Project Plan

Fill in a descriptive name of the project, something catching attention and telling what it is about.

Names and student numbers of the group members. For a thesis or internship, it would only be one name. Preferred way of filling this is like 'John Doe (123456)

Monday, April 10, 2017

Version Version number, in the format x.y, where x is the major revision number, y the minor revision number

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# Introduction

This usually is a small chapter. It gives guidelines on the purpose of this document, how to read it, and what to find in what chapters. It might explain a bit on how the project came into existence. There is not much more to tell here, as most of the content is in the next chapters.

# Context

The situation at hand. This paragraph contains the factual description of what is going on. After reading this paragraph, one should understand the situation, know the reason the organization exists, how they earn money or provide services to the public / other organizations / other organizational units, and how they operate.

## Result of preliminary research

This is an optional paragraph. If you did a preliminary research in order to define the project, this paragraph describes how that research was performed and the results of it. In that case, this paragraph contains the knowledge relevant to understanding the rest of the project plan.

## Situation in the organization

Here you describe the organization; what does it do, how does it earn the money, what kind of customers does it have. It is often good to include a diagram of the organizational structure, do the reader can see where the project fits in the organization. This paragraph provides the background necessary to understand the problem or wishes of the organization and the role of the project in solving them.

## Problem statement

Whereas the previous paragraph described the current situation, this – short – paragraph makes the problem to be solved explicit.

# Goals of the project

## Objectives

Here, the problem which has been made explicit in paragraph 2.3 is translated into an envisioned solution, without detailing how to reach that situation. Assuming the problem would be ‘Company X has little insight in what kind of customers buy their products’, the objective could be ‘developing an application to analyze the data they have on sales over the last three years’. It would not be ‘telling the company what customers buy their products’, because that is only rephrasing the problem. It would not be ‘using data mining techniques to analyze their databases’, as that is detailing how to reach the objective.

## Main research question and subquestions

Here, the problem and objectives are translated first to a main research question, which, if answered in full, would achieve the objectives. Subsequently, the main research question is broken down into about three to five subquestions, which, if answered, would answer the main question.

Use a numbered list for the subquestions, making referring to them more practical.

# Preconditions

Many projects need to have certain conditions fulfilled in order to have any chance of finishing it successfully. In the previous example, access to the sales data is critical to the project. There is no substitute for the sales data; if the customer cannot guarantee access before the project starts, it is unwise to start anyway.

In this – optional – chapter, one describes the things critical to the project. Only external factors are described. Access to data is such a factor; however, project members being available at certain hours is not, as this is something the project group has control over itself.

# Methodology

This chapter describes how the subquestions – and hence the main question – are going to be answered in such a way that the way is repeatable and the results proven, not assumed or using a D*eus ex Machina* (hey, it works, so it must have been the correct solution.) We make a distinction between research strategy and research design. Instead of strategy and design, one can also combine it and describe methodology per subquestion. In that case, keep in mind to actually make the difference while figuring it out.

## Research Strategy

The research strategy is a general thing, applying to both main research question and all subquestions. It covers the kind of research (quantitative, qualitative) and the depth of it (exploratory, explanatory, predictive). It also describes how the validity and reliability of the data collection has been ensured.

## Research Design

For each subquestion, you describe how to answer it. It is common to have one method for each subquestion, such as literature study to get an overview of potential algorithms, a questionnaire to get insight in the current usage of an application, or an experiment to determine which data mining tool would have the best performance.

More than one method for a subquestion is possible if they are complementing each other. It could also indicate you need to split the subquestion.

Also describe how the operationalization of the chosen methods works, unless it is self-evident. Put another way: how will you actually *do* the somewhat abstract design you described?

Use the numbered list for the subquestions here as well.

# Risks and solutions

Things can go wrong, and they will. As much as this is unavoidable, it is possible to anticipate, avoiding major risks and mitigating the effects of others. As the saying goes: if you do not manage the risks, the risks will manage you.

In this chapter, you think of all situations which could arise and cause a problem for the progress of the project. Those are called risks. For each risk, determine how likely it is the situation will occur, scaling from 1 (very unlikely, but not impossible) to 6 (very likely.) For each risk, you also determine the damage (trouble) it causes, again scaling from 1 (minor damage which can easily be accepted) to 6 (high damage which will, if not tackled, wreck the project.)

Multiplying the chance and impact gives the priority of the risk, so priority goes from 1 to 36. The higher this number, the more dangerous a risk is. Risks with an attached priority of 25 or 30 are called *critical* risks (sometimes, 24 is also taken as critical.)

Then, you think of countermeasures. If the chance of the risk is high, you try figuring something out to lower it. If for example the risk is ‘people we need to interview are too busy’, a countermeasure to the chance could be ‘ask the team lead to make the appointments’. If the effect (usually called *impact*) is high, you search for a countermeasure lessening the impact. In the previous example, you could use ‘look for documents to use as backup for the interviews.’ For critical risks, you need at least two countermeasures.

## External risks

Those are the risks having a cause outside the project group, not under your control. The examples given before are external risks. You put those risks in the form of a table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk** | **Chance** | **Impact** | **Priority** | **Countermeasure** |
| System admins to interview do not have enough time | 6 | 5 | 30 | Ask team lead to make the appointments  Gather technical documentation on the system to translate to functional requirements |
|  |  |  |  |  |
|  |  |  |  |  |

## Internal risks

Those risks are internal to the project group, and should be handled there, if needed assisted by the tutor. Those explicitly are not things to put in a project plan which can be read by the customer, as it contains items best described as ‘that is not a risk, but unprofessional behavior. If it were a risk, I do not want to hire you anyway!’

Examples are ‘John is sick for two days’ (short, so can be handled by another group member), ‘Jane is not doing her tasks’ (what do I, being the paying client, care? Handle it!) and ‘The group is fighting between members.’

In a school project plan, this paragraph is quite okay to have, as it describes things you are learning to tackle in a gracious way.

# Task division and planning

In this chapter, you analyze the tasks to be done, the amount of work each needs, the order in which it needs to be done, and finally assign the tasks to the group members. There are a lot of ways to do this; here, one of them is given. Whatever way you use, it is a lot of work, but doing it thoroughly spares you a lot of time after that. Doing it poorly in the end means you are spoiling much more time in the effort to keep the project on track.

A way to do the planning is by using the Product Breakdown, Work Breakdown and Critical Path Analysis, three techniques used in that order.

## Product Breakdown

The objectives give products to create, and from the research question, you have an idea how the product will look like (in very, very general terms!) You take this result, and split it into smaller chunks. And those into smaller yet, until the chunks are of a size you understand how much time it would take to create them.

Example: the product envisioned is an application which can take pictures and tell the user whether it is a dog, a cat or something else. That application is large. It would have some GUI, an implementation of artificial intelligence called a neural network, documentation, a training set to teach it the difference and a test set. The neural network can be split into code, mathematical model and unit tests. The code can be split into backbone code and feedback code. Now I have chunks I understand, even if I do not know how to implement them.

## Work Breakdown

Each of the chunks identified needs some work to be created. Identify those steps, making sure to check the methodology all the time (it will contain most things to be done, just at a higher level of abstraction.) Create a list of those steps, filtering out the doubles. Make an estimate on the amount of work each step takes. Then order them in a way that will make certain you do them in the order enforced by the nature of the steps (things need to be done before other things.) You will need a 2D distribution for this.

## Task distribution

Finally, distribute the tasks identified over the weeks and over the group members. Do not forget to include people checking work of others as peer review.

# Contact information

List of group members and teachers involved, with email address and phone numbers.

# References

The list with all literature having been used. Use the same style all the time; APA is preferred, and MS Word has templates for that. Other acknowledged styles are allowed.

Keep this list up-to-date all the time, don’t try ‘filling it in’ afterwards. Aim for high-level sources such as scientific papers or thorough, recent text books written by specialists in the field. Just technical sites are almost always weak sources, as they tend to be focusing on the ‘click here and type this’ approach instead of explaining why something is done that way and proving that as well.

Always refer to the original source whenever possible. When you use a pdf from a scientific paper, do not refer to the URL of the pdf, but to the original publication in a magazine.