

# Technical Solution Description

## LogiWeb Application

author: Evgenii Govorushkin  
version 1.0

Saint Petersburg, 2021

# Table of Contents

About system.....	2
Used technologies and instruments.....	3
Additional implemented features.....	5
Database schema .....	6
Architecture .....	7
Layers of application.....	8
User interface.....	11
Unit tests.....	19
Build and deploy applications.....	20
Logging.....	21
The statistic about application code.....	22
Planned improvements.....	23

## **About system**

LogiWeb - web-application, a logistics system for some transportation company. It contains two types of users - Administrator and Driver. The administrator can view, add, modify and edit drivers, trucks, cargoes and orders.

Drivers can view their personal information, change their status and status of order.

# Used technologies and instruments

## Instruments

Name	Version
IntelliJ IDEA 2020	2020.2.3 (Ultimate Edition)
MySQL Workbench 8.0	8.0.22.Build 107600 CE (64 bits) Community

## Technologies

Name	Version
JDK	1.8.0_275
Apache Maven	3.6.3
Apache Tomcat	8.5.61
WildFly (JBoss)	22.0.0.Final
Spring Framework	5.3.2
Spring Security	5.3.6.RELEASE
Hibernate	5.4.26.Final
Hibernate Validator	6.1.7.Final
MySQL Connector	8.0.22
Servlet API	4.0.1
JSTL	1.2
C3P0	0.9.5.5
Model Mapper	2.3.9
Log4j	1.2.17
SI4j	1.7.30
JUnit 5 (Jupiter API)	5.7.0
Mockito	3.7.7
Spring Test	5.3.3
Hamcrest	2.2
Jackson	2.12.1
Active MQ Spring	5.16.1
Spring JMS	5.3.3
GSON	2.8.6
JSON	20201115
SonarQube	8.5.1.38104
Google Maps API	0.17.0
JSF	2.2.20
JavaEE	8.0.1
Primefaces	10.0.0-RC1
Bootstrap	4.5.2

Datatables	1.10.23
JQuery	3.5.1
Feather Icons	4.28.0
Font Awesome Icons	5.15.2

## **Additional implemented features**

To calculate the distance and travel time between two cities is used Google Maps API (Directions API).

# Database schema

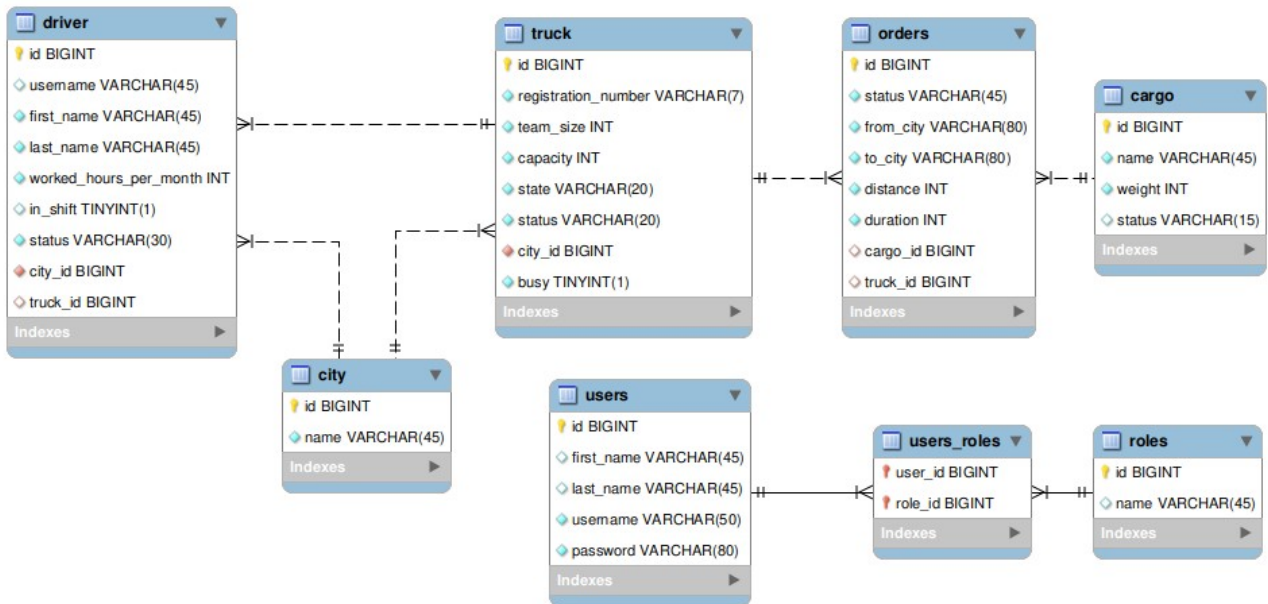
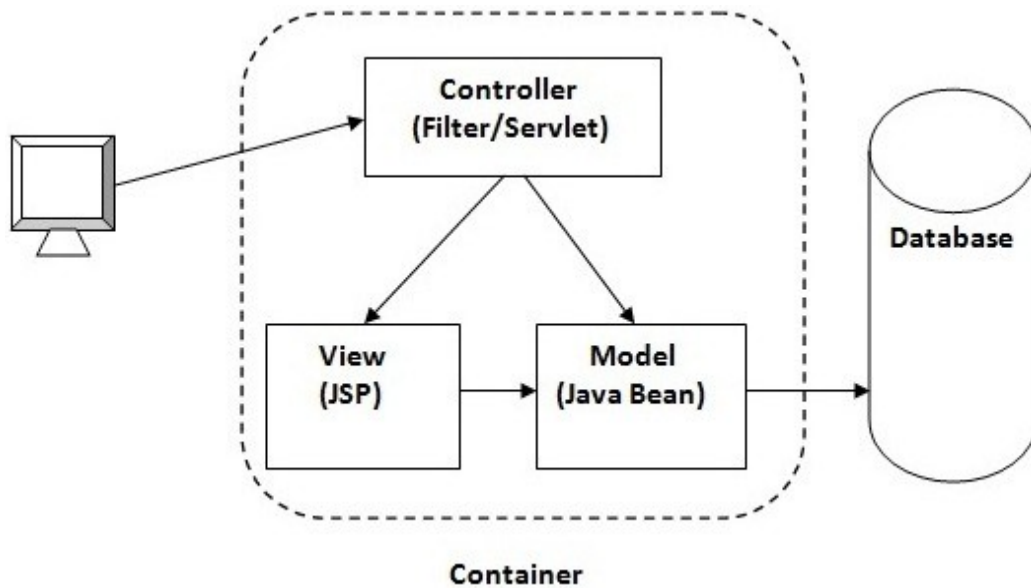


Figure 1 - Database schema

# Architecture

The web application based on client-server architecture. On server side used Model-View-Controller (MVC) pattern. That pattern divides the information related program logic into three interconnected elements.



*Figure 2 - MVC Pattern*

To transfer data from view to controller and vice versa using the DTO pattern.



# Layers of application

## Model layer

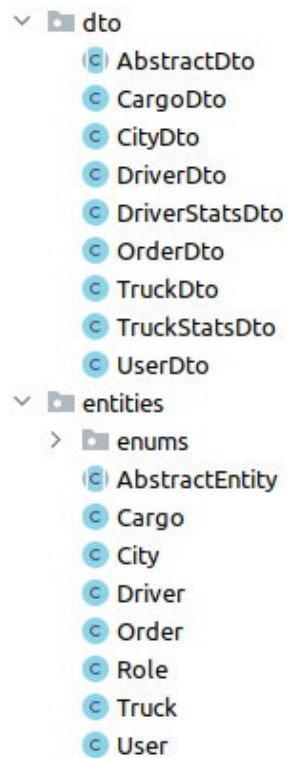


Figure 3 - Model layer

## Controller layer

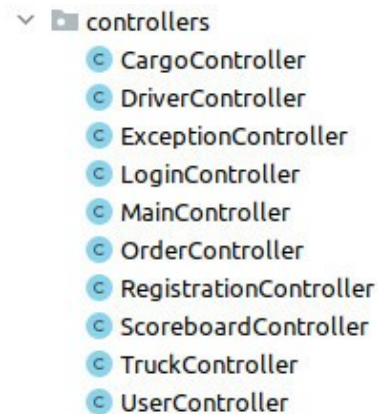


Figure 4 - Controller layer

## Service layer

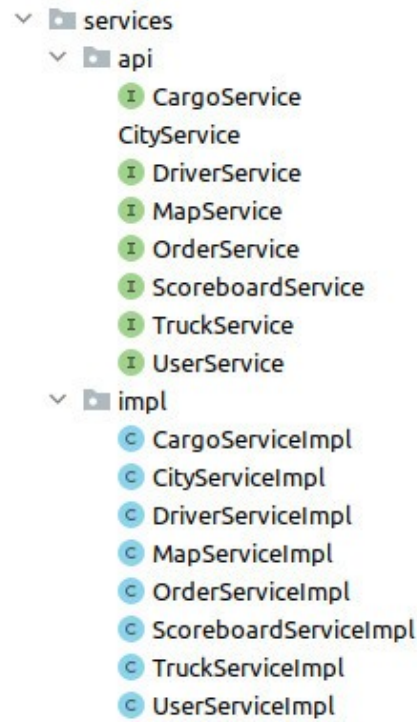


Figure 5 - Service layer

## DAO layer

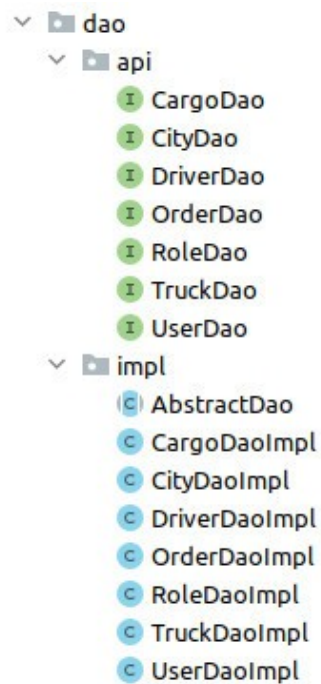


Figure 6 - DAO layer

## View layer

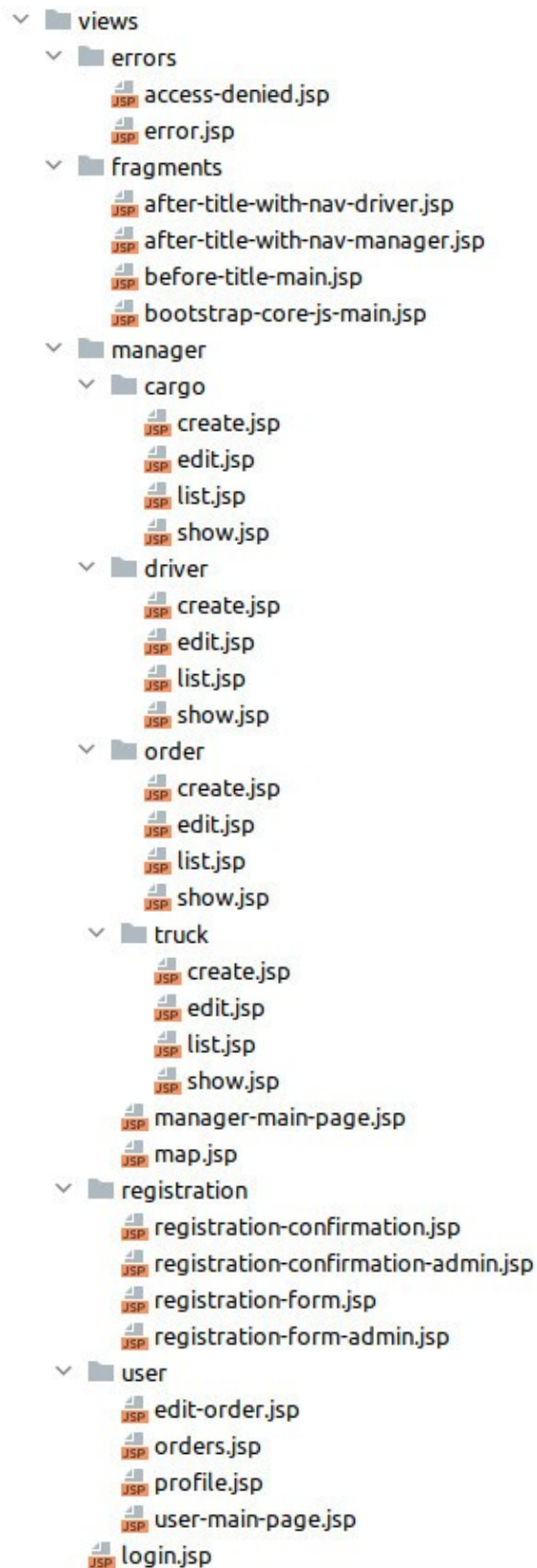


Figure 7 - View layer

# User interface

Sign in

username

password

Sign in

Don't have an account yet? [Sign Up](#)

Figure 8 - Login page

Create Account

username (\*)

password (\*)

confirm password (\*)

First Name

Last name

Chelyabinsk

Create Account

Have an account? [Sign In](#)

Figure 9 - Registration page

The next pages represent when the user logged with the Admin role:

LogiWeb

Home

Trucks

Drivers

Orders

Cargoes

Add Admin

Hi, admin

Logout

Trucks

Show

7

entries

Search:

Registration №	Capacity (kg)	State	Status	Current City	Edit	Delete
AL01221	17000	Serviceable	Parked	Volgograd	<a href="#">Edit</a>	<a href="#">Delete</a>
AV12233	30000	Serviceable	Parked	Yekaterinburg	<a href="#">Edit</a>	<a href="#">Delete</a>
ER87221	16000	Serviceable	Parked	Saratov	<a href="#">Edit</a>	<a href="#">Delete</a>
FH56342	10000	Serviceable	Parked	Rostov-on-Don	<a href="#">Edit</a>	<a href="#">Delete</a>
LQ55432	15000	Serviceable	Parked	Voronezh	<a href="#">Edit</a>	<a href="#">Delete</a>
MM00001	20000	Serviceable	Parked	Kaliningrad	<a href="#">Edit</a>	<a href="#">Delete</a>
NB44211	19000	Faulty	Parked	Omsk	<a href="#">Edit</a>	<a href="#">Delete</a>

Showing 1 to 7 of 11 entries

Previous

1

2

Next

Add Truck

Figure 10 - All trucks page (only Admin)

LogiWeb
Hi, admin
Logout

Home
Trucks
Drivers
Orders
Cargoes
Add Admin

## Create New Truck

Registration №:

Team Size: ☒ 1 ☐ 2

Capacity (kg):

Condition:

Current City:

Figure 11 - Create new truck page (only Admin)

LogiWeb
Hi, admin
Logout

Home
Trucks
Drivers
Orders
Cargoes
Add Admin

## 🚚 | Edit Truck QW12332

Registration №:

Team Size: ☐ 1 ☒ 2

Capacity (kg):

State:

Current Status:

Current City:

### Available Drivers

	First Name	Last Name	Personal №	Worked Hours / Month	Status	City	Truck	Bind To Truck
👤	Nikolay	Pogodin	1001	0	Resting	Moscow	None	+

Figure 12 - Edit truck page (only Admin)

LogiWeb
Hi, admin
Logout

Home
Trucks
Drivers
Orders
Cargoes
Add Admin

## 👤 | Drivers

Show  entries

Search:

First Name	Last Name	Personal №	Worked Hours / Month	Current Status	Current City	Current Truck	Edit	Delete
Alex	Alex	1011	18	Resting	Omsk	QW11010	<a href="#">✎</a>	<a href="#">✖</a>
Bill	Bill	1008	15	Resting	Kaliningrad	MM00001	<a href="#">✎</a>	<a href="#">✖</a>
Bob	Bob	1010	25	Resting	Kazan	PP00010	<a href="#">✎</a>	<a href="#">✖</a>
John	Johnson	1007	15	Resting	Kaliningrad	MM00001	<a href="#">✎</a>	<a href="#">✖</a>
Mike	Mike	1009	25	Resting	Kazan	PP00010	<a href="#">✎</a>	<a href="#">✖</a>
Nikolay	Pogodin	1001	0	Resting	Moscow		<a href="#">✎</a>	<a href="#">✖</a>
Oleg	Oleg	1012	18	Resting	Omsk	QW11010	<a href="#">✎</a>	<a href="#">✖</a>

Showing 1 to 7 of 7 entries

Previous
Next

Figure 13 - All drivers page (only Admin)

LogiWeb

Hi, admin
Logout

Home
Trucks
Drivers
Orders
Cargoes

Add Admin

+ | Create New Driver

Username:

Password:

Confirm password:

First Name:

Last Name:

Current City:

Save
Back

Figure 14 - Create new driver page (only Admin)

LogiWeb

Hi, admin
Logout

Home
Trucks
Drivers
Orders
Cargoes

Add Admin

+ | Edit Driver

First Name:

Last Name:

Personal №:

Worked Hours / Month:

Current Status:

Current City:

Current Truck:

Update
Delete
Cancel

Available Trucks

	Registration №	Capacity (kg)	State	Status	Current City	Add
	QW12332	20000	Serviceable	Parked	Moscow	+

Figure 15 - Edit driver page (only Admin)

LogiWeb

Hi, admin
Logout

Home
Trucks
Drivers
Orders
Cargoes

Add Admin

+ | Orders

Show 7 entries
Search:

№	Status	From City	To City	Distance (km)	Duration (hr)	Cargo	Truck	Edit	Delete
63	Not completed	Moscow	Samara	1065	14	Meat			
64	Not completed	Moscow	Saratov	847	11	Water	QW12332		
65	Completed	Kaliningrad	Moscow	1252	15	Water	MM00001		
66	Not completed	Volgograd	Saratov	378	5	Windows			
67	Not completed	Kazan	Ufa	534	6	Bottles			
68	Not completed	Chelyabinsk	Volgograd	1672	22	Stone			
69	Not completed	Rostov-on-Don	Barnaul	3946	50	Laptops			

Showing 1 to 7 of 7 entries
Add Order

Previous
1
Next

Figure 16 - All orders page (only Admin)

LogiWeb

Hi, admin
Logout

Home
Trucks
Drivers
Orders
Cargoes
Add Admin

Create New Order

From City

Chelyabinsk

To City

Omsk

Cargo:

Stone (20000kg), Prepared

Save

Back

Figure 17 - Create new order page (only Admin)

LogiWeb

Hi, admin
Logout

Home
Trucks
Drivers
Orders
Cargoes
Add Admin

Edit Order №67

Current Status:

Not completed

From City:

Kazan

To City:

Ufa

Distance (km):

534

Travel time (hr):

6

Cargo:

Bottles

Current Truck:

None

Update

Delete

Cancel

Available Trucks

Registration №	Capacity (kg)	State	Status	Current City	Bind truck
PP00010	25000	Serviceable	Parked	Kazan	+

Figure 18 - Edit order page (only Admin)

LogiWeb

Hi, admin
Logout

Home
Trucks
Drivers
Orders
Cargoes
Add Admin

Cargoes

Show 7 entries

Search:

Id	Name	Weight (kg)	Status	Edit	Delete
1	Meat	500	Shipped		
2	Wood	10000	Delivered		
3	Bottles	500	Prepared		
5	Water	1000	Delivered		
6	Stone	20000	Prepared		
7	Tubes	5000	Delivered		
9	Laptops	10000	Delivered		

Showing 1 to 7 of 10 entries

Previous
1
2
Next

Add Cargo

Figure 19 - All cargoes page (only Admin)

LogiWeb

Hi, adminLogout

Home

Trucks

Drivers

Orders

Cargoes

Add Admin

Create New Cargo

Name:

Weight (kg):

SaveBack

Figure 20 - Create new cargo (only Admin)

LogiWeb

Hi, adminLogout

Home

Trucks

Drivers

Orders

Cargoes

Add Admin

Edit Cargo

Id:

Name:

Weight (kg):

Current Status:

SaveDeleteCancel

Figure 21 - Edit cargo page (only Admin)

LogiWeb

Hi, adminLogout

Home

Trucks

Drivers

Orders

Cargoes

Add Admin

Add New Administrator

Username:

Password:

Confirm password:

First Name:

Last Name:

Create Account

Figure 22 - Create new administrator page (only Admin)



The next pages represent when the user logged with the Driver role:

LogiWeb Hi, john Logout

My profile My orders

| John Johnson, №1007

Hours worked this month: 15

My Truck: MM00001

Current city: Kaliningrad

Current State: Not in shift

Current Status: Resting

Change State

In shift

My colleague

Personal №	First Name	Last Name	Worked Hours / Month	State	Status
1008	Bill	Bill	15	Not in shift	Resting

Figure 23 - Driver profile page (only Driver)

LogiWeb Hi, john Logout

My profile My orders

### My Orders

Show 7 entries Search:

№	Status	From City	To City	Distance (km)	Travel time (hr)	Name of cargo	Truck	Edit
65	Completed	Kaliningrad	Moscow	1252	15	Water	MM00001	

Showing 1 to 1 of 1 entries Previous 1 Next

Figure 24 - Orders of driver page (only Driver)

LogiWeb Hi, john Logout

My profile My orders

### | Edit Order №65

Current Status: Completed

From City: Kaliningrad

To City: Moscow

Distance (km): 1252

Travel time (hr): 15

Name of cargo: Water

Weight of cargo: 1000

Cargo status: Delivered

Back

Figure 25 - Edit order (only Driver)

The next page represents the scoreboard with a statistic about trucks and drivers and also the latest orders:

Trucks		Latest orders							
Total	11	Number	Cargo	Weight of cargo	Status of cargo	From City	To City	Truck	Status
Available	10	69	Laptops	10000	Delivered	Rostov-on-Don	→ Barnaul	None	Not completed
Busy	0	68	Stone	20000	Prepared	Chelyabinsk	→ Volgograd	None	Not completed
Faulty	1	67	Bottles	500	Prepared	Kazan	→ Ufa	None	Not completed
Drivers		66	Windows	5000	Prepared	Volgograd	→ Sarartov	None	Not completed
Total	7	65	Water	1000	Delivered	Kaliningrad	→ Moscow	MM00001	Completed
Available	7	64	Water	1000	Delivered	Moscow	→ Saratov	QW12332	Not completed
Not available	0	63	Meat	500	Shipped	Moscow	→ Samara	None	Not completed

Figure 26 - Scoreboard view

# Unit tests

## Example of successful tests

✓ <default package>	10 s 267 ms
✓ ScoreboardServiceTest	1 s 916 ms
✓ Test update scoreboard success	1 s 916 ms
✓ CargoControllerTest	3 s 209 ms
✓ Render the HTML view that displays the info	3 s 209 ms
✓ Should render the Cargo create view	2 s 208 ms
✓ Should render the Cargo list view	54 ms
✓ Should return the HTTP status code 200	57 ms
✓ Render the HTML view that displays the info	474 ms
✓ When the requested cargo is found from	357 ms
✓ Should display the correct informatio	136 ms
✓ Should display the information of the	59 ms
✓ Should render the view cargo	53 ms
✓ Should return the HTTP status code 20	54 ms
✓ Should display a shipped cargo	55 ms
✓ When the requested cargo isn't found fr	117 ms
✓ Should render the 404 view	61 ms
✓ Should return HTTP status code 404	56 ms
✓ When two cargoes are found from the data	318 ms
✓ Should display two cargoes	128 ms
✓ Should display the information of the fir	71 ms
✓ Should display the information of the fir	59 ms
✓ Should display the information of the sec	60 ms
✓ When no cargoes is found from the databas	98 ms
✓ Should display zero cargoes	98 ms

Figure 27 - Small example of successful tests

Service layer coverage is 80% tests:

services	87% classes, 80% lines covered
api	
impl	87% classes, 80% lines covered
CargoServiceImpl	100% methods, 100% lines covered
CityServiceImpl	100% methods, 100% lines covered
DriverServiceImpl	87% methods, 81% lines covered
MapServiceImpl	0% methods, 0% lines covered
OrderServiceImpl	93% methods, 78% lines covered
ScoreboardServiceImpl	100% methods, 100% lines covered
TruckServiceImpl	100% methods, 100% lines covered
UserServiceImpl	57% methods, 70% lines covered

Figure 28 - Test coverage of the service layer

## **Build and deploy applications**

1. LogiWeb
  - a) Run MySQL Server and create database with tables.
  - b) Run Apache Tomcat Server and deploy “LogiWeb.war” to it.
2. Scoreboard application for LogiWeb
  - a) Run ActiveMQ message broker
  - b) Run WildFly Server and deploy “Scoreboard.war” to it.

# Logging

Logging is configured using Log4j. Logs are written to a file.

Small piece of the log file:

2	2021-02-23 12:30:52	INFO	CityServiceImpl:43 - Found city with id = 1
3	2021-02-23 12:30:53	INFO	CargoServiceImpl:99 - Cargo with id = 1 deleted
4	2021-02-23 12:30:53	INFO	CargoServiceImpl:88 - Cargo with id = 1 updated
5	2021-02-23 12:30:53	INFO	CargoServiceImpl:43 - Found cargo with id = 1
6	2021-02-23 12:30:53	INFO	CargoServiceImpl:72 - Cargo with id = 1 created
7	2021-02-23 12:30:53	INFO	TruckServiceImpl:92 - Truck with id = 1 created
8	2021-02-23 12:30:53	INFO	TruckServiceImpl:59 - Found the truck with id = 1
9	2021-02-23 12:30:53	INFO	TruckServiceImpl:124 - Truck with id = 1 deleted
10	2021-02-23 12:30:53	INFO	TruckServiceImpl:111 - Truck with id = 1 updated
11	2021-02-23 12:30:54	INFO	DriverServiceImpl:166 - Available trucks found
12	2021-02-23 12:30:54	INFO	DriverServiceImpl:134 - Driver with id = 6 deleted
13	2021-02-23 12:30:54	INFO	DriverServiceImpl:121 - Driver with id = 6 updated
14	2021-02-23 12:30:54	INFO	DriverServiceImpl:72 - Found driver with id = 6
15	2021-02-23 12:30:54	INFO	DriverServiceImpl:103 - Driver with id = 6 created
16	2021-02-23 12:30:55	INFO	OrderServiceImpl:180 - Order with id = 2 updated
17	2021-02-23 12:30:55	INFO	OrderServiceImpl:162 - Order with id = created
18	2021-02-23 12:30:55	INFO	OrderServiceImpl:193 - Order with id = 1 deleted
19	2021-02-23 12:30:55	INFO	OrderServiceImpl:62 - Found order with id = 1

Figure 29 - Example of the log file

# The statistic about application code

Code statistic provided by SonarQube:

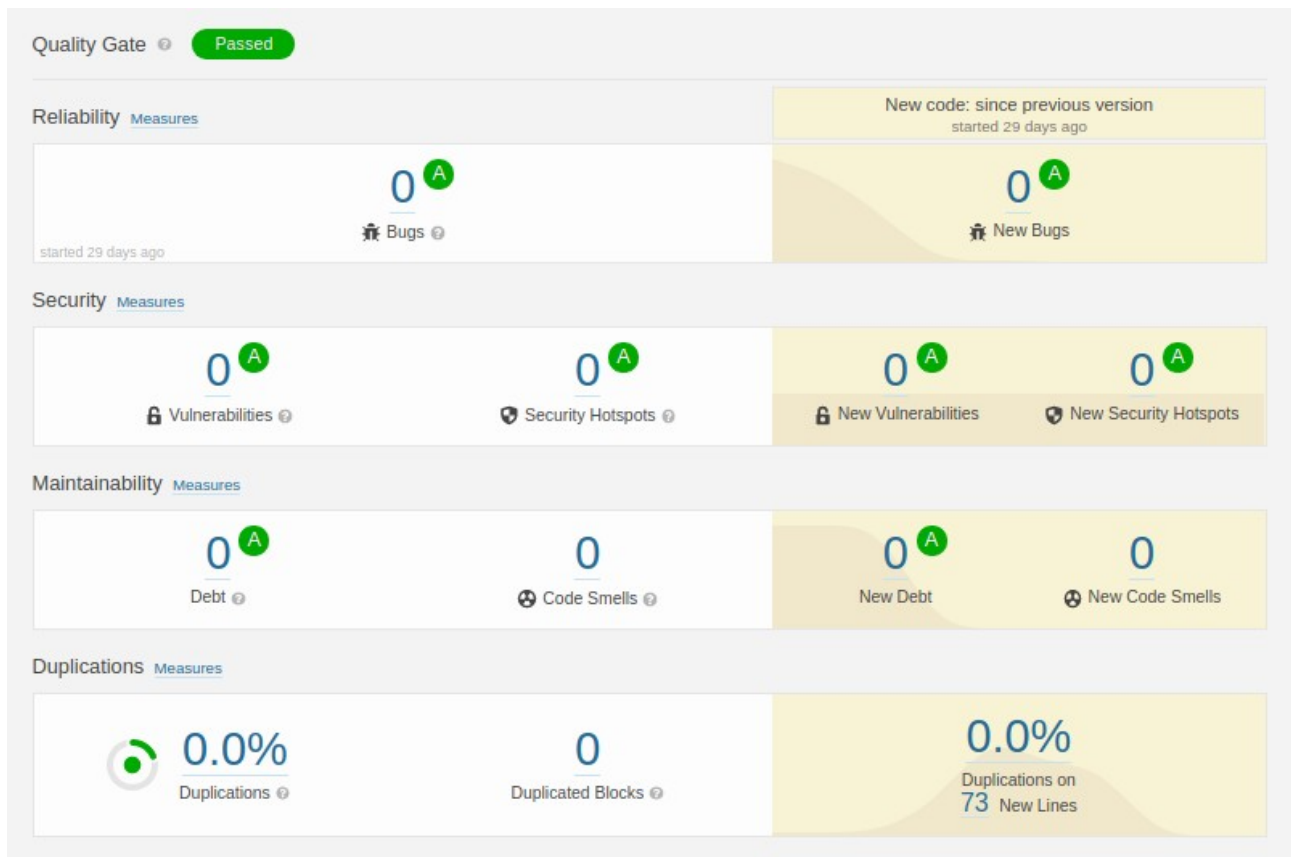


Figure 30 - SonarQube statistic

## **Planned improvements**

1. Full implementation Google Maps API (Place Autocomplete and show map).
2. Improve performance (implement pagination with Hibernate)