deti universidade de aveiro departamento de eletrónica, telecomunicações e informática

TQS: Product specification report

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1 Introduction

1.1 Overview of the project

The objective of this final project of the Software Testing and Quality curricular unit was for students to develop a project while adopting good and systematic QA processes and a test-driven development with automated integration and deployment pipelines. For this task, we developed an order delivery system, which we called EasyDelivers, in which a rider when accepting an order and delivering it, its status is transmitted to the trading company. The company that was developed as an example of partnership with EasyDelivers is named ProudPapers, a store that sells office and reading material.

1.2 Limitations

Because of time limitations, the profile data for the client and rider can not be changed in the interface.

2 Product concept

2.1 Vision statement

Easy Delivers is a generic order delivery system that consists of two components: the mobile application, used by riders, that is, order deliverers, where they will be notified of pending orders made to the system, order's details such as the destination location, among other pieces of information; and also the web interface, used by Easy Delivers managers to monitor the work carried out by their employees (that is, the riders). This second component will allow checking the performance index of each of the riders, making it easier to maintain quality control in the delivery service, namely through the delivery of orders in perfect condition and in a short time, thus allowing the *Easy Delivers* to become a national reference in the order shipment.

Proud Papers is an online bookstore and stationery, selling books, newspapers, magazines, and even office supplies. Its web platform allows the client to browse the catalogue and purchase items. If a given product is purchased by a customer, the delivery will therefore be shipped using *Easy Delivers*.

2.2 Personas

Filomena Ribeiro

Job Title
Teacher

Age
45

Highest Level of Education
University (Master's degree)

Goals

- Buy Nicholas Sparks' new book
- Intuitive and easy-to-use application

Frustrations

- Application with too many steps to make a purchase
- Not being able to give a gift to her daughter on her 18th birthday

Environment

As a Portuguese teacher in the 21st century, she knows how to do the minimum with a computer, because she uses it to prepare her classes and show some multimedia resources in class to her students. She is also adept at online shopping platforms, so using another one will not be a problem. She just wants the web application to be simple and quick to use to realise her daughter's wish.

João Aguiar

Job Title
Manager at Easy Delivers

Age
30

Highest Level of Education
University (Master's degree)

Goals

- Manage the riders who work for the company he runs
- Application with lots of information related to each rider and functionalities

Frustrations

- Buggy application
- Application crashes
- Not being able to get an overall performance of all riders

Environment

He is a person with high technological literacy, always up-to-date with new technologies that help him to do his work with better discipline. Being one of the managers of the company, he expects to see at least once a day some statistical data related to the work performed by his employees to assess the quality of the services provided by them, namely obtaining the average delivery time of the riders and the score of a specific rider. For him, what matters is that the application makes it easier for him to analyze the riders' performance, so he is not concerned with too many different functionalities.

Damiano Almeida

Job Title
Rider at Easy Delivers

Age
18

Highest Level of Education
High School

Goals

- Accept an order for delivery of an order
- Use of a user-friendly application

Frustrations

- Not being able to receive notifications
- Slow application
- Application with a high learning curve

Environment

Damiano is in his last year of high school and, given his free time, because he has fewer school hours, he started working as a rider at Easy Delivers. He has a lot of technological literacy, like most teenagers today, so he has no difficulty handling a mobile application; however, he would like it to be quick to use, in addition to not having much time to learn how to use it, as he wants to make as many deliveries as possible, in order to receive a satisfactory monetary amount that will help him pay his driving license.

2.3 Main scenarios

Scenario 1 - Customer
Filomena Ribeiro is a 45 years old Portuguese teacher that lives in Aveiro. She loves reading, and that's one of the reasons why she wanted to be a Portuguese teacher - so that she could learn more about well-known writers, to better understand their stories and thoughts. Her daughter Antónia celebrates her 18th birthday tomorrow, and Filomena wants to buy her the latest book of Nicholas Sparks, her favourite writer. That's why she goes to the *Proud Papers* web page and creates an account. Then, she searches for Nicholas Sparks' book in the search bar and adds the desired book to her shopping cart. After paying for the product, she just needs to wait some time for the order to come to her home.

Tasks:

- Create an account
- Search product
- Add item to cart

Scenario 2 - Manager
João Aguiar is a thirty-year-old manager at *Easy Delivers*. He is passionate about his job and the company where he works - because it's the one that, after he graduated, accepted him as a member of the enterprise, allowing him to grow in this area and to be today the lead manager of *Easy Delivers*. A part of his work is to daily check their rider-workers' performance to maintain the quality assurance of the deliveries. That's why he wants to be able to have many statistical data about the riders, to be easier to evaluate their work and, thanks to that, manage them and keep the quality of their provided services - he logs into his account and then goes to the dashboard page, where he can see multiple data about his fleet of riders, such as their average time to conclude a delivery, their average score, among others. He then selects a specific rider and sees all his metrical data and indicators.

Tasks:

- Make login
- Search for statistic data of all riders
- Search for statistic data of a specific rider
- Check all existing riders
- Check all existing deliveries

Scenario 3 - Rider
Damiano Almeida is an eighteen-year-old high school student and a rider at *Easy Delivers* because he wants to save for his college degree. Therefore, in his spare time after school, he works for the company, delivering orders in his spare time to the city of Ovar. For this reason, he likes to make several deliveries in a short period, not forgetting to execute them with quality and safety, and because of it he uses the *Easy Delivers* mobile application to, after receiving notifications of new delivery orders, accept them all. This way, he logs into the application, goes to the orders tab, where he selects a specific order, checks the delivery location, and clicks on the "start delivery" button.

Tasks:

- Accept open deliveries
- Update delivery states

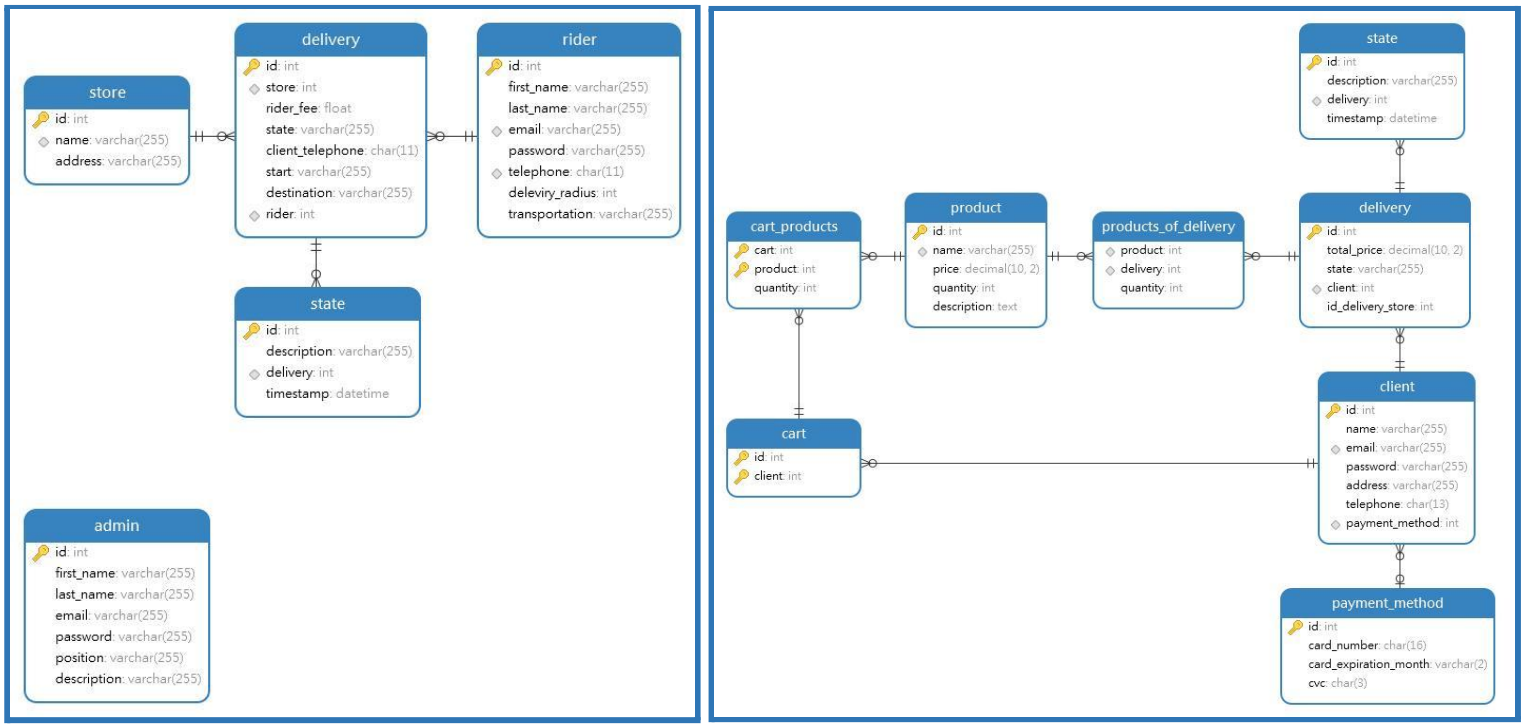
2.4 Project epics and priorities

Basic features and Search for product		
Access the dashboard using admin account	Domain models (Easy Delivers & Proud Papers)	Check details of a product
Search for a product by name	Search for a product by id	End user is able to create an account
Create Easy Delivers Endpoints	Create ProudPapers Endpoints	

Purchase and Shipping products		
Create rider account	Accept an order by a rider successfully	Add product to cart
Deliver products	Check credit card payment option	EasyDelivers services into specialized containers
Check client info	Make the checkout of a purchase	End user gets deliver status update

Transition		
Rider is able to see their profile information with success	Rider gets notified of new deliveries	Rider is able to see the departure and destination of a delivery on a map
Manager is able to check statistic data about all riders	Manager is able to check statistic data about a specific rider	

3 Domain model



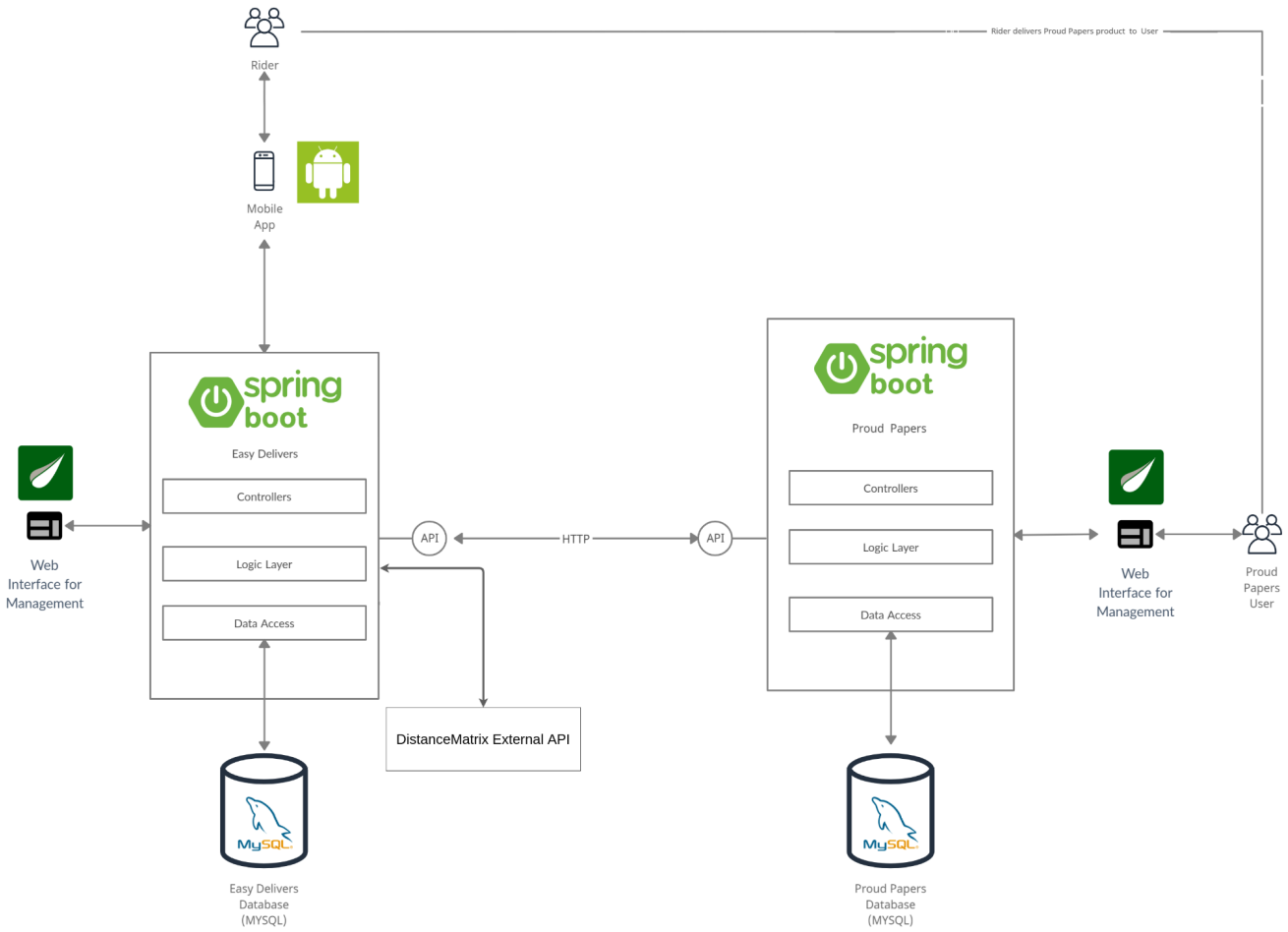
NOTE: All passwords stored into the database are encrypted using SHA-256.

4 Architecture notebook

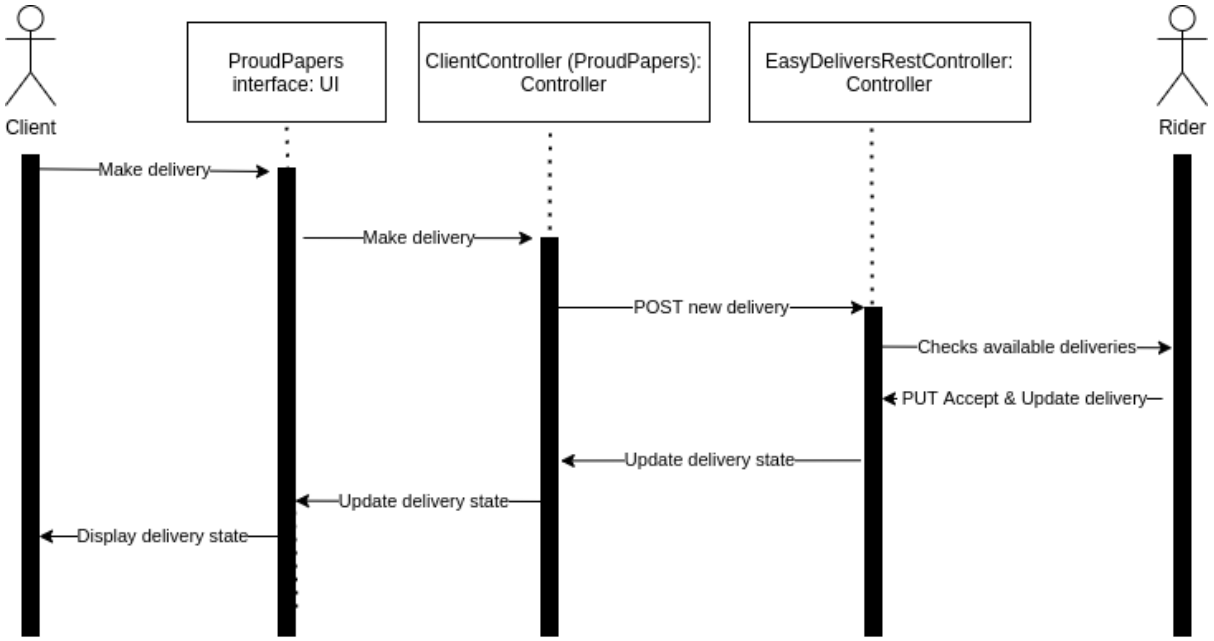
4.1 Key requirements and constraints

- The system should be compliant with legacy Systems.
- The system should have a high performance so that no orders get lost.
- The system should be robust and fault-tolerant, especially to network connection losses.
- The system should ensure complete protection of users' data, such as username and password.
- The system should ensure complete protection of the company's and employees' data.
- The web platform should be multi-platform and OS.

4.2 Architectural view

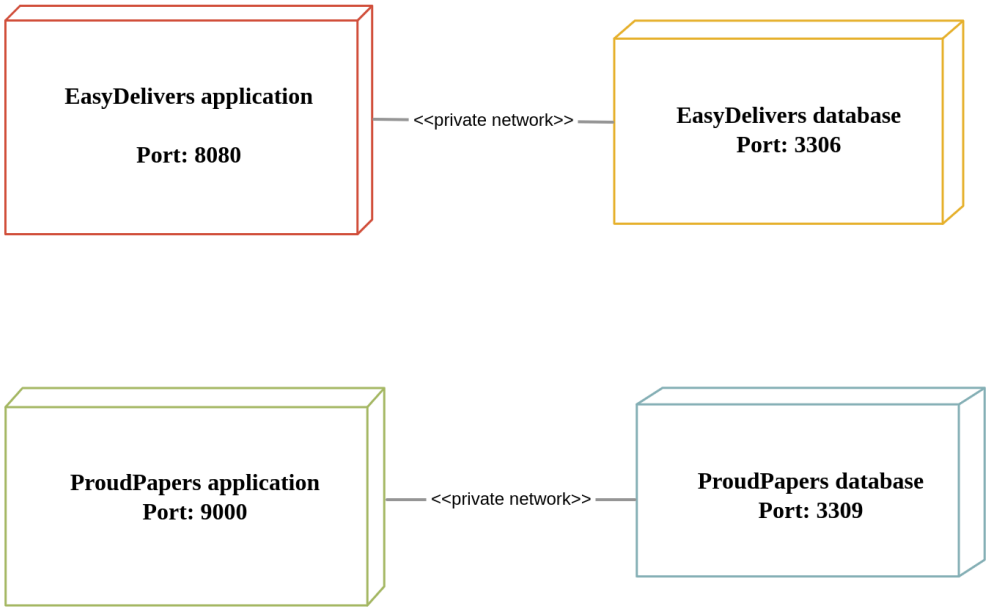


The architecture diagram encompasses the three components of our project: ProudPapers web interface, EasyDelivers web interface (manager section) and EasyDelivers mobile application (rider section).
Both EasyDelivers web interface and mobile app share the same MySQL database, but while the web interface was developed in Spring Boot, Android was used to make the mobile application, although it uses the backend from the Spring Boot project.
EasyDelivers is mainly divided into three parts - controllers, logic layer/service, and finally the data access. For the web interface, Thymeleaf was also requested. This segmentation is the same for the ProudPapers component.
An external API named DistanceMatrixAi was used to obtain the distance between two locations to inform both the rider about the distance they need to cover and the manager about the kilometres the riders had covered.



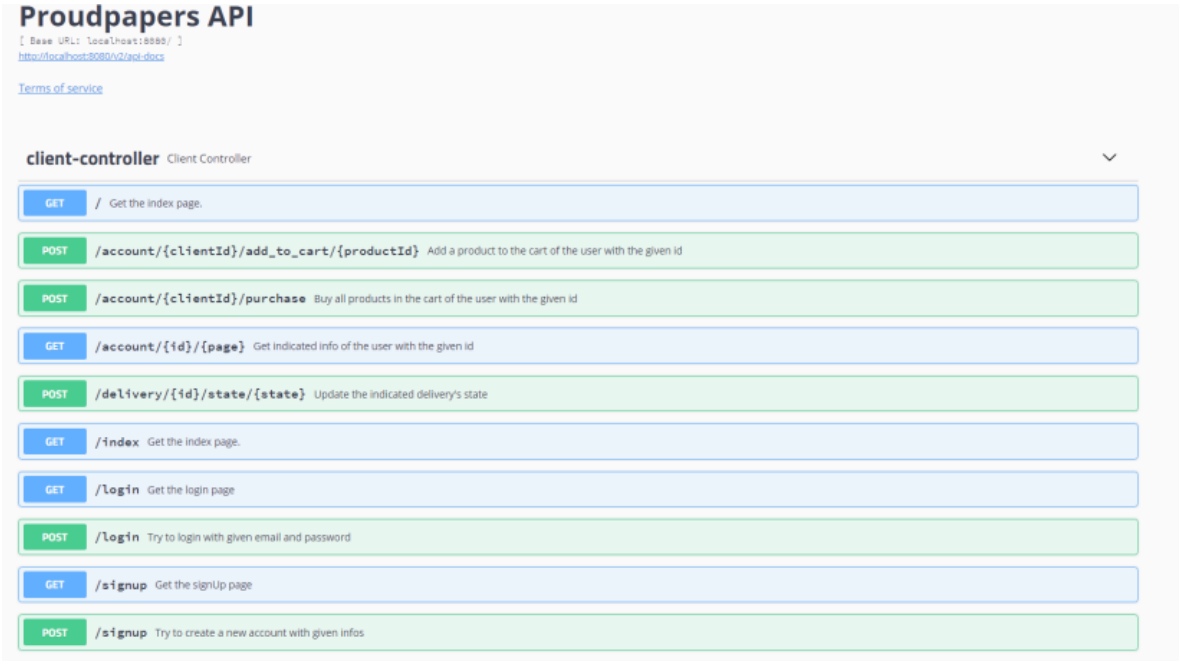
A ProudPapers customer interacts with the ProudPapers web interface to make a purchase that is sent to the Easy Delivers REST API; a rider receives a notification on their mobile application and accepts the delivery; finally, the rider delivers the order to the ProudPapers customer.

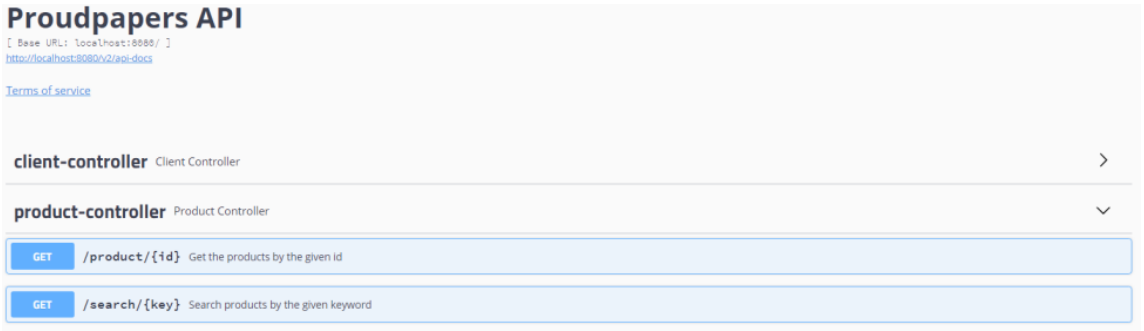
4.3 Deployment architecture

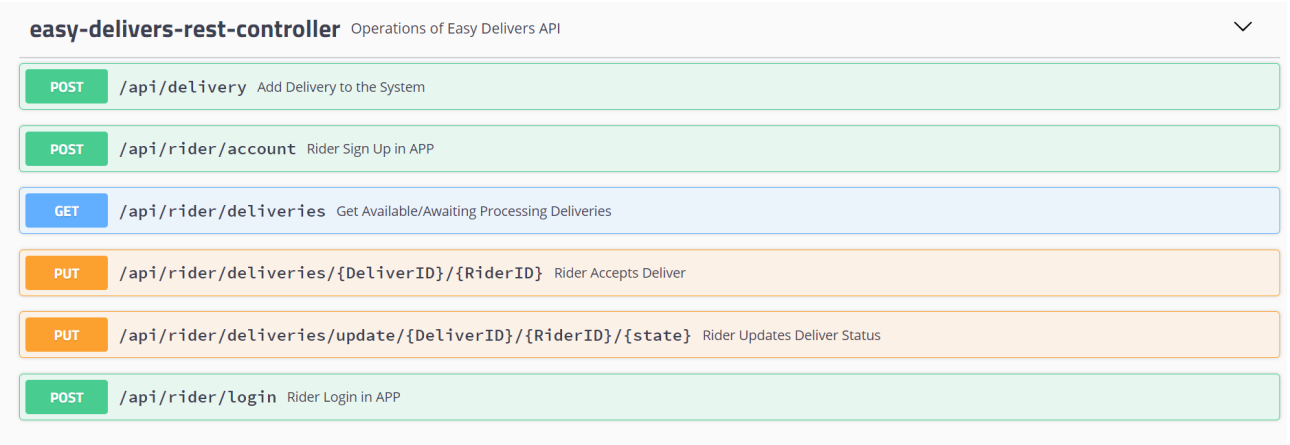


Two docker-compose files were developed to deploy the project: one for the Easy Delivers Spring Boot project, and another for ProudPapers.

5 API for developers



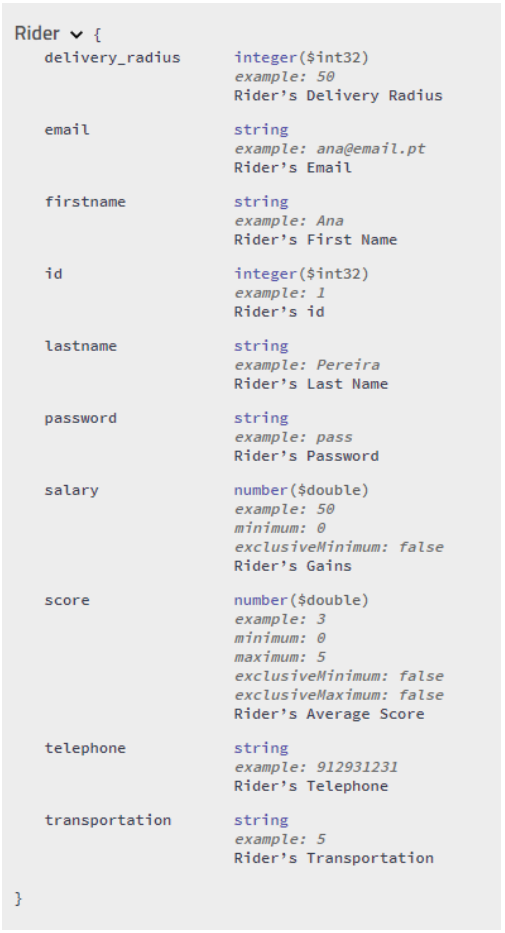




Delivery {

client_telephone	string *example: 912931231* Client's Telephone
destination	string *example: Loc2* Delivery's Destination
id	integer($int32) *example: 1* Delivery's id
rider	integer($int32) *example: 1* Rider's ID
rider_fee	integer($int32) *example: 5* *minimum: 0* *exclusiveMinimum: false* Rider's Fee
score	integer($int32) *example: 3* *minimum: 0* *maximum: 5* *exclusiveMinimum: false* *exclusiveMaximum: false* Delivery's Score
start	string *example: Loc1* Delivery's Start
state	string *example: awaiting_processing* Delivery's Current State
store	integer($int32) *example: 1* Store's id

}



Rider {

delivery_radius	integer($int32) *example: 50* Rider's Delivery Radius
email	string *example: ana@email.pt* Rider's Email
firstname	string *example: Ana* Rider's First Name
id	integer($int32) *example: 1* Rider's id
lastname	string *example: Pereira* Rider's Last Name
password	string *example: pass* Rider's Password
salary	number($double) *example: 50* *minimum: 0* *exclusiveMinimum: false* Rider's Gains
score	number($double) *example: 3* *minimum: 0* *maximum: 5* *exclusiveMinimum: false* *exclusiveMaximum: false* Rider's Average Score
telephone	string *example: 912931231* Rider's Telephone
transportation	string *example: 5* Rider's Transportation

}

6 References and resources

DistanceMatrixAi - used to obtain the distance between two locations: https://distancematrix.ai/