PROJECT REPORT

INTERNSHIP PORTFOLIO HBO-ICT

FONTYS UNIVERSITY OF APPLIED SCIENCES

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Project period: (from – till)	18 February- 28 June
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Date:	17/06/2024

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Version

Version	Date	Author	Description
1.1	03/04/2024	Denitsa Goranova	Started document
1.2	21/05/2024	Denitsa Goranova	Updated document based on feedback
1.3	07/06/2024	Denitsa Goranova	Updated document based on feedback
1.4	17/06/2024	Denitsa Goranova	Updated based on feedback

Contents

Introduction

Context

Leading truck manufacturer DAF introduces connected services as PACCAR Connect starting in April 2024. Through its Global Connected Services business, PACCAR, global heavy-duty truck manufacturer, focuses on offering cutting-edge solutions in connected vehicles. PACCAR Connect gathers and transforms vehicle data into insightful analyses and over-the-air updates with the goal of streamlining operations for DAF truck owners**.**

Goal of the project

As every company aiming for success, PACCAR understands the importance of having a competitive advantage. They want to remove the disadvantage of lack of connectivity and also want to provide customers with transparency.

Their objective is to choose a solution that is easy to integrate and provides quick access to their services. Third party integration was happening throughout a couple of documents, containing information about how to integrate with the APIs. The company used a document for introducing clients to the APIs and how they can use them, also another word document, containing more details. The goal of the internship project is to offer clients a solution that will enable smooth communication with PACCAR CONNECT. This solution needs to have detailed information for the API, integration details, requirement and response parameters, as well as error codes. The ultimate goals are to increase client awareness of DAF capabilities, facilitate client integration with PACCAR CONNECT systems, increase service sales for DAF, and promote innovation. To demonstrate service functioning, a toolkit will be created, giving the company a competitive edge and boosting client confidence. By completing the project, the company hopes to provide a gateway for related services so that users and outside parties may test out what they have to offer.

The assignment

The assignment is an online resource that will include documentation, assistance, and resources. It will act as a single point of contact for customers and developers of software for information about our products and guidance on how to best incorporate them into applications. The first step will be doing research and applying the findings to generate

concepts for the developer portal. To assist them, we will provide sample use cases in several programming languages.

We want to achieve high satisfaction of parties who want to integrate our data. They should be guided through the process of making full use of our data services. This, we will do by giving clear guidelines, explanations and instructions on how to use our services in the best way possible. In the project we want to understand what is requested by these type of parties and what we need to deliver to make them happy. Since a happy data integrator, could give us a competitive advantage or at least a good image within the market.

Description of the process

After I did a research about a development library and had a chance to meet with a 3rd party, we developed the portal in JavaScript and Java. For programming languages we are going to start with Java for the backend together with Spring Boot, and for the implementation of the APIs use cases we are going to have various languages based on the client needs, which ae clear explanations about the APIs and how to use the, where to use them, and API versions. For API documentation we are going to use Swagger, an open source specification that allows us to describe each element of the API so that the system can interact with it. We will have a backend of Spring Boot and a frontend of React, for database we are going to use the company choice which is Snowflake. The reason behind those choices is firstly simplicity. For the front end we were seeking interactive user interfaces and we would like to use the following methods: KISS, DRY, SOLID and YAGNI , which would be easily used in React because of its components-based structure. On the other hand, Spring Boot is chosen because we can create strong and reliable services quickly. By having those two components, we are going to build an efficient and powerful solution based on the 3rd parties and the clients' needs.

Research questions

Customers and 3rd parties of DAF PACCAR Connect were informed about the idea of an API Development Portal and they are interested in it and are looking forward to see the process and the final result. It is clear that the development portal will be a good idea but there are a lot of questions that we need to firstly answer before starting the process.

Main question:

How can an API Portal meet the needs and preferences of developers, consumers and 3rd parties?

Sub- questions:

What specific features should an API Portal have in order to be helpful for a target group?

What can we do for the 3rd parties onboard to use our data services?

How can we improve effectiveness in the company with an API Portal?

How will the library be deployed?

Research methods

Sub question	Research method
What specific features should an API Portal have in order to be helpful for a target group?	Problem analysis
What can we do for the 3rd parties onboard to use our data services?	Expert interview, Observation
How can we improve effectiveness in the company with an API Portal?	Expert interview, Explore user requirements
How will the library be deployed?	Community research

Results

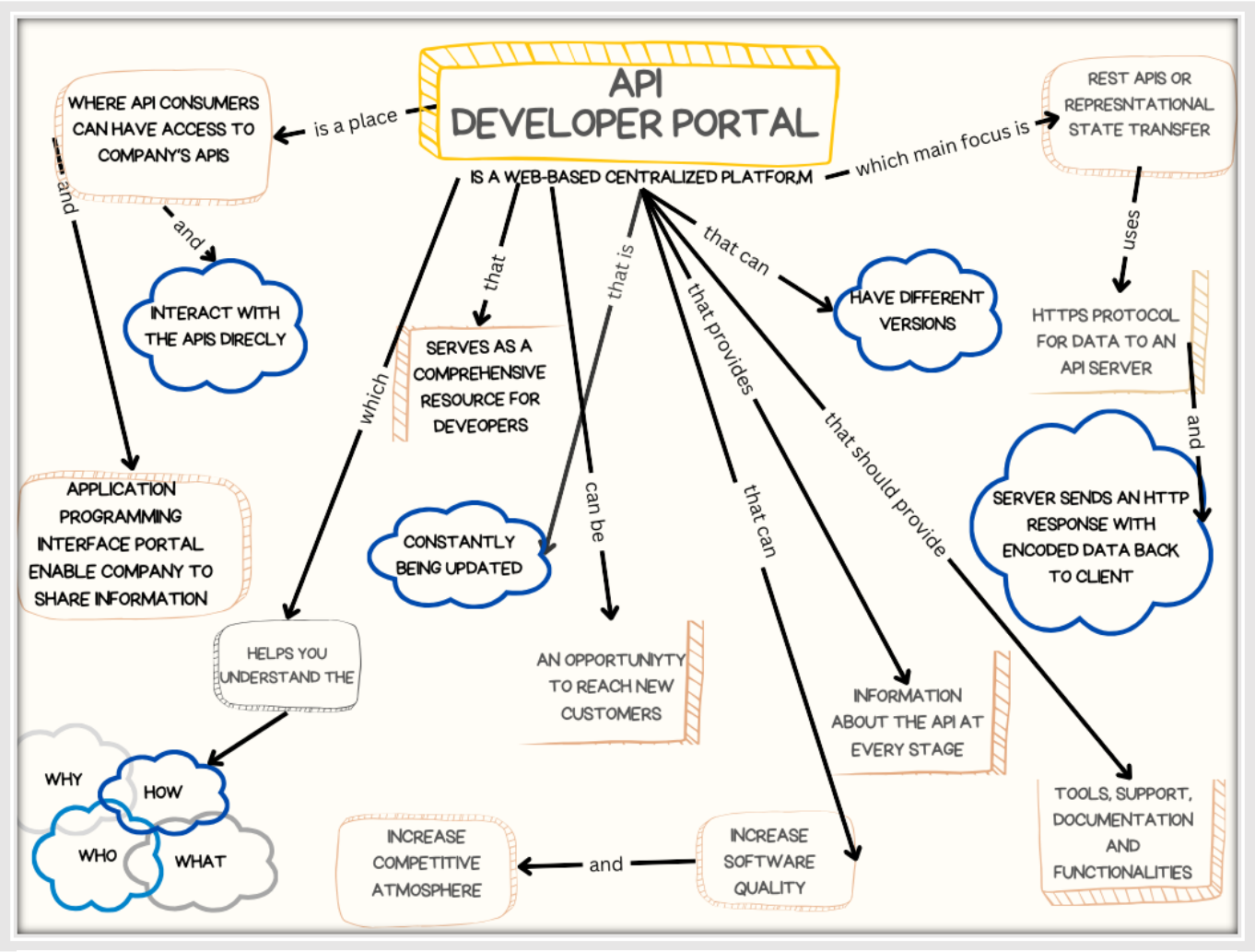


Figure 1 -Cognitive scheme

The main findings of the research emphasize how important an API portal is in appealing to the various requirements and preferences of customers, developers, and other stakeholders. To make integration and testing simpler for developers, tools like interactive API terminals, sandbox environments, and thorough documentation are crucial. Customers place a high value on intuitive user interfaces, open pricing structures, and extensive support systems to guarantee dependability and simplicity of use. To optimize acceptance, third parties need broad integration choices, a large number of developer resources, and efficient onboarding procedures. Additionally, by centralizing API management, optimizing workflows, and facilitating real-time monitoring and analytics, the API Portal improves internal effectiveness. The API library's deployment may take use of contemporary techniques like containerization and CI/CD pipelines for automation, scalability, and robustness. These observations are derived from the given study document. The research results can also be seen in the appendix.

Approach

The project will employ an Agile methodology, primarily focusing on Scrum. We choose this architecture for team communication because it enables us to swiftly respond to changes and new needs while the project is ongoing. It focuses on fulfilling discrete criteria, and by doing so, we are able to make changes and provide the highest quality possible. Your clients may monitor your progress when you use SCRUM. We concluded that Agile, the company's default methodology, would be the most appropriate. The firm does two-week sprints during which there is constant progress. My university tutor and internship mentor will meet with me once a week to discuss my progress.

Planning

Sprint 1

During my first Sprint, my main focus was conducting research to understand the customer needs and how we can effectively satisfy them. This started with investigating the problem based on research questions. I had the opportunity to talk with some of my stakeholders and interview them. Interviews are in the appendix of the research report: https://github.com/goranova124/developerLibrary/blob/main/researchReport.pdf . The first sprint I was also creating a project plan as well as outlining a possible solution for the applications. Investigating the problem was the main objective during this sprint so I was mainly focused on it. I had to lay a string foundation by thoroughly understanding the problem and identifying the best way of action to address it. My research helped me to properly visualize the end product and because of the research I was able to demonstrate my research and analytics skills, as well as my ability to collaborate with stakeholder while gathering their input. Creating the possible structure showed my project management capabilities.
For the company, these findings were mainly centered around understanding the problem even more. My research provided valuable insights into customer demands.

Sprint 2

During my second sprint, several task were completed, such as experimenting with the APIs, starting the project structure, wireframes, data provisioning, meeting with stakeholders. The experimentation with the APIs allowed for a better understanding of their functionalities and how to possibly include them in the developer library. This was a crucial moment for the project, since it helped me ensure the solution would effectively address the needs of the third parties, while using our product. During my stakeholder retrospective moment, we discussed possible complications of the APIs usage. I made sure to gather feedback during those sessions so I can improve my work. With the stakeholders, we started thinking of the best solution in details and how we can help 3rd parties to have a smooth journey integrating with our products.

Sprint 3

My third sprint was focused on foundation. I started with consideration for a database, initialized the backend framework which is Spring Boot. Considering which choice for the database will be most suitable, helped me increase my knowledge on the company structure and which frameworks they are using. We decide that the most appropriate one will be Snowflake.
I also had to connect the different layers- backend, frontend and database.
During this sprint my university tutor visited the company.

Sprint 4

After having the main components in the application, it was time to develop it. I started the implementation of the backend. I was using methods like SOLID, KISS, YAGNI. I started with the implementation of one API because I wanted to understand the logic behind it firstly and then to make it in the easiest way possible for the user to integrate with it.

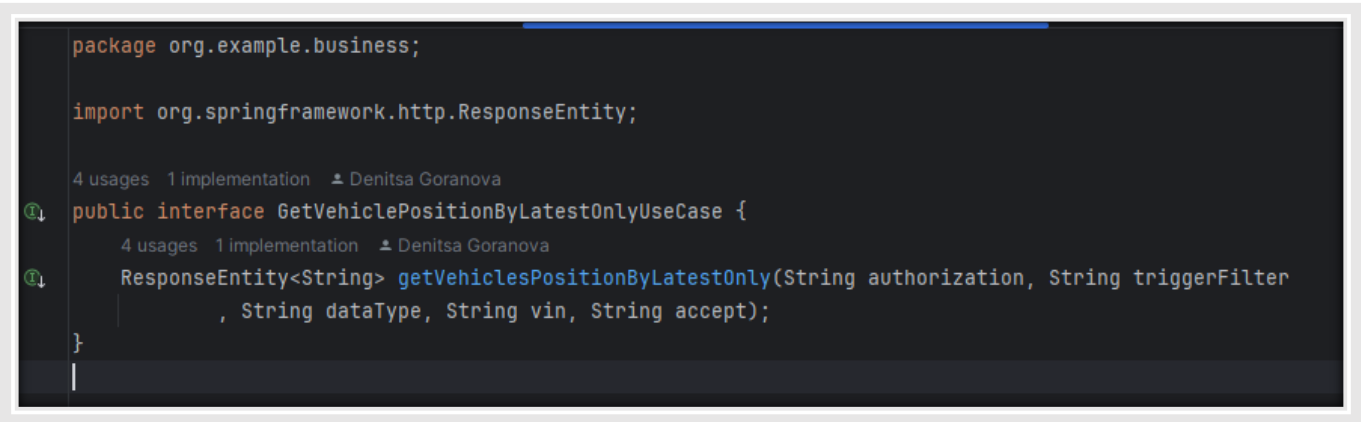
```
@Service
public class GetVehiclePositionByLatestOnlyUseCseImpl implements GetVehiclePositionByLatestOnlyUseCase {

    4 usages  Denitsa Goranova
    @Override
    public ResponseEntity<String> getVehiclesPositionByLatestOnly(String authorization, String triggerFilter, String dataType, String vin, String accept) {
        try {
            WebClient webClient = WebClient.create();
            HttpHeaders headers = new HttpHeaders();

            headers.add( headerName: "Authorization", authorization);
            headers.add( headerName: "Accept", accept);

            StringBuilder stringBuilder = new StringBuilder("https://api.connect.daf.com/rfms/vehiclepositions?latestOnly=true");
            if (triggerFilter != null && !triggerFilter.trim().isEmpty()) {
                stringBuilder.append("&triggerFilter=").append(triggerFilter);
            }
```

Figure 2 -Implementation of class



```
package org.example.business;

import org.springframework.http.ResponseEntity;

4 usages  1 implementation  Denitsa Goranova
public interface GetVehiclePositionByLatestOnlyUseCase {
    4 usages  1 implementation  Denitsa Goranova
    ResponseEntity<String> getVehiclesPositionByLatestOnly(String authorization, String triggerFilter
            , String dataType, String vin, String accept);
}
```

Figure 3- Interface of a class

Sprint 5 and Sprint 6

The fifth and sixth sprint were focused on the frontend and mainly developing even more the backend.

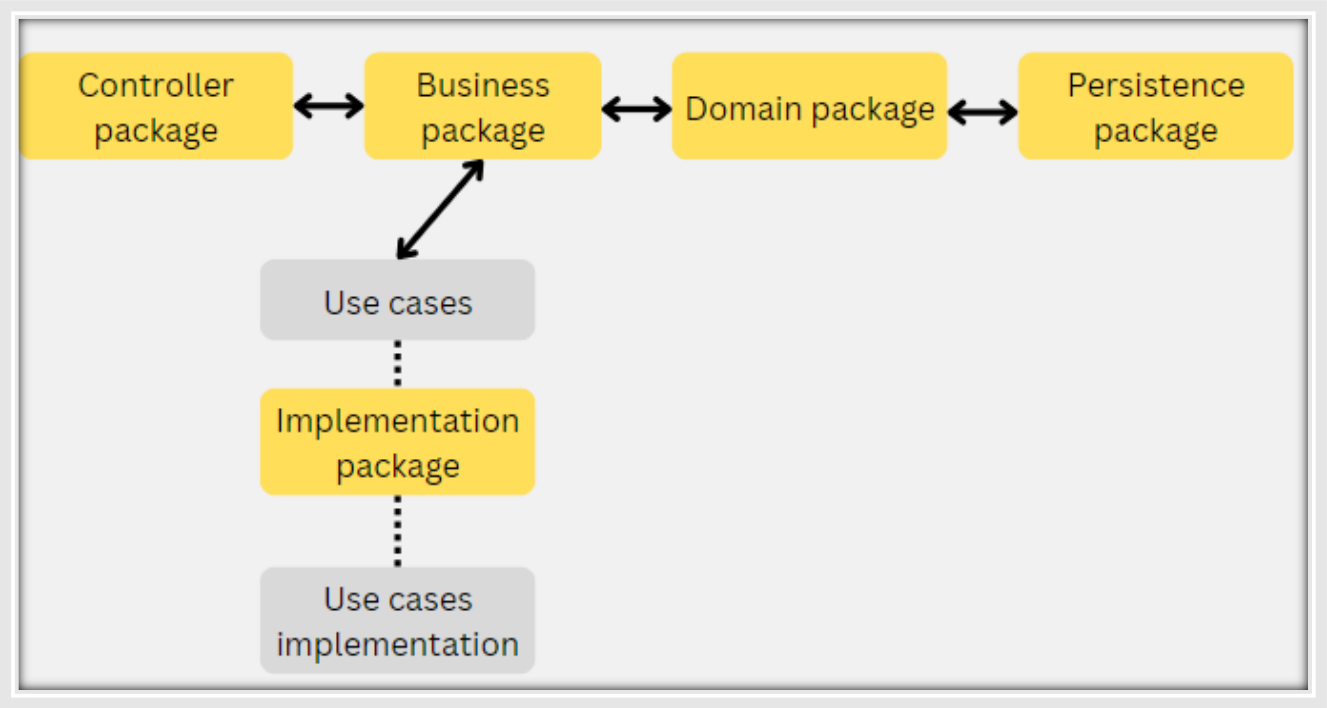


Figure 4 - Architecture of backend

This contained implementation of code snippets examples, database input, implementation of classes. I had a meeting with a 3rd party of PACCAR- Code Yellow where I presented my work and got feedback from developers, people who are going to use the solution. This helped me improve my solution, so it can be compatible for developers as well as people with not a lot of technical knowledge. After my meeting with Code Yellow, I also improved and developed some of the points in the frontend.

. For the backend, I focused on the implementation of the APIs. There were in total four APIs and for better usage and understanding of the various use case my stakeholders and I decided to separate two of the APIs into separate ones, so at the end we had 6 APIs, which had to be implemented. The process was to start with the different layers of the backend and to divide every part of the API as follows: controller, domain, persistence and business classes a you can see in Figure 5. Every class has its own responsibility and is independent from the rest, an for that part we also used SOLID.

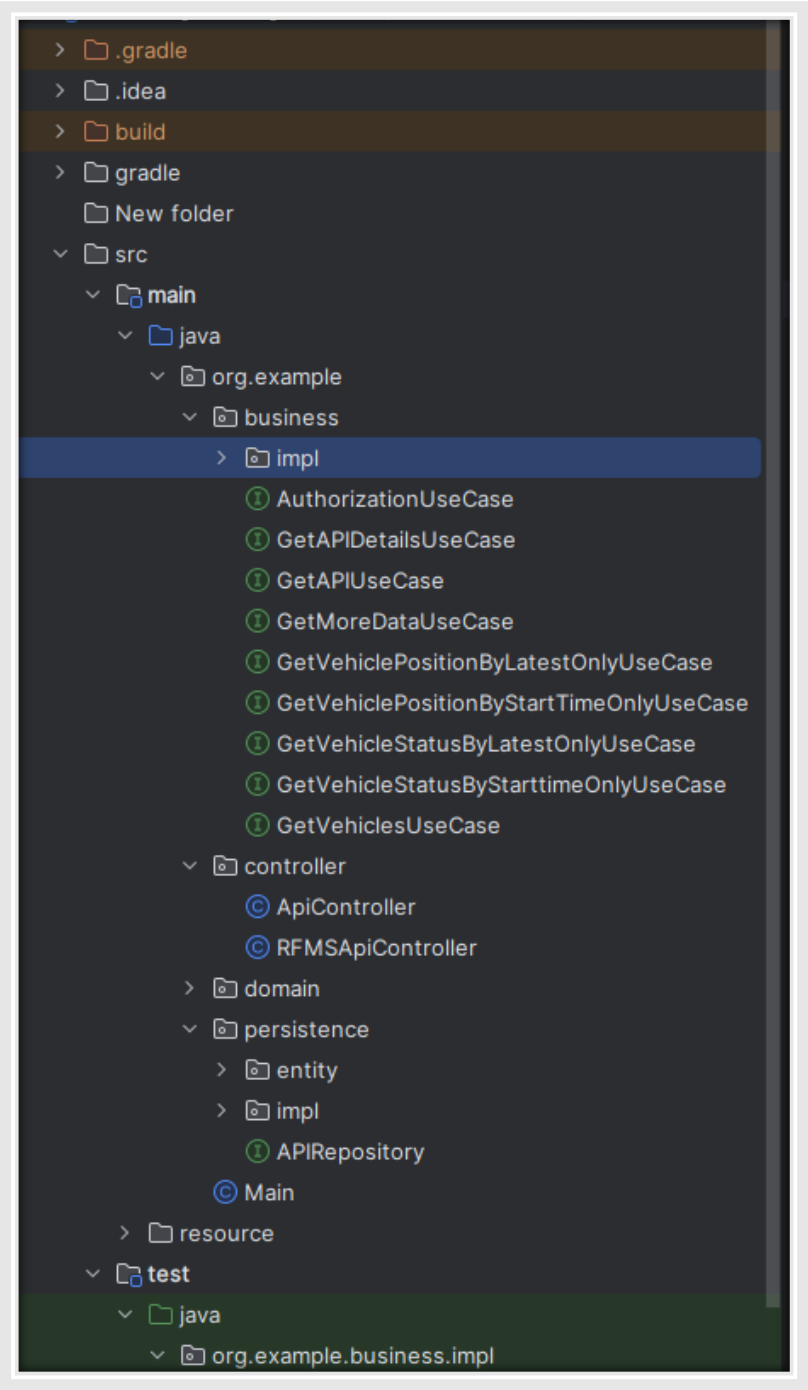


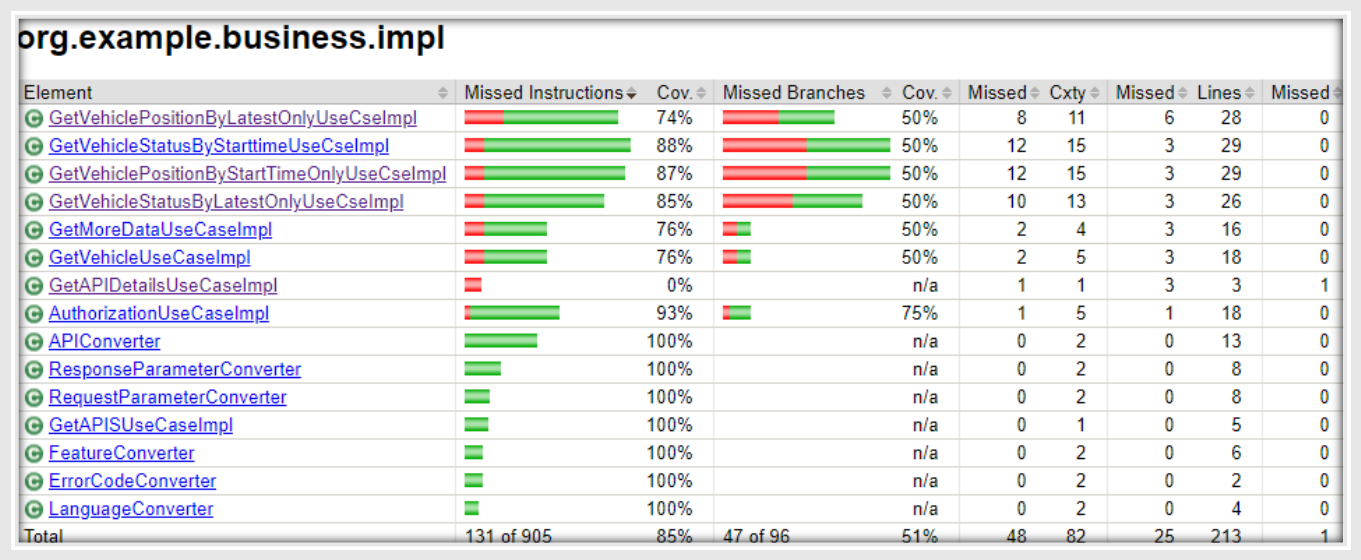
Figure 5- Backend structure

Sprint 7 and Sprint 8

During this sprint, we had a meeting with Francisco Nunez, Manager Platform Architect, who provided us with a code review session and was part of the deployment process. Based on the report, I updated the applications and I also started with the process of testing.
I made the decision to incorporate thorough unit testing in order to guarantee the dependability and robustness of my program. At least 80% code coverage is what I want to accomplish. Code

coverage is a critical indicator that helps you find untested areas of your application by showing you what proportion of your code is being executed by automated tests. Reaching high code coverage guarantees that most of your code is tested, which may drastically lower the amount of problems that go undiscovered and raise the overall caliber of the program.

I decided to use JaCoCo, a well-liked and effective code coverage tool for Java programs, to accomplish this aim. Java Code Coverage, or JaCoCo as it is short for Java Code Coverage, is easily integrated with a number of build technologies, including Jenkins and Maven, as well as continuous integration platforms. The capacity of JaCoCo to provide thorough coverage reports is one of its main features. These reports offer information on the areas of the codebase that are and are not tested. It is simple to identify places that require more testing thanks to the reports' visual cues, which include colored markers in the code to emphasize covered and uncovered lines. Developers may concentrate their efforts on creating tests for the most intricate and crucial sections of the application with the support of this fine degree of detail. JaCoCo facilitates several forms of coverage measures, such as branch, method, and line coverage. JaCoCo offers a thorough overview of the test coverage and aids in locating any potential flaws in the testing method by utilizing these various metrics. To sum up, my goal is to improve the robustness and dependability of my program by utilizing JaCoCo to get a minimum of 80% code coverage. JaCoCo is an easy-to-use and efficient tool for making sure that the codebase is completely tested and that possible issues are found and fixed early in the development process. Its features include seamless integration, extensive coverage metrics, and detailed reporting.



org.example.business.impl

Element	Missed Instructions	Cov.	Missed Branches	Cov.	Missed	Cxty	Missed	Lines	Missed
GetVehiclePositionByLatestOnlyUseCseImpl		74%		50%	8	11	6	28	0
GetVehicleStatusByStarttimeUseCseImpl		88%		50%	12	15	3	29	0
GetVehiclePositionByStartTimeOnlyUseCseImpl		87%		50%	12	15	3	29	0
GetVehicleStatusByLatestOnlyUseCseImpl		85%		50%	10	13	3	26	0
GetMoreDataUseCaseImpl		76%		50%	2	4	3	16	0
GetVehicleUseCaseImpl		76%		50%	2	5	3	18	0
GetAPIDetailsUseCaseImpl		0%		n/a	1	1	3	3	1
AuthorizationUseCaseImpl		93%		75%	1	5	1	18	0
APIConverter		100%		n/a	0	2	0	13	0
ResponseParameterConverter		100%		n/a	0	2	0	8	0
RequestParameterConverter		100%		n/a	0	2	0	8	0
GetAPISUseCaseImpl		100%		n/a	0	1	0	5	0
FeatureConverter		100%		n/a	0	2	0	6	0
ErrorCodeConverter		100%		n/a	0	2	0	2	0
LanguageConverter		100%		n/a	0	2	0	4	0
Total	131 of 905	85%	47 of 96	51%	48	82	25	213	1

Figure 6 - Test coverage

Sprint 9

For my final print, I have been mainly involved with testing and also feedback session. I had a meeting with all my stakeholders, which were related with

deployment and testing. We had a lot of discussion what will be the method for deployment and with who should we communicate for this part. There were different opinions but we decided that we are going to try wo different versions. One o which was to continue with deploying the website with the help of PACCAR, which was going to take some time and the other one was to try to deploy it by ourselves. I ha to do a small research what tool would b most applicable in our case and how to use it, I had different opportunities and it took me some time to decide which would be the most suitable for our problem. We were aiming for a tool which will efficiently migrate already our existing Spring App, manage scaling, manage secrets and certificates. Possible tools were GitHub, Azure, AWS. Heroku. For each one of them I tested how they are performing and what advantages and disadvantage they have. For our last decision, we are currently using GitHub Pages together with Azure, but you can read more about the decision taking in the "Investigate Problem Solving" part of the document.

Personal Reflection

Learning outcomes

1. Professional duties

You fulfil your professional responsibilities at a junior Bachler level, creating professional deliverables that align with the specific IT field I am working in.

Analysis, Design, Realize, Advise, Manage, and Control: During my internship, I took part in a range of tasks that correspond to junior bachelor-level professional responsibilities. This included managing project activities, advising stakeholders on best practices, creating system designs, implementing integration solutions, and assessing client needs. The extensive Project Plan, for example, describes the steps of analysis and design, including the project's goals, schedule, and scope. The implementation of the integration solutions is demonstrated by the API documentation and deployment scripts, and the client feedback shows that stakeholder expectations are advised and managed.
Professional Products: The outcomes of these professional responsibilities are demonstrated by the final products, which include the Code Repository, Deployment Scripts, and API Documentation. The User Manuals, Test Cases, and Results are examples of intermediate deliverables that better clarify the procedure.
IT sector Alignment: The developed professional goods are typical of the software

development and integration IT sector. Their expertise in building and managing IT solutions is demonstrated by their adherence to the HBO-I framework proficiency level 20.
Project plan link:
https://github.com/goranova124/developerLibrary/blob/main/projectPlan.pdf

Project Development:

I was in charge of creating an online resource at DAF Trucks N.V. for PACCAR CONNECT during my internship, which contained thorough documentation and tools for software developers and customers. The project required careful planning, consistent communication with the stakeholders and professional approach to deliverables. The goal of this project was to provide customers with a single point of contact for information about our products and suggestions on how to use them in applications. In order to guarantee great satisfaction among parties integrating our data services, the resource included comprehensive API documentation, sample use cases in a variety of programming languages, and unambiguous integration directions. I covered Analysis, Design, Realize and Manage & Control by creating various documents as for APIs. I tried to follow both university and internship duties during my semester. I tried to do everything so my work is understandable and perhaps developed after the end of my internship. Also I had used Javadoc for backend understand. The tool is scanning the application and is creating a website with the details.

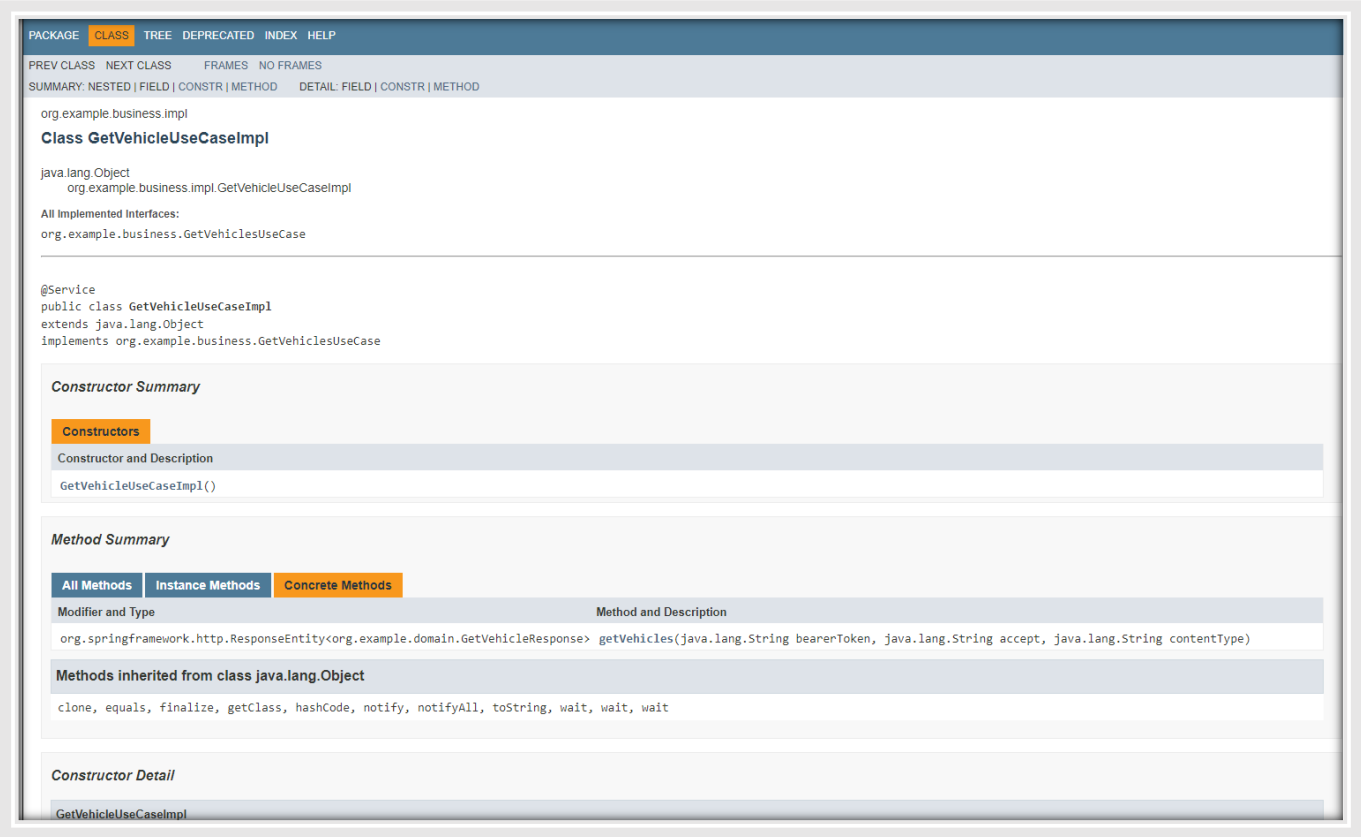


Figure 7 - Example of a class with Javadoc

Involvement in Company Offerings:

I developed an extensive understanding of PACCAR CONNECT's data services, which convert vehicle data into perceptive analysis and over-the-air upgrades to simplify DAF truck owners' operations. This information was essential for customizing the web resource to our developers' and customers' unique requirements.

Throughout the project, I have been communicating with my stakeholders, including Luuk Tuijtelaars, Tülin Ercelebi Ayyildiz, Esra Esmer Ozcan, Barton Meijer. We had our weekly meetings during which we discussed my progress on the project, we addressed challenges and incorporate feedback. This made sure that the assignment complied with academic criteria as well as business goals. I did researches based on the project specifications. This involved gathering information and validating the project's methodology through observation, expert interview, issue analysis and community research.

https://github.com/goranova124/developerLibrary/blob/main/researchReport.pdf

Also to successfully implement the project, I needed to get key stakeholders. This involved presenting the project in front of the management team, including influential figures such as Paul Vaessen, Director Global Programs, and Lily Ley, VP and CIO of PACCAR. I also presented to Code Yellow, a third-party of PACCAR, to ensure their requirements and perspectives were considered. Fitting the developer library with marketing desires was crucial. I collaborated with the management team to ensure that the project will also be aligned with the company's branding and strategic message. I presented progress to my team at the end of each sprint, incorporating feedback and making the necessary adjustments.

2. Situation- orientation

You apply your previously acquired knowledge and skills in an authentic context to deliver relevant results for the project and company.

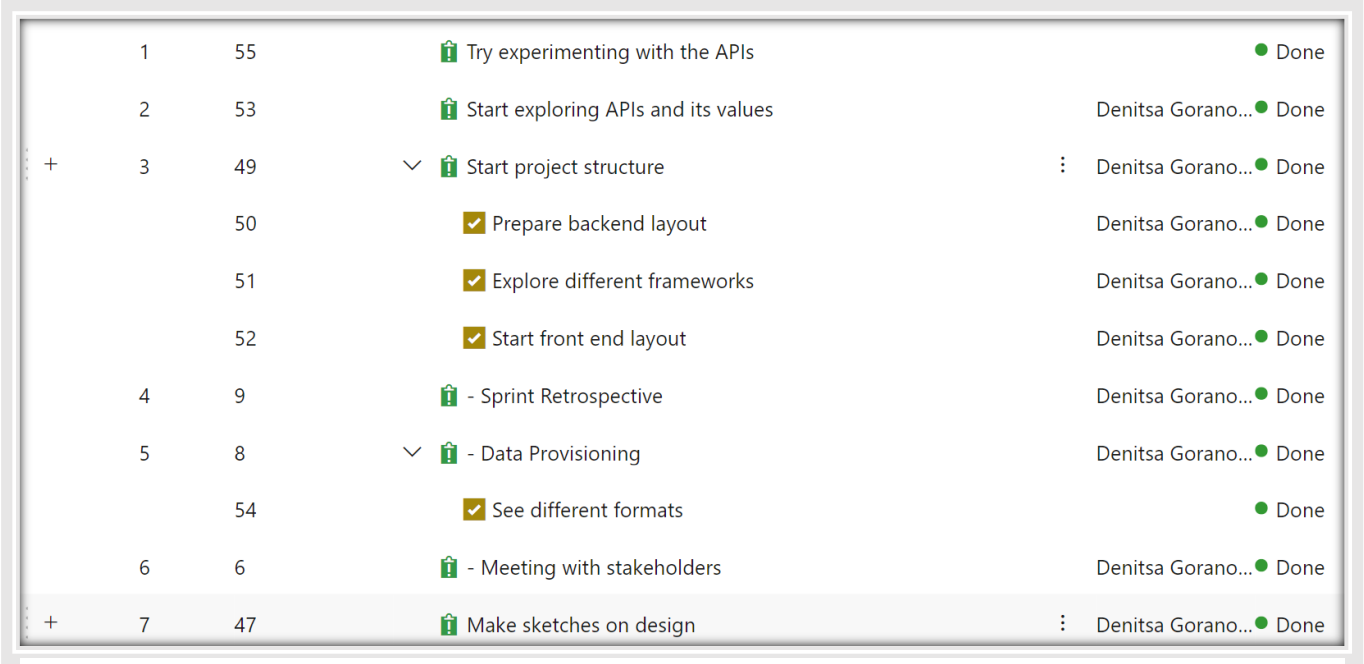
Methodical and Structured Work: After adjusting to PACCAR Connect's procedures, I used my previously obtained knowledge and abilities in a methodical and structured manner. The methodical methodology used, together with deliverables and milestones, is described in full in the project plan and project report.

Relevance: Both internal teams and outside developers find the effort to be pertinent to a variety of stakeholders. The project's relevance and practical impact are illustrated in the sections on client feedback and the project report.

realistic Context: I worked on real-world issues with several stakeholders in a realistic IT setting throughout my internship. The presentation slides and client feedback from stakeholder meetings provide proof of this.

I used the information and abilities I had gained from my academic studies to provide pertinent outcomes for the project and the company during my internship. Programming languages as

Java were used for the front-end development with React and JavaScript for back-end development with Spring Boot. I also used my knowledge of API design to produce thorough and approachable developer materials.
I adopted the company established procedures and working style as I addressed the assignment methodologically and systematically. In order to guarantee ongoing development and alignment with the project goals, this required adhering to the company approach and taking part in frequent meetings.
A variety of corporate stakeholders found value in the work I performed. Positive feedback was received from the stakeholders, such as internal team members and also outside ones,



	1	55	Try experimenting with the APIs			Done
	2	53	Start exploring APIs and its values		Denitsa Gorano...	Done
+	3	49	Start project structure	⋮	Denitsa Gorano...	Done
		50	Prepare backend layout		Denitsa Gorano...	Done
		51	Explore different frameworks		Denitsa Gorano...	Done
		52	Start front end layout		Denitsa Gorano...	Done
	4	9	- Sprint Retrospective		Denitsa Gorano...	Done
	5	8	- Data Provisioning		Denitsa Gorano...	Done
		54	See different formats			Done
	6	6	- Meeting with stakeholders		Denitsa Gorano...	Done
+	7	47	Make sketches on design	⋮	Denitsa Gorano...	Done

Figure 8 - JIRA planning for a sprint

indicating that the resource will greatly improve their productivity and comprehension of the services provided. During my internship, I worked on a real-world IT challenges with a broad team of experts throughout my internship, which was entrenched in a professional atmosphere. Making a developer library that is both expansive and easily available for PACCAR CONNECT's data services was the challenge that I was given to overcome. Adapting to the company way of working involved understanding procedures likes JIRA for project management.
By incorporating that tool for example, I made sure that my contributions met the requirements and standards of the organization. For this I had to interact with a variety of stakeholders, such as product managers, software developers and outside parties, in order to collect requirements, verify solutions and make sure the finished product satisfied their demands. The project's success was also demonstrated by the company's decision to adopt the library for ongoing use beyond my internship.

I was able to close the gap between theory and practice thanks to my internship. I was able to use ideas like API design, user experience and software development best practices in a concrete and significant way by working on an actual IT issue.

3. Future- Oriented Organization

You explore the organisational context of your project, make business, sustainable and ethical considerations and manage all aspects of the execution of the project.

Organizational Context: The project report explains the business legitimization of the project by identifying the stakeholders and business domain. Key business requirements and prospects for PACCAR Connect are addressed by the initiative.
Aspects of business, sustainability, and ethics: The Project Report goes into detail on business, sustainability, and ethical considerations. To make sure these considerations were included into my decision-making process, I employed TICT and other standards, procedures, and tools.
Oversee Execution: I prepared a thorough project plan that details research procedures, budgetary constraints, schedules, risk assessment, and quality control. Project plan link: https://github.com/goranova124/developerLibrary/blob/main/projectPlan.pdfI extensively investigated the organization background. This also involved determining the business domain, which is centered on networked services that employ vehicle data to improve customer happiness and operational effectiveness. Since the developer library aims to improve the integration and usage of PACCAR Connect's data services, consequently fostering innovation and commercial growth, I was imperative that I understand the business legitimization of my project.
I considered commercial, sustainable development and ethical considerations while making my decisions. In terms of business concerns, I made sure that the developer library complemented the organization's strategic objectives of enhancing service integration and customer engagement. By emphasizing the creation of resources and documents that encourage adaption and long-term usage, I also took sustainable development into consideration, which lessens the need for regular updates and minimizes resource waste. Upholding ethical norms in software development and guaranteeing data privacy and security in the library were examples of ethical issues. I used techniques and resources like TICT(The Impact of Technology on Communities and the Transformation of Societies). I was in charge of managing the project's implementation in its entirely. I stared with creating wireframes for the website and its

functionalities.

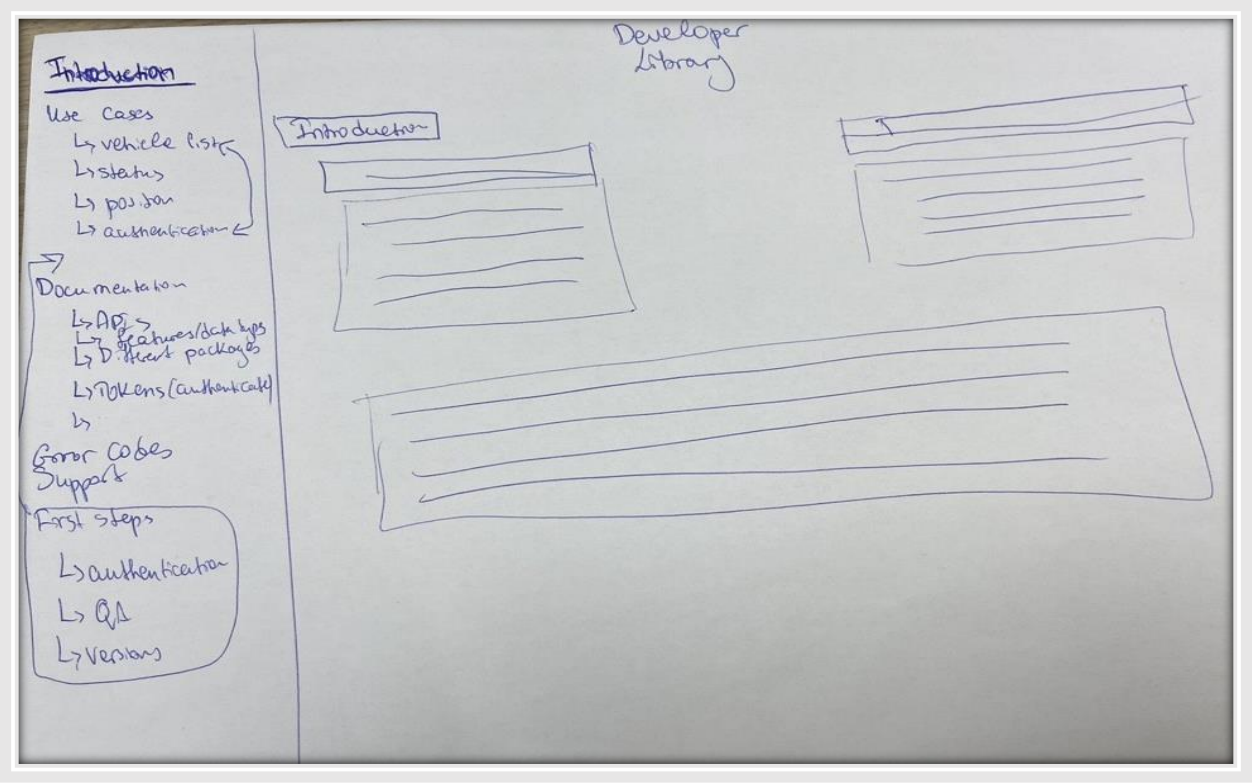


Figure 9 - Wireframe of a page in the developer library

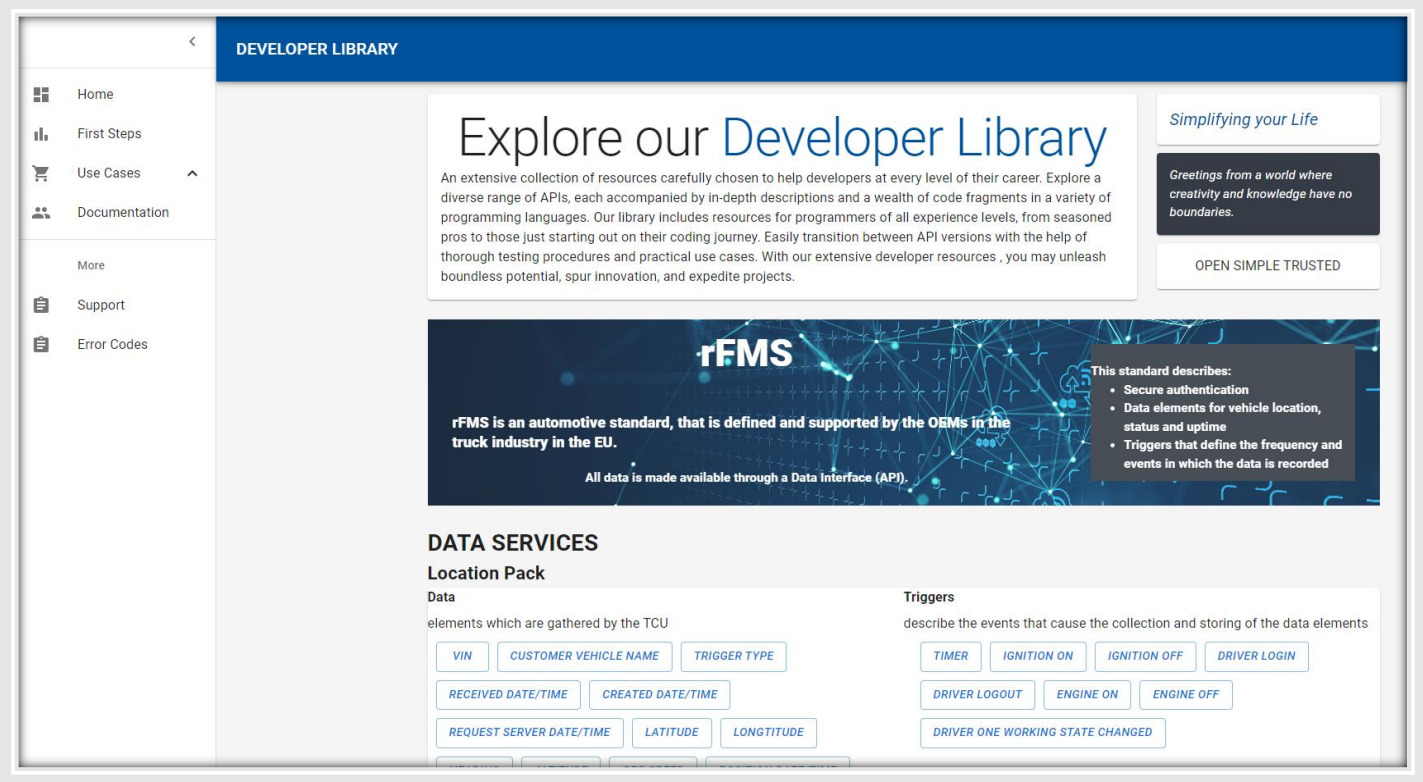


Figure 10 - Implementation of wireframe

Here we can see what the user is going to firstly see when enters the developer library. It contains information about the APIs and our services. The user can see a variety of information and can also integrate with the APIs. This leads to the other page where the main process is happening.

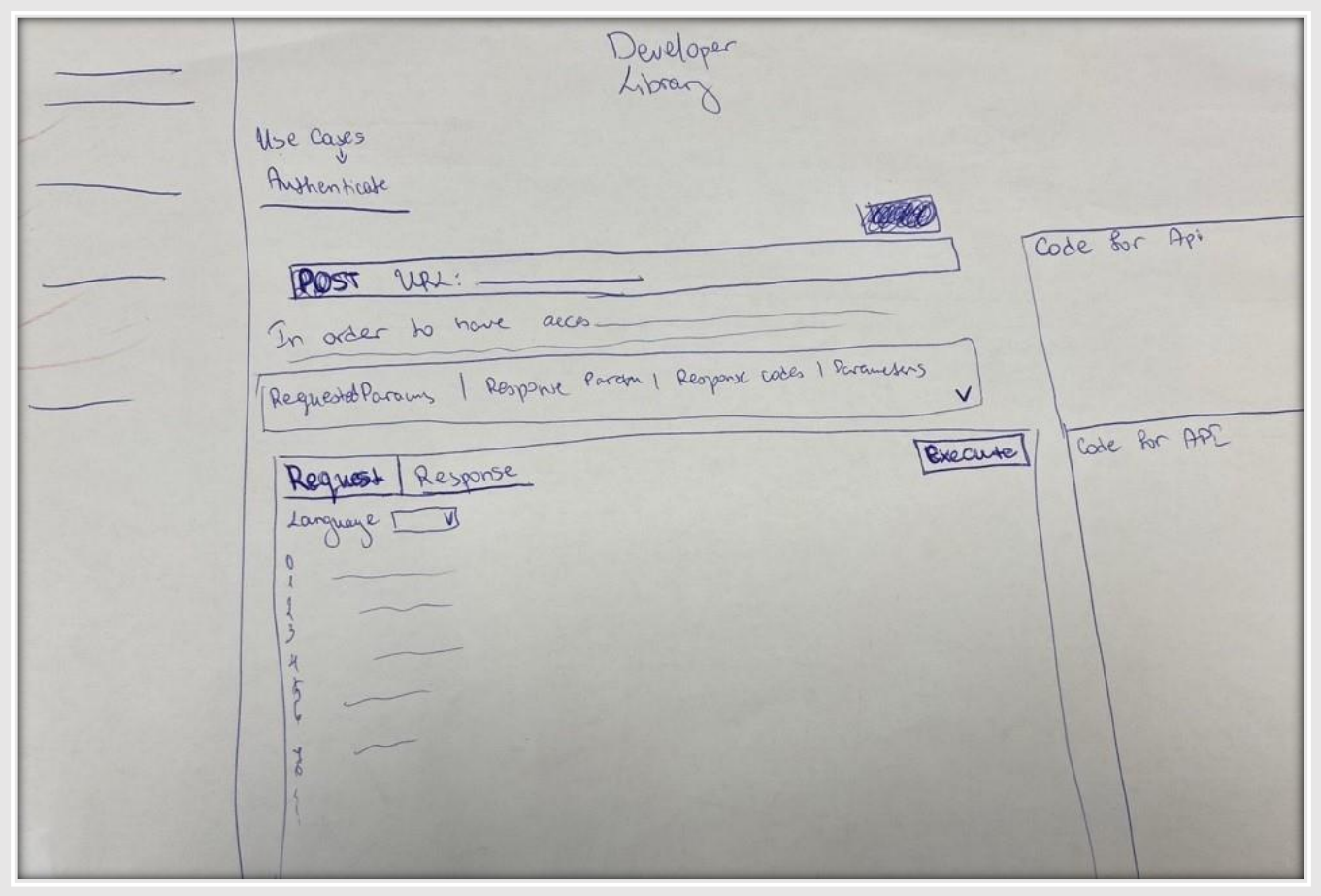


Figure 11- Wireframe of a page which is testing an API

This page contains specific details for the APIs and their functionality. You can see request parameters, response parameters, error codes, type of API, URLs, code snippets in different languages and an option to actually test them.

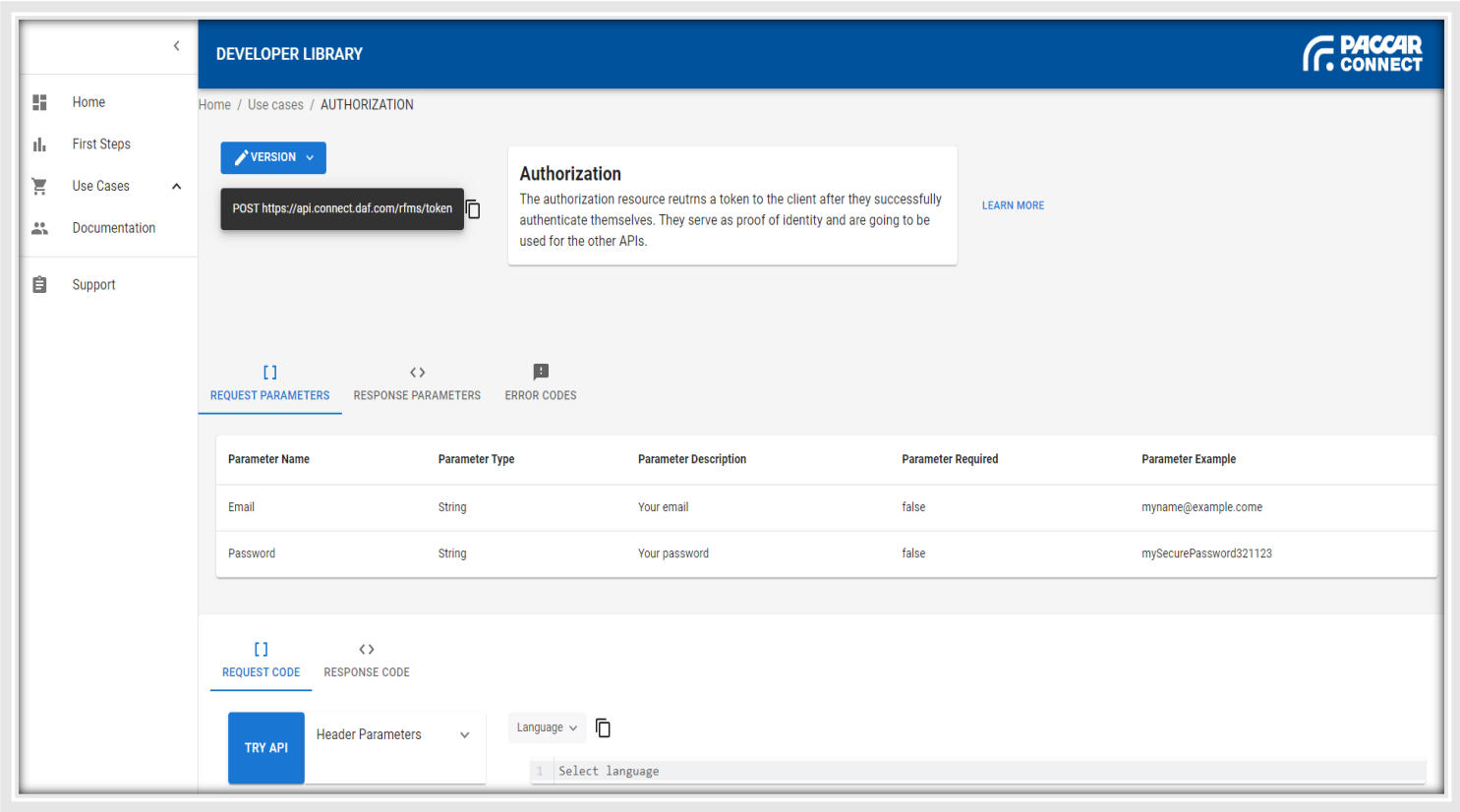


Figure 12- Implementation of wireframe

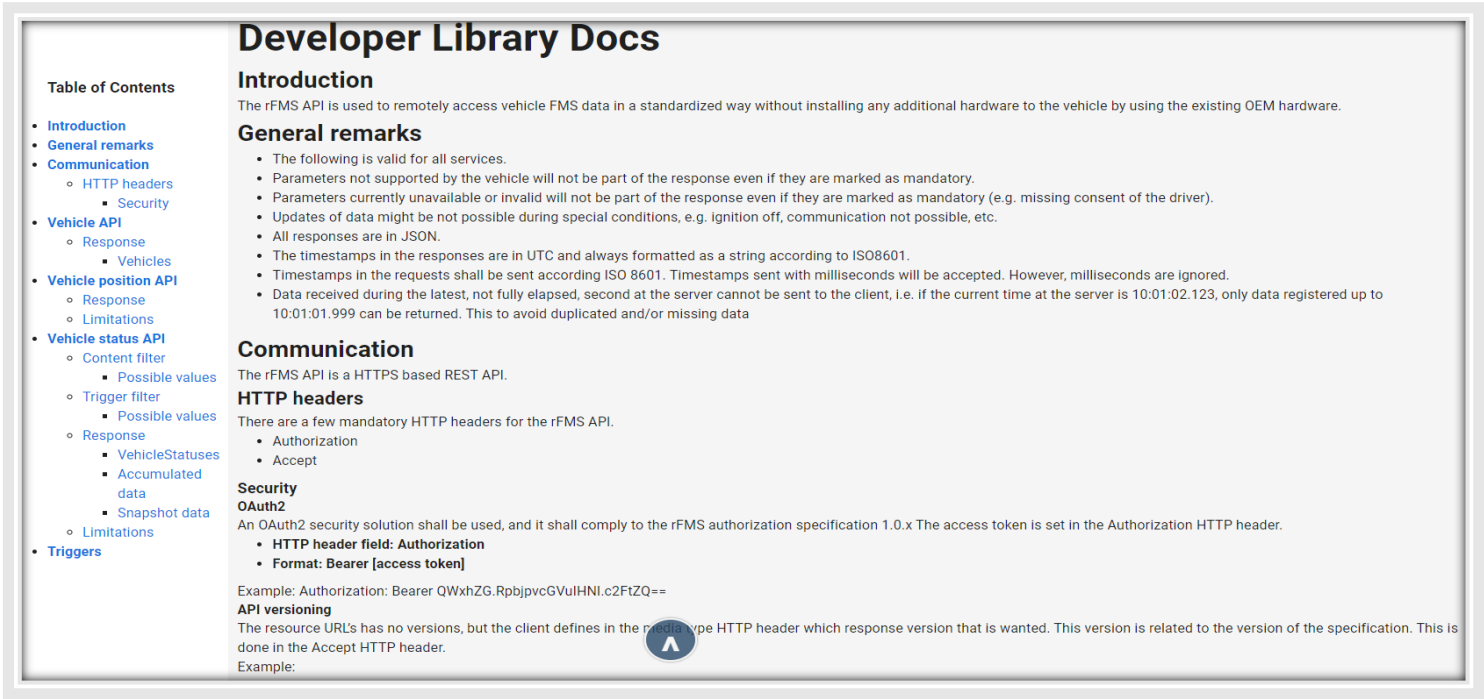


Figure 13- Documentation page

Developing a thorough project plan that included important deadlines, deliverables, and milestones was a part of this. I was providing frequent updates and modifications to make sure

it continued on course. Research activities: Analyzing problems, gathering stakeholder perspectives and validating the project's methodology are all done through research, which is attached in the appendix. Time management is the process of setting aside enough time for every stage of the project, from early planning to final execution and making sure that activities are completed on schedule.
After the developer library was almost finished for deployment, we decided to start thinking of possible solutions for deployment. One solution was t deploy the application with the help of the American team, but at the end we decided to try to do it by ourselves. I stared a research what would be the best approach to deploy the application, since we had to deploy both front end and back end. The main part was he backend and we wanted to run the backend on an HTTPS server because of security. After carefully observing which tool would perform the best related to scalability and security, I decided to stick with AWS. We faced some issues, for which you can learn more in "Investigate Problem solving" part of the document. During the deployment part, we also had meetings with the American department for another possible solution, which was to merge to Rapi and Apigee. We decided that we are going to continue having meeting to check the progress.
I was aware of the possible risks such as feedback delays or technological difficulties. I learned a lot about the business domain and the demands of different stakeholders by investigating the organizational context. With the use of this knowledge, I was able to modify the developer library to better meet the requirements of both internal and external users, increasing the total worth of the company.

4. Investigative Problem Solving

You take a critical look at your project from different perspectives, identify problems, find an effective approach and arrive at appropriate solutions.

I used a methodical strategy to find issues and opportunities in every stage of my project at DAF. In the beginning, I collaborated with stakeholders to comprehend the demands of the customer and established the primary objective of the project, which to provide an extensive developer library for the data services offered by PACCAR. I anticipated potential problems and risks and I prechecked in advance.
Link to research document:
https://github.com/goranova124/developerLibrary/blob/main/researchReport.pdf

```
▼<data>
  ▼<row>
      <ERROR_CODE>200 OK</ERROR_CODE>
      <ERROR_DESCRIPTION>It will contain a list of vehicles matching the filter parameters supplied
      account an empty list will be returned</ERROR_DESCRIPTION>
      <POSSIBLE_REASON>None</POSSIBLE_REASON>
      <ID>1</ID>
      <API ID>1</API ID>
```

Figure 15 - XML file

This allowed me to mitigate some issues before they became significant. However some unforeseen problems did arise. During the process there were some changes which required adjustments on the initial plan, such as the need to migrate from Snowflake to XML files.
I had regular meetings with people at various levels within the organization, which allowed me to gather insights from individuals with different technical knowledge and expertise, This helped me addressing different diverse concerns and incorporating a wide range of perspectives into the project.

Figure 16- Presenting progress to people with no technical knowledge

Resource from presentation: Link **https://www.canva.com/design/DAF-6HSTcEY/FaE-3tsgRd9QHULYgQJR_Q/edit**

We had a problem, deploying the website and since we were aiming for a fast solution of the problem, I started investigating how to fix the issue. We have made the decision to handle the website's deployment problems on our own because working with the Paccar community has proven to be difficult. To host our application, we first used GitHub Pages and AWS Web Services.

Discussions about the possible deployment of the development library alongside Rapid and Apigee were covered at the meeting at the American Department that was intended to deepen your comprehension of API deployment. This calculated addition spurred thoughtful discussions about how workflow efficiency may be maximized and the efficacy of Apigee and Rapid deployments strengthened by integrating the development library. Investigating this route revealed the mutually beneficial partnership between the development library and these platforms, providing a comprehensive strategy for API deployment. It emphasizes how

dedicated your team is to using state-of-the-art resources and techniques to spur creativity and effectively accomplish corporate goals.
We successfully used GitHub Pages to deploy the front-end on a particular URL. This allows us to host static webpages straight from our GitHub repository.

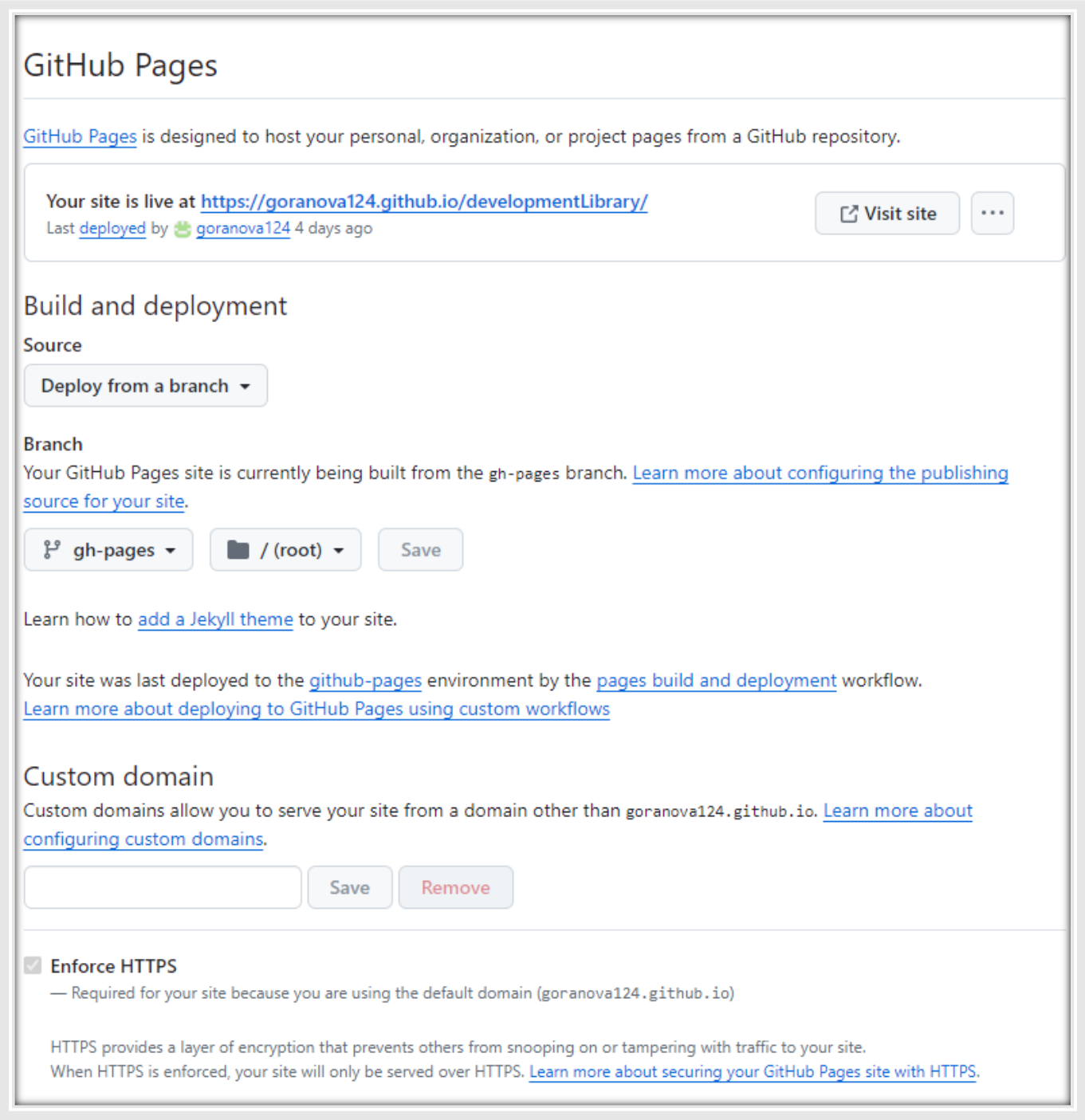


Figure 17- GitHub Pages configuration

We started the back-end deployment process using Amazon Web Services (AWS). We

established an Elastic Compute Cloud (EC2) instance, a virtual machine that offers expandable processing power.

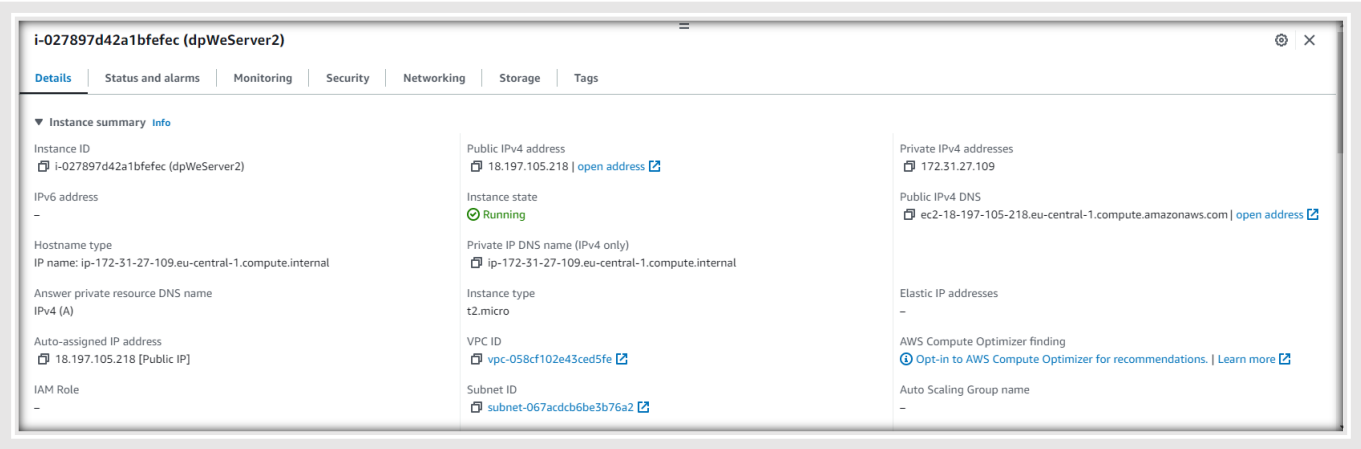


Figure 18- Elastic Compute Cloud instance of the backend

This instance is setup with a key pair for safe instance connection and a security group that functions as a virtual firewall to regulate traffic for one or more instances.

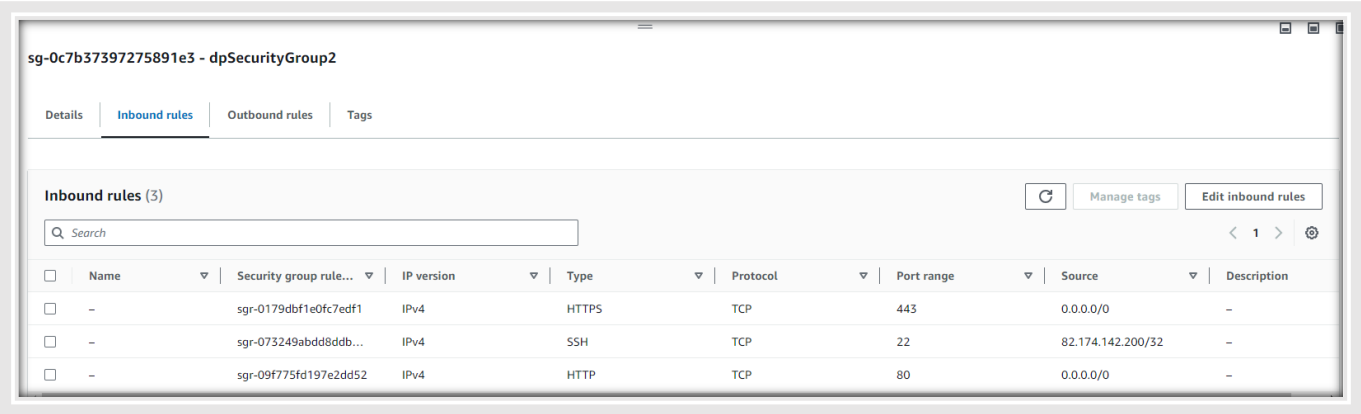


Figure 19-Security Group of the EC2

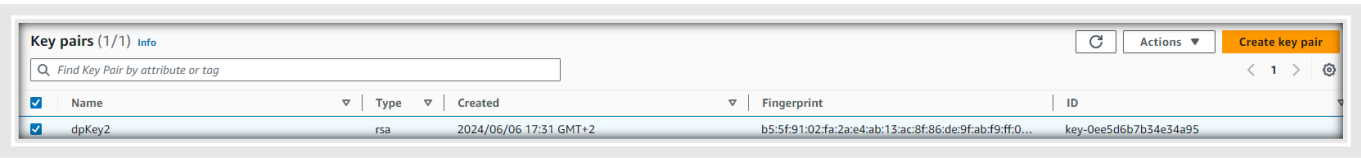


Figure 20-Key pair of the EC2

Currently, the EC2 instance talks with a certain domain over HTTP. We are using HTTPS to guarantee safe connection. A listener, a component that scans for incoming HTTP requests and immediately translates them into HTTPS requests, is set with the domain. A higher degree of security is provided by this configuration, which guarantees that all communications between the client and the server are encrypted.

AWS Route 53, a scalable Domain Name System (DNS) web service that routes users to Internet applications by converting human-readable names into the numerical IP addresses that computers use to connect to one another, is another way we have connected our domain to the EC2 instance.

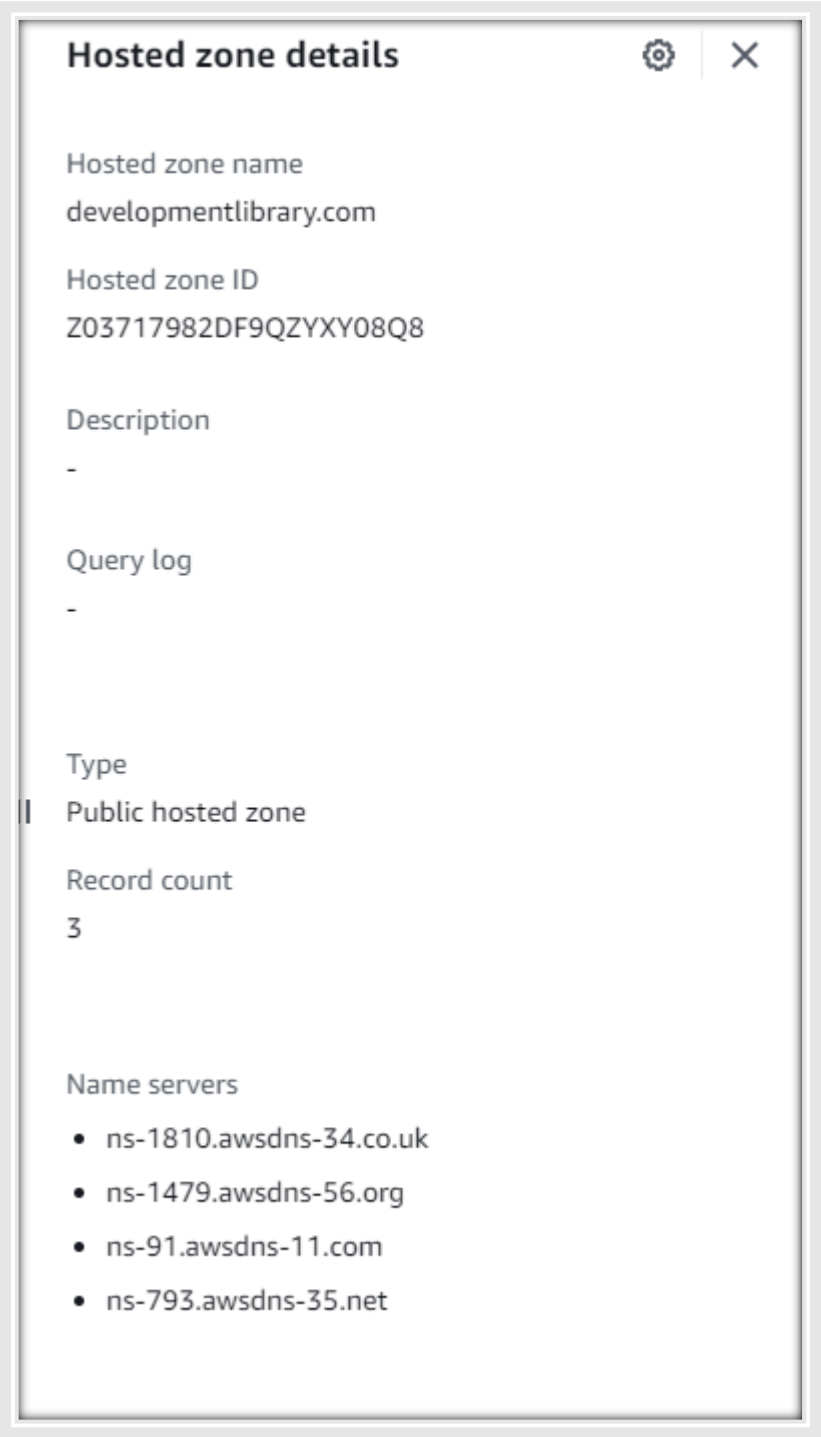


Figure 21--Route 53

This setup should guarantee that our users can access our application safely and enables us to manage domains effectively. After carefully observing the behavior from AWS, we concluded that there is a another possible and better solution. We wanted to try another approach, which had to be running on an HTTPS server. I decided o stick with Azure and tarte the implementation for deploying the backend in AZURE, which is going to run the application on a HTTPS server.

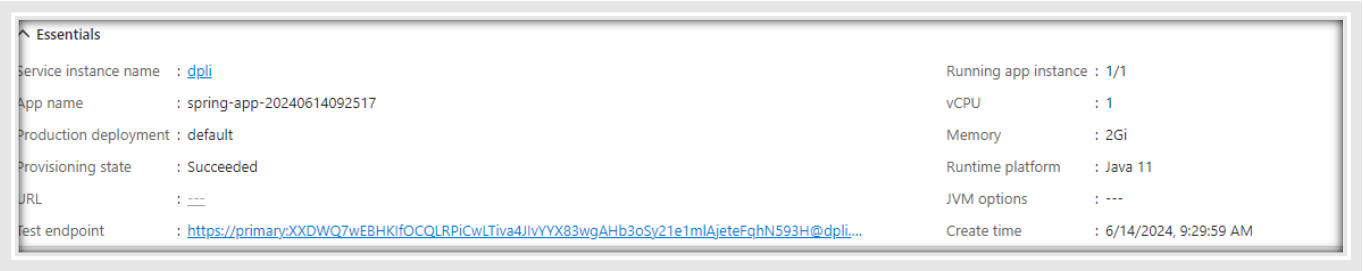


Figure 22- Details for backed in Azure

I have also containerized my application in Docker.

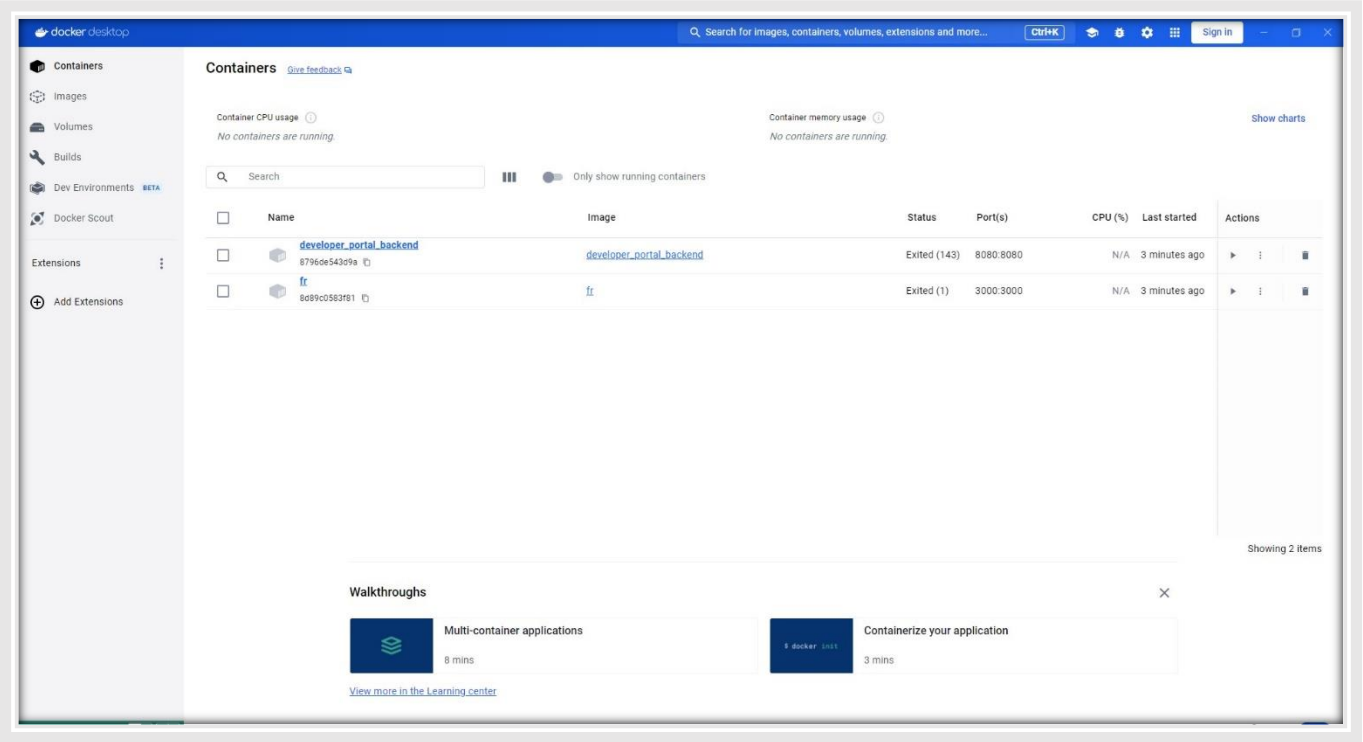


Figure 23- Docker container of backend and frontend

Our application can be deployed in a reliable and safe manner thanks to the combination of GitHub Pages for the front end and Azure services for the back end. A smooth and safe user experience is ensured by the cooperation of those services.

5. Personal Leadership

You are entrepreneurial around your projects and personal development; you pay attention to your own learning ability and keep in mind what kind of IT professional and/or what type of positions you aspire to.

Project IT-deliverable
Specifically indicate the IT-products (proof-of-concept) that will be developed. Describe the end product as well as any intermediate products or other deliverables that are already known. For each IT-deliverable, specify the technology(s) to be used.

The creation of an extensive development library will be the main IT deliverable. For external parties, this library will offer real-use cases and API calls so they can easily incorporate our linked data into their systems. The final solution will be an easily navigable and well-documented library that will enable third parties to quickly and easily integrate their linked services. To guarantee accessibility and clarity, technologies such as documentation tools and API frameworks will be used.

Figure 24- Initial project plan of internship

The original plan of the internship was to come up with a couple of use cases as you can see in Figure 23. I showed entrepreneurial leadership during my internship by taking the initiative to lead my project in terms of both strategy and content. I had the freedom to choose how I want to implement the project. I started the project by clearly defining the goals and vision , putting together a thorough project plan, establishing deadlines and milestones. I took responsibility for the content, making sure it was easy to use and in line with the business's strategic objectives. The initial plan of the internship was to have a few use cases at the end but I was able to advance the project and make great progress throughout the internship.

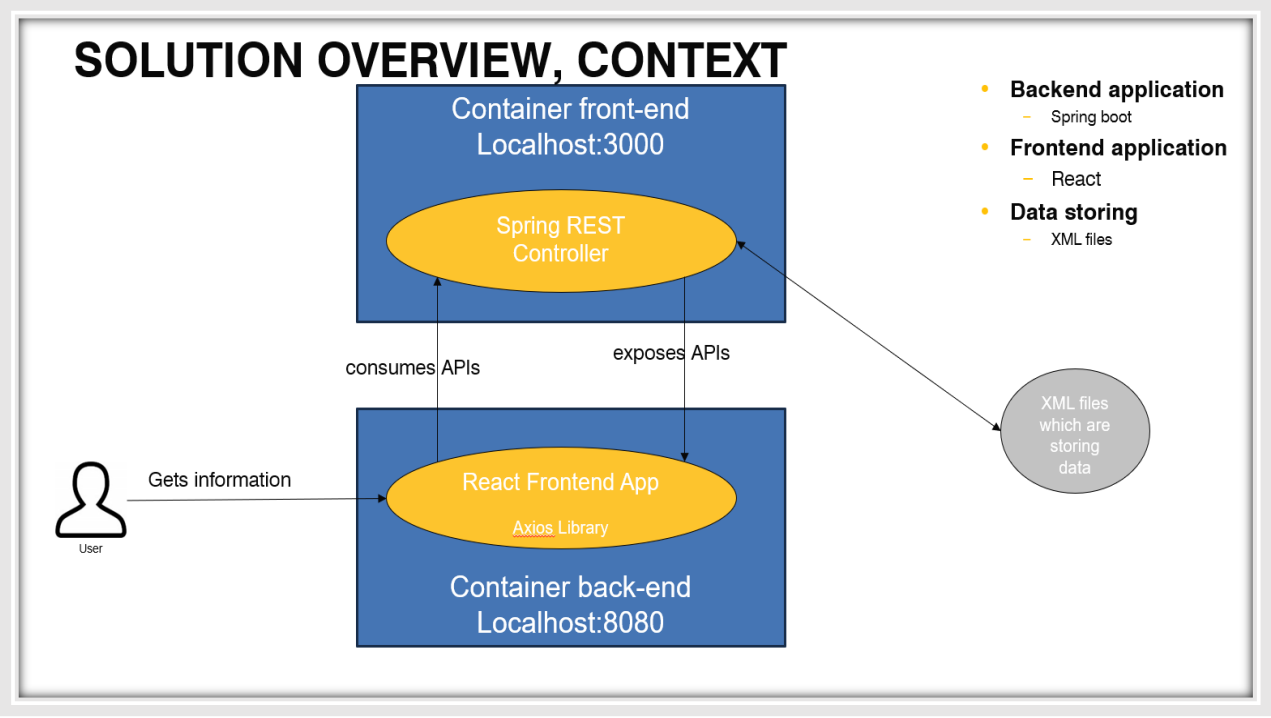


Figure 25- Full stack application components

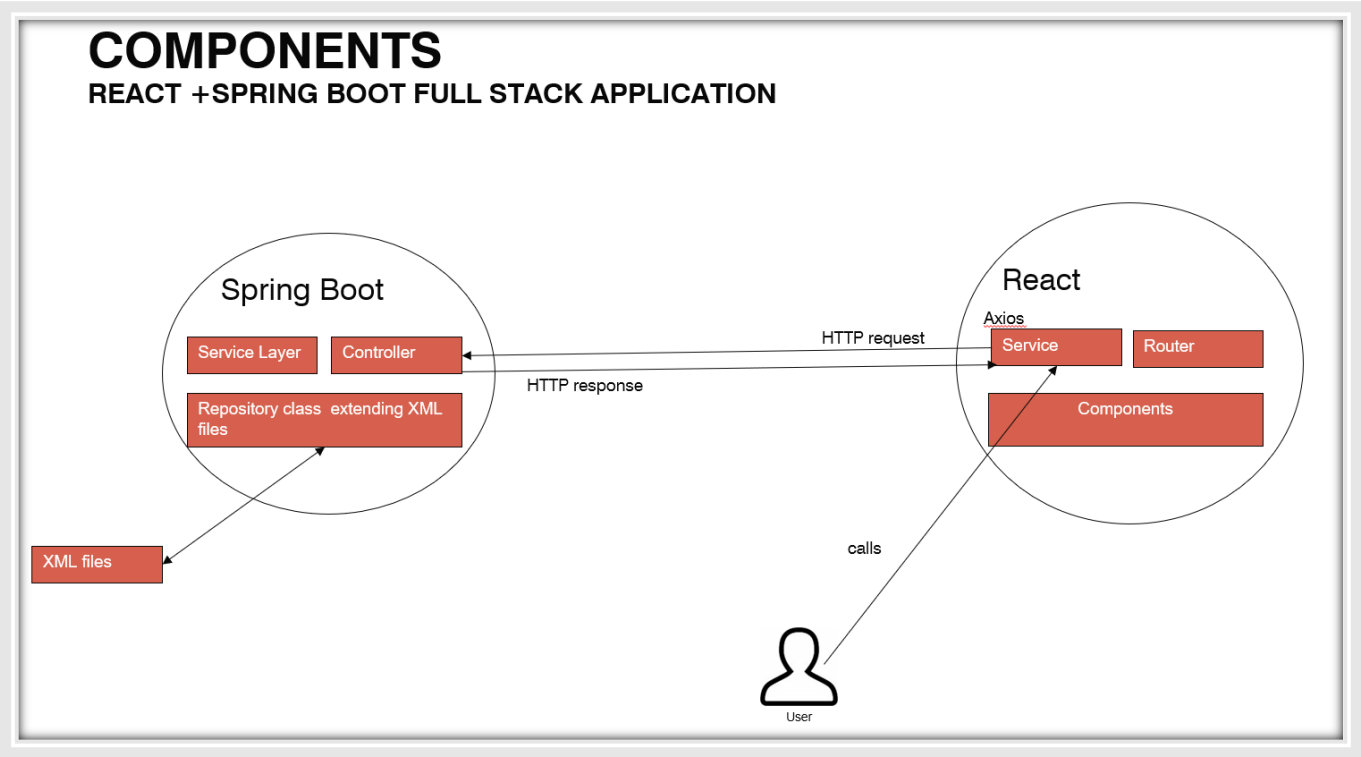


Figure 26-- Back end and front end components

By regularly reflecting on my activities and asking my instructors and coworkers for comments, I paid special attention to my capacity for learning. Frequent feedback sessions with my academic sessions and corporate tutor gave me important insights into my performance and opportunities for development. In order to obtain other viewpoints, I also solicited input from team members and other stakeholders. This feedback loop enabled me to pinpoint areas that needed improvements and hone my project management strategy.
I was able to comprehend my strengths and places for growth more fully after giving my actions some thought and after getting feedback. For instance, input on documentation encouraged me to take a more user-centric approach, which greatly enhanced the developer library's readability and usefulness. In addition, I saw chances to improve my technical abilities by picking up new, project-related tools and technologies, I went to business meetings, training sessions, including also talks related to a event from the company-Hackathon.
I remained focus on growing as an information technology professional. I have set myself certain personal development objectives, such sharpening my technical ability in API development, growing my professional network and strengthening my project management skills.

6. Targeted Interaction

You determine which partners play a role in your project, collaborate constructively with them and communicate appropriately to achieve the desired impact.

Achieving the project's intended impact required effective communication. I made sure that my communication was understandable and appropriate for the target audience.

- Internal communication: To tell internal stakeholders about the project's progress and get the input, I utilized formal presentation thorough and frequent updates.
- External communication: For third- party developers I provided some demos in order to get their input and address their issues.

I made sure that every stakeholder input was properly taken into account and included into the project. I also made sure to have proper communication not only with my company stakeholders but also my university tutor.
Link to FeedPulse checkpoints:
https://github.com/goranova124/developerLibrary/blob/main/feedPulse.pdf
The developer library was improved through this process of gathering and implementing input, which made it more efficient and user-focused. It was crucial for me to understand the interests of all the stakeholders and also people who are outside of the IT field.
Link to presentation: https://www.canva.com/design/DAF-6HSTcEY/FaE-3tsgRd9QHULYgQJR_Q/edit
It was important to prioritize having good communication with all parties involved. My ability to effectively and clearly explain difficult ideas is demonstrated by the Presentation Slides I utilize for both stakeholder meetings and project updates.
I worked well with a variety of partners, such as university assessors, outside developers, and my firm mentor. These exchanges and the many stakeholders' responsibilities are recorded in the client feedback

Reflection on project

Without a question, the technical side of PACCAR Connect offered a lot of difficulties that forced me to broaden my skill set and problem-solving techniques. Navigating the complexity of database migration and deployment was one of the most significant hurdles. Careful preparation, thorough testing, and productive cooperation with database administrators and other stakeholders were necessary to ensure a smooth data transfer while preserving data integrity and reducing downtime.

A further set of difficulties was presented by the integration of diverse resources and technology. During the process of choosing the best tools and frameworks and coordinating their integration into the project environment, I ran across a number of challenges that required ingenuity and a thorough comprehension of the functions and dependencies of each component. Despite these difficulties, I saw each one as a chance for development and education. Through the utilization of my technical proficiency and tight teamwork, I successfully overcame obstacles and came up with creative solutions. I attacked every obstacle with tenacity and a strategic attitude, whether it was using Docker to streamline development and deployment processes or utilizing microservices architecture to construct modular and scalable apps.

Looking back, overcoming these technical obstacles not only improved my software development skills but also gave me a stronger sense of flexibility and resilience. I am confident in my abilities to take on challenging technical tasks head-on and use my skills at PACCAR Connect to spur creativity as I move into other projects and jobs.

Conclusion

I have advanced professionally and technically throughout my internship at PACCAR Connect, which has helped me meet my initial development objectives. I've developed my project management abilities professionally by working with a variety of teams, adhering to deadlines, and making sure that third-party services are integrated seamlessly. My communication skills have improved via regular meetings with stakeholders, my business mentor, and outside engineers. I can now clearly explain complicated technical topics and obtain insightful input for project enhancements. These encounters have also improved my capacity for handling and resolving disputes, which promotes teamwork in the workplace.

I have gained more insight into full-stack development in the ICT field, especially when it comes to utilizing JavaScript and Java to create reliable front-end and back-end solutions. Working with React on the front end and Spring Boot on the back end has improved my capacity to develop apps that are scalable, effective, and easy to use. I had practical expertise in developing safe authentication procedures, building RESTful APIs, and performance-boosting database queries. I also spent a lot of time using Swagger for API documentation, which helped me become more proficient at writing thorough, understandable technical documentation for stakeholders and other engineers.

I was able to ensure consistency across several settings by streamlining the development and deployment procedures through my exposure to Docker for containerization. Understanding the significance of DevOps approaches in contemporary software development was made possible thanks in large part to this experience. In addition, I looked at the usage of microservices architecture, which gave me insights into creating easily scalable, modular apps that meet customer needs. I broadened my knowledge on cloud services, I had to think of way to deploy the application, which needed to have solution for the backend and the frontend. I choose GitHub Pages for the front end and Azure for the backend.

By utilizing safe coding techniques and guaranteeing data privacy and protection, I enhanced my understanding of cybersecurity concepts in addition to these technical abilities. In order to find and fix any flaws, this included using encryption methods, safe data transfer procedures, and frequent security audits.

These educational opportunities support my original objectives of developing into a skilled full-stack developer and strengthening my project management skills. In addition to improving my technical skills, working on this project has given me a strategic attitude that will help me solve challenges in the real world. In the end, this experience has been life-changing, giving me the skills and self-assurance I need to succeed in my next ICT profession.

My experience with PACCAR CONNECT has solidified my interest in working on projects that involve complex integrations and data-driven applications.. These positions align with my skills and interests, allowing me to leverage my experience in creating robust, scalable, and user-centric software solutions. My ultimate goal is to contribute to innovative projects that drive technological advancements and provide value to users and businesses alike. I am confident that these experiences have prepared me for the professional roles I aspire to, and I am excited to continue my growth as an IT professional. My experience with PACCAR

CONNECT has solidified my interest in working on projects that involve complex integrations and data-driven applications.

Recommendations

In order to optimize value for our stakeholders, we should keep funding cutting-edge technologies and environmentally friendly procedures. Using Docker, Azure for containerization, embracing microservices design, and integrating third-party services has shown me how important it is to keep up with technological advancements in infrastructure. These procedures guarantee operational effectiveness, cut expenses, and boost profitability—all of which immediately benefit our stakeholders. Furthermore, by concentrating on ongoing communication and project management enhancement, we can guarantee smooth team collaboration—a critical component of a timely and successful project completion. Encouraging consistent participation from stakeholders will promote openness and trust, guaranteeing that our projects are in line with customer expectations and corporate objectives.

Resources

Documents: https://github.com/goranova124/developerLibrary