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## REZUMAT

Teza de master prezentată în acest raport de către student-ul Bantus Vladislav urmărește îmbunătățirea sistemelor de acces la parcări prin folosirea ALPR. Acest obiectiv a reieșit din analiza sistemelor de acces al parcarilor existente în Republica Moldova. În urma cercetării au fost identificate mai multe măsuri care ar putea îmbunătăți calitatea serviciilor oferite.

După cum a fost menționat mai sus, sistemele de acces la parcări din Republica Moldova pot fi îmbunătățite prin utilizarea ALPR, care va aduce următoarele beneficii:

- automatizarea procesului de lucru al unei parcări cu acces limitat;
- permiterea accesului în parcare numai a mașinilor autorizate;
- reducerea factorului uman în procesul de management al parcarilor;
- creșterea calitatii serviciilor oferite.

Structura acestei lucrări este organizată pe capitole. Mai jos acestea vor fi enumerate împreună cu o scurtă descriere:

- capitolul 1 - descrie sistemele de acces existente și avantajele utilizării ALPR;
- capitolul 2 - descrie cerințele de sistem și software;
- capitolul 3 - descrie sistemul folosind diagrame UML;
- capitolul 4 - descrie tehnologiile utilizate pentru dezvoltarea sistemului;
- capitolul 5 - descrie cerințele funcționale principale și caracteristicile sistemul

## **ABSTRACT**

The master's thesis presented in this report by the student Bantus Vladislav aims to improve parking access systems by applying ALPR. This goal emerged from the analysis of existing parking access systems in the Republic of Moldova. After the research, several measures were identified which could increase the quality of the provided services.

As written above, parking access systems in Republic of Moldova can be improved by using ALPR, that will bring the following benefits:

- automation of the working process of a parking lot with limited access;
- allowing access to the parking lot of authorized cars only;
- reducing the human factor in the parking management process;
- increasing the quality of services provided.

The structure of this work is organized by chapters. Below they will be listed along with a short description:

- chapter 1 - describes existing access systems and advantages of using ALPR;
- chapter 2 - describes system and software requirements;
- chapter 3 - describes system using UML diagrams;
- chapter 4 – describes technology stack used to develop the system;
- chapter 5 – describes main functional requirements and system features.

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## DICTIONARY

ALPR - Automated License Plate Recognition

API - Application Programming Interface

JSON - JavaScript Object Notation

UML - Unified Modelling Language

WORA - Write Once Run Anywhere

JVM – Java Virtual Machine

ALPR - Automated License Plate Recognition

IOC - Inversion of Control

DI - Dependency Injection

JDBC - Java Database Connectivity

JPA - Java Persistence API

## INTRODUCTION

Today, the world is becoming more and more automated and digitized. As a result, people's living standards, expectations and demands have become higher. Travel requirements have led to an increase in the use of personal transport like cars.

According to statistics, there are about 1.446 billion vehicles on Earth in 2021, this is a very big number considering that we are 7.8 billion people [1].

Analyzing what happens in Republic of Moldova, can be observed in Annex A that report of vehicles per population is not better.

Taking in consideration that Moldova's population is 3.5 million, of which 1 million are abroad, there are approximately 1.1 million cars for 2.5 million people and this number is increasing. So why it happens, why people need so many cars?

- in most cases people use their cars for moving purpose, in order to get from home to work, to shopping center, etc...;
- some people are driving cars as part of their work;
- there are also cases when having a car is not a necessity, but just a privilege for comfort.

There are many reasons why the number of cars increase, but it leads to certain problems, and one of them is the large number of transport units which leads to congestion on the streets.

This problem is being solved with creation of parking areas, where drivers can park their cars. So based on that, a lot of companies, business centers require to have parking areas for their employees or clients. Thereby it solves the problem with congestion on the streets, but here we face another problem, the security one. Depending on company business, there can be or not some restriction rules regarding access of employees or customers to restricted area. That security problem can be solved with restricting access of vehicles in parking space, and one of the most popular implementation of this solution is access barrier/gate.

Access barrier/gate is a clear physical deterrent, marking out where company's property begins and ends, and leaving possible intruders in no doubt that they should not be moving beyond them. Installing a good set of gates or barriers is one of the easiest and most effective methods which can be used in order to increase area security, that's why they become so popular nowadays.

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