

Business Case

Project: PLCOpen-Editor (SWE I practice-based project 2020/2021, TINF19C)

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1. Introduction

The goal of the project is to implement a web version of the PLCOpen-Editor that supports the languages Sequential Function Chart and Function Block Diagram. It is supposed to be an easy tool to program a programmable logic controller without needing a lot of knowledge about the concrete syntax of the languages. Thereby for example a company can benefit, because it doesn't have to train the employees which results in a decrease of costs and time.

By planning a business case the contractors can get aware of all costs and risks that might occur and in order of that they can find out if the project is profitable.

2. Working hours

In total each member of the project has a capacity of 180 hours. The distribution to the different work packages and members is as follows.

	Mouaz Tabboush (Project Manager)	Leonie de Santis (Product Manager)	Elian Yildirim (Programmer)	Franziska Kopp (Technical Editor)
Documents	35	40	30	40
GitHub Organisation	5	10	15	10
Analysis	15	15	15	15
Design	10	10	10	10
Programming	35	35	40	35
Testing	30	30	30	30
Meetings	30	30	30	30
Project management	10	0	0	0
Presentation	10	10	10	10
Total (Stunden)	180	180	180	180

Table 1: Estimated working hours

3. GANTT-Chart

The GANTT-Chart belonging to this project is available via the following URL:
https://github.com/elian15122000/TINF19C-PLCOpen-Editor/blob/master/PROJECT/PM/Gantt_chart.xlsx

4. Risk Analysis

Risk	Annotation	Probability of occurrence	Measure
Personnel risks	Member leaves project	Low	Project plan will have to be adapted, so that the working hours of the missing member distributes to the left members
Planning risk	Milestones are not achieved at the planned time	Medium	Project plan will have to be adapted
Risk in communication between the members	Tasks are done in a different way than consulted or tasks are not done in time.	Medium	Regular meetings
Risk in communication to client	The project is not implemented the way the client wanted it to be.	Medium	As soon as there are concerns about how the client wants something to be implemented, the product manager will ask the client.
Financial risk	The planning of the costs is wrong and the project is more expensive than expected.	Low	As soon as there are concerns about the costs, the members of the project will discuss about how to reduce the costs.

Table 2: Risk analysis

5. Cost Calculation

The members of the project are all working remote from home so there is no rent for an office to pay. Merely the cost of power and for internet access will have to be paid. In the following table this is summarized under the term *additional costs*. For the project a sever was bought, so the costs for server and software is 200,00€/month. Moreover, some of the members had to buy some hardware like a second screen or a better office chair in order to have a better working environment. These costs for the initial equipment are estimated to 250,00€ per person. Table 3 shows all the fixed costs summed up.

Fixed costs	Price	Term/User	Total costs
Additional costs	7,00€/month/user	6 months/4 users	168,00€
Server	200,00€/month	6 months	1.200,00€
Initial equipment	250,00€/user	4 users	1.000,00€
Total			2.368,00€

Table 3: Fixed costs

The salary of each member is as follows:

Project Manager: 46,00€/h

Product Manger: 43,00€/h

Programmer: 42,00€/h

Technical Editor: 41,00€/h

The cost of the salary set off against the estimated working hours (Table 1) make the following costs.

Working package	Costs
Documents	6.230,00€
GitHub Organisation	1.700,00€
Analysis	2.580,00€
Design	1.720,00€
Programming	6.230,00€
Testing	5.160,00€
Meetings	3.960,00€
Project management	460,00€
Presentation	1.720,00€
Total	29.760€

Table 4: Costs of the working packages

Adding the costs of the working packages to the fixed costs makes a total of 32.128,00€.

6. Offer

As the profit is meant to be at least +0,2% of the costs, this makes a minimum offer price of

$$32.128,00\text{€} * 1,2 = 46.264,32\text{€}$$

In order to have an even price the final offer price is **46.265,00€**.

7. Calculation of earning power

A possibility to sell the product is to sell licenses for using the product. This could be 200,00€/month/user. In addition there could be offering for companies, so that there are 10 licenses for 1.500,00€/month. These numbers lead to the following calculation of profits in the first year.

1st quarter:

	Profit
Estimated abonnements: 6	3.600,00€
Estimated abonnements of the offering for companies: 0	0,00€
Total	3.600,00€

2nd quarter:

	Profit
Estimated abonnements: 8	4.800,00€
Estimated abonnements of the offering for companies: 1	4.500,00€
Total	9.300,00€

3rd quarter:

	Profit
Estimated abonnements: 9	5.400,00€
Estimated abonnements of the offering for companies: 3	13.500,00€
Total	18.900,00€

4th quarter:

	Profit
Estimated abonnements: 10	6.000,00€
Estimated abonnements of the offering for companies: 5	22.500,00€
Total	28.500,00€

The calculation of profits set against the offer price and the costs of the server leads to the following calculation of earning power.

	1 st quarter	2 nd quarter	3 rd quarter	4 th quarter
Profit	+3.600,00€	+9.300,00€	+18.900,00€	+28.500,00€
Costs	-600,00€	-600,00€	-600,00€	-600,00€
Total	-43.265,00€	-34.565,00€	-16.265,00€	+11.635,00€

Table 5: Calculation of earning power

As shown in table 5 there is already in the first year a profit of 11.635,00€.