EU Rental

GROUP - 8

Jash Pithadia
Saurabh Singh
Rahul Deore
Peerada Looareesuwan

INFS 622 | Dr. Larry Kerschberg

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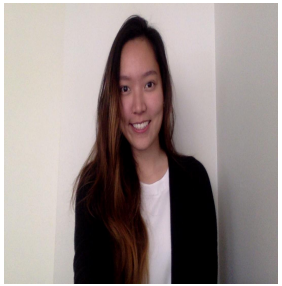
PROJECT MEMBERS

Jash Pithadia
- Project Manager
- Requirement Analysis and Design

Saurabh Singh
- Database and Business

Rahul Deore
- Program Design and Specification



Peerada Looareesuwan
- Architecture Design and Analysis

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INTRODUCTION

- Three businesses, EU fly , EU Rental and EU stay.
- Adding new features to the EU Rentals.
- Existing strong customer base.
- Autonomous Car feature in 5 US States.
- Customer safety and enhanced customer relationship.

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MAJOR FINDING

- Adding autonomous cars.
- Reduced break even point from 3.45 year to 2.42 years.
- Launching Autonomous module in 5 States.
- Plan is to lease the car rather than buying them.
- AWS RDS Mysql instance as database server.

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EXISTING SYSTEM

- EU rental has its own information system.
- Online and walk in reservations options.
- Flexible Reservation policies.
- Servicing branches for periodic maintenance.
- Loyalty incentives scheme.
- Base rules on granting the reservation to customers.
- Branch managers are responsible for profits.

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PROPOSED SYSTEM

- Vanguard in the field of autonomous cars.
- Adding more payment options.
- Mobile application for cell phones and watches.
- Disaster recover to safeguard the customer data.
- Use business analytic tools and data mining.
- Introducing load balancers.
- Fast transactions handling for booking clerks.

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REQUIREMENTS

Functional Requirements

- Manage Booking
- Produce schedule

Non-functional Requirements

- Operational Requirement
- Performance Requirement
- Security Requirement
- Cultural and Political requirement

FEASIBILITY ANALYSIS

- **Technical feasibility**
  - Familiarity with self-driving cars.
  - Familiarity with web and mobile applications with respect to adding rent-a-self driving car function.

- **Economic feasibility**
  - Development costs: 1,370,000 (1.37 M)
  - Annual operating costs: 760,000
  - Return on Investment: 19.57%
  - Break-even Point: 2.42 years

- **Organizational feasibility**
  - This project has low risk
  - We have IT- infrastructure ready. We have a strong customer base.
  - Professor Larry Kerschberg is our senior manager.

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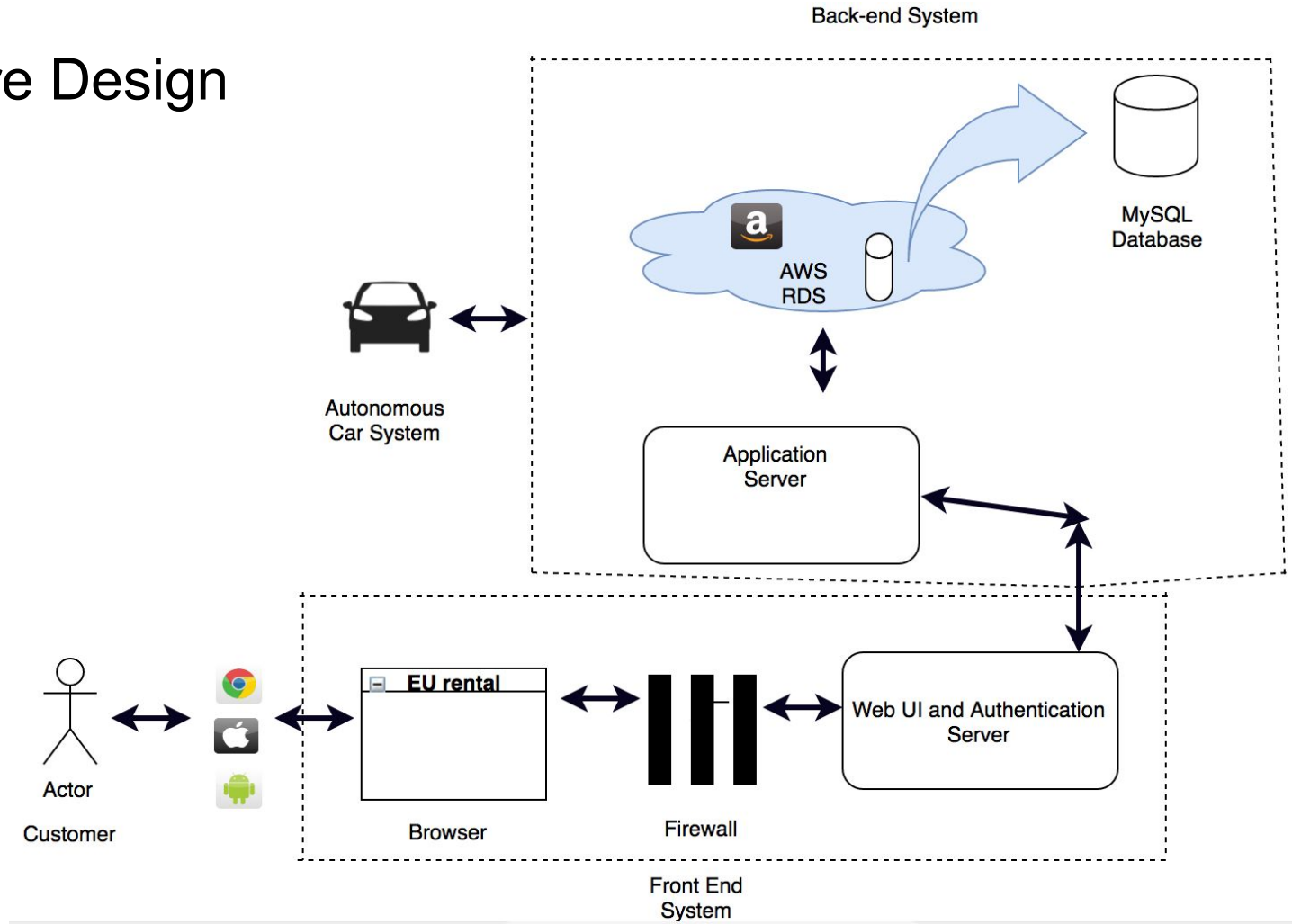
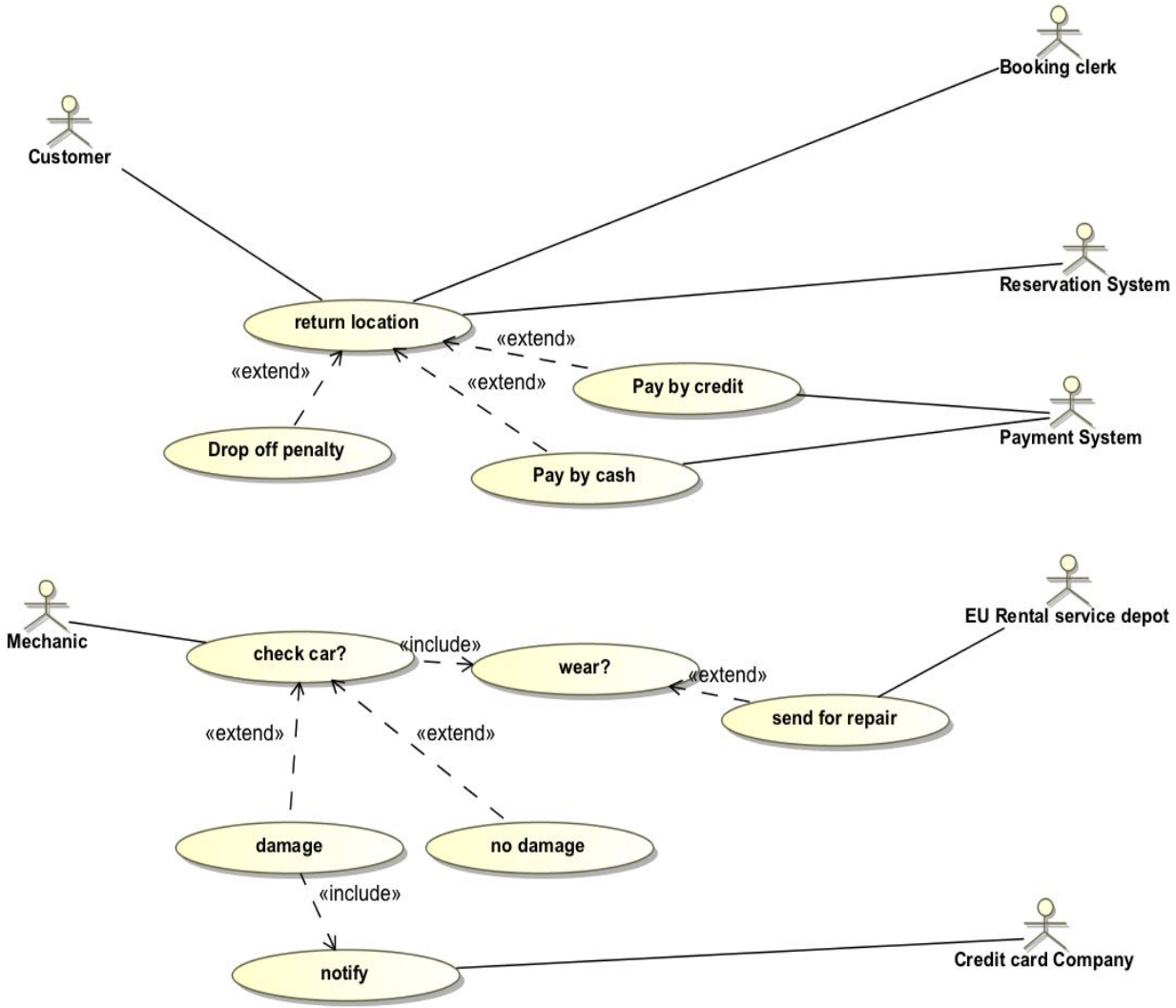
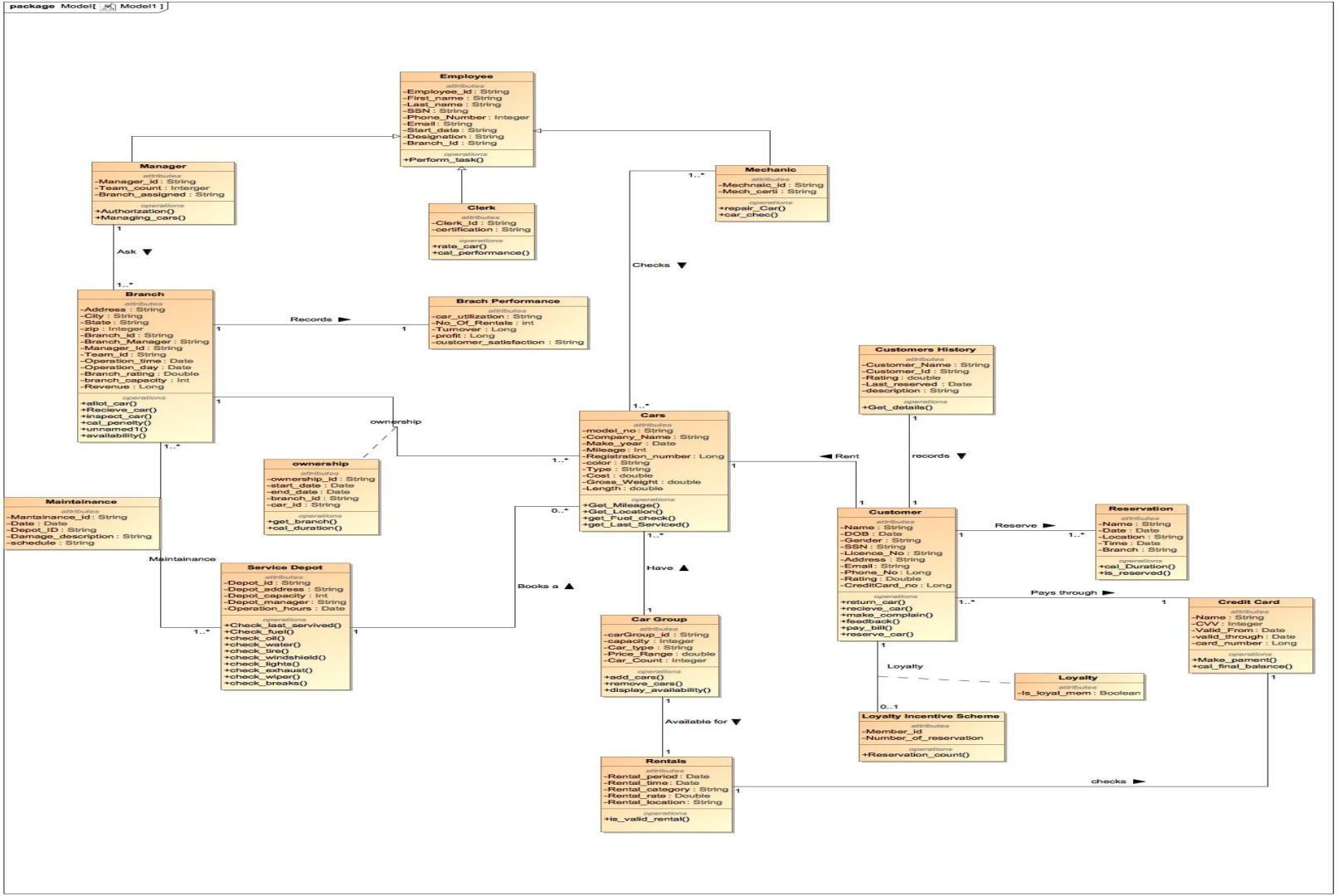
Architecture Design



Use case

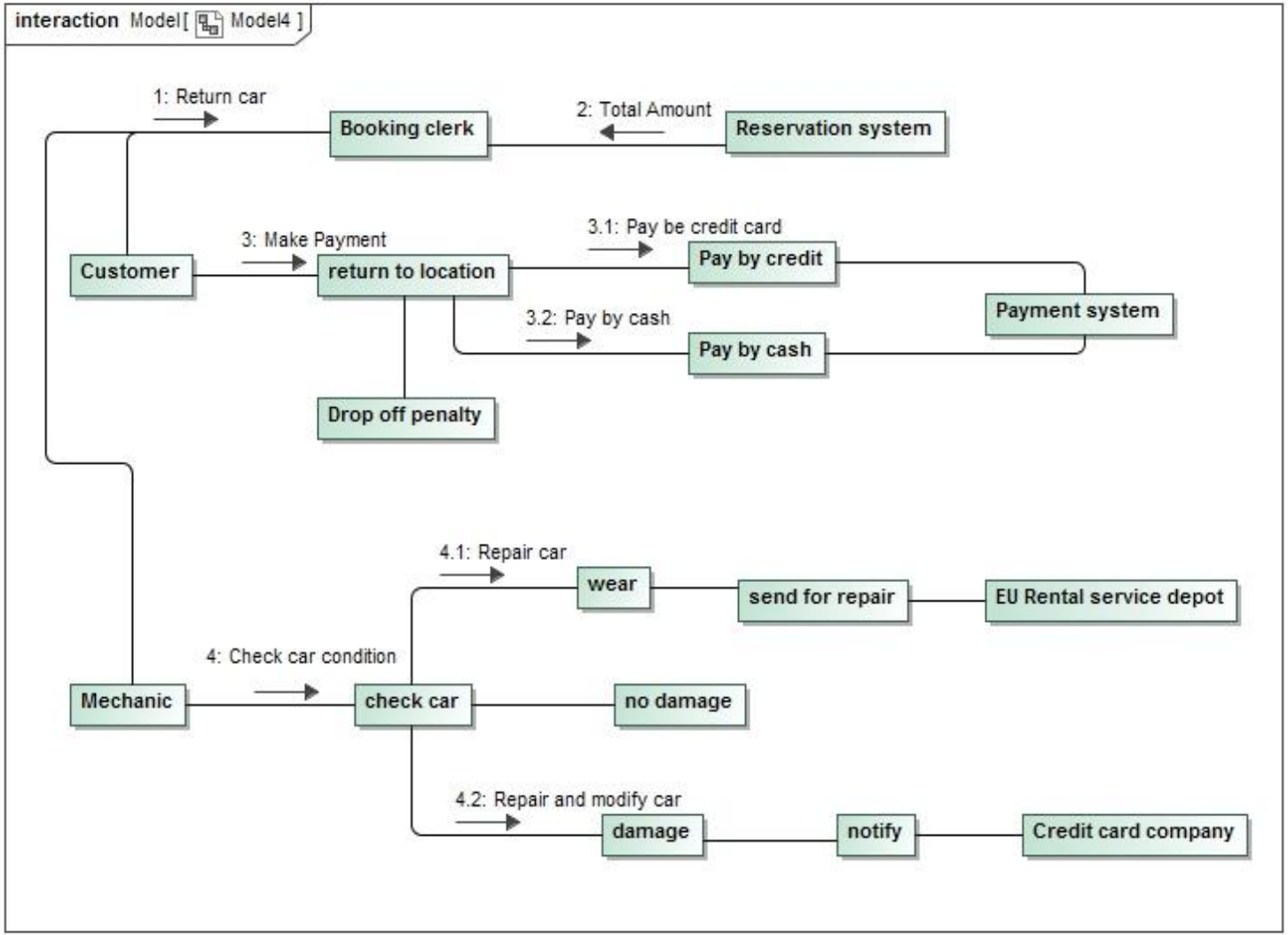

Booking clerk
Customer
Reservation System
return location
«extend»
«extend»
«extend»
Pay by credit
Drop off penalty
Pay by cash
Payment System
Mechanic
check car?
«include»
wear?
«extend»
EU Rental service depot
send for repair
«extend»
«extend»
damage
no damage
«include»
notify
Credit card Company

Class Diagram



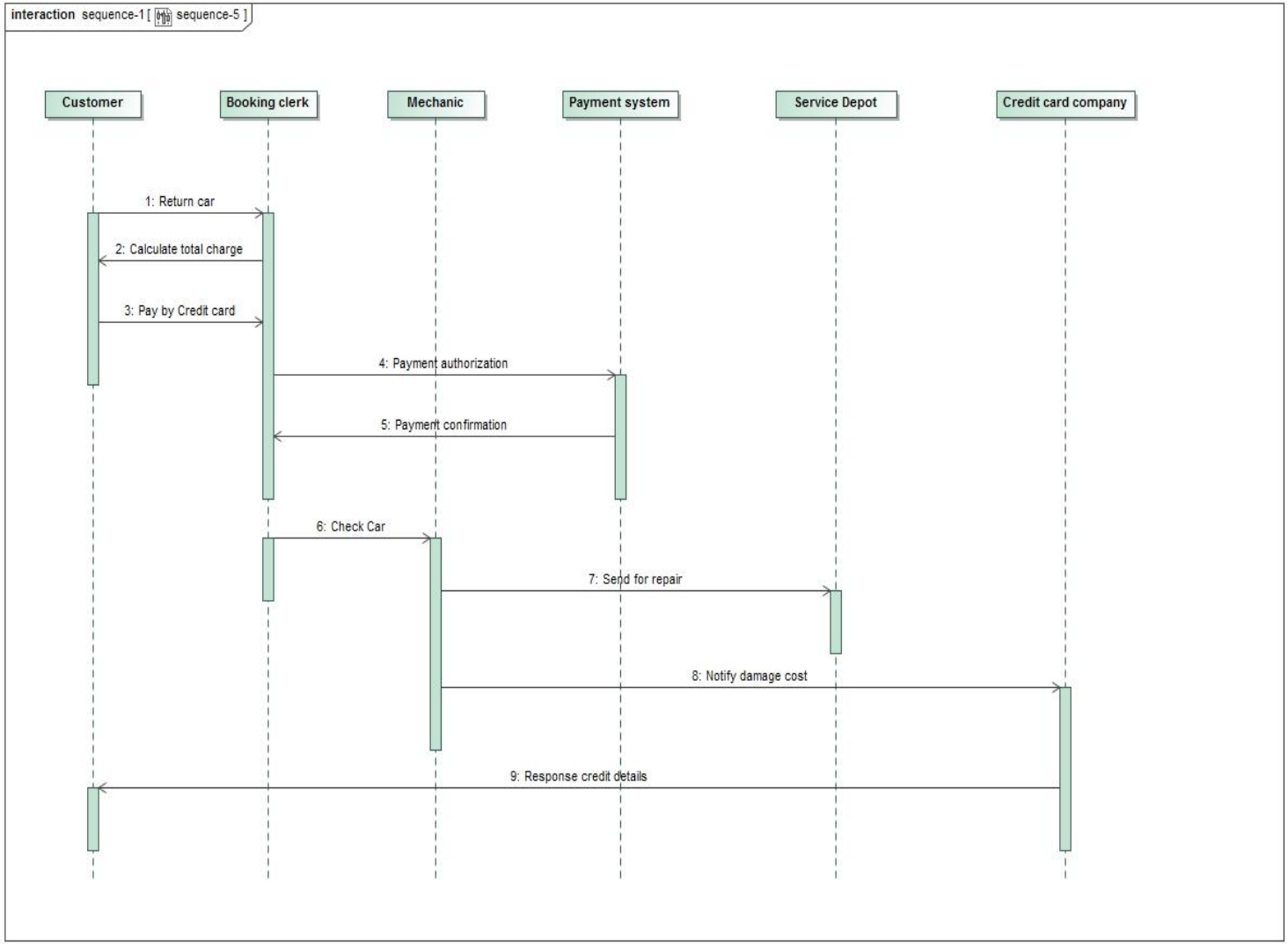
Communication diagram

Car return

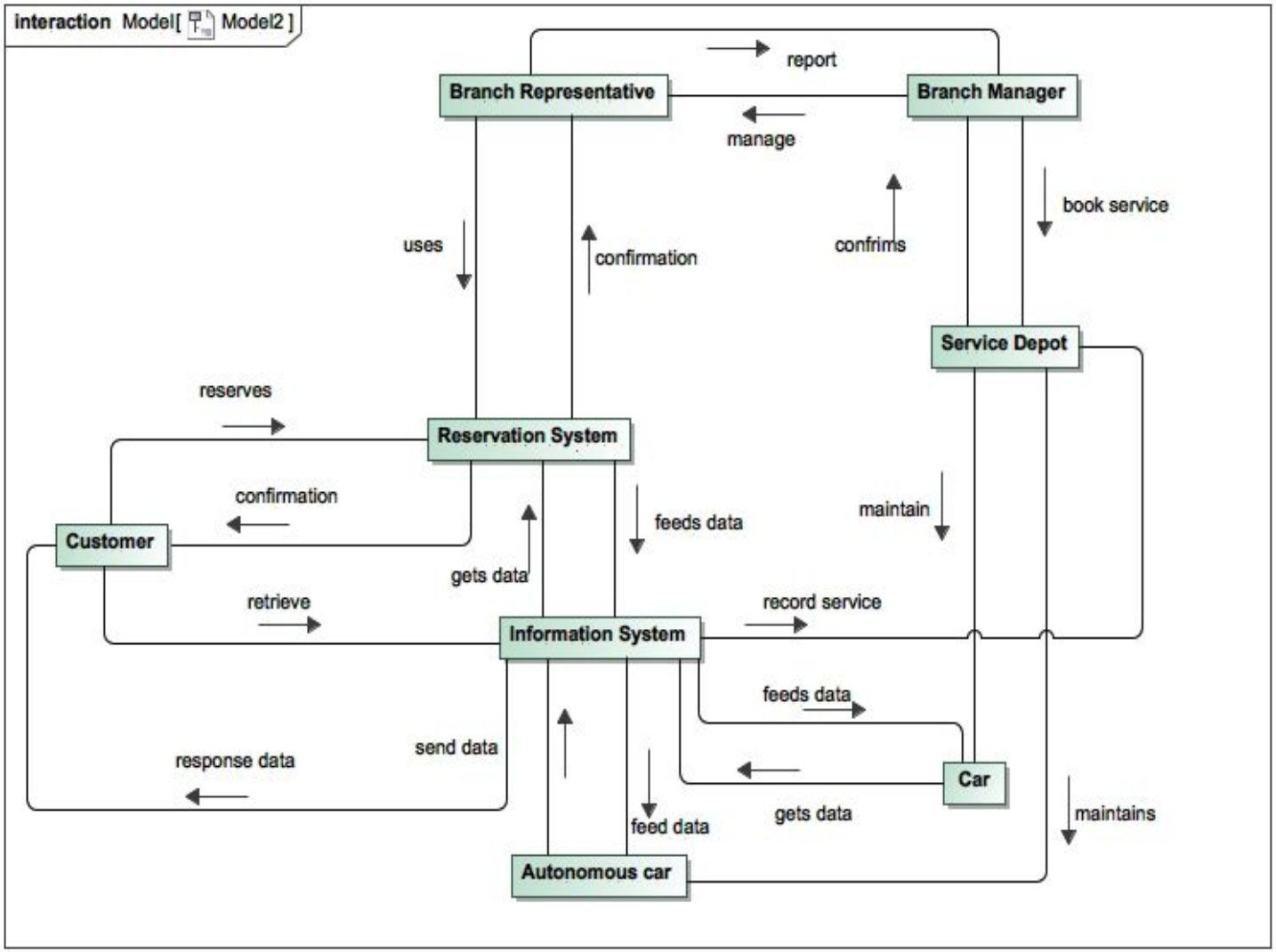


Sequence diagram

Car return

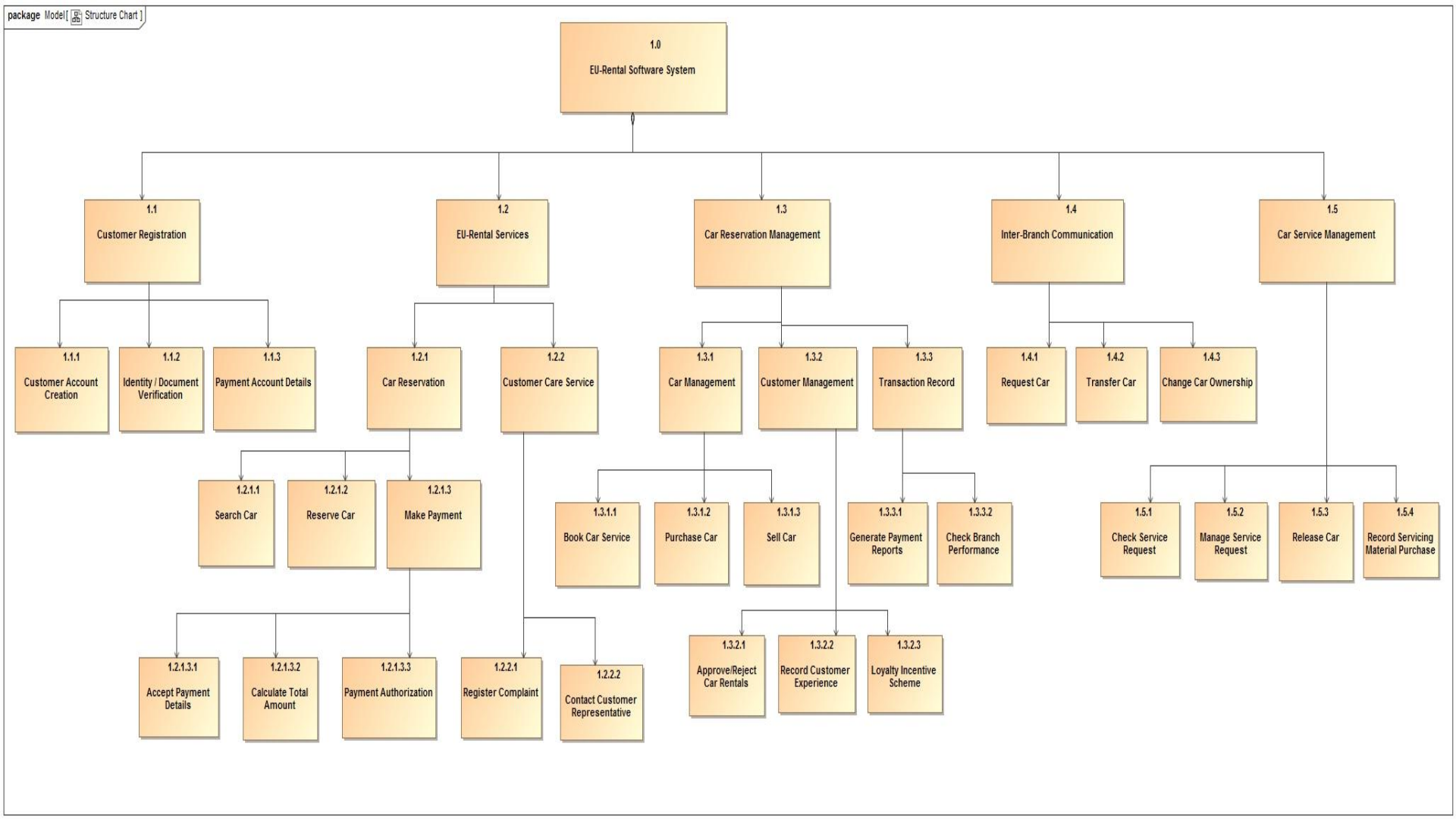


Data flow Diagram

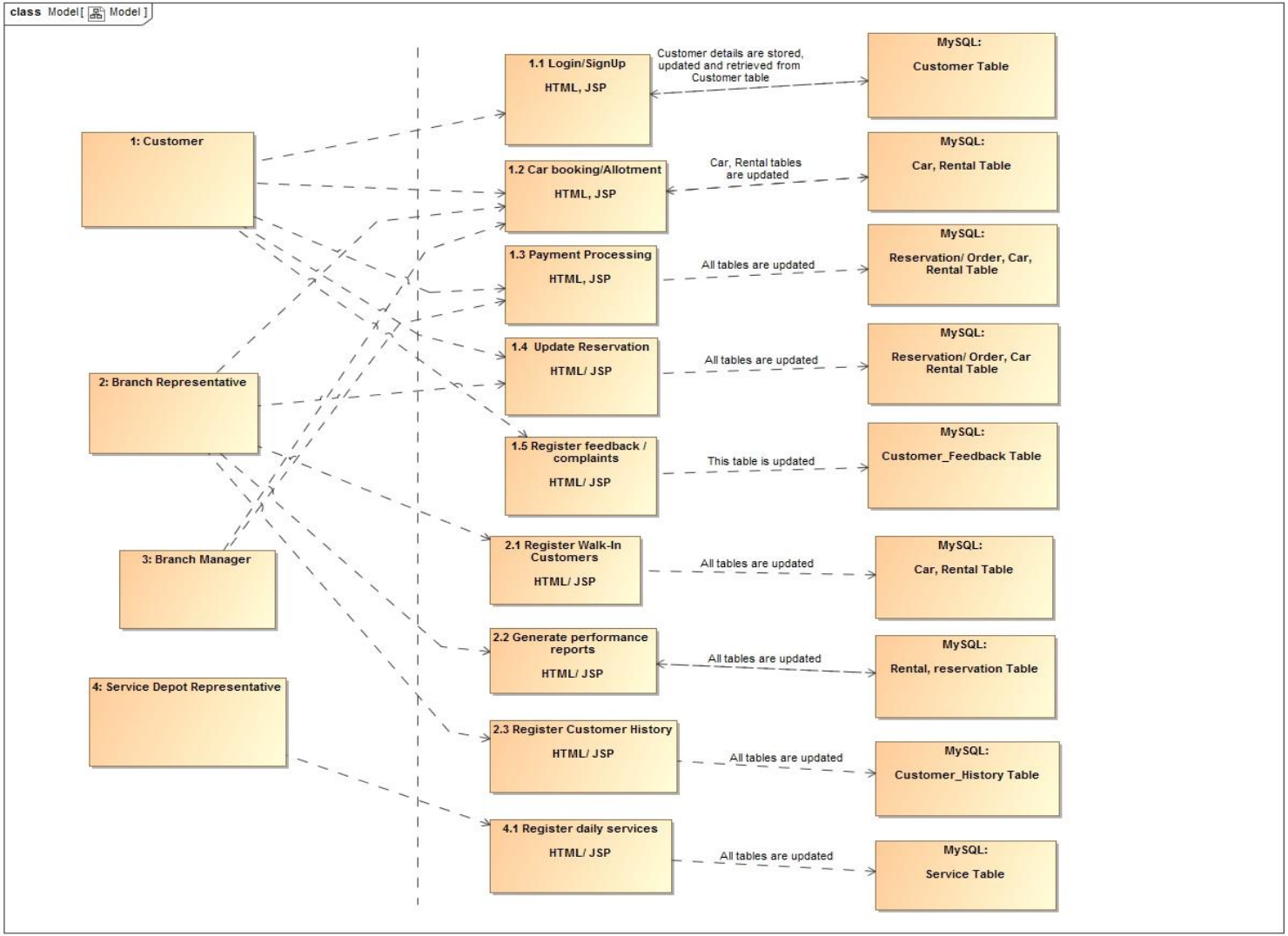


Hardware/Software Specifications

	Standard client	Standard Web Server	Standard Application Server	Standard Database Server
Operating System	· Windows 7/8/10 · Mac/Linux	· Windows	· Windows	· AWS RDS Instance (Memory optimized)
Special Software	· Eclipse · MagicDraw · MySQL Workbench · Chrome/Firefox	· Apache Tomcat	· Java/J2EE · JBoss	· MySQL
Hardware	· 500-GB disk drive · Intel® Core(TM) i5-5200 CPU @ 2.20GHz	· 500-GB disk drive · Dual- Core Xeon	· 500-GB disk drive · Six-Core Xeon	· db.r3.8x.large · 244 GB · 10 Gbps Network Performance
Network	· Always-on Broad-band preferred · Dial-up at 256 Kbps, Possible with some performance loss	· Dual 100 Mbps Ethernet	· Dual 100 Mbps Ethernet	· Dual 100 Mbps Ethernet


package Model [Structure Chart]
1.0
EU-Rental Software System
1.1
Customer Registration
1.2
EU-Rental Services
1.3
Car Reservation Management
1.4
Inter-Branch Communication
1.5
Car Service Management
1.1.1
Customer Account Creation
1.1.2
Identity / Document Verification
1.1.3
Payment Account Details
1.2.1
Car Reservation
1.2.2
Customer Care Service
1.3.1
Car Management
1.3.2
Customer Management
1.3.3
Transaction Record
1.4.1
Request Car
1.4.2
Transfer Car
1.4.3
Change Car Ownership
1.2.1.1
Search Car
1.2.1.2
Reserve Car
1.2.1.3
Make Payment
1.3.1.1
Book Car Service
1.3.1.2
Purchase Car
1.3.1.3
Sell Car
1.3.3.1
Generate Payment Reports
1.3.3.2
Check Branch Performance
1.5.1
Check Service Request
1.5.2
Manage Service Request
1.5.3
Release Car
1.5.4
Record Servicing Material Purchase
1.2.1.3.1
Accept Payment Details
1.2.1.3.2
Calculate Total Amount
1.2.1.3.3
Payment Authorization
1.2.2.1
Register Complaint
1.2.2.2
Contact Customer Representative
1.3.2.1
Approve/Reject Car Rentals
1.3.2.2
Record Customer Experience
1.3.2.3
Loyalty Incentive Scheme

Human/ Machine Interface Design



Program Specification 1.3.2.2 for Late Returned Cars

Module

Name: Calculate_late_return_penalty

Purpose: Compute and return the penalty amount for late return of the car

Programmer: Rahul Deore

Date due: June 20, 2017

§ HTML/JSP JavaScript SQL

Events

Enter customer_id and car return time.

Submit inputs by calculate button is clicked

Input Name:	Type:	Provided by:	Notes:
Customer_id	Integer	Program 1.3.2	
Return_time	DateTime	Program 1.3.2	

Output Name:	Type:	Used by:	Notes:
Penalty_amount	Double	Program 1.3.2	

Pseudocode

```
(Calculate_late_return_penalty)
penalty_amount = 0.00
If (delay_hours > 0  AND  delay_hours <= 6)
        penalty_amount = delay_hours * charge
End If
If (delay_hours > 6)
        penalty_amount = 24 * charge
End If
Return
```

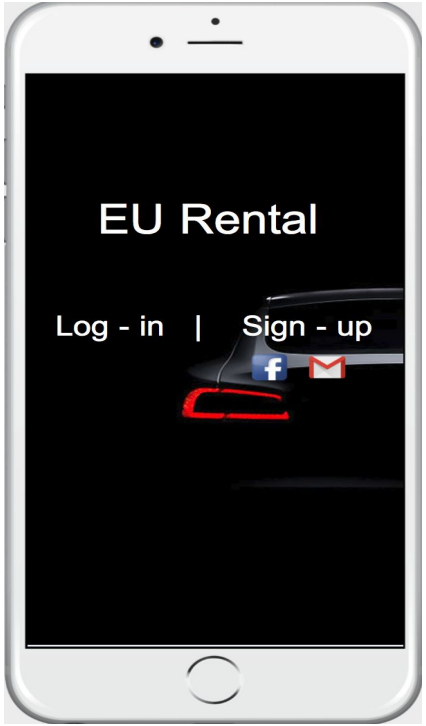
Other

Business rule: Calculate late return penalty amount based on total delay time. For more than 6 hours delay whole day rent is charged as penalty.

Recommended System Acquisition Strategy

	CUSTOM	PACKAGED	OUTSOURCE
Business need	The business need is unique	The business is common	The business need is not core to the business
In-house experience	In house functional and technical experience exists	In house functional experience exists	In house functional and technical experience does not exists
Project skills	There is a desire to build in-house skills	The skills are not strategic	The decision to outsource is a strategic decision
Project Management	The project has a highly skilled project management team	The project has a project manager who can coordinate vendor's effort	The project has a highly skilled project manager at the level of organization that matches the scope of the outsourcing.
Time Frame	The time frame is flexible	The time frame is short	The time frame is short or flexible

USER INTERFACE DESIGN AND EVALUATION



Made by JustinMind
Prototype

Mobile application
Interface

Web application
Interface

Risk Analysis

- Risk 1: The self driving car is a very young technology to adapt for rentals
- Risk 2 : Service Engineers and technicians have less knowledge
- Risk 3: Investment cost higher in future

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OTHER CONSIDERATIONS

- Testing of autonomous cars will be monitored
- Feedback will be recorded.
- Performance parameters will be recorded.
- EU rental Operations will launch time to time promotions
- 24 * 7 customer care support .
- Getting latest technology onboard

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Questions?

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