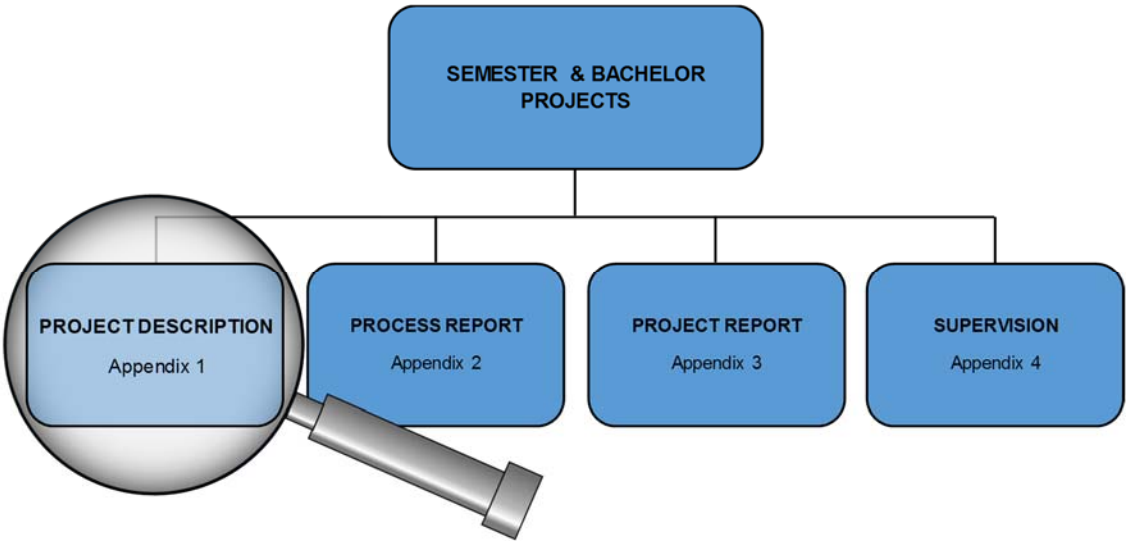
APPENDIX 1
Project Description

VIA ENGINEERING GUIDELINES



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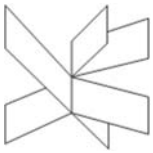
Content



1 Introduction

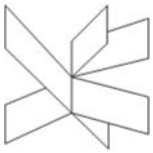
Before commencing the actual project work, a project description needs to be developed defining why the project is relevant, its purpose and output. Likewise, the Project Description contains a plan for its activities including why, what, who and when. Finally, the Project Description describes which theories and methods the project will involve.

The guidelines presented here are valid across all of VIA Engineering and describe requirements and recommendations for Project Descriptions. It should be noted that following these guidelines is necessary, but not sufficient, for a project group to receive a high grade for their work.

The Project Description belongs to a set of guidelines for project work in VIA Engineering. More information about this set of guidelines is found in the current version of the master document “Semester & Bachelor Projects – VIA Engineering Guidelines”.

An accepted Project Description is mandatory for the commencing of a project. When the Project Description has been approved and a supervisor has been appointed, the actual project work may begin. Please note that important changes of the Project Description after approval requires acceptance from the supervisor. Normally, the length of the Project Description is 8-10 pages. A Microsoft Word template for VIA Engineering Project Descriptions is available electronically for use by the project group, but use of this template is not required.

A Problem Analysis is a prerequisite for the formulation of the Project Description, but is not part of the actual Project Description itself. Depending on the scope of the project, this process may be more or less comprehensive. In the problem analysis phase, an investigation of issues relevant for the project is made including the necessary collection of data to back this up, e.g. identification of the overall problem, establishment of causes and effects, identification of stakeholders, etc.



2 Text

Many rules and recommendations are universal for all types of writing, including correct grammar, correct spelling, and identifying the target audience. In addition to these universal aspects, the Project Description, which is technical writing, has a number of specific conventions which contrast with many other types of writing.

2.1 Universal language elements

There are a great many universal elements for creating good technical writing. One of the universal elements which are often problematic is:

- **Target audience:** The target audience of the Project Description is the group itself and the supervisor. Thus, the authors should assume that the target audience is intellegent and has a basic understanding of the field in question.

2.2 Language conventions

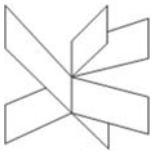
Formal language is associated with particular choices in grammar and vocabulary. In technical writing, formal language is used by convention. These conventions include the avoidance of:

- **Contractions:** Omission of letters in a word or words, i.e. “isn’t”
- **Colloquial:** Casual and conversational language, i.e. “buzz off” or “go bananas”
- **Slang:** Non-standard words that imply familiarity, lower dignity, etc., i.e. “my bad”

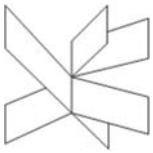
In addition, technical language is concise. This means that the writing should be brief in form, but comprehensive in scope, giving a lot of information, but with only a few words. All unneccesary senteces should be excluded.

Technical writing intentionally creates a distance between the author and the subject matter to emphasize objectivity. This supported by avoiding the following:

- **Use of first person:** Use of first person (I, me, we, us) should be avoided in project reports. This is done intentionally to focus on the subject matter.



- **Emotive language:** Emotive language arouses feelings. It is therefore subjective rather than neutral. To promote objectivity, emotive language must be avoided.
- **Unsupported arguments:** Technical writing uses supported arguments. This means that information is referenced to other work. In addition, personal opinions are avoided.



3 Visuals (figures and tables)

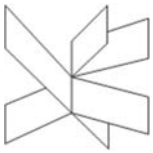
Visuals (such as sketches, graphs, diagrams, figures and tables) should be used when they assist the reader in understanding the report more clearly. Visuals should be tailored to emphasize the writer's point. If the point is to compare two sets of data, for example, both sets should be included in one graph rather than two separate graphs.

All visuals must be numbered (the word processor can keep track of this automatically) and include a text description. ALL visuals must be referred to in the text.

If relevant, visuals should include the following:

- A legend to explain symbols
- Scale, north arrow and publisher for maps
- Labelled axes for graphs

In some cases, visuals included in a project report are captured in pixel format in low resolution. This is especially a problem when a small visual is enlarged. Adequate resolution should be ensured.



4 Project Description Structure

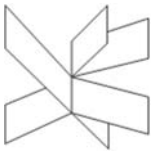
The Project Description is the foundation of the project work, defining the initial whys, whats and hows, stating with what is to be achieved and how to achieve it. The Project Description consists of three parts:

1. **Front matter:** Meta-data as report cover, title page, etc.
2. **Main matter:** The report from bacground description and problem statement to time schedule.
3. **Back matter:** Supplemental matter in support of the main matter including Appendices.

4.1 Front matter

The front matter of a Project Description may include the following elements:

- **Header and Footer:** The page header of the main matter of the project description must include the title of the report, while the page footer of the main matter of the project description must include page numbers. Additional information in the header and footer may be included if desired.
- **Cover:** A report cover is optional and may be formatted as desired.
- **Title page:** The design of the title page may be determined by the project group. However, the title page must include the following elements:
  - name and logo of the educational institution
  - the title of the project
  - the name of the study programme and semester
  - the name(s) of the student(s) and student numbers
  - number of characters
  - the name of the supervisor
  - date
- **Preface:** A preface may be included if additional comments on context of the project description are needed. The project group and the supervisor should discuss the need to include a preface.



- **Table of contents:** The project report must include a table of contents which outlines the structure of the report and how the information is organized.
- **List of figures and tables:** This list must contain a full listing of all figures and tables used in the report.

4.2 Main matter

The main matter of the Project Description includes the following items:

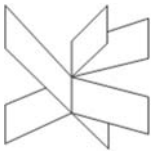
1. Background description
2. Definition of purpose
3. Problem statement
4. Delimitation
5. Choice of models and methods
6. Time schedule
7. Risk assessment
8. Sources of information

4.2.1 Background description

The background description is an overall introduction to the problem area based upon the group's analysis of the problem as well as an explanation of how the problem has arisen. Furthermore, the project group must state its reasons for choosing to work on the topic in question. Eventually, the project group may state why a company they are doing the project for wants the group to work on this specific topic in question.

4.2.2 Definition of purpose

The purpose of the project describes the overall motivation for the project (e.g., the purpose of designing a wind turbine could be to avoid CO_2 emissions). Definition of the purpose should not exceed a few lines and should be a natural continuation of the background description. Thus, a well-defined purpose can be used for judging the relevance of the outcome throughout the project.



4.2.3 Problem Statement

One of the most important parts of the Problem Description is the Problem Statement. A problem statement is a concise portion of prose that raises an issue that needs addressing. A good problem statement sets the stage for and guides a subsequent investigation. It should be brief, focused, solvable within the given timeframe and relevant for the semester topics. The Problem Statement should have sufficient engineering depth and have a taxonomy suitable for the students' level of progression. It is NOT a topic, a problem, a solution, or a goal.

The Problem Statement must consist of one - and only one - overall question. Based upon the Problem Statement, the overall requirements and criteria for the solution can be defined in the form of a requirement specification technical, economical, marketing related etc.

On basis of the above, a group of sub- problems can be defined and included. In this way, the Problem Statement defines all the (unresolved) problems that need to be addressed in order to obtain a useable solution.

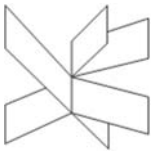
This strict hierarchical listing of the problems is mandatory in order to avoid collision between the derived sub-problems.

4.2.4 Delimitation

The delimitation specifies which of the sub-problems that the project will not cover, or alternatively, it indicates the estimates and assumptions that the project will be based on.

In any case, the delimitation criteria should be accounted for in relation to the chosen problem(s) that needs to be solved. The delimitation(s) must first and foremost be relevant and well argued.

Example: In the case of business-related problems, it has often been predetermined which market you should study and survey (geographically), and which product(s) you



should investigate on this market. In addition to these predetermined limitations, the delimitation must contain a time frame, i.e. how far back and forth in time the problem should be studied.

In the delimitation you are not allowed just to exclude all the professionally demanding parts of the problem(s). The problem statement and the delimitation must be logically linked.

4.2.5 Choice of models and methods

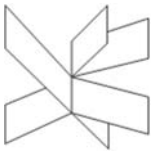
The model and method section describes how – and to which detail – the individual problems listed in the problem statement (delimitations excluded) are solved.

A description should be made on which theoretical models and methods are used when working on the project, e.g. descriptive analysis, explorative analysis, causal analysis, field or laboratory work, etc. Further, a description of why a given method is chosen with regards to the expected outcome. The choice of model and methods also includes the project's research design, meaning that the overall strategy is explained. Choice of model and methods as well as strategy will affect the project results and findings.

The project group should also reflect upon the scientific tradition and paradigm that the project study takes it outset in. Table 1 is a useful planning tool for this purpose.

What - partial problem.	Why - study this problem – related to the purpose of the project.	Which - level of the outcome is expected.	Which - methods/ models / theories will be used.	Who - in the group is the main responsible person for this point.	What - is the estimated workload (hours)

Table 1. Planning tool for reflection on project model and methods



The choice of models and methods may often lead to a more detailed description of to which extent an analysis will be performed. It may often be necessary to prioritize which analyses are performed in detail and which are only given few resources.

4.2.6 Time schedule

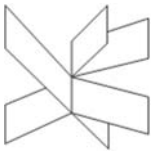
The time schedule specifies the overall timeframe of the project period and the duration of the individual tasks and their interdependence. The time schedule must be visualized in a Gantt chart stating activities and milestones followed by small textual descriptions of the most important tasks. It is important to understand, that the time schedule is regarded as a planning tool, likely to change. However, a thorough planning of the Project Execution regarding choice of models and methods as well as time schedule is essential for submitting a high quality Project Report in time.

4.2.7 Risk assessment

In order to secure that the project evolves in accordance with the quality level and timeline stated in the Project Description, the group may include a Risk assessment. The assessment can be formed as a matrix where the most possible risks in the project are defined, calculated and paired with possible preventive actions. The matrix may look like this:

Risks	Description	Likelihood Scale: 1-5 5 = high risk	Severity Scale: 1-5 5 = high risk	Product of likelihood and severity	Risk mitigation e.g. Preventive- & Responsive actions	Identifiers	Responsible
Risk 1	Lack of time before hand-in	4	5	20	Tight control of time schedule; corrective action – work weekends	Making excuses, blaming others	XXX
Risk 2							

Table 2 Risk assessment matrix example.



4.2.8 Sources of information

In technical reports in general, many types of sources of informations or references may be used. These include book chapters, reports, patents, standards, interviews, dissertations, conference proceedings and peer reviewed papers in scientific journals. Due to questions about objectivity, newspaper articles, brochures and web addresses are often used sparingly.

There are two main ways to use an information source:

- The typical case is to paraphase the source, i.e. rewriting the information in the project group's own words. Here, the source must be referenced.
- When it is important to use the exact words of the previous work, direct quotes may be used. Quotes must always be 100 % accurate, and quotation marks must be used. In addition to quotation marks, the source must be referenced.

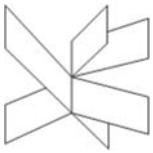
Plagiarism is the use of previous work in the form of words, figures, ideas, etc. without crediting the source. It is considered ethically dishonest and is not permitted in project reports at VIA Engineering. The offence is serious and may result in a range of outcomes including re-writing the report, failure of the course or the student(s) being expelled. Automatic tools in WISEflow are used by the supervisor to assist in the detection of plagiarism.

A list of the references used in the Project Report must be included as a separate chapter at the end of the report. Each source in the list must be referred to in the text.

For VIA Engineering project reports, the HarwardAnglia reference system must be used. This system describes how to reference a source of information in the text as well as how to structure the reference list in the final chapter. More information regarding this standard can be found at http://libweb.anglia.ac.uk/referencing/harvard.htm.

4.3 Back matter

Back matter of a project description are appendices. Appendices contain various types of information that support the content of the main matter including Group Contract,



description of the problem analysis phase, technical descriptions and pre-analyses documents:

- **Group contract:** A Group Contract include a discussion of the ground rules of the group collaboration. In addition to a working title for the project and a list of project members, the Group Contract must include the following:
  - A description of planned group procedures including meetings, peer-review and communication.
  - An identification of personal and group expectations including goals, level of ambition and responsibilities.
  - A specification of the consequences for failing to follow procedures and fulfil expectations.

  A Microsoft Word template is available for use, if desired.
- **Description of the problem analysis phase.** This include mind-maps, Ishikawa diagrams, interview summaries.
- **Pre-analysis documents.** These includes technical descriptions, product description, standard methods, etc.