# Fleet Management System

## Diploma in Software Engineering

## Final Project Documentation

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## School of Computing and Engineering

## National Institute of Business Management Colombo-7


**Year Of Submission 2023**

# Fleet Management System

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31/08/2023

“The project is submitted in partial fulfillment of the requirement of the Diploma in Software Engineering of National Institute of Business Management.”

## Declaration

We hereby declare that this report titled "Fleet Management System for NOLIMIT" represents our original work and research. All external sources used are appropriately cited. The data, findings, and conclusions presented are accurate. This report has not been submitted elsewhere. We acknowledge contribution received. We have adhered to ethical guidelines and take responsibility for any limitations.

Date: 31/08/2023

Signatures:

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Signature of the supervisor: …….

# Preamble

Abstract

NOLIMIT is a prominent retail fashion supply chain in Sri Lanka, catering to the diverse and evolving fashion needs of the local market. Established in 1992, the company has grown to become a house hold name, synonymous with quality, affordability, and contemporary style.

As a market leader in the fashion industry, NOLIMIT offers an extensive range of clothing and accessories for men, women, and children. With a keen focus on delivering the latest trends and designs, their dedicated team of designers and buyers constantly curate collections that resonate with the preferences and aspirations of our customers. Through a well-established network of retail outlets across the country, NOLIMIT provides a seamless shopping experience, ensuring accessibility and convenience for all.

The company is always looking towards the continuous improvement of their current processes, so that they will upgrade them necessarily to work more efficiently and effectively. The ‘current fleet management’ is one of the processes that they wanted to look into. As per their current management method, they are into manual processes, and data sheet management via MS Excel. Hence a requirement of a software was raised and a solution was given.

There are short term and long-term gains by this new introduction, such as live location monitoring, ease of analysis monthly and annually etc.

In addition, NOLIMIT is conscious of its social and environmental responsibilities. They prioritize sustainable practices throughout their operations, from responsible sourcing to ethical manufacturing processes. By promoting eco-friendly initiatives and supporting local communities, they aim to contribute positively to society and minimize ecological footprint.

This implementation will lead to less paper work, where it leads towards environment sustainability.

While NOLIMIT being a leading fashion brand in Sri Lanka, known for its quality, affordability, and contemporary style, they further search for value additions to their existing processes, which will lead to be a cost initiative as well as a point for their sustainable story.

## Acknowledgment

We would like to take this opportunity to express our sincere appreciation and gratitude to the individuals who have provided invaluable assistance and support throughout the completion of our project. Their contributions have been crucial to the successful execution of this study, and we are truly grateful for their efforts.

First and foremost, we would like to extend our thanks to the management team and staff of NOLIMIT Sri Lanka for their cooperation and support throughout this project. Their willingness to provide access to necessary information, data, and resources has been instrumental in shaping the outcome of this study.

Also, we are especially grateful to Mr. Thisara Weerasinghe for his valuable guidance, expertise, and encouragement. His knowledge and insights have greatly influenced the direction and quality of this project.

Lastly, we would like to acknowledge the unwavering support and understanding of our families and friends. Their encouragement and motivation have been the driving force behind our successful completion of this project.

We extend our deepest appreciation to all those who have contributed to the successful completion of this project on ‘Fleet Management System for NOLIMIT Sri Lanka’. Their assistance and support have been invaluable, and we are truly grateful for their involvement.

## Table of Contents

# Chapter 1: Introduction

## 1.1 Introduction to the organization

NOLIMIT is a prominent retail company in Sri Lanka, specializing in fashion and lifestyle products. Established in 1992, the company has rapidly expanded its operations and currently operates a vast network of stores across the country. NOLIMIT offers a diverse range of products, including clothing, accessories, and household items, catering to a wide customer base.

## 1.2 Organization structure

NOLIMIT follows a hierarchical organizational structure. The company is led by a dedicated management team lead by a CEO where department heads, and store managers reports to CEO. The various departments include Purchasing, Inventory management, Sales and Marketing, Operations, Human Resources Management and IT.

## 1.3 Current operations in the organization

Currently, NOLIMIT manages its fleet of vehicles used for transporting goods and materials via a manual process. The fleet management operation involves coordination between the procurement, warehouse and delivery. However, this manual system has limitations, such as lack of real-time tracking, difficulty in monitoring vehicle performance and maintenance, and inefficient routing, leading to delays and increased costs.

## 1.4 Users and responsibilities in the organization

The stakeholders involved in the fleet management system include the procurement team, warehouse managers, delivery supervisors, and drivers. Their responsibilities include vehicle purchase, schedule deliveries, ensuring vehicle maintenance, monitoring fuel consumption, and optimizing delivery routes.

## 1.5 Problem definition

The existing manual fleet management system at NOLIMIT faces various challenges as below:

- Lack of real-time tracking: Inability to monitor vehicle location and progress in real-time, resulting in limited visibility and inefficient coordination.
- Inefficient maintenance management: Difficulty in tracking vehicle maintenance schedules, resulting in increased breakdowns and higher maintenance costs.
- Ineffective route planning: Manual route planning leads to suboptimal routes, longer travel times, and increased fuel consumption.
- Inadequate performance monitoring: Inability to track key performance indicators (KPIs) such as fuel efficiency, vehicle utilization, and delivery timeframes.

## 1.6 Project objectives

The primary objectives of implementing the fleet management system at NOLIMIT are as follows:

- Improve real-time tracking and visibility of the fleet, enabling better coordination and responsiveness.
- Streamline vehicle maintenance processes to minimize breakdowns and reduce maintenance costs.
- Optimize delivery routes to improve efficiency, reduce fuel consumption, and enhance customer satisfaction.
- Implement performance monitoring mechanisms to track and analyze key metrics for continuous improvement.

## 1.7 Proposed solution

The proposed solution is the implementation of a comprehensive fleet management system that incorporates advanced technologies such as GPS tracking, vehicle telematics, and data analytics. The system will include the following features:

- Maintenance scheduling and alerts: The system will automate maintenance scheduling and send alerts to responsible person based on vehicle usage and pre-defined maintenance intervals.
- Route optimization: Advanced algorithms will be employed to optimize delivery routes, based on the factors such as traffic conditions, distance, and time constraints.

- Performance monitoring and reporting: Key performance indicators (KPIs) such as fuel consumption, vehicle utilization, and delivery timeframes will be tracked and analyzed, generating comprehensive reports for performance evaluation.

## 1.8 Chapter summary

In this chapter, the introduction to the subjected company was provided, including its background and industry. The existing fleet management challenges were outlined, leading to the project objectives of implementing a centralized fleet management system. The proposed solution, including its features and functionalities, was described, highlighting the benefits it will bring to the organization.

# Chapter 2: Methodology

## 2.1 Introduction

This chapter presents the methodology employed in the development and implementation of the fleet management system for NOLIMIT. It outlines the data collection methods, software process model, software development tools, testing strategies, and the implementation plan.

## 2.2 Data collection methods

To gather the necessary information for designing and developing the fleet management system, a combination of primary and secondary data collection methods was utilized. Primary data was collected through:

- Interviews with process stakeholders, including the logistics department, Drivers and maintenance staff.

Secondary data was obtained from existing records such as:

- Vehicle logs.
- Maintenance schedules.
- Fuel consumption reports.

## 2.3 Software process model

### Agile model

For the development of the fleet management system, the Agile software development methodology was chosen. This iterative approach allowed for flexibility and adaptability throughout the development process. It involved breaking the project into smaller tasks and delivering incremental updates, ensuring regular feedback and collaboration with stakeholders.

## 2.4 Software development tools

- Visual Studio
- MSSQL
- Figma UI Editor

## 2.5 Testing strategies

White box testing.

White box testing, also known as structural testing, was employed to assess the internal structure and logic of the fleet management system. This testing approach involved examining the system's code and conducting tests to ensure that all statements, branches, and paths were executed as expected. The objectives of white box testing were to identify any coding errors, logical flaws, or potential vulnerabilities. Techniques such as code reviews, unit testing, and code coverage analysis were employed to ensure the reliability and robustness of the system's underlying implementation.

Black box testing

Black box testing focused on evaluating the functional requirements of the fleet management system without considering its internal implementation details. This approach involved creating test cases based on the system's specifications and inputs/outputs and executing those test cases to verify the expected behavior. Functional testing, integration testing, and system testing were performed as part of black box testing. The aim was to ensure that the system operated correctly, met the specified requirements, and provided the intended functionality to the end-users.

Acceptance testing

Acceptance testing involved stakeholders from the company using the fleet management system in a simulated production environment to validate its readiness for deployment. This testing phase aimed to ensure that the system met the organization's requirements, addressed the identified problems, and

was suitable for everyday operational use. During acceptance testing, users performed real-world scenarios, such as assigning vehicles, tracking routes, generating reports, and managing maintenance schedules. Feedback from stakeholders were collected and incorporated into the system to improve its usability and effectiveness. The acceptance testing phase ensured that the system met the organization's expectations and gained approval for deployment.

## 2.6 Implementation plan

The implementation plan involved a phased approach to ensure a smooth transition from the existing manual processes to the new fleet management system. The plan included the following steps:

1. System design and development: This phase involved gathering requirements, designing the system architecture, and developing the necessary software components.
2. Data migration: Existing vehicle, driver, and maintenance data were transferred to the new system, ensuring data continuity and accuracy.
3. User training: Training sessions were conducted for the logistics department, drivers, and maintenance staff to familiarize them with the new system and its functionalities.
4. Pilot testing: A pilot test was carried out with a select number of vehicles and users to evaluate the system's performance and address any initial issues.
5. System rollout: The fleet management system was gradually rolled out to all vehicles and users, ensuring proper support and monitoring during the transition phase.

## 2.7 Chapter summary

Chapter 2 presented the methodology employed in the development and implementation of the fleet management system for NOLIMIT. The chapter outlined the data collection methods, software process model, software development tools, and testing strategies utilized in the project. By employing a combination of white box testing, black box testing, and acceptance testing, the fleet management system underwent rigorous evaluation, addressing both internal code quality and external functional requirements.

# Chapter 3: Analysis

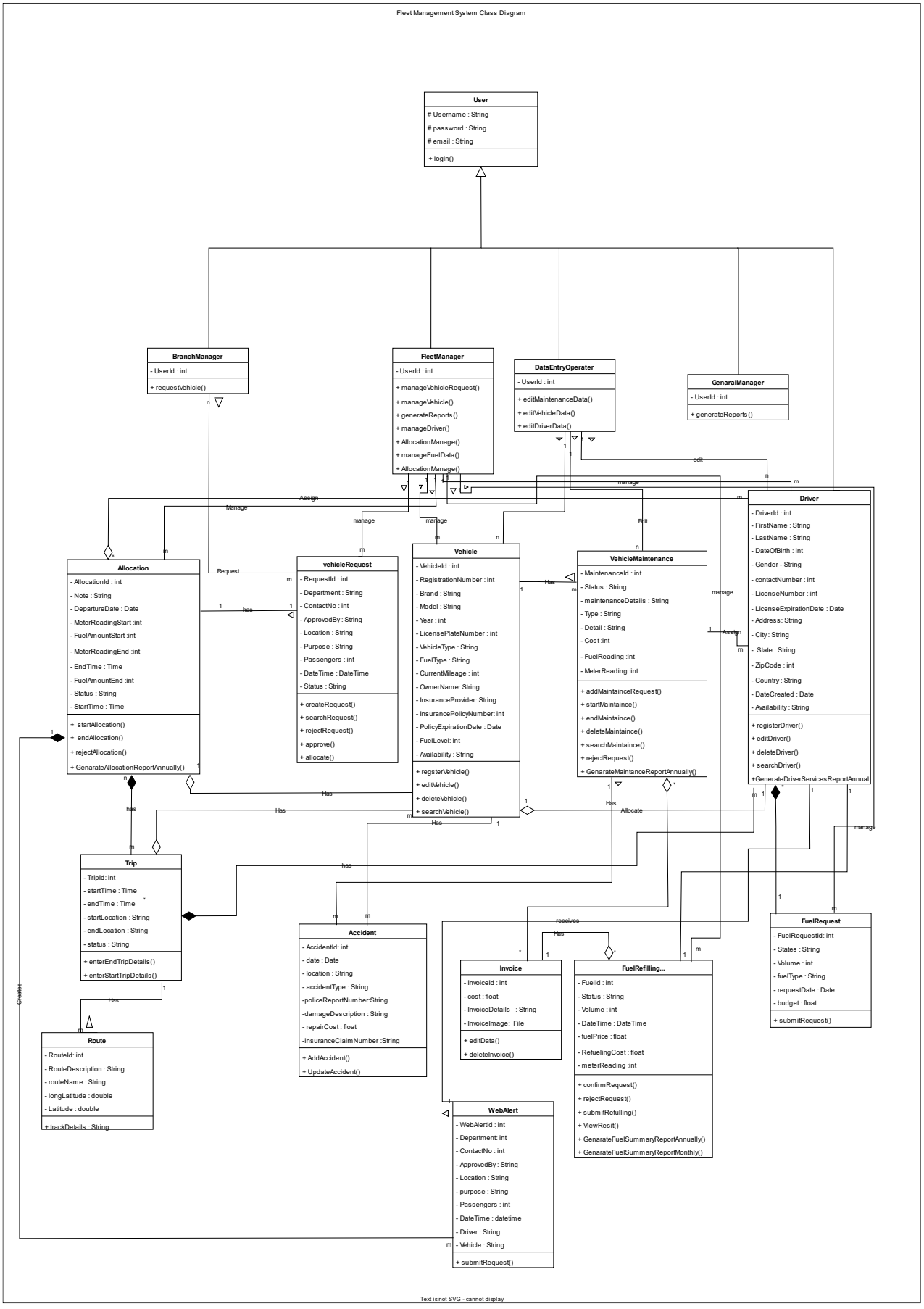
## 3.1 Introduction

This chapter focuses on the analysis of the current system against the proposed software solution. This mainly elaborated the UML diagrams, Class diagram and the database Entity relationship diagram. These mentioned diagrams depict the nature of the solution and the accessibility of it. This also shows which entities and data would be saved after fully developing the software solution.

## 3.2 UML design

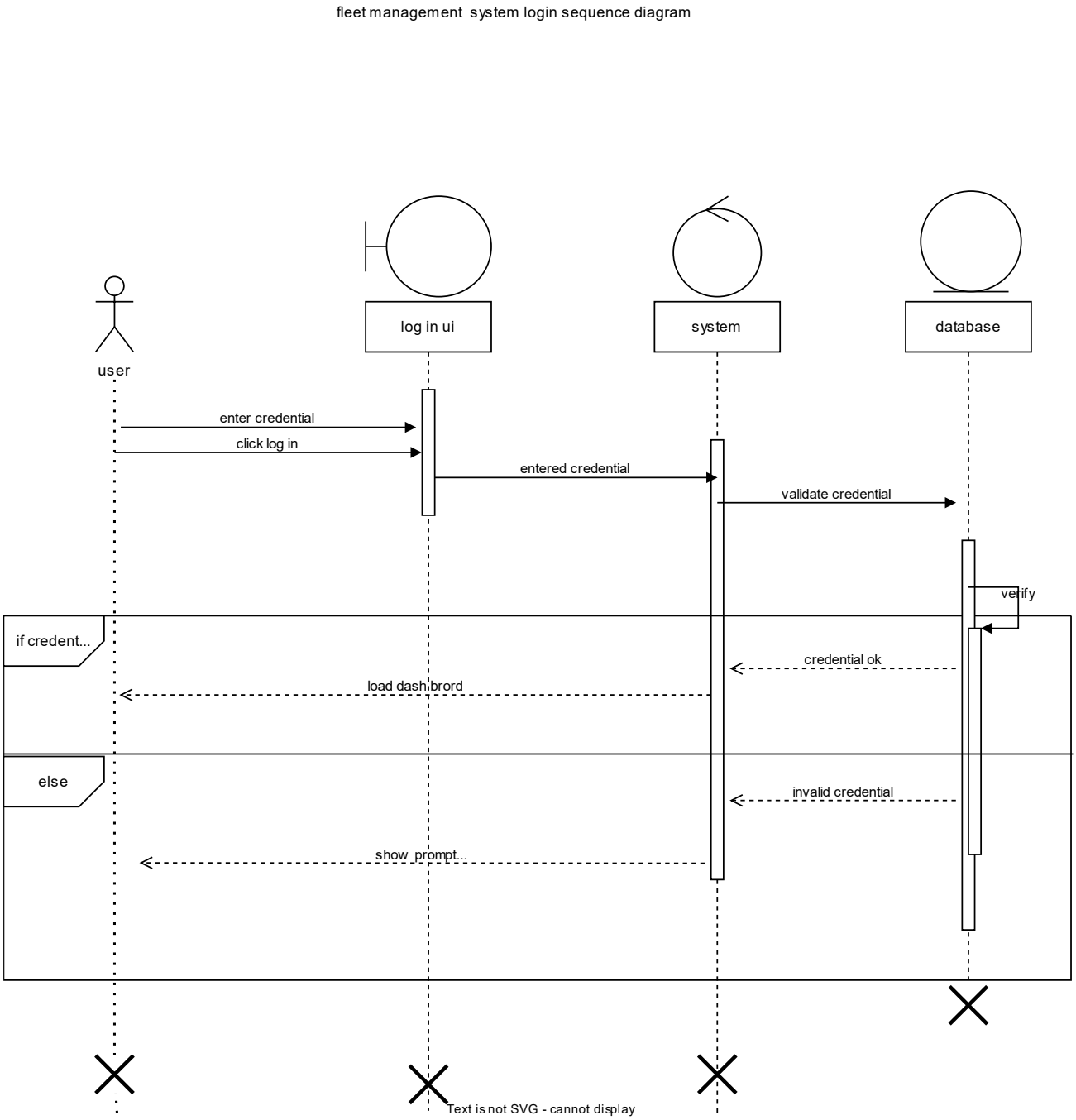
### Use Case Diagram of Current System

Class diagram of proposed system.

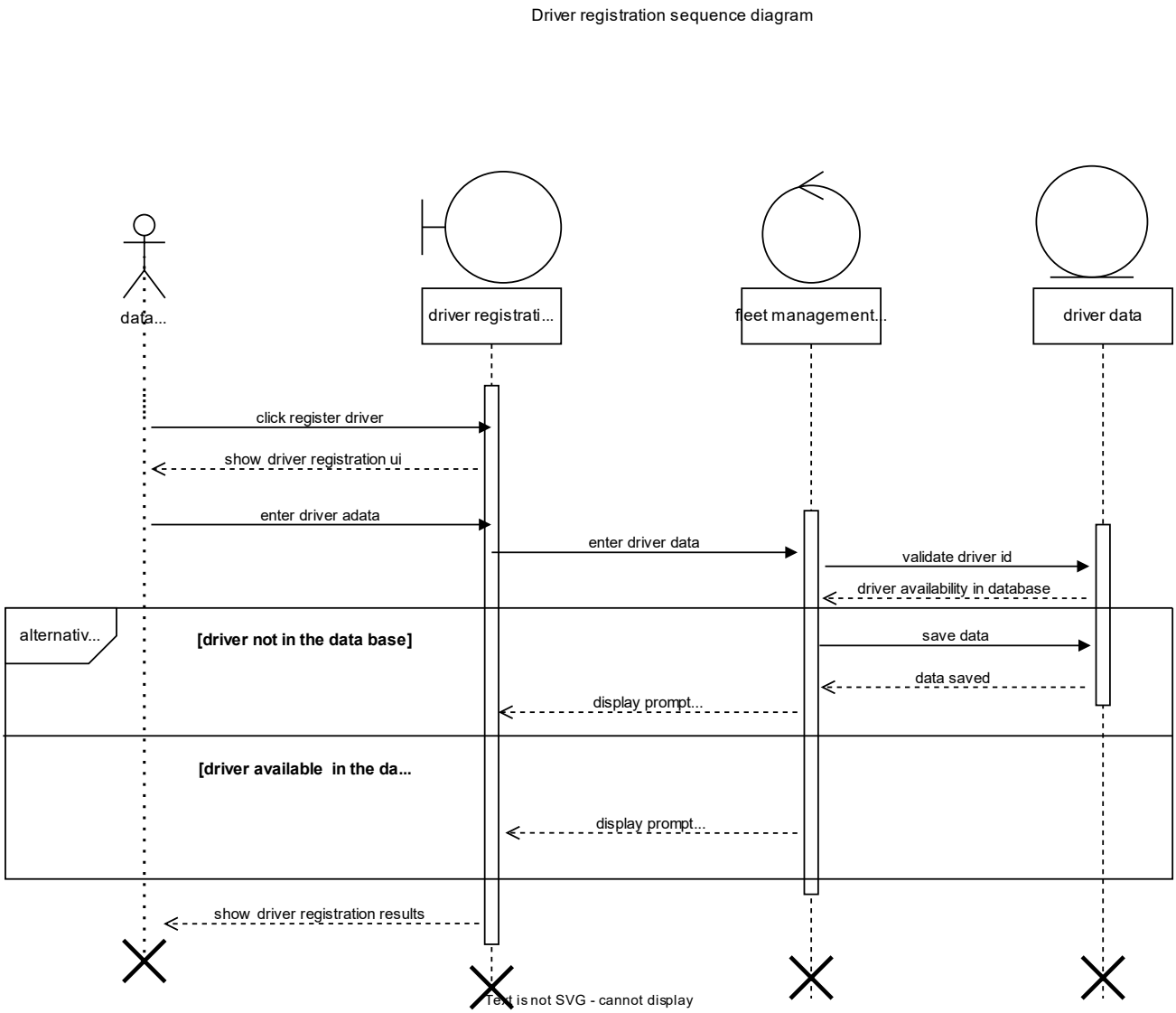


Sequence diagrams (each use case) for proposed system.

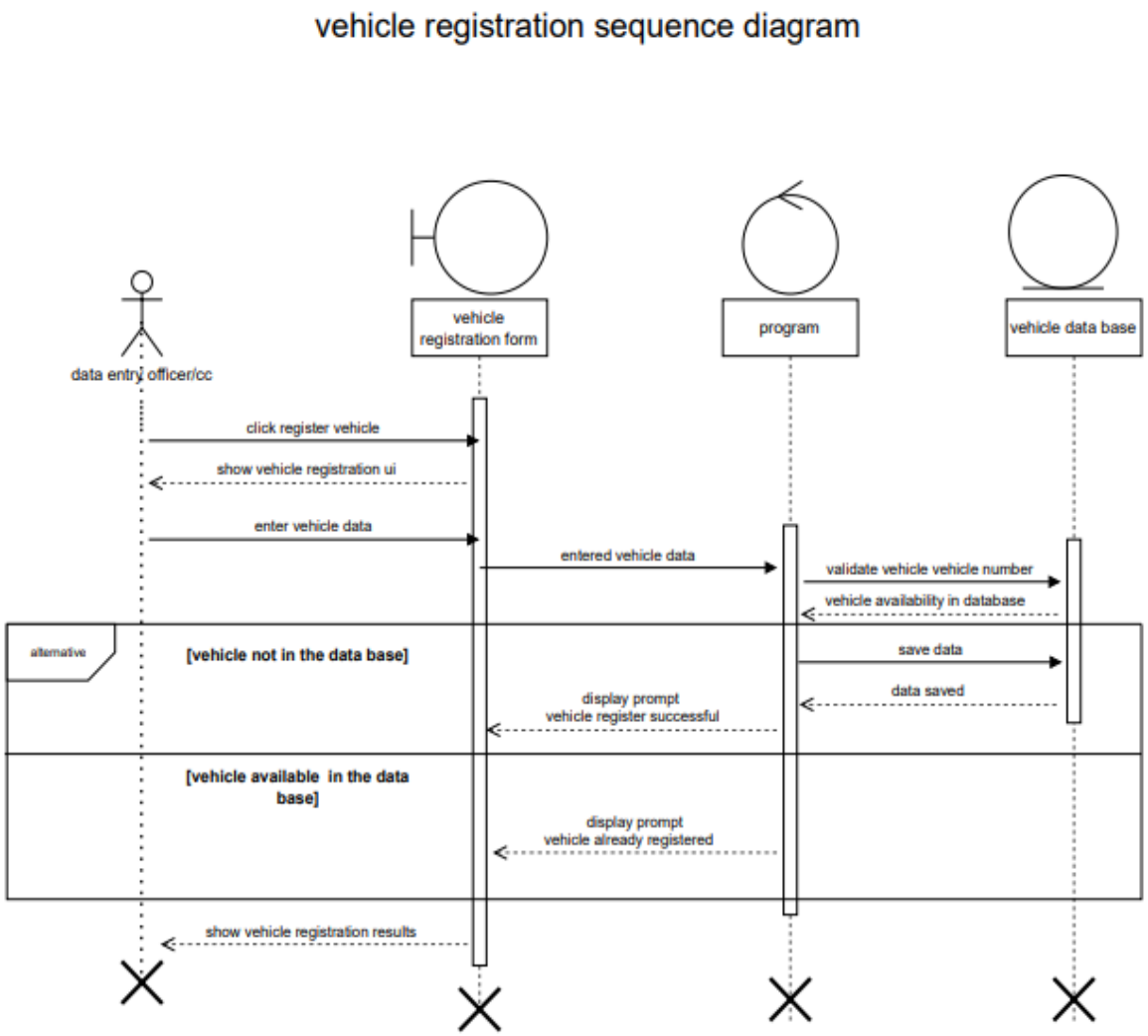
1. User Login



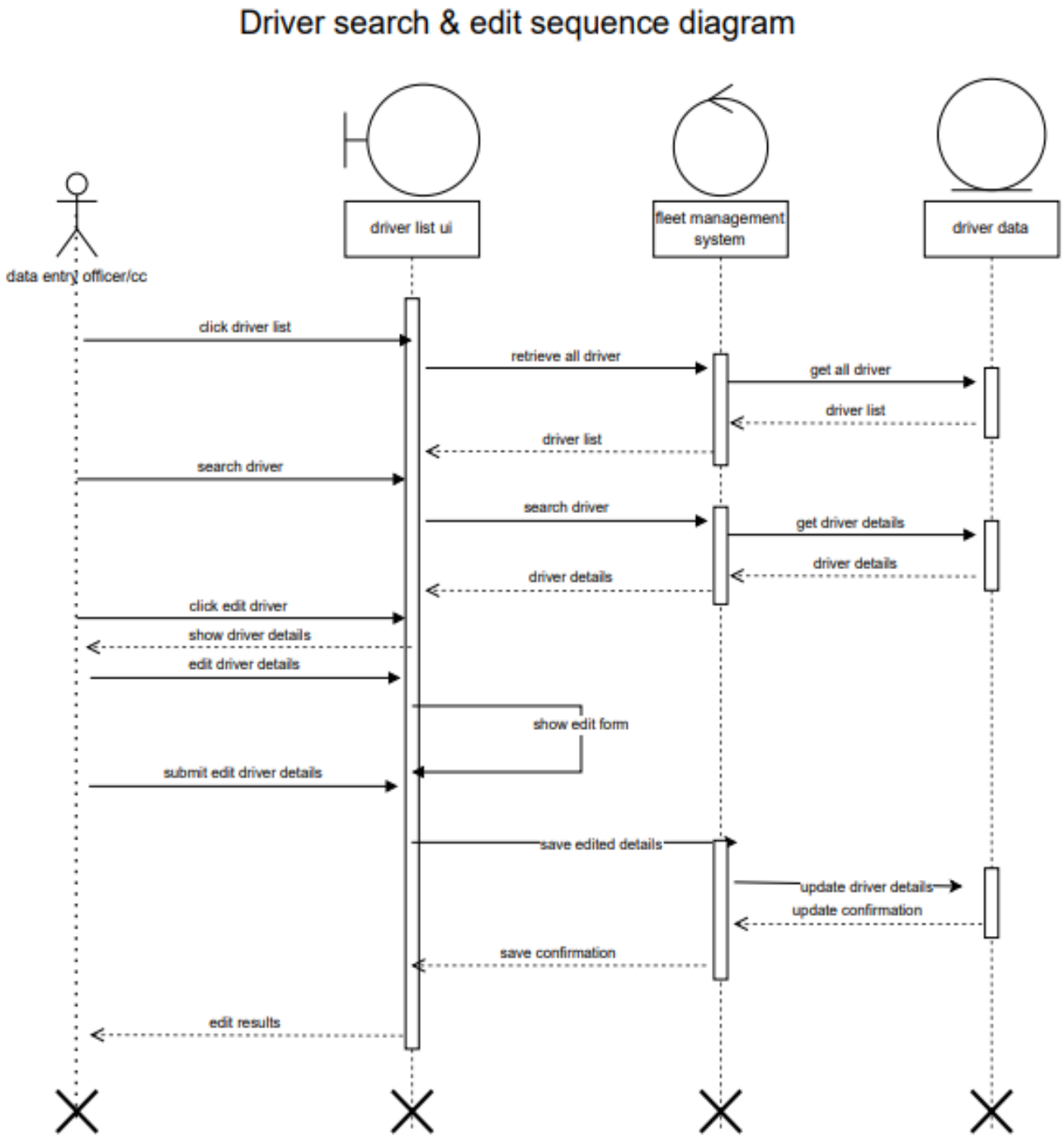
## 2. Driver Registration



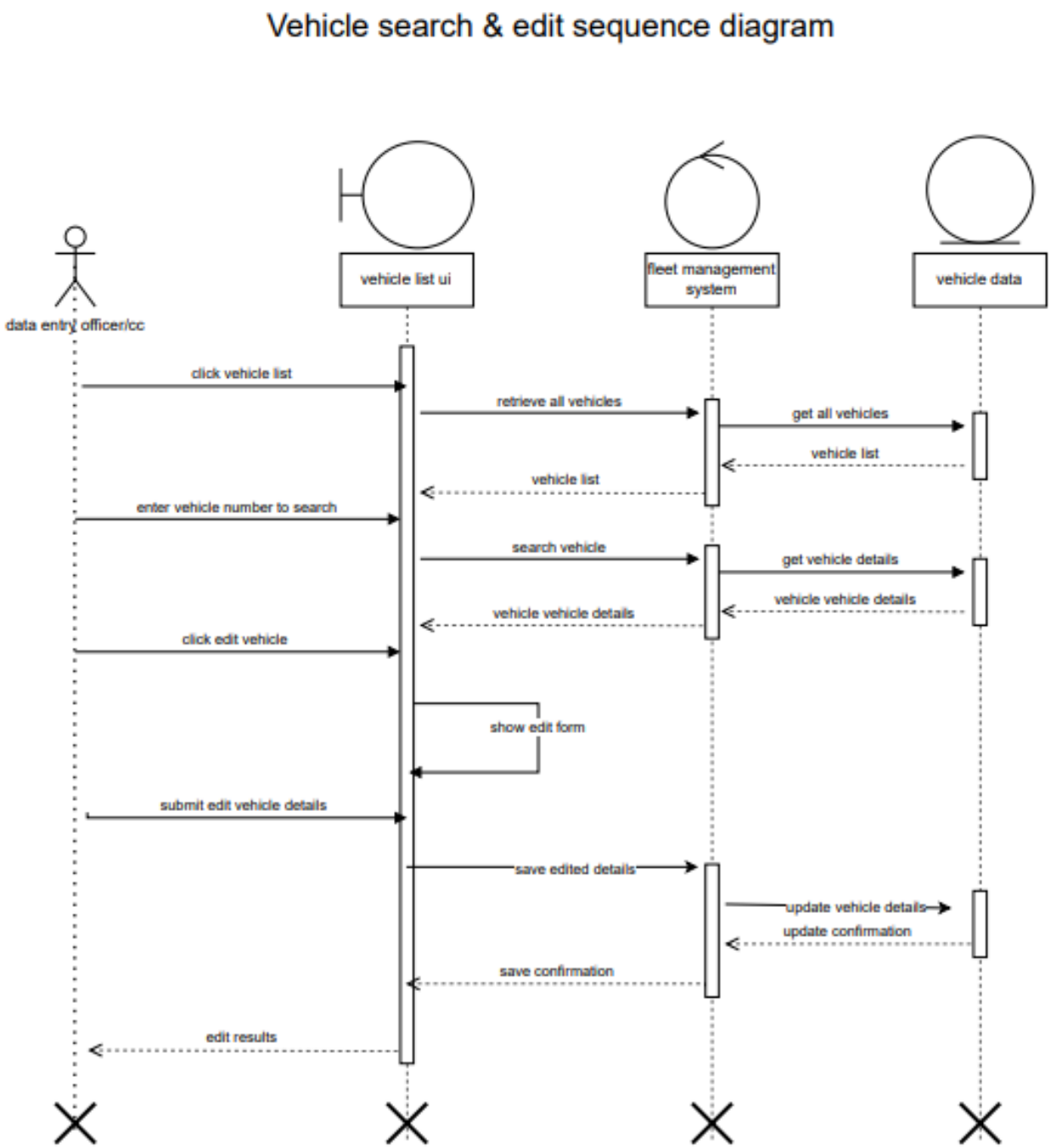
3. Vehicle Registration



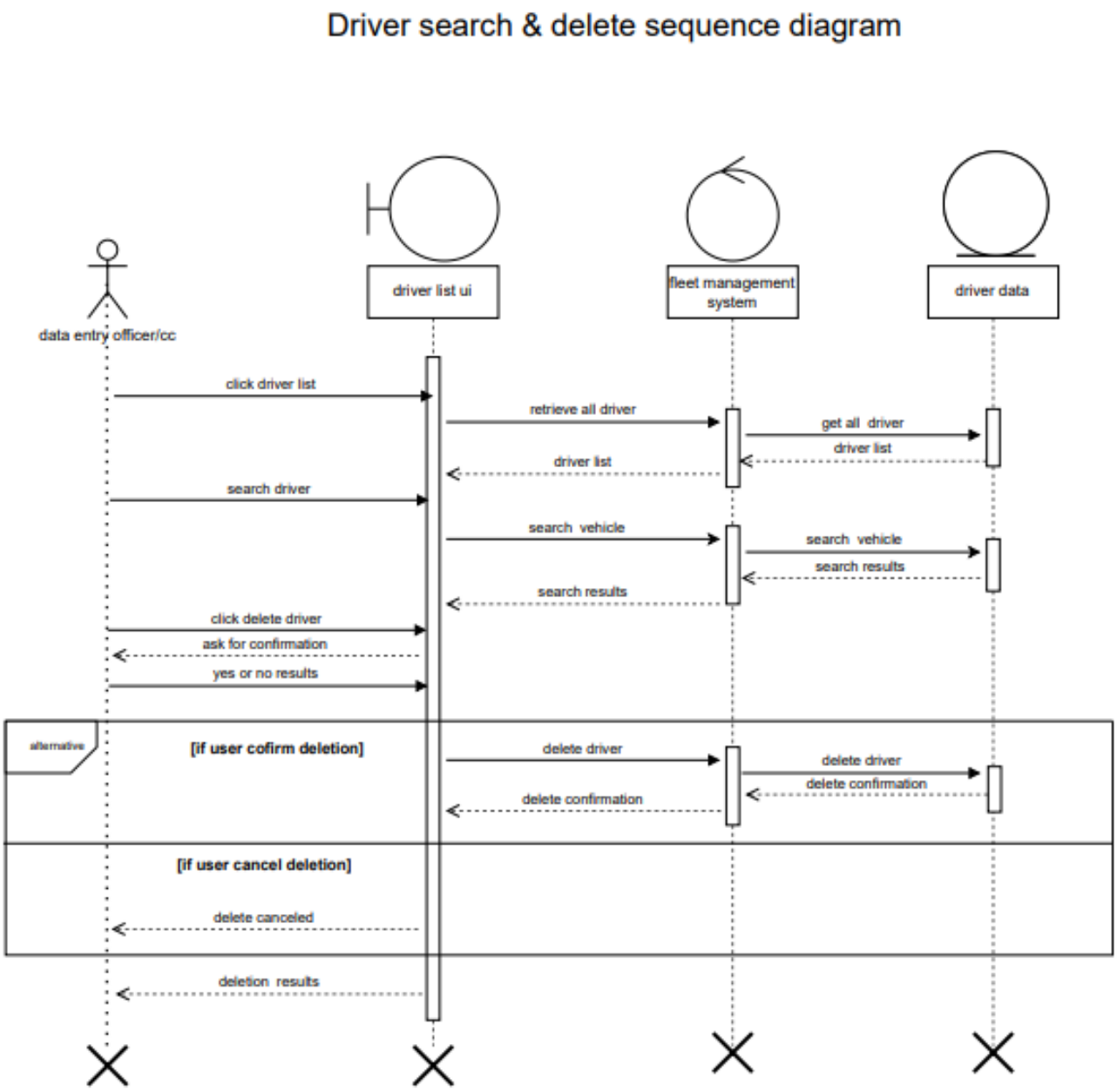
4. Diver Search & Edit



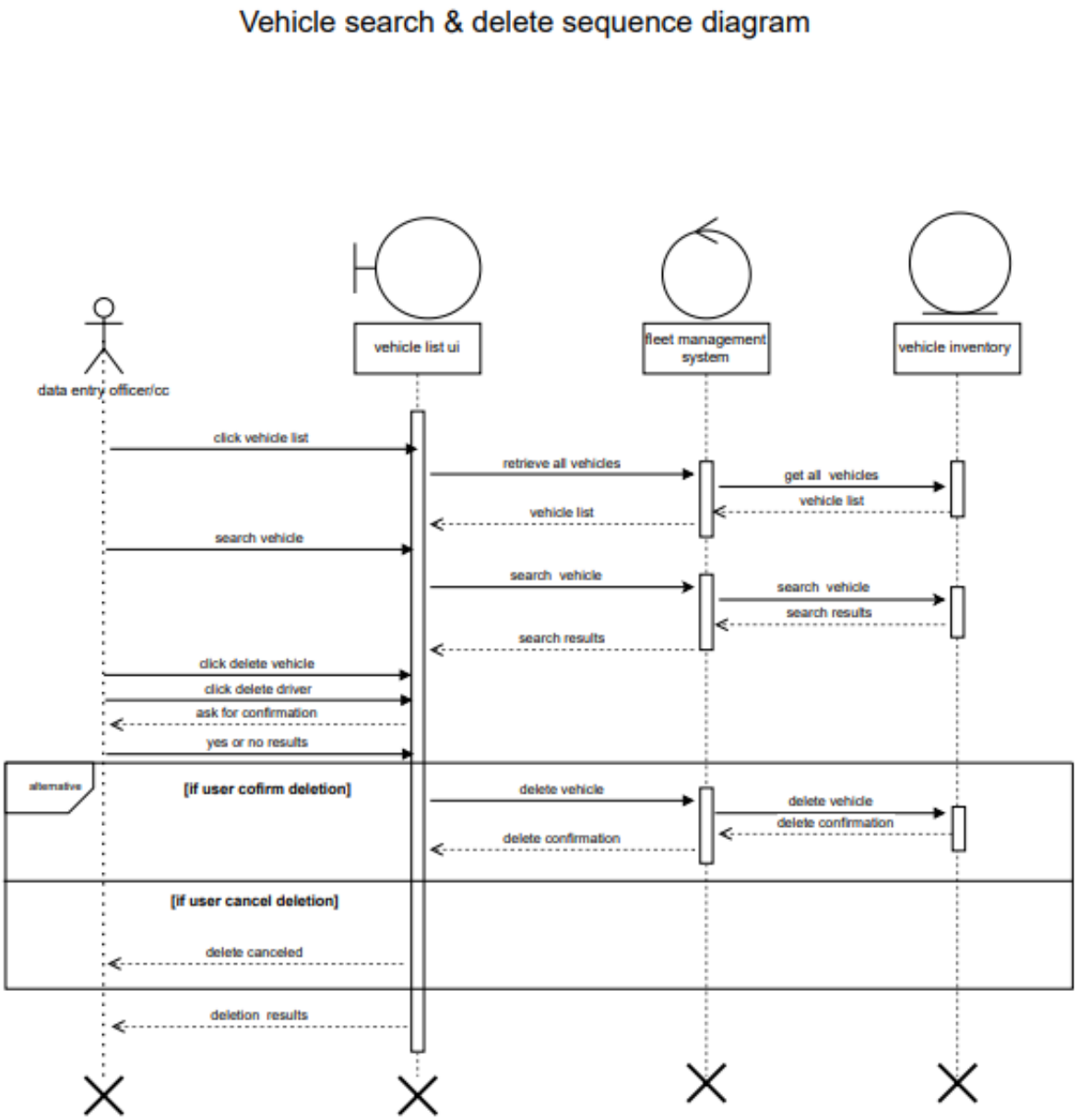
5. Vehicle Search & Edit



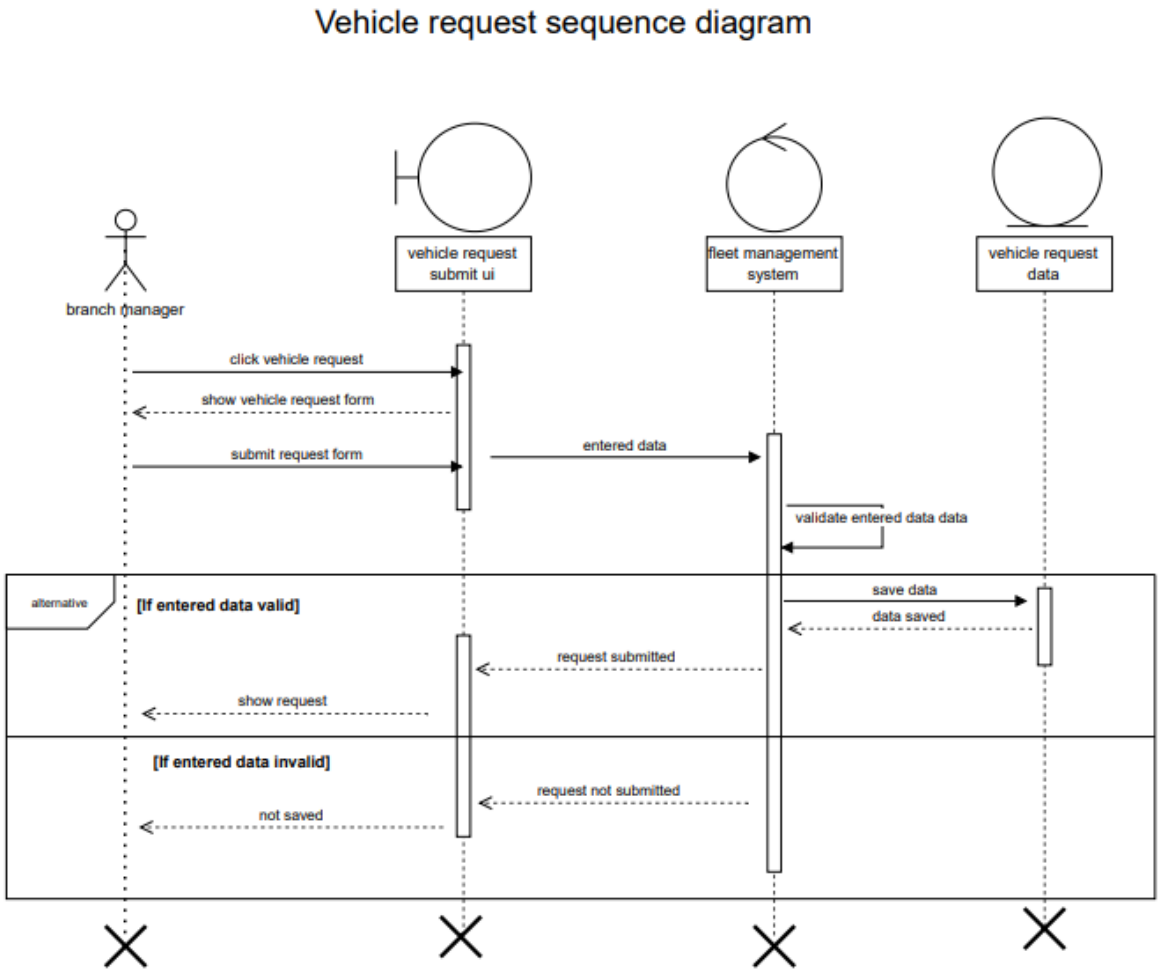
6. Driver Search & Delete



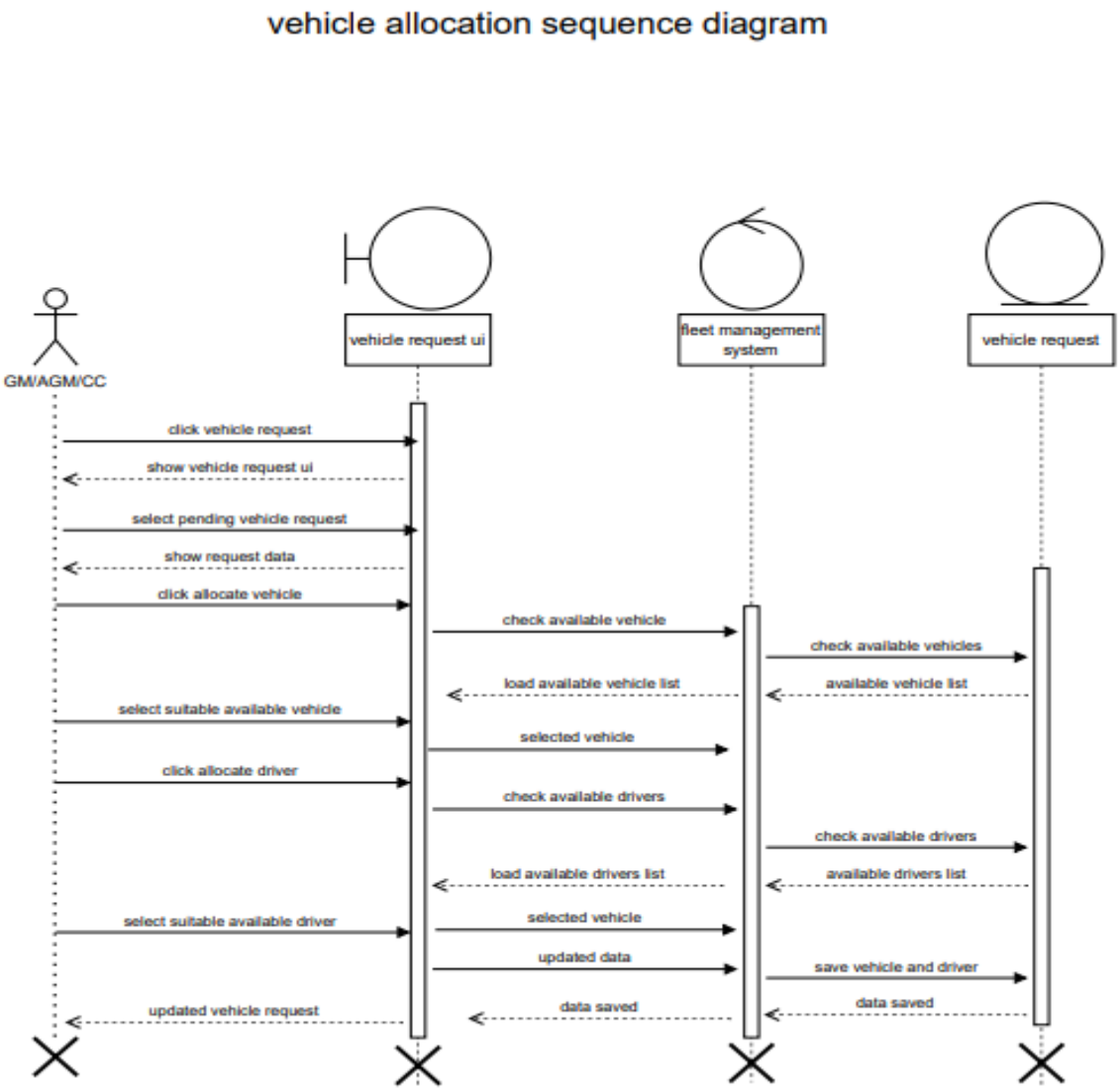
7.Vehicle Search & Delete



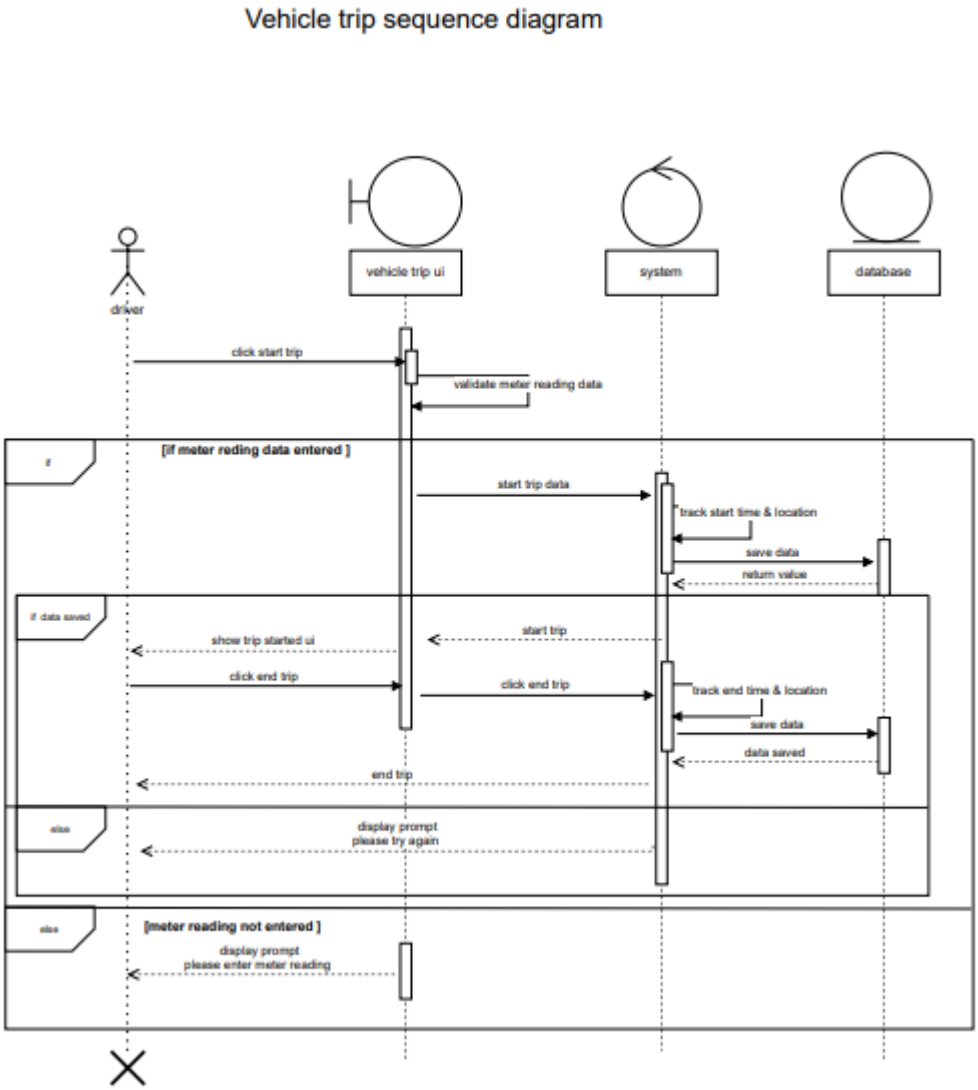
7. Vehicle Request



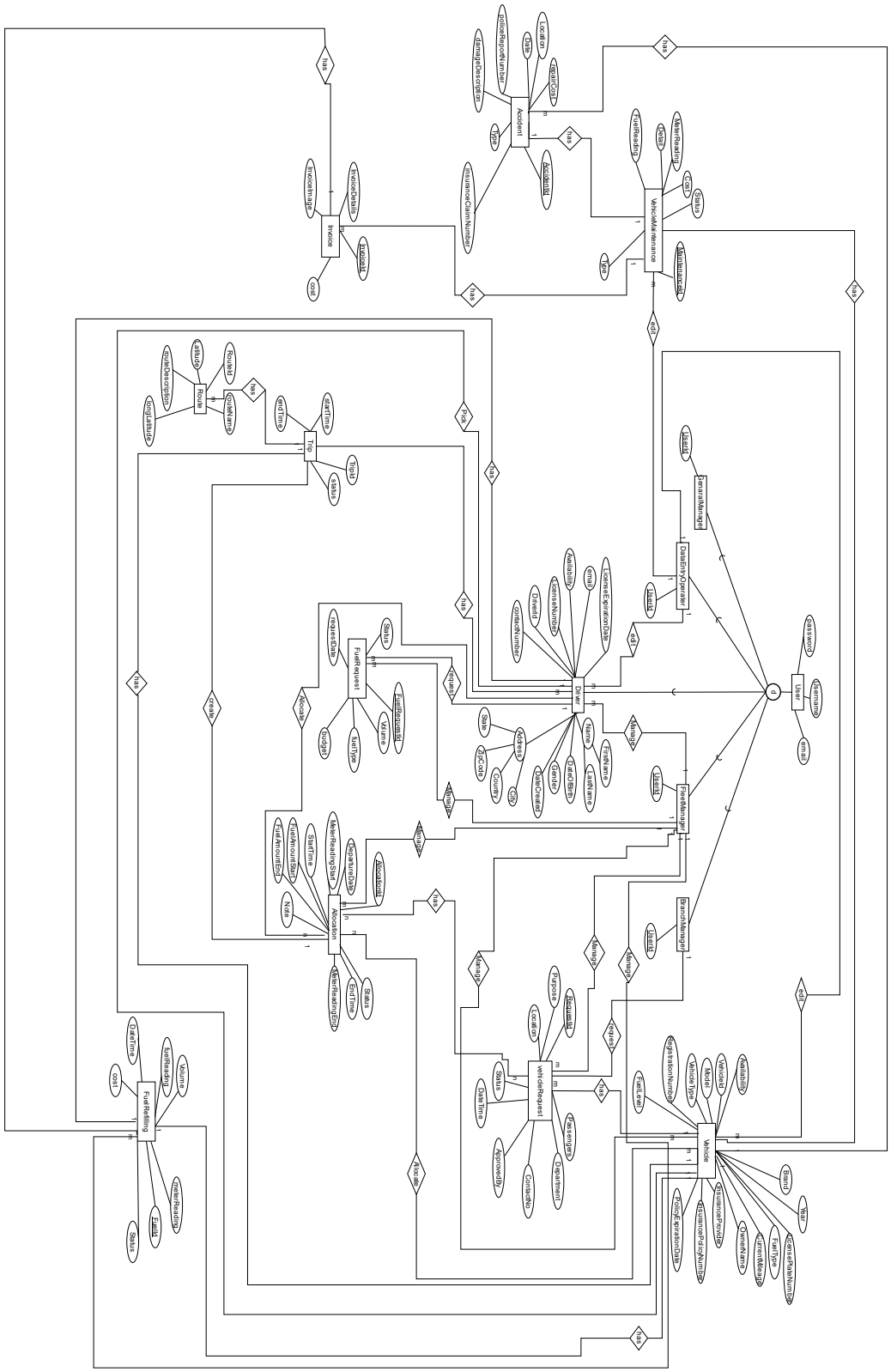
8. Vehicle Allocation



9. Vehicle Trip



## 3.3 ER Diagram of the Proposed System



## 3.4 Chapter Summary

This chapter focuses on the analysis and systematic design of the proposed software solution for fleet management. It provides an overview of the software's nature, the available processes of the client, and the solution's accessibility. Detailed diagrams are presented to illustrate how the proposed solution will be utilized and executed. The analysis of these diagrams offers a deeper understanding of the scenarios and validates the alignment with the owner's preliminary requirements. This chapter concludes by establishing a solid foundation for the subsequent stages of system design and development.

# Chapter 4: Solution Design

## 4.1 Introduction

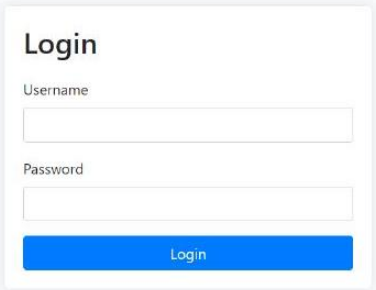
This chapter presents the solution design for the fleet management system of NOLIMIT. Here the focus is on outlining the key aspects and components of the designed solution, providing a comprehensive understanding of its architecture and functionalities. The design phase is crucial in translating the identified requirements into a concrete solution that addresses the organization's needs effectively. By following a systematic approach and utilizing industry best practices, the solution design ensures the development of a robust and scalable fleet management system. This chapter sets the stage for the subsequent chapters, where specific design elements and modules will be discussed in detail.

## 4.2 Interface designs

Interface number: 01

Interface name: Login

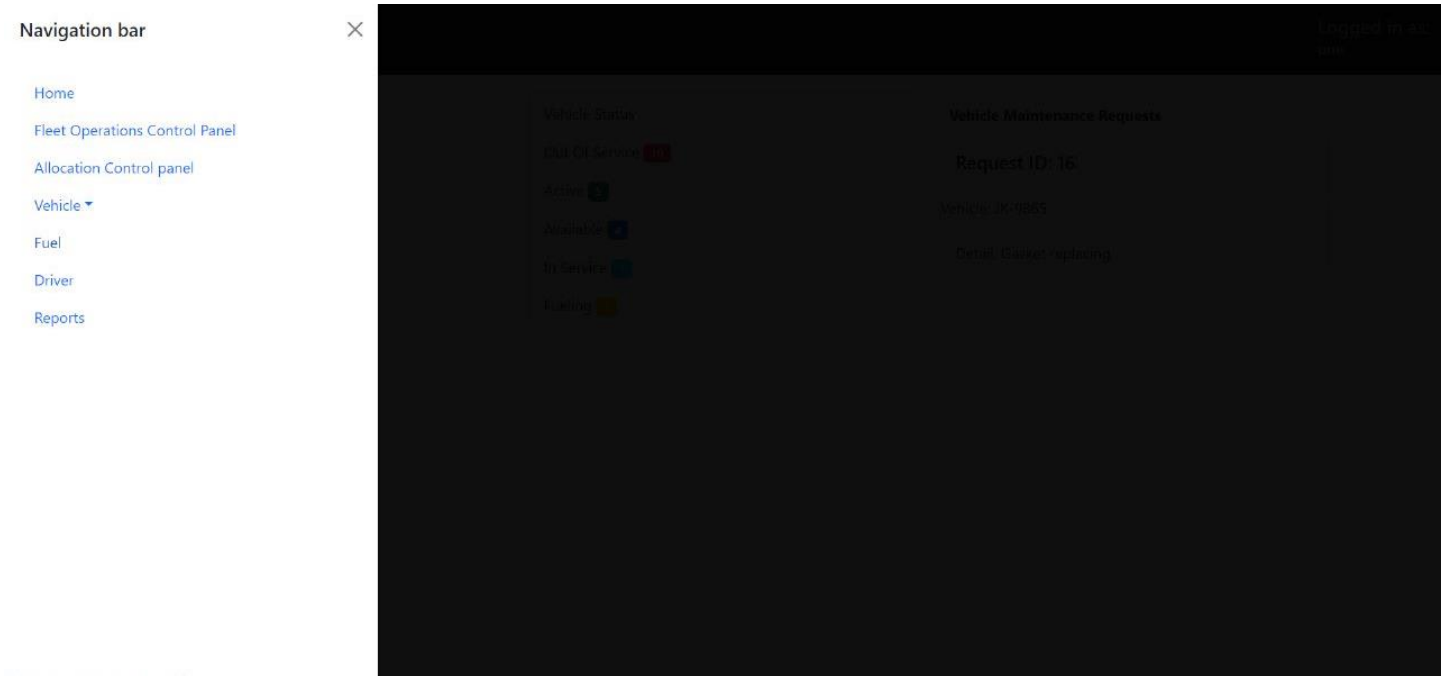
Description: This allows a user to login to the system



Interface number: 02

Interface name: Navigation Bar

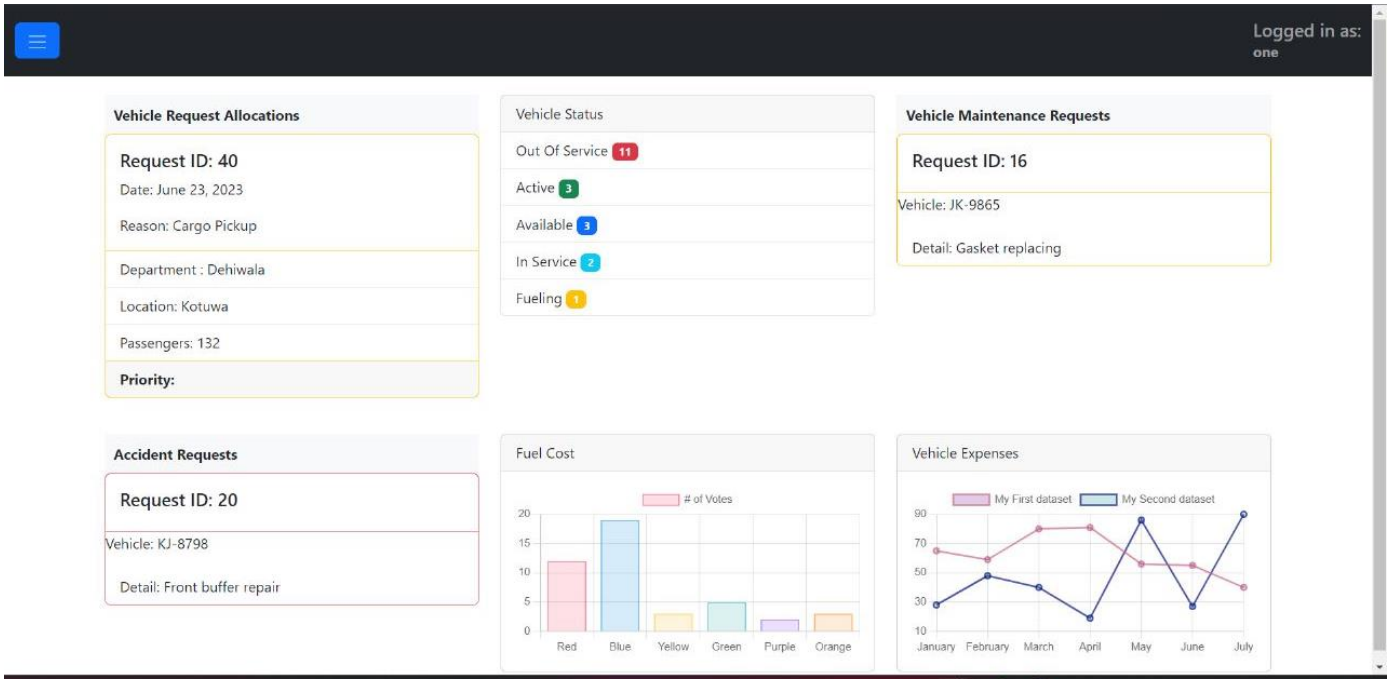
Description: Helps to select the required area to work in, for the logged in user



Interface number: 03

Interface name: Home

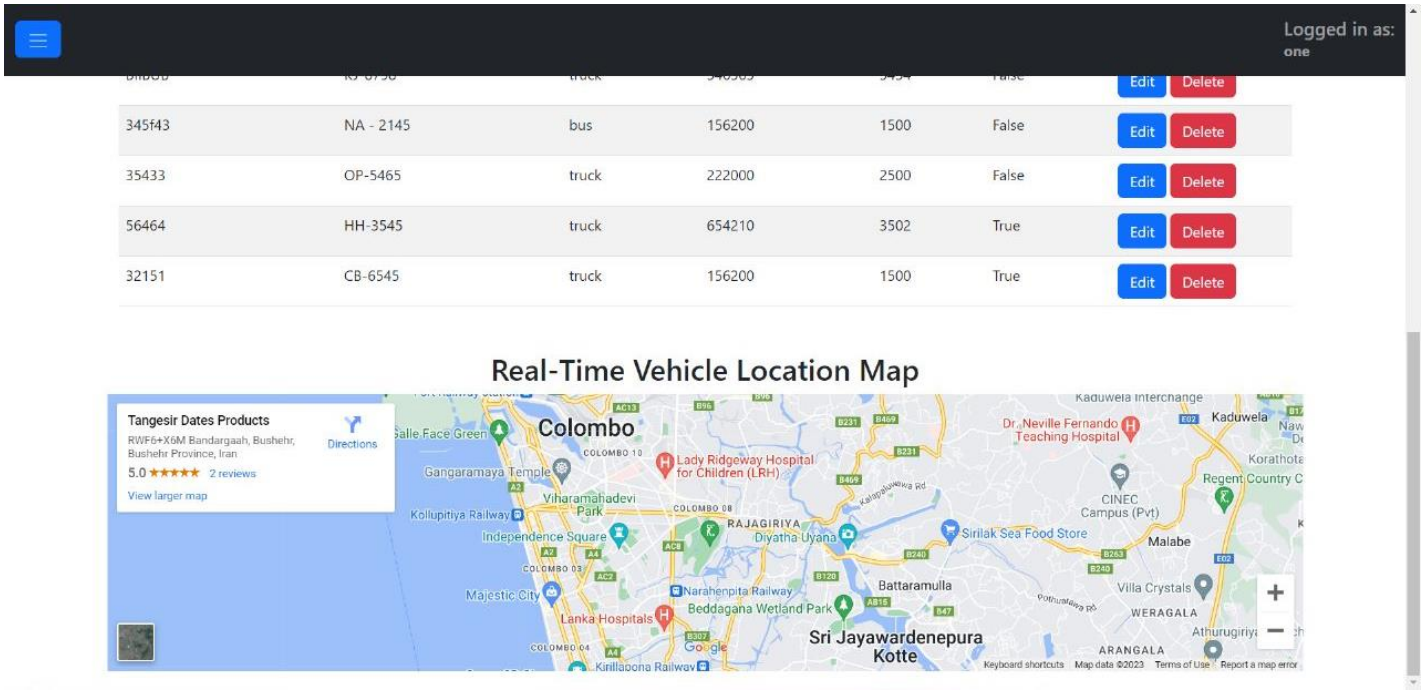
Description: Provides an overall analysis of the major sections provided in the system



Interface number: 04

Interface name: Real time vehicle allocation map

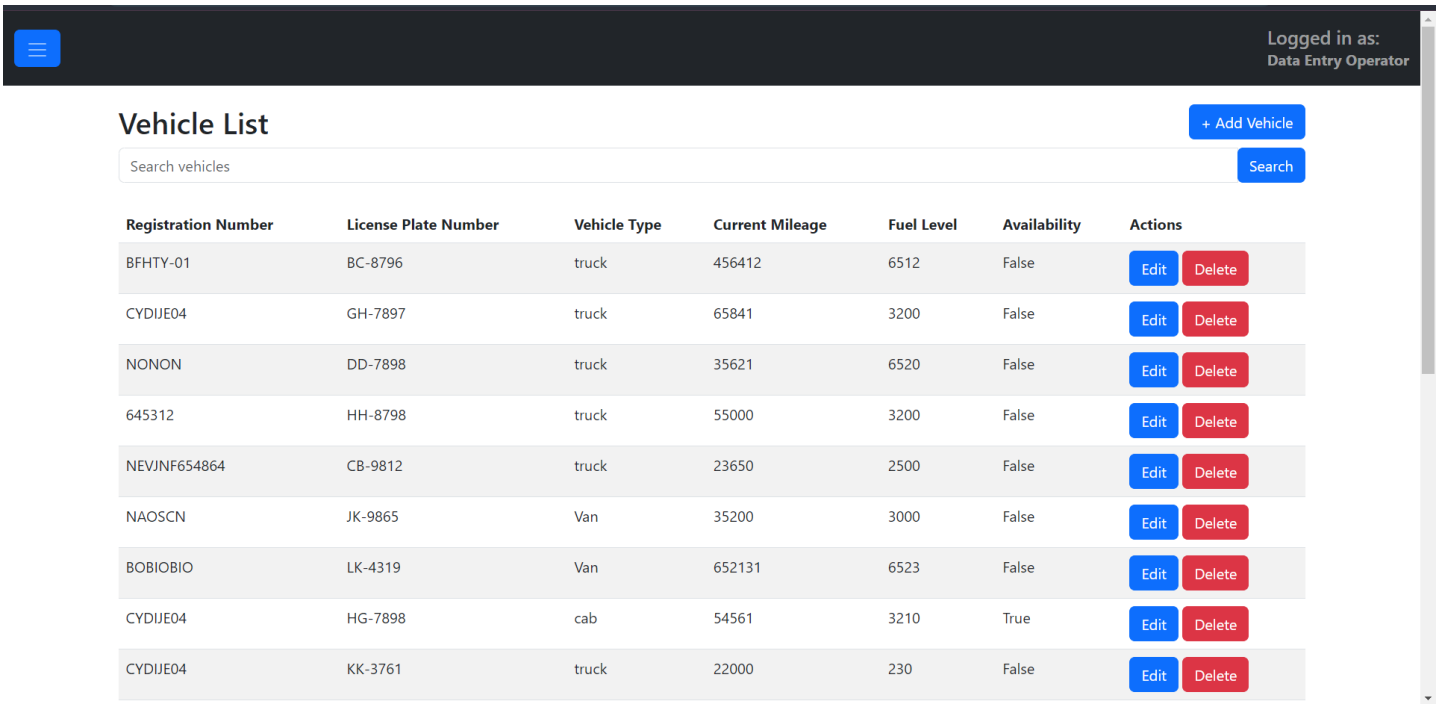
Description: This UI allows to view the locations of the current vehicles which are in use.



Interface number: 05

Interface name: Vehicle List

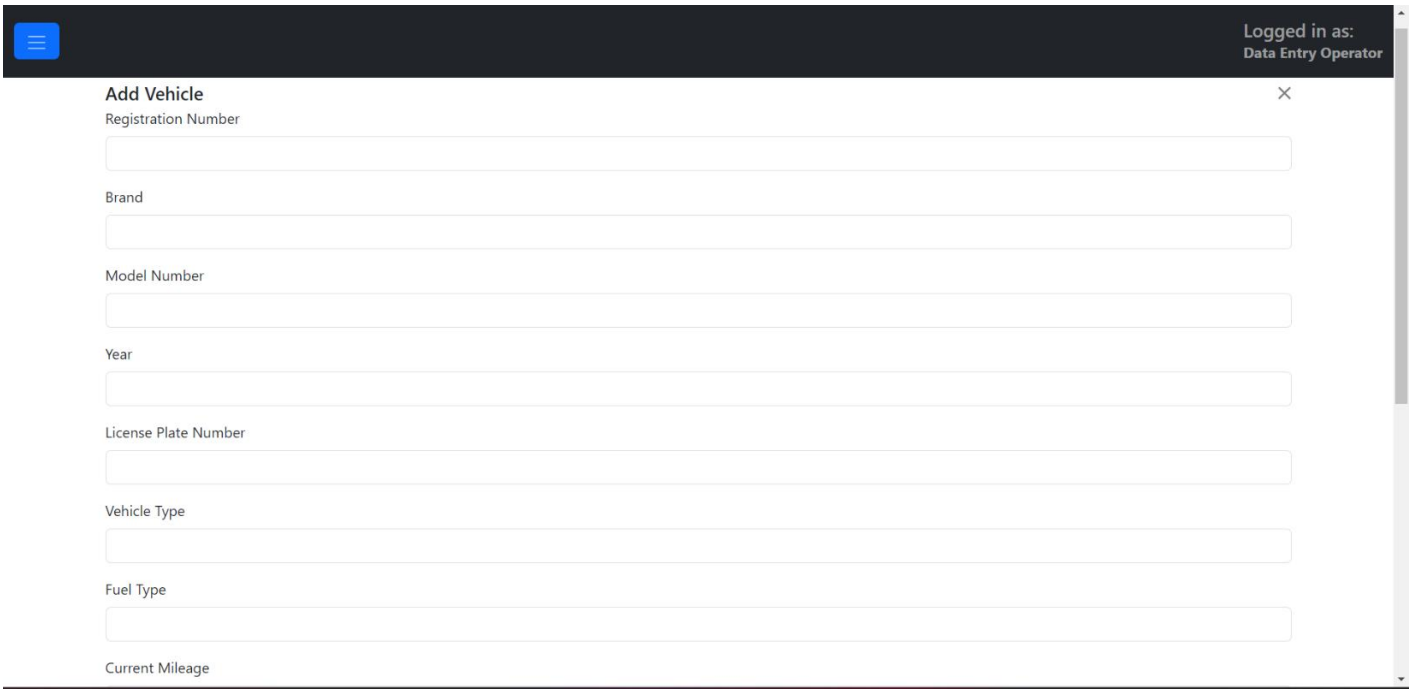
Description: This shows out the vehicle list which is already registered and allows to edit or delete data with relevant to them



Interface number: 06

Interface name: Add Vehicle

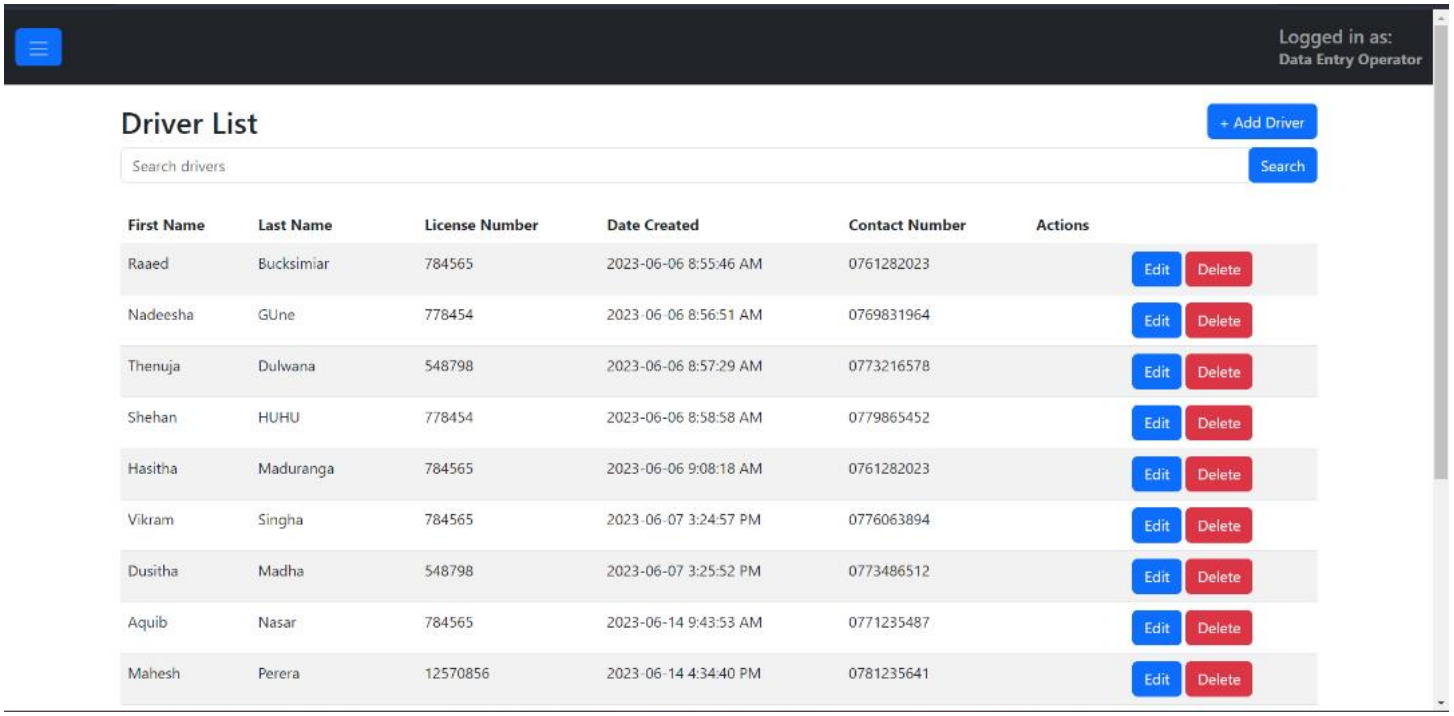
Description: This is used to add required data of a new vehicle to be registered in the system



Interface number: 07

Interface name: Driver List

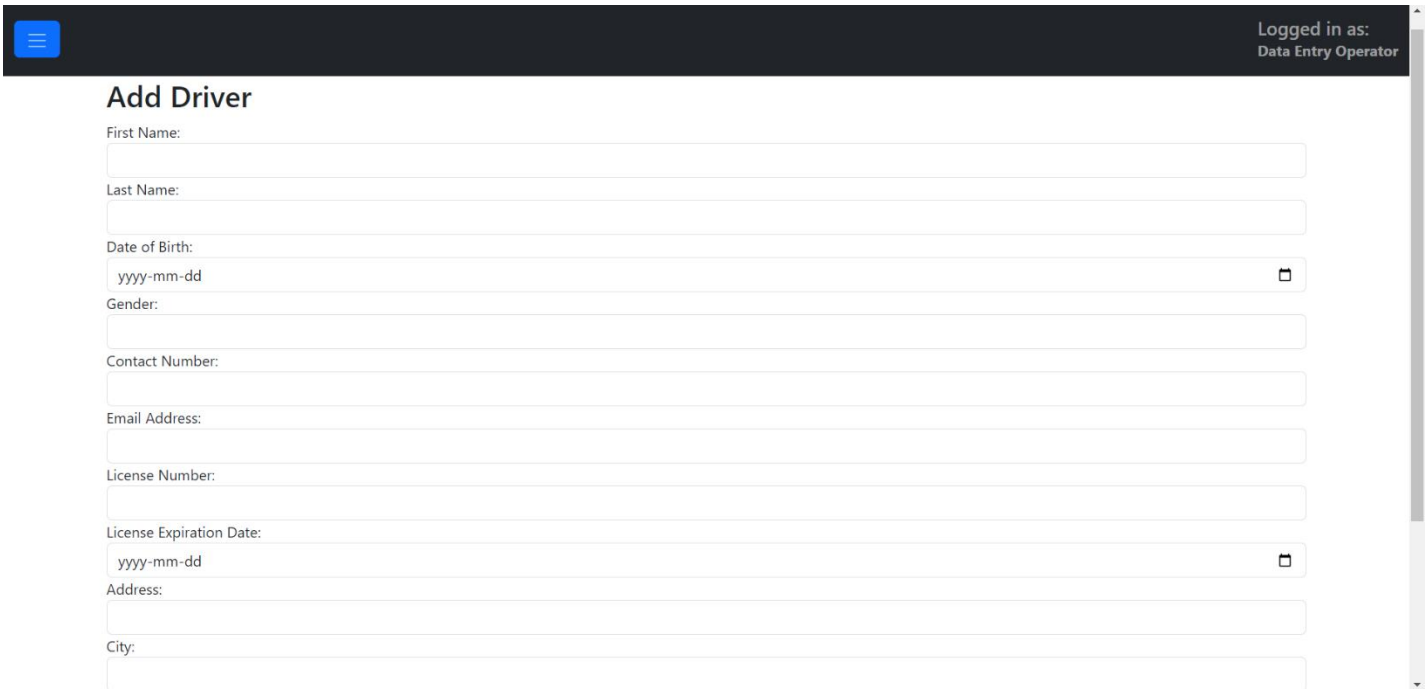
Description: This UI shows the data of the registered drivers and allows to Edit/Delete data relevant to them



Interface number: 08

Interface name: Add Driver

Description: This is used to add the details of a new driver once a new driver to be registered.



Interface number: 09

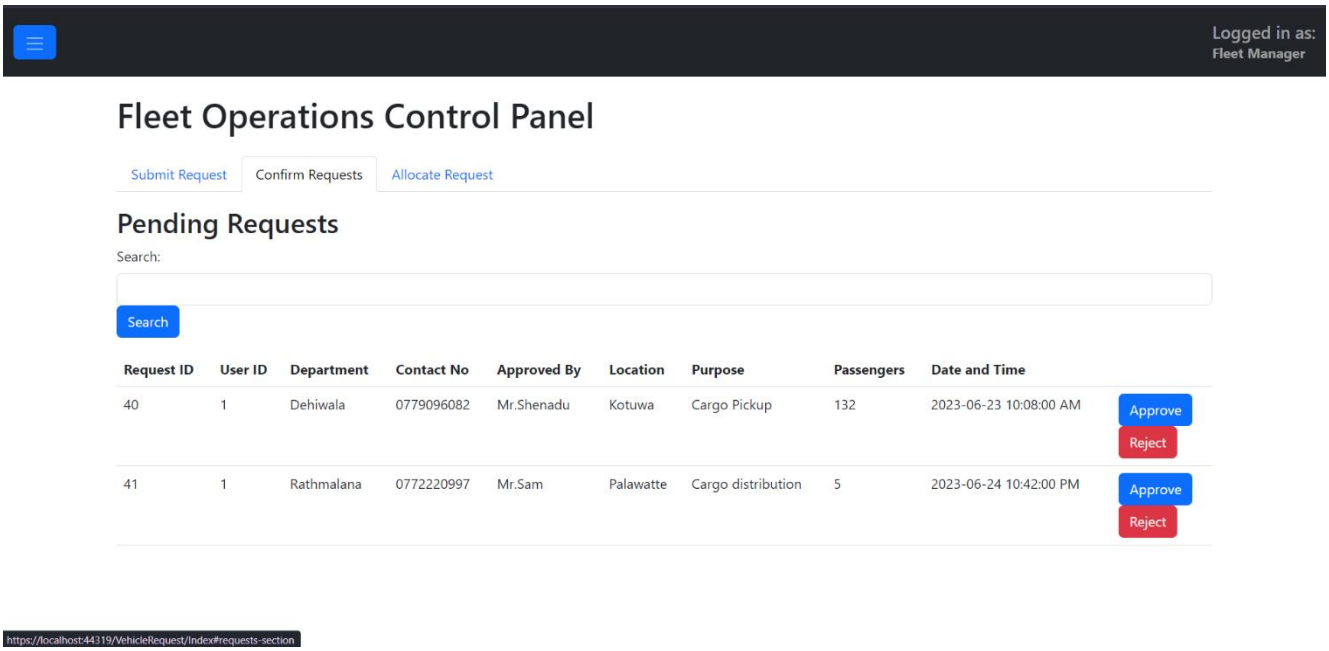
Interface name: Fleet Operation Control Panel Request Form

Description: This allows to create a vehicle request by Branch Manager.

Interface number: 10

Interface name: Fleet Operation Control Panel Pending Requests

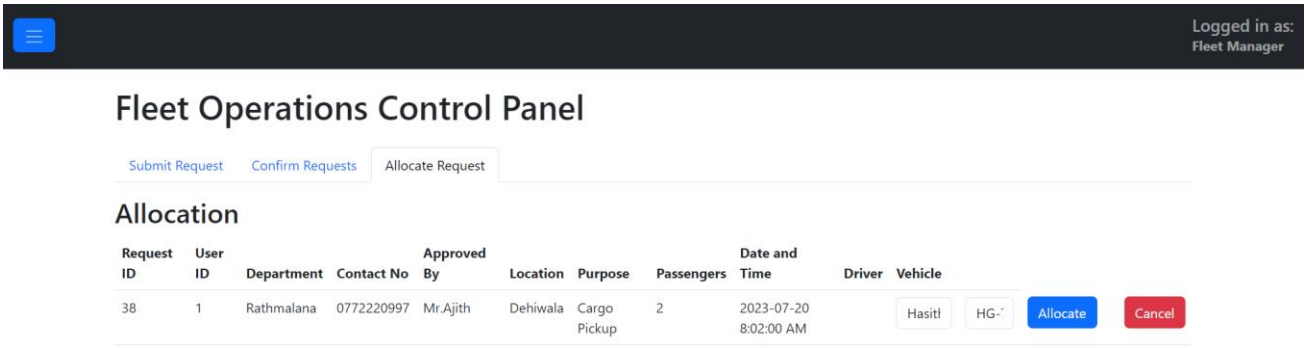
Description: This Interface allows to do the vehicle allocation and passed to the manager for approval or rejection.



Interface number: 11

Interface name: Fleet Operation Control Panel Allocation

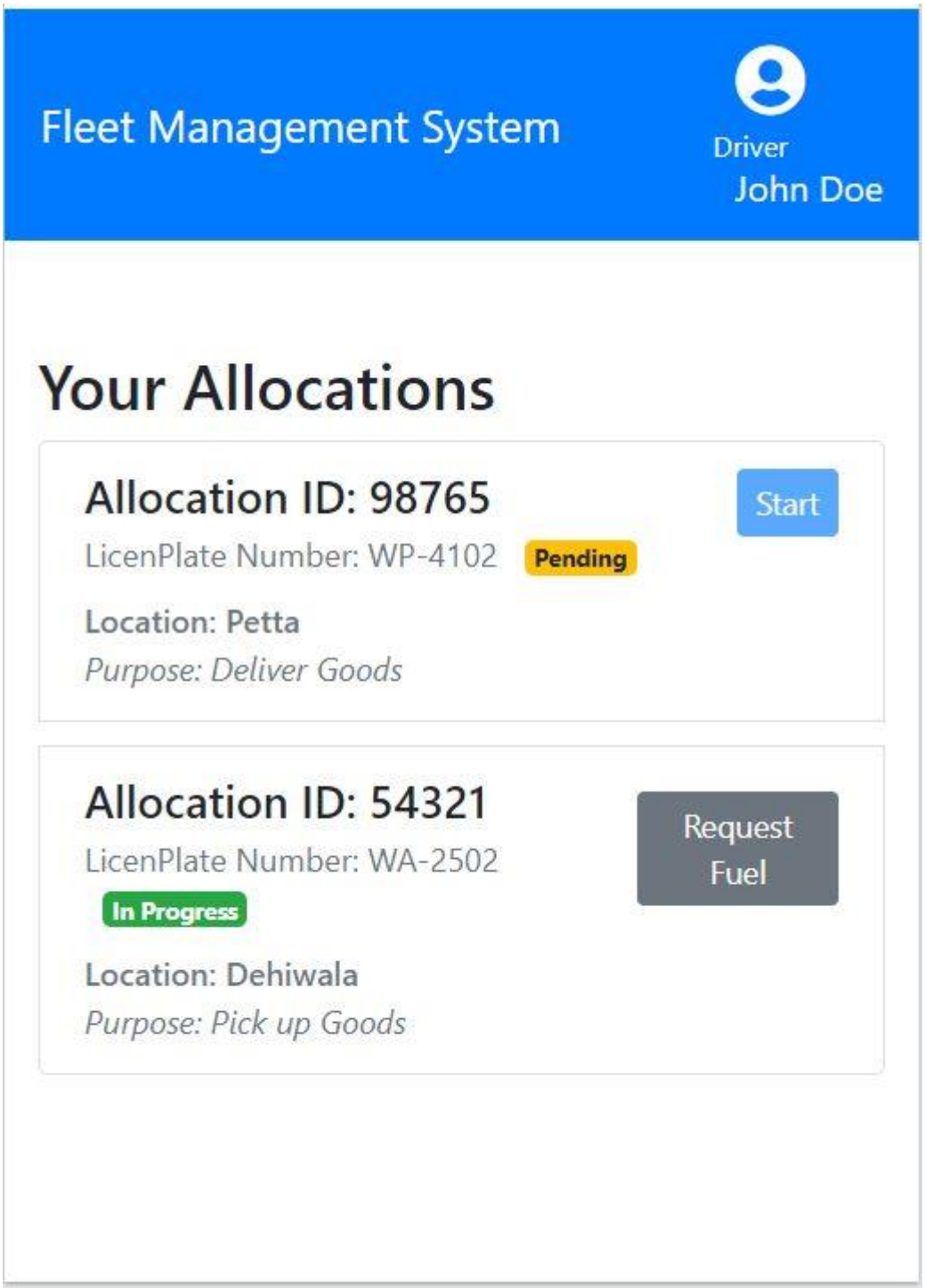
Description: Allows to finalize and approve the final stage of vehicle arrangement, send allocation approval to driver from here.



Interface number: 12

Interface name: Driver assignment

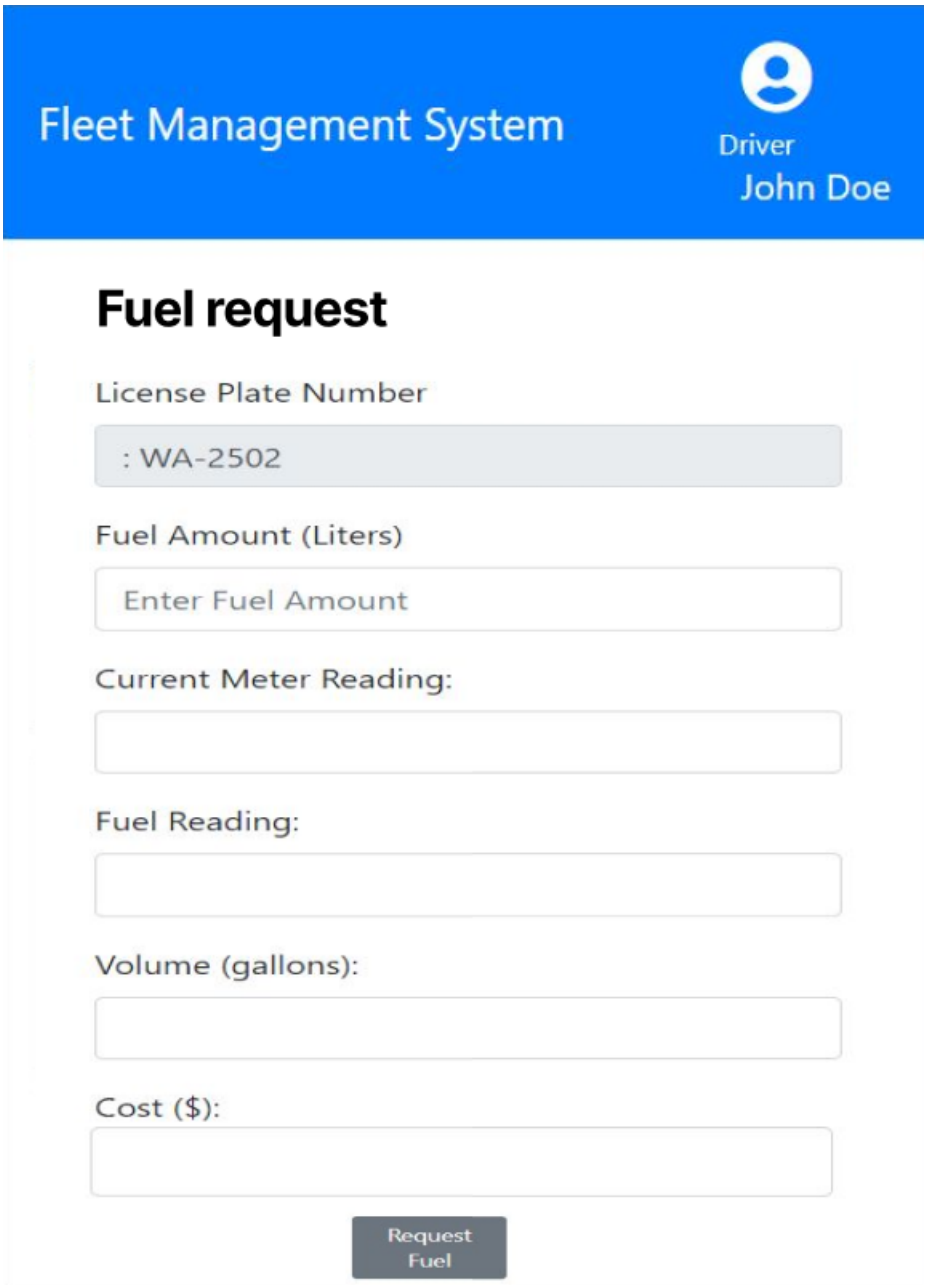
Description: Driver Can find his Allocation Details thorough this mobile UI.



Interface number: 13

Interface name: Fuel Request

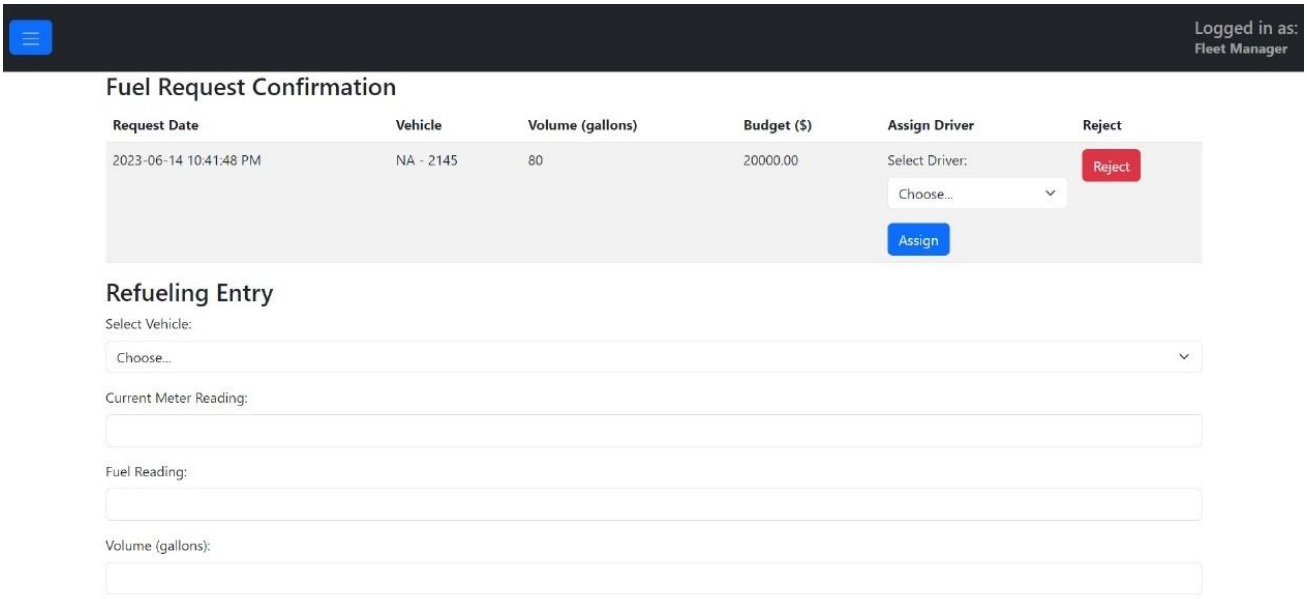
Description: Driver can check fuel in vehicle and send fuel request through this interface to the system.



Interface number: 14

Interface name: Fuel Request confirmation

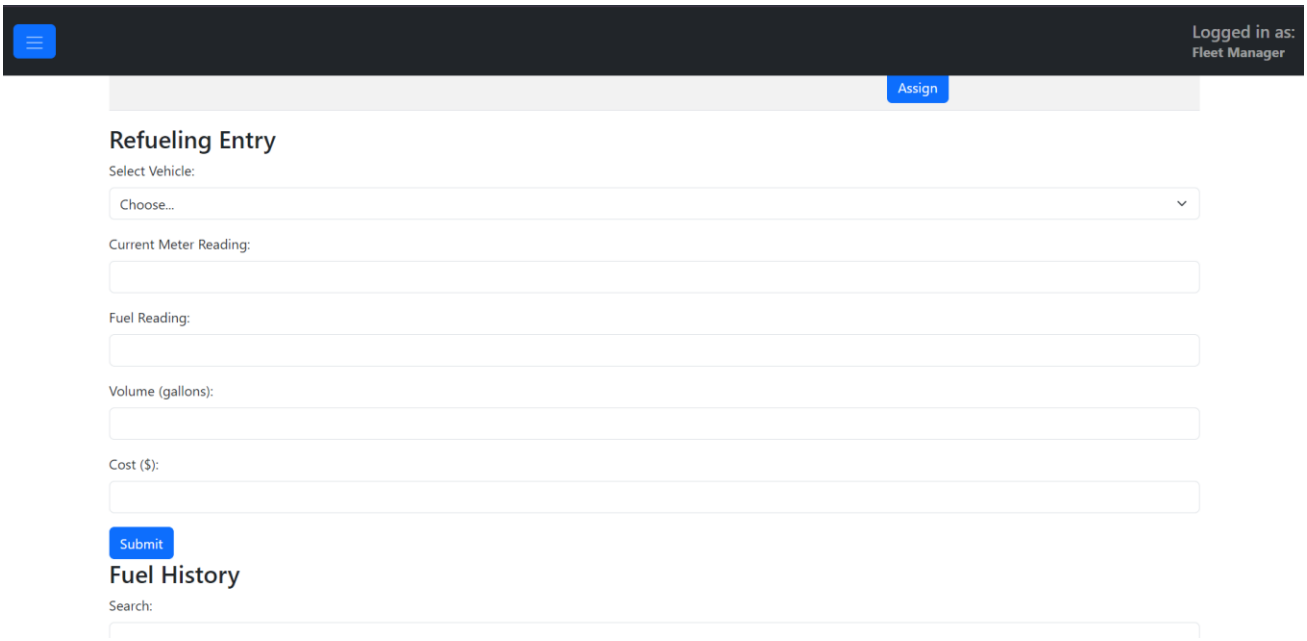
Description: Once driver send the request, can confirm or reject the requests in this UI.



Interface number: 15

Interface name: Refueling Entry

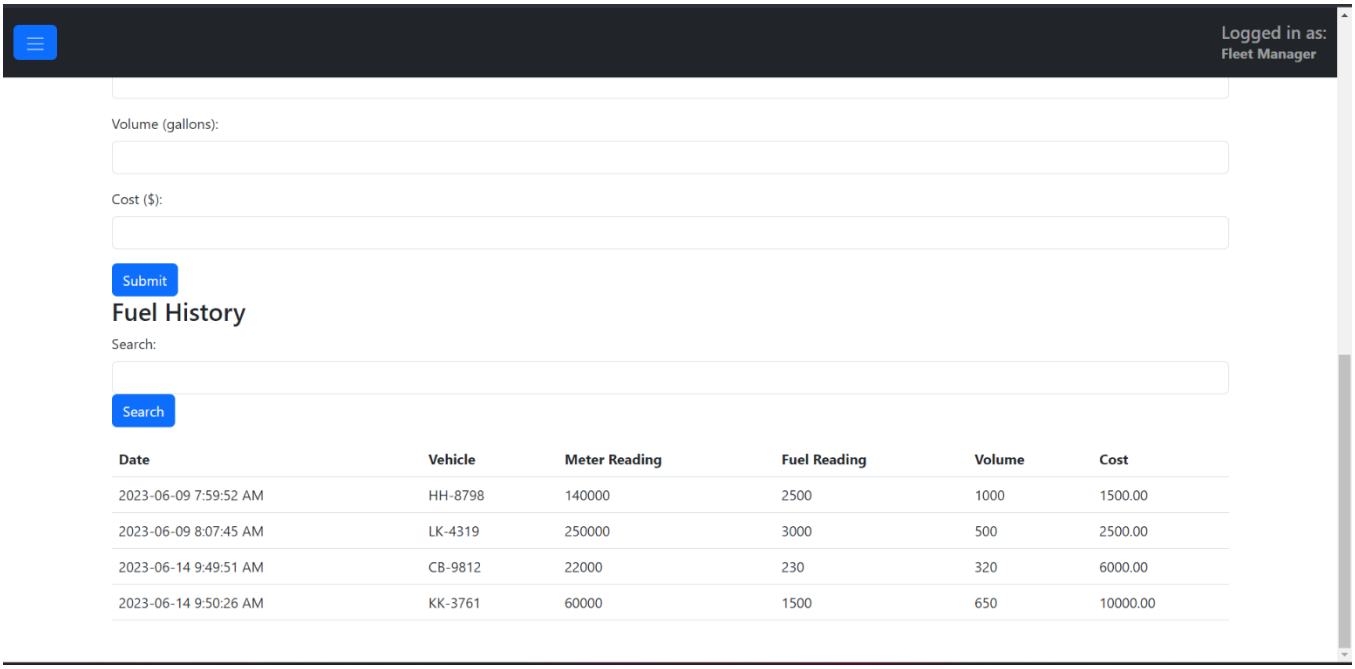
Description: Allows to enter the fuel pumping history of the vehicles



Interface number: 16

Interface name: Fuel History

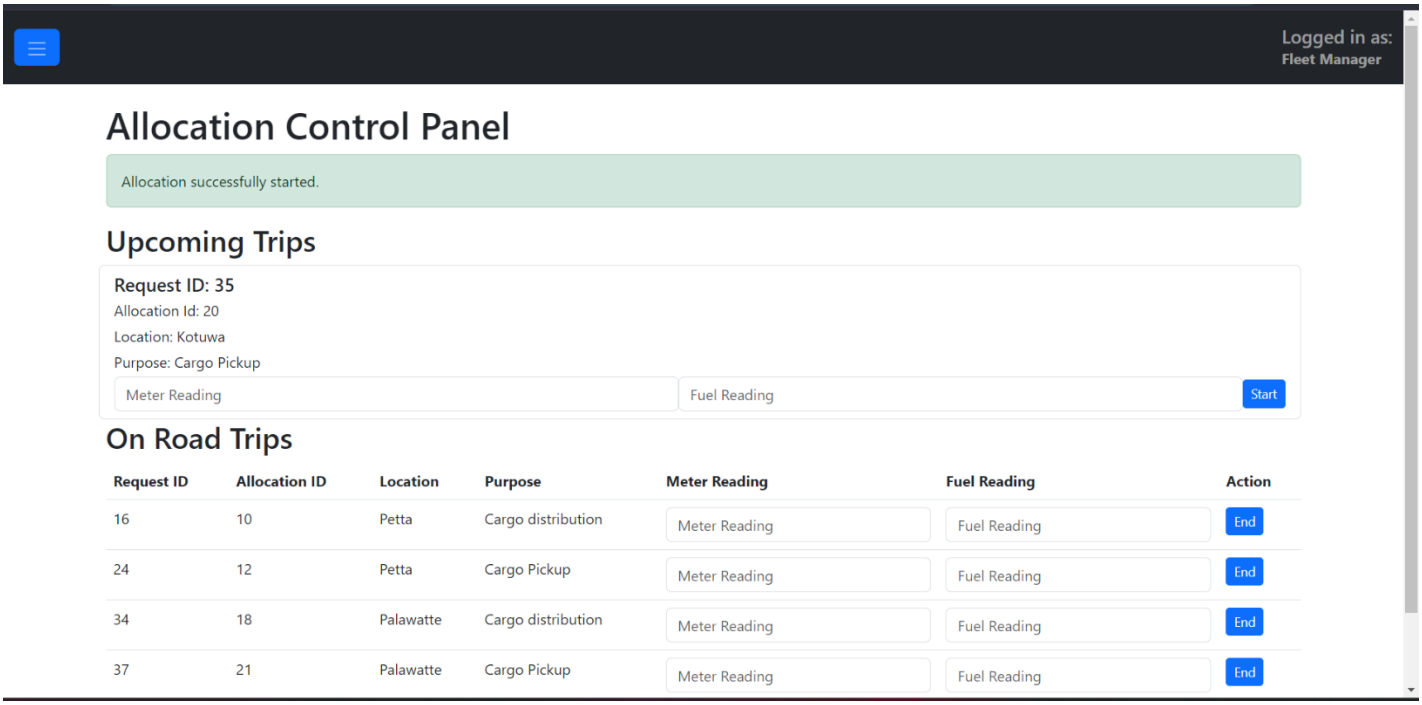
Description: This shows the fuel pumping summary of particular period for all the vehicles



Interface number: 17

Interface name: Allocation Control Panel

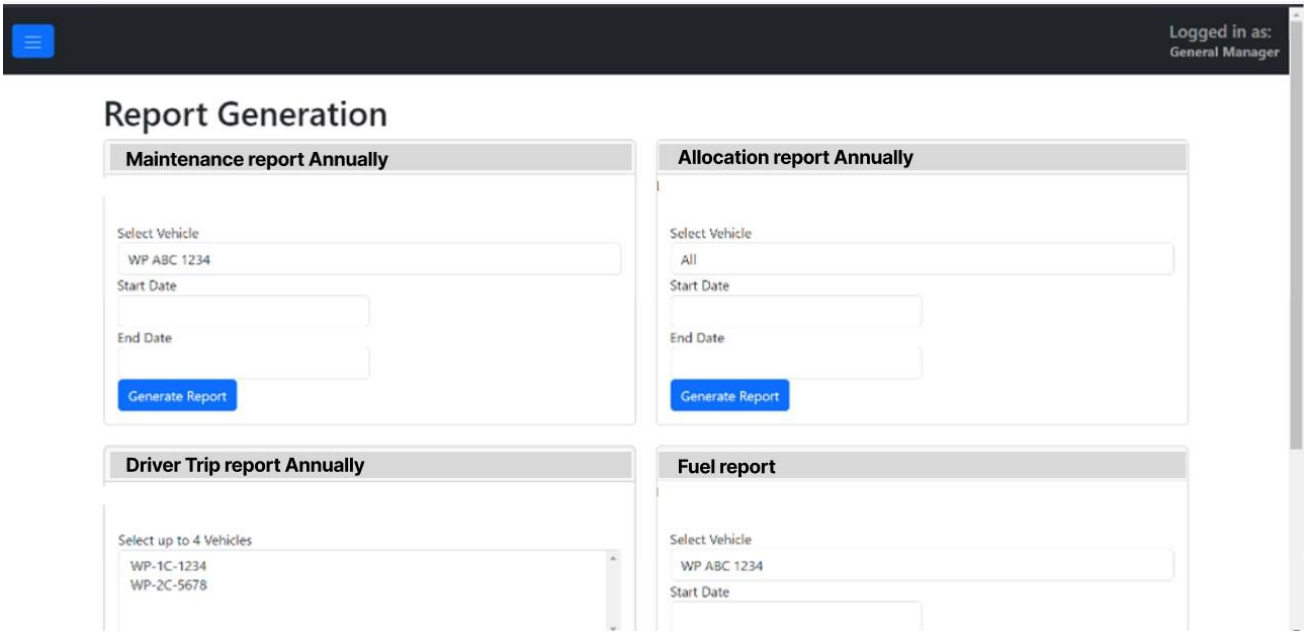
Description: This allows to enter ‘before start trip Meter reading’ & Fuel reading as allocation details also shows a summary of meter reading and Fuel Reading



Interface number: 18

Interface name: Report Generation

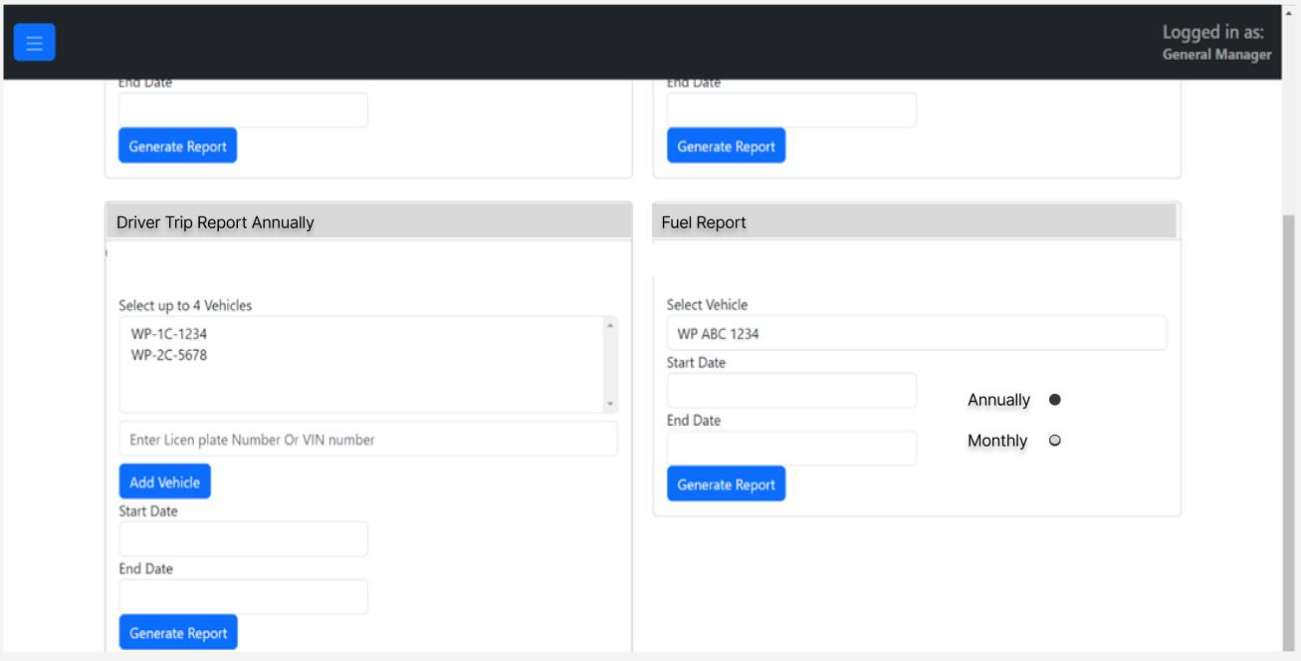
Description: Allows to generate reports under each category



Interface number: 19

Interface name: Report Generation

Description: Allows to generate reports under each category



## 4.3 Database design

**Table Number:** 1

**Table Name:** User

**Primary key:** Username

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| Username | Text | 20 | User name |
| password | Text | 20 | User password |
| email | Text | 125 | Email Address |
| Record size | 165 | | |

**Table Number:** 2

**Table Name:** GeneralManager

**Primary key:** UserId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| UserId | Number | 5 | User unique id |
| Record size | 5 | | |

**Table Number:** 3

**Table Name:** BranchManager

**Primary key:** UserId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| UserId | Number | 5 | User unique id |
| Record size | 5 | | |

**Table Number:** 4

**Table Name:** FleetManager

**Primary key:** UserId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| UserId | Number | 5 | User unique id |
| Record size | 5 | | |

**Table Number:** 5

**Table Name:** **DataEntryOperator**

**Primary key:** UserId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| UserId | Number | 5 | User unique id |
| Record size | 5 | | |

**Table Number:** 6

**Table Name:** Driver

**Primary key:** DriverId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| DriverId | Number | 5 | Driver unique id |
| FirstName | Text | 15 | Driver First Name |
| LastName | Text | 15 | Driver Last Name |
| DateOfBirth | Date | 4 | Driver Date of Birth |
| Gender | Text | 10 | Driver Gender |
| contactNumber | Number | 10 | Driver Contact Number |
| email | Text | 125 | Driver Email Address |
| LicenseNumber | Text | 10 | Driver License Number |
| LicenseExpirationDate | Date | 4 | Driver License Expiration Date |
| Address | Text | 50 | Driver Address |
| City | Text | 20 | Driver City |
| State | Text | 50 | Driver State |
| ZipCode | Number | 4 | Driver Zip Code |
| Country | Text | 20 | Driver Country |
| DateCreated | Date | 4 | Driver Date Created |
| Availability | Text | 1 | Driver Availability |
| Record size | 347 | | |

**Table Number:** 7

**Table Name:** Vehicle

**Primary key:** VehicleId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| VehicleId | Number | 5 | Vehicle unique id |
| RegistrationNumber | Number | 15 | Registration Number |
| Brand | Text | 25 | Vehicle Brand |
| Model | Text | 25 | Vehicle Model |
| Year | Number | 4 | Vehicle Year |
| LicensePlateNumber | Number | 10 | License Plate Number |
| VehicleType | Text | 25 | Vehicle Type |
| FuelType | Text | 10 | Fuel Type |
| CurrentMileage | Number | 25 | Current Mileage |
| OwnerName | Text | 50 | Owner Name |
| InsuranceProvider | Text | 50 | Insurance Provider |
| InsurancePolicyNumber | Number | 10 | Insurance Policy Number |
| PolicyExpirationDate | Date | 8 | Policy Expiration Date |
| FuelLevel | Number | 100 | Vehicle Fuel Level |
| Availability | Text | 1 | Vehicle Availability |
| Record size | 363 | | |

**Table Number:** 8

**Table Name:** vehicleRequest

**Primary key:** RequestId

**Foreign key:** VehicleId

**Foreign key:** UserId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| RequestId | Number | 5 | Request Id |
| VehicleId | Number | 5 | Vehicle Id |
| UserID | Number | 5 | User id |
| Department | Text | 20 | Department |
| ContactNo | Number | 10 | Contact No |
| ApprovedBy | Text | 20 | Approved By |
| Location | Text | 50 | Location |
| Purpose | Text | 50 | Request Purpose |
| Passengers | Number | 10 | Passengers |
| DateTime | Date | 12 | Request Date Time |
| Status | Text | 10 | Status |
| Record size | 197 | | |

**Table Number:** 9

**Table Name:** Allocation

**Primary key:** AllocationId

**Foreign key:** VehicleId

**Foreign key:** DriverId

**Foreign key:** UserId

**Foreign key:** RequestId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| AllocationId | Number | 5 | Allocation ID |
| VehicleId | Number | 5 | Vehicle No |
| DriverId | Number | 5 | Driver No |
| UserId | Number | 5 | User No |
| RequestId | Number | 5 | Request No |
| Note | Text | 50 | Allocation Note |
| DepartureDate | Date | 12 | Departure Date |
| MeterReadingStart | Number | 200 | Meter Reading Start |
| FuelAmountStart | Number | 100 | Fuel Amount Start |
| MeterReadingEnd | Number | 200 | Meter Reading End |
| EndTime | Text | 4 | End Time |
| FuelAmountEnd | Number | 5 | Fuel Amount End |
| Status | Text | 10 | Status |
| StartTime | Text | 4 | StartTime |
| Record size | | 131 | |

**Table Number:** 10

**Table Name:** VehicleMaintenance

**Primary key:** MaintenanceId

**Foreign key:** VehicleId

**Foreign key:** DriverId

**Foreign key:** InvoiceId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| MaintenanceId | Number | 5 | Maintenance Id |
| VehicleId | Number | 5 | Vehicle No |
| DriverId | Number | 5 | Driver No |
| InvoiceID | Number | 5 | Invoice No |
| Status | Text | 5 | Status |
| Type | Text | 20 | Maintenance Type |
| Detail | Text | 255 | Maintenance Detail |
| Cost | Number | 10 | Cost |
| FuelReading | Number | 5 | Fuel Reading |
| MeterReading | Number | 10 | Meter Reading |
| Record size | 320 | | |

**Table Number:** 11

**Table Name:** Invoice

**Primary key:** InvoiceId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| InvoiceId | Number | 5 | Image Id |
| InvoiceDetails | Text | 150 | Image Data |
| InvoiceImage | File | 255 | Image Data |
| cost | Text | 10 | Type |
| Record size | 420 | | |

**Table Number:** 12

**Table Name:** FuelRefilling

**Primary key:** FuelId

**Foreign key:** DriverId

**Foreign key:** VehicleId

**Foreign key:** InvoiceId

**Foreign key:** FuelRequestId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| FuelId | Number | 5 | Fuel ID |
| VehicleId | Number | 5 | Vehicle No |
| DriverId | Number | 5 | Driver No |
| InvoiceId | Number | 5 | invoice No |
| FuelRequestId | Number | 5 | Fuel Request Id |
| Status | Text | 5 | Status |
| Volume | Number | 5 | Volume |
| DateTime | Daate | 12 | Date Time |
| cost | Number | 10 | Cost |
| fuelReading | Number | 5 | Fuel Reading |
| meterReading | Number | 10 | Meter Reading |
| Record size | 72 | | |

**Table Number:** 13

**Table Name:** FuelRequest

**Primary key:** FuelRequestId

**Foreign key:** UserId

**Foreign key:** DriverId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| FuelRequestId | Number | 5 | Fuel Request Id |
| DriverId | Number | 5 | Driver Id |
| UserId | Number | 5 | User Id |
| Status | Text | 5 | Status |
| Volume | Number | 5 | Volume |
| fuelType | Text | 10 | Fuel Type |
| requestDate | Date | 12 | request Date Time |
| budget | Number | 10 | budget |
| Record size | 57 | | |

**Table Number:** 14

**Table Name:** Accident

**Primary key:** AccidentId

**Foreign key:** VehicleId

**Foreign key:** MaintenanceId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| AccidentId | Number | 5 | Accident Id |
| VehicleId | Number | 5 | Vehicle Id |
| MaintenanceId | Number | 5 | Maintenance Id |
| Type | Text | 150 | Type |
| Location | Text | 255 | Location |
| Date | Date | 4 | Date |
| insuranceClaimNumber | Number | 20 | Insurance Claim Number |
| policeReportNumber | Number | 20 | Police Report Number |
| damageDescription | Text | 200 | Damage Description |
| repairCost | Number | 50 | Repair Cost |
| Record size | 415 | | |

**Table Number:** 15

**Table Name:** Trip

**Primary key:** TripId

**Foreign key:** VehicleId

**Foreign key:** AllocationId

**Foreign key:** RouteId

**Foreign key:** DriverId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| TripId | Number | 5 | Trip Id |
| RouteId | Number | 5 | Route Id |
| VehicleId | Number | 5 | Vehicle Id |
| DriverId | Number | 5 | Driver Id |
| AllocationId | Number | 5 | Allocation Id |
| status | Text | 100 | Trip Status |
| endTime | Number | 5 | Trip End Time |
| startTime | Number | 5 | Trip Start Time |
| Record size | 135 | | |

**Table Number:** 16

**Table Name:** **Route**

**Primary key:** RouteId

| Field Name | Data Type | Data Size | Description |
|---|---|---|---|
| RouteId | Number | 5 | Route Id |
| RouteName | Text | 50 | Route Name |
| Latitude | Number | 5 | Latitude |
| LongLatitude | Number | 5 | Long Latitude |
| RouteDescription | Text | 255 | Route Description |
| Record size | 320 | | |

## 4.4 Report layout design

Report layout number: 1

Report layout name: Fuel Summery Report Annually & monthly

Description: Gives a detailed summary of individual fuel consumption behavior for all vehicles

Fuel Monthly report

# Vehicle Fuel Report Monthly

**Vehicle Information**

| VEHICLE IDENTIFICATION NUMBER (VIN#) | | ENGINE NUMBER (if applicable) | LICENSE PLATE # |
|---|---|---|---|
| JALFXH12RKH123456 | | 3.0L Diesel | WP ABC 1234 |
| YEAR | MAKE | MODEL | Fleet Id |
| 2015 | Isuzu | N-Series | #23 |
| ODOMETER READING (**Miles**) | | Start-Date | End-Date |
| **75,345** | | **May 28, 2024** | **June 28, 2024** |

| Date dd/mm/yyyy | Odometer (total) km | Filled volume L | Fuel price LKR/L | 100% filled? | Accumulated km | Refill cost LKR | Cost of the km LKR/km |
|---|---|---|---|---|---|---|---|
| 28-5-2024 | 72,000 | 20 | 320.00 | Yes | | 6,400.00 | |
| 29-5-2024 | 72,300 | 30 | 320.00 | No | 300 | 9,600.00 | 32.00 |
| 30-5-2024 | 72,800 | 30 | 320.00 | No | 800 | 9,600.00 | 12.00 |
| 31-5-2024 | 72,950 | 30 | 325.00 | No | 950 | 9,750.00 | 10.26 |
| 1-6-2024 | 73,200 | 30 | 325.00 | No | 1,200 | 9,750.00 | 8.13 |
| 2-6-2024 | 73,500 | 30 | 325.00 | Yes | 1,500 | 9,750.00 | 6.50 |
| 3-6-2024 | 73,800 | 29 | 322.00 | Yes | 300 | 9,338.00 | 31.13 |
| 4-6-2024 | 74,100 | 25 | 322.00 | No | 300 | 8,050.00 | 26.83 |
| 10-6-2024 | 74,400 | 32 | 322.00 | Yes | 600 | 10,304.00 | 17.17 |
| 13-6-2024 | 74,700 | 24 | 321.00 | Yes | 300 | 7,704.00 | 25.68 |
| 17-6-2024 | 75,000 | 32 | 321.00 | No | 300 | 10,272.00 | 34.24 |
| 18-6-2024 | 75,300 | 31 | 323.00 | Yes | 600 | 10,013.00 | 16.69 |
| 25-6-2024 | 75,600 | 25 | 350.00 | Yes | 300 | 8,750.00 | 29.17 |
| **Total** | 959,650 | 368 | 4,216.00 | | 7,450 | 119,281.00 | 16.01 |

| Statistics | | General |
|---|---|---|
| Average consumption | km/L | 4.9 |
| Average km cost | LKR/km | 21 |
| Total refills done | | 13 |

Fuel Annual Report

# Vehicle Fuel Report Annually

## Vehicle Information

| VEHICLE IDENTIFICATION NUMBER (VIN#) | | ENGINE NUMBER (if applicable) | LICENSE PLATE # |
|---|---|---|---|
| JALFXH12RKH123456 | | 3.0L Diesel | WP ABC 1234 |
| YEAR<br>2015 | MAKE<br>Isuzu | MODEL<br>N-Series | Fleet Id<br>#23 |
| ODOMETER READING (**Miles**)<br>**75,345** | | Start-Date<br>**May 28, 2023** | End-Date<br>**June 9, 2024** |

| Date<br>dd/mm/yyyy | Odometer (total)<br>km | Filled volume<br>L | Fuel price<br>LKR/L | 100% filled? | Accumulated<br>km | Refill cost<br>LKR | Cost of the km<br>LKR/km |
|---|---|---|---|---|---|---|---|
| 28-5-2024 | 72,000 | 20 | 320.00 | Yes | | 6,400.00 | |
| 29-5-2024 | 72,300 | 30 | 320.00 | No | 300 | 9,600.00 | 32.00 |
| 30-5-2024 | 72,800 | 30 | 320.00 | No | 800 | 9,600.00 | 12.00 |
| 31-5-2024 | 72,950 | 30 | 325.00 | No | 950 | 9,750.00 | 10.26 |
| 1-6-2024 | 73,200 | 30 | 325.00 | No | 1,200 | 9,750.00 | 8.13 |
| 2-6-2024 | 73,500 | 30 | 325.00 | Yes | 1,500 | 9,750.00 | 6.50 |
| 3-6-2024 | 73,800 | 29 | 322.00 | Yes | 300 | 9,338.00 | 31.13 |
| 4-6-2024 | 74,100 | 25 | 322.00 | No | 300 | 8,050.00 | 26.83 |
| 5-6-2024 | 74,400 | 32 | 322.00 | Yes | 600 | 10,304.00 | 17.17 |
| 6-6-2024 | 74,700 | 24 | 321.00 | Yes | 300 | 7,704.00 | 25.68 |
| 7-6-2024 | 75,000 | 32 | 321.00 | No | 300 | 10,272.00 | 34.24 |
| 8-6-2024 | 75,300 | 31 | 323.00 | Yes | 600 | 10,013.00 | 16.69 |
| 9-6-2024 | 75,600 | 25 | 350.00 | Yes | 300 | 8,750.00 | 29.17 |
| **Total** | 959,650 | 368 | 4,216.00 | | 7,450 | 119,281.00 | 16.01 |

| Statistics | | General |
|---|---|---|
| Average consumption | km/L | 4.9 |
| Average km cost | LKR/km | 21 |
| Total refills done | | 13 |

Report layout number: 2

Report layout name: Allocation Report Annually

Description: Shows an individual summery of the vehicle allocation for the year

# Vehicle Allocation Report Annually

**Vehicle Information**

| VEHICLE IDENTIFICATION NUMBER (VIN#) | | ENGINE NUMBER (if applicable) | LICENSE PLATE # |
|---|---|---|---|
| JALFXH12RKH123456 | | 3.0L Diesel | WP ABC 1234 |
| YEAR<br>2015 | MAKE<br>Isuzu | MODEL<br>N-Series | Fleet Id<br>#23 |
| ODOMETER READING (**Miles**)<br>**75,345** | | Start-Date<br>**May 28, 2023** | End-Date<br>**June 9, 2024** |

| Date | Journey | | Odometer reading | | | Reason for trip |
|---|---|---|---|---|---|---|
| | From | To | Start | Finish | Dist.(km) | |
| 2023-10-15 | Borella | Moratuwa | 56764 | 56870 | 106 | Business Trip |
| 2023-10-16 | Dehiwala | Petta | 56789 | 56890 | 62 | Dilivery |
| 2024-10-17 | Petta | Batharamulla | 56814 | 56910 | 18 | Cargo Pickup |
| 2024-10-18 | Malabe | Batharamulla | 56839 | 56930 | 26 | Diliivery |
| 2024-10-19 | Kottawa | Dehiwala | 56864 | 56950 | 70 | Dilivery |
| 2024-10-20 | Piliyandala | Dehiwala | 56889 | 56970 | 114 | Maintenance |
| | | | | | | |

Report layout number: 3

Report layout name: Driver services Summery report Annually

Description: Gives a summary of individual driver on their Trips

# Driver Trip Report Annually

| DRIVER NAME | LICENCE NO | | LICENCE EXP DATE |
|---|---|---|---|
| **SAMPATH PATHUM** | **84933946589** | | **2024/06/29** |
| DRIVER ADDRESS | CONTACT NO | GENDER | DATE OF BIRTH |
| **53A new Jyaweera Mawatha Ethull Kotte** | **0779096082** | **MALE** | **1995/02/15** |

Trips Taken

| Date | Trip ID | Startin Location | Ending Location | Distance (Miles) |
|---|---|---|---|---|
| 2024-10-15 | 112 | Dehiwala | Rathmalana | 250 |
| 2024-10-16 | 152 | Borella | Port | 321 |
| 2024-10-17 | 153 | Petta | Piliandala | 199 |
| 2024-10-18 | 155 | Dehiwala | Borella | 220 |

Refueling

| Date | Trip ID | Fuel Location | Gallons | Invoice ID |
|---|---|---|---|---|
| 2024-10-15 | 152 | Borella | 15 | 23 |
| 2024-10-16 | 155 | Katubedda | 10 | 25 |
| 2024-10-17 | 160 | Rajagiriya | 16 | 43 |

Maintenance Trips

| Date | Trip ID | Maintenance Details | Garage name | Cost (LKR) |
|---|---|---|---|---|
| 2024-10-15 | 123 | Oil Change | Sampath Garage | 5000 |
| 2024-10-16 | 162 | Brake Fluid Change | Sampath Garage | 2500 |
| 2024-10-17 | | | | |

Report layout number: 4

Report layout name: Vehicle Maintenance Report

Description: Generates a summary of a Vehicle Maintenances for the Year

# Vehicle Maintenance Report Annually

**Vehicle Information**

| VEHICLE IDENTIFICATION NUMBER (VIN#) | | ENGINE NUMBER (if applicable) | LICENSE PLATE # |
|---|---|---|---|
| JALFXH12RKH123456 | | 3.0L Diesel | WP ABC 1234 |
| YEAR | MAKE | MODEL | Fleet Id |
| 2015 | Isuzu | N-Series | #23 |
| ODOMETER READING (**Miles**) | | Start-Date | End-Date |
| **75,345** | | **May 28, 2023** | **June 9, 2024** |

| Date of Service | Mileage at Service | Work Performed and Service Schedule | Performed By | Invoice / Receipt # | Cost |
|---|---|---|---|---|---|
| 28/5/2023 | 8,755 | STARTER MOTOR REPAIR /REPAIR CHARGED/CLUTCH CABLE/GAS CUT/PACKING SET/ | EDRISINGHE MOTORS | 4 | 37,800.00 |
| 29/5/2023 | 17,339 | POWER STEERING HOSE CHANGED/REPAIR CHARGED | WELCOME HYDRAULIC | 12 | 37,800.00 |
| 30/5/2024 | 20,611 | 01 PATCH | RAVINDRA LANKA | 32 | 37,800.00 |
| 31/5/2024 | 30,000 | FULL SERVICE/OIL FILTER CHANGED | DEHIWALA AUTO CARE | 45 | 37,800.00 |
| 1/6/2024 | 40,000 | FULL SERVICE/BOOT 01/HAND BREAK OUTER CHANGED | SARATHCHANDRA SERVICE | 46 | 37,800.00 |
| 2/6/2024 | 45,000 | 02 TYRE CHANGED | RAVINDRA LANKA | 48 | 37,800.00 |
| 3/6/2024 | 50,000 | 01 TYRE CHANGED | RAVINDRA LANKA | 50 | 96,600.00 |
| 4/6/2024 | 60,000 | 04 TYRE REPLACEMENT WORK | RAVINDRA LANKA | 51 | 98,700.00 |
| 5/6/2024 | 61,654 | FULL SERVICE/OI FILTER CHANGED | DEHIWALA AUTO CARE | 52 | 100,800.00 |
| 6/6/2024 | 65,321 | WHEEL ALIGHMENT WORK | CAR CARE | 53 | 102,900.00 |
| 7/6/2024 | 67,556 | BREAK REAIR WORK DONE | SHASHIKALA MOTORS | 54 | 105,000.00 |
| 8/6/2024 | 71,654 | FULL SERVICE | SARATHCHANDRA SERVICE | 60 | 107,100.00 |
| 9/6/2024 | 72,645 | BREAK MASTER PUMP/UNIVERSAL JOINT/RADIATOR WATER REPAIR WORK | TOYOTA LANKA | 67 | 109,200.00 |
| | | | Total Cost: | | 947100 |

## Chapter 5: Conclusion

In conclusion, the development and implementation of the fleet management system for NOLIMIT have been successfully accomplished. This final chapter provides an overview of the key findings, achievements, and future implications of the project.

Throughout the project, a comprehensive analysis of the organization's fleet management needs was conducted, identifying the existing challenges and requirements. This analysis served as the foundation for designing and developing a customized solution tailored to address these specific needs. The proposed fleet management system offers a range of features and functionalities that streamline operations, enhance efficiency, and improve decision-making within the organization.

The successful implementation of the system has yielded several significant benefits. The automation of various tasks, such as vehicle tracking, route optimization, and maintenance scheduling, has resulted in improved productivity and cost savings. Real-time monitoring and reporting capabilities have facilitated better resource allocation and utilization. The system's intuitive user interface and user-friendly features have enhanced the user experience and minimized the learning curve for employees.

Moreover, the fleet management system has also contributed to the overall safety and security of the organization's fleet. The integration of GPS tracking and real-time monitoring has enabled proactive measures to mitigate risks, prevent theft, and ensure timely response in case of emergencies. The system's data analytics capabilities have provided valuable insights for strategic decision-making, such as optimizing fleet size, identifying fuel-efficient routes, and planning maintenance schedules.

Continuous monitoring and evaluation of the system's performance will enable ongoing improvements and fine-tuning. Integration with other organizational systems, such as inventory management and customer relationship management, can create a more comprehensive and interconnected ecosystem.

The successful completion of this project is a result of the collective effort, dedication, and collaboration of the project team, stakeholders, and the support received from NOLIMIT. The insights gained from this project can serve as a valuable reference for similar organizations seeking to implement a robust and efficient fleet management system.

Overall, the fleet management system has demonstrated its effectiveness in improving operations, enhancing efficiency, and optimizing resource utilization. It marks a significant milestone for NOLIMIT, enabling them to navigate the complexities of fleet management with ease and excellence.

## References

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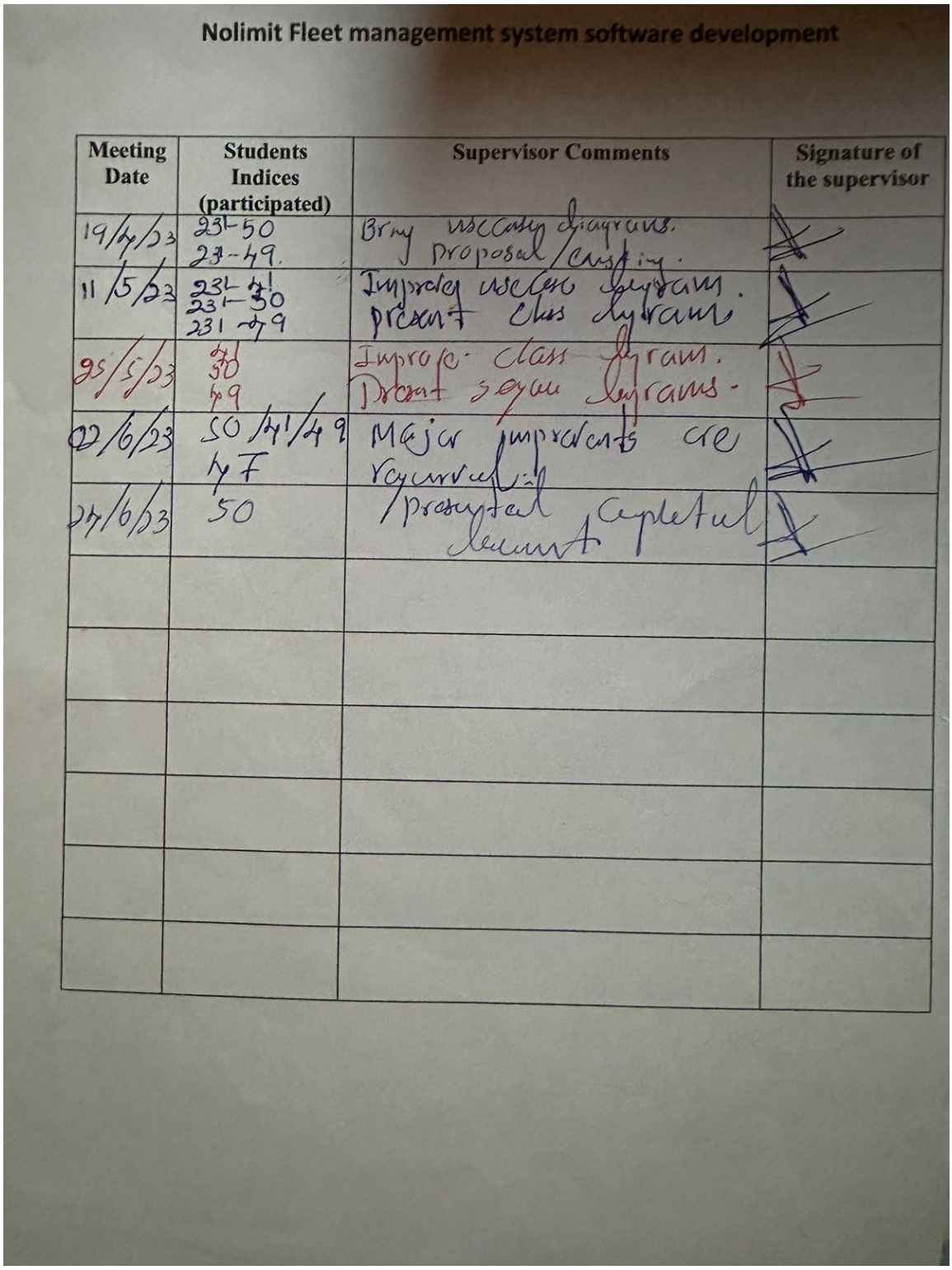
# Appendix



**Nolimit Fleet management system software development**

| Meeting Date | Students Indices (participated) | Supervisor Comments | Signature of the supervisor |
|---|---|---|---|
| 19/4/23 | 231-50<br>23?-49. | Bring usecase diagrams.<br>Proposal/Crafting. | |
| 11/5/23 | 231-41<br>231-50<br>231-49 | Improve usecase diagram.<br>Present class diagram. | |
| 25/5/23 | 41<br>50<br>49 | Improve class diagram.<br>Draw sequence diagrams. | |
| 22/6/23 | 50/41/49<br>4F | Major improvements are required. | |
| 24/6/23 | 50 | Presented Completed document | |
| | | | |
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