DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Faculty of Technology and Engineering

The Maharaja Sayajirao University of Baroda

Vadodara

As a Partial Fulfillment Towards the Degree of

"Master of Computer Applications / Bachelor in Engineering (CSE)"

A Project Report on

FLEET MANAGEMENT

Submitted By:

Tandel Yograj 613028

CERTIFICATE

This is to certify that **Tandel Yograj** Seat Number **613028** have successfully completed final year project entitled, Fleet Management and have submitted the project report for the degree of Master of Computer Science in Department of Computer Science and Engineering of The Maharaja Sayajirao University of Baroda.

This is the record of their own work carried under my supervision and guidance. The matters embodied in this project, to the best of my knowledge, have not been submitted earlier for any award of any other degree, diploma or fellowship of any University.

Head
Department of Computer Science and Engineering Faculty of Technology and Engineering
The Maharaja Sayajirao University of Baroda Vadodara

_____
Project Guide
Department of Computer Science and Engineering Faculty of Technology and Engineering
The Maharaja Sayajirao University of Baroda Vadodara

ACKNOWLEDGEMENT

I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them.

I am highly indebted to Shreya Thakkar, Nikunj Ladva, Harshad Modi(CTO) for their guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in developing the project.

I would like to express my gratitude towards my parents & member of Odoo India for their kind co-operation and encouragement which help me in completion of this project.
I would like to express my special gratitude and thanks to industry persons for giving me such attention and time.

My thanks and appreciations also go to my colleague in developing the project and people who have willingly helped me out with their abilities.

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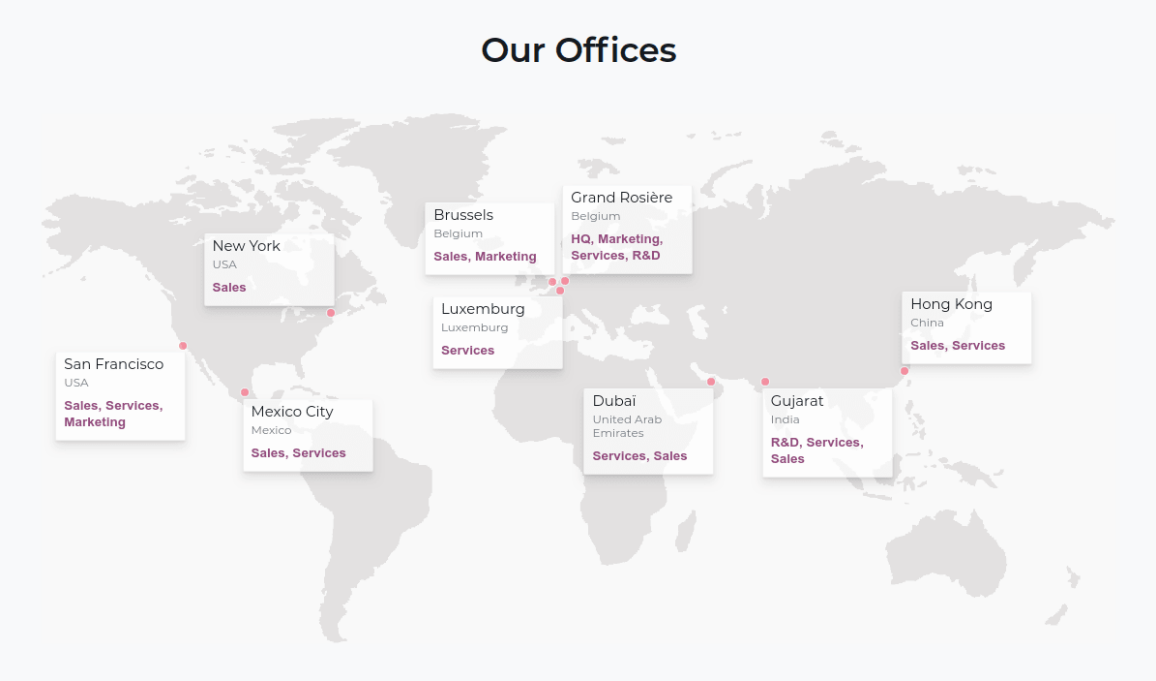
1. Company Profile

Name: Odoo India (Tiny ERP Pvt Ltd.)
Description: Odoo is business management software including CRM, e-commerce, billing, accounting, manufacturing, warehouse, project management, and inventory management.

Employees: 850+
Partners: 2550
Users: 4.5 million
Awards:

- 2010 INSEAD Young Innovator Award
- 2012 Highest-ranked Belgian company in the Deloitte Technology Fast50 Benelux (growth of 1,549% in the past 5 years)
- 2012 Bossie Award for the Best Open Source Solution
- 2013 Trends Gazelles Award
- 2013 Linux New Media Award for The Best Open Source solution compatible with European Accounting Systems
- 2013 Bossie Award for the Best Open Source Solution
- 2013 L'Entreprise Prometteuse by Ernst & Young
- 2015 Bossie Award for the Best Open Source Solution
- 2015 Fabien Pinckaers is elected "Top Manager of the year" by Le Soir
- 2018 Trends Gazelle Award - SME category



6. Introduction

Managing a fleet of vehicles is a challenging task, especially with rising fuel and maintenance costs, concerns about driver and passenger safety, and the need to deliver excellent customer service. Helping fleet operators address these areas, evolving technology, and the rise of connected vehicles provide new opportunities to improve fleet performance and customer satisfaction.

Nowadays, operating a fleet encompasses the management of vehicles, routes, and workers using a variety of technologies, including vehicle tracking, telematics. Making this easier, advanced fleet management systems allow fuel economy, driver behavior, and other things to be closely monitored by gathering useful data, such as mileage and fuel consumption.

i. Purpose

Purpose of this document is to describe various requirements for the Fleet-Management App.

It describes various paths for fulfilling the requirement and details for various assumptions taken.

The purpose of the Fleet management system is to ease Transports or vehicle Rental business and to manage cost, keep watch on vehicle and driver.

ii. Scope

- User Management
- Vehicle Management
- Driver Management
- Cost Management
- Contract Management
- Odometer Management
- Trip Management

iii. Objective

Develop fleet management system within 6 month which is easy to use, has user friendly UI and help to run business in effective manner.

7. Technology Used

7.1 Frontend Technology

- XML
- JAVASCRIPT
- CSS
- BOOTSTRAP

7.2 Backend Technology

- PYTHON
- XML

7.3 Server

- Odoo

7.4 Framework

- Odoo

8. Literature Review

While assigning project CTO told me to do research on fleet management and possible features of it. I researched it and propose the feature describe content. But first company want me to develop basic fleet management with feature like cost management, vehicle management, contract management etc and then develop advance feature.

Fleet management software is a standalone app or a cloud product that helps businesses maintain optimal use of their work vehicles from a central platform. Besides the software, fleet management involves the use of a telematics unit (which we discuss further) with a human interface device.

FMS allows for tracking a large number of a vehicle's data: speed, temperature, engine block, fuel level, door opening, geographical location, route direction, etc. Received from a vehicle's sensors, this data is displayed to the manager who can track all their vehicles in real time, determine when they'll get to the destination, and how well the vehicles are handled by the drivers.

Using dedicated software for managing fleet brings multiple benefits to the table:

- automates tasks (e.g. proper routing)
- streamlines associated processes (e.g. Vehicle maintenance)
- provides real-time insights for better management of both drivers and vehicles
- connects vehicles
- ensures smart transportation
- enhances driver safety
- guarantees consistent fleet performance
- reduces costs

Main modules of fleet management software:

- **Routing** – helps make logistics decisions based on vehicle GPS position, duration of stops, speed, etc.
- **Fuel management** – tracks fuel consumption tendencies to minimize idling time, emissions, and more.
- **Vehicle maintenance** – streamlines the process of diagnosing and inspecting, reminds of routine checkups.
- **Drivers management** – stores personal profiles and hours of service to analyze productivity and behavior.
- **Shipment management** – analyzes expenses, quotes, licenses and more to optimize delivery, dispatch, and cargo placement.
- **Security and safety features** – assist drivers with any safety issues on the road.

Routing

Asset tracking- Installed in the dashboard, a GPS locator beacon allows fleet managers to track and study the vehicles in the fleet.

Tracking can be active, pinpointing a live vehicle's whereabouts, and passive, capturing the ride data for further analysis – such as route optimization, driving speed, idling tendencies, etc.

Geofencing- This feature provides various notifications on the vehicle's whereabouts: when the vehicles depart, when it leaves pre-defined boundaries.

Route planning and optimization- Route optimization functionality plans efficient routes by determining the shortest and most fuel-efficient paths between each stop. Pairing route optimization with the fuel management module will save both time and fuel costs.

Custom mapping- Route planning capacity can be further expanded with the ability to design your own business-relevant maps. Being highly customizable in terms of views, legends, zone shapes, and sizes makes your maps so convenient in use.

Fuel management

A fuel management module monitors a fuel tank and forms fuel management reports. This allows fleet managers to efficiently plan routes and coordinate drivers. Eventually, this helps reduce fuel expenses.

Engine idling- This is one of the main fuel-guzzling habits. Many trucks idle up to eight hours per day resulting in increased fuel and maintenance costs. So to reduce fuel costs in the long run, it's important to track and reduce idle time. Besides that, excessive engine idling hurts the environment.

Fuel cards- As a specific form of cashless payment, fuel cards help keep a record of costs and scrutinize inefficiencies across the fleet. Among the key benefits of fuel cards are wholesale prices, secure purchasing, and close monitoring of fuel consumption via dedicated fuel card accounts.

Remote fuel tank monitoring- The Engine Control Module (ECM) collects all sorts of data about the condition of your vehicle, including fuel quantity measurement. In fact, ECM provides miles per gallon/liter information to the vehicle dashboard and flashes the fuel indicator as a signal for a refill.

Fuel management reports- These contain the information on every fuel purchase made. Therefore, by keeping an eye on this data, fleet managers can easily spot unauthorized purchases and set restrictions for each fuel card: the number of transactions, the quantity of fuel, and even the type of fuel that can be purchased.

Drivers management

This module helps to keep track of driver behavior and stores the related data.

Driver profiles- FMS keeps your driver records up-to-date, organized, and easily accessible from a central location. By storing all driver licensing and medical information

in the software, fleet managers can always check if their drivers have valid licenses, set up reminders for those whose license needs renewing, and ensure that drivers have taken and passed medical tests.

Behavior monitoring- Having skilled drivers behind the wheel reduces accident risks and saves up to 12 percent on the fleet costs. That's why monitoring driver performance will certainly pay off. You'll be able to take immediate action if a driver demonstrates aggressive driving, acts fatigued, or distracted.

Security and safety features

Safety management tools protect your vehicles and drivers by providing emergency roadside assistance, vehicle theft alerts, and remote monitoring. Being able to monitor a driver's time of arrival, speed and more, fleet companies can secure themselves from false claims.

Road hazard alert- Alerting services keep drivers informed in real time of the state of the road, the weather, or last-minute changes on the route. Such services automatically notify drivers when they're approaching potential roadway weather hazards.

Roadside assistance- Should fleet drivers experience any roadside issue, they can request help via their telematics device with integrated roadside assistance solution. The latter dispatches a service request to the closest provider, ensuring a fast response. A driver can then track the service vehicle driving to their location.

Dash cam- Automatically making photos, videos, and panorama thumbnail views, a dash cam can playback the entire event. Integrated with telematics, a dash cam provides visibility into the incidents and driver behavior.

9. System Requirement Study

9.1 Product Perspective

A distributed database system stores the following information.

Vehicle Detail:

It incudes vehicle registration number, no of seats , company of vehicle etc.

Driver Detail:

It includes name, driving licence number, phone number etc,

Customer Detail:

It includes name, address, phone number. This information may be used for keeping the records of the customer for any emergency or for any other kind of information.

Contract Detail:

It include pickup and destination address, vehicle, dates etc,

Trip Detail :

It includes contract and driver detail.

Odoeter Detail :

It includes odometer vehicle, reading, date etc.

Cost on Vehicle :

It includes date, amount, type of service(petrol, tire, licence) etc.

9.2 System Feature

- vehicle management
- driver management
- contract management
- trip management
- odometer management
- cost management
- online payment
- multi company
- customer portal
- driver portal
- live tracking

9.3 Functional Requirements

There will be three type of user (Manager, sales person, Driver in company and the fourth user is customer who will use system. There should be privileges for all type of user.

The customer should be able to do the following functions:

Retrieve information about availability of vehicle between two given dates.

- Make new contract
- Cancel contract
- Confirm contract
- Give rating, review
- View travelling history

The sales person should have following management functionalities:

- **CUSTOMER FUNCTIONS**

  - Get all available vehicle between given date.

- **ADMINISTRATIVE**

  - Add/Update new contract
  - Add/Update new trip
  - Add/Update odometer entry

The manager should have following management functionality

- **CUSTOMER FUNCTIONS**

  - Get all customers who have travelled between given dates.
  - Get all customers detail who travelled in given vehicle between given dates.
  - Get all vehicles booked on given date.
  - Get all available vehicle between given date.
  - Get all vehicles whose contract is running.

- **ADMINISTRATIVE**

  - Add/Update/Delete new vehicle
  - Add/Update/Delete new driver
  - Add/update customer
  - Add/Update new contract
  - Add/Update new trip
  - Add/update odometer entry
  - Add/Update cost spend on vehicle (ex. Cost on vehicle service)

9.4 Non-functional Requirement

- **Security** :

  The system should be developed such that user data remains secure.

- **Performance** :

  The system should be designed such that it is optimized, such that the user experience is smooth.

- **Maintainability** :

  The system shall be easy to maintain and will be getting updates whenever necessary.

9.5 External Interface Requirements

- **Hardware and Software Interfaces for Developer**

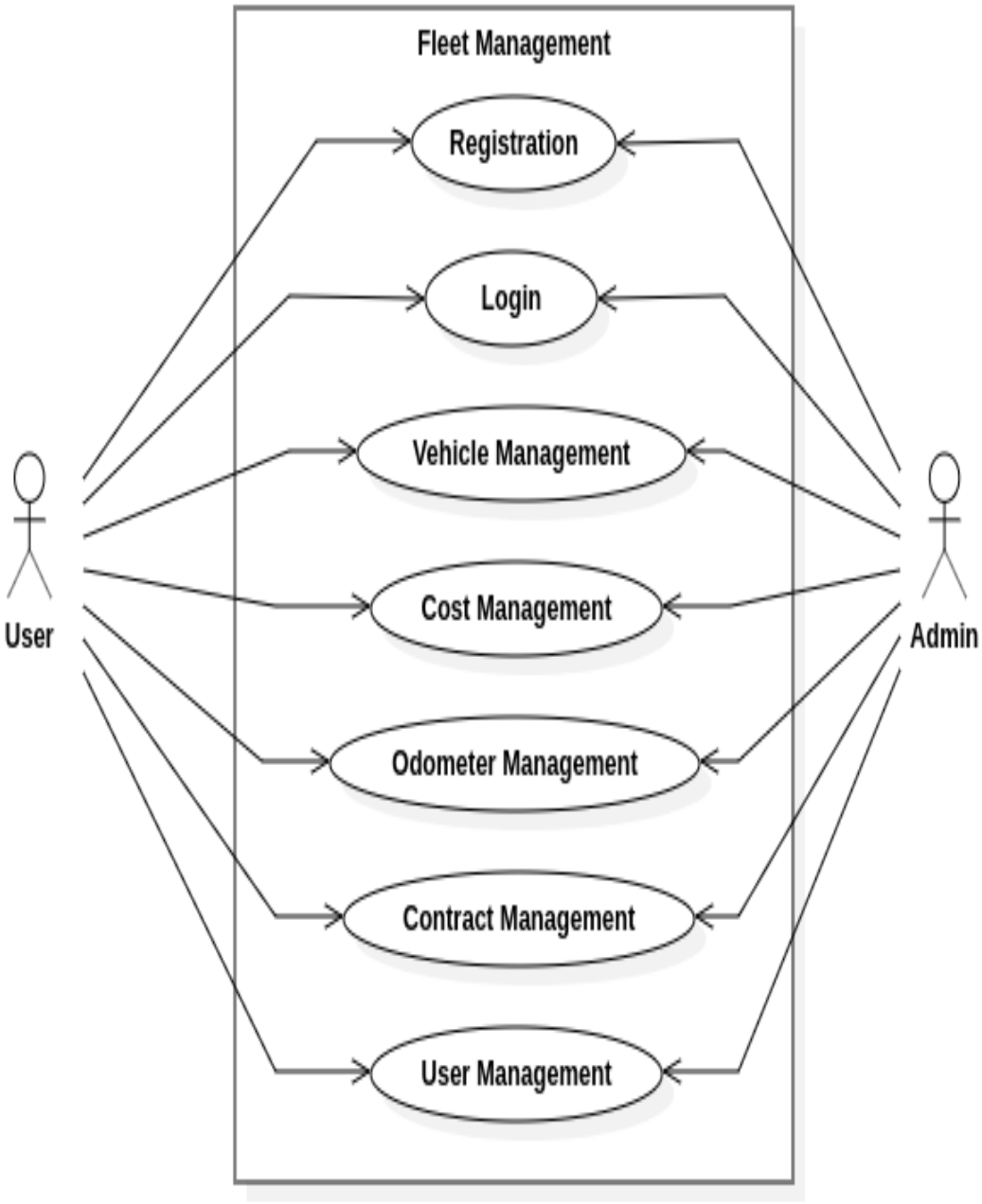
  - OS : ubuntu
  - RAM : 2 Gb minimum
  - Editor : any text editor(Recommended: Sublime)
  - Prerequisites : odoo framework, postgreSQL, apache server, python

- **Hardware and Software Interface for User**

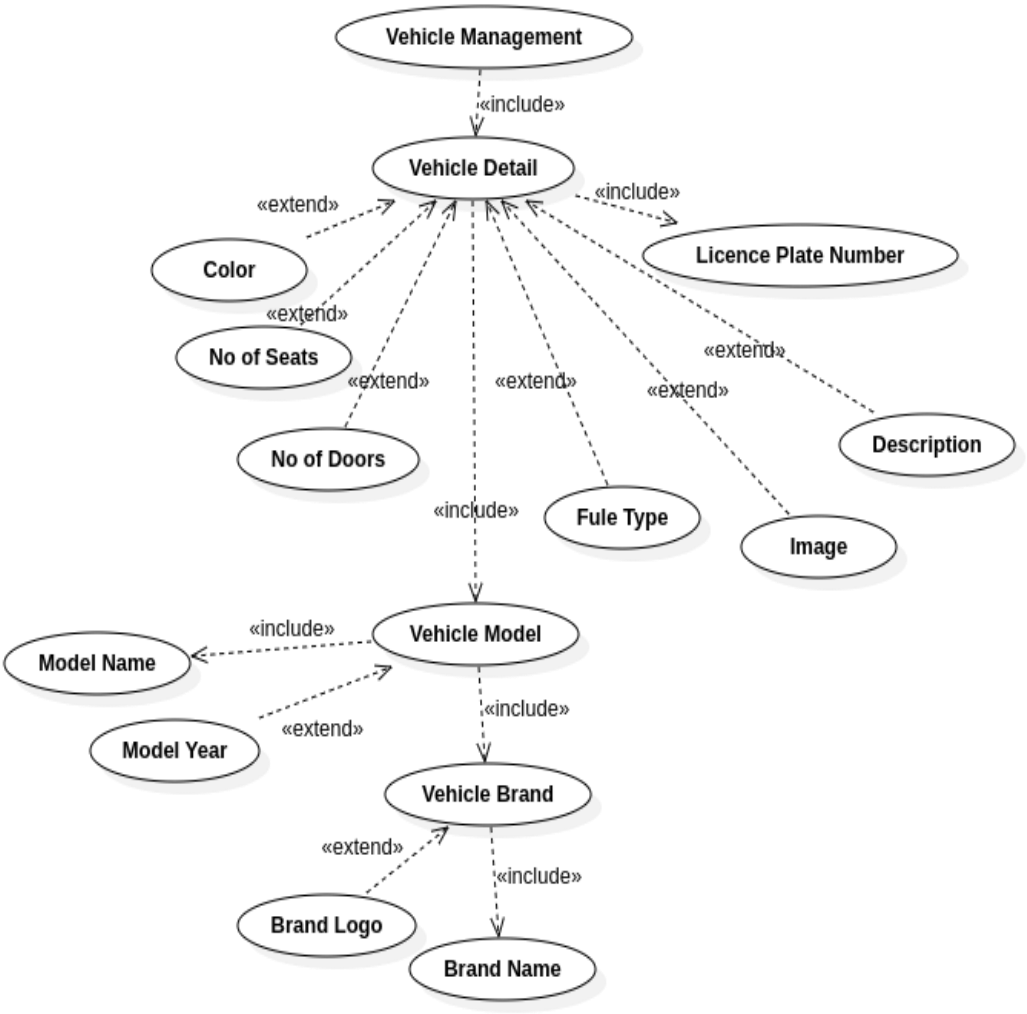
  - OS: Any operating system that support browser
  - RAM : 1 GB minimum
  - Network: active internet.
  - Web application: Google chrome(recommended),internet explorer, firefox, etc.

10. System Design

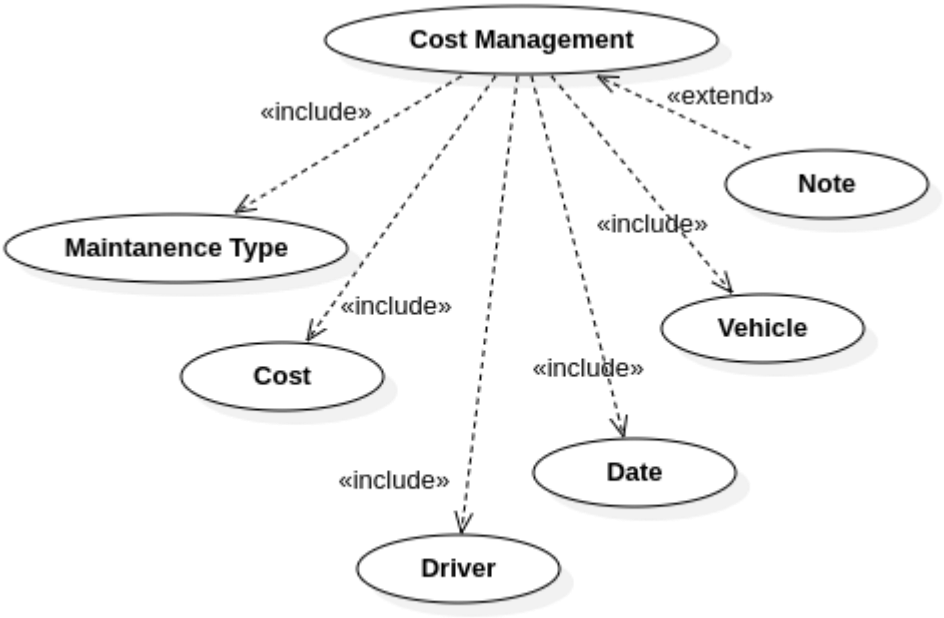
10.1 Use Case



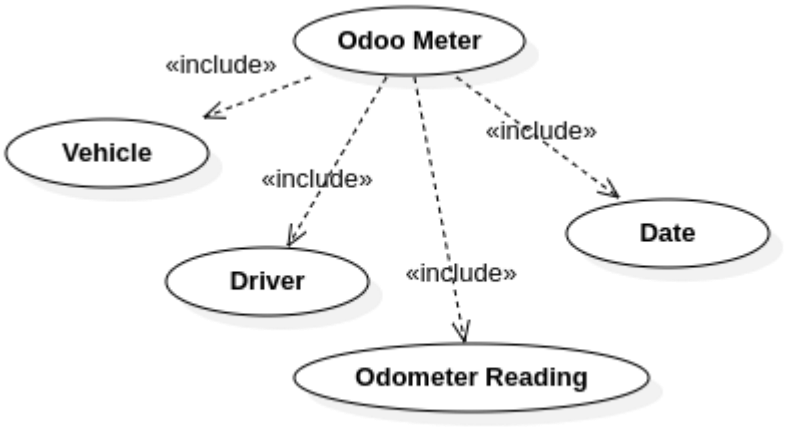
- **Vehicle Management**



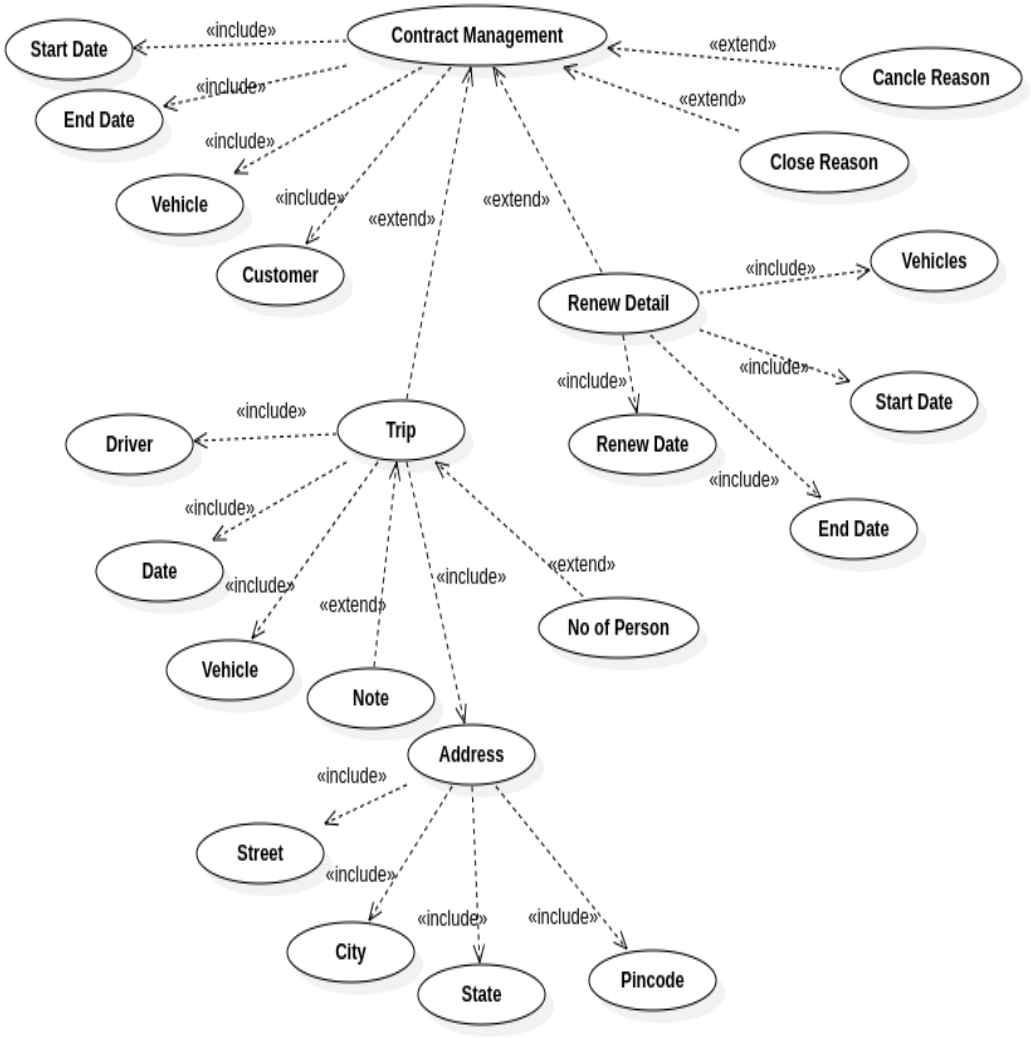
- **Cost Management**



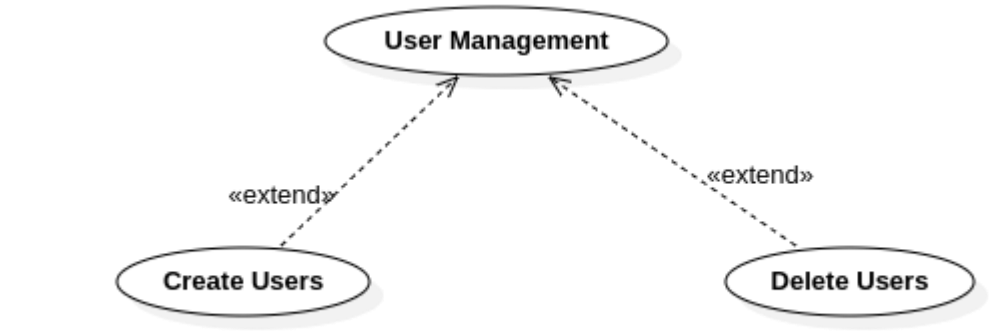
- **Odometer Management**



- **Contract Management**

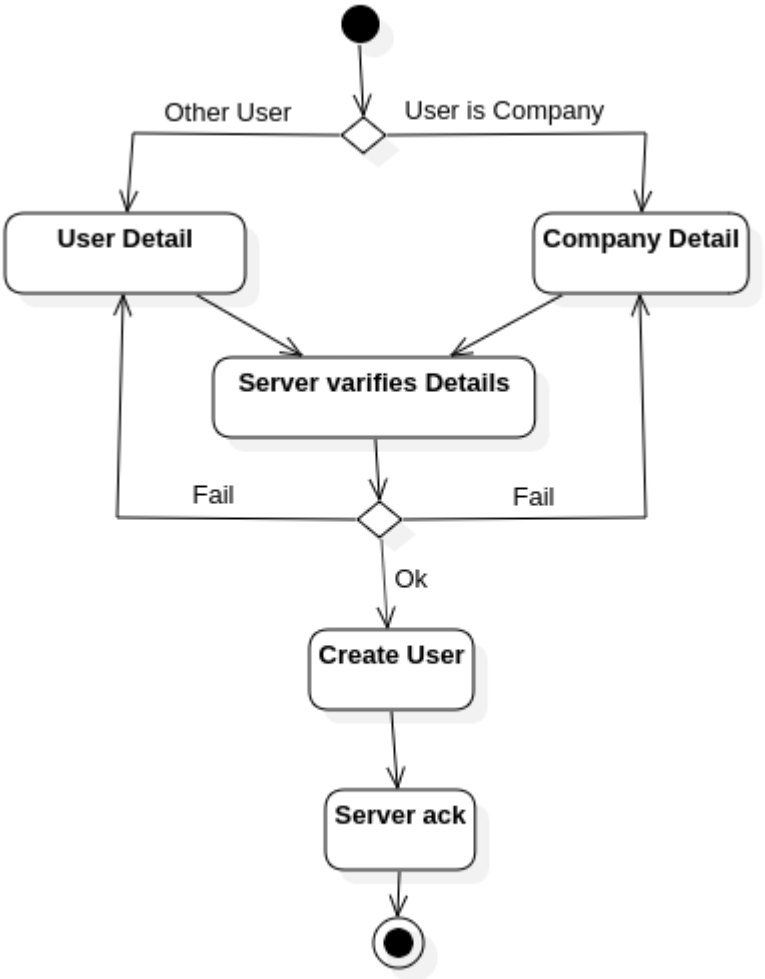


- **User Management**

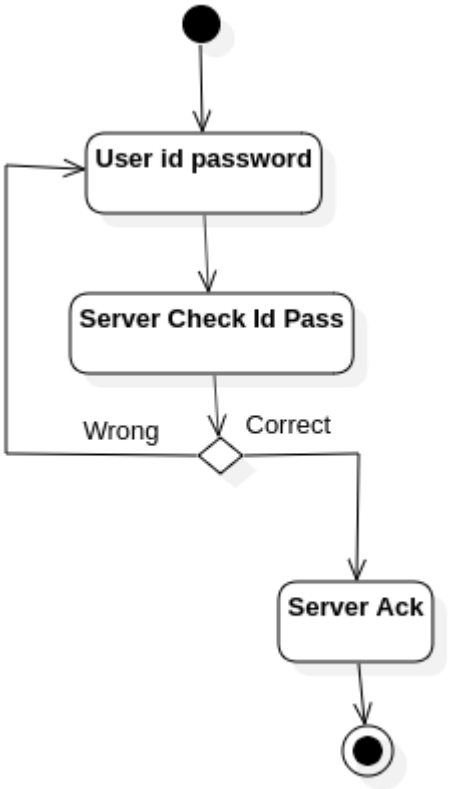


10.2 Activity

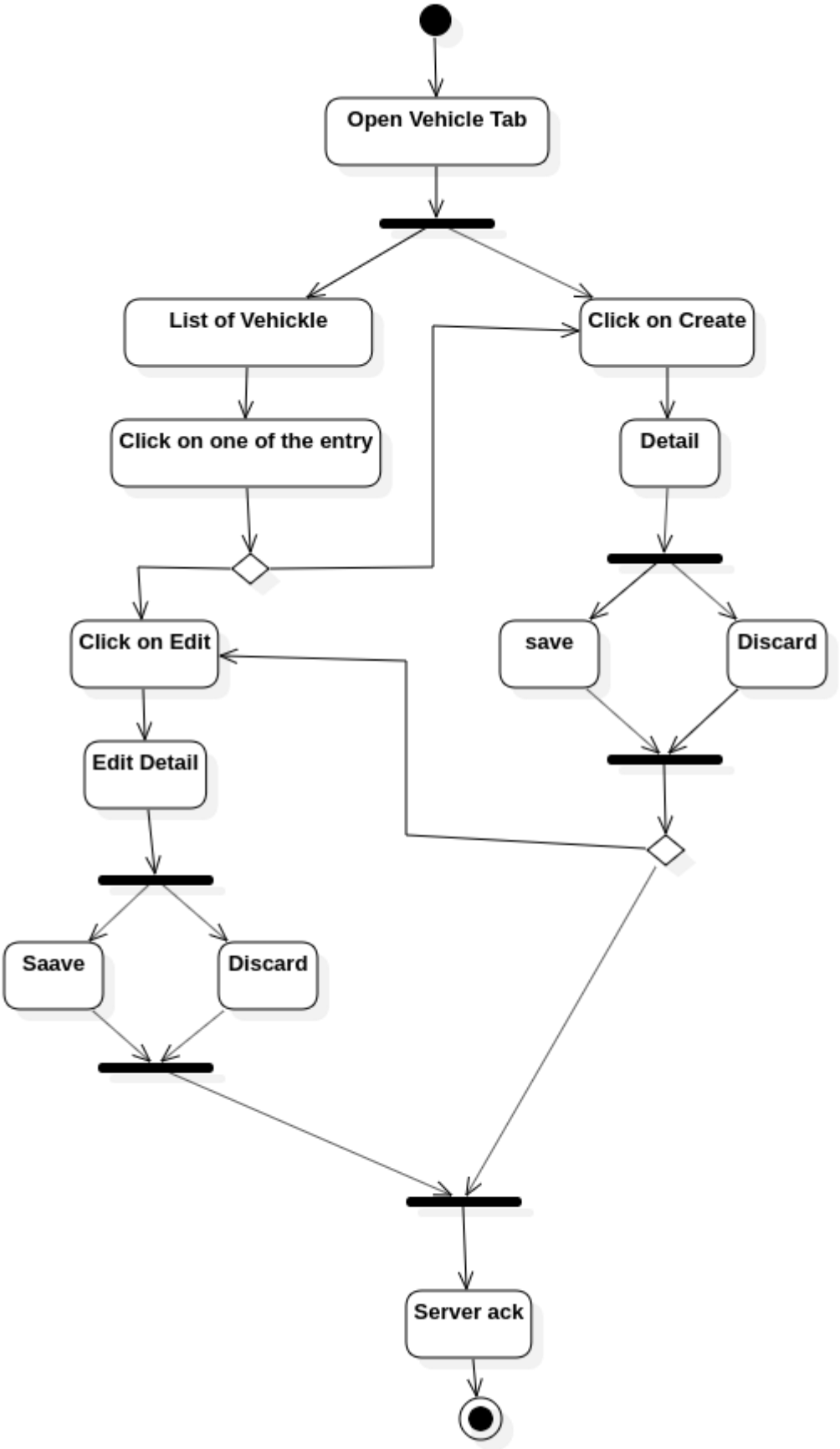
- **Registration**



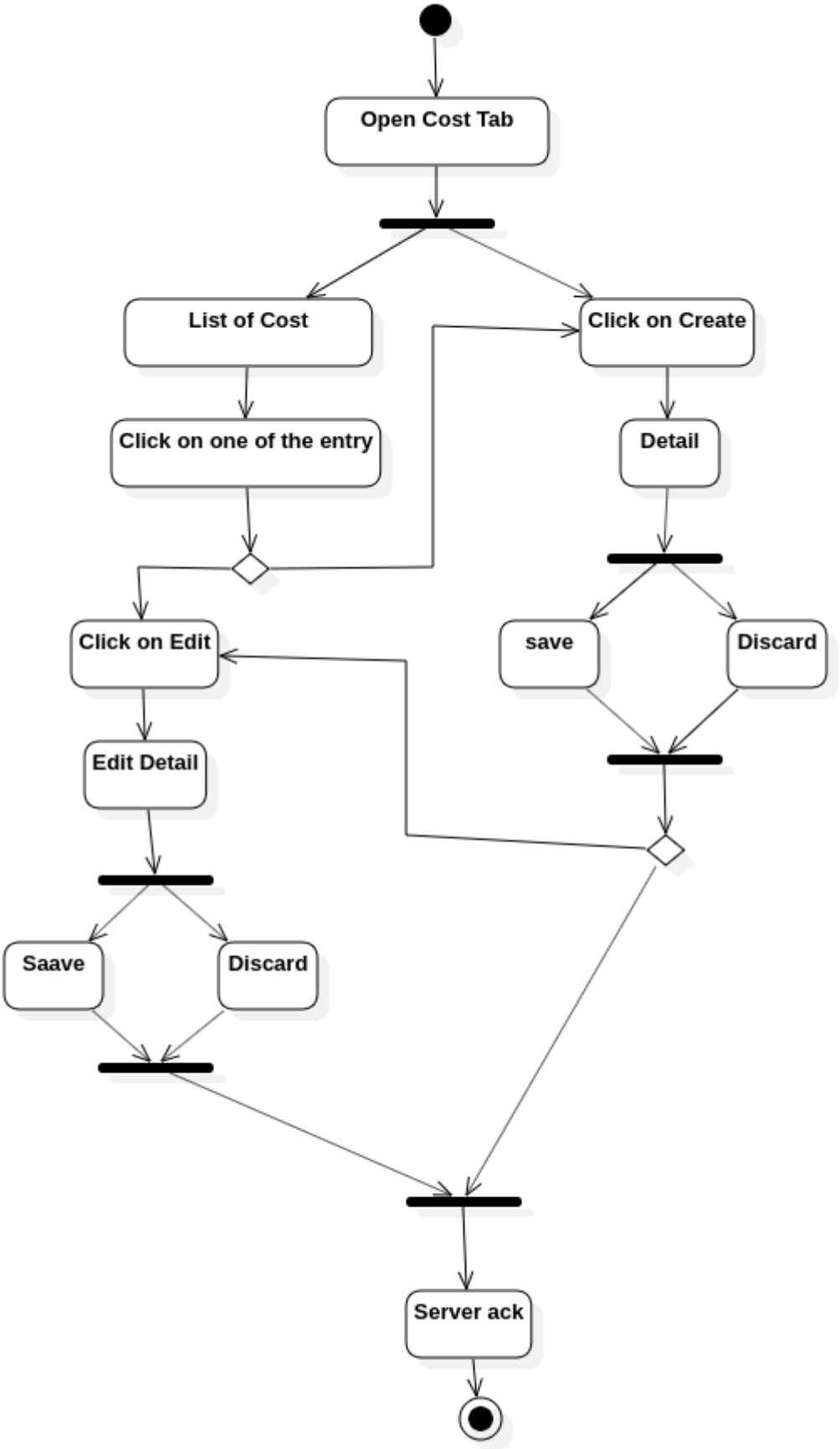
- **Login**


User id password
Server Check Id Pass
Wrong
Correct
Server Ack

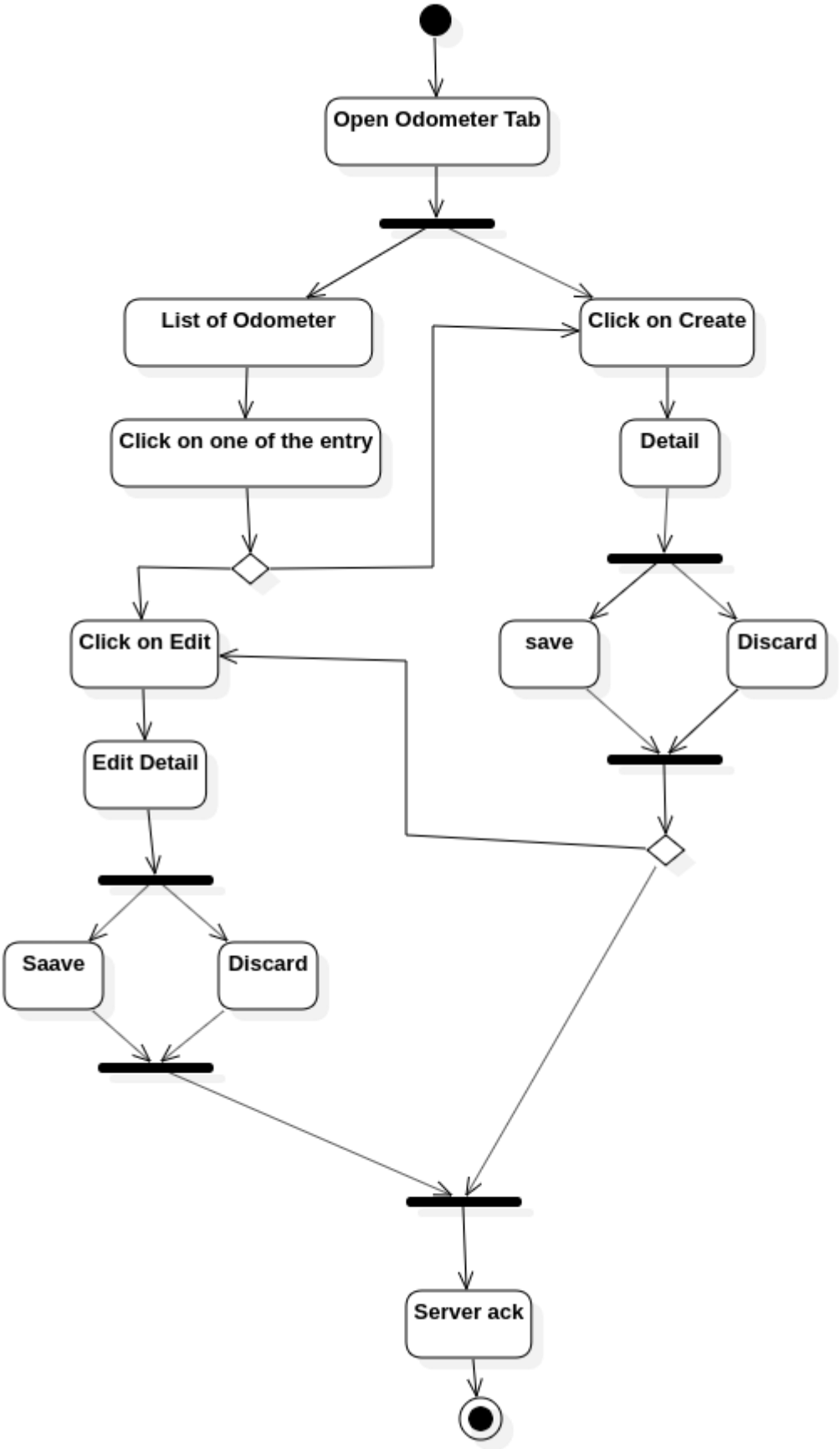
- **Vehicle Management**



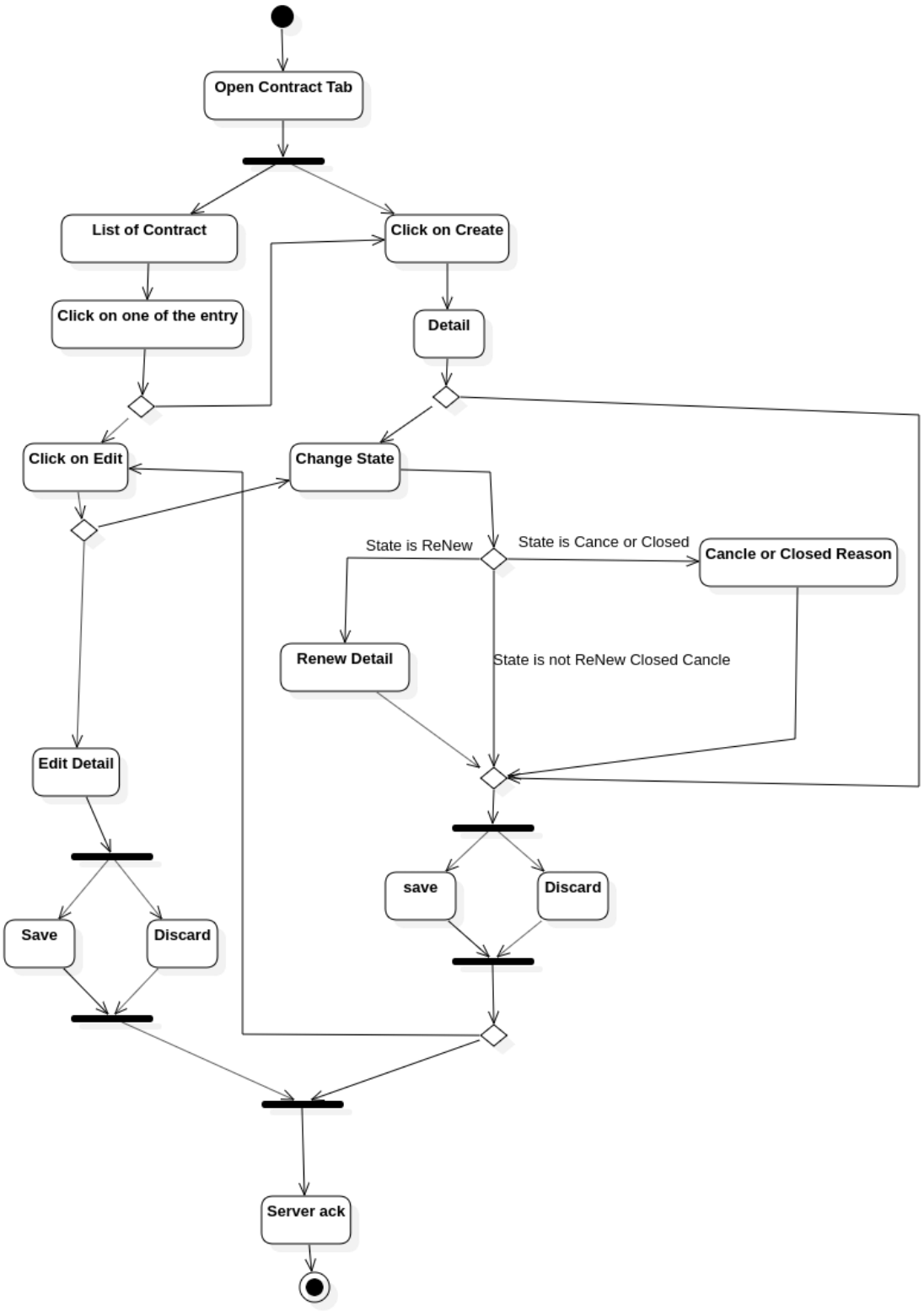
- **Cost Management**



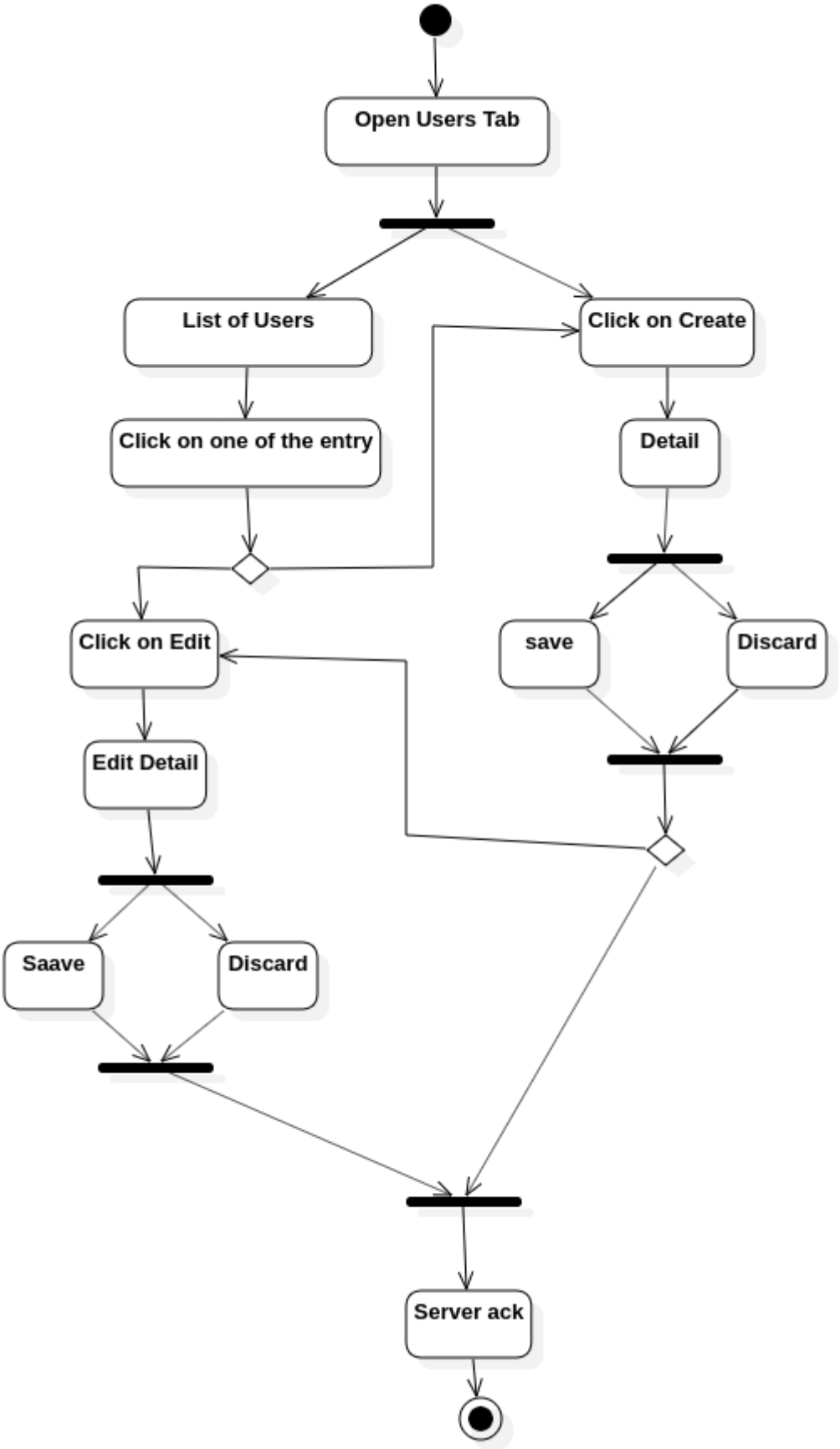
- **Odometer Management**



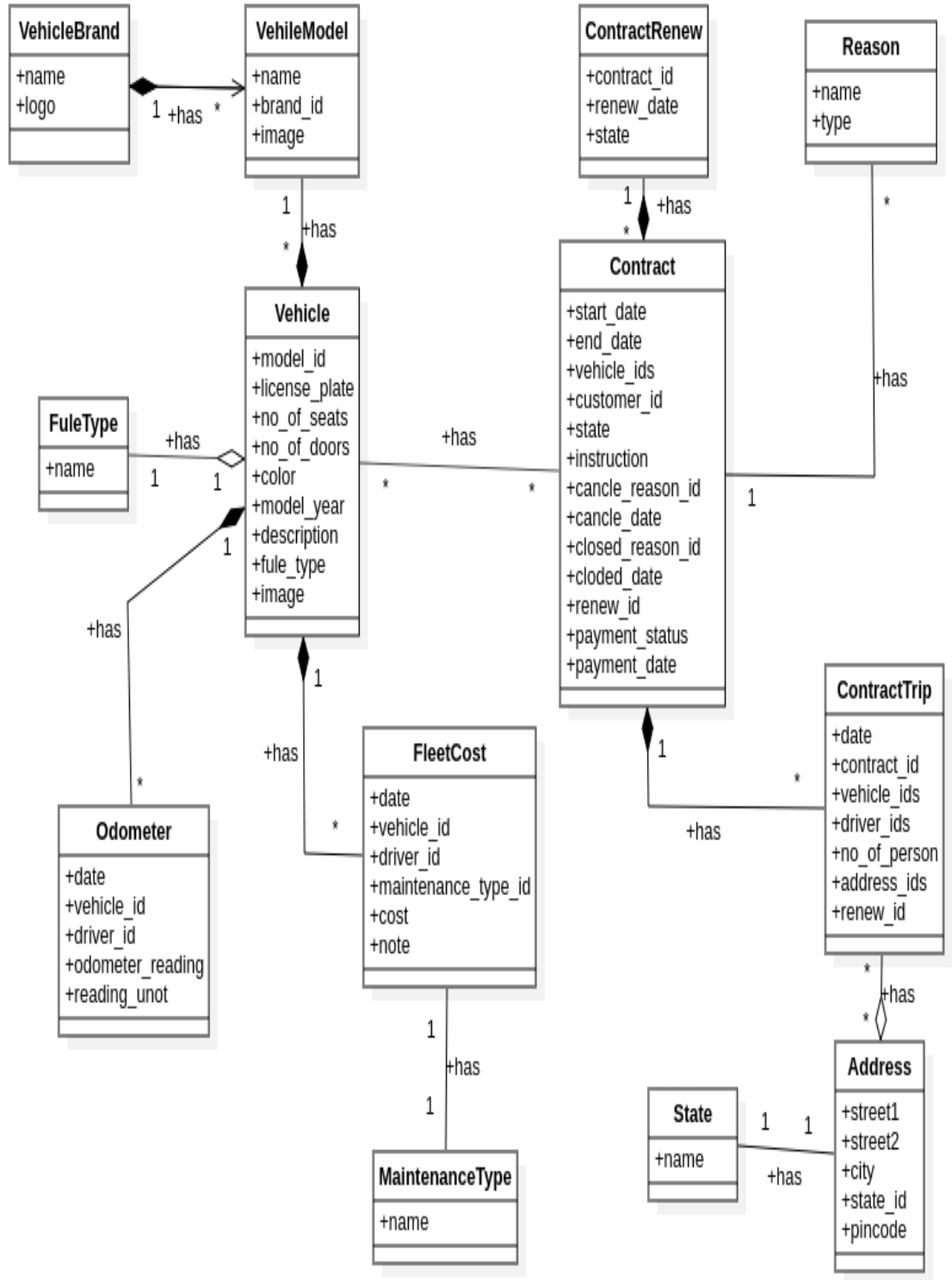
- **Contract Management**



- **User management**

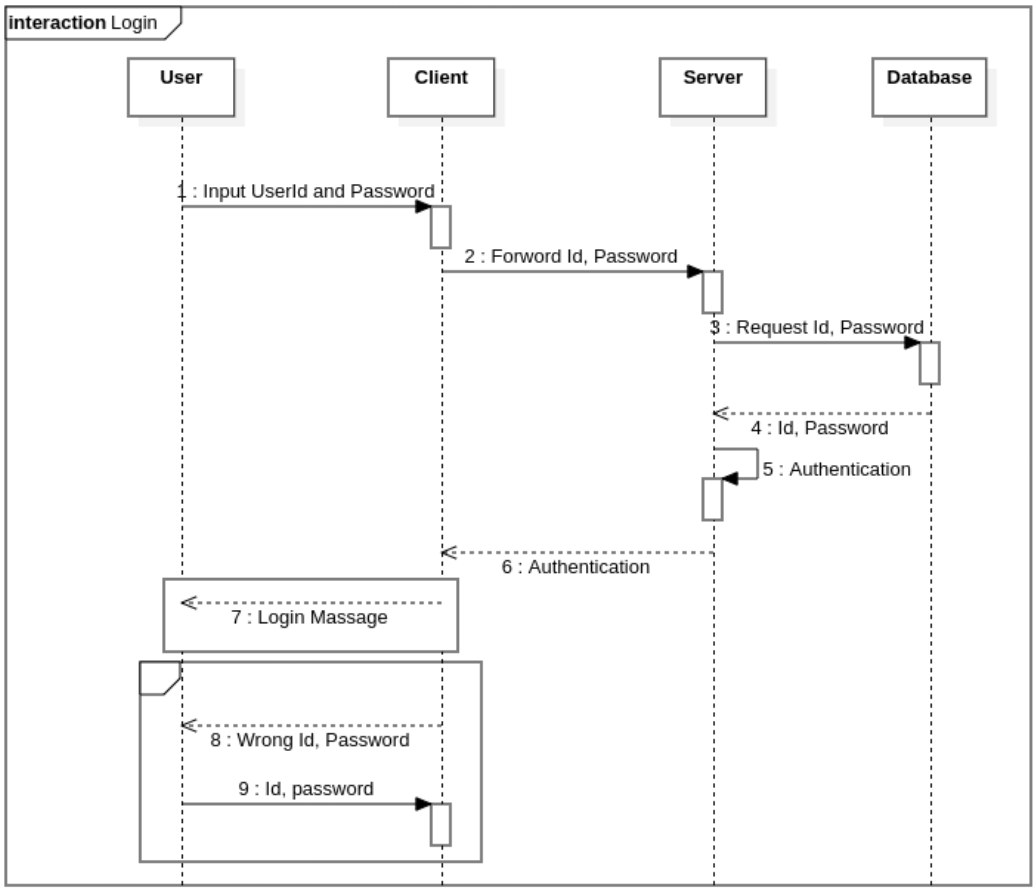


10.3 Class

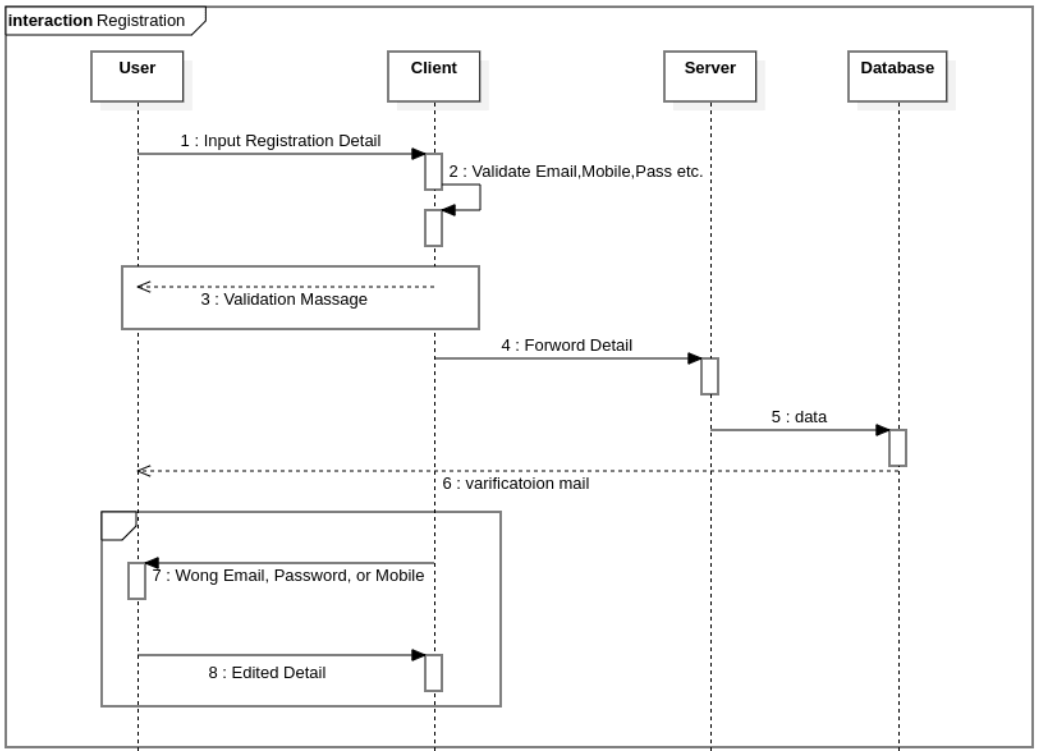

VehicleBrand
+name
+logo
1
+has
*
VehileModel
+name
+brand_id
+image
1
+has
*
ContractRenew
+contract_id
+renew_date
+state
1
+has
*
Reason
+name
+type
*
+has
Contract
+start_date
+end_date
+vehicle_ids
+customer_id
+state
+instruction
+cancle_reason_id
+cancle_date
+closed_reason_id
+cloded_date
+renew_id
+payment_status
+payment_date
1
Vehicle
+model_id
+license_plate
+no_of_seats
+no_of_doors
+color
+model_year
+description
+fule_type
+image
FuleType
+name
+has
1
1
+has
*
*
1
+has
*
Odometer
+date
+vehicle_id
+driver_id
+odometer_reading
+reading_unot
1
+has
*
FleetCost
+date
+vehicle_id
+driver_id
+maintenance_type_id
+cost
+note
1
+has
1
MaintenanceType
+name
1
+has
*
ContractTrip
+date
+contract_id
+vehicle_ids
+driver_ids
+no_of_person
+address_ids
+renew_id
*
+has
*
Address
+street1
+street2
+city
+state_id
+pincode
State
+name
1
1
+has

10.4 Sequence

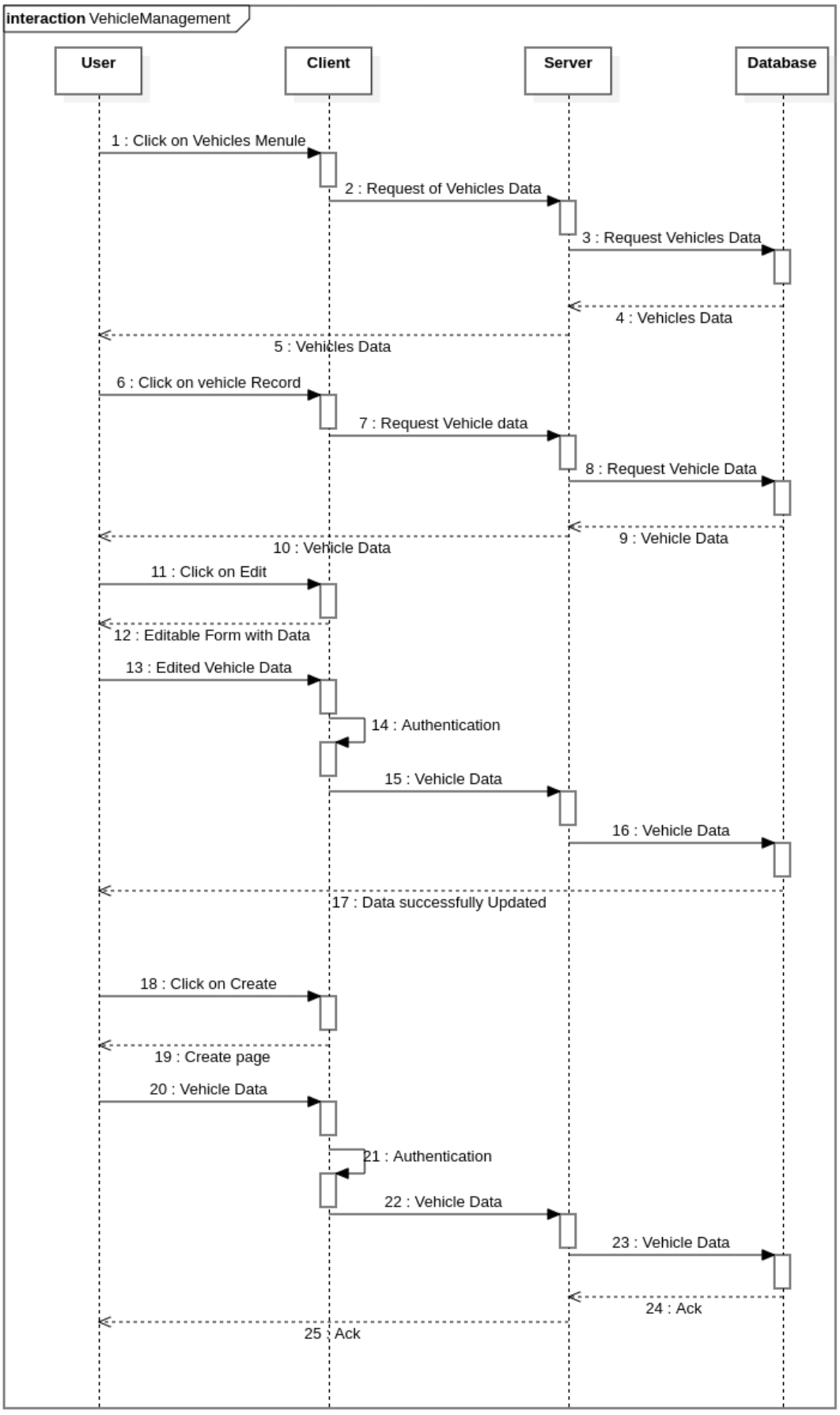
- **Registration**



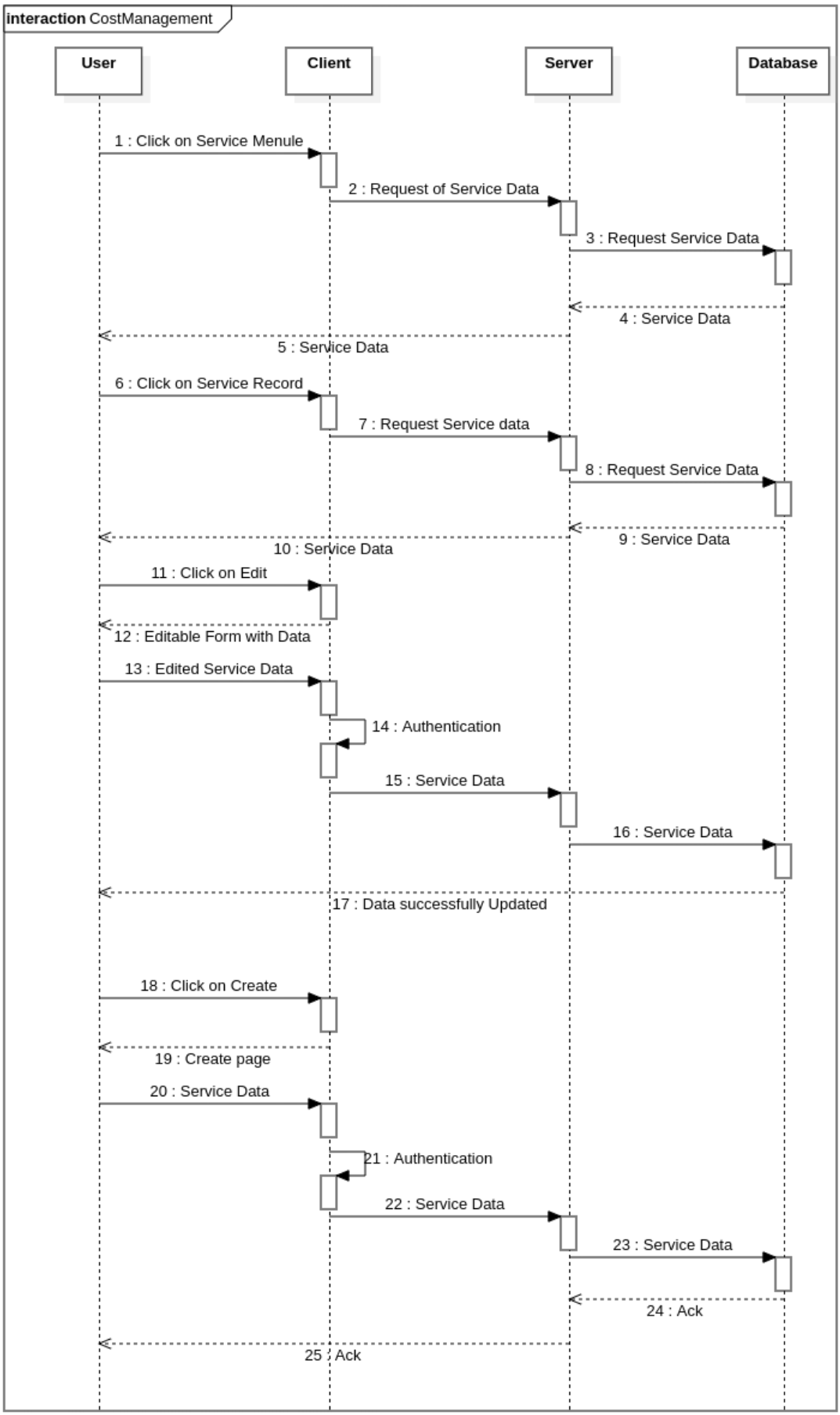
- **Login**



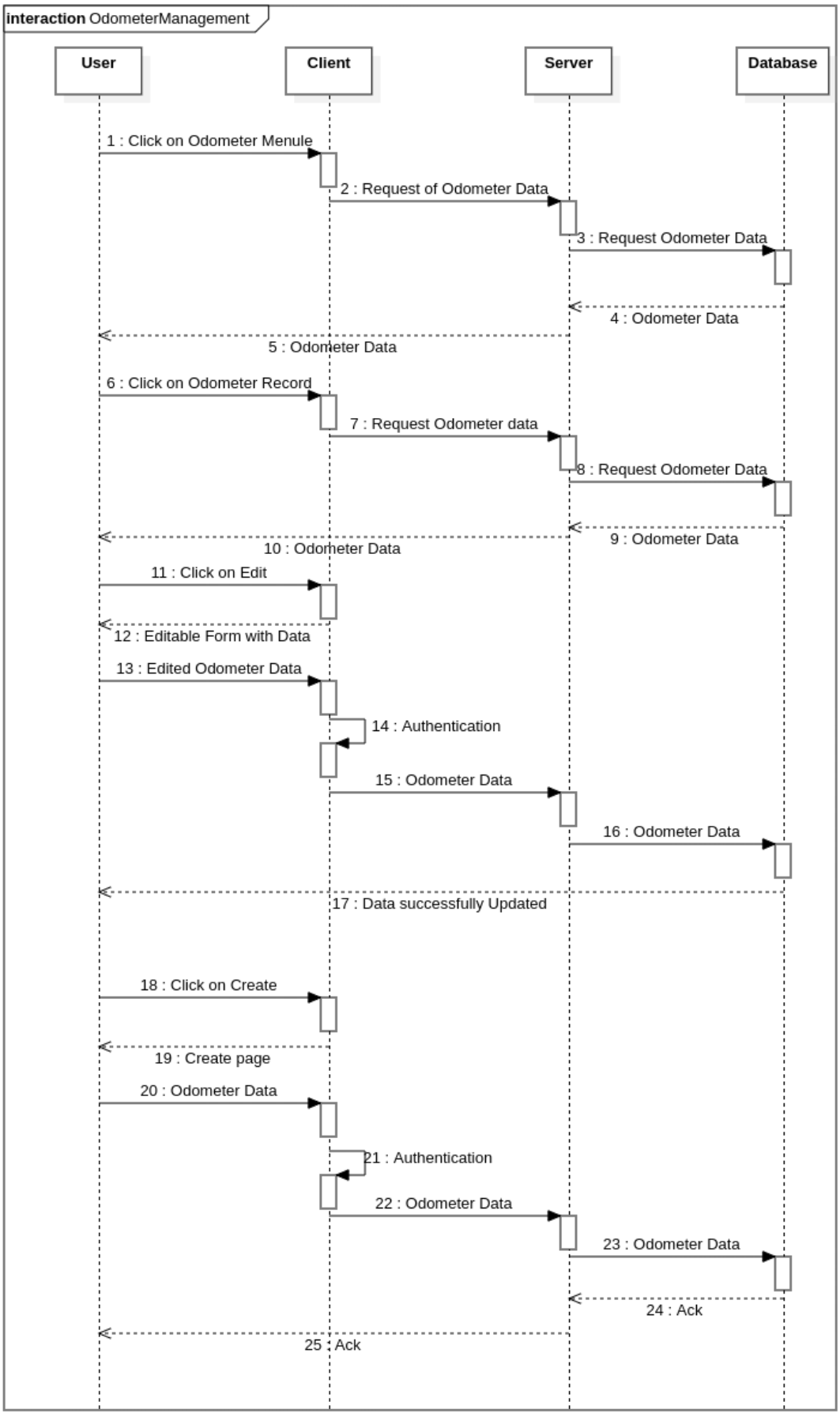
- **Vehicle Management**



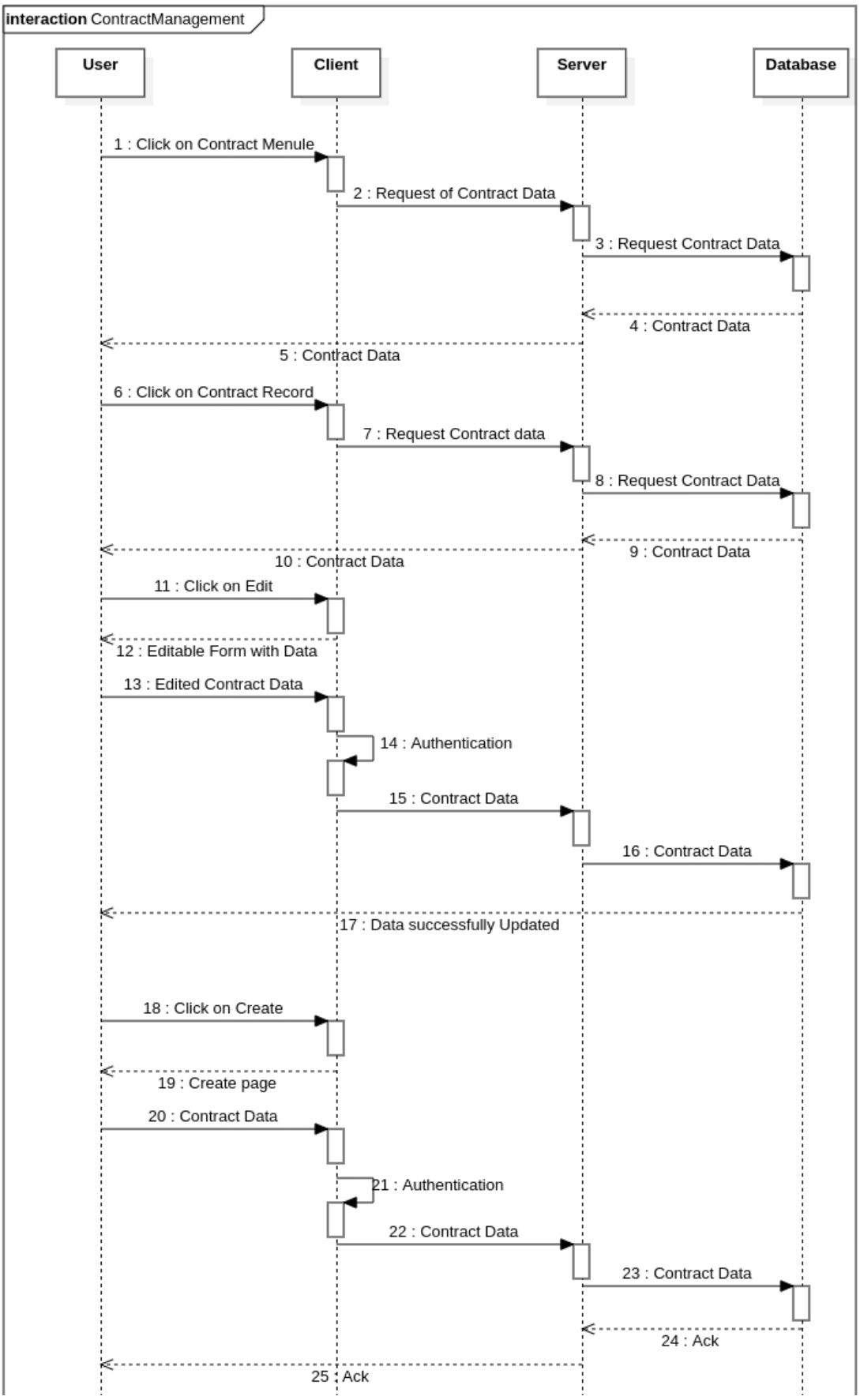
- **Cost Management**

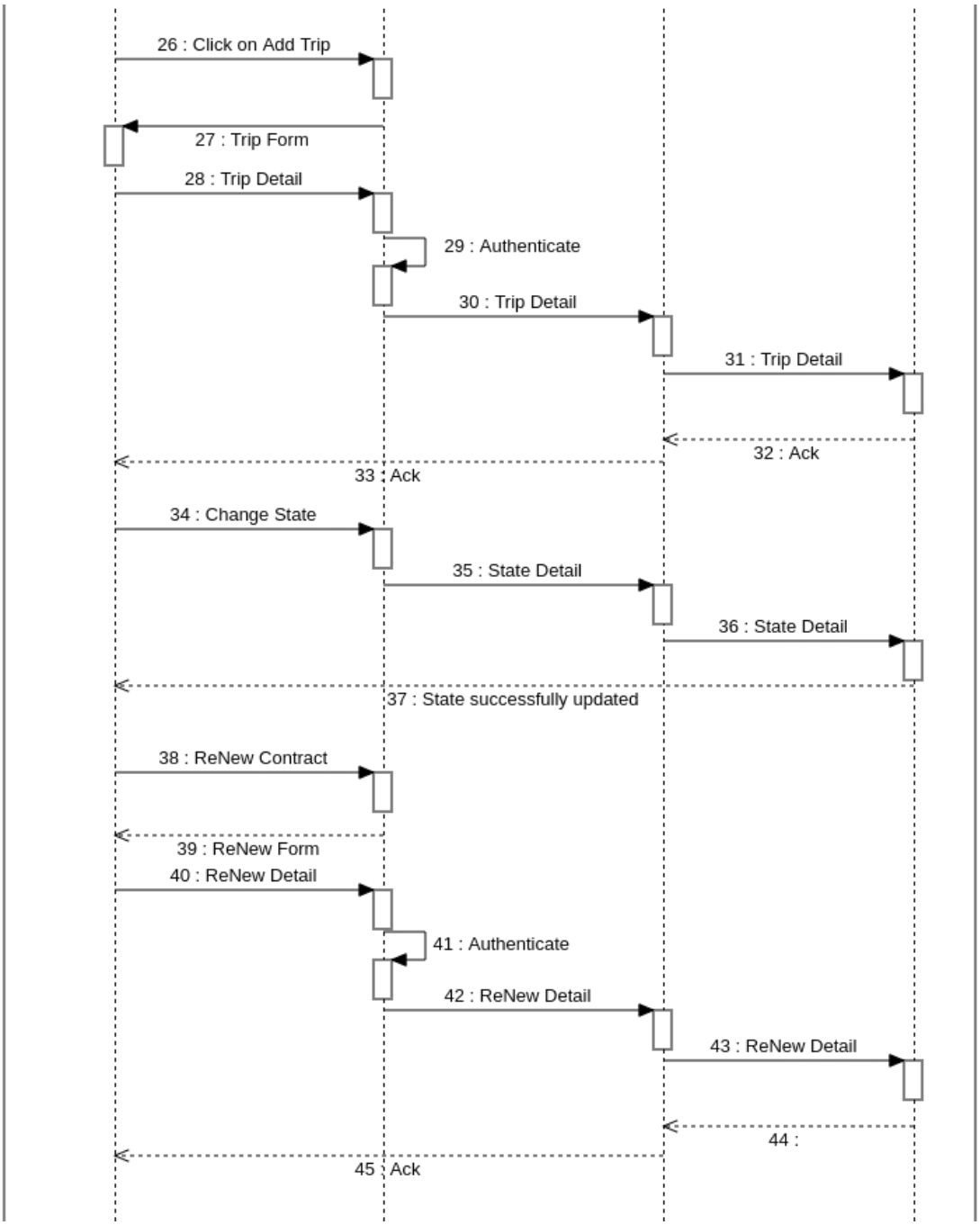


- **Odometer Management**

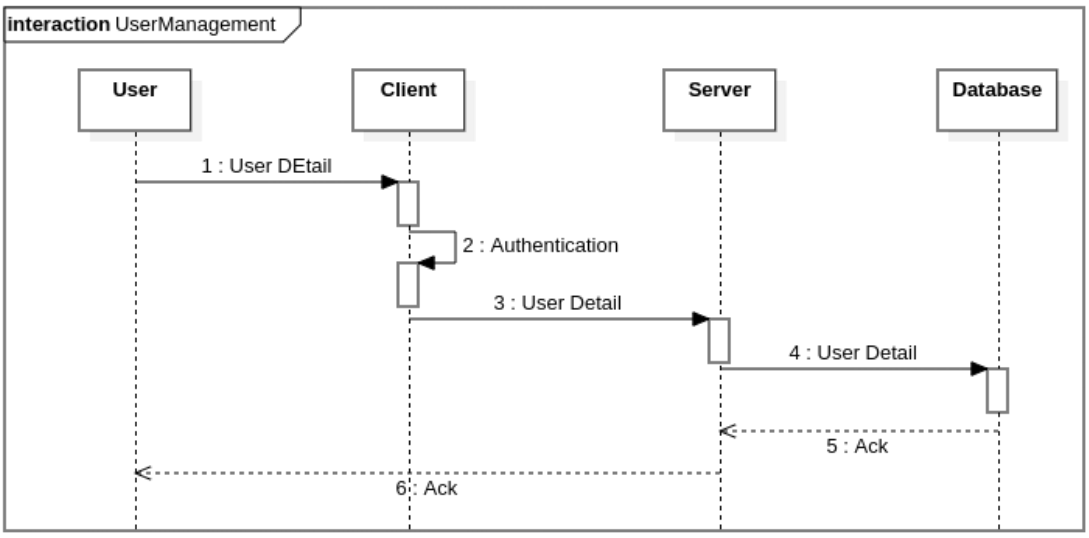


- **Contract Management**




26 : Click on Add Trip
27 : Trip Form
28 : Trip Detail
29 : Authenticate
30 : Trip Detail
31 : Trip Detail
32 : Ack
33 : Ack
34 : Change State
35 : State Detail
36 : State Detail
37 : State successfully updated
38 : ReNew Contract
39 : ReNew Form
40 : ReNew Detail
41 : Authenticate
42 : ReNew Detail
43 : ReNew Detail
44 :
45 : Ack

- **User management**



11.0 Testing and implementation

This section explains the various activities performed as part of the Testing of the. Fleet Management system.

11.1 Testing Scope

- **In Scope**
  - Vehicle management
  - Cost management
  - Odometer management
  - Contract management
  - User management
- **Out of Scope**
  - Performance Testing was not done for this application.
- **Items not tested**
  - Multi company features
- **Partially tested**
  - Tracking function
  - Take address by moving marker on map

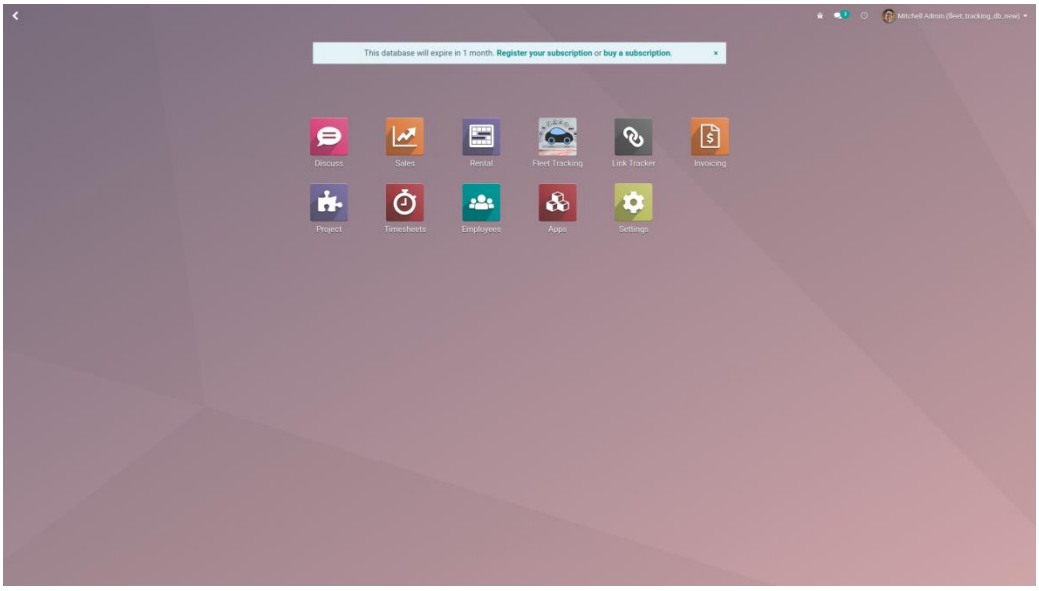
11.2 Function tested by manual testing

Function	Description
Create new vehicle	Checked new vehicle is created
Edit vehicle detail	Checked vehicle can be edited
Create service	Checked service can be created
Edit service	Checked service can be edited
Create odometer entry	Checked new odometer entry created
Edit odometer entry	Checked odometer entry edited
Create new contract	Checked new contract created
Change state of contract	Checked state of contract can be changed
Add trip	Checked trip created for particular contact
Edit trip	Checked trip can be edited
Renew contract	Checked contract can be renewed
Edit renew detail	Checked renew detail edited
Cancel contact	Checked contract can be canceled
Close contract	Checked contract can be closed
Create user	Checked new user is created
Edit user	Checked user can be edited
Create company	Checked new company is created
Create contract	Checked new contract is created from customer portal
Payment of contract	Checked payment process
Create odometer entry	Checked odometer entry create from driver

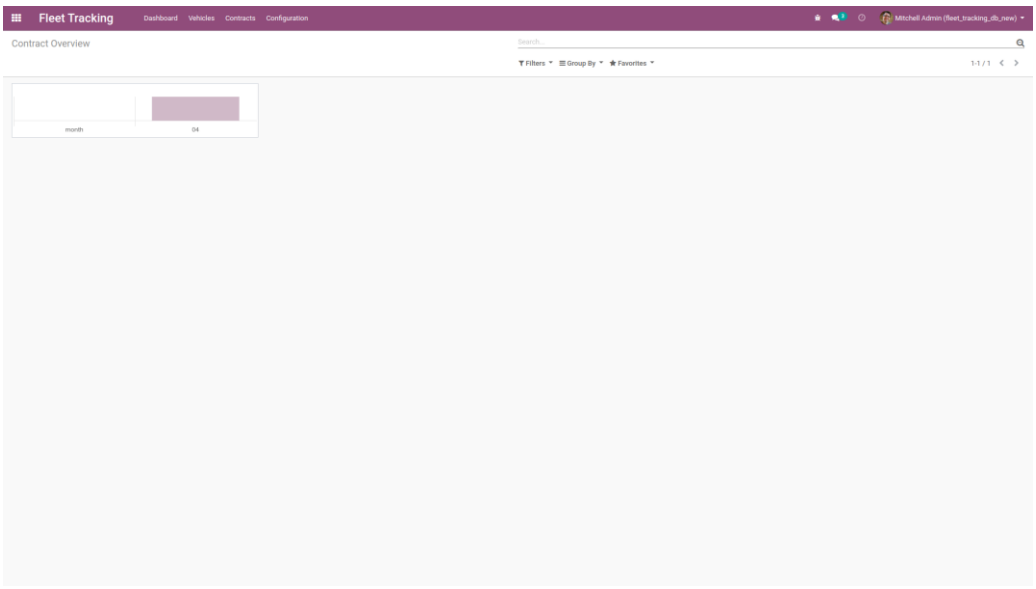
	portal
Live tracking	Partially Checked
Calculate address by move marker	Partially checked address can be calculated

12.0 Screen Shote

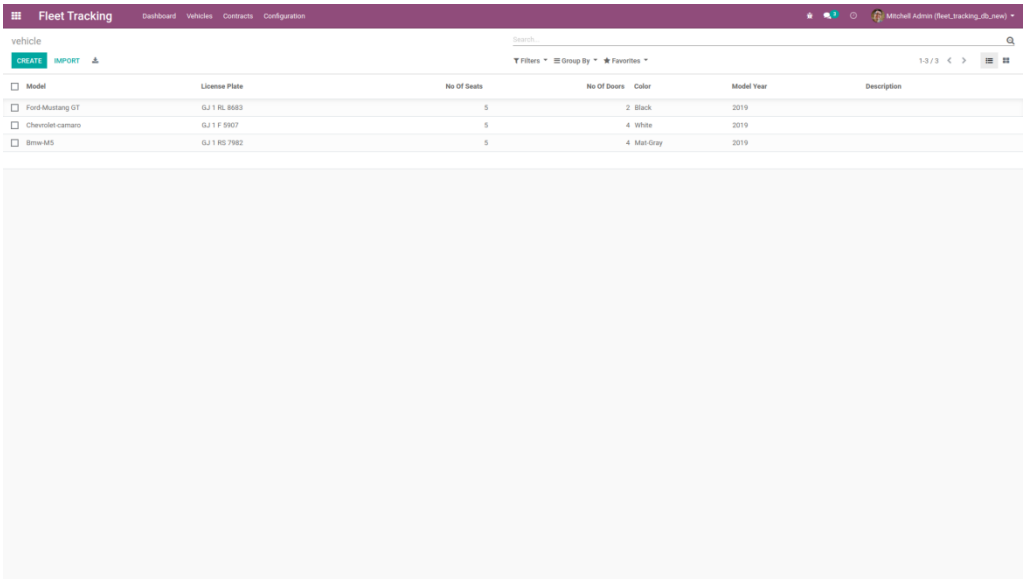
- **Apps**



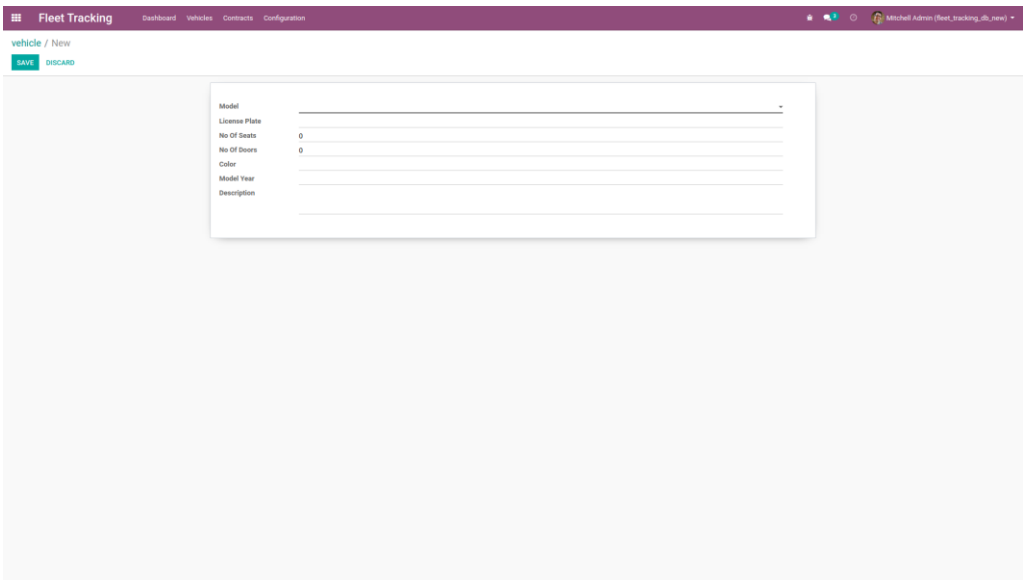
- **Dashboard**



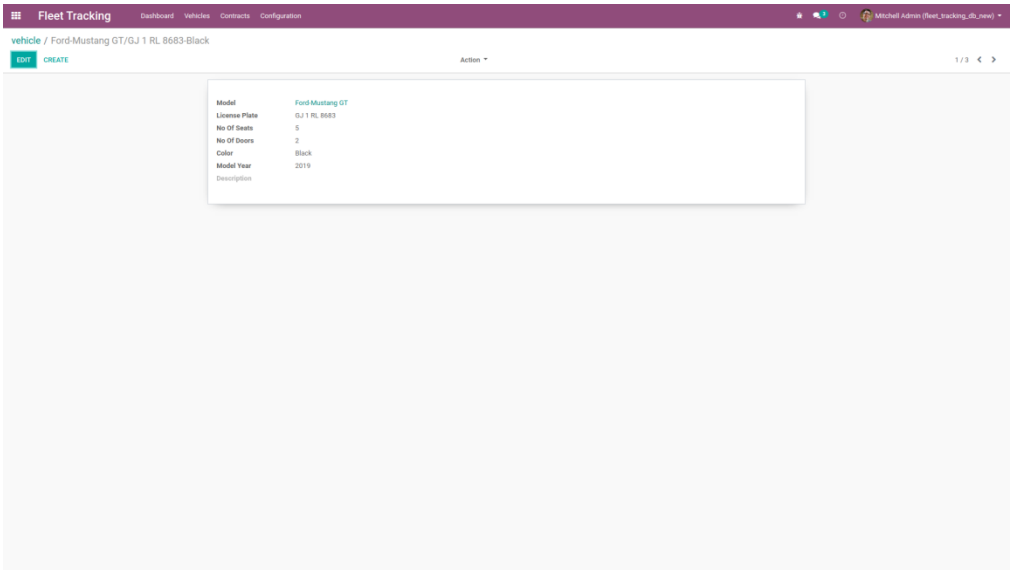
- **Vehicle management**
  - **list view**



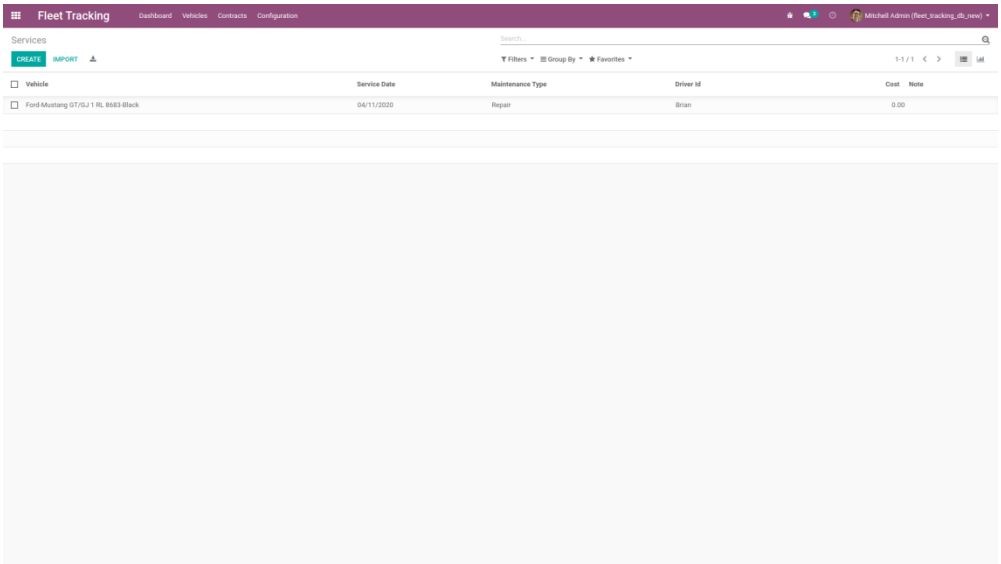
  - **form view**



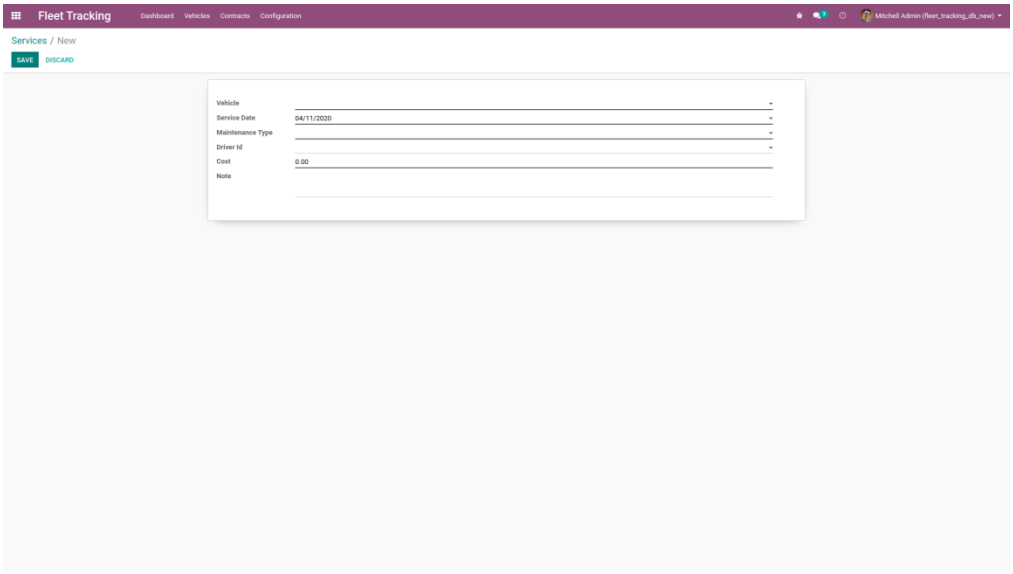
- **Vehicle detail**



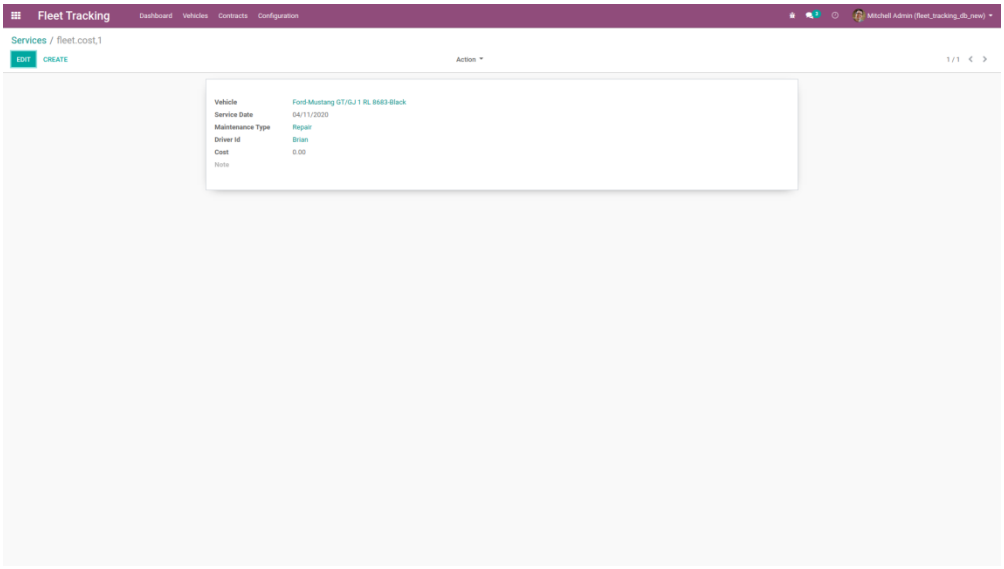
- **Service management**
  - **list view**



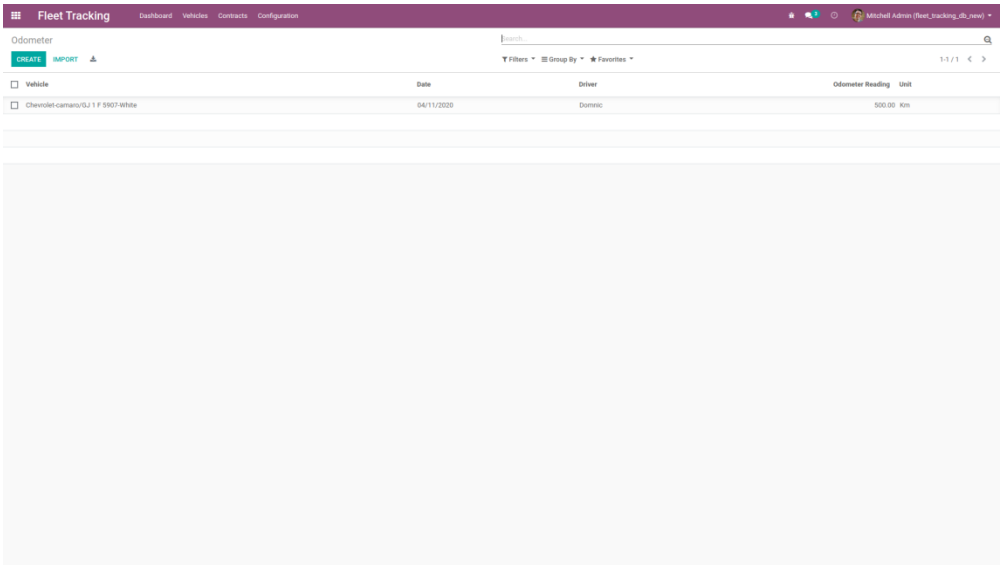
- **form view**



- **Service detail**

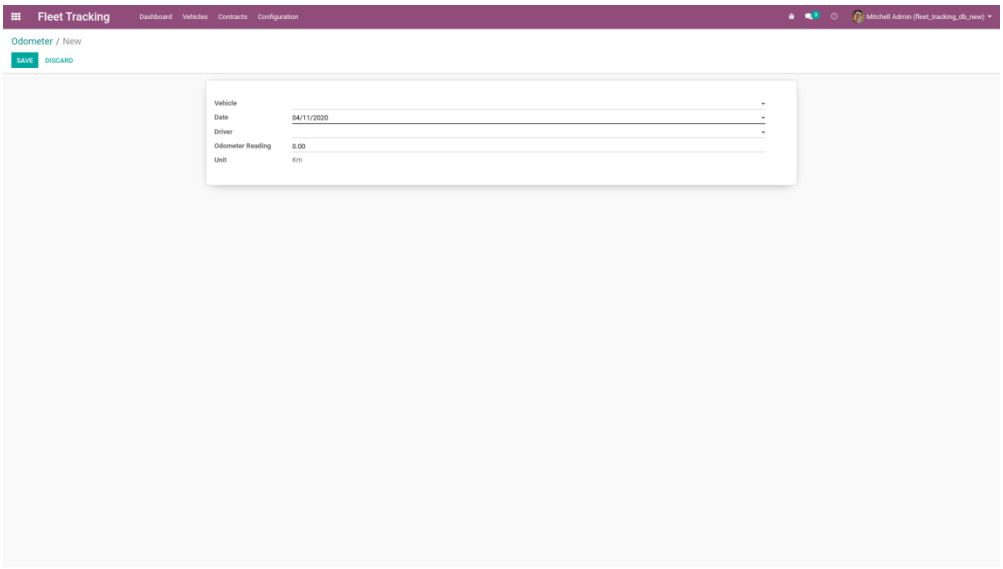


- **Odometer management**
  - **list view**

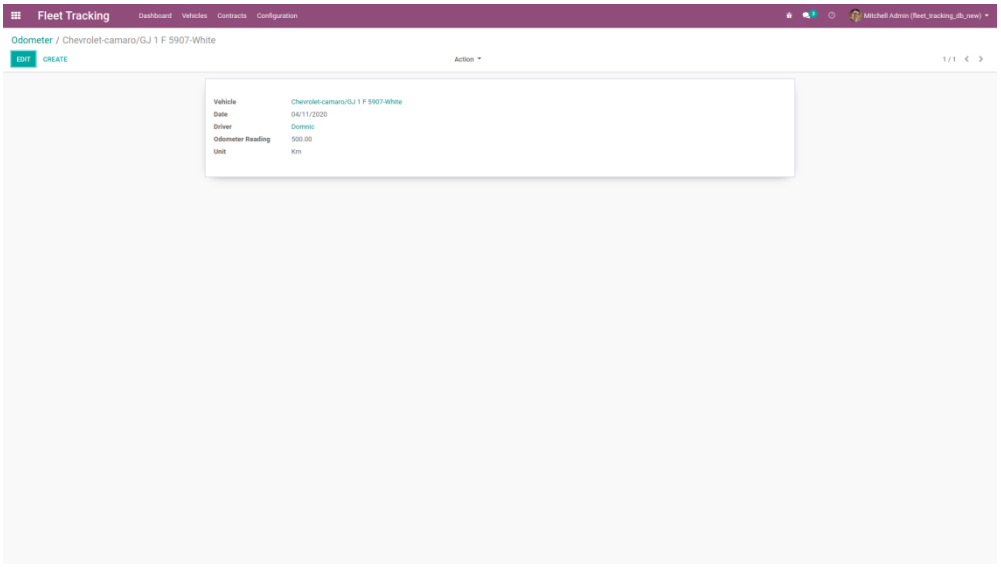


  - **form view**

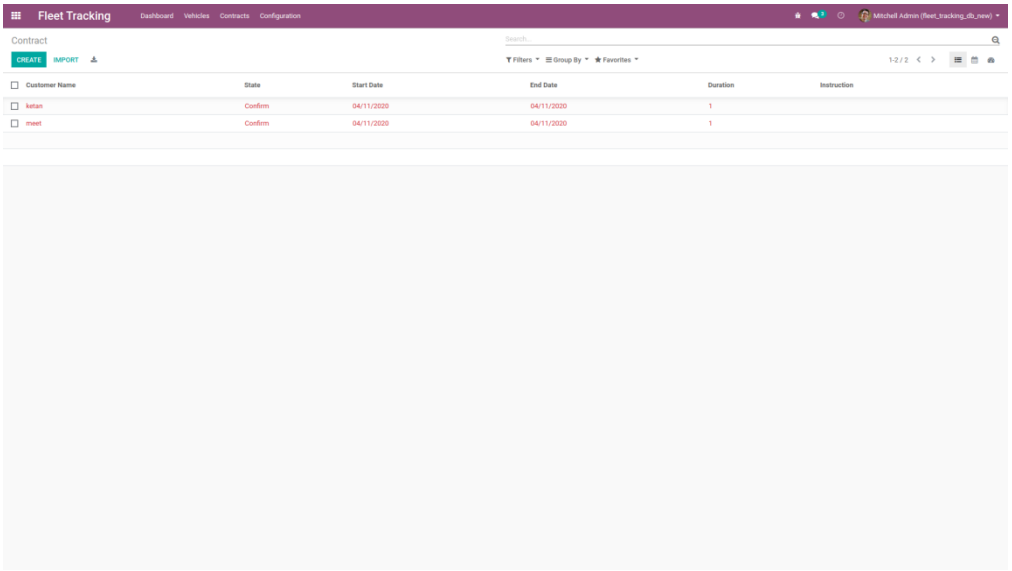
    SS



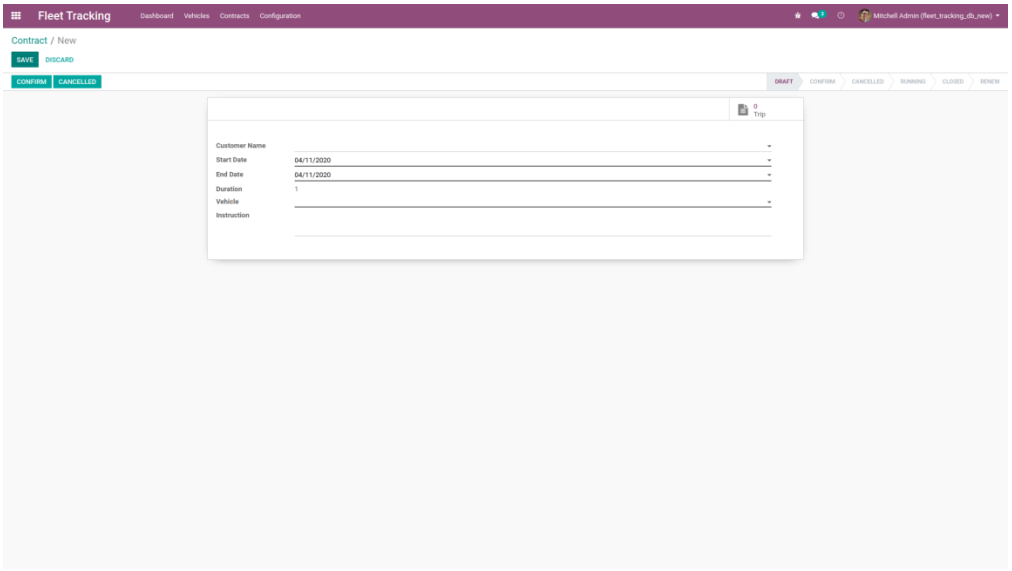
- **Odometer detail**



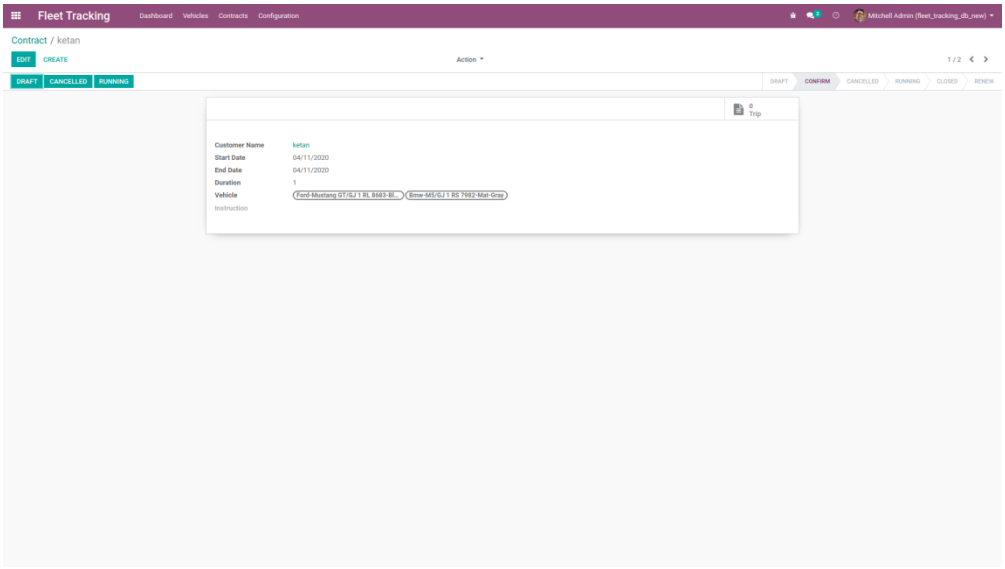
- **Contract management**
  - **list view**



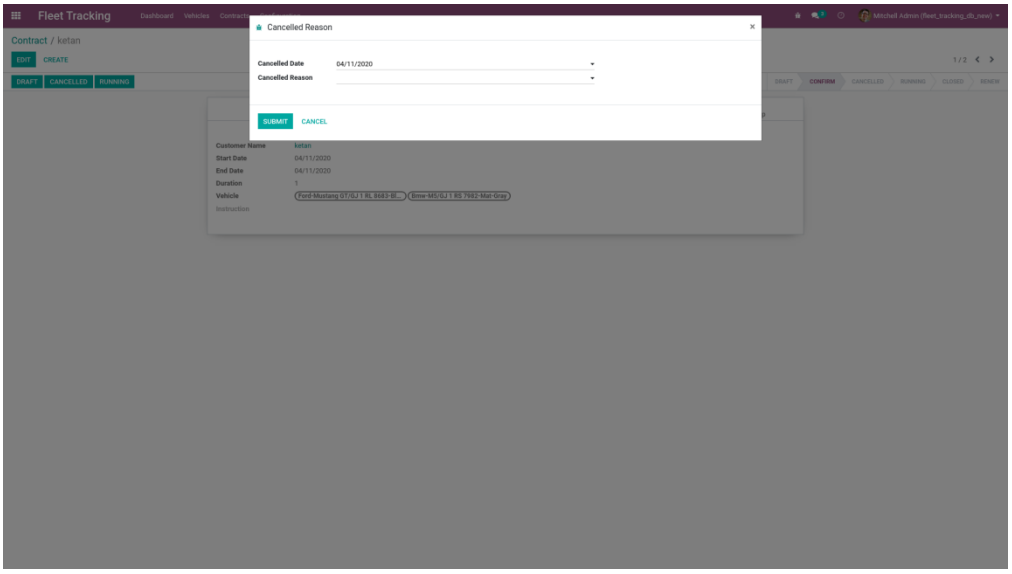
- **Form view**



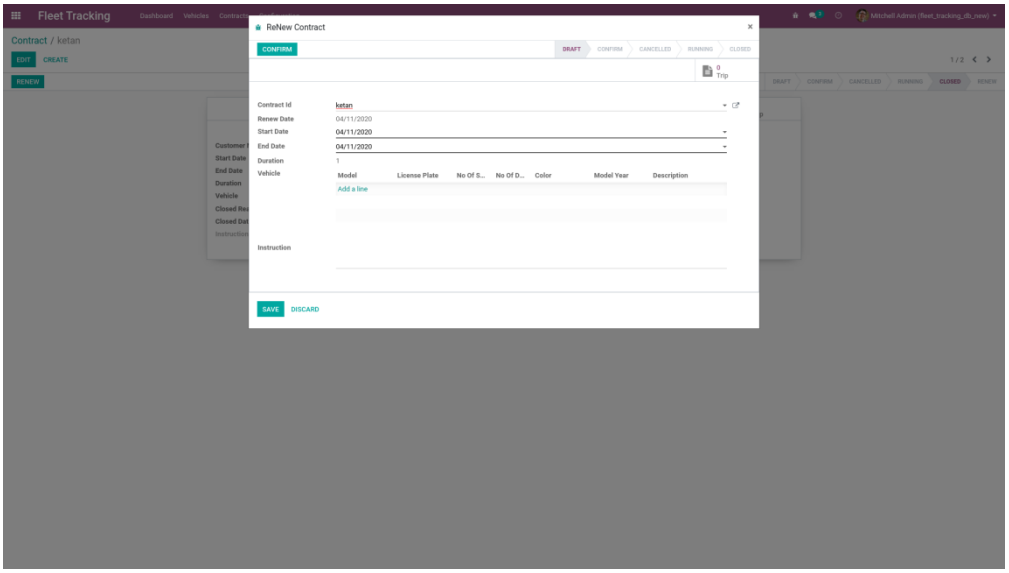
- **Contract detail**



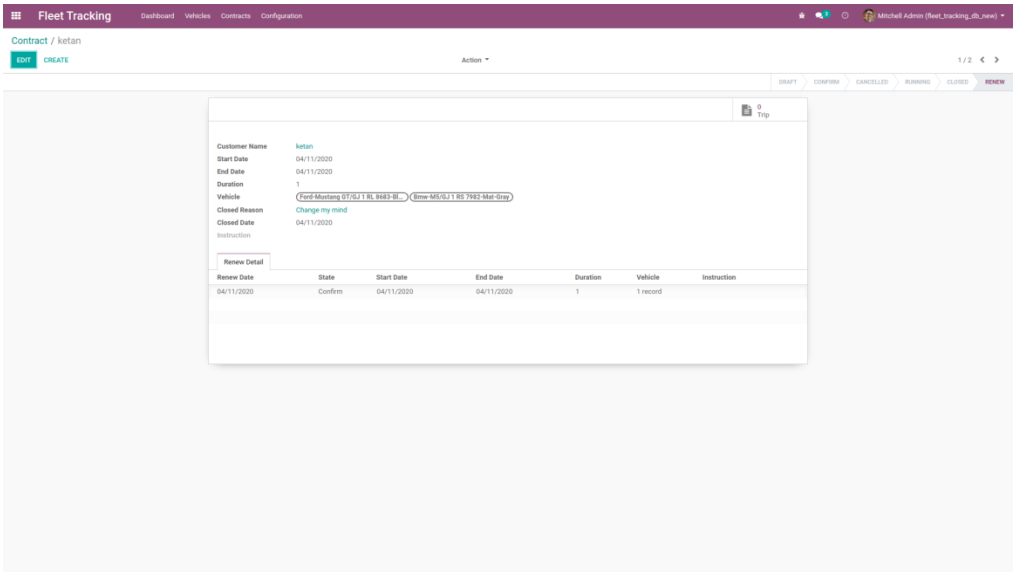
- **Cancel contract**



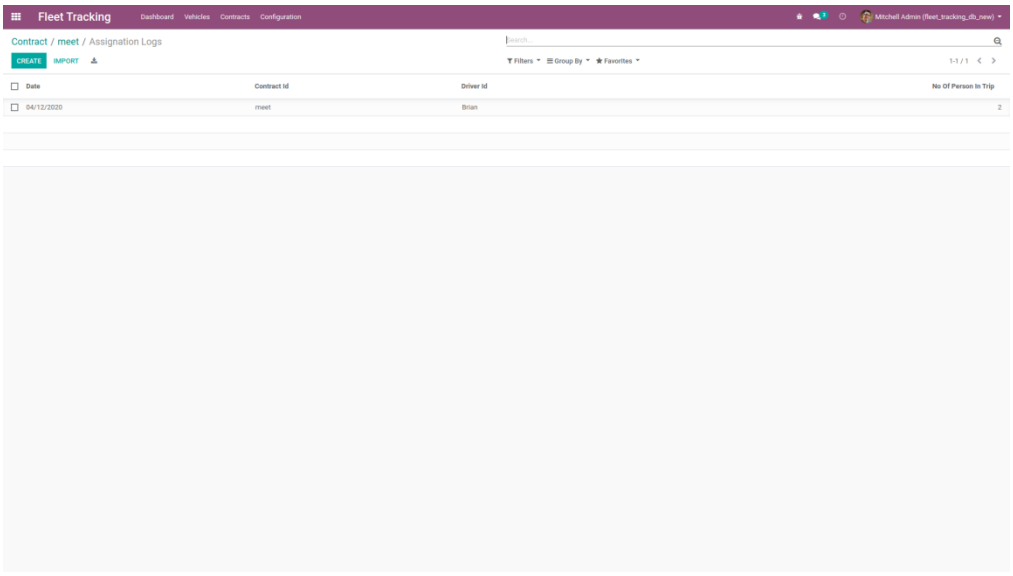
- **Renew contract**



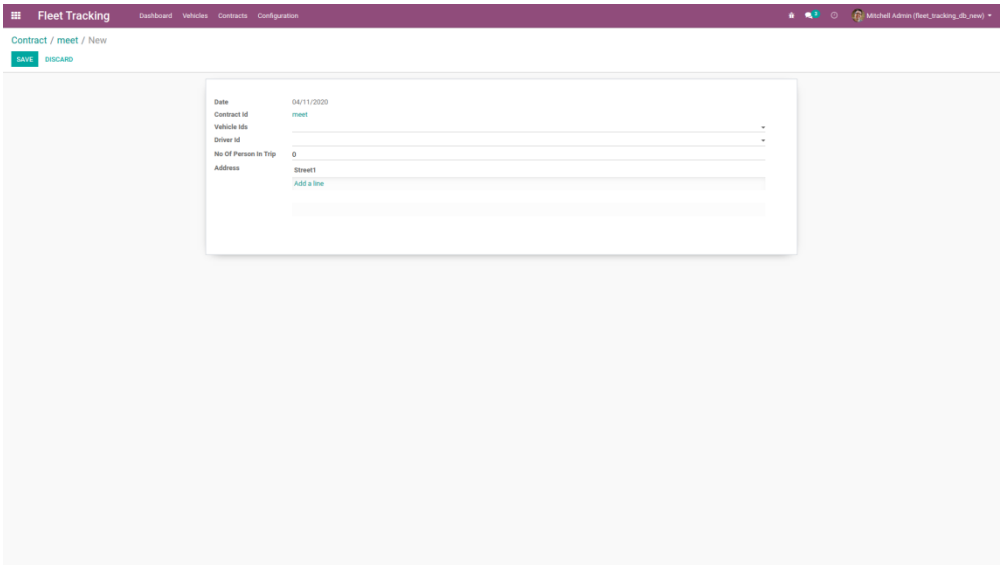
- **Contract renew detail**



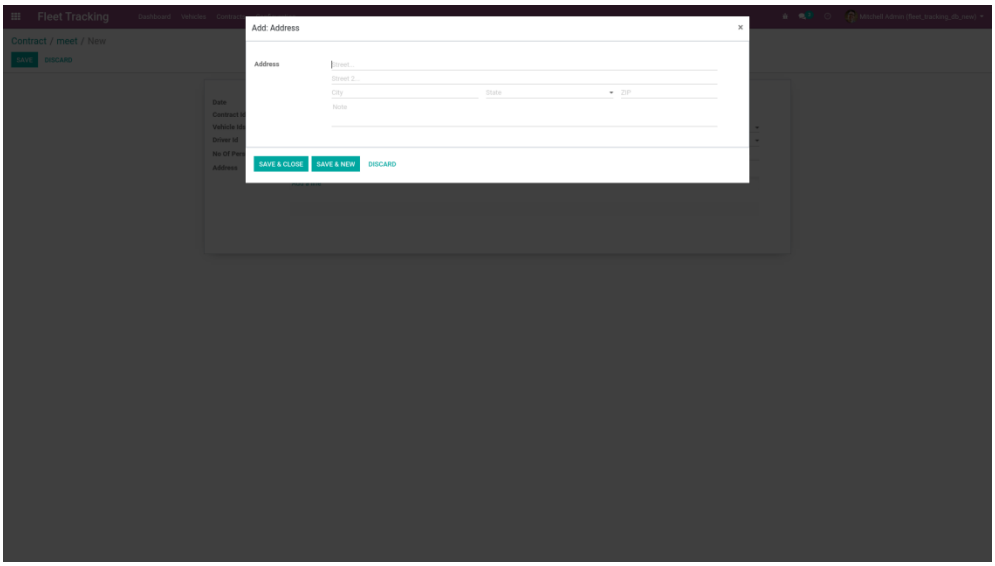
- **Trip list view**



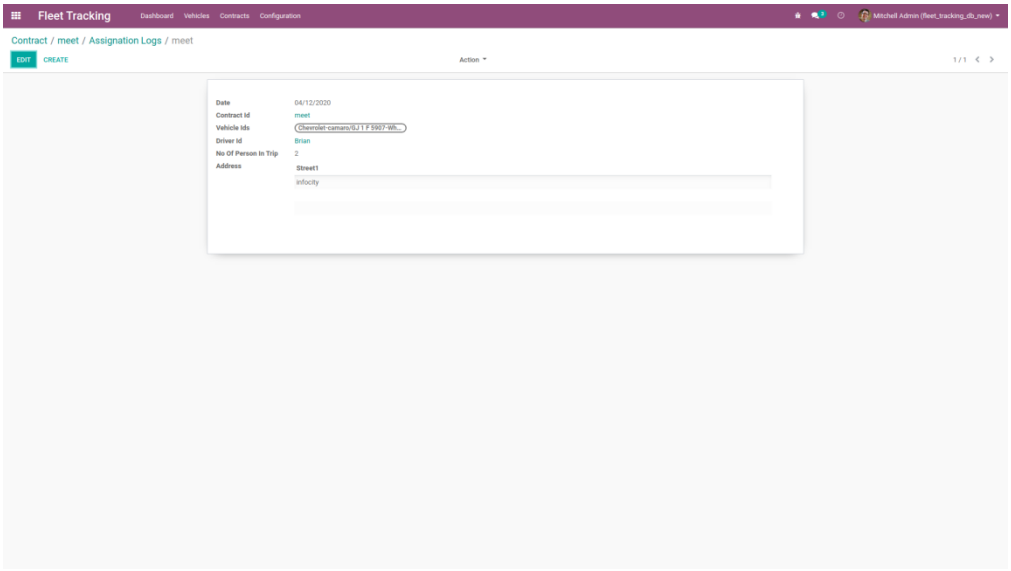
- **Trip form view**



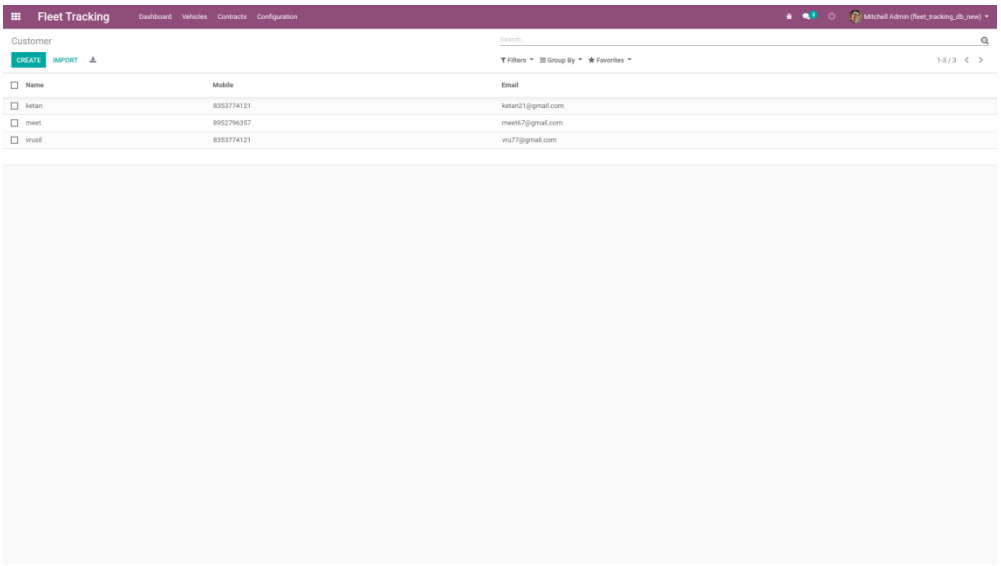
- **Trip address form**



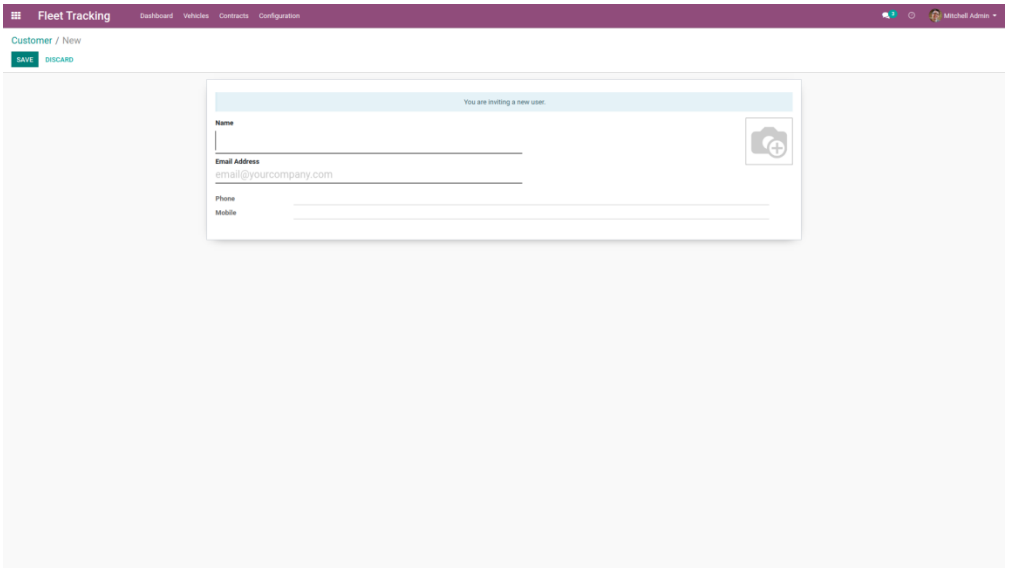
- **Trip detail**



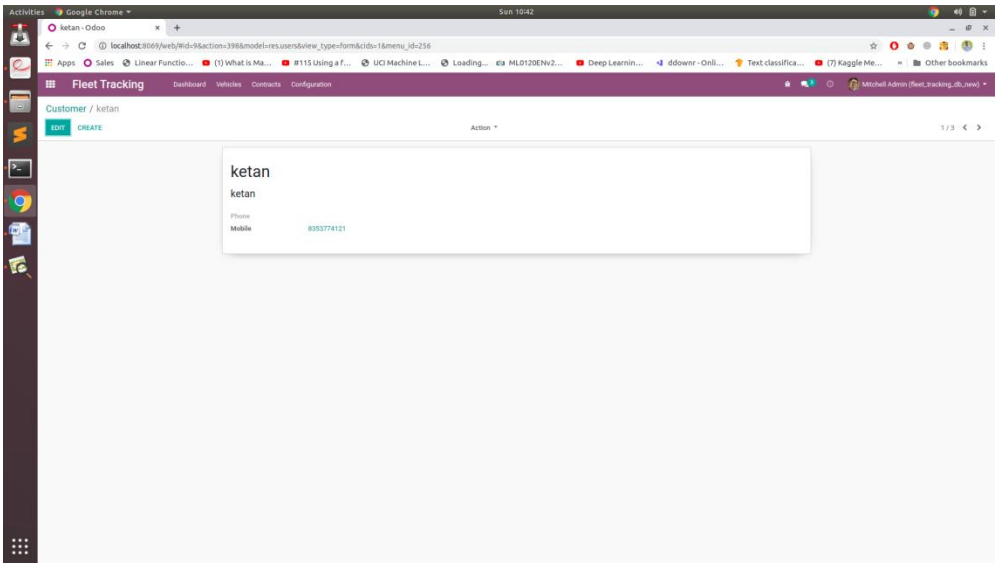
- **Customer**
  - **list view**



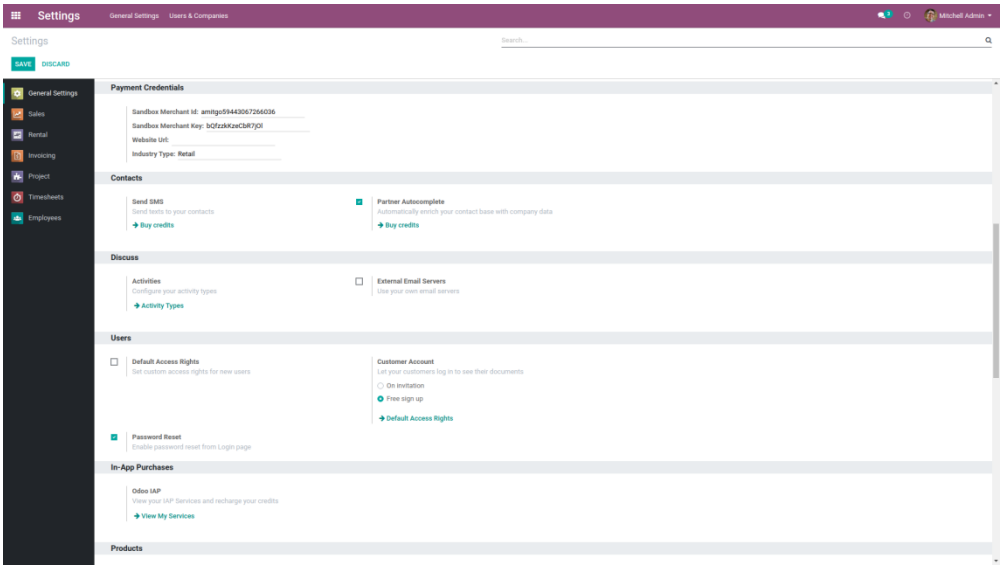
- **form view**



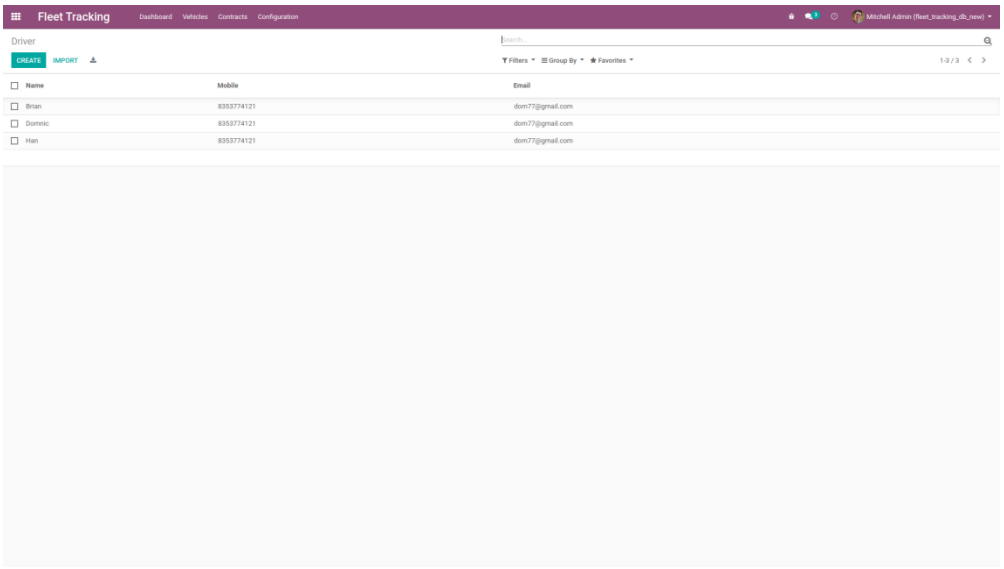
- **Customer detail**



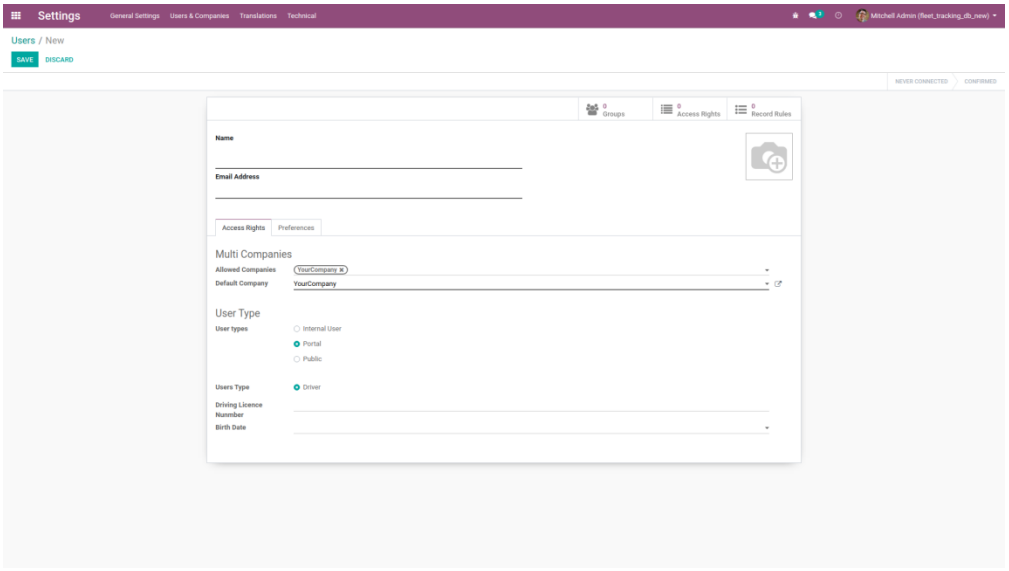
- **App setting**



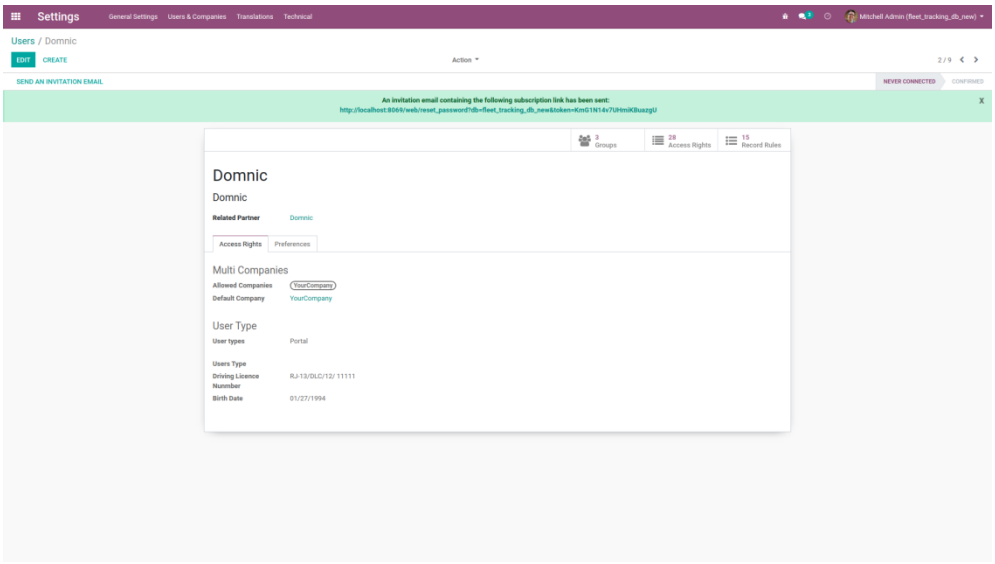
- **Driver**
  - **list view**



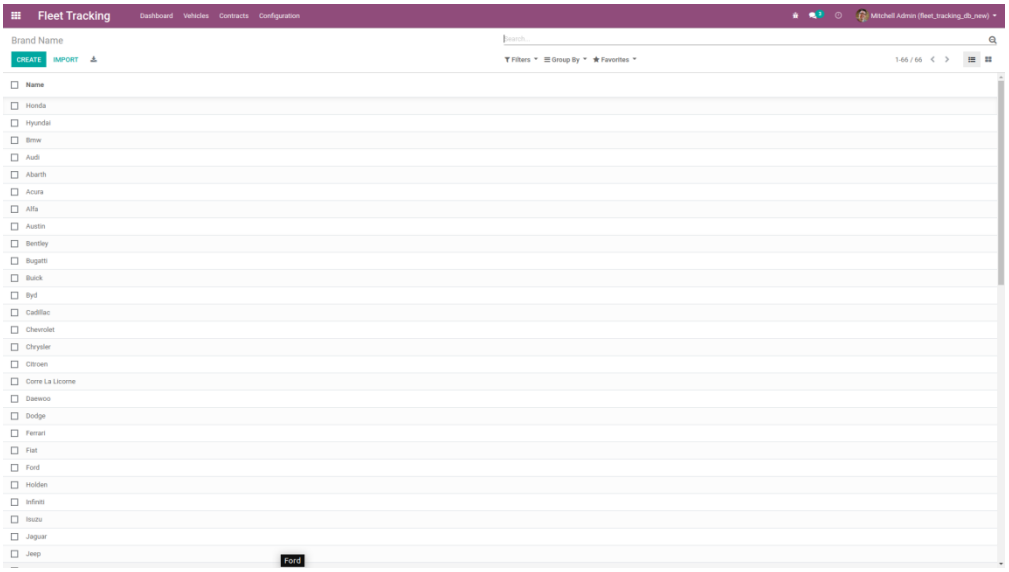
- **form view**



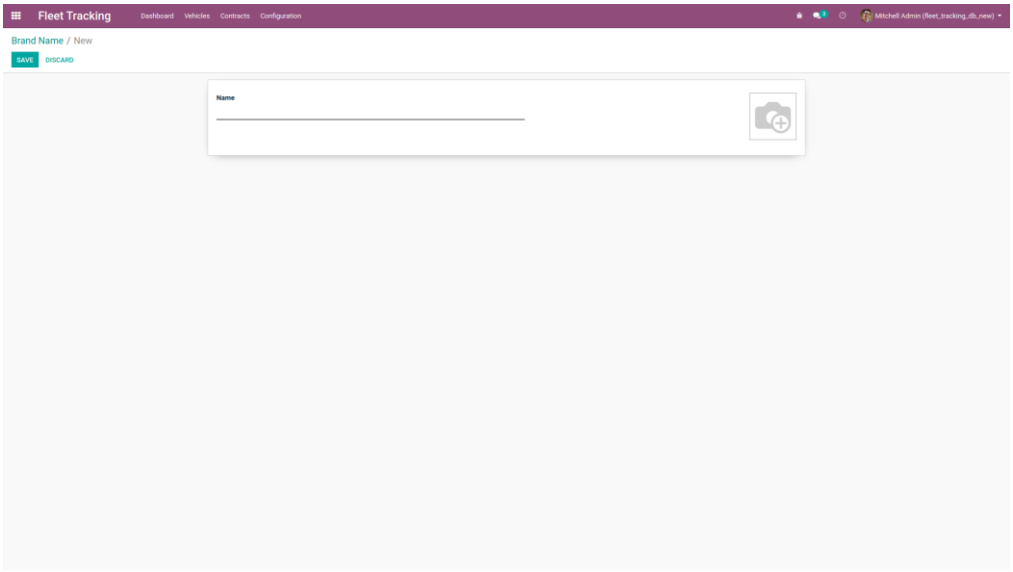
- **Driver detail**



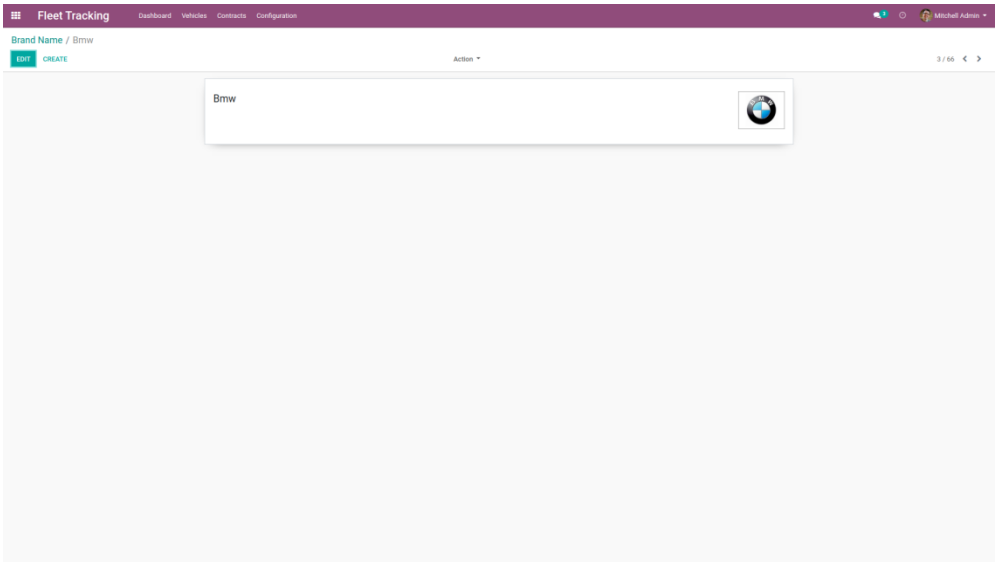
- **Manufacturer**
  - **list view**



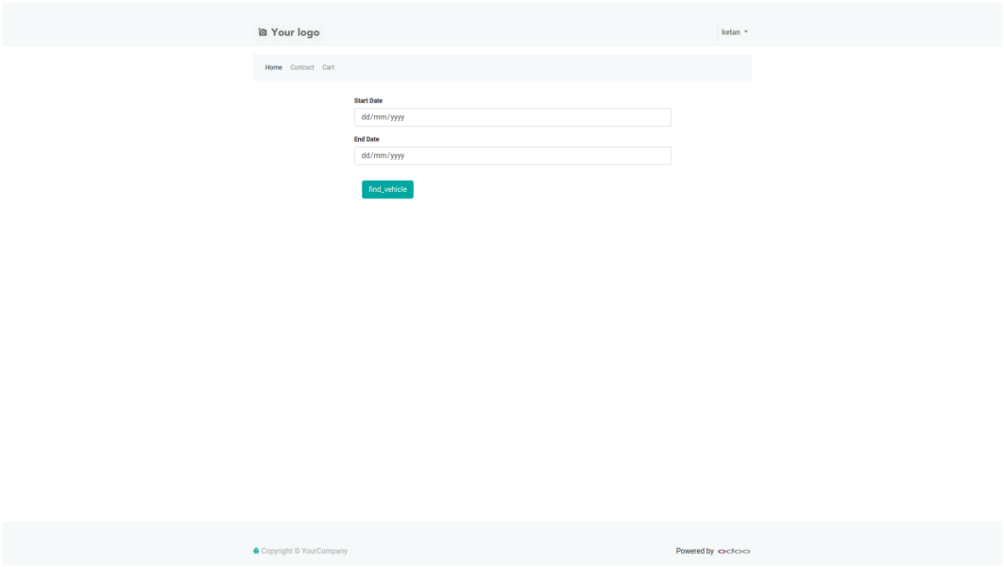
  - **form view**

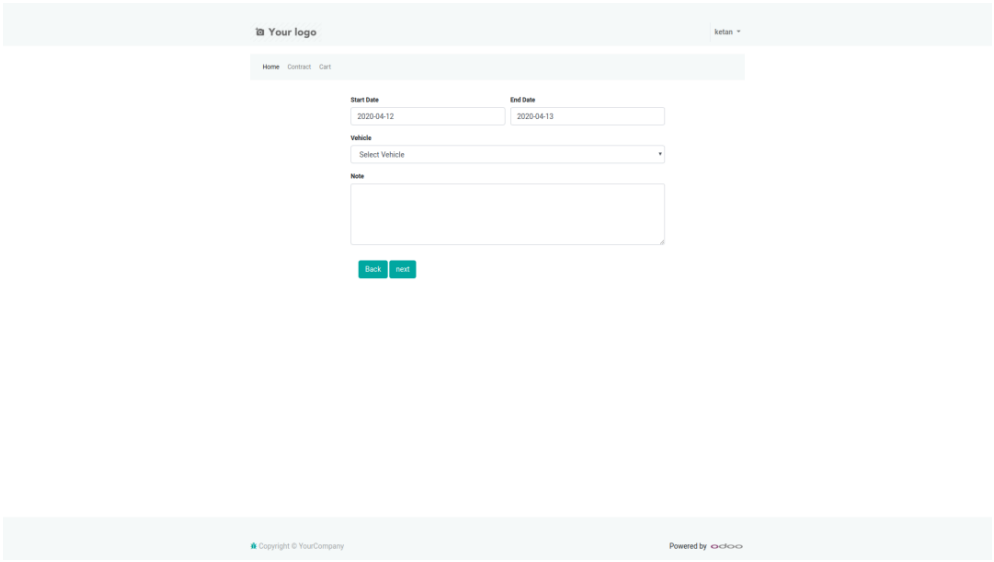


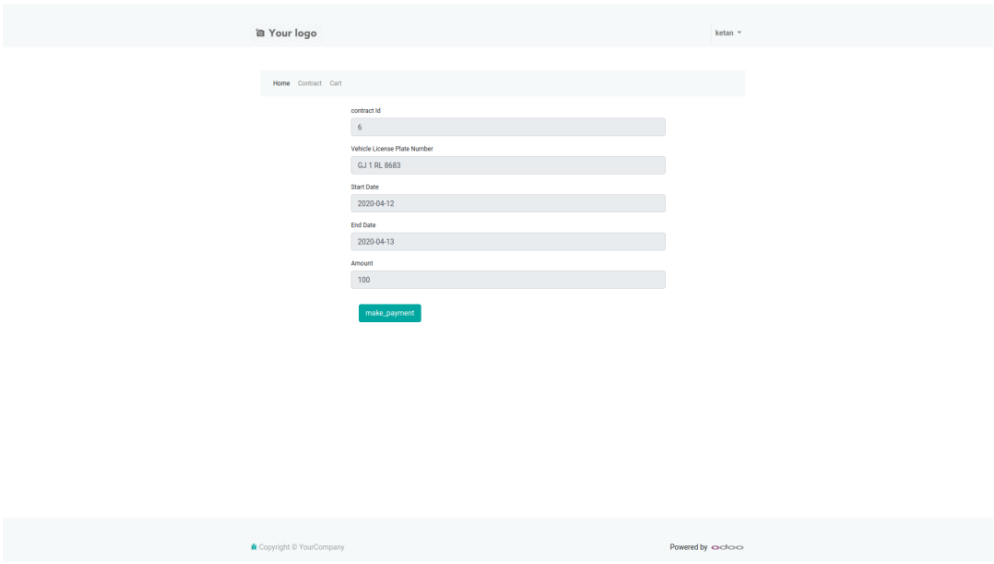
- **Manufacturer detail**

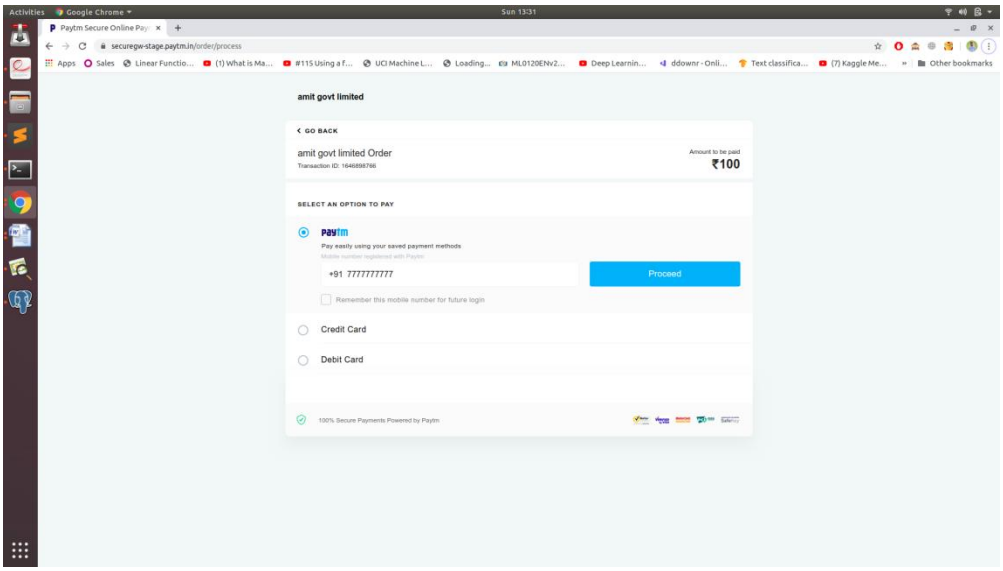


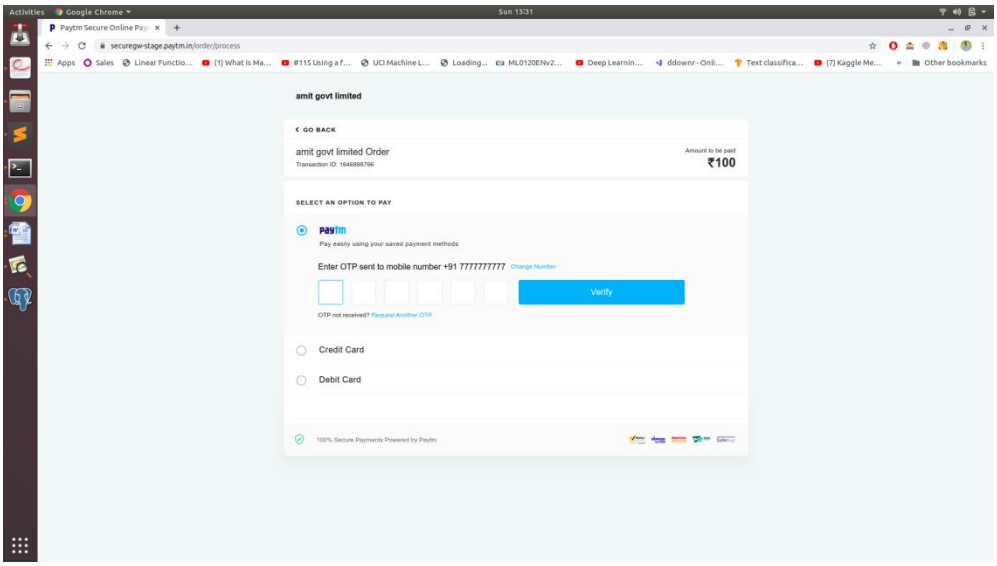
- **Customer portal view**
  - **Contract view**

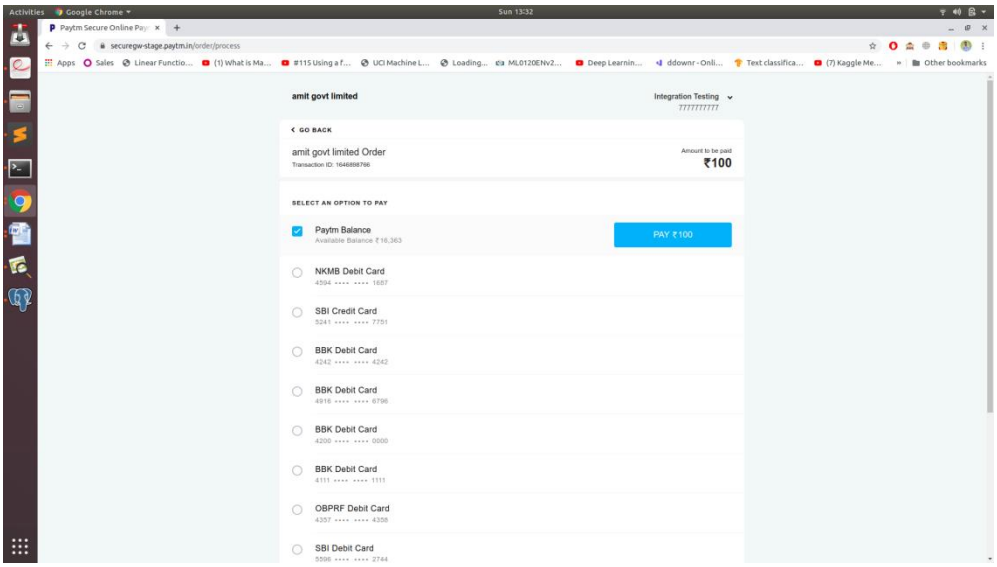


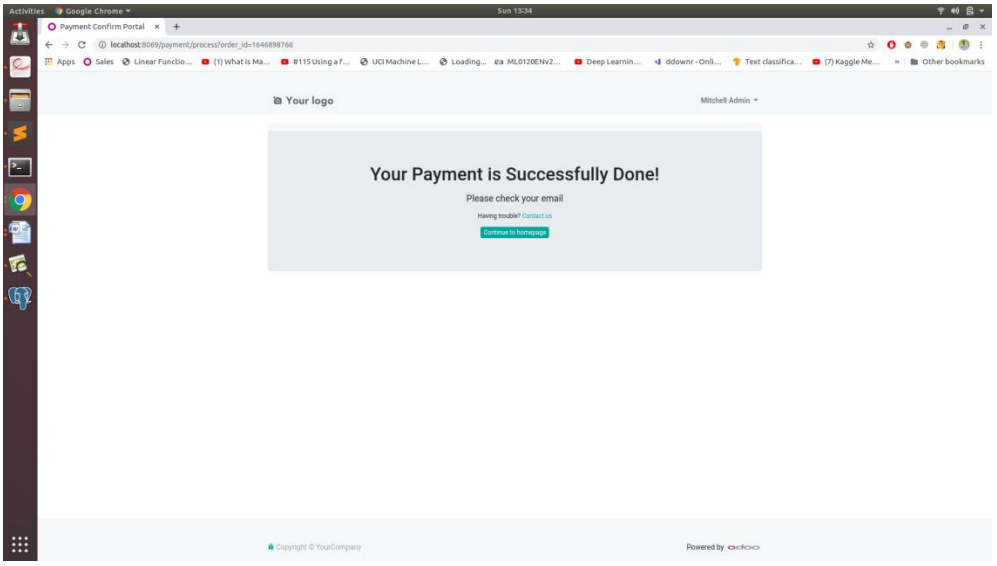

Your logo
ketan
Home
Contract
Cart
Start Date
2020-04-12
End Date
2020-04-13
Vehicle
Select Vehicle
Note
Back
next
Copyright © YourCompany
Powered by odoo


Your logo
ketan
Home
Contract
Cart
contract id
6
Vehicle License Plate Number
GJ 1 RL 8683
Start Date
2020-04-12
End Date
2020-04-13
Amount
100
make_payment
Copyright © YourCompany
Powered by odoo

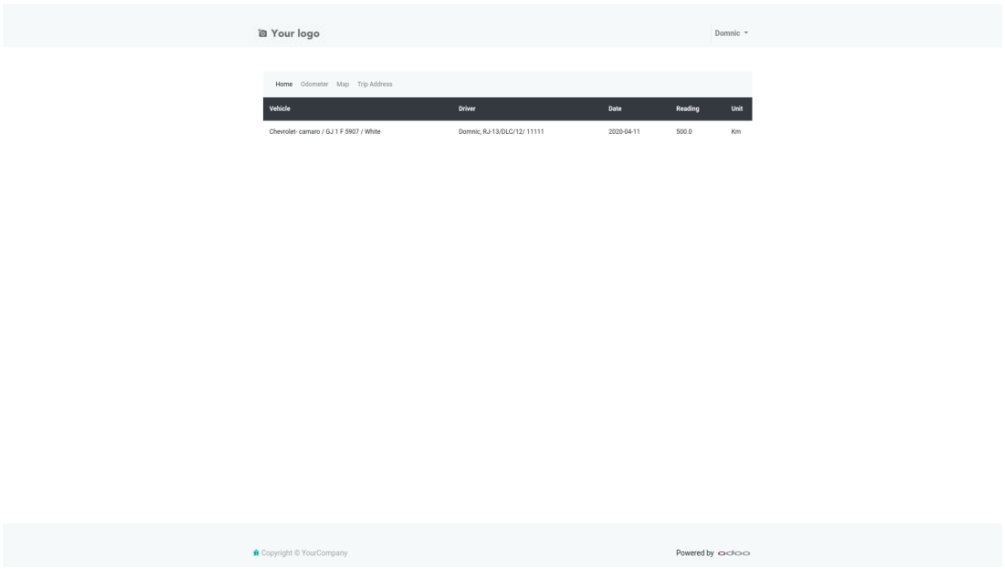

Activities
Google Chrome
Sun 13:31
Paytm Secure Online Pay
securegw-stage.paytm.in/order/process
amit govt limited
GO BACK
amit govt limited Order
Amount to be paid
₹100
SELECT AN OPTION TO PAY
Paytm
Pay easily using your saved payment methods
+91 7777777777
Proceed
Credit Card
Debit Card
100% Secure Payments Powered by Paytm


amit govt limited
GO BACK
amit govt limited Order
Transaction ID: 1646898766
Amount to be paid
₹100
SELECT AN OPTION TO PAY
Paytm
Pay easily using your saved payment methods
Enter OTP sent to mobile number +91 7777777777
Change Number
Verify
OTP not received? Request Another OTP
Credit Card
Debit Card
100% Secure Payments Powered by Paytm

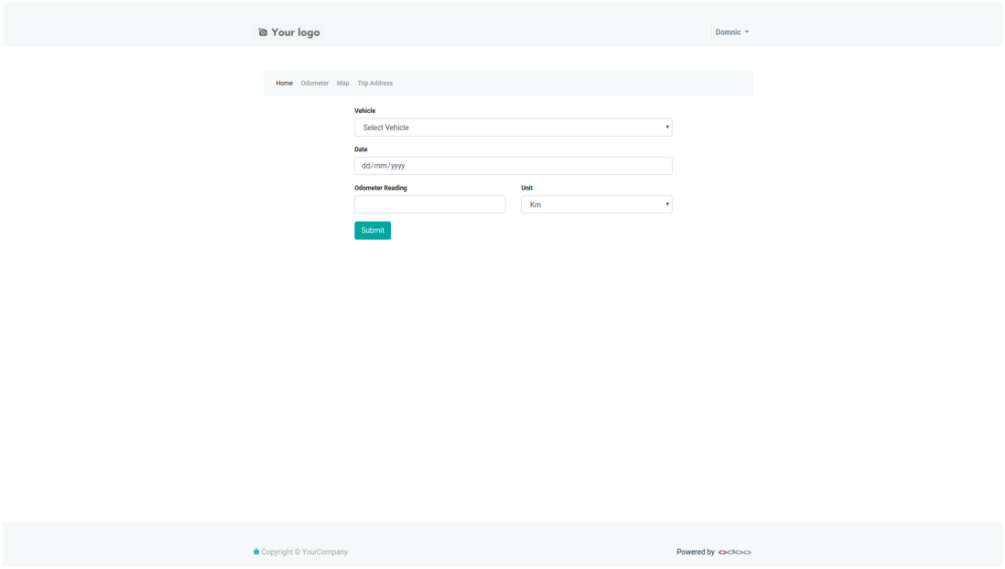

amit govt limited
Integration Testing
7777777777
GO BACK
amit govt limited Order
Transaction ID: 1646898766
Amount to be paid
₹100
SELECT AN OPTION TO PAY
Paytm Balance
Available Balance ₹16,363
PAY ₹100
NKMB Debit Card
SBI Credit Card
BBK Debit Card
BBK Debit Card
BBK Debit Card
BBK Debit Card
OBPRF Debit Card
SBI Debit Card


Your logo
Mitchell Admin
Your Payment is Successfully Done!
Please check your email
Having trouble? Contact us
Continue to homepage
Powered by odoo

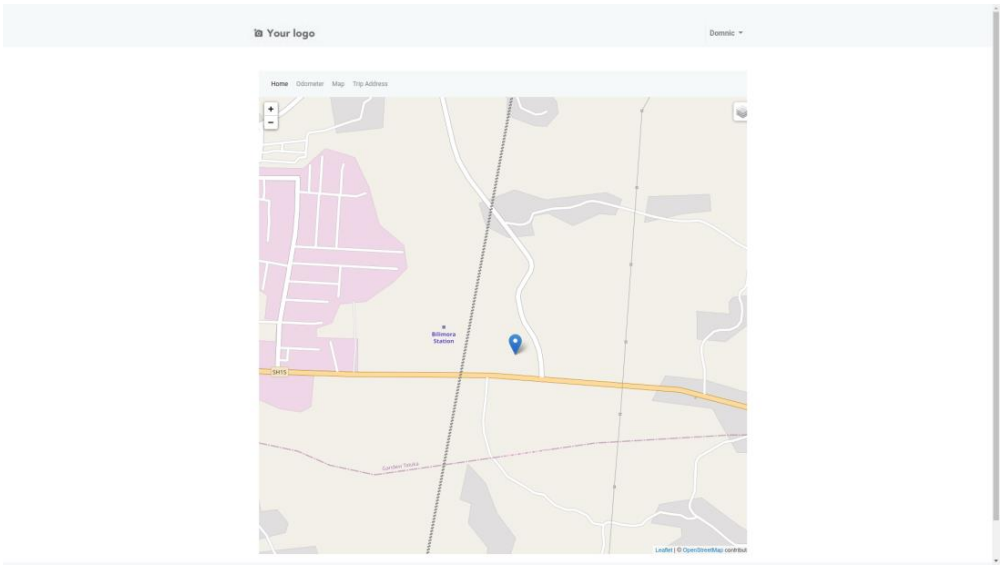
- **Driver portal view**
  - **Home**



Odometer

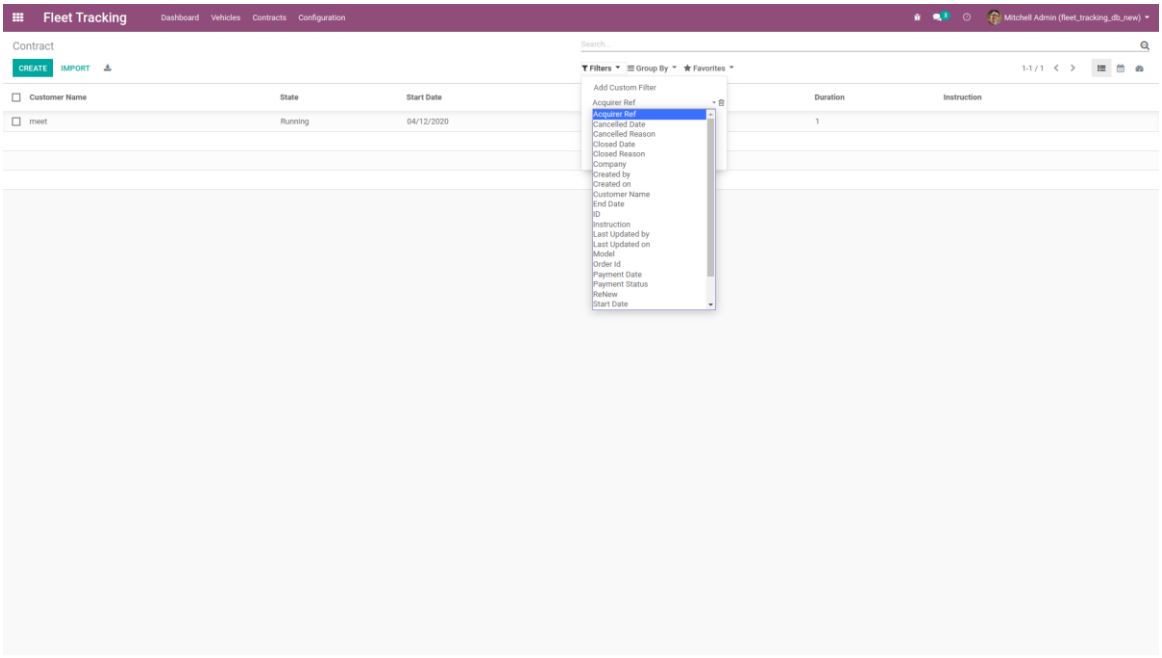


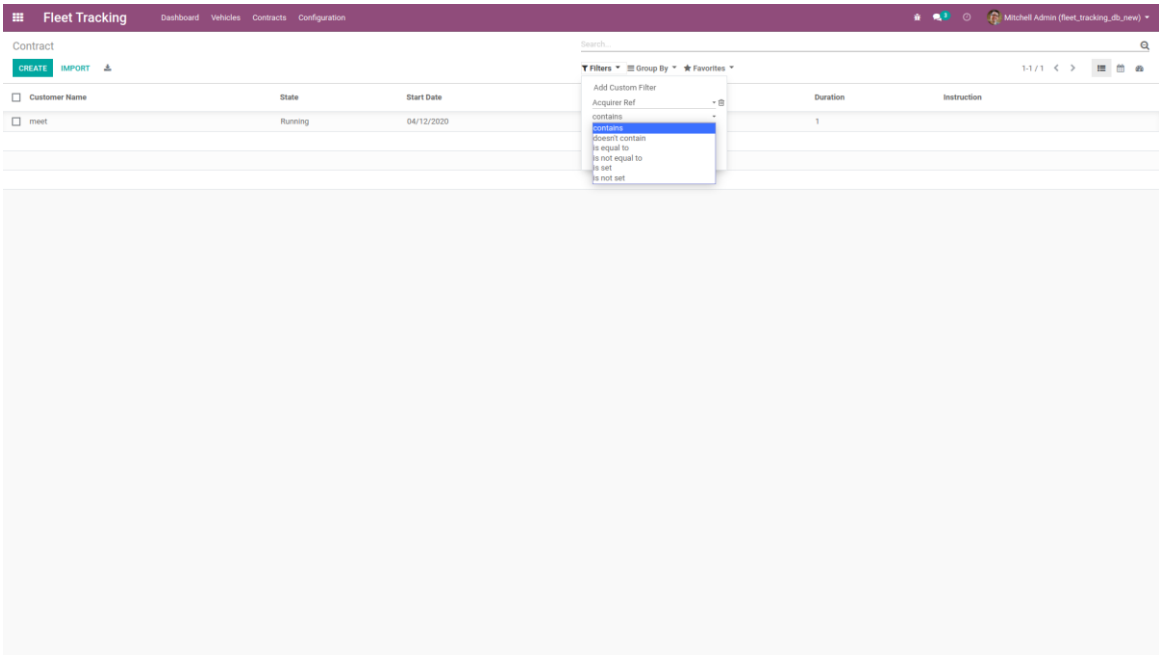
- **Map**

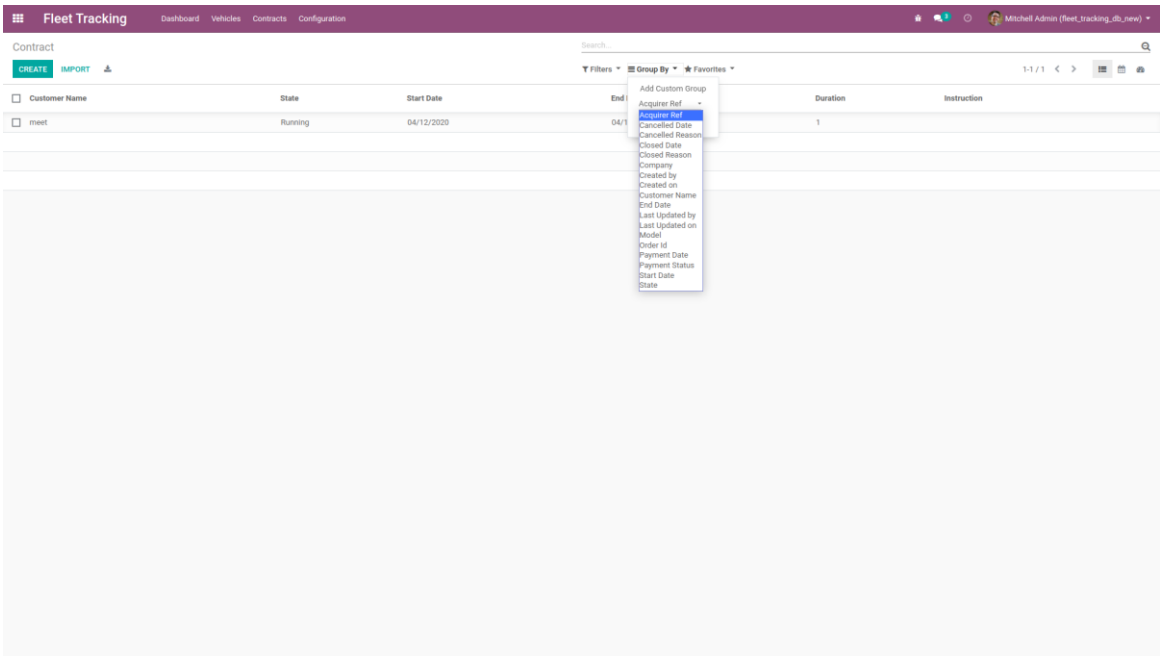

Your logo
Domnic
Home
Odometer
Map
Trip Address
Billimora Station
SH15

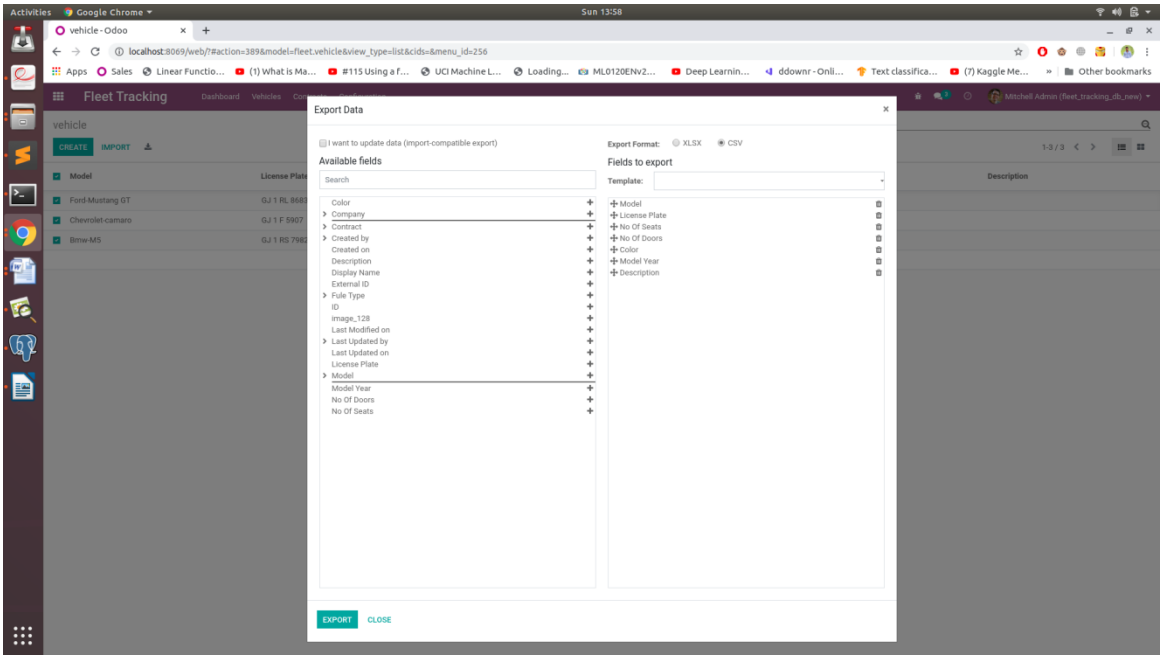
13.0 Reports

For report **odoo** provide facility of filter data as per required condition, group by data as per chosen field, search facility, and also provide facility to export data in xlsx or csv format.






Fleet Tracking
Dashboard
Vehicles
Contracts
Configuration
Contract
CREATE
IMPORT
Customer Name
State
Start Date
Duration
Instruction
meet
Running
04/12/2020
1
Add Custom Group
Acquirer Ref
Cancelled Date
Cancelled Reason
Closed Date
Closed Reason
Company
Created by
Created on
Customer Name
End Date
Last Updated by
Last Updated on
Model
Order Id
Payment Date
Payment Status
Start Date
State


Activities
Google Chrome
Sun 13:58
vehicle - Odoo
localhost:8069/web/?#action=389&model=fleet.vehicle&view_type=list&cids=&menu_id=256
Fleet Tracking
vehicle
CREATE
IMPORT
Export Data
I want to update data (import-compatible export)
Export Format:
XLSX
CSV
Available fields
Search
Fields to export
Template:
EXPORT
CLOSE

14.0 Future Enhancements

In future we are planning to add more features in live tracking like

- Smart routing
- Store live tracking data in server and give feature to keep watch on vehicle
- Geofanciing
- Analyze Driver behavior using machine learning
- Vehicle diagnosis
- Watch on fuel
- Live chatting between drives and office
- Show driver nearby drivers
- Add more payment method
- Add feature of travel history in customer side
- Add feature of rating in customer side

15.0 Bibliography

https://www.odoo.com/documentation/13.0/

https://www.altexsoft.com/blog/business/fleet-management-software-key-functions-solutions-and-innovations/

https://shodhganga.inflibnet.ac.in/bitstream/10603/199078/10/10_chapter2.pdf

https://www.academia.edu/35464320/Comparative_Analaysis_of_fleet_Management_Technology_usage_in_Ethiopia