

# Development of the information system of the motor transport company on the example of "TAXI-COMFORT "

Part 1 - Development of the concept of the IS of the motor transport company "TAXI-COMFORT “.

Performed by O. Lisova

Part 2 - Development of the subsystem of IS for automation of business processes.

Performed by P. Tatarskyi

Part 3 – Development of subsystem for checking up the state of vehicles.

Performed by A.Misiura

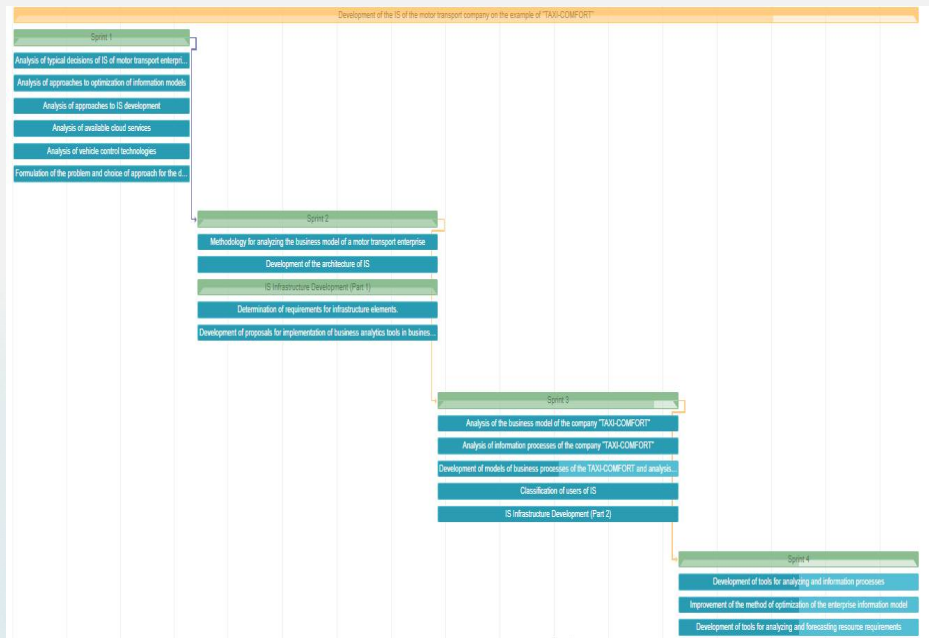
Supervisor Dubovoi V. M.

## Main goals:

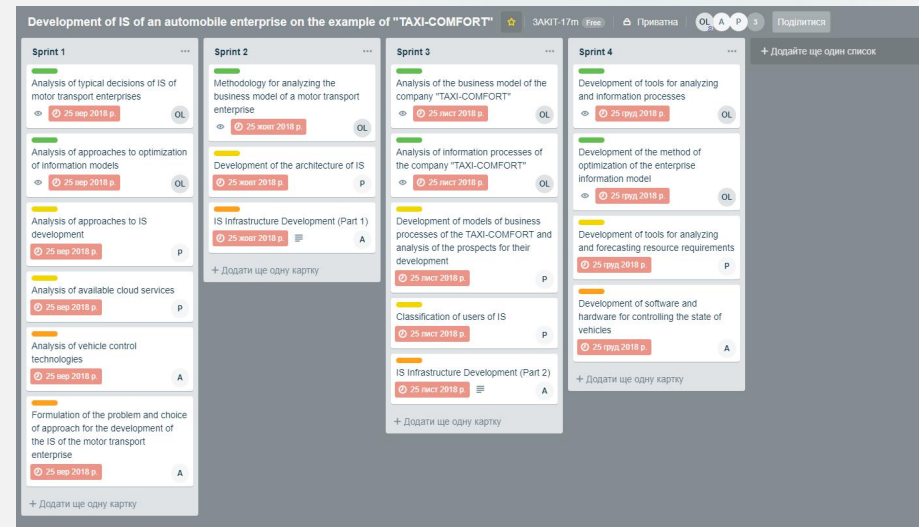
Improving the efficiency of vehicle use by business-processes automation;

- improving of the method of information transmission;
- improving the control by measurement of vehicle statement.

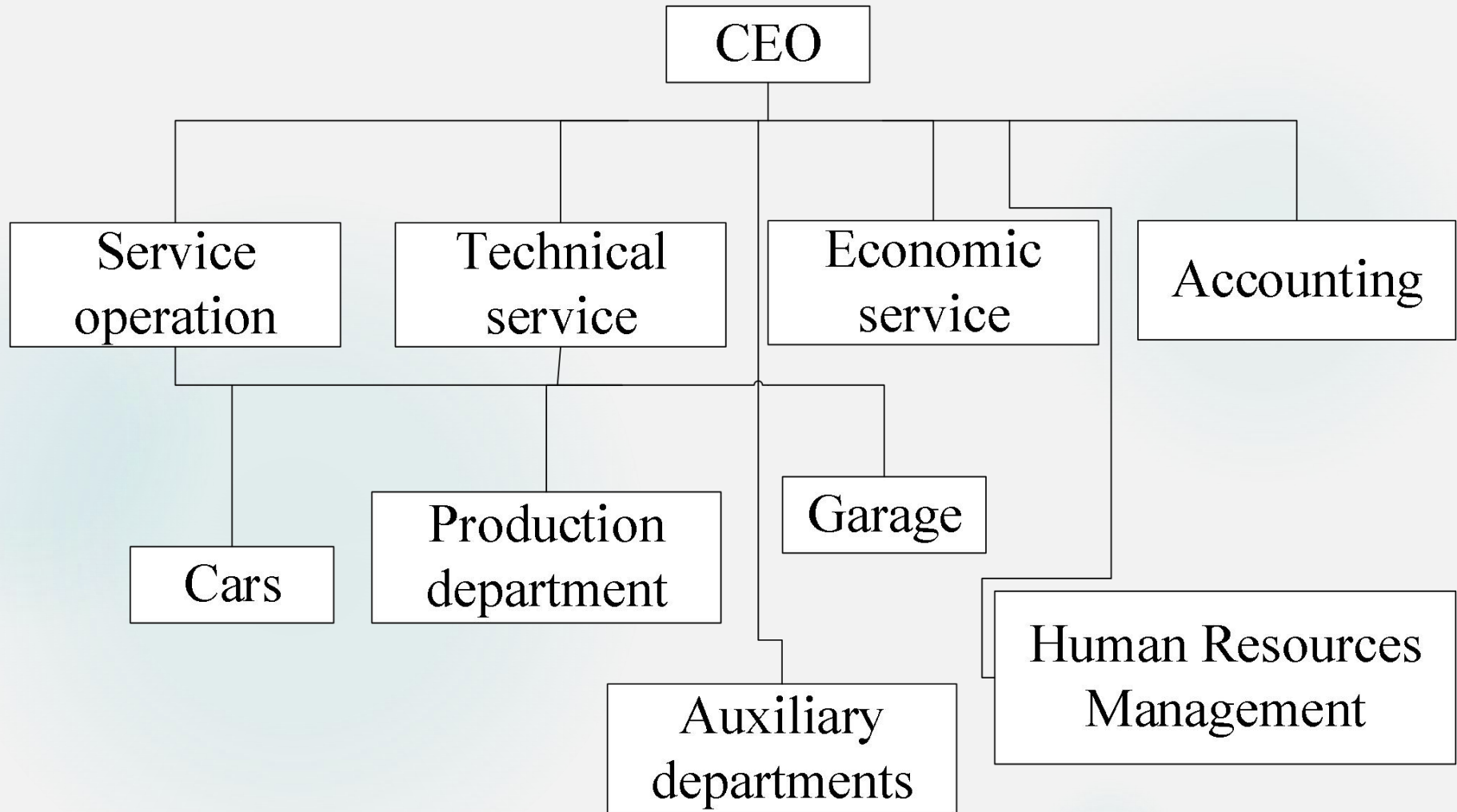
# Diagram of Gantt



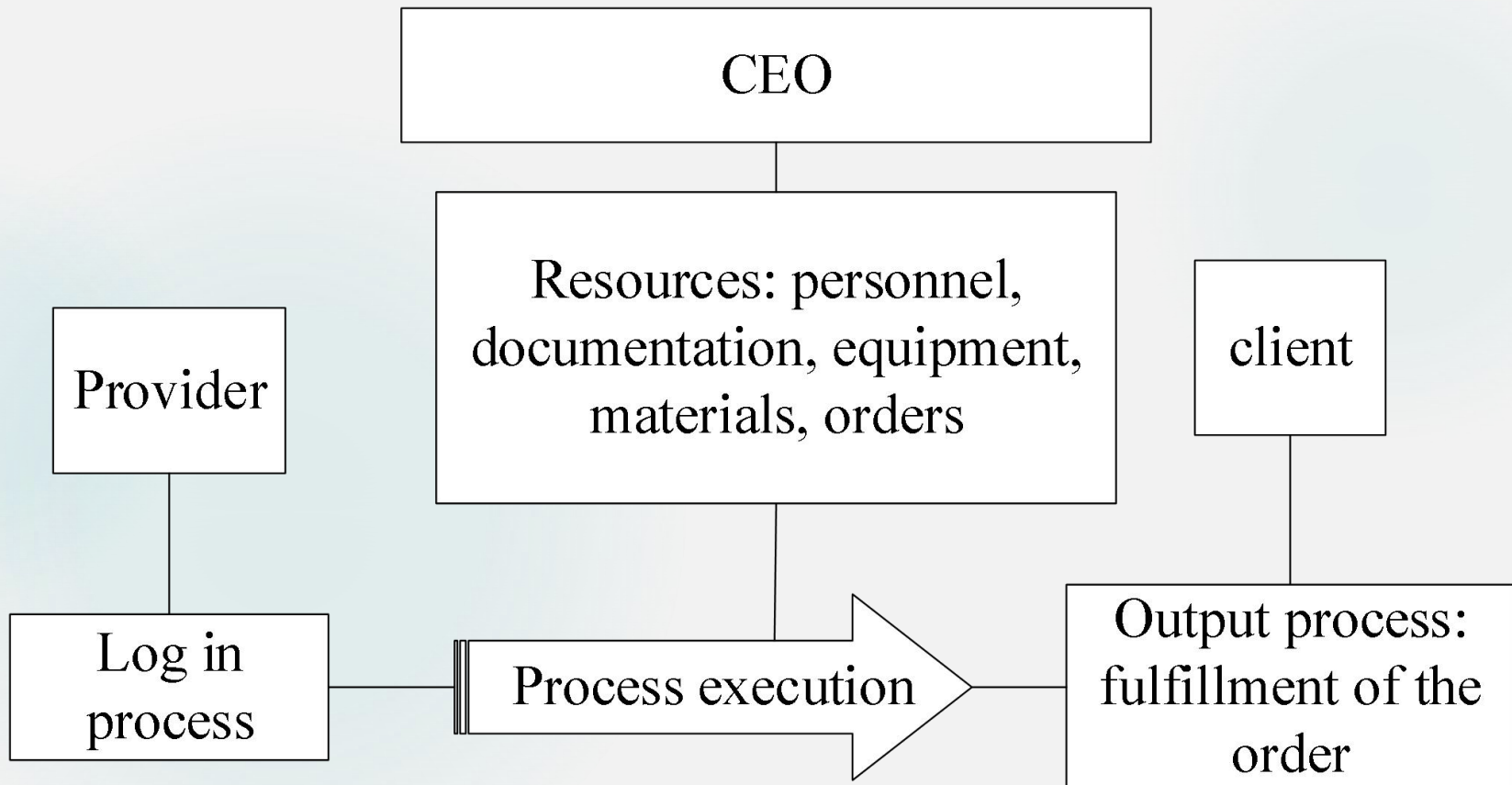
# Dashboard with sprints

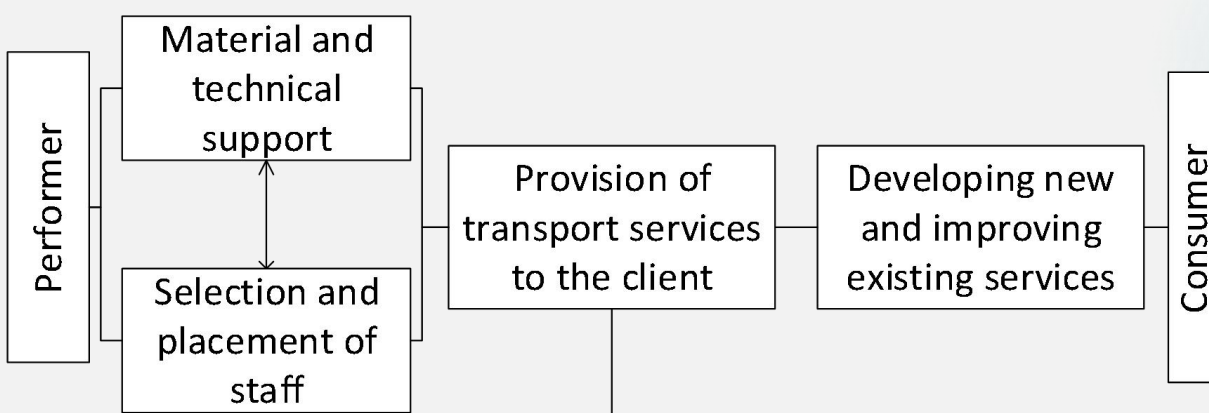


# The management's structure

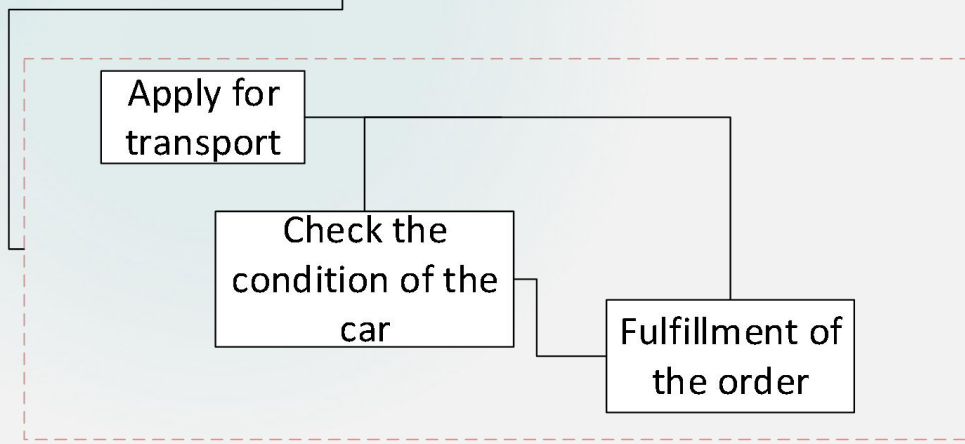
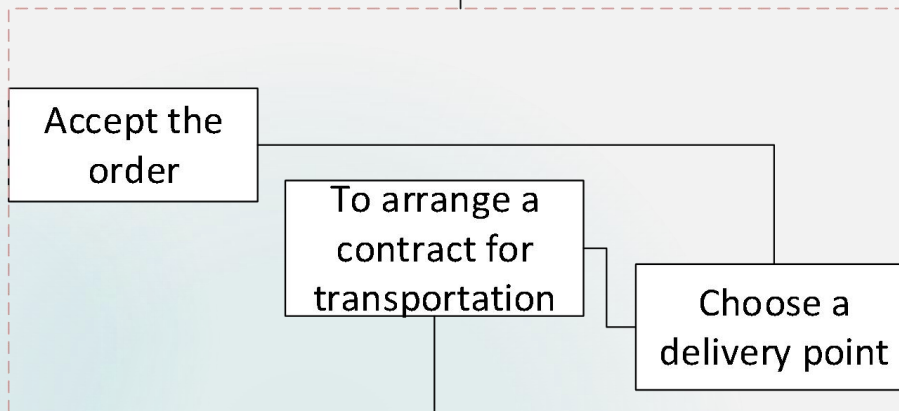


# Simplified business process diagram

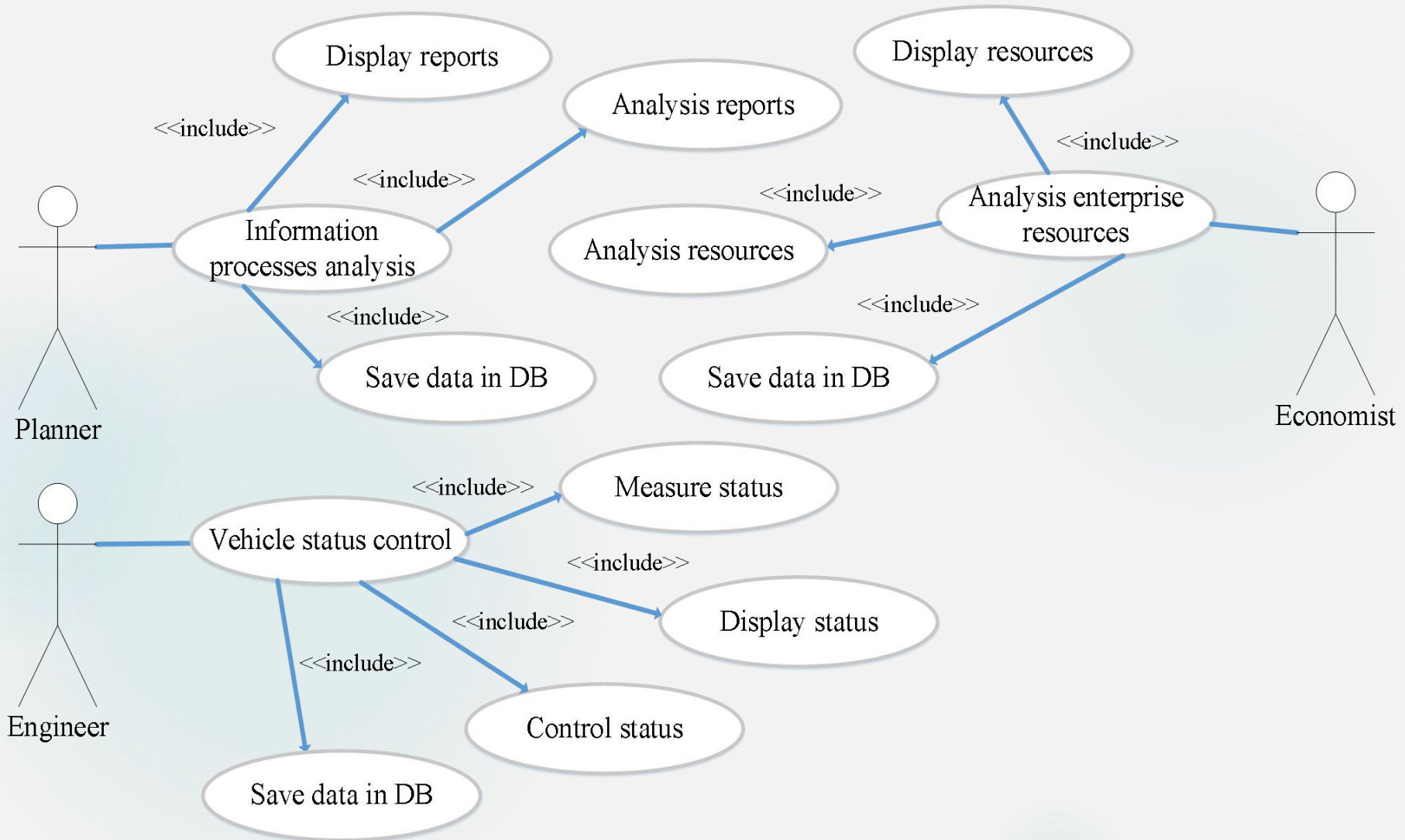


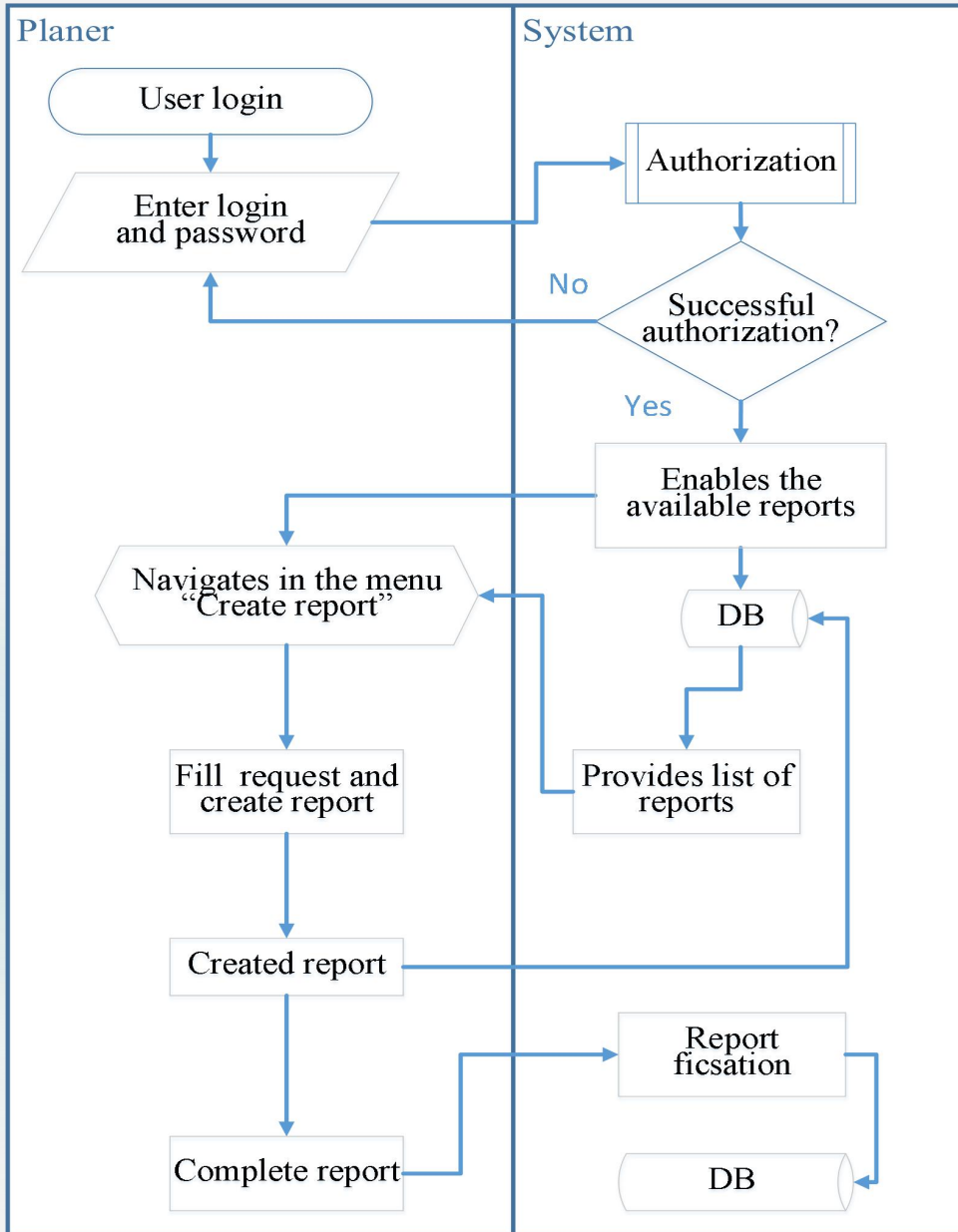


## Ordering of process and order fulfillment



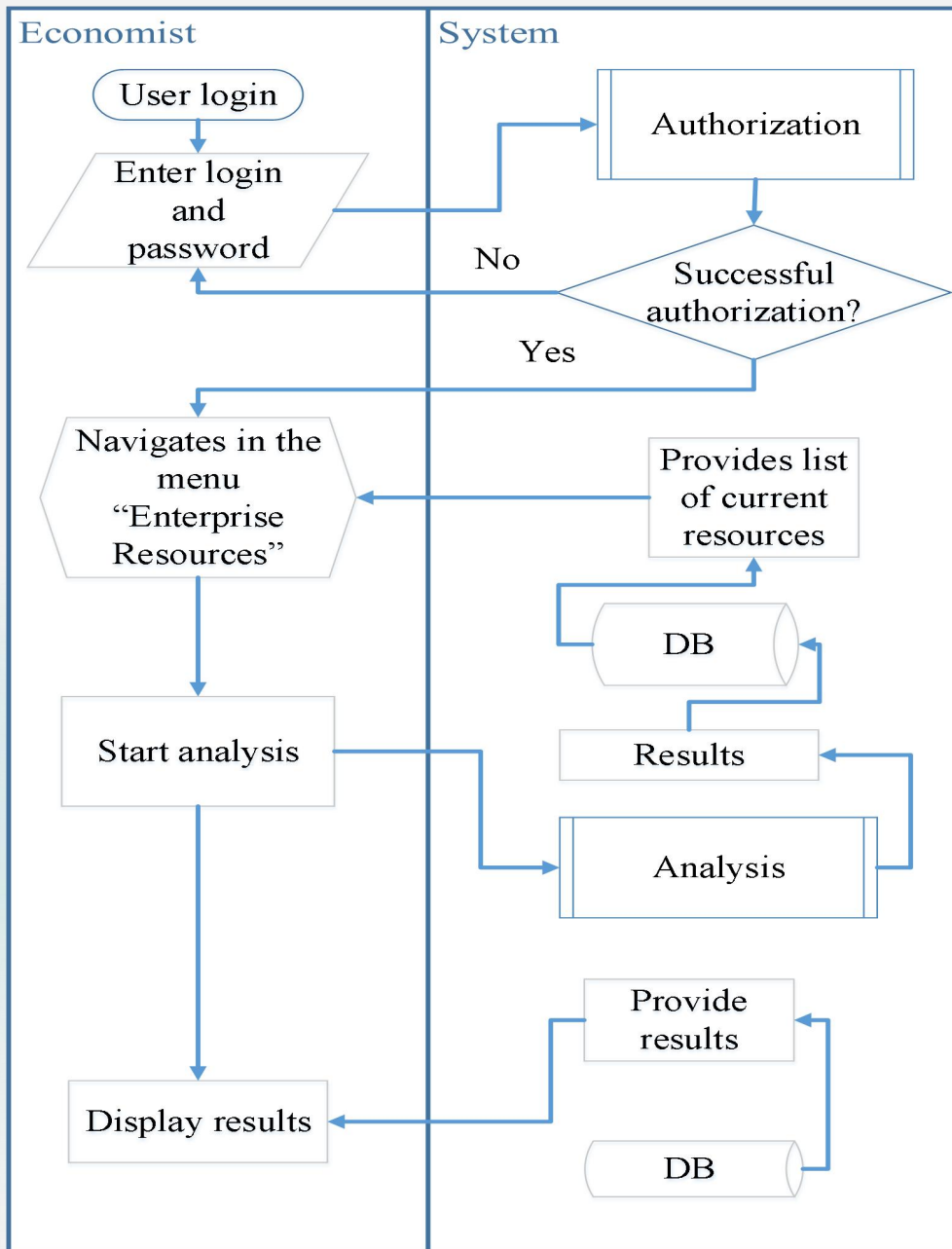
# UML use case diagram



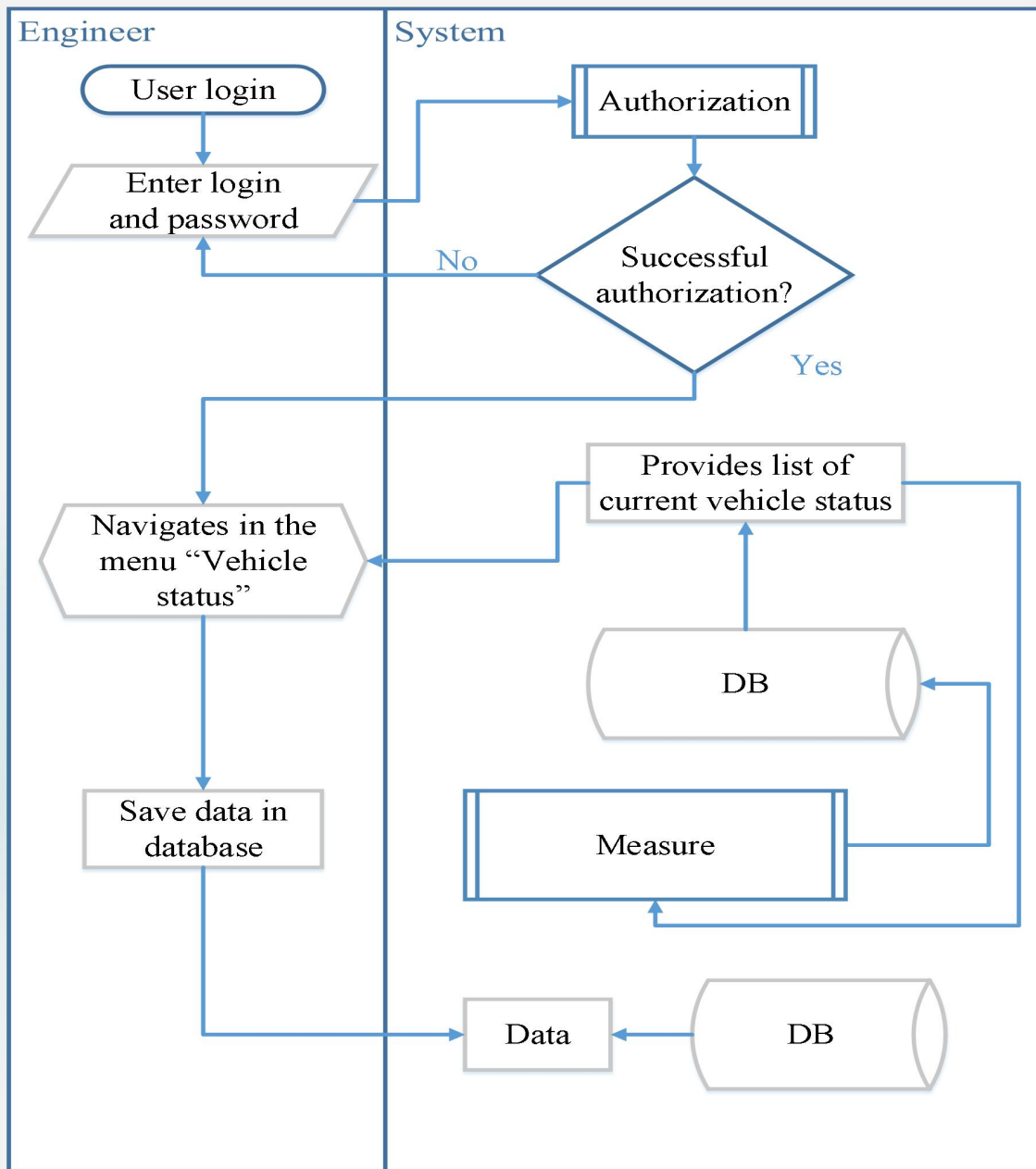


Business process  
diagram for analyzing  
information



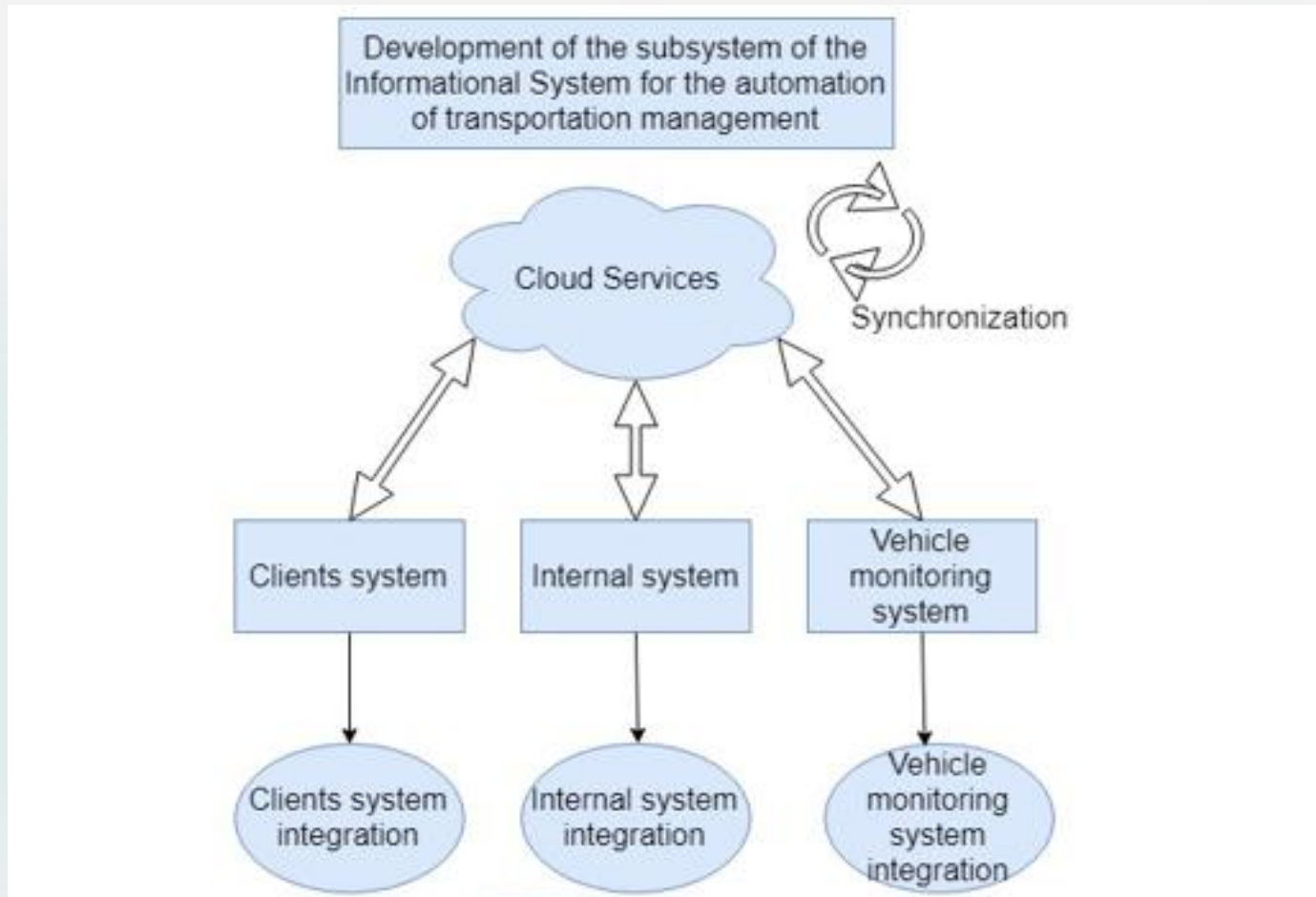


Business process  
diagram for resource  
allocation

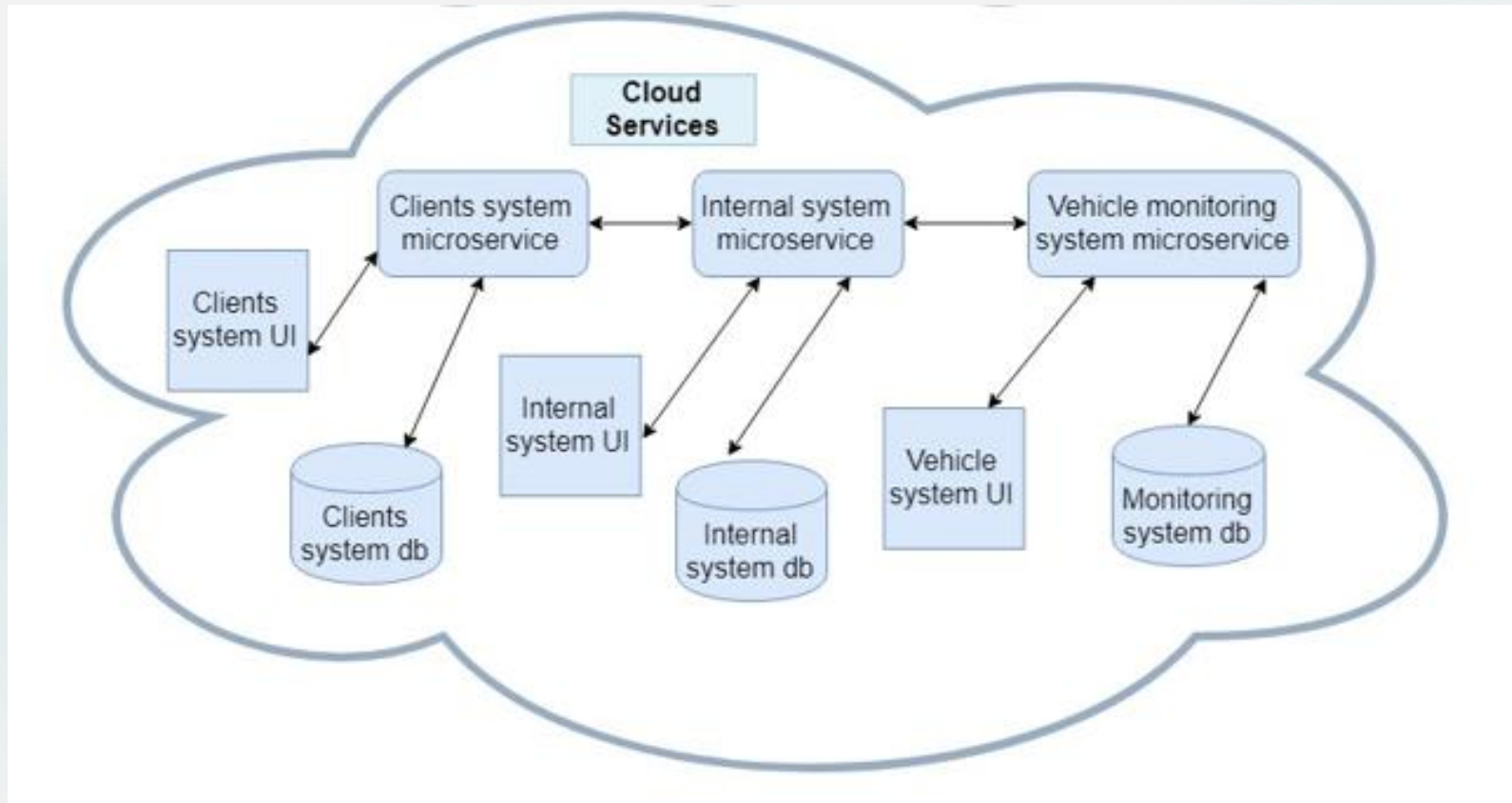


Business process  
diagram for  
measuring the state  
of cars

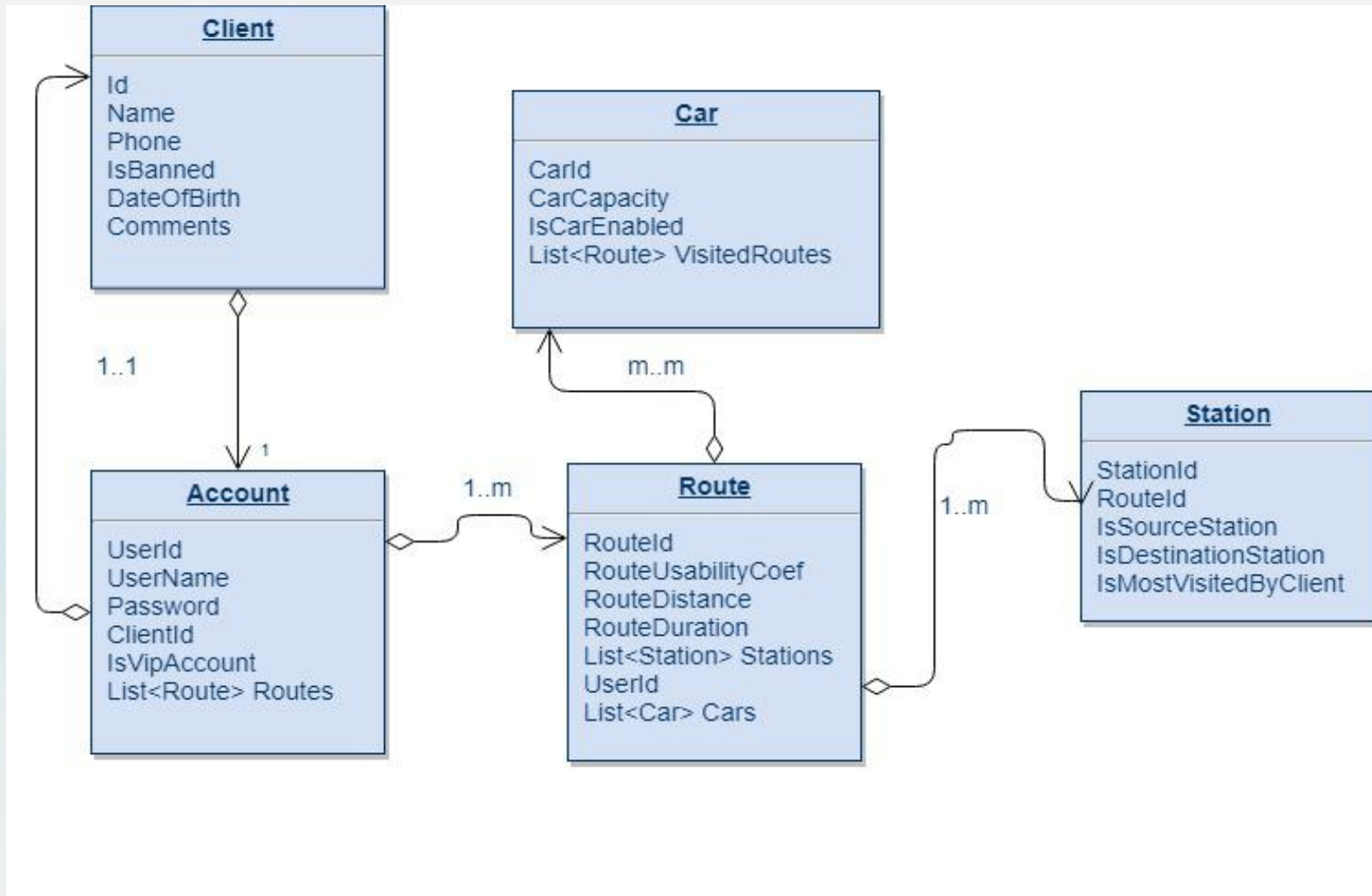
# Designing of information system infrastructure



# Designing of information system infrastructure

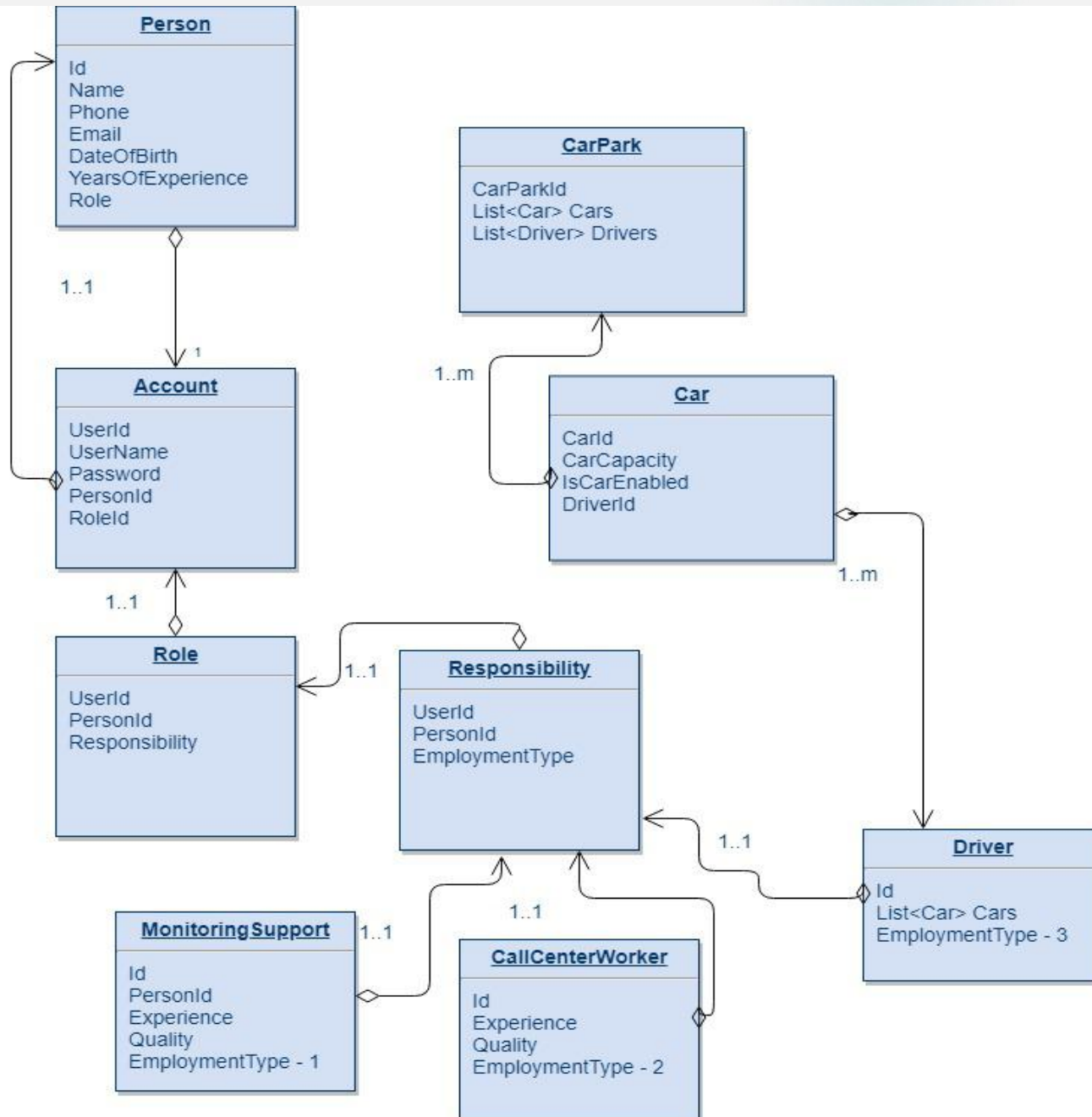


# Client system database

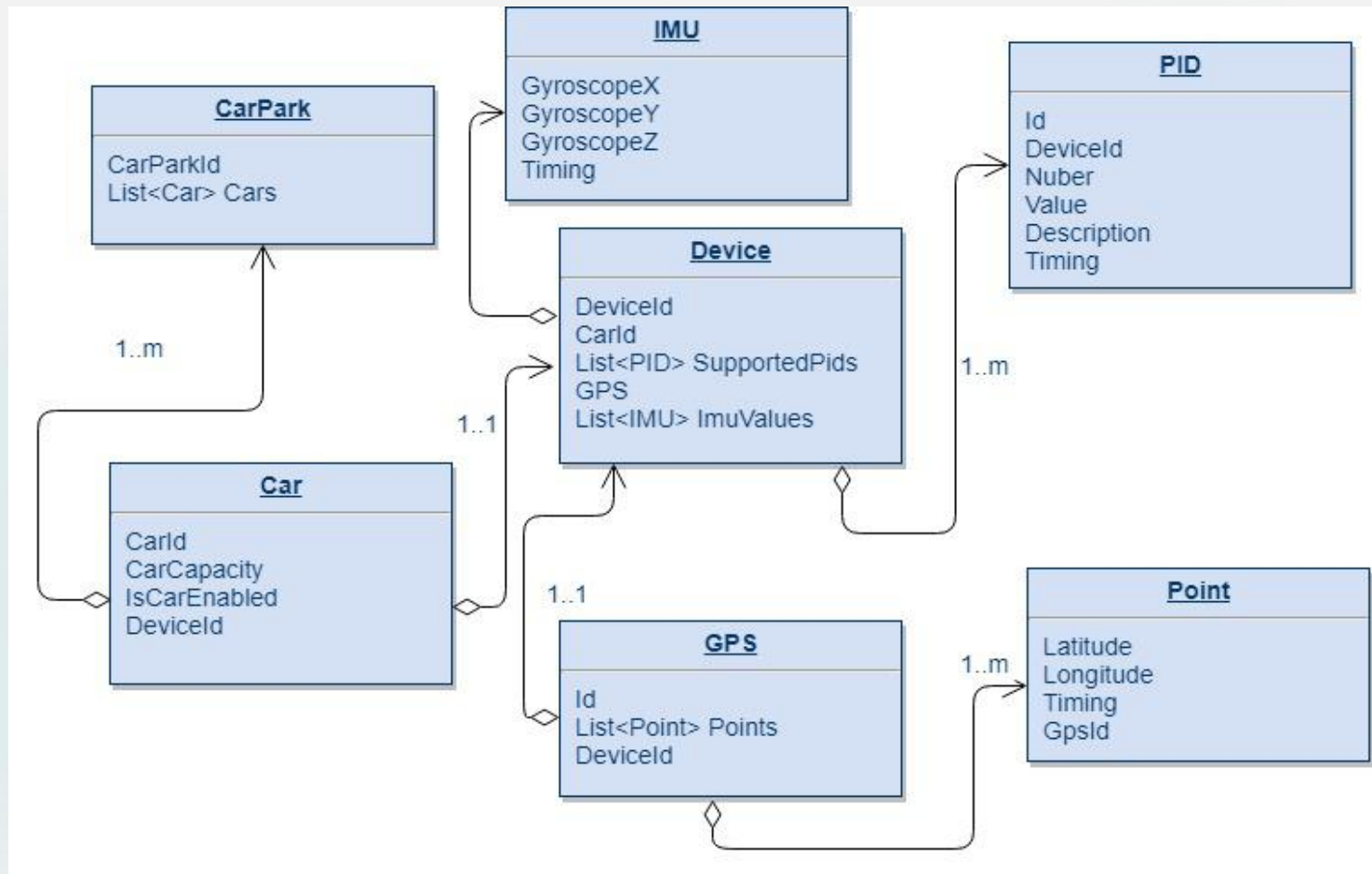


# Internal systems resource database ER model

1  
4

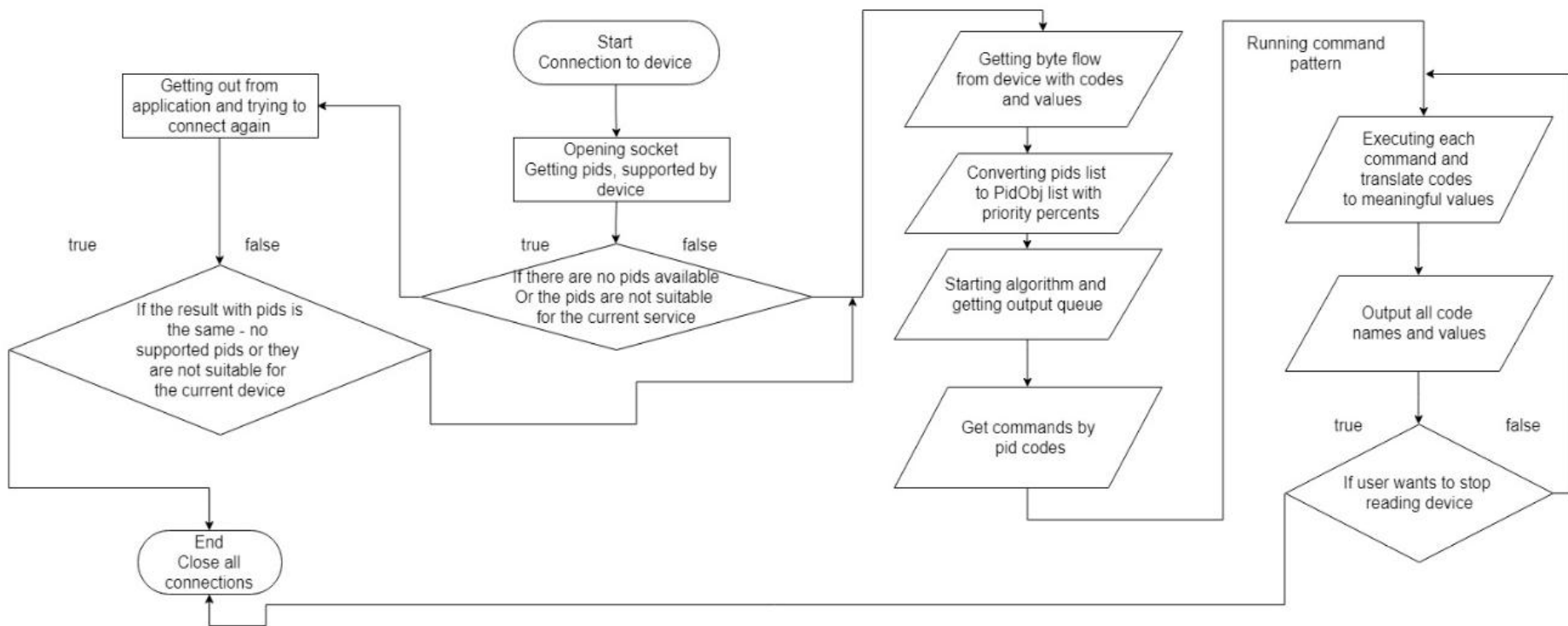


# ER-diagram of vehicle state check up





# Scheme of algorithm





# Realization of command pattern

```
3 references
public class EngineTemperatureCommand : CommandBase
{
    2 references
    public EngineTemperatureCommand()
    {
        Name = "Engine Temperature";
        Pid = "01 05";
        BytesNum = 1;
        RequestsNum = 1;
    }

    3 references
    public int EngineTemperature { get; private set; }

    16 references
    public override string ToString()
    {
        return $"{Name}: {EngineTemperature}";
    }

    18 references
    protected override bool Parse(string data)
    {
        EngineTemperature = Convert.ToInt32(data.Split(' ')[2], 16) - 40;
        Console.WriteLine("Engine Temperature: " + EngineTemperature);
        return true;
    }
}
```

```
public class EngineRpmCommand : CommandBase
{
    2 references
    public EngineRpmCommand()
    {
        Name = "Engine RPM";
        Pid = "01 0C";
        BytesNum = 2;
        RequestsNum = 1;
    }

    3 references
    public double EngineRpm { get; private set; }

    16 references
    public override string ToString()
    {
        return $"{Name}: {EngineRpm}";
    }

    18 references
    protected override bool Parse(string data)
    {
        var dataA = Convert.ToInt32(data.Split(' ')[2], 16) * 256;
        var dataB = Convert.ToInt32(data.Split(' ')[3], 16);

        EngineRpm = (dataA + dataB) / 4.0;
        Console.WriteLine("Engine RPM: " + EngineRpm);

        return true;
    }
}
```

# Data results screenshots

The image displays a Windows desktop environment with two main windows open. The left window, titled "C:\Program Files\dotnet\dotnet.exe", shows a text-based log of OBDII data. The right window, titled "OBDII Simulator", shows a graphical dashboard with five gauges and a DTCs list.

**Terminal Window Data:**

| Time      | Unit    | Samples | Queries | Speed    | Q/Speed  |
|-----------|---------|---------|---------|----------|----------|
| 10.014234 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.021210 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.027264 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.014749 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.025032 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.049316 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.007208 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.025008 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.022918 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.020837 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.026807 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.019728 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.045985 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.030995 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.027308 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.027067 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.027940 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.026353 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.019816 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.027787 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.016832 | seconds | 52      | 52      | 5.19 s/s | 5.19 q/s |
| 10.089913 | seconds | 69      | 69      | 6.84 s/s | 6.84 q/s |
| 10.022813 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.019425 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.018852 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.019103 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.018204 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.096486 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |
| 10.019297 | seconds | 0       | 0       | 0.00 s/s | 0.00 q/s |

**OBDII Simulator Dashboard:**

Mode 1 Values

- Engine RPM: 8192
- Throttle Position: 44
- Engine Temp: 71
- Mass Airflow: 103
- Vehicle Speed: 80

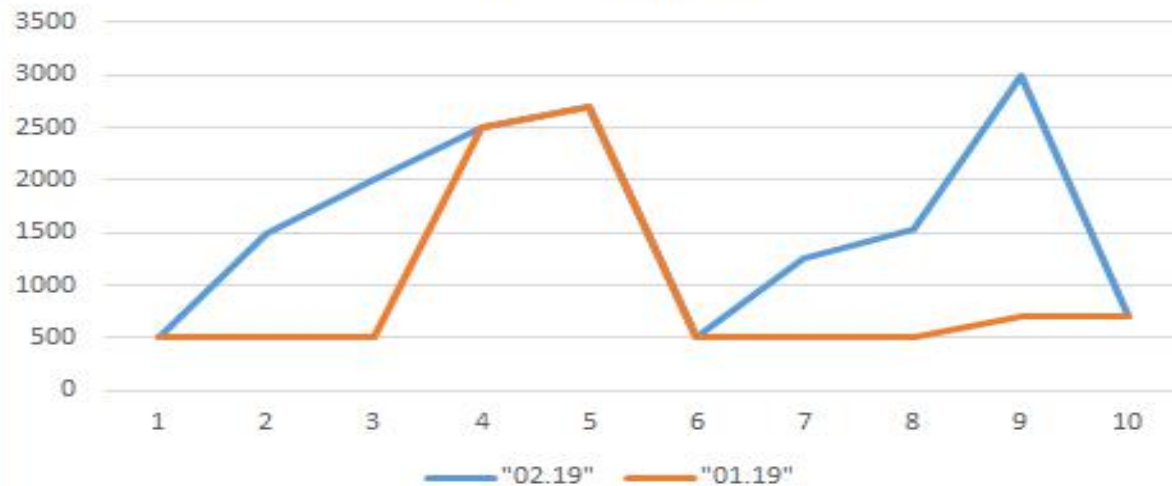
DTCs

- P0103

Report DTCs

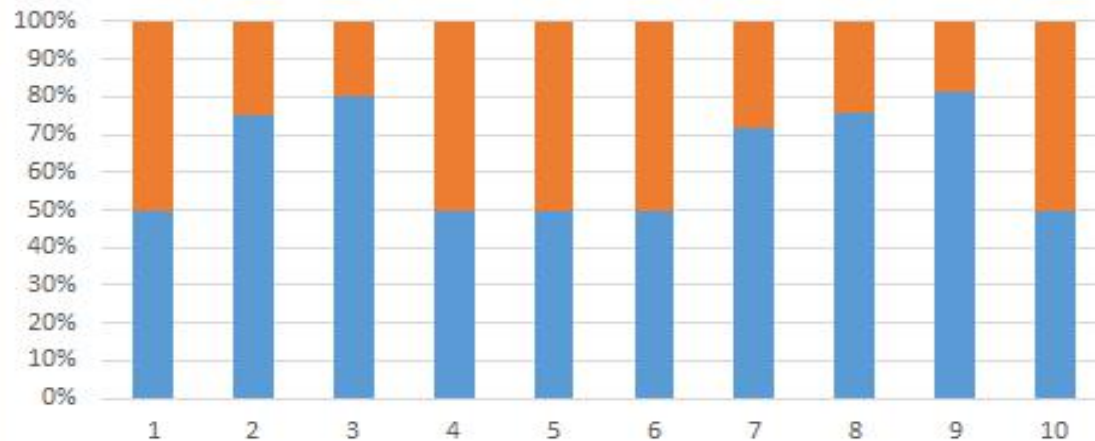
## Analysis data

Earned money



## Analysis data

Norm for delivering



Recourse  
allocation  
results

# Output of the results of the simulator

## OUTPUT DATA

ALL METRICS

ENGINE RPM

THROTTLE POSITION

ENGINE TEMP

MASS AIRFLOW

VEHICLE SPEED

| Number | EngineRPM |
|--------|-----------|
| 1      | 1500      |
| 2      | 1525      |
| 3      | 1650      |
| 4      | 1475      |
| 5      | 1489      |
| 6      | 1513      |
| 7      | 1457      |
| 8      | 1567      |
| 9      | 1597      |
| 10     | 1558      |

## OUTPUT DATA

ALL METRICS

ENGINE RPM

THROTTLE POSITION

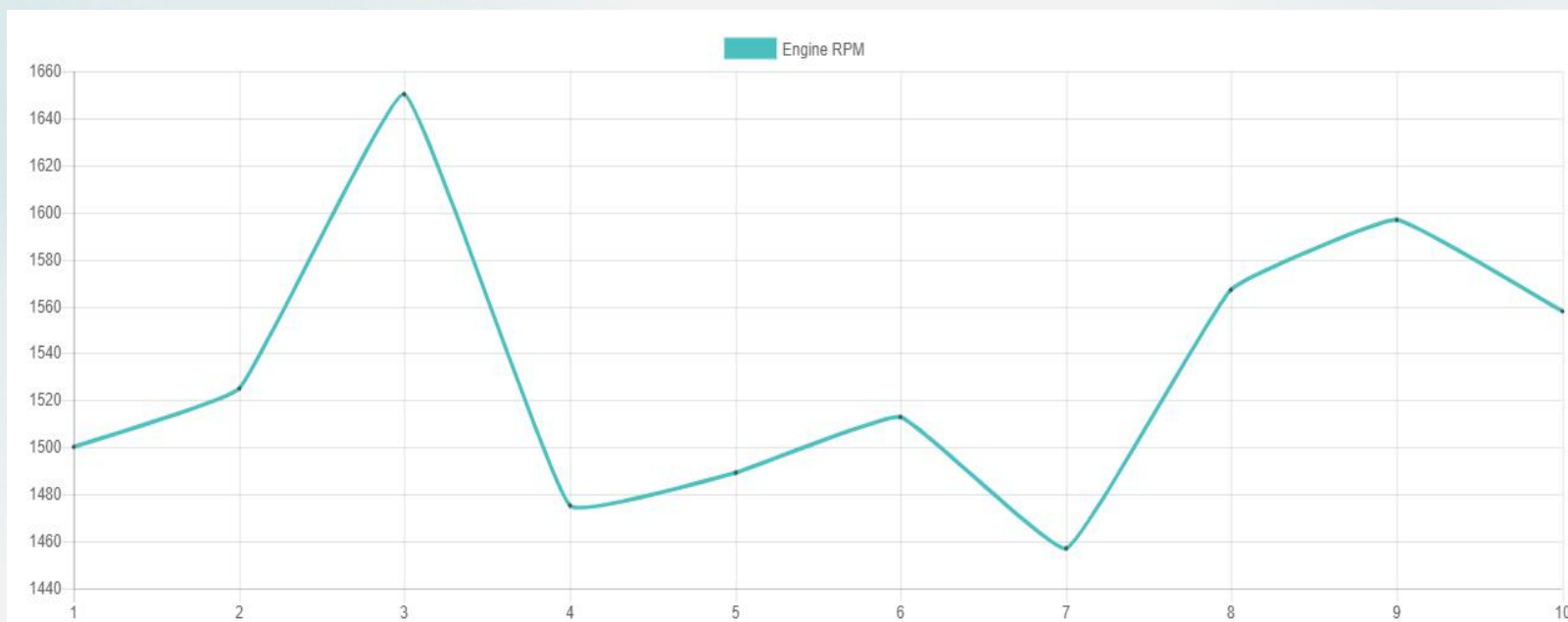
ENGINE TEMP

MASS AIRFLOW

VEHICLE SPEED

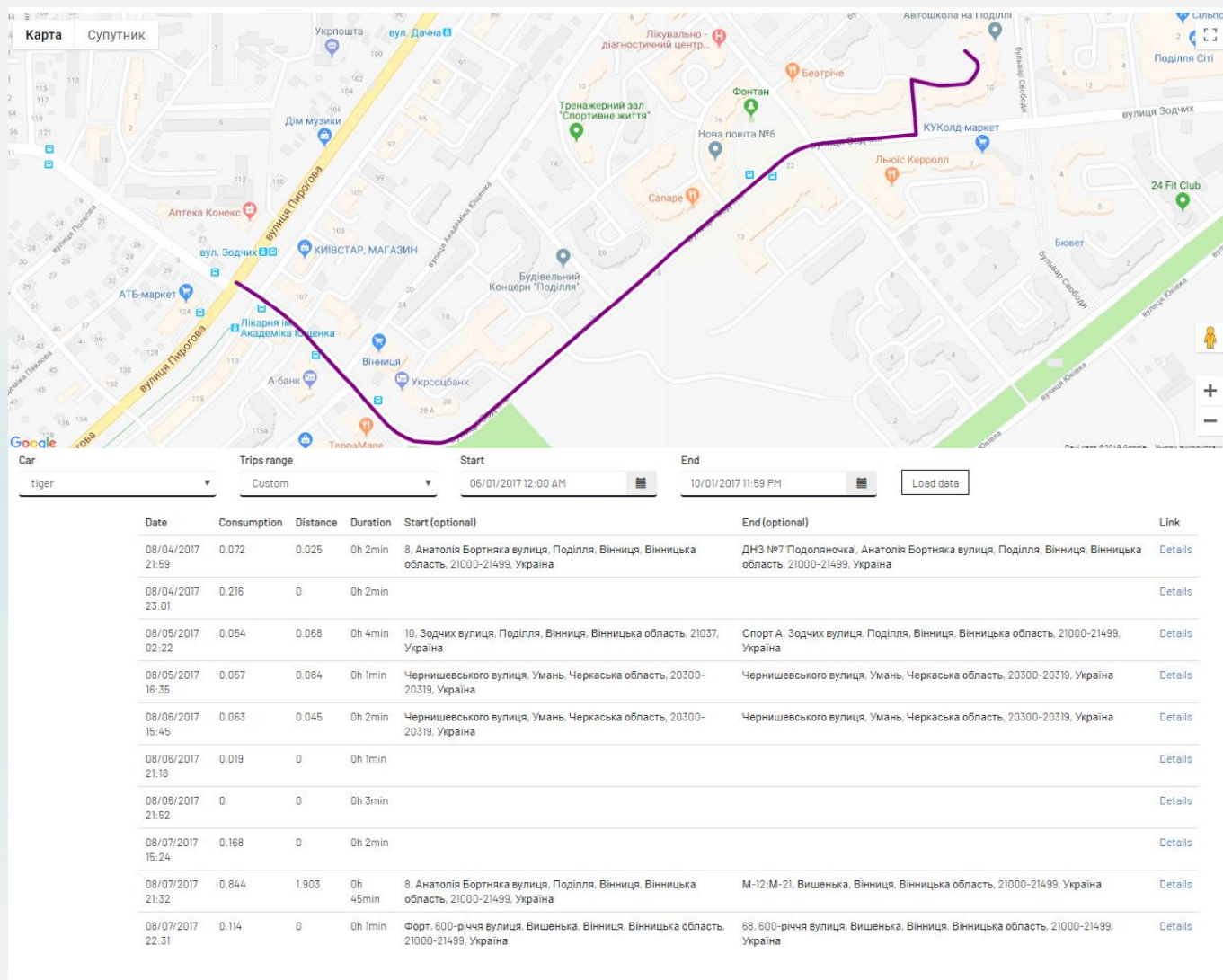
| EngineRPM | VehicleSpeed | EngineTemp | MassAirflow | ThrottlePosition |
|-----------|--------------|------------|-------------|------------------|
| 60        | 1500         | 65         | 14,7        | 4,1              |
| 65        | 1525         | 67         | 15          | 4,5              |
| 70        | 1650         | 68         | 15,2        | 4,8              |
| 55        | 1475         | 60         | 14,2        | 3,8              |
| 59        | 1489         | 63         | 14,8        | 4                |
| 62        | 1513         | 63         | 14,9        | 4,1              |
| 51        | 1457         | 56         | 14,1        | 3,4              |
| 68        | 1567         | 66         | 15,1        | 5,3              |
| 71        | 1597         | 69         | 15,6        | 5,7              |
| 63        | 1558         | 68         | 14,8        | 4,6              |

DIAGRAM

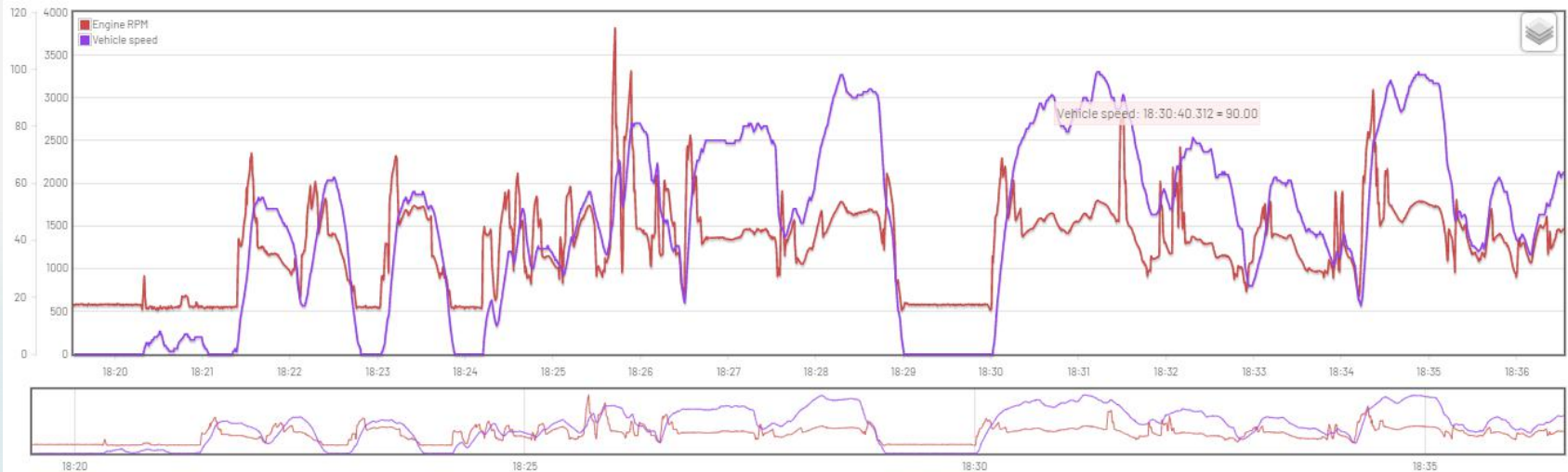




# Perspectives of subsystem of vehicle state check up development



# Perspectives of subsystem of vehicle state check up development



- Long term fuel trim-Bank 1
  - Long term fuel trim-Bank 2
  - Engine RPM
  - Intake air temperature
  - Vehicle speed
  - MAF air flow rate
  - Ambient air temperature
  - Throttle position
  - Engine coolant temperature
  - Distance traveled since codes cleared
- Apply Cancel Zoom