, “the effect of”, etc. Also, avoid using abbreviations in a title.
- The abstract should include a research question, the objectives aim to achieve, the methodology plan to employ and the anticipated outcomes.

# 2. Planning a research proposal

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## Formatting a research proposal ....cont'd

### Step-2. Introduction

- The first part of a proposal is the initial pitch for a project. Make sure it briefly explains what is to be done and why. Introduces research question or problem, explains its significance, and states the objectives of the study. To guide the introduction, include information about:
  - Who could have an interest in the topic (e.g., scientists, policymakers)?
  - How much is already known about the topic?
  - What is missing from this current knowledge?
  - What new insights the research will contribute?
  - Why we believe this research is worth doing?

## Formatting a research proposal ....cont'd

### Step-3: Research objectives

- Outline specific, clear and achievable objectives that align with research problem.
- These objectives should be well-defined, focused and measurable, serving as the guiding pillars for our study.
- They help in establishing what is intend to accomplish through the research and provide a clear direction for investigation.

[4]. Venngage, How to Write a Research Proposal: A Step-by-Step, Danesh Ramuthi, November 29, 2023. <https://venngage.com/blog/how-to-write-a-research-proposal/>

# 2. Planning a research proposal

...cont'd

## Formatting a research proposal ....cont'd

### Step-4: Preliminary literature review

- In this part, conduct a thorough review of existing literature related to once research topic.
- This involves a detailed summary of key findings and major contributions from previous research. Identify existing gaps in the literature and articulate how the research aims to fill these gaps.
- The literature review not only shows our grasp of the subject matter but also how the research will contribute new insights or perspectives to the field.

[4]. Venngage, How to Write a Research Proposal: A Step-by-Step, Danesh Ramuthi, November 29, 2023. <https://venngage.com/blog/how-to-write-a-research-proposal/>

# 2. Planning a research proposal

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Formatting a research proposal ....cont'd

## Step-5: Research Methodology

- Research design or methodology will describe the overall approach, and the practical steps we will take to answer research questions.

### a) Determiner Research type

- Qualitative or quantitative?
- Original data collection or primary and secondary source analysis?
- Descriptive, correlational, or experimental research design?

[3] Passion Driven Statistics, Writing About Empirical Research.

[https://statacumen.com/teach/S4R/PDS\\_book/writing-about-empirical-research.html](https://statacumen.com/teach/S4R/PDS_book/writing-about-empirical-research.html)

# 2. Planning a research proposal

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## Step-5: Research Methodology ....(cont'd)

### b) Population and sample

- Who or what will we study (e.g., high school students in New York; local newspaper archives 1976-80)?
- How will we select the subjects (e.g., probability sampling, non-probability sampling)?
- When and where will to collect our data?

[1]. Scribbr, Research Proposal | Definition, Purpose, and Examples, Shona McCombes, October 12, 2022. <https://www.scribbr.com/research-process/research-proposal/>

## Step-5: Research Methodology ....(cont'd)

### c) Research methods

- What data collection tools and procedures will be used (e.g., surveys, interviews, observational studies, experiments)? And Why?

### d) Practicalities

- How much time will we need?
- How will we gain access to the population?
- How will we address any obstacles we face?

## Step-6. Contribution to knowledge

- To finish the proposal on a strong note, explore the potential implications of the research for the field.  
Emphasize again what aims to contribute and why it matters.

### **Example, the results might have implications for:**

- Improving best practices
- Informing policymaking decisions
- Strengthening a theory or model
- Challenging popular or scientific beliefs
- Creating a basis for future research

# 2. Planning a research proposal

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## Formatting a research proposal ....cont'd

### Step-7. Timeline/ Research plan

- Construct a detailed timeline that maps out the major milestones and activities of the research project.
- This timeline should cover everything from the initial research phase to the final submission, including periods for data collection, analysis and report writing.
- It helps in ensuring the project stays on track and demonstrates to reviewers that we have a well-thought-out plan for completing the research efficiently.

[4]. Venngage, How to Write a Research Proposal: A Step-by-Step, Danesh Ramuthi, November 29, 2023.

<https://venngage.com/blog/how-to-write-a-research-proposal/>

# 2. Planning a research proposal

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## Formatting a research proposal ....cont'd

### Step-8. Budget/Resource

- Show the estimates of how much each part of the project will cost.
- Make sure to check what type of costs the funding body will agree to cover. For each item, include:
  - **Cost:** exactly how much money do you need?
  - **Justification:** why is this cost necessary to complete the research?
  - **Source:** how did you calculate the amount?
- **Example:** Determine the budget such as, travel costs, and Materials (access to any tools or technologies), etc.

## Step-9. Ethical considerations

- Address any ethical issues that may arise during research.
- This is particularly important for research involving human subjects.
- Describe the measures one will take to ensure ethical standards are maintained, such as obtaining informed consent, ensuring participant privacy, and adhering to data protection regulations.
- Here, in this section we should reassure reviewers that we are committed to conducting the research responsibly and ethically.

[2]. Venngage, How to Write a Research Proposal: A Step-by-Step, Danesh Ramuthi, November 29, 2023.

<https://venngage.com/blog/how-to-write-a-research-proposal/>

# 2. Planning a research proposal

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## Formatting a research proposal ....cont'd

### Step-10. References/Bibliography

- Compile a comprehensive list of all the references cited in the proposal.
- Adhere to a consistent citation style (like APA or MLA) throughout our document.
- The reference section not only gives credit to the original authors of the sourced information but also strengthens the credibility of our proposal.
- Use tool for managing references insert in-text citations.
  - **Mendeley, Zotero and EndNote:** freely access tool to help to collect, organize, cite, search, create bibliographies, and share references with others.

## Step-11. Appendices

- Include additional supporting materials that are pertinent to once research proposal.
- This can be survey questionnaires, interview guides, detailed data analysis plans or any supplementary information that supports the main text.
- Appendices provide further depth to a proposal, showcasing the thoroughness of preparation.

[4]. Venngage, How to Write a Research Proposal: A Step-by-Step, Danesh Ramuthi, November 29, 2023.

<https://venngage.com/blog/how-to-write-a-research-proposal/>

# 3. How to address limitations in research proposal?

## How to address potential limitations in research proposal?

**Scope limitations:** Clearly define the scope of the research.

- Mention if the study will focus on a specific population, location, or timeframe, and explain how these choices may affect the generalizability of your findings.

**Methodological limitations:**

- Acknowledge any constraints related to our research design, such as sample size, data collection methods, or access to specific resources.
- **Example**, if one rely on self-reported data, note the potential for bias and describe strategies to mitigate this.

[2]. Research.com, How to Write a Research Proposal, Imed Bouchrika, Oct.13,2024.  
<https://research.com/research/how-to-write-a-research-proposal>

# 3. How to address limitations in research proposal? ..Cont'd

## How to address potential limitations in research proposal? ...cont'd

**Time constraints:** Discuss any limitations imposed by time.

- If the study has a tight timeline, explain how this might restrict certain aspects, such as longitudinal data collection or in-depth analysis.

**Ethical or logistical constraints:** If the research involves human participants, ethical considerations may limit the methodology.

- Mention how these will be addressed, such as through institutional review board (IRB) approval.

**Solutions or alternatives:** For every limitation you acknowledge, propose strategies to mitigate its impact.

- This can include alternative data sources, supplementary methods, or a plan for expanding the study in future research.

# 4. Common mistakes to avoid in proposal writing

## Usual mistakes when submitting a research proposal:-

- **Submitting lengthy proposals.** When writing research proposals, be to the point. Once submitted document must be focused and concise.
- **Covering too much research ground.** A proposed research must clearly inform the reader how the study will investigate the problem.
- **Not citing major works in a literature review.** While it is advised to keep everything in the proposal at a minimum—a few milestone research studies must already be included.

[2]. Research.com, How to Write a Research Proposal, Imed Bouchrika, Oct. 13, 2024. <https://research.com/research/how-to-write-a-research-proposal>

# 4. Common mistakes to avoid in proposal writing ..Cont'd

## Usual mistakes when submitting a research proposal:- ...cont'd

- **Too much focus on minor issues, yet very few details on major issues.** A proposal must focus only a few key study questions to clearly argue why it should be conducted.
- **Inability to frame a persuasive and coherent argument for the proposed study.** In essence, the research proposal must be able to effectively argue why a study should be approved or funded.
- **Poor grammar or careless writing.** While a research proposal only represents a small part of a complete study, it is expected to be well-written and observes the writing style and guidelines of good academic writing.

[2]. Research.com, How to Write a Research Proposal, Imed Bouchrika, Oct.13,2024.  
<https://research.com/research/how-to-write-a-research-proposal>

# Summary

- A proposal is not a creative production that strives to engage readers with complex characters, vivid images, and a fascinating plot. The language must be clear, sharp, and exact.
- Formatting a research proposal specifics a standard research proposal typically includes the following element: title and Abstract, introduction, research objectives, literature review, research methodology, contribution to knowledge, research plan, resources, ethical considerations, expected outcomes and significance and references.
- Addressing limitations in research proposal should consider Scope limitations, methodological limitations, time constraint , ethical constraints and Solutions.
- One has to ensure that any customary mistakes are made when submitting a research proposal such as Submitting lengthy proposals, covering too much research ground, poor grammar or careless writing.

# References

1. Scribbr, Research Proposal | Definition, Purpose, and Examples, Shona McCombes, October 12, 2022.  
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[https://statacumen.com/teach/S4R/PDS\\_book/writing-about-empirical-research.html](https://statacumen.com/teach/S4R/PDS_book/writing-about-empirical-research.html)
4. Venngage, How to Write a Research Proposal: A Step-by-Step, Danesh Ramuthi, November 29, 2023.  
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**Thank you !**