Business Case

AAS Digital Nameplate Generator

Customer: Rentschler & Holder

Company address: Rotebühlplatz 41, 70178 Stuttgart

Supplier: Team 2

Role	Name	Email Address
Team Lead	Adrian Khairi	Inf21196@lehre.dhbw-stuttgart.de
Test Manager	Janin Ahlemeyer	Inf21006@lehre.dhbw-stuttgart.de
System Architect & Software Developer	Mika Kuge	Inf21059@lehre.dhbw-stuttgart.de
Technical Documentation	Maris Koch	Inf21050 @lehre.dhbw-stuttgart.de
Product Manager	Erika Zhang	Inf21174@lehre.dhbw-stuttgart.de

Version Control

Version	Date	Author	Comment
1.0	25.09.2022	Adrian Khairi	Initialize the BC and create a first version of the offer
1.1	27.09.2022	Adrian Khairi	Refined the document with Erika Zhang's comments
1.2	28.09.2022	Adrian Khairi	Grammatical refinements
1.3	01.10.2022	Adrian Khairi	Adjusting formulations in cooperation with Erika Zhang
1.4	13.10.2022	Adrian Khairi	Improved the document's quality even more by using inspirations of actual enterprise documents
1.5	16.10.2022	Adrian Khairi	Adjusting the BC based on customer meeting on 14.10.2022 and adding Excel sheets
1.6	19.10.2022	Adrian Khairi	Adjusting formulations and details of Excel sheets in cooperation with Erika
1.7	15.02.2023	Adrian Khairi	Improvements and updating the Excel Sheets
2.0	27.03.2023	Adrian Khairi	Final improvements based on customer consultation

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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 overweigh its costs.

2 Scope

A nameplate generator shall be developed using the DIN standard, a REST-API and the Asset Administration Shell (AAS) - Server. Furthermore, a search function and a user interface with a list of all the assets shall be included in the final version. The user shall be able to choose an asset and all the information regarding it shall be displayed pre-sorted. The nameplate can be downloaded in PNG or SVG format.

3 Qualitative and Quantitative Benefits of Development

The purpose of development is to automate the name plating process acting as a long-term solution since no more employees will be needed for this task. It eases the collection of information for a certain product as well as speeding up the information collecting process by presorting it. Thus resulting in employee productivity growth. The clear illustration improves the quality as the ease of use opens up more opportunities to use this program. To sum up, the efficiency and productivity are increased, while the costs are decreased in a long term. It should also be mentioned that there is a possibility to earn money by selling the final product.

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 from the aspects of chapter 2 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. But this risk is considered quite low since all team members usually get good grades. 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

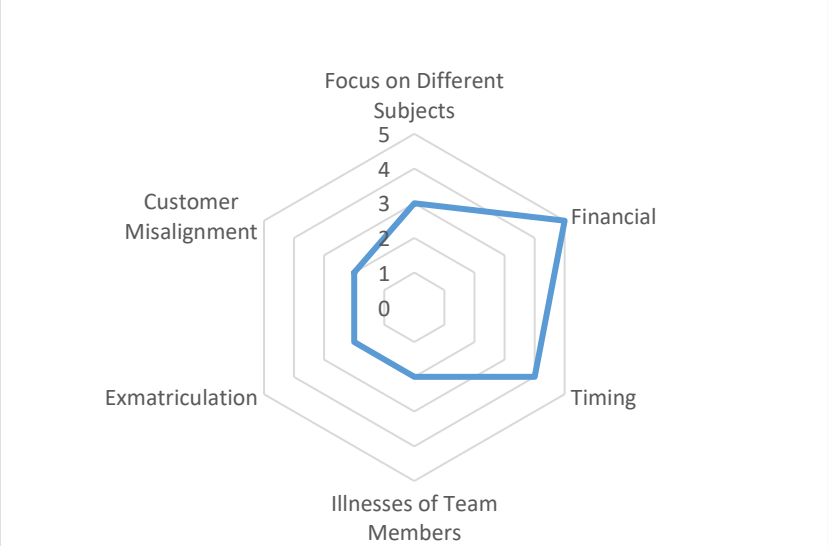

Figure 1: Ratings of Risks

5 Time Frame

The time frame for this project is 16.09.2022 - 28.05.2023. However, from 28.11.2022 - 06.03.2023 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 program the functional tasks, e.g., the requests to the AAS Server through input by the user. The goal of the fourth semester is to create a React front end. While fulfilling those, the requested documents, e.g., Business Case, are written and refined. 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. 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	249 €	5	1.245 €
Energy & Internet	150 €	5	750 €
Server	0 €	1	0 €
Total fix costs			**1.995 €**

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 **73500€**. That results in a **total costs** of **75495€** 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	Adrian Khairi	110 €	16.500 €
Product Manager	Erika Zhang	105 €	15.750 €
Test Manager	Janin Ahlemeyer	90 €	13.500 €
System Architect & Software Developer	Mika Kuge	100 €	15.000 €
Technical Documentation	Maris Koch	85 €	12.750 €
Estimtated Variable Costs			**73.500 €**

Table 3: Employee Costs based on Hourly Wages

Work Packages	Adrian Khairi	Janin Ahlemeyer	Mika Kuge	Maris Koch	Erika Zhang	Costs	Relative Variable Costs
Protocoling	5	0	0	0	5	1.075 €	1,40%
Documents	30	10	5	40	25	10.725 €	14,60%
Product analysis	10	0	0	0	50	6.350 €	8,60%
Project design	0	10	30	10	10	5.800 €	7,90%
Coding	0	35	50	40	10	12.600 €	17,20%
Test	0	50	5	5	0	5.425 €	7,40%
Meetings	20	20	20	20	20	9.800 €	13,30%
Customer exchange	15	0	5	0	0	2.150 €	2,90%
Leading project	35	0	0	0	0	3.850 €	5,20%
Presentation	20	0	10	0	0	3.200 €	4,60%
Research	10	10	10	10	10	4.900 €	6,60%
GitHub	5	15	15	25	20	7.625 €	10,30%
Sum of Working Hours	**150**	**150**	**150**	**150**	**150**		
Estimtated Variable Costs						**73.500 €**	

Table 4: Work Packages of the Employees and Costs

7 Offer

All the information and costs, both fix and variable costs, lead to the upcoming offer. Those details and the **offer sum** of **90594€** 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	73.500 €
Fix Costs	1.995 €
Total Costs	**75.495 €**
Profit of 20%	15.099 €
Offer Sum	**90.594 €**

Table 5: Offer