Vehicle Management System

A Project Review-3 Document

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INDEX

1.Introduction

1.1 Theoretical Background

Vehicle management system is to manage the parking of different type of vehicles at a predefined field. All vehicles should be allowed to enter in the parking field if there is a vacant parking spot. The project aims at helping in differentiating the different vehicle. It also aims to reduce the manual effort required to check if parking is available or not. The project will help in the parking of cars and trucks using sensors and see that the process of entering and exiting of vehicles go smoothly.

1.2 Motivation

The motivation of the project was that users will interact with the system directly without the use of a third party, the third party in this project was the workers who assist in managing a parking plot. We found that many times workers don't utilise a parking plot properly or miss an empty parking space. With the help of sensors and a proper management system we can utilise any parking plot to its maximum. This can also help in easing traffic in big cities where parking plots are not easy to find.

1.3 Aim of the proposed Work

The aim of our project "Vehicle management system" is to manage the parking of different type of vehicles at a predefined field. All vehicles should be allowed to enter in the parking field if there is a vacant parking spot. The project aims at helping in differentiating the different vehicle. It also aims to reduce the manual effort required to check if parking is available or not. The project will help in the parking of cars and trucks using sensors and see that the process of entering and exiting of vehicles go smoothly.

1.4 Objective(s) of the proposed work

- Maximum use of parking plot
- Entry and exit of vehicle with the help of ultrasonic sensors
- Vehicle limitation
- Differentiating between different types of vehicle using ultrasonic sensor

2. Literature Survey

2.1 Survey of the Existing Models/Work

The survey of parking management in shopping malls was taken in consideration for our project. We studied how malls use digital boards to showcase the number of parking space available. We also studied how different Parking floors handle traffic. In developed countries like Dubai where parking is a huge business, we looked in how many places track the vehicles.

For sensors, we looked in the working of Arduino board, and how it detects any object. We also surveyed what materials that sensors can detect and how the ultrasonic waves determine how far the object is placed.

2.2 Summary/Gaps identified in the Survey

In our survey, we conclude that our project with the help of ultrasonics sensors can detect any type of vehicle. With this information, we can code for the parking of vehicles with a known and defined parking space.

3. Overview of the Proposed System

3.1 Introduction and Related Concepts

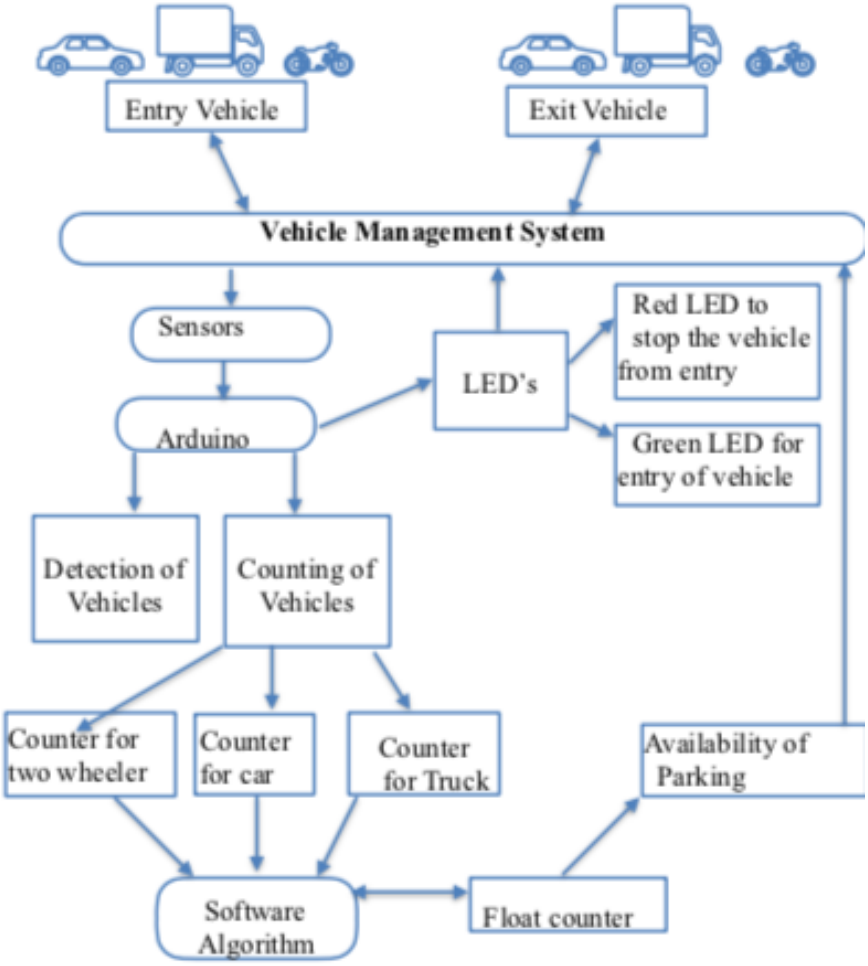
The vehicle management system detects the vehicle moments through ultrasonic sensors who feed the information to the software. The software is configured to see that all parking spots are utilised to the maximum. Each parking spot and sensors have to been carefully planned and known beforehand to the software. The software based on parking availability interacts with vehicle driver through LED lights. The vehicle management systems also helps in differentiating the different type of vehicle through the sensors. The project will use Arduino boards to gather information and feed it to the system. The code will generate with the given information and help in the parking system.

3.2 Framework, Architecture or Module for the Proposed System

The spiral process model is best architectural strategies in the project. Arduino is an open source based prototyping platform used to sense and control physical devices. Thus for our project spiral model is most suitable as we will launch multiple prototypes by increasing the features in it. We are using the process model in our project because our project requires rapid prototyping of the product to make sure that the project and its components are working properly. After generation of every product model and its respective

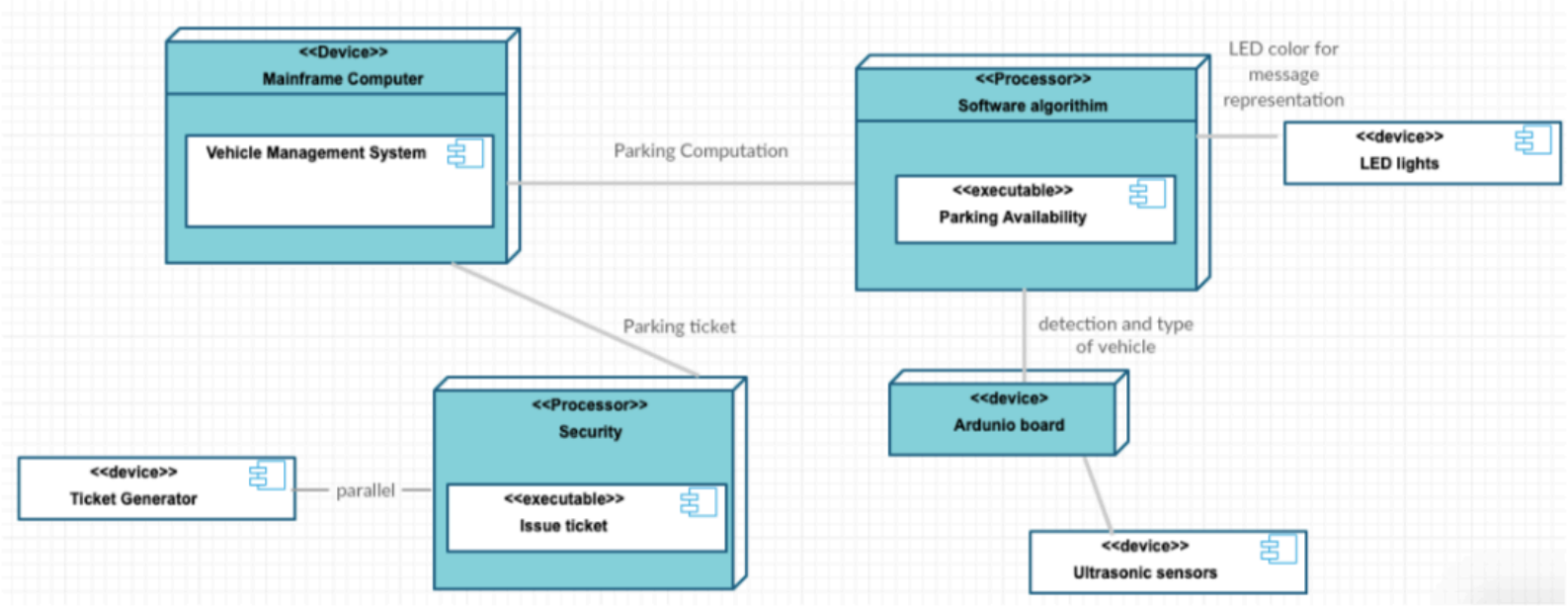
prototype the code is also updated and committed to Github. Spiral model make sure that the working prototype is generated for every version of the product developed. By the use of Github it is easy to fall to the code and design for a previous version thus making the project development more versatile. As and when new prototype will be launched it would be tested and after the testing a new development plan would be developed for new features. New constraints are then defined and circuit diagrams are updated according to the new needs of the development plan. Alternatives for the plan are explored and then the development of the prototype begins.

ARCHITECTURE DESIGN



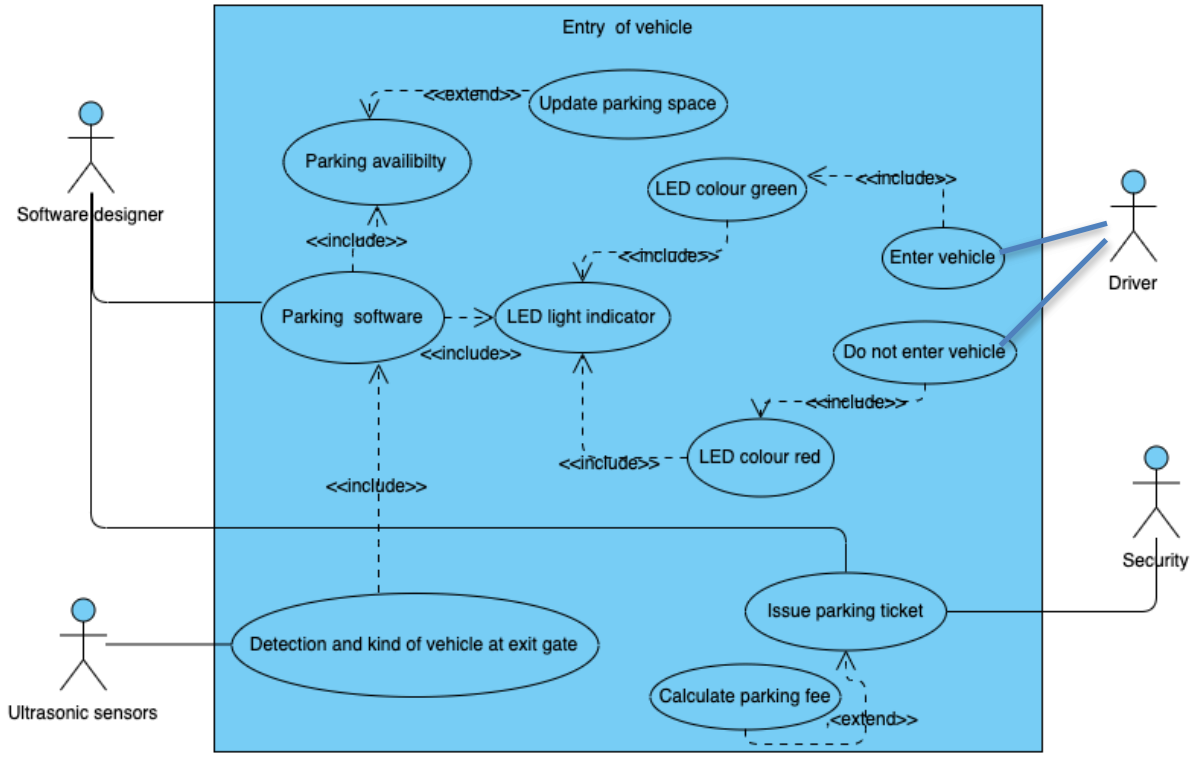
3.3 Proposed System Model (ER Diagram/UML Diagram/Mathematical Modeling)

Deployment Diagram

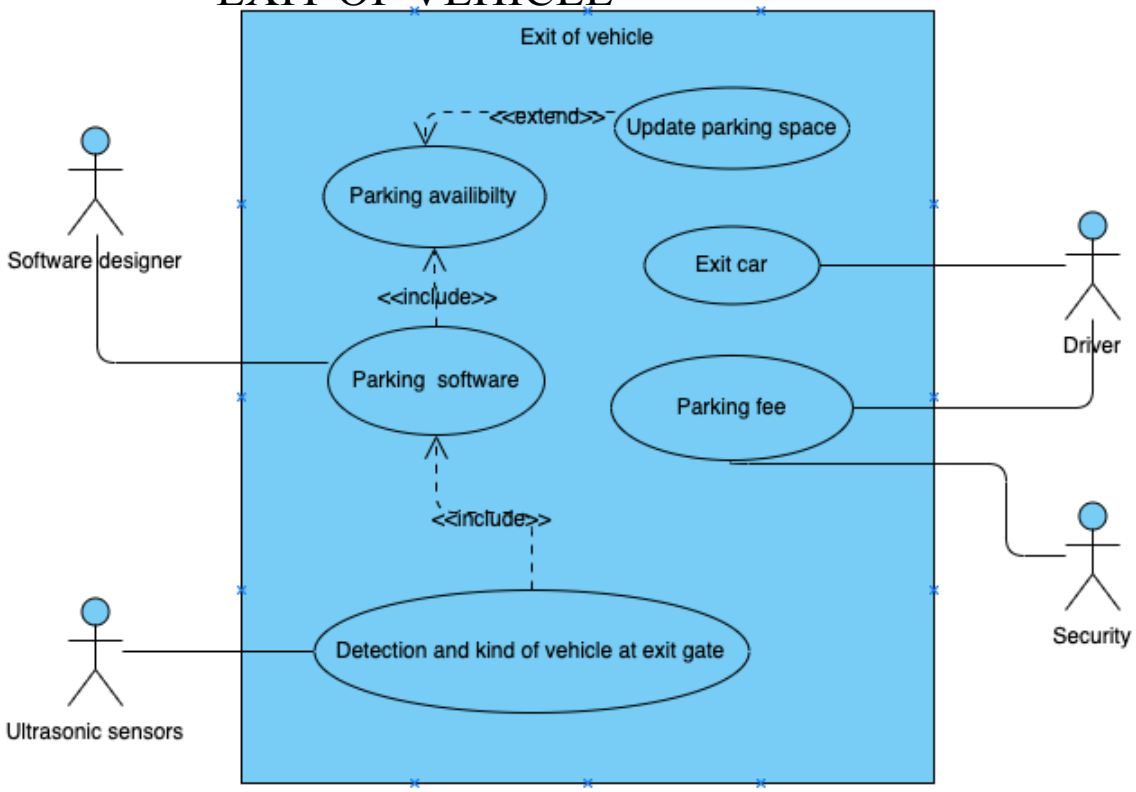


USE CASE

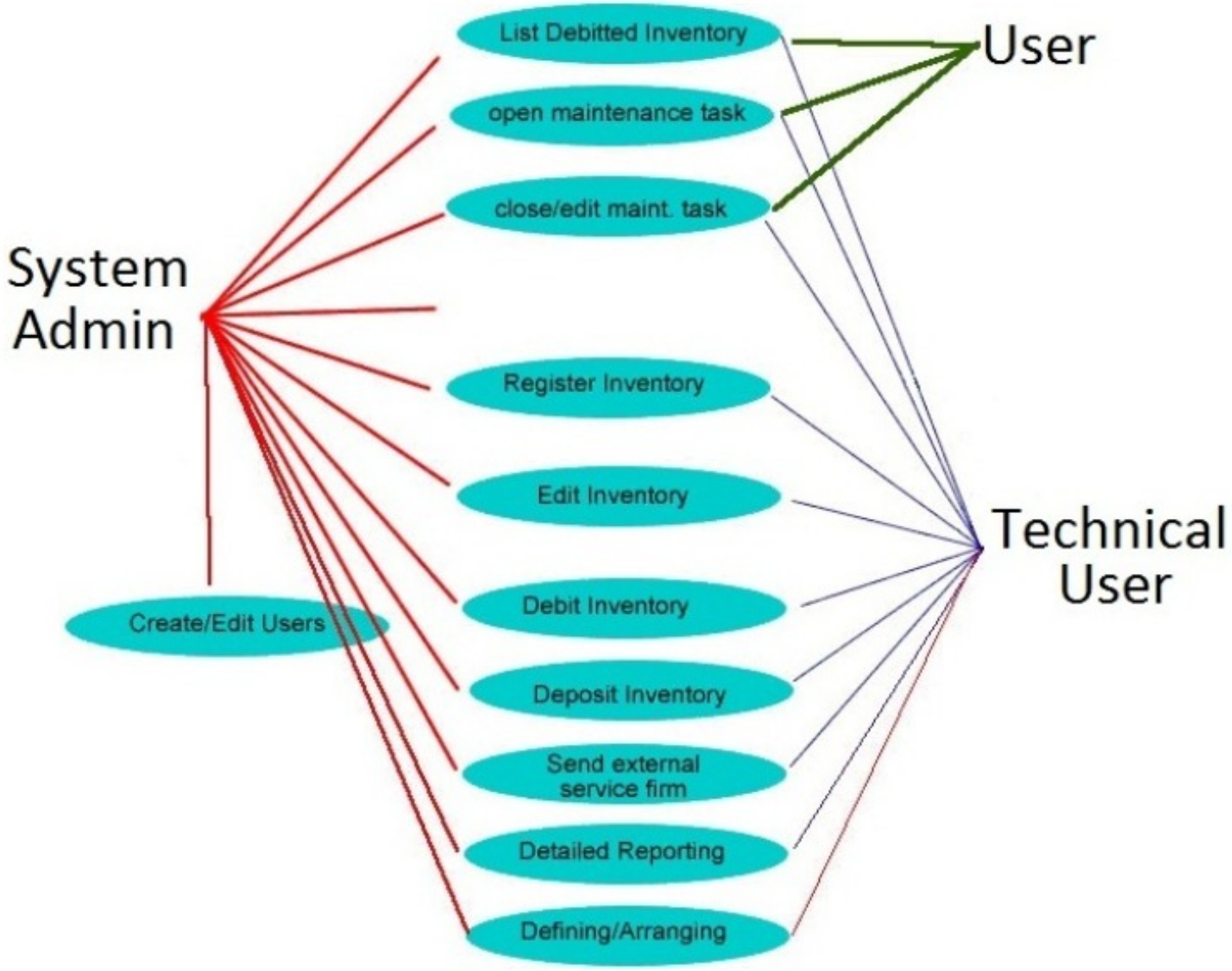
ENTRY OF VEHICLE



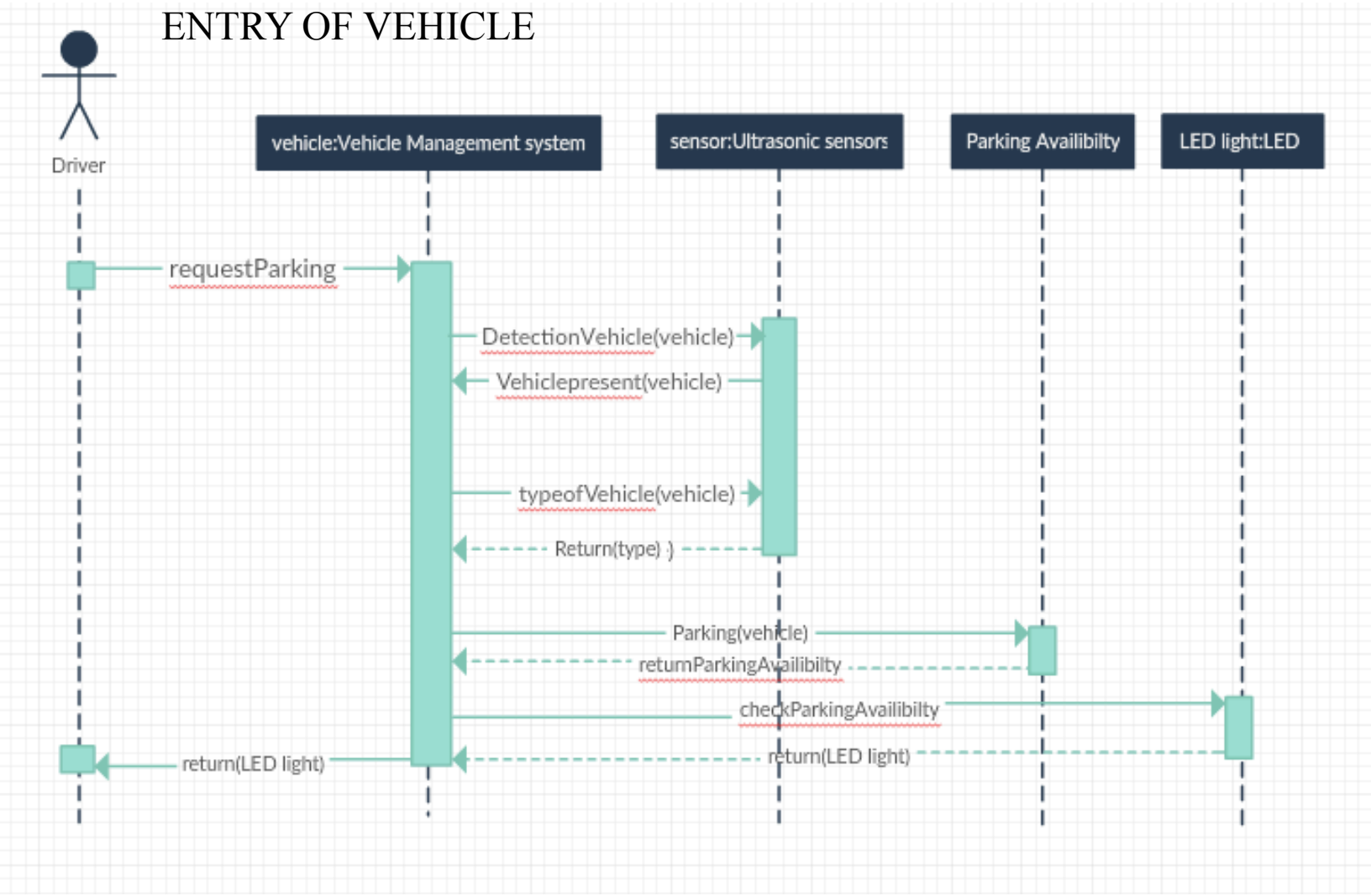
EXIT OF VEHICLE



VEHICLE LIMITATION AND
LIMITATION REMOVED



Sequence diagram



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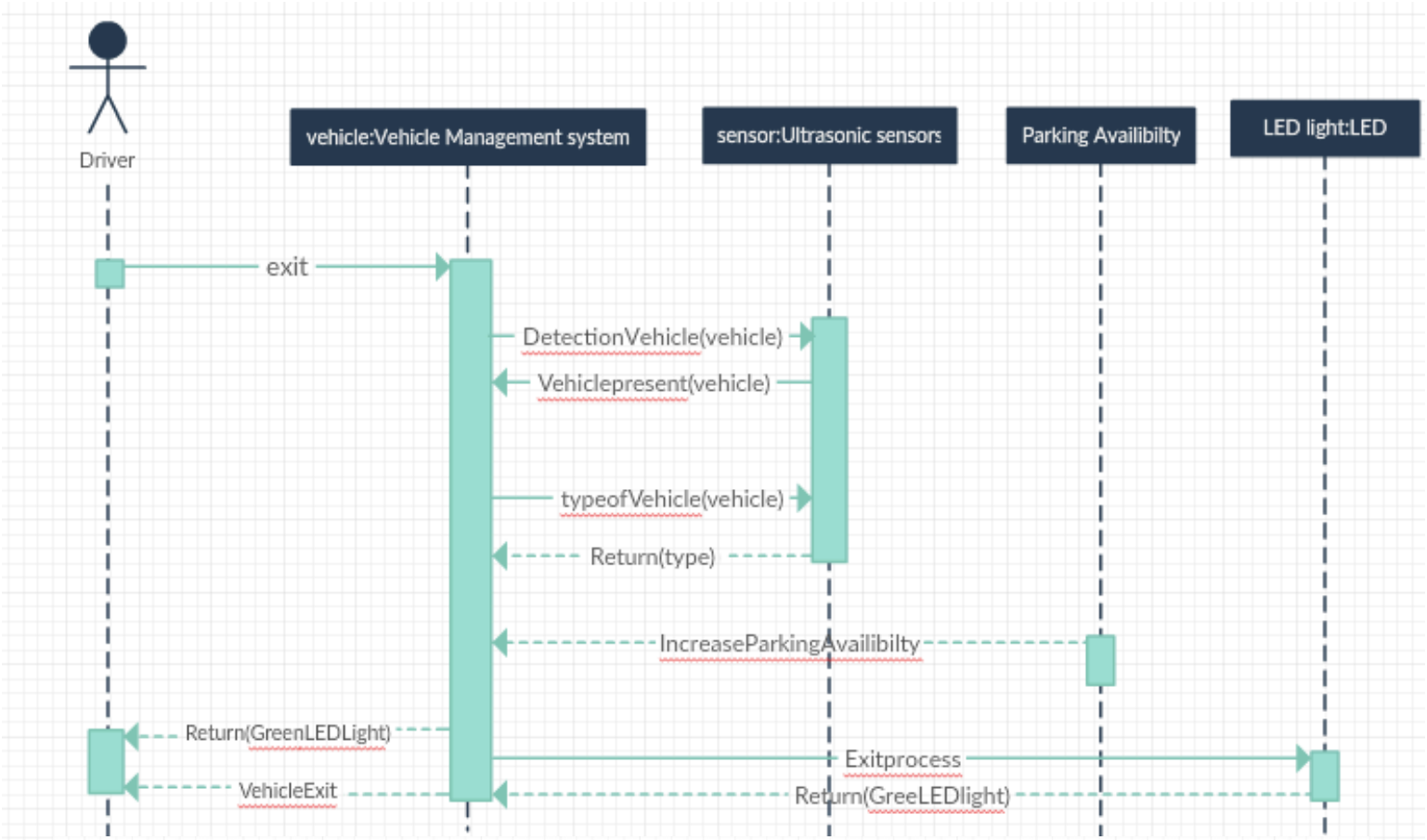
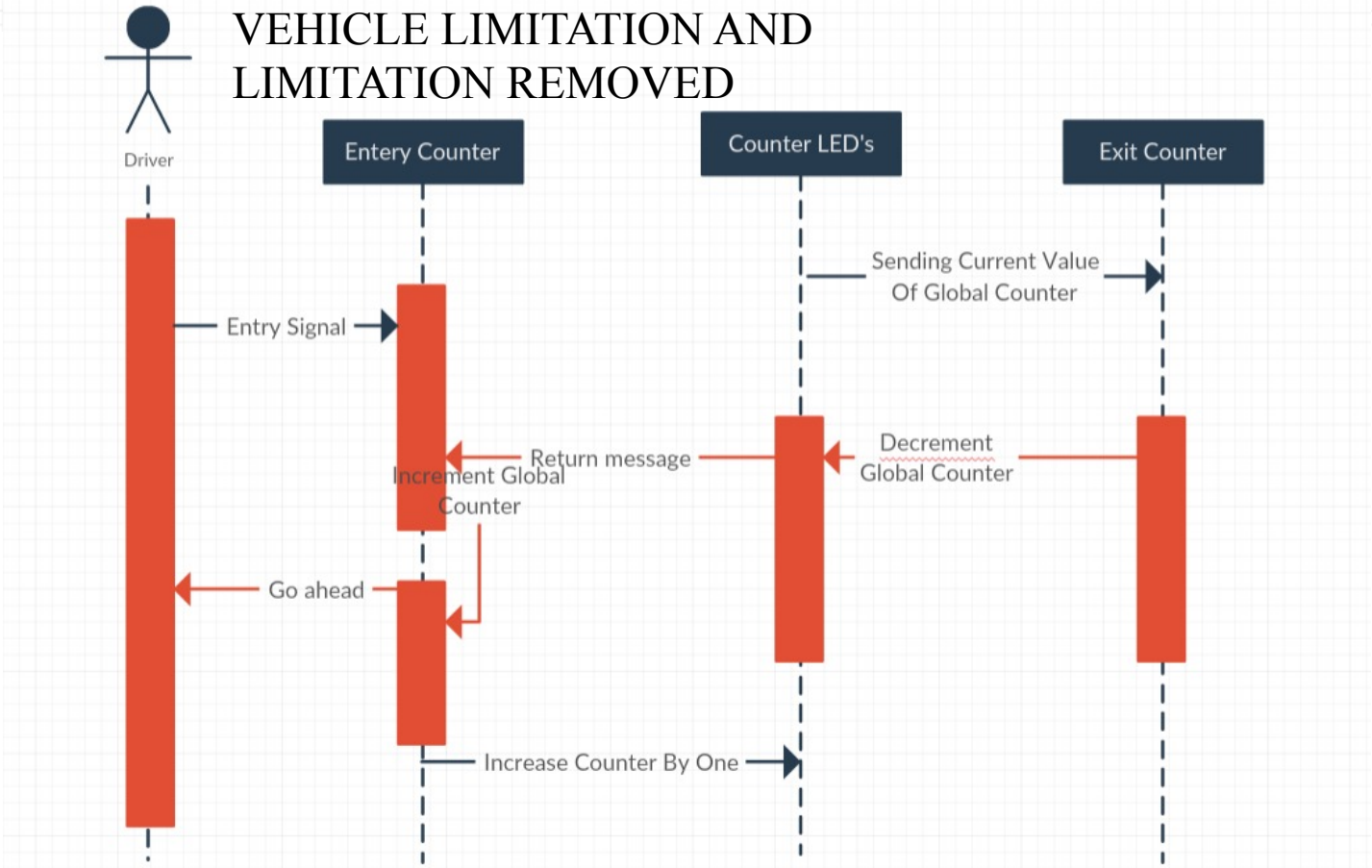
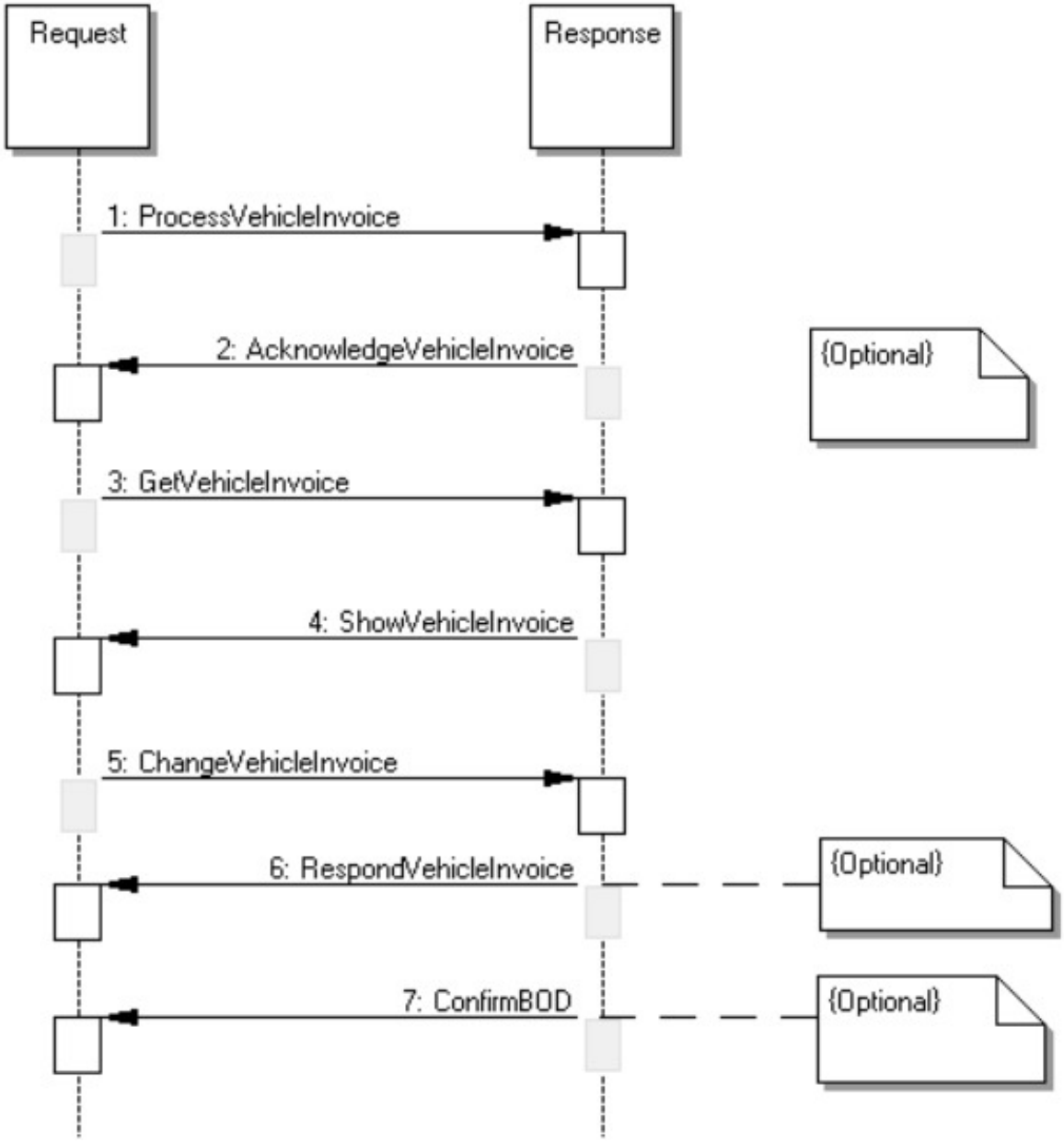


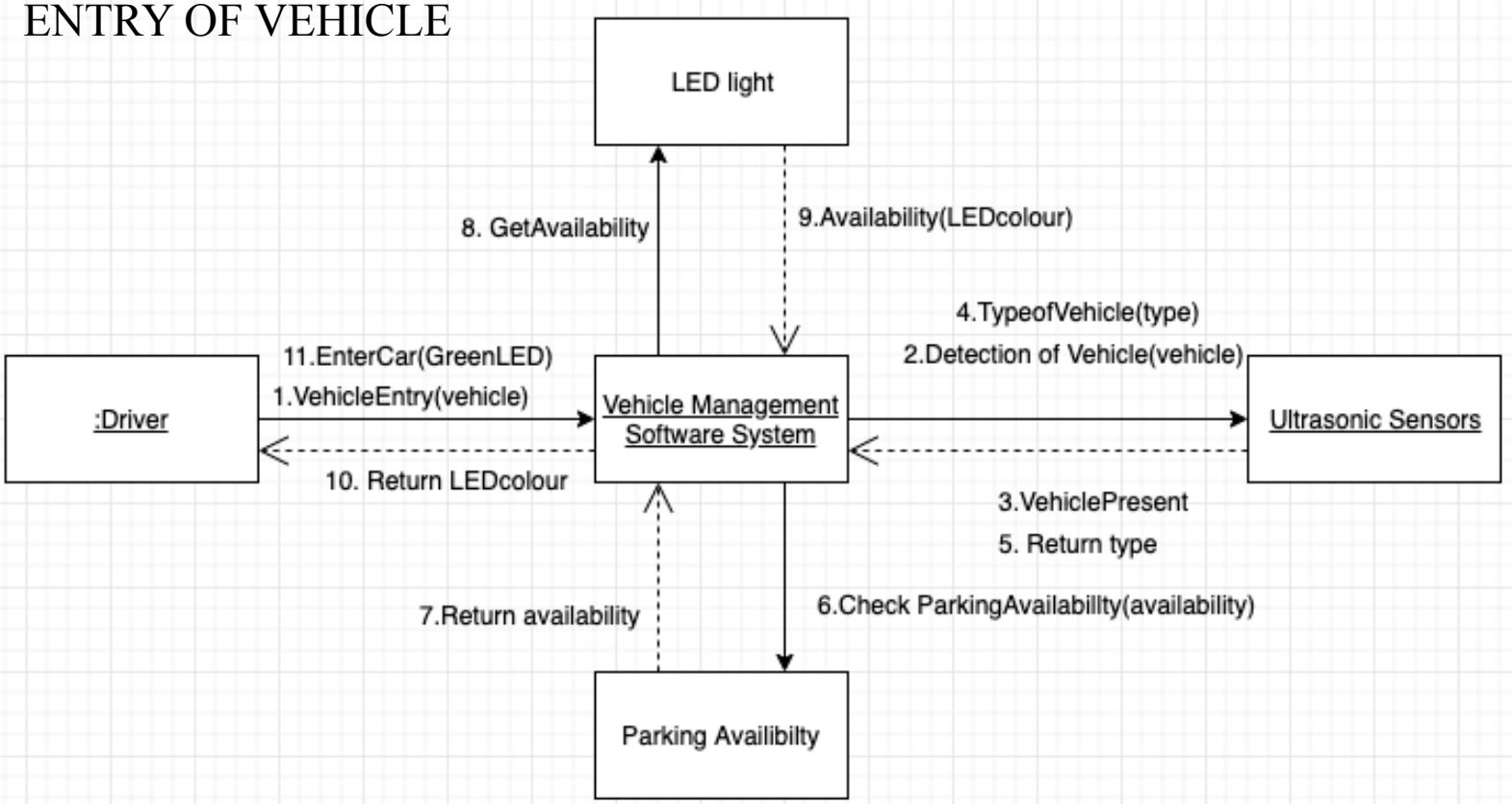
VEHICLE LIMITATION AND LIMITATION REMOVED




Request
Response
1: ProcessVehicleInvoice
2: AcknowledgeVehicleInvoice
{Optional}
3: GetVehicleInvoice
4: ShowVehicleInvoice
5: ChangeVehicleInvoice
6: RespondVehicleInvoice
{Optional}
7: ConfirmBOD
{Optional}

Collaboration diagram

ENTRY OF VEHICLE



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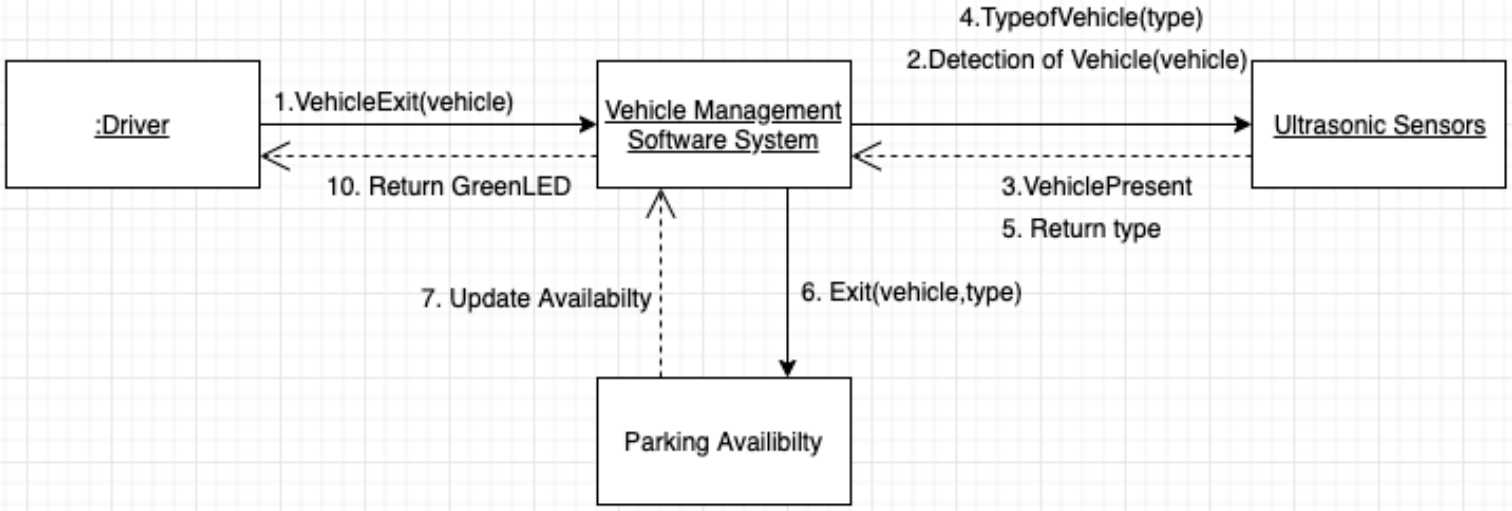
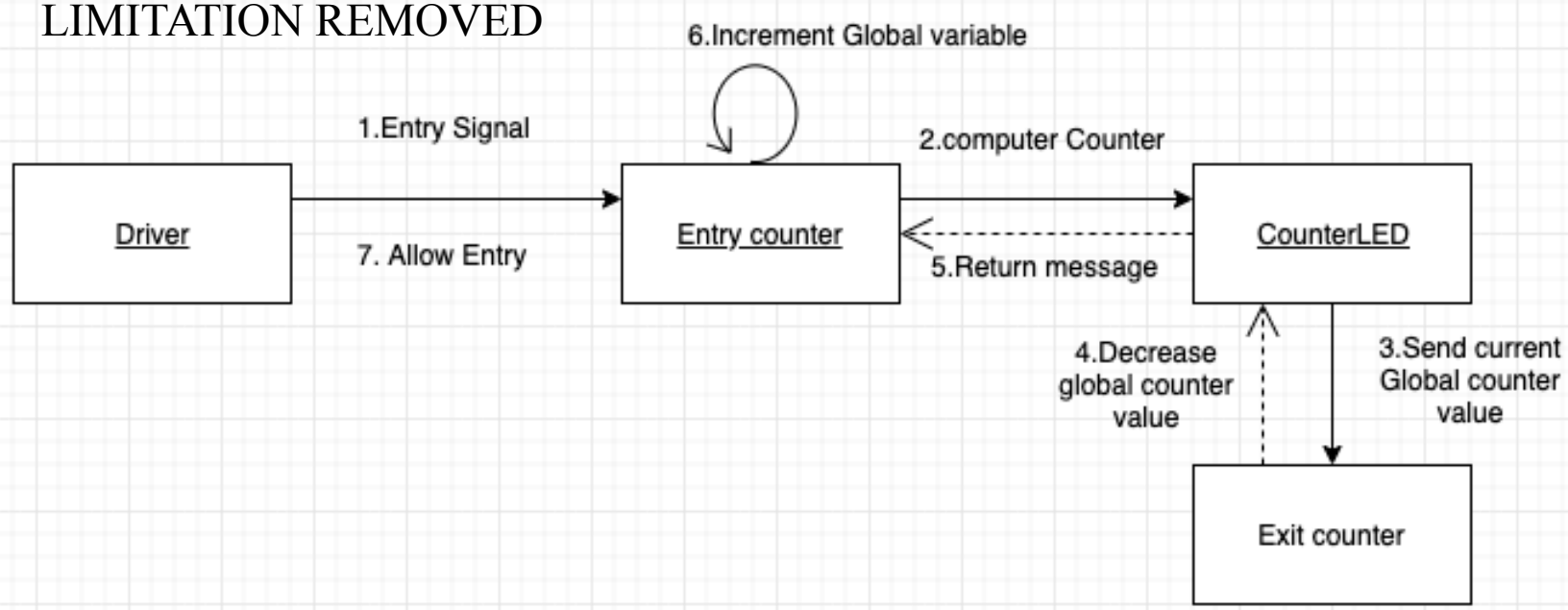
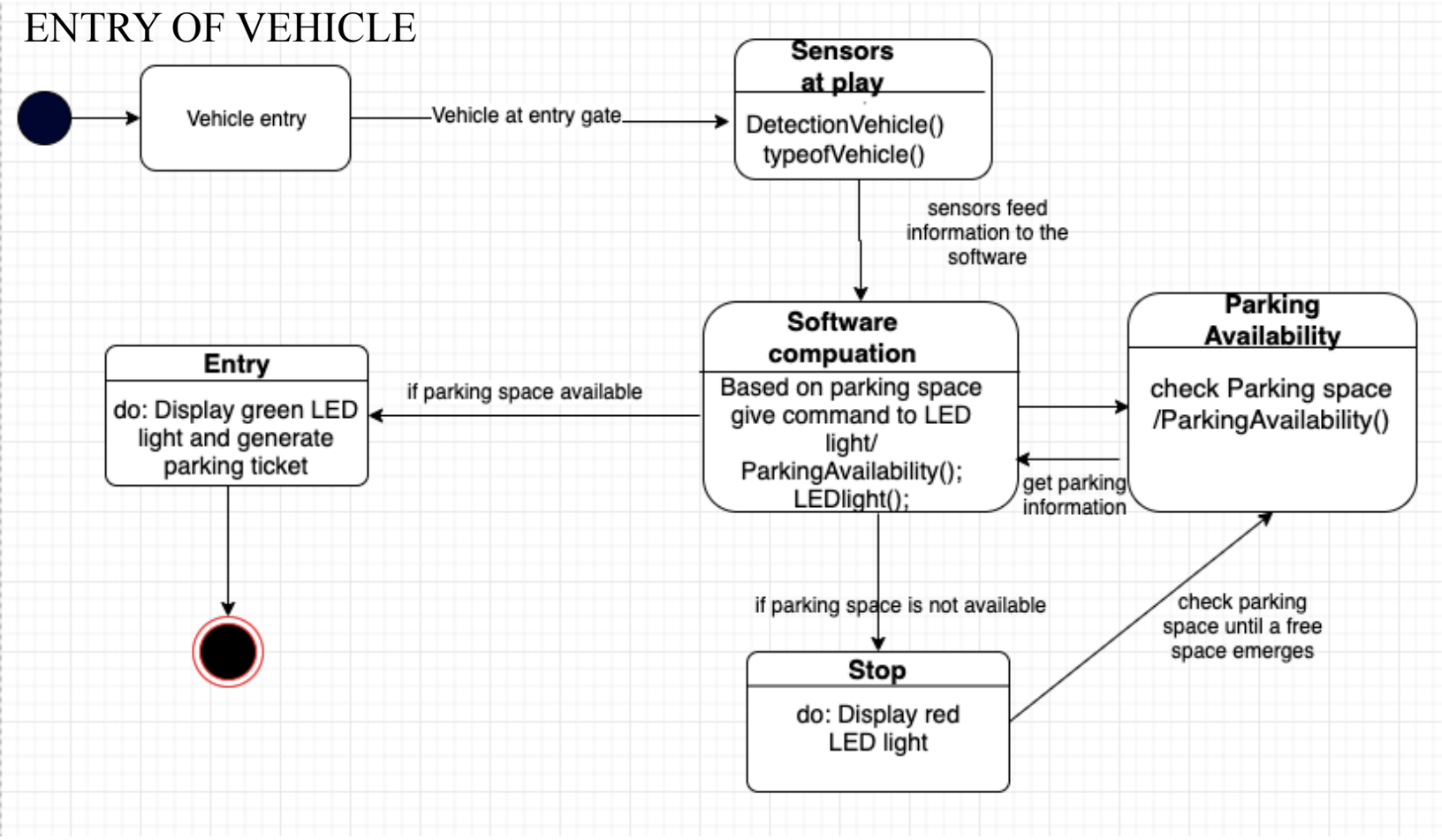
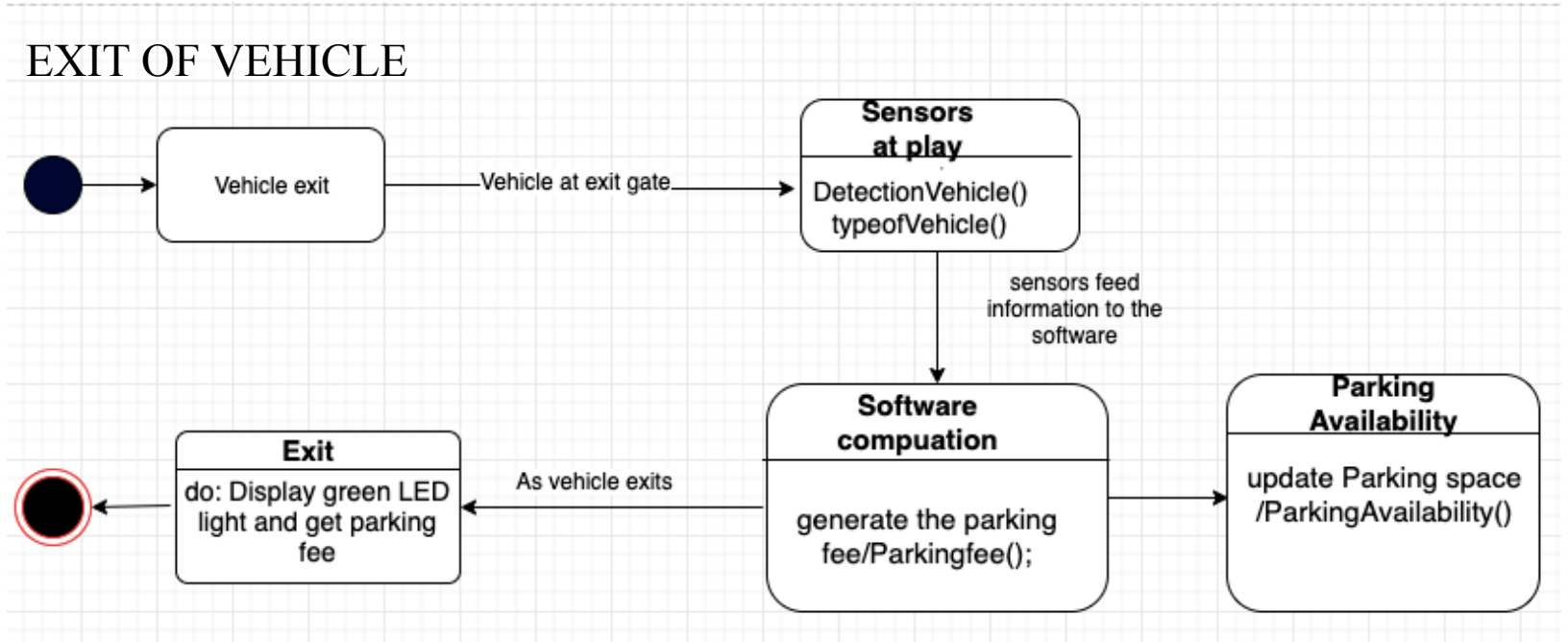


VEHICLE LIMITATION AND LIMITATION REMOVED

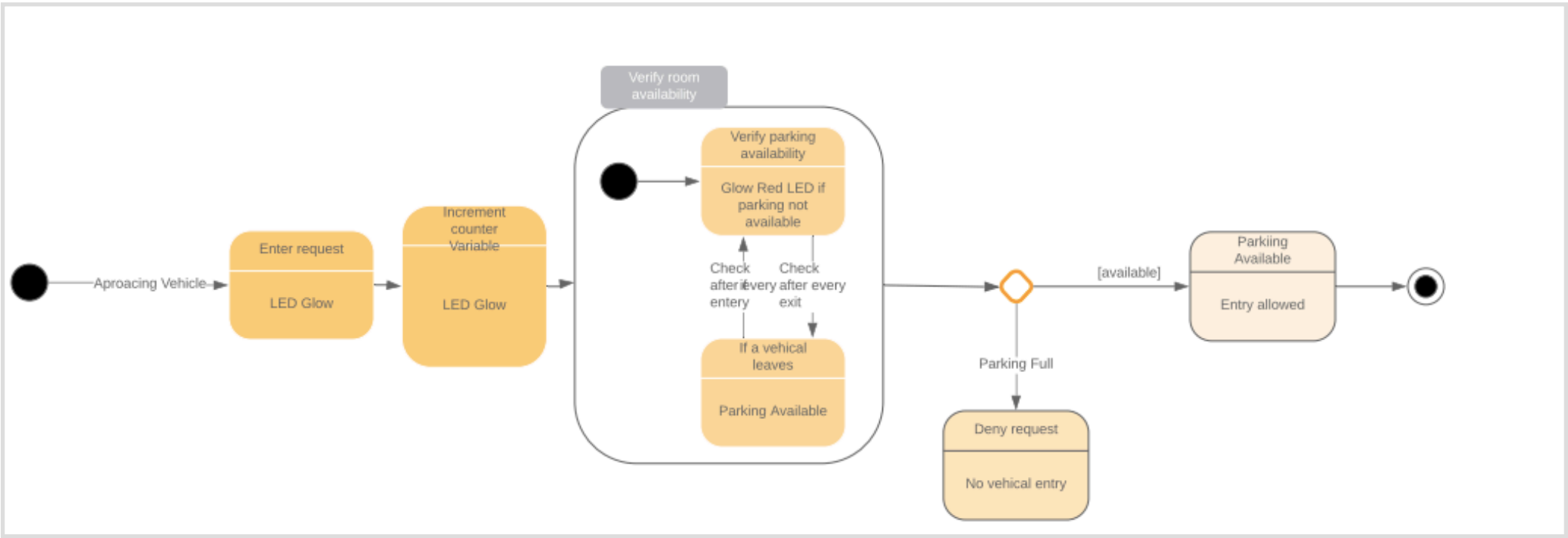


State chart diagram



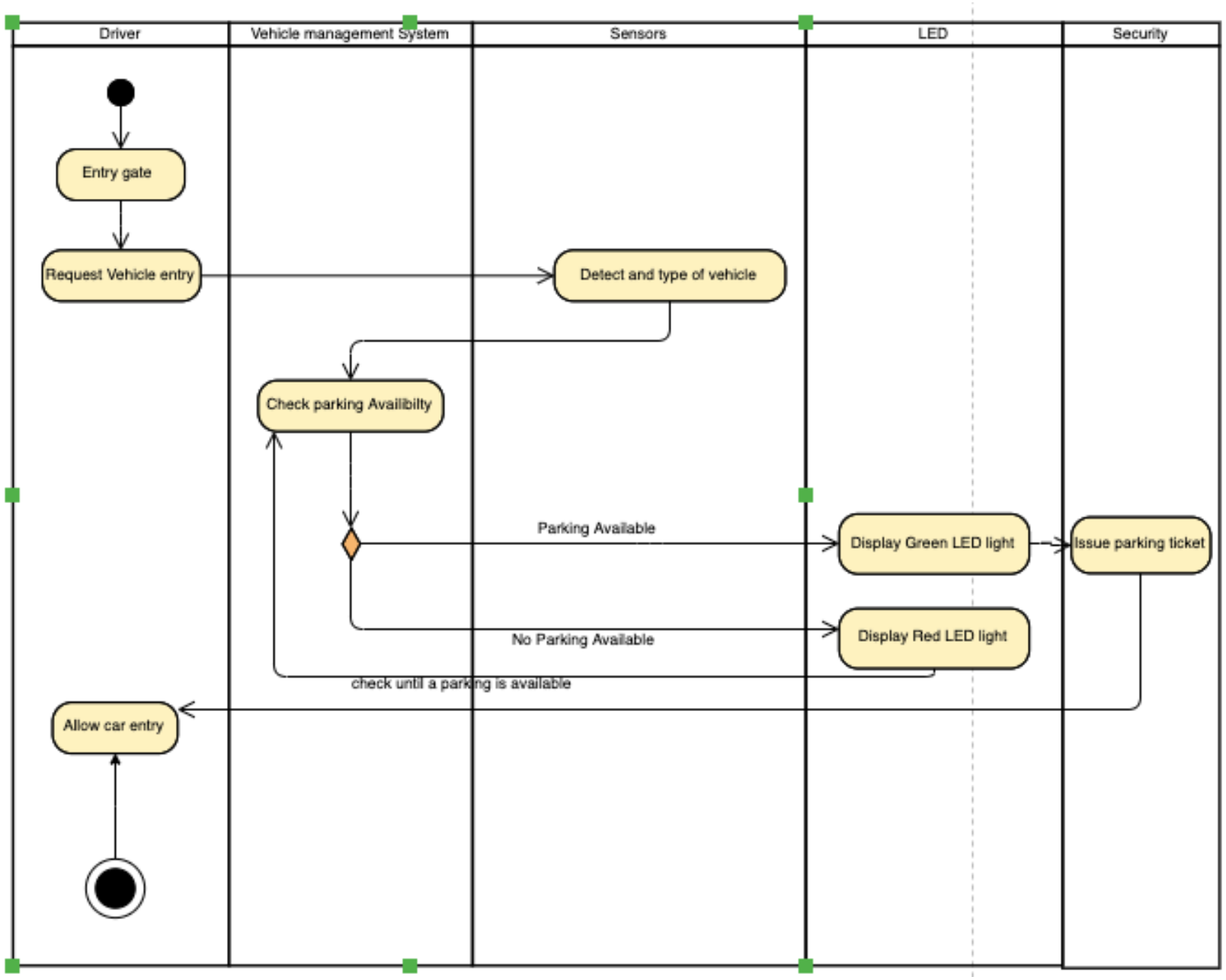


VEHICLE LIMITATION AND LIMITATION REMOVED

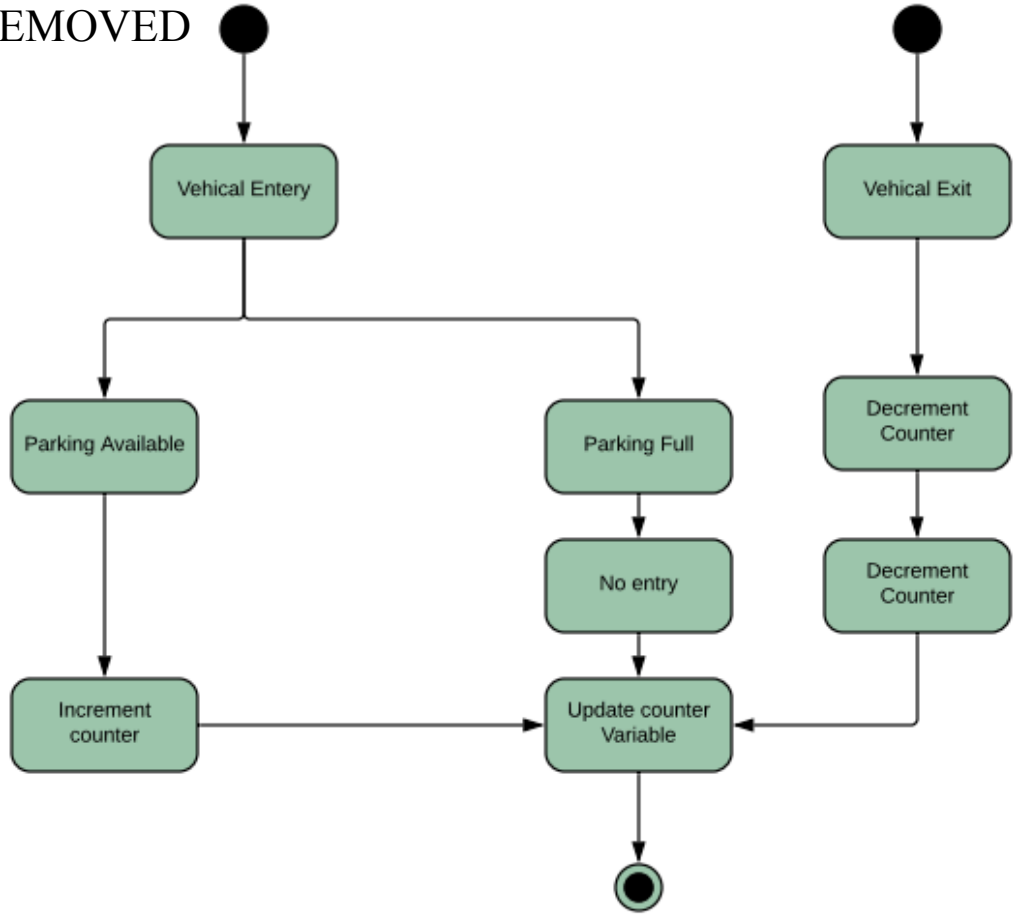


Activity diagram

ENTRY OF VEHICLE



VEHICLE LIMITATION AND LIMITATION REMOVED



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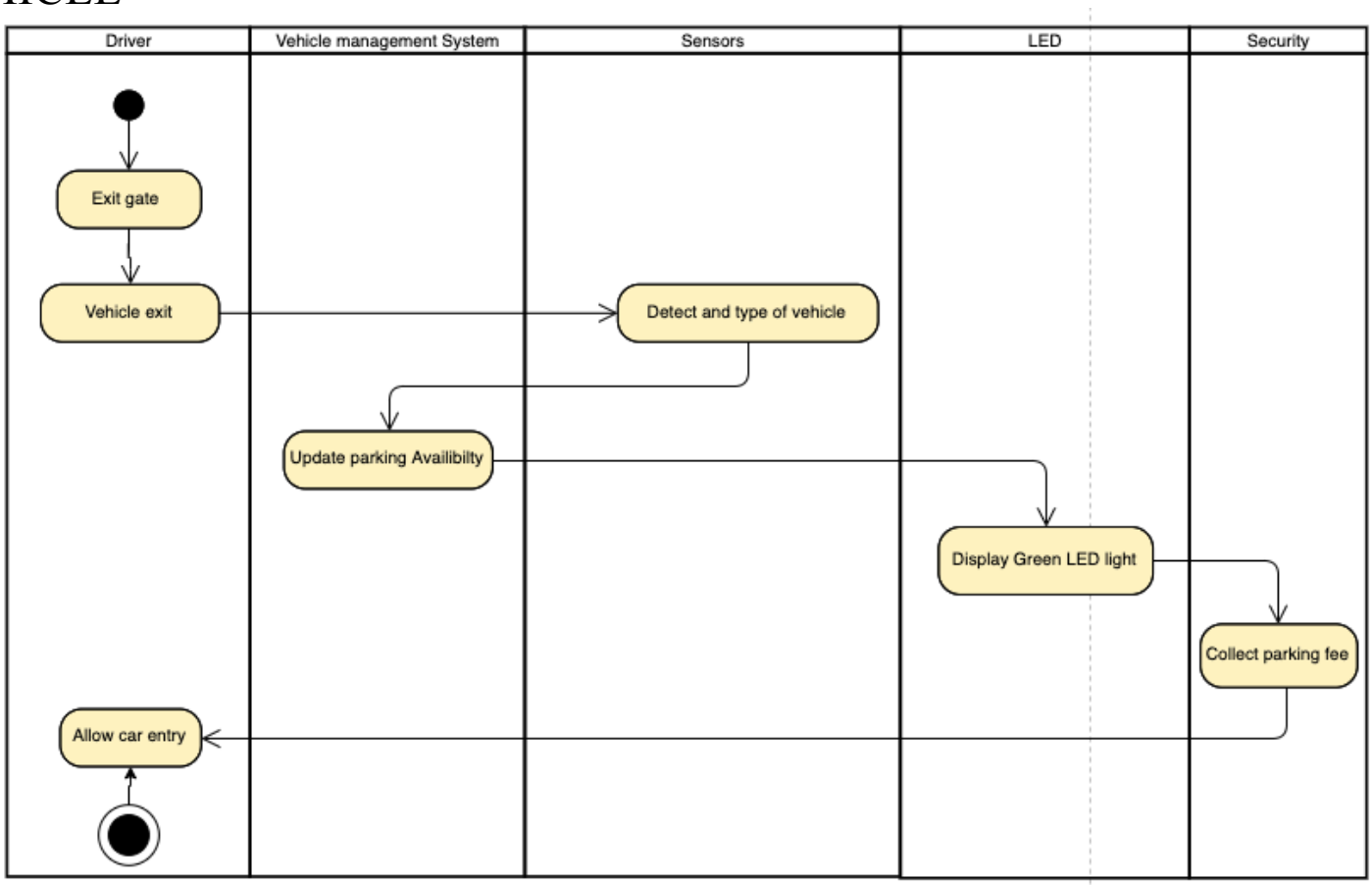
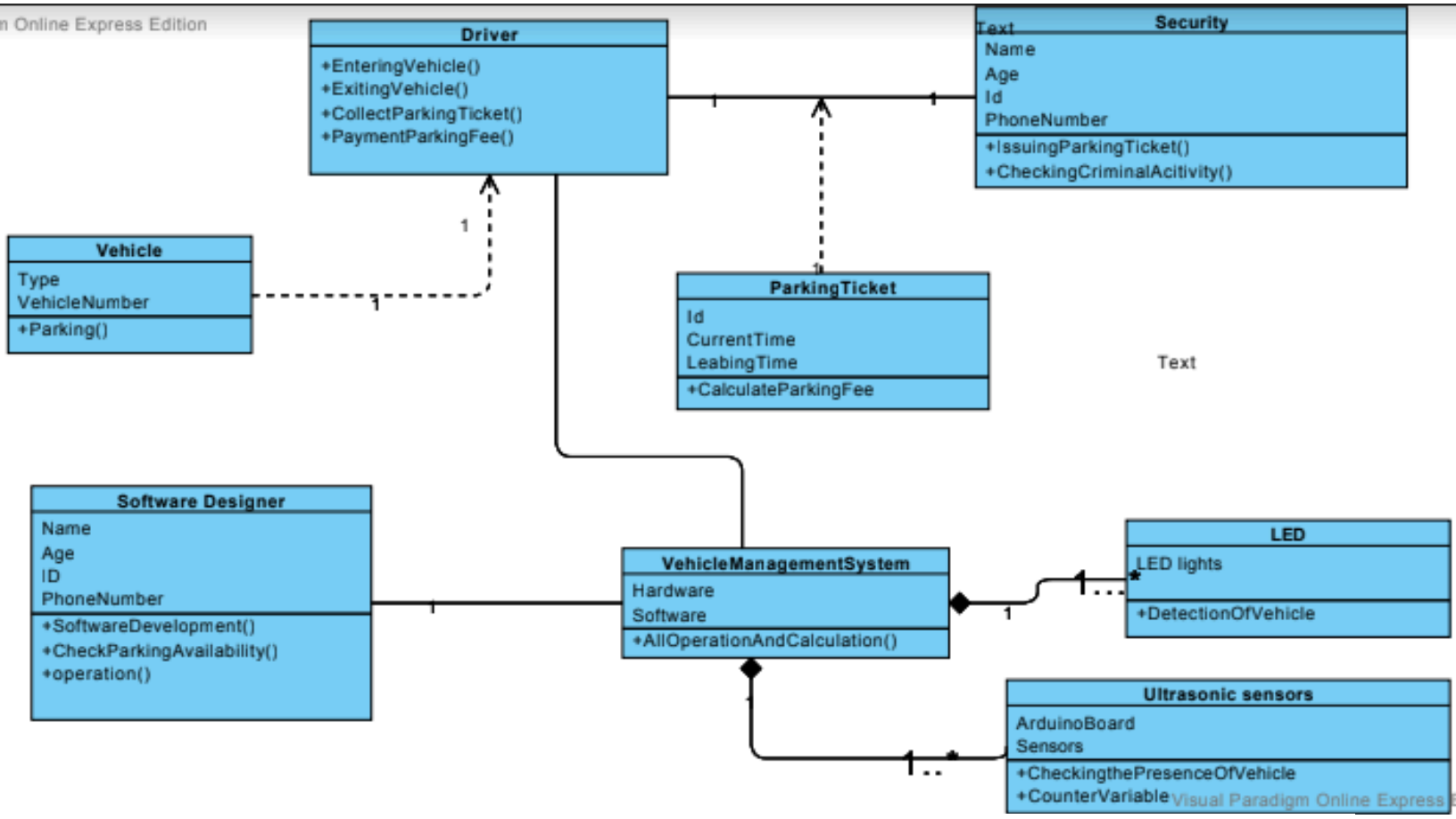


Class diagram



Component Diagram