

Business Case

AAS Digital Nameplate Generator

Customer: Rentschler & Holder

Company address: Lerchenstraße 1, 70178 Stuttgart

Supplier: Team 2

Role	Name	Email Address
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Technical Documentation	Tristan Kopp	inf22062@lehre.dhbw-stuttgart.de
Software Developer	Robin Ernst	inf22176@lehre.dhbw-stuttgart.de

Version Control

Version	Date	Author	Comment
1.0	13.10.2023	Robin Ernst	Initialize the BC and create a first version of the offer
1.1	3.11.2023	Robin Ernst	Update Work Packages and financial calculations

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1 Introduction

The purpose of this document is to evaluate the benefits, costs and risks of the project “Digital Nameplate Generator”. Furthermore, it will substantiate why the benefits of this project outweigh its costs.

2 Scope

A nameplate generator shall be developed using the DIN standard, a REST-API and the Asset Administration Shell (AAS) - Server. A nameplate for a selected product will be generated in a backend application. The nameplate can be downloaded in PNG or SVG format. This nameplate should include important details about the product as well as a QR-Code and safety and regulation markings along the border.

3 Qualitative and Quantitative Benefits of Development

Moving the software into the backend allows for the application to be used as a micro service by other applications in the background using the REST-API. Furthermore redesigning the generation of the nameplate allows for a more user friendly design featuring safety and regulation markings directly on the nameplate of ease of use. Automating this process frees personnel of this tedious task and saves time and money.

4 Limits and Risks

First, a risk is that team members have to focus on different subjects, e.g., tasks in their companies, while working on this project. There is also a financial risk for the customer. The customer shall only profit if the project scope is accomplished and the expenditures are kept manageable. Another risk is that the milestones plan cannot be achieved in the requested time. Fulfilling the project scope and avoiding aforesaid risks is realistic because the workload of each team member is manageable and comprehensible. Furthermore, risks, e.g., illnesses like Covid-19, are also considered in the schedule, based on a 30% of total time buffer in the milestones plan to

maintain the expectations of the customer. The risk of customer misalignment is met by asking the customer's opinion on every major decision. There are also more common risks, like exmatriculation. This argumentation is the reason for the upcoming illustrations. The risks are rated on a scale from 1 to 5. 1 conveying a low risk and 5 a high risk.

Risks	Rating (1-5)
Focus on Different Subjects	3
Financial	5
Timing	4
Illnesses of Team Members	2
Exmatriculation	2
Customer Misalignment	2

Table 1: Risks with Rating

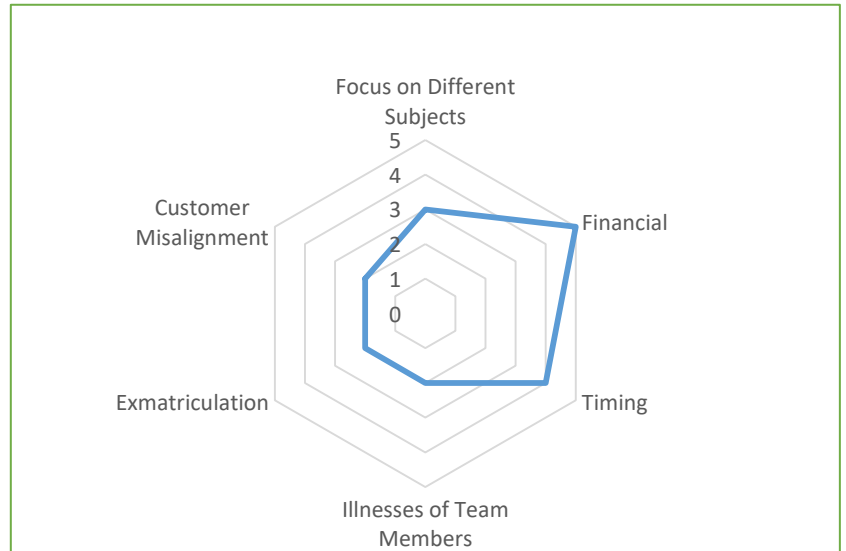


Figure 1: Ratings of Risks

5 Time Frame

The time frame for this project is 4.09.2023 - 26.05.2024. However, from 27.11.2023 - 03.03.2024 the team members will work in their companies. Thus, the workload during this time will be reduced.

To achieve the project scope, the main goal is split into two. The goal of the third semester is to write the requested documents and redo the architecture. The goal of the fourth semester is revisit the nameplate generation. The development shall be documented in meeting protocols, which are standardized via a self-made template. The estimated expenditure of time is 150 hours per person. This estimation is based on the plan for self-study via the DHBW of 180 hours for both semesters. 30 hours are removed for exam preparation etc. The estimation of expenditure time as well as the costs of it are shown and illustrated in the table 3 later on in the document.

6 Expenses

It is a software project. Thus, the costs shall be composed of software tools, standard office equipment, server solution and working hours.

Most of the software tools, used in this project, are either free or open source. The only tool costing money is JetBrains' Webstorm licenses. Renting an office space is not necessary since remote work is possible. Every team member has standard office equipment, so no costs are expected in this area, other than energy and internet. Furthermore, after accomplishing the scope, the project should work on an efficient server which is maintained in certain time periods. The compiled project shall be hosted on a Hypertext Transfer Protocol (Secure), also known as HTTP(S). The server does not need special infrastructure. Therefore, it will be a free server. All the fix costs shown above are estimated in table 2.

Fix Costs	Costs in Euro per Person	Amount	Costs for whole Team
JetBrains Webstorm license	159 €	5	795 €
Energy & Internet	200 €	5	1000 €
Server	0 €	1	0 €
Total fix costs			1.795 €

Table 2: Fix Costs

The variable costs of this project are the average wages of those roles or rather jobs in Germany. Furthermore, the estimated amount of working hours are considered in this document. The variable costs can also be shown by separating the costs by work packages. Both ways of listing and illustrating the variable costs are presented in the upcoming graphics. Adding up all employee costs or rather **variable costs** results in **31.500€**. That results in a **total costs** of **33.295€** including the fix- and variable costs. The following tables and figures shall show deeper insights into the work packages and employee costs. On the one hand, it shall show the employee costs based on their hourly wages. On the other hand, it shall show the employee costs based on their work packages.

Role	Team Member	Hourly Wage	Costs of 150 Hours
Project Lead	Florian Dörr	50 €	7.500 €
Software Developer	Robin Ernst	45 €	6.750 €
Test Manager	Thomas Ekhardt	40 €	6.000 €
System Architect	Simon Luz	40 €	6.000 €
Technical Documentation	Tristan Kopp	35 €	5.250 €
Estimted Variable Costs			31.500 €

Table 3: Employee Costs based on Hourly Wages

Work Packages	Florian Dörr	Thomas Ekhardt	Simon Luz	Tristan Kopp	Robin Ernst	Costs	Relative Variable Costs
Protocolling	5	0	0	20	0	500 €	1,60%
Documents	30	10	10	40	15	4.000 €	12,70%
Product analysis	20	0	20	0	20	3.000 €	9,50%
Project design	0	5	30	10	10	2.500 €	7,90%
Coding	10	20	30	10	50	6.000 €	19,00%
Test	0	50	5	10	0	2.500 €	7,90%
Meetings	20	20	20	20	20	3.500 €	11,10%
Customer exchange	15	0	5	0	0	1.000 €	3,20%
Leading project	35	0	0	0	0	1.500 €	4,80%
Presentation	5	15	5	10	5	1.500 €	4,80%
Research	10	10	10	10	10	2.000 €	6,30%
GitHub	0	20	15	20	20	3.500 €	11,10%
Sum of Working Hours	150	150	150	150	150		
Estimted Variable Costs						31.500 €	

Table 4: Work Packages of the Employees and Costs

ACTIVITY	PLAN START	PLAN DURATION	ACTUAL START	ACTUAL DURATION	PERCENT COMPLETE	WEEKS
						1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
Planning (CRS, SRS, BC, SAS, ...)	1	7	1	7	70%	
Execution	8	8	8	8	0%	
Testing	16	3	16	3	0%	
Finished	19	1	19	1	0%	

7 Offer

All the information and costs, both fix and variable costs, lead to the upcoming offer. Those details and the **offer sum** of **39.954€** are illustrated in the following table, which shows the total cost of the project along with the profit margin and the offer.

Type of Costs	Costs
Variable Costs	31.500 €
Fix Costs	1.795 €
Total Costs	33.295 €
Profit of 20%	6.659 €
Offer Sum	39.954 €

Table 5: Offer