

## MOBILE APPLICATION FOR VEHICLE OPERATION MANAGEMENT

*Solimuhammadov Jamshidbek Sohijjon o'g'li*

*Andijan machine-building institute – bachelor student, Uzbekistan*

[solimuhammadovjamshidbek@gmail.com](mailto:solimuhammadovjamshidbek@gmail.com)

*Tel: +998911137125*

*Xoshimov O'tkirjon Hakimjon o'g'li*

*Andijan machine-building institute – bachelor student, Uzbekistan*

[hoshimovotkirbek133@gmail.com](mailto:hoshimovotkirbek133@gmail.com)

*Tel: +998889571904*

*Tursunpulatova Durdona Azamat qizi*

[tursunpulatovadurdona14@gmail.com](mailto:tursunpulatovadurdona14@gmail.com)

*Andijan machine-building institute – bachelor student, Uzbekistan*

*Tel: +9989872214*

**Abstract** :The article examines the problems of modern economics of transport. Every year the number of owners of a personal vehicle is constantly growing. However, a number of users prefer not to have their own vehicle due to the high cost of maintaining it, but to use taxi services. Owners of fleets and production fleets of vehicles also face the problem of determining the costs of their operation. Thus, the need to track up-to-date information, cost analytics and ways to reduce them significantly affect the economic attractiveness of driving

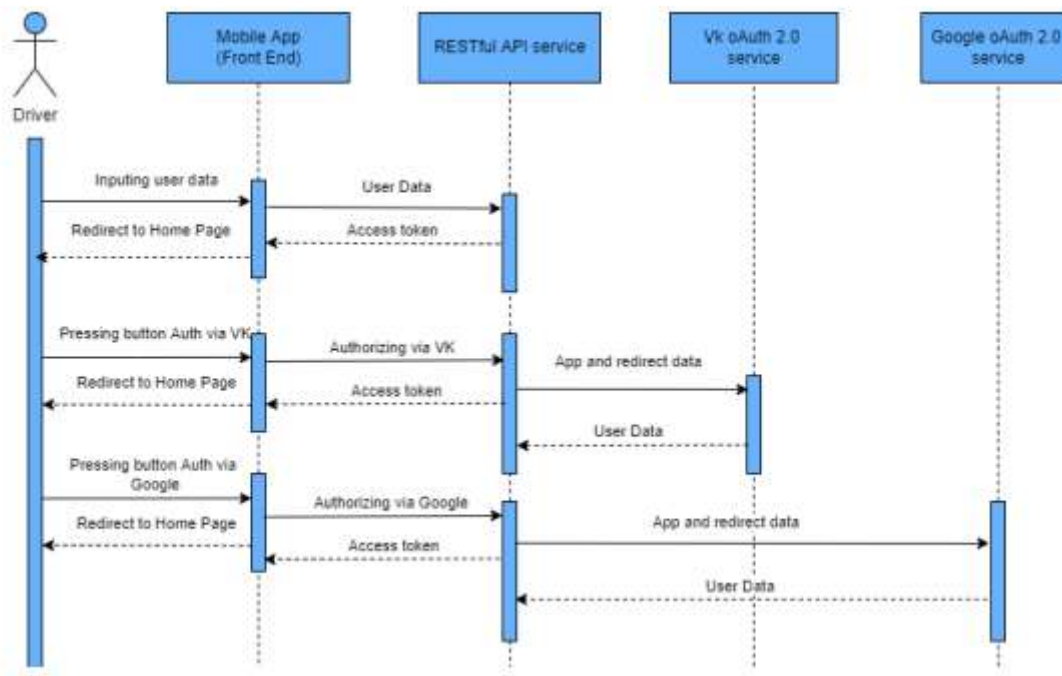
**Keywords:** Economics of transport; vehicle operation management; mobile application.

**Introduction** The modern economics of transport is associated with a large number of issues, among which one might single out the use of information systems in transport, which allow managing transport and logistics systems using methods of forecasting and planning cargo flows, solving issues of resource allocation efficiency, on the basis of which it becomes possible to build and analyze models of the architecture of the traffic control system. The modern transport information technology market includes a wide range of solutions, including: the intelligent transport systems, smart cart, next-gen GPS devices, mobile applications, urban transport vehicles. A special place is occupied by the relevance of managing the operating costs of the vehicle. In matters of management and decision support, intelligent systems have proven themselves well, allowing them to support vehicle management, as well as infrastructure management, including entire policies and the overall management system; Internet of things technologies that make it possible to control the flow of vehicle traffic and recognize license plates. Vehicle owners are forced to spend more

resources on vehicle maintenance every year compared to the previous year. According to an analysis of thematic news services for 2021, on average, drivers spend about 100 thousand per year on car maintenance, averaging fuel prices (47.5 r/l), averaging consumption of 8 liters. per 100 km and mileage averaging (15 thousand km). Taking into account the average monthly salary in the territory of the Russian Federation, the cost of a car per year averages 16%. Mobile technologies have proven themselves well as a mechanism capable of managing a large amount of semistructured information with a user-friendly interface. As studies show, the convenience and speed of a transaction affect the attractiveness of mobile applications, which determines the ease of understanding, intuitive operation and reliability. Intelligent mobile technologies with the functions of context-sensitive recommendation systems are also worth attention. In addition, mobile technologies are used to control the quality of the urban environment, road networks and transport services for the population, and the reasons for the popularity of mobile technologies in the field of transport attract the attention of researchers that might be interested in studying the factors that influence the intention of drivers to use mobile navigation applications. Given the significant popularity of mobile devices among car enthusiasts, the development of a mobile application that can aggregate information on the costs of operating a vehicle, take notes, view up-to-date gas stations within the radius of the user's location, and also predict consumption for the coming month is of the greatest relevance. In connection with the problem described above, the application will allow the user to structure information about their vehicle expenses and will also show the highest expenses by financial criterion

**Methods and Materials:** The basic functionality of the application is:

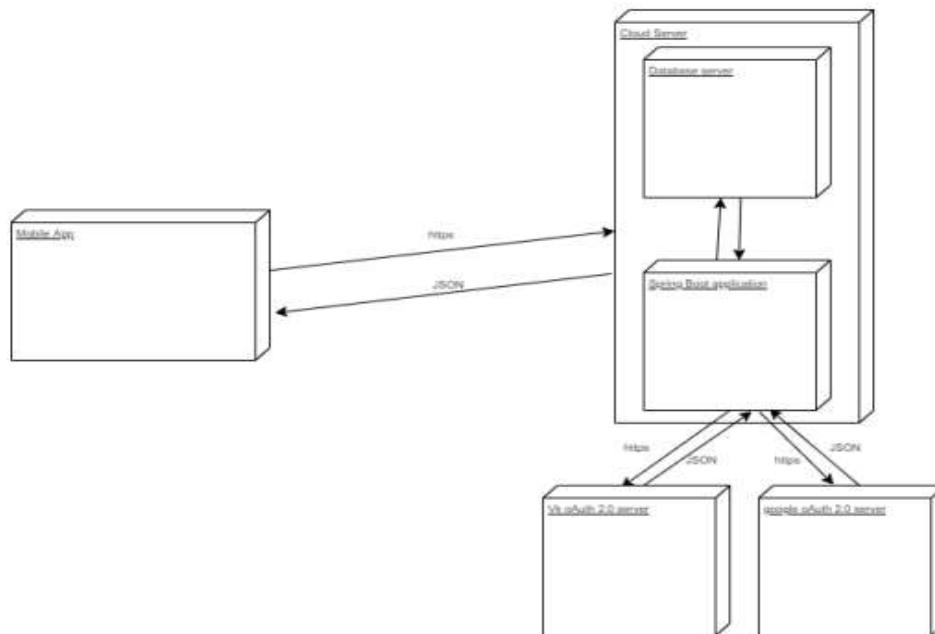
- viewing the nearest places on the map (gas stations, car washes, vehicle maintenance services);
- adding a seat if the system did not provide it;
- cost management;
- personal data management;
- management of temporary notes;
- vehicle control. At the stage of logical design of the mobile application, a software architecture was defined that implements the stated functional requirements. The result of software architecture design is shown in Figure 1.



The following functional subsystems are supposed to be distinguished in the system:

- data storage subsystem;
- data presentation subsystem on the client;
- subsystem for executing user requests.

To implement the application, a three-tier client-server architecture was chosen, since it is crucial to access a third-party database, and the MVC pattern. The model of the physical architecture of the mobile application is shown in Figure 2. As the comparison shows, the most popular programming languages are Java and Python, but Python loses significantly in performance. Since Spring is a very flexible and rich framework that provides high performance, decomposition and improves the readability of code written in the Java programming language, this programming language was chosen for the back end



## Conclusions

Thus, the developed mobile tool allows in a format convenient for the driver to control the operation of the vehicle. Based on the analysis of statistical data, the driver quickly receives analytical information on the costs of operating the vehicle, has the ability to automatically determine the list of current gas stations within the radius of the user's location, and also predict the consumption for future periods of time.

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