

Guide to the preparation of a scientific project

For the scientific practice it is proven to document and communicate the chosen approach in a transparent and comprehensible way. Since the development and execution of a scientific work is a creative achievement, i.e. not a stringent, but rather an iterative process, the work usually does not proceed in such a linear and consistent manner as the final formulated version would suggest. Errors are - as long as they do not disproportionately prolong the duration of the work - definitely part of a work process in which one can and must prove that one is capable of working out solutions to a posed problem. Of course, errors should be detected as early as possible. A clear conception, structuring of the work and communication with the work group members helps here. Sufficient intensive research and reading is the prerequisite for scientifically or legally sound work. The first part of such a work is usually the preparation of an exposé, which concretizes the research question and possible solutions. The following points are of central importance for the preparation of such an exposé.

Development of a scientific project/question

Besides the definition of the research question on the basis of one of the topics of the topic list, a subsequent design of the project to address the research question is primarily concerned with developing a solution scheme that is as efficient and reproducible as possible. In the center of such a design it is important to identify the methods and information essential for answering a focused question. The information should be provided by data sets that are as homogeneous and ubiquitously available as possible (data). Finally, it must be worked out how these are processed, why and with which working methods.

Helpful can be a table or as a representation in a mind map.

The goal of all these suggestions is to bring the thinking process into a comprehensible form in order to be able to present the results in a suitable structured way. In addition to the pure table or mind map, a short text can also have an explanatory effect

The Exposé

A so-called exposé is a tried and tested tool for dealing with these complex requirements. In an exposé, the research question is developed independently. The exposé is used by a group to discuss the project and as a guideline for working on the project. The following structure should serve as a guideline for the development of a **maximum** two-page exposé. The deconstructed exposé broken down into individual work packages can be understood as a **project plan**. Such a plan is intended as a condensed guideline for the conception and procedure in the development of scientific/planning questions. For further deepening of this topic, please refer to the posted literature.

1. The **development of the theme** involves a concentrated study of the following points:

- ◇ **Problem statement** - It should make clear that the work is devoted to an interesting question or problem that makes scientific study useful, desirable, but above all interesting.
- ◇ **Guiding question** or conceptual framework - What should the work find out This goal-oriented question must usually be differentiated into sub-questions or theses. It should be chosen in a structured way and not too broad and comprehensive
- ◇ **Objective of the work, working hypotheses:** The objective of the work can be narrowed down more precisely after the state of knowledge has been reviewed. The formulation of working hypotheses (what can be expected, what is to be proven?) is an essential result of this process. Without a clear objective and hypothesis, no meaningful or comprehensible study can be conducted.

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2. **The aim of the work** is therefore closely linked to the review of the source situation or the state of research and the consideration or integration of the theoretical / legal / technical foundations. It is important to refer to the paradigms as well as to the theoretical context on which the work is based. In the context of a practical work, this is usually regulated by ordinances, laws, technical sheets or tender texts and specifications. These have a binding character and must be considered (=acknowledged and quoted). This is both a basis for the derivation of the hypothesis but also serves the documentation and disclosure of the sources. Furthermore, it is necessary to cover the current state of research/application in addition to the basics in order to achieve an adequate (=temporary and valid) result.

3. **Work conception, methodical procedure:** Based on the work objectives defined in point 1 and the framework conditions identified in point 2, a work conception has to be developed. The (potential) work flow and methodological procedure should be briefly described, if possible presented in a graphic (flow chart) as a guide.

5. **Methodical approach:** The chosen methodological approach should be explained. The implementation of the calculations statistical approaches and the evaluations etc. are to be described briefly. Summary of the expected results - results are expected only at the end of the processing, nevertheless, it is very helpful to articulate briefly what the processor expects as a result.

6. **Feasibility and time schedule** - the available time is a scarce resource. Therefore, the creation of a work program is very helpful to estimate the time and progress of the individual work steps. In any case, the exposé should show that the planned work steps are feasible with the available resources. **This plan does not belong in the elaboration of the final results.**

Work program

Specify your work program here in the form of one or more so-called work packages, which you can abbreviate with "WP1, WP2...", for example. As a rule, more than one work package is necessary for the implementation of even small projects. If you have previously formulated several sub-goals, it is recommended that you write at least one work package for each sub-goal. It may be easier to describe the planned implementation as concretely as possible if a work package is subdivided into smaller steps, e.g. WP1.1, WP1.2.... . Please note that this section is the crucial part of your proposal.

Schedule

	Week from start of project								
	1	2	3	4	5	6	7	8	9
WP1									
Task 1									
Task 2									