

A Practical Guide to Developing Competitive Research and Innovation Project Proposals

Building Bridges Initiative

October 5-7, 2026 | Research Symposium
University of the Witwaterstrand | Johannesburg

Contents

1. Introduction.....	1
2. Define the problem and project rationale.....	2
3. Formulate credible objectives and indicators	3
4. Show the gap and project ambition.....	5
5. Describe the project methodology	6
6. Describe results and impact.....	8
7. Plan communication, dissemination, exploitation and sustainability 10	
8. Develop the work plan.....	12
9. Define deliverables, milestones and risks	14
10. Explain roles, resources and implementation capacity	16
11. Check the proposal as one coherent whole.....	17
12. Final note.....	18

1. Welcome to the Guide

This guide provides a practical introduction to developing competitive research and innovation project proposals. It takes readers step by step through the main elements of proposal development, from defining the problem and objectives to designing the methodology and work plan, describing expected results and impact, planning communication and exploitation, and demonstrating that the proposed team and resources can deliver the project.

Throughout the guide, selected examples from the successful Horizon 2020 illuMINEation project proposal show how these principles were applied in practice. The examples are intended to make the guidance more concrete and should be used as inspiration rather than as a template. Every proposal must ultimately be developed around the requirements, evaluation criteria and expected outcomes of its specific funding call.

2. Introduction

A competitive project proposal must explain clearly:

- ☐ why the project is needed;
- ☐ what it intends to achieve;
- ☐ how the objectives will be reached;
- ☐ what results will be produced;
- ☐ what difference those results may make;
- ☐ and why the proposed team can deliver the work.

These elements should form one connected argument:

Problem → Objectives → Methodology → Work plan → Results → Outcomes and impact

This guide provides practical support for drafting the main narrative sections of research and innovation proposals. It is intended primarily for researchers, doctoral candidates and university staff.

Each substantive chapter contains:

1. concise drafting guidance;
2. a practical example from the successful illuMINEation¹ proposal;
3. and a short quality check.

The illuMINEation examples show how particular proposal elements were addressed in practice. They should not be copied mechanically, as every

¹ The illuMINEation proposal used as a practical example throughout this guide was kindly provided by the Chair of the Mining Department at Montanuniversität Leoben.

application must respond to its own topic, consortium and funding conditions.

Applicants must always follow the specific call, evaluation criteria and application template. Where the official documents differ from this guide, the official requirements take priority.

3. Problem and project rationale

Explain why the project is needed. Begin with the wider context, but quickly narrow it to a specific problem that the proposed project can realistically address. The reader should understand:

- ☐ what is not working or is still missing;
- ☐ who or what is affected;
- ☐ why the problem matters;
- ☐ and why a new project response is justified.

Use evidence such as research findings, operational data, policy documents, previous project results or stakeholder consultations.

3.1. How to draft it

- 1. Introduce the wider challenge.** Provide only the context needed to understand the project.
- 2. Define the specific problem.** State precisely what is missing, ineffective, costly, unsafe or inaccessible.
- 3. Explain the consequences.** Show why the problem deserves attention and who is affected.
- 4. State the required response.** Indicate what kind of solution, knowledge or change is needed without describing the full methodology.

A useful drafting formula is:

Although [existing situation], [specific problem] remains because [main limitation]. This affects [target group or field] by [main consequence]. A project is therefore needed to [required response].

3.2. illuMINEation example

“European mining operations need to improve safety, environmental performance and operational efficiency. Existing digitalisation initiatives

focus mainly on individual machines and do not provide an integrated view of rock stability, environmental conditions, equipment performance and personnel safety.

Continuous monitoring is further limited by expensive sensors, fragmented data and difficult underground communication. Mine operators therefore lack timely information for preventing accidents, reducing downtime and improving resource efficiency.

An integrated approach is needed that combines affordable sensors, reliable communication, data analysis and user-oriented visualisation.”

3.3. Quick checklist

- ☐ Is the problem specific and supported by evidence?
- ☐ Is it clear who or what is affected?
- ☐ Are the consequences credible and proportionate?
- ☐ Is the need for a new project evident?
- ☐ Can the proposed project realistically address the problem?

4. Objectives and indicators

Objectives state what the project intends to achieve. They should respond directly to the identified problem and provide the basis for the methodology, work plan and expected results. Indicators then provide the evidence needed to assess whether those objectives have actually been achieved. A project should normally have:

- ☐ one overall aim, describing its central purpose;
- ☐ and a limited number of specific objectives, describing the concrete achievements required to realise that aim.

4.1. How to draft it

1. Define the overall aim

Summarise the project's purpose in one sentence.

Example: To improve the safety and resource efficiency of underground mining through integrated digital monitoring and decision-support solutions.

2. Formulate specific objectives

Use action-oriented verbs such as develop, test, validate, demonstrate, compare, establish, increase or reduce.

Weak: To promote cooperation between researchers.
Stronger: To establish and test five interdisciplinary research teams involving at least six partner institutions by Month 24.

3. Distinguish objectives from activities

Objective	Activity
Improve researchers' ability to apply a new method	Organise four training workshops
Validate a monitoring system in three environments	Install and test the system at three pilot sites

An activity describes what the project will do. An objective describes what should be achieved as a result.

4. Test each objective

SMART element	Question
Specific	Is the intended achievement clear?
Measurable	Can achievement be verified?
Achievable	Is it realistic within the project?
Relevant	Does it respond to the problem and call?
Time-bound	Is there a clear deadline?

5. Define how achievement will be measured

For each objective, identify:

- ☐ an indicator;
- ☐ the starting point or baseline;
- ☐ the target and deadline;
- ☐ and the source of evidence.

For example:

Objective	Indicator	Baseline	Target	Verification
Improve system performance	Average response time	20 minutes	Below 5 minutes by M30	Validated pilot results

4.2. illuMINEation example

Specific objective	Selected indicators and targets
<i>Develop and validate low-cost sensor-equipped rock bolts</i>	<i>Additional production cost below €10; successful underground data transmission; validation at participating mine sites</i>
<i>Demonstrate predictive-maintenance solutions</i>	<i>Machinery utilisation improved by 5–10%; battery performance improved by more than 20%; testing under operational conditions</i>

*The example is effective because the objectives are linked to measurable technical and operational achievements.

4.3. Quick checklist

- ☐ Do the objectives respond directly to the problem?
- ☐ Are they achievements rather than activities?
- ☐ Are they specific and realistic?
- ☐ Does each objective have a meaningful indicator and target?
- ☐ Can every objective be linked to the methodology and work plan?

5. The gap and project ambition

The state of the art explains what is currently known, available or practised. The project ambition explains how the proposed work will advance beyond this starting point. This is not a complete literature review. Include only the knowledge, methods, technologies or practices needed to demonstrate the project gap.

5.1. How to draft it

For each central project element, explain:

1. **Current position:** What already exists or can currently be achieved?
2. **Limitation:** Why is the current approach insufficient?
3. **Proposed advance:** What will the project improve, combine, test or apply differently?
4. **Added value:** Why does that advance matter?

A table is often the clearest format, here is an example:

Current state	Main limitation	Proposed advance	Added value
Existing systems monitor individual components	Data are fragmented and not available in one operational view	Integrate data within a shared platform	Faster and better-informed decisions

Innovation does not always mean inventing something completely new. It may also involve a new combination, application, validation environment, scale or transfer into practice. Support important novelty claims with

appropriate evidence. Avoid claims such as “completely unique” or “revolutionary” unless they can be demonstrated.

5.2. illuMINEation example

Area	Current limitation	Proposed advance
<i>Underground drilling analysis</i>	<i>Manual sampling and long analysis times</i>	<i>Develop and test analysis during underground drilling</i>
<i>Borehole positioning</i>	<i>Drill-hole trajectories are estimated and uncertain</i>	<i>Develop a real-time in-rock positioning tool</i>
<i>Predictive maintenance</i>	<i>Conventional spare-part production causes delays</i>	<i>Combine predictive maintenance with additive manufacturing</i>
<i>Mining data platforms</i>	<i>Data and computing are fragmented</i>	<i>Develop a distributed platform linking devices, edge systems and cloud infrastructure</i>

5.3. Quick checklist

- ☐ Is the existing state described fairly and selectively?
- ☐ Is the remaining gap specific?
- ☐ Is the proposed advance clear?
- ☐ Is its significance explained?
- ☐ Are novelty claims supported by evidence?

6. Project methodology

The methodology explains how the project will achieve its objectives. It should describe the overall approach, the methods to be used, how the different parts fit together and how the results will be tested. A useful logic is:

Objective → Approach → Method → Validation → Expected result

6.1. How to draft it

1. Explain the overall approach

Summarise the project’s methodological logic in a few sentences.

The project will analyse existing practices, develop a common model, test it in selected institutions, evaluate the results and revise the model before wider implementation.

2. Describe the methods and their purpose

Do not merely list methods. Explain what each method will do and what evidence it will generate.

Weak: Interviews and workshops will be conducted.

Stronger: Interviews will identify barriers to cross-border recognition. The findings will be validated in workshops and used to design the common procedure.

3. Show sequence and integration

Explain the order of the main stages and how different disciplines, partners or components interact.

Analysis → Design → Development → Pilot → Evaluation → Finalisation

Where several disciplines are involved, show how their contributions influence one another rather than presenting them as separate activities.

4. Explain testing and validation

State:

- ☐ what will be tested;
- ☐ where and with whom;
- ☐ according to which criteria;
- ☐ and how the findings will be used to improve the result.

5. Address assumptions and call-specific requirements

Identify the conditions on which the methodology depends, such as access to data, user participation or technical compatibility. Explain important alternatives where necessary. Address gender dimensions, open science, research data management, AI robustness or other requirements only when requested by the specific call.

Keep the methodology distinct from the work plan:

Methodology	Work plan
Explains how and why the approach will work	Explains who will do what and when
Describes methods and integration	Organises work into packages and tasks
Explains how evidence will be generated	Assigns responsibilities and resources

6.2. illuMINEation example

illuMINEation followed a use-case-driven and iterative approach:

*→ Operational requirements → Data collection → Technical development
→ Platform integration → Pilot testing → Refinement*

Requirements were first identified at five mine sites. Research and technology partners then developed the sensing, analysis and visualisation components. These were integrated and tested in the participating mining environments, with feedback used to improve the final solutions.

6.3. Quick checklist

- ☐ Does the methodology cover every core objective?
- ☐ Is the overall approach clear?
- ☐ Is the purpose of each main method explained?
- ☐ Are sequence, integration and validation visible?
- ☐ Are important assumptions and relevant call-specific requirements addressed?

7. Results and impact

Explain:

- ☐ what the project will produce;
- ☐ who will use the results and how;
- ☐ what outcomes should result from their use;
- ☐ and what wider impact the project may contribute to. what the project will produce;

Distinguish the levels of change

Level	Meaning	Example
Activity	What the project does	Develop and test a monitoring system
Result	What the project produces	Validated monitoring system
Outcome	Change resulting from use	Operators identify hazards earlier
Impact	Wider long-term contribution	Safer workplaces

7.1. How to draft it

1. Identify the main results

Concentrate on the most important knowledge, methods, prototypes, tools, datasets, guidelines or services. Do not reproduce the complete deliverable list.

2. Identify users and intended use

For each result, state who will use it and what they are expected to do with it.

Too broad: The result will benefit society.

More precise: Recognition officers will use the procedure when assessing courses completed at partner universities.

3. Explain outcomes and wider impact

Describe the change expected when the result is used. Then explain the wider impact to which that outcome may contribute. Use realistic language. A project normally contributes to broader impact rather than causing it alone.

4. Address scale, evidence and barriers

Explain:

- ☐ how many users, institutions or environments may be affected;
- ☐ how important the expected change is;
- ☐ which evidence supports the estimate;
- ☐ and what may influence whether the expected outcomes are achieved.

Practical drafting table:

Result	User	Intended use	Outcome	Wider impact contribution	Evidence or indicator

7.2. illuMINEation example

<i>Result</i>	<i>Intended use</i>	<i>Outcome</i>	<i>Wider impact contribution</i>
<i>Intelligent rock bolts</i>	<i>Operators monitor underground stability</i>	<i>Earlier identification of hazardous conditions</i>	<i>Safer mining operations</i>

<i>Integrated drilling data</i>	<i>Mine planners distinguish ore and waste more accurately</i>	<i>More selective extraction</i>	<i>Reduced waste and energy use</i>
<i>Predictive-maintenance tools</i>	<i>Maintenance teams identify approaching failures</i>	<i>Reduced downtime</i>	<i>More efficient operations</i>
<i>Training materials</i>	<i>Mining staff learn to use new tools</i>	<i>Improved digital capacity</i>	<i>More adaptable workforce</i>

7.3. Quick checklist

- ☐ Are the main results concrete?
- ☐ Is it clear who will use them and how?
- ☐ Are outcomes distinguished from wider impacts?
- ☐ Are the expected outcomes and wider impact claims realistic and supported by credible evidence?
- ☐ Have the expected scale and possible barriers been considered?

8. Communication, dissemination, exploitation and sustainability

The previous chapter identifies the expected results, users and changes. This chapter explains how the project will reach those users, support the use of its results and enable continuation after funding ends.

Explain how the project will:

- ☐ make its activities and results visible;
- ☐ share results with relevant audiences;
- ☐ support their use in research, practice, policy, education or business;
- ☐ and enable important results to continue after funding ends.

The four concepts have different purposes:

Concept	Main purpose
Communication	Inform and engage wider audiences about the project
Dissemination	Share results with groups that can learn from or build on them
Exploitation	Enable results to be used in practice, research, policy or business
Sustainability	Ensure that important results continue after funding ends

8.1. How to draft it

1. Start from the project results

Do not begin with a generic list of websites, conferences and social-media activities. For each important result, identify:

- ☐ the relevant target group;
- ☐ the intended use or response;
- ☐ the most suitable measure;
- ☐ and how continued use will be supported.

2. Select targeted measures

Choose measures suited to the result and audience.

Weak: The project will organise workshops for stakeholders.

Stronger: Three practitioner workshops will present the methodology to university recognition officers and support its testing in five institutions.

A limited number of well-targeted measures is more credible than a long list of communication channels.

3. Measure use as well as visibility

Indicators such as website visits, publications and event participants show reach. Where possible, also measure uptake, for example:

- ☐ organisations testing a result;
- ☐ institutions adopting a procedure;
- ☐ users applying a tool;
- ☐ or project materials integrated into regular training.

Practical tool

Result	Target group	Intended use	Main measure	Uptake indicator	Continuation arrangement

8.2. illuMINEation example

Result	Measure and intended continuation
Digital rock bolts	Operational demonstrations and cooperation with manufacturers supported further development and integration into production
Predictive-maintenance tools	Pilot demonstrations and technical guidance supported future operational use

<i>Training materials</i>	<i>Online and on-site training enabled continued professional development</i>
<i>Research findings</i>	<i>Publications, conferences and cooperation with related projects supported further research</i>

To support uptake, illuMINEation combined operational demonstrations, technical documentation, professional training, scientific dissemination and partner-level exploitation planning.

8.3. Quick checklist

- ☐ Are measures linked to specific results and target groups?
- ☐ Is the intended use clear?
- ☐ Are the four concepts correctly distinguished?
- ☐ Do indicators assess uptake as well as visibility?
- ☐ Is it clear how important results may continue after the project?

9. The work plan

The work plan translates the methodology into an implementable structure. It should show:

- ☐ what work will be carried out;
- ☐ how it is grouped;
- ☐ in what sequence;
- ☐ by whom;
- ☐ and when.

A strong work plan follows:

Objectives → Methodology → Work packages → Tasks → Results

9.1. How to draft it

1. Identify the main stages of the project

Return to the methodology and identify the major bodies of work needed to achieve the objectives.

2. Group related activities into work packages

Each work package should have:

- ☐ a distinct objective;
- ☐ a leader;
- ☐ a limited number of tasks;
- ☐ a clear result;
- ☐ and a defined start and end.

Use as many work packages as necessary, but as few as possible.

3. Define logical tasks

Tasks should describe the main steps required to achieve the work-package objective.

WP objective: Develop and validate a common institutional procedure.

Tasks: Analyse existing practice; design the procedure; pilot it; evaluate and revise it.

4. Show sequence and dependencies

Explain how the work packages connect.

Findings from WP2 define the requirements for WP3. The prototype developed in WP3 is tested in WP4, and the results are returned to WP3 for revision.

A Gantt chart shows timing. A project architecture or PERT-style diagram shows relationships.

5. Assign timing and responsibility

Identify a leader for every work package and, where relevant, every task. Allow sufficient time for testing, feedback and revision rather than placing all important outputs at the end.

Practical tool

WP	Objective	Main tasks	Lead and contributors	Main result	Timing	Dependencies

9.2. illuMINEation example

Work package: Development and integration of the digital platform

- **Objective:** *Develop a secure platform for receiving, processing and presenting mining data.*
- **Tasks:** *Define requirements; design the architecture; develop data and security services; integrate the components; prepare pilot validation.*
- **Sequence:** *Architecture by M7; first operational version by M18; final integrated platform by M34.*
- **Dependency:** *Requirements came from the mining use cases; the integrated platform was subsequently tested at the pilot sites.*

9.3. Quick checklist

- ☐ Does each work package contribute to an objective?
- ☐ Does every package have a distinct result?
- ☐ Are tasks grouped and sequenced logically?
- ☐ Are dependencies visible?
- ☐ Is there sufficient time for testing and revision?

10. Deliverables, milestones and risks

These elements show what the project will produce, how progress will be checked and how major difficulties will be managed.

Element	Purpose
Deliverable	A major project output that is formally submitted or recorded
Milestone	A verifiable control or decision point
Risk	A possible event that could prevent the project from achieving its objectives

10.1. How to draft it

Deliverables - Include only major and meaningful outputs.

Weak: Report on stakeholder meetings.

Stronger: Validated stakeholder requirements for the pilot system.

Specify the title, related work package, lead, due month and expected content.

Milestones - A milestone confirms that an important condition has been achieved.

Weak: Pilot workshop organised.

Stronger: Pilot methodology tested and approved for implementation.

Every milestone should have a clear means of verification.

Risks - Describe:

- ☐ what might happen;
- ☐ how it would affect the project;
- ☐ its likelihood and severity;
- ☐ how it will be prevented or reduced;
- ☐ and what will be done if it occurs.

Risk: Partners cannot provide data in the agreed format, delaying comparative analysis.

Mitigation: Agree formats early and conduct preliminary quality checks.

Contingency: Use existing datasets for the initial analysis and integrate delayed data later.

Design the elements together

Task: Develop and integrate a platform.

Deliverable: First operational platform version.

Milestone: Platform ready for pilot testing.

Risk: The platform cannot process the required data volume.

Mitigation: Test performance incrementally and distribute processing between edge and cloud resources.

Contingency: Reduce the initial processing scope and prioritise the functions required for pilot validation.

10.2. illuMINEation example

Deliverable D7.2 – First operational platform version, Month 18

A documented and operational first version of the multi-level platform, integrating the initial data-management and processing functions required for the project use cases.

Milestone MS3 – First development phase completed, Month 20

The principal subsystem prototypes are available, the first platform iteration has been integrated and initial testing has begun at the use-case sites.

Means of verification

- ☐ *operational platform version available;*
- ☐ *selected technical components integrated;*
- ☐ *initial tests conducted at the use-case sites;*
- ☐ *test results and identified improvements documented.*

illuMINEation identified a risk that the required data-processing performance might not be achieved because of the volume of data, time constraints and limited processing capacity of devices operating at the edge of the system. The planned mitigation included:

- ☐ *prioritising data according to processing urgency;*
- ☐ *distributing processing between different parts of the platform;*
- ☐ *and moving data-intensive analytical tasks to cloud resources where necessary.*

10.3. Quick checklist

- ☐ Are deliverables limited to major results?
- ☐ Are milestones genuine and verifiable control points?
- ☐ Are the most important risks identified?
- ☐ Are mitigation and contingency measures specific?
- ☐ Are all three elements consistent with the work plan?

11. Roles, resources and implementation capacity

Demonstrate that the proposed team has the expertise, access and resources needed to implement the methodology and work plan. The section should answer four questions.

1. What expertise and capacity does the project require?

Identify the scientific, technical and practical capabilities needed, including access to data, infrastructure, users or pilot environments.

2. Why is each partner needed?

Connect every partner to a specific contribution.

Weak: Partner A is a leading university with extensive international experience.

Stronger: Partner A leads the comparative analysis because it specialises in cross-border recognition and has access to the required institutional data.

3. Who is responsible for what?

Identify the coordinator, work-package leaders, task leaders and contributing partners. Avoid assigning every partner to every task. Keep governance functional. Explain only who coordinates the project, who leads the substantive work and how major decisions are taken.

4. Do the resources match the responsibilities?

Check that person-months, equipment and other costs correspond to the work assigned.

Weak: €40,000 is required for equipment.

Stronger: The equipment is required for underground pilot testing in Task 4.3 and will be used to validate the monitoring system against Objective 2.

11.1. illuMINEation example

Partner type	Contribution	Responsibility
<i>Mining companies</i>	<i>Operational knowledge, data and pilot sites</i>	<i>Define requirements and test solutions</i>
<i>Manufacturers</i>	<i>Product and manufacturing expertise</i>	<i>Develop equipment-related solutions</i>
<i>Universities and research organisations</i>	<i>Scientific methods and analysis</i>	<i>Develop models, algorithms and research solutions</i>
<i>Digital-technology partners</i>	<i>Software, communication and cybersecurity</i>	<i>Develop and integrate the platform</i>
<i>Coordinator</i>	<i>Scientific and coordination capacity</i>	<i>Maintain overall coherence and implementation</i>

11.2. Quick checklist

- ☐ Is every partner necessary?
- ☐ Are responsibilities linked to relevant expertise?
- ☐ Is accountability clear?
- ☐ Do resources correspond to the assigned work?
- ☐ Is any essential expertise or access missing?

12. Final check

Before submission, review the proposal as one connected argument:

Problem → Objectives → Methodology → Work plan → Results → Outcomes and impact

Complete one row for each specific objective:

Problem or gap	Objective	Method	Main tasks	Result	User	Expected outcome	Wider impact contribution	Indicator

The table should reveal:

- ☐ objectives without a clear problem;
- ☐ objectives without suitable methods;

- ☐ tasks that do not produce meaningful results;
- ☐ results without users;
- ☐ impact claims without a credible pathway;
- ☐ or indicators that do not measure the intended achievement.

Also verify that:

1. partner responsibilities match their expertise;
2. person-months and budget correspond to the work;
3. deliverables and milestones follow the project sequence;
4. risks reflect the actual methodology;
5. terminology, targets and numerical information are consistent throughout.

A reader should be able to answer quickly:

- ☐ Why is this project needed?
- ☐ Why is the proposed approach credible?
- ☐ Why is this team capable of delivering the expected results?

13. Final guidance

A strong proposal is not the longest or most complicated proposal. It is the one that makes the project logic easy to understand and credible to evaluate. Use this guide to structure the main argument, but always adapt the content to the specific call, evaluation criteria and official application template. The illuMINEation examples demonstrate useful drafting approaches; they are illustrations, not text or structures to copy mechanically.

Learn more and connect on:
buildingbridges.eurecapro.eu