



PRINCE MERGREN DATA MINING CENTER
مركز الأمير مergen للبيانات وتحليلها

Strategies for Effective Proposal Writing

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Why Research



Why research ?

Why is the development of research within universities a must ?



- To maintain the quality of teaching programs.
- Provide the basis for undergraduate and graduate thesis research projects.
- Universities should be more than degree delivering institutions.
- Universities should be the basket for new knowledge and developments.

Why a research proposal ?

- Convince others the project you have designed is important, worth the effort.
- Convince others that you have the ability to carry out the research design and report the findings.
- Generate funds to sustain the research units operation.





Evaluation

Criteria

Evaluation Criteria



Quality



Impact

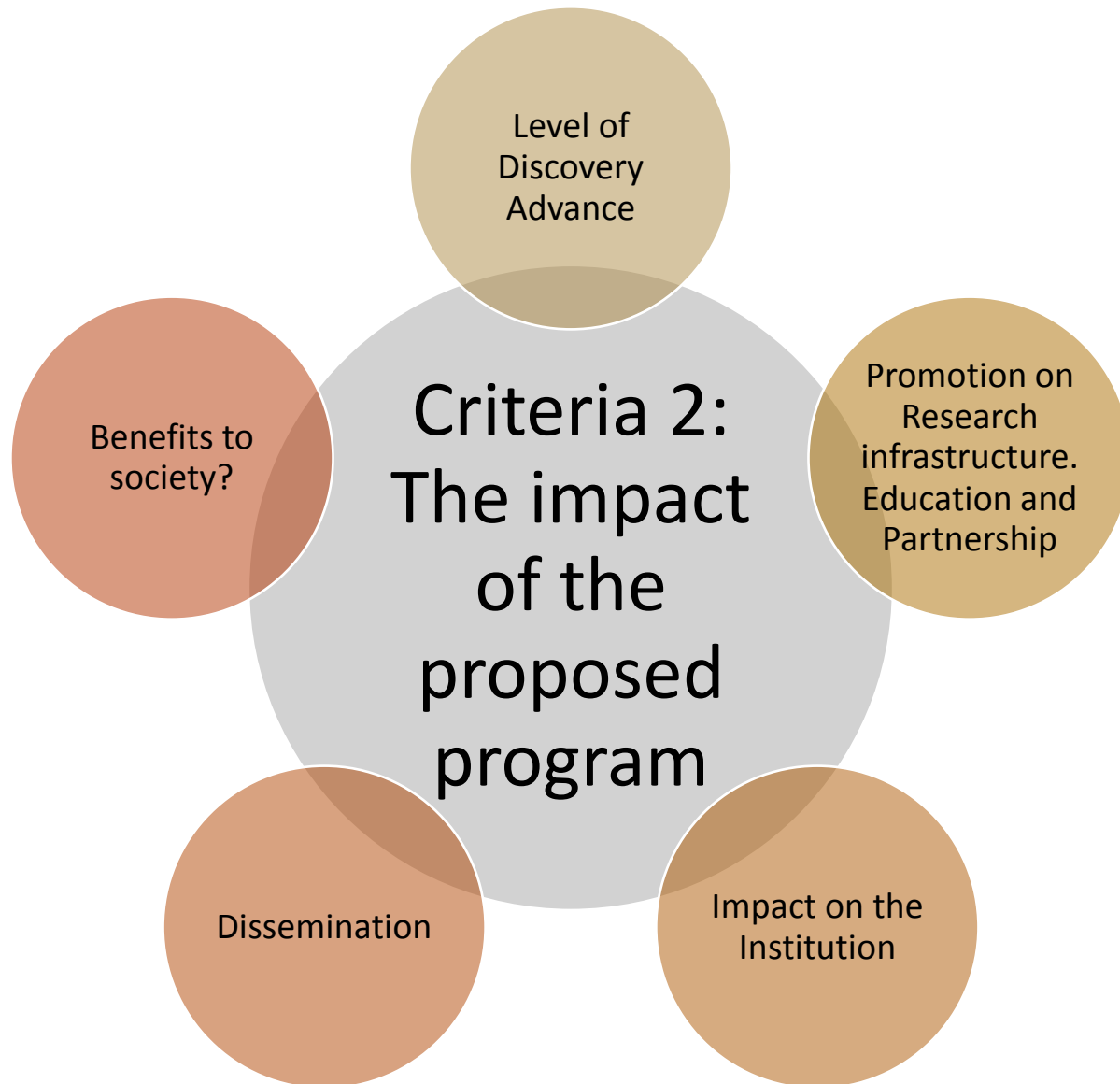


**Path to
Success**

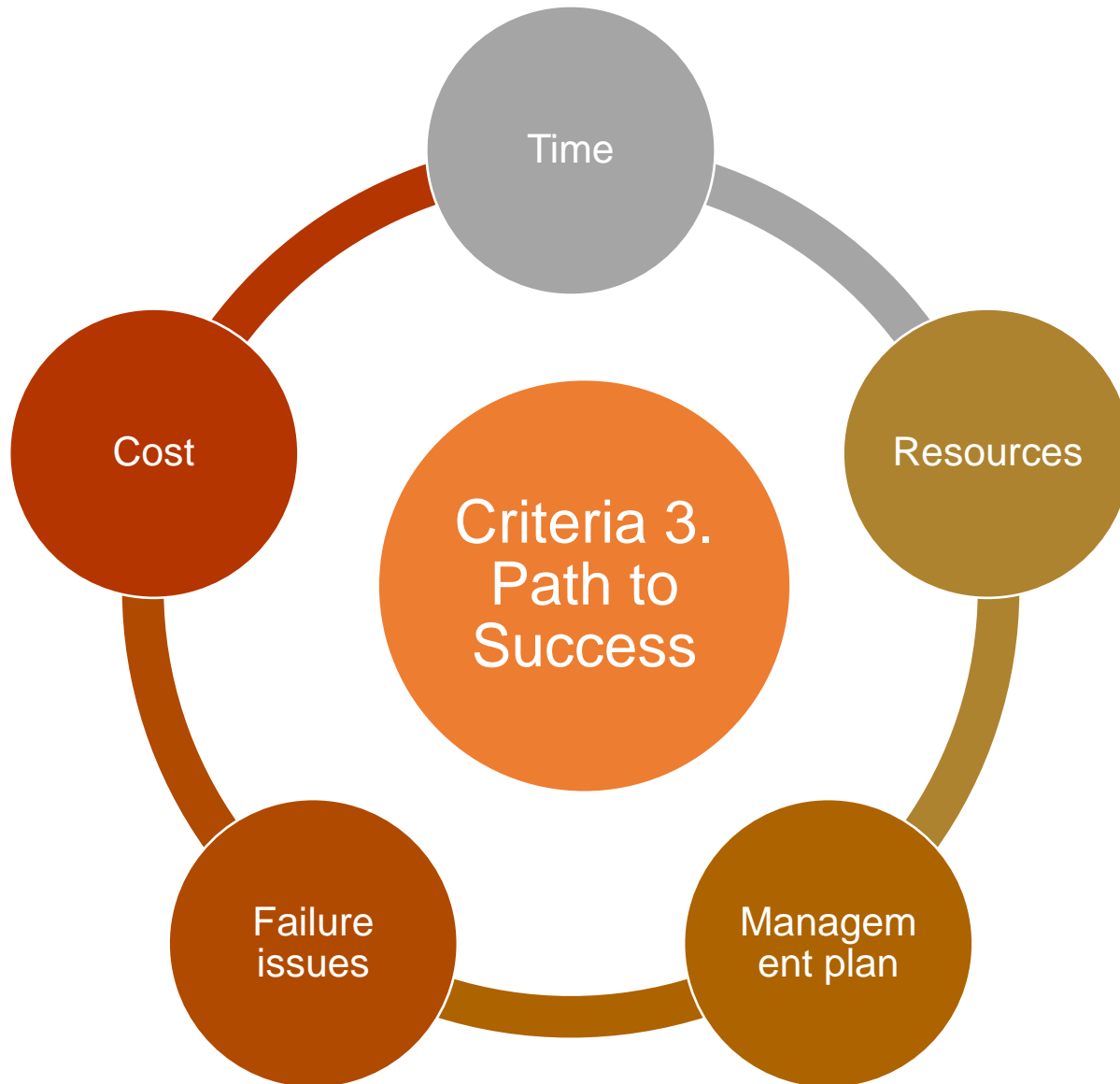
Evaluation Criteria: Quality



Evaluation Criteria: Impact



Evaluation Criteria: Path to Success



WORK

What makes a good proposal ?

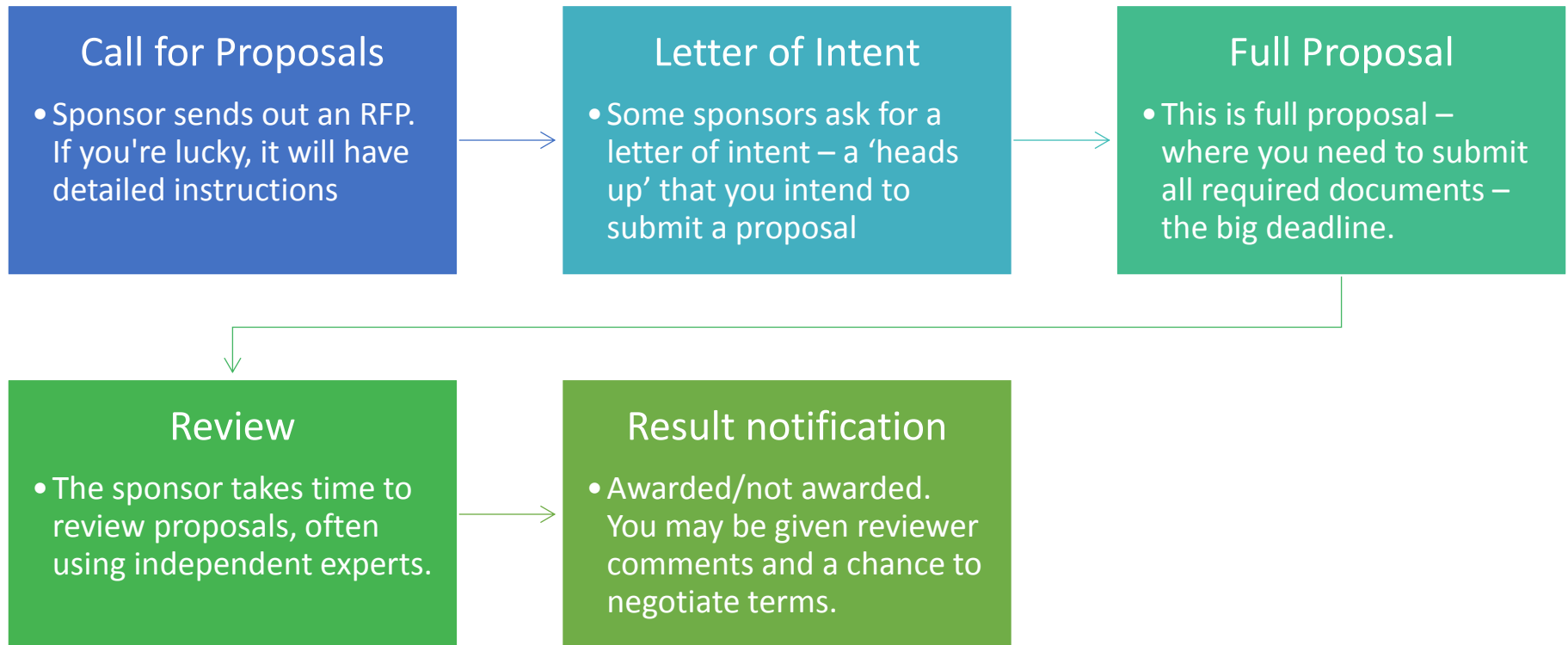


What makes a good proposal ?

- A well-prepared application should require minimal effort on the part of the reviewer.
- Proposals must demonstrate high scientific quality.
- The requested funds must be in proportion to the proposed project (cost-effectiveness).



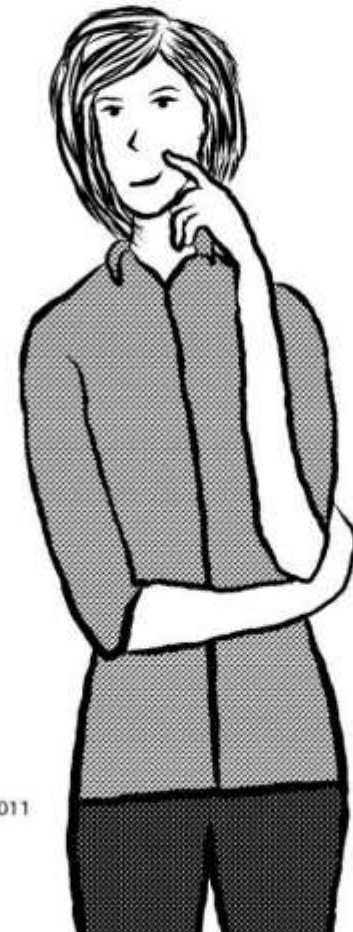
The grant application process



The grant application process

Why is it that a great idea takes so long to implement whereas really stupid ideas take hold immediately?

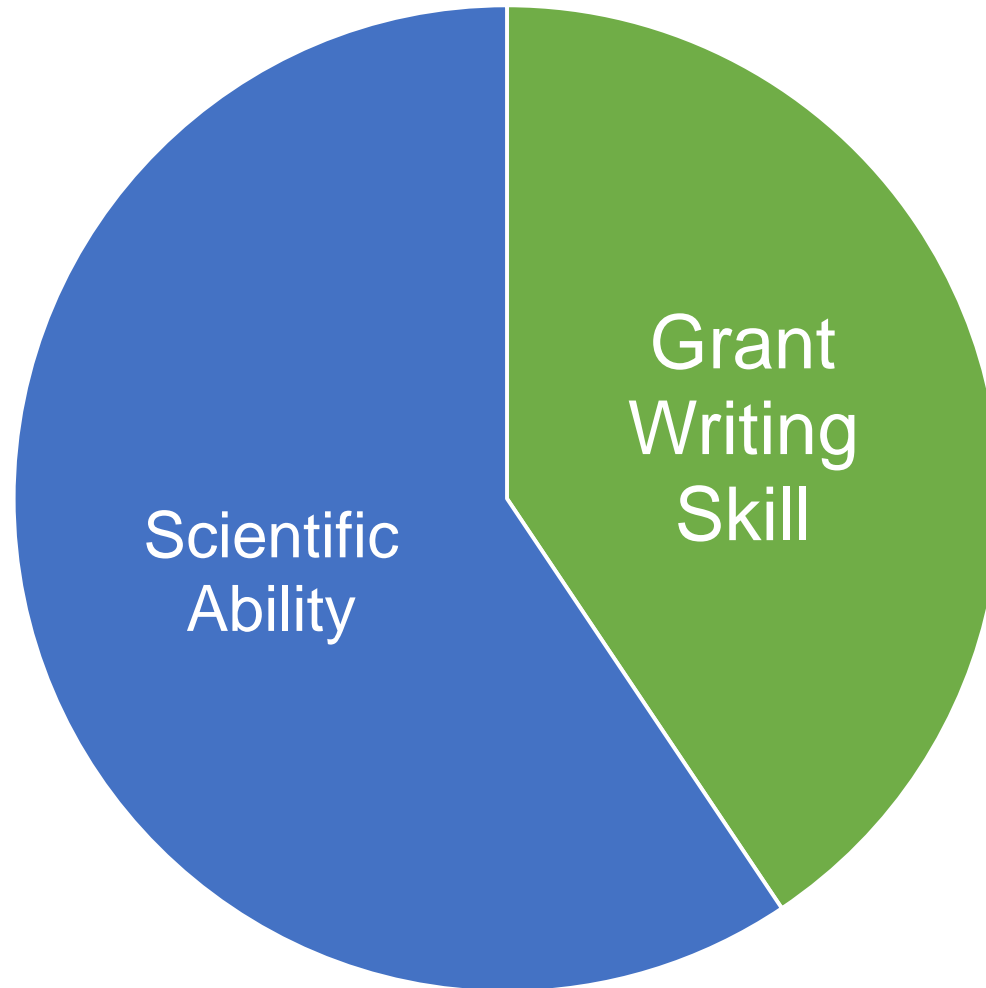
● Tip: Start with a good research idea



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Components of Success



Start with a good idea

- Actively seek opportunities that fit with your idea – the right sponsor, with the right \$\$\$, at the right time. ORS can help.

Call for proposals

- Sponsor sends out an RFP. If you're lucky, it will have detailed instructions.

Letter of intent

- Some sponsors ask for a letter of intent – a 'heads up' that you intend to submit a proposal.

Full proposal

- This is full proposal – where you need to submit all required documents – the big deadline.

Review

- The sponsor takes time to review proposals, often using independent experts.

Result notification

- Awarded/not awarded. Often you will be given reviewer comments. Don't forget to let ORS know the results too.



Start with a good idea

● How do I know I have a good idea?

1

Write an abstract – use clear language.

2

Seek input from your colleagues.

3

Conduct preliminary experiments

4

Consult with the literature

Getting ready to write a proposal

- Writing a proposal is a problem of **PERSUASION**
- In persuasive writing, you convince your reader to agree with you
- In a persuasive proposal, you convince your reviewer to fund your proposal



Persuasion

- Identify a problem that needs a solution
- Offer your solution to the problem
- Persuade the reviewer that your solution is worth funding

Identify the problem you will solve

- Establish that the problem exists and that it needs a solution
- Analyze the problem to show that you understand it.
- Refute Possible Counter [Argument/Solution]
- Demonstrate that your solution is the best and that you are the best person to solve the problem



Read the guidelines carefully



- The first part of writing is always reading.
- Read every page of the RFP!
- Make sure you understand:
 - What they are seeking to fund
 - Eligibility criteria
 - Why are they funding this?
 - **Follow the instructions!**

Preparation for Grant Writing

- Understanding grant agencies
- Finding a grant opportunity
- Matching project to funding opportunity
- Deciphering the program announcement
- Finding international collaborators
- Understanding the review process

Main parts of a proposal

- 1 Title
- 2 Project overview / Executive summary
- 3 Background information / Statement of the problem
- 4 Project detail
 - Goals and objectives
- 5 Budget - available and needed resources and budget narrative/justification

1

Title/cover page

- Follow the sponsor's guidelines
- The cover page should look professional and neat
- Title should be clear and unambiguous
 - Words used clearly reflect the focus of the proposal
 - Important words should come first

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The Art of Writing a Good Title

- Focus attention on research purpose
- Be brief
- Be memorable
- Do not try to be overly clever
- Clearly communicate what is novel
- Avoid excessive jargon when feasible

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Titles: Example 1

- **Tip:** Try to put the important bit up front (applies to pretty much all writing).
- Title 1: Neural networks and their use for power grid stability
 - Focus is on Neural Networks
 - Too many words connecting the 2 main clauses
- Title 2: Power grid stability using neural networks
 - Focus is on Power Grid Stability
 - Fewer words are used to connect the two main clauses

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Titles: Example 2

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● **Tip:** *If you can, simplify.*

● **Title 1:** Observing the Ocean's Intrinsic Actions by a Local Initiative to Create a Cable-based Underwater Power System

● **Title 2:** A Power System for an Ocean Observatory

- Title 1 is too complex with unnecessary details
- Title 2 is as informative as title 1.

2

Project overview/Executive summary

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- **Tip:** Write the Executive Summary *after* completing the rest of the proposal.
- Be specific and concise (details can come later).
- It is the framework of the proposal.
- This is where you should show your knowledge to the sponsor:
 - Address the sponsor's key concerns.
 - If collaborating with other organizations, their capability should be highlighted.

Project overview/Executive summary

- **Tip: Make a positive impression.**
 - Demonstrate originality
 - Make sure your proposal is focused
 - Strong rationale
 - Clear writing that a non-expert could understand
 - Explain experience of the PI and/or problem is within PI capacity
 - Emphasize the problem to be solved

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Abstract

● Most-read component

● 1/2 page (250-400 words)

● Full summary

- Why?
- What?
- Who?
- How?
- Where?
- When?



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Summary

- **Motivation**
 - *Why do we care* about the problem?
- **Problem statement**
 - What *problem(s)* are you trying to solve?
- **Approach**
 - *What are the prospective scientific approaches* to solve the problem?
- **Impact**
 - *What is the impact* of the research?
- **Expected Results**
 - What are the most important expected results.

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Background information / Statement of the problem

This is a review of **relevant** previous work

Show how your project:

- Extends the previous work
- Is unique

Tip: When writing, imagine you're addressing a reviewer who is *not* an expert in your field.

- Minimize jargon and confusing language or abbreviations

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Background information / Statement of the problem

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- Show that your proposed work is actually needed and should be funded
 - **Tip: Demonstrate your claims** – provide examples and context
- Consider the following questions:
 - What are the pressing problems you want to address?
 - How do you know those problems are important?
 - What other sources/programs consider these needs as important?

4

Project details: Goals and Objectives

- **Tip:** Clearly define the goals and objectives of your proposal.
- Goals are the *large statements* of what you hope to accomplish
 - Usually **not measurable**
 - Create the setting of what you are proposing
- Objectives are *operational*
 - Give specifics that you will accomplish in your project
 - With **measurable** outcomes
 - These serve as the basis for the evaluation of your project

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Project details: Goals and Objectives

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Tip 1

Differentiate
between your
goals and
objectives

Tip 2

Make sure your
objectives are
measurable,
and state how
they would be
measured.

Tip 3

Show that there is a
considerable overlap
between the goals
and objectives for
your proposal and
the goals and
objectives of the
sponsor.

Examples of Goals and Objectives

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Goal:

- To build underwater observatory



Objectives:

- Build underwater power network
- Feed the power station from 2 shore stations
- Provide interface between power network and science equipment



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Budgeting

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- **Tip:** Make sure you understand the full cost of doing your research project.
- Full economic **cost** = the total cost of the project, including 'hidden' costs that may not be charged to the sponsor.
- **Price** to sponsor = the amount of money you will ask for in your proposal budget.

Budgeting

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- **Universities are not-for-profit.**
 - This means that you need to cost very accurately, as there will be no ‘margin’ for you to access if you make a mistake.
 - If the sponsor reduces the budget, you may need to reduce the scope of your project.
- **Tip:** Consider how you could reduce the scope, if necessary, before submitting the proposal – **have a ‘plan B’.**

Budgeting

- Read the budget guidelines
- What can be funded?
 - individual financial support
 - equipment
 - travel
 - training
 - materials and supplies
 - external contracts
 - institutional overhead
- Maximum per category

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Writing your proposal

- Allow plenty of time to prepare your proposal. A good starting point is to write a one-page summary of the whole project. This may take a while to get right, but once completed it will serve as an invaluable tool for writing your full proposal.
- Use your proposal to show the need and then fill the gap.

Writing your proposal

- Present your proposal in terms of the aims and objectives of the funder and not just your own – make it clear how you will be helping **them** to fund **their** priorities.
- Consider the questions the funder will be asking: Why fund you ? Why fund this ? Why now ? ... and make sure that the proposal answers them!

Writing your proposal

- Be aware that you will have limited to none opportunities to answer queries arising from a reading of your proposal.
- Consult the funders website and read clearly the call for research proposals as well as the criteria against which your proposal will be judged.

Writing your proposal

- Although it is the content that matters, good presentation is often crucial to making your proposal accessible to reviewers and keeping their interest.
 - Use diagrams and tables to add clarity;
 - Bullet points and sections can break up text;
 - Keep to page, word and font size restrictions; and
 - Activate the spell checker while writing.

Technical Writing Style

- Use confident language:
 - We hope to **versus** We will
- Be specific:
 - Apples, oranges, etc. **versus**
 - Apples, oranges, pears, and plums
- Reflect the language of the call for proposals:
 - Our German colleagues will provide 14C analysis
 - versus**
 - We **collaborate internationally** with Mainz University for 14C analysis

Technical Writing Style



You do not really understand something unless you can explain it to your grandmother.”

-Albert Einstein

Literature Review



Literature Review

● Selecting Sources

- √ Select literature that is relevant or closely related to the problem and purpose
- √ Emphasize the primary sources
- √ Use secondary sources selectively
- √ Concentrate on scholarly research articles
- √ Discuss your criteria for inclusion of articles



Writing The Literature

- The literature should have an introduction, body and conclusion
- The introduction defines the framework of the review, the body that evaluates the literature and the conclusion summarizes the current state of knowledge on the problem

Writing The Literature

- Organize the review by topics or ideas, not by author
- Organize the review logically (least to most relevant – evolution of topic –by key variables)
- Discuss major studies/theories individually and minor studies with similar results or limitation as a group

Writing The Literature

- Adequately criticize the design and methodology of important studies so readers can draw their own conclusions
- Compare and contrast studies.
- Note for conflicting and inconclusive results
- Explicitly show the relevance of each to the problem statement

Writing The Literature

- Summary including a restatement of the relationships between the important variables under consideration and how these relationships are important to the hypothesis proposed in the introduction
- Identify the gaps in the current techniques that would be filled in by the proposed technique.
- Highlight the novelty of the proposed technique as compared to other existing techniques.

Literature Review – recommendations

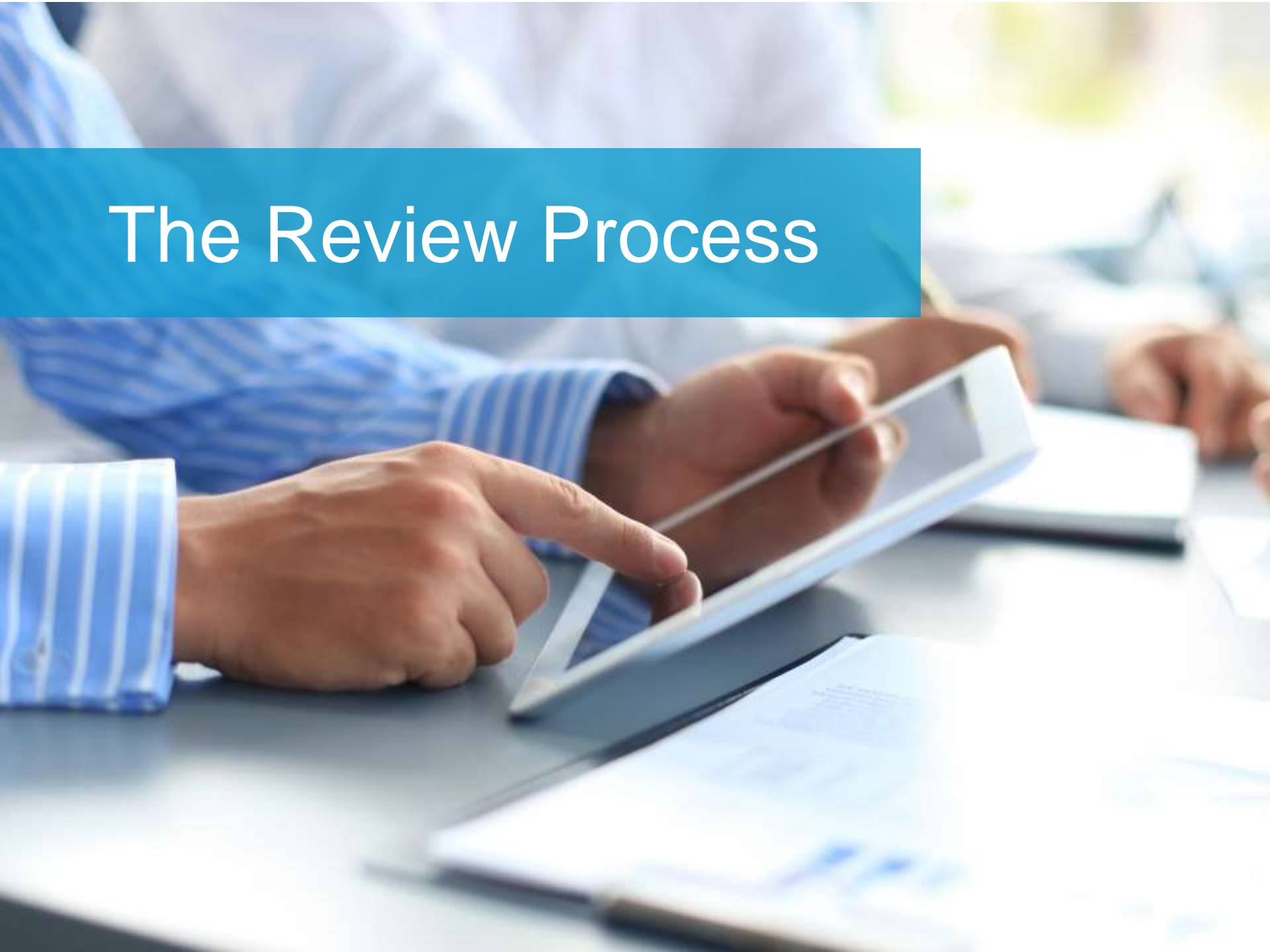
- Make sure to cite **recent** and up-to-date references
 - Old references will infer that research proposal is outdated
- Give a structure to literature review section
- Discuss previous works and clarify your contributions in comparison to them
- Deeply analyze related works
 - Avoid being verbose and descriptive
- Never copy/paste from other sources.
 - Make your own literature review.

References



- Must be up to date
- High quality references
- Comprehensive and complete
- Relevant

The Review Process



The review process

Expert assessment: Traditionally applications will be assessed by 2 to 3 reviewers selected from the pool of experts. Reviewers will make an independent assessment of the scientific quality of the proposal. To be selected for funding at least 2 of the 3 reviewers should provide a positive assessment.



The review process



What are reviewers looking for ?

- High scientific quality.
- Proposals that meet the funder's priorities or fill a knowledge gap.
- Novelty and timeliness.
- Value for money.
- A clear and well thought out approach.
- An interesting idea – catch their attention!

The review process



Awards committee: Ranks the submitted proposals on the basis of the reviewer's reports. Their operation and procedures can be very variable from funder to funder. They might for policy reasons of the funder deviate from the reviewer's assessment.

Consider your reviewer!

- Assume that the reviewer is busy, impatient, skeptical.
- Assume that the reviewer has many proposals to read and wants to read yours as quickly as possible.
- Assume that the reviewer will be looking for reasons **NOT** to fund your proposal



Answer these questions for your reviewer

Assume that your reviewer is looking for easy answers to the following questions:



- What do you want to do?
- How much will it cost?
- How much time will it take?
- Does this proposal fit with the sponsor's interests?

Answer these questions for your reviewer



- What difference/contribution will the project make?
- What has already been done in the area of this project?
- How do you plan to do the project?
- Why should YOU, rather than someone else, do this project?



Good criteria and common mistakes

Good Criteria

CRITERIA FOR A GOOD GRANT PROPOSAL

- Does the proposal address a well-formulated problem?
- Is it a research problem, or is it just a routine application of known techniques?
- Is it an important problem, whose solution will have useful effects?
- Is special funding necessary to solve the problem, or to solve it quickly enough, or could it be solved using the normal resources of a well-found laboratory?
- Do the proposers have a good idea on which to base their work? The proposal must explain the idea in sufficient detail to convince the reader that the idea has some substance, and should explain why there is reason to believe that it is indeed a good idea.

CRITERIA FOR A GOOD GRANT PROPOSAL

- Does the proposal explain clearly what work will be done? Does it explain what results are expected and how they will be evaluated? How would it be possible to judge whether the work was successful?
- Is there evidence that the proposers know about the work that others have done on the problem? This evidence may take the form of a short review as well as representative references.
- Do the proposers have a good track record, both of doing good research and of publishing it?

Common Mistakes

Shortcomings

- *It is not clear what question is being addressed by the proposal.*
- *The question being addressed is woolly or ill-formed.*
- *It is not clear why the question is worth addressing.* The proposal must be well motivated.
- *The proposal is just a routine application of known techniques.* Research funding agencies are interested in funding research rather than development.
- *Industry ought to be doing it instead.* If the work is 'near market' then it should be done by industry or industry or venture capital should be funding you to do it. If no industry is interested then the prima facie assumption is that the product has no commercial value.
- *There is no evidence that the proposers will succeed where others have failed.* It is easy enough to write a proposal with an exciting-sounding wish-list of hoped-for achievements, but you must substantiate your goals with solid evidence of why you have a good chance of achieving them.

Common Mistakes

- Guidelines are not followed
Tip: follow the application instructions
EXACTLY
- Proposals are too long (consider your reviewer!) even without length limitations
- Review criteria are ignored (if evaluation standards are provided, reference all of them)

Common Mistakes

- The proposal is too vague in the following key areas:
 - The question addressed by the proposal
 - The outcome of the research
 - The measure of success or failure
 - The contribution to human knowledge
- The proposal lacks evidence of clear thinking
 - The formulation of the problem is poor
 - The planned solution is unclear or illogical

Common Mistakes

- The proposal does not address the importance of the problem
- Sufficient technical details of the idea are not given
- The proposal is comprehensible only to experts in the field

Tip: Some evaluators will not be experts in all areas of the proposal

Tip: A good proposal should be comprehensible to non-experts, while also convincing experts that you know your subject

Common Mistakes

- Other researchers have addressed the problem and failed
Tip: Offer evidence that the PIs will succeed this time
Tip: Support with solid evidence of potential success
- The proposal is written in such a way that gives the impression of *“give us the money and we will figure out how to do the work”*
Tip: Clearly state all your ideas
Tip: Describe your preliminary work that shows evidence that the idea is good
- The proposal is heavy on showing off your good track record
Tip: Include a relevant list of publications but not all of them

Common Mistakes

- The proposal is simply too expensive for the probable gain
 - Tip:** Expensive proposals are more likely to be rejected
- The proposal sounds like it might be written by a graduate student

Reasons for Failure

- Proposal not appropriate for the program
- Insufficient detail in research plan
- Poor organization
- Does not anticipate reviewers' questions
- Not a significant contribution
- Not relevant to current state of the field
- Poor budget narrative

Learning from Rejection

- Many good proposals are rejected—It's a competition.
- Read the reviewer comments objectively
- Study the negative comments
- Look for another opportunity
- Revise the proposal
- Reapply



The KACST Model



Grant Programs and Research Types

Grant Programs



- Basic Research Grants Program (BRGP)
- Applied Research Grants Program (ARGP)
- Developmental Research Grants Program (DRGP)
- Social and Humanities Research Grants Program (SHRGP)

Grant Programs and Research Types

Research Grants Programs	Research Type
BRGP	Large, co-operative, small and graduate students research
ARGP	National, large, co-operative, small, and graduate students research
DRGP	Large, co-operative, small, graduate students and creative & innovative research.
SHRGP	Under National projects, large and co-operative research (limited to announced priorities).

Definition of Research Types

- **National Research Project**
 - It is an applied or social research that addresses an urgent national problem in the Kingdom
- **Large Research Project**
 - This research is concerned with a comprehensive and in-depth study of a particular subject
- **Small Research Project**
 - It includes research that is aimed at achieving specific objectives in one area of pure sciences such as: Engineering, Medicine, Agriculture, Basic Sciences.
- **Co-operative Research Project**
 - Include those research projects that are implemented with partial or full financial support from sources other than KACST.
- **Graduate Students Research Project**
 - These include research projects which are designed to assist students in completing the requirements towards earning a Master degree or PhD degree in one of the natural sciences fields such as: Engineering, Medicine, Agriculture, Basic Science.
- **Creative and Innovative Works**
 - These include scientific activities which are associated with original innovative and creative ideas. These original activities often lead to a patent.

Elements of the Research Proposal

- Cover Page
- Summary of the Research Proposal
- List of the Contents of the Proposal
- Introduction
- Literature review
- Objectives
- Experimental Design and Research Methodology
- Management Plan
- Work Plan
- List of References
- Existing Expected Support
- Budget

Curriculum Vitae

- Use format if given
- If no format given, provide
 - Personal information
 - Employment history
 - Education
 - Professional qualifications
 - Publications
 - Books
 - Awards, honors, affiliations

