



## Project Supervision - An Engineering Approach

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# Project Supervision – An Engineering Approach

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## ABSTRACT

### Introduction

For more than twenty years, a group based supervision strategy has been used when supervising engineering bachelor- and master thesis students at our research group. In recent years, we have formalised the approach and used our industry experience to create a very successful framework for project supervision. This paper is a best practice guide aiming at research groups that would like to try to implement our supervision approach or parts of it.

The approach is based on the belief that engineering students should be prepared for their new role as development engineers or PhD students as part of their master thesis writing. The supervision principles are:

- **Ownership** The student should feel that their project is their own. Ideally, they should formulate the project themselves.
- **Write early** We strongly encourage the students to write and generate figures and images already from the first week of the project period.
- **Management** The student is considered project manager of his own project. The supervisor is a guide or coach (or a project owner)
- **Plans** The student is asked to write a project plan during the first week of the project together with a risk-analysis.
- **Group Meetings** A group of students and supervisors meet every week on a fixed weekday.

In our team, it is normal that one supervisor supervises three to five projects simultaneously. The core of the supervision is the weekly meetings where the students present what they have been doing and what they plan to do. By default, all students are present at all meetings. Weekly meetings are scheduled to be at a specific day at a specific place for the entire process.

### Project Start

At the project start a kick-off meeting is held where the students are explained what is expected from them. In addition, it is also described what they can expect from the supervisors. In short, they can expect one weekly meeting with their supervisor, where the supervisor will have read their weekly report.

During the start-up meeting, the following topics are covered: what is a thesis, how to read a paper, introduction to our intranet, templates for project plans and weekly reports. However, probably the most important topic of the meeting is that the students are asked to give a very short presentation (less than a minute) of

their understanding of their own project. We use this as a start for helping the students writing their first weekly report. The first weekly report should contain the student's description of his own project. If written well, this can even be used as a general introduction to the thesis. It should include the background of the project, the motivation, description of potential system setup, data description, and potential methods to be evaluated

### **Project Plan**

During the first weekly meeting, the students are asked to produce a plan for their projects. The most important is not that the deadlines in the plan are kept, but that a plan exists and that it is used actively. This will introduce the students to what they will (with a high probability) experience in their job just after their thesis. We use plans from previous projects as inspiration.

The students are also asked to judge the "risk" of each of their tasks. Risk in this context is the risk of not being finished on time. While a literature study has a very low risk, data gathering can for example have a higher risk. This analysis is used to formulate alternative plans in case high-risks activities are delayed.

Most projects are done in collaboration with external partners, for example companies and hospitals. The project plan and the first weekly report with the students understanding of the project serve as an initial contract between the student, the supervisors, and the company. We see it as a protection for the student that there already from the start is an agreement of the scope of the project.

### **Weekly Report and weekly meeting**

The students are asked to write a weekly report that should be delivered so the supervisor has it before the weekly meeting. The weekly meeting is based on this report. The weekly report serves several purposes. It should be formulated so it can be directly used in the final thesis. It should make the student stable users of their text processing system and reference handling system. Furthermore, students are strongly motivated to create and use figures, tables, and drawings in their reports. The weekly report is used as the basis for the weekly meeting. Here we go through each report and encourage all to comment and give advices. The supervisor role is mostly coaching. An important point is to formulate the plan for the next weeks and evaluate the progress with respect to the project plan.

### **Conclusions**

Generally, we believe that we get the best out of the students using our supervision approach. Furthermore, it is very effective for the supervisors, since we can co-supervise each others students.

We have made a small student survey asking them about their experience with the supervision. Generally, the students are very satisfied and students that did their bachelor project with us often return to do their master project in our group.

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