How to write a grant proposal
...that gets funded
How to write a project proposal ...that gets you an M.Sc.

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Epic Games

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These are all just sales pitches.

Your job is to convince the reader to part with a resource/money against a promise that it will be put to good use.

Sales happen at one or more of three levels:

**Head**: This is clever and solves a problem.

**Heart**: The world be a better place

**Wallet**: You will end up with more money
The state of play

• Even a strong proposal is in a lottery for resource; but a weak one is certainly dead

• Many research proposals are weak

• Most weak proposals have readily-fixable flaws

Largely taken/modified from https://simon.peytonjones.org/great-grant-proposal/
Audience

• Your proposal will be read carefully by one or two experts (your supervisor/s). You must convince them.

• But it will certainly be read superficially by non-experts... and they will be decision makers / markers. You absolutely must convince them too.

• Some influential readers (external examiners, auditors) will give you one minute max.

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The vague proposal

1. I want to work on better type systems for functional programming languages
2. Give me the money

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The vague proposal

1. I want to work on better type systems for functional programming languages
2. Let me do my M.Sc. Project.

Give me the money → Let me do my project
Hopefully you get the idea now, I won’t keep doing these in future slides.

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You absolutely must identify the problem you are going to tackle

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So what? Why should I care?

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Identifying the problem

• What **is** the problem?

• Is it an **interesting** problem? That is, is it research at all?

• Is it an **important** problem? That is, would anyone care if you solved it? (this is known as **impact**)

• Having a "customer" helps

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Why is Impact important?

If we perceive our role aright, we then see more clearly the proper criterion for success: a toolmaker succeeds as, and only as, the users of their tool succeeds with their aid. However, shining the blade, however jewelled the hilt, however perfect the heft, a sword is tested only by cutting. That swordsman is successful whose clients die of old age.

The aspirational proposal

1. I want to solve the problem of avoiding deadlocks and race conditions in concurrent and distributed programs

2. Give me the money
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It is easy to identify an impressive mountain

But that is not enough: you must convince your reader that you stand a good chance of climbing part of the mountain
Identify your contribution

- **Wider context**: Explain the path to the big goal

- **Specific Objectives**: Explain your role in solving one of those steps

- **Why you and why now?**
Your idea

• Identify a promising pathway up the mountain: give real technical “content”, so an expert reader could (without reading your doubtless-excellent papers / CV etc) have some idea of what the idea is

• Offer objective evidence that it’s a promising idea:
  • Results of preliminary work
  • Prototypes
  • Publications / Other literature
  • Applications

• Many, many proposals are buzz-word-compliant, but lack almost all technical content. Reject!

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The I’ll-work-on-it proposal

1. Here is a (well-formulated, important) problem
2. Here is a promising idea (...evidence)
3. We’re a great team (...evidence)
4. We’ll work on it
5. Give me the money

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The key question
How would an unbiased observer know if your research had succeeded?

i.e., aims & objectives
Suspicious phrases

• “Gain insight into...”
• “Develop the theory of...”
• “Study...”
• “Produce a database of...”

The trouble with all of these is that there is no way to distinguish abject failure from stunning success.

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Good phrases

• “We will build an analyser that will analyse our 200k line python program quicker than package X”
• “We will build a prototype walkabout information-access system, and try it out with three consultants in hospital Y”

The most convincing success criteria involve identifiable “customers”

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Related work / background

• **Goal 1**: demonstrate that you totally know the field. Appearing ignorant of relevant related work is certain death.

• **Goal 2**: a spring-board for describing your promising idea

• But that is all! **Do not spend too many words on comparative discussion**. The experts will know it; the non-experts won’t care.

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Methodology and work plan

Work Package 2.1(a):
Use the Leo2 prover to build a detailed model of endomorphic defibrillators. Survey competing approaches. This work will take 3.5 weeks.

• Concentrate on (a) your idea, and (b) your aims/objectives/success criteria. We trust you to manage the minute details

• But if there is research risk in some aspect, you must describe those, and fall-back positions

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The ideal proposal

1. Here is a problem
2. It’s an important problem (evidence...)
3. We have a promising idea (evidence...)
4. We are a world-class team (evidence...)
5. Here is what we hope to achieve, and how we’ll know if we have succeeded.
6. Here is a sketch plan of how we’re going to get from our idea to that destination
7. Give us the money. Please.
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2. It’s an important problem (evidence...)
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7. **Give us the money. Please.**

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The Heilmeier Catechism

• What are you trying to do? Articulate your objectives using absolutely no jargon.
• How is it done today, and what are the limits of current practice?
• What is new in your approach and why do you think it will be successful?
• Who cares? If you are successful, what difference will it make?
• What are the risks?
• How much will it cost?
• How long will it take?
• What are the mid-term and final “exams” to check for success?

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The Most Important Thing

• Above all, convey your enthusiasm for your field.

I have this amazing idea and I’m going to change the world. All I need is the chance to do it.
Writing a research proposal

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Attend the tutorials

• Most of the key elements of IPP are covered there
• Exchange ideas with classmates
• Get input from tutors

Talk to your supervisor

• Refine idea
• Discuss specific methods and approaches
Read the rubric

• Understand what you **must** include to pass IPP
• Understand how IPP is going to be marked.

Use the template

• Stops you missing an essential section
• Means markers know where to find everything.
Help each other

Ask others to read your proposal critically
Revise, and ask someone else
Repeat. Repeat. Repeat.

• **Cheap**: what someone thinks after a 10-minute read is *really really* Important

• **Informative**: after reading 20 proposals by others, you’ll write better ones yourself. Much better. Much, much better.

• **Effective**: dramatic increases in quality. There is just no excuse for not doing this. And yet few people do that
Educate your proof readers

• Give them a check-list of things to look for
• Strongly discourage them from correcting spelling and grammar, except just before submission
• Ask them to spend **30 minutes max** reading. A proposal MUST convince fast.
• Then get their feedback through a face-to-face **conversation**.
  • Friend: “I didn’t quite understand X”
  • You: “Oh, I meant that Y and Z”
  • Friend: “Aha... why don’t you just write that down?”

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