



MINISTRY OF EDUCATION AND  
TRAINING

# FPT UNIVERSITY

## Capstone Project Document

## Insurance Card

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<b>Capstone Project Code</b>	MIC

-Ho Chi Minh City, 12 May 2015 -

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## CAPSTONE PROJECT REGISTER

Class: Duration time: from 11/05/2015.... To /2015.....

(\*) Profession: <Software Engineer> Specialty: <ES> <IS>

(\*) Kinds of person make registers: Lecturer  Students

### 1. Register information for supervisor (if have)

	Full name	Phone	E-Mail	Title
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### 2. Register information for students (if have)

	Full name	Student code	Phone	E-mail	Role in Group
Student 1					
Student 2					
Student 3					
Student 4					

### 3. Register content of Capstone Project

(\*) 3.1. Capstone Project name:

English:Insurance Card.

Vietnamese:Thẻ bảo hiểm

Abbreviation:

- MIC

- Building the application combining with mobile devices provides following services

+ **Simulate with Motor Insurance Card**

+ **Multiple Insurance Card (optional if team members have good knowledge and skills)**

(\*) 3.2. Main proposal content (including result and product)

a) Theory and practice (document):

- Student should apply the software development process and the UML

- . Software artifacts include User Requirement, Software Requirement Specification, Architecture Design, Detail Design, System Implementation and Testing Document, Installation Guide, sources code, and deployable software packages
- . 3 tiers should be applied
- . Server side technique:
  - o Database design, OOA, OOD, OOP, MVC, Java or .Net technology, ...
- . Client side technique
  - o HTML5, CSS, JavaScript, JQuery, Ajax, Androids ...
- . Communication technique
  - o Exchange information and transfer data in effective in networks, communicating protocol between mobile device, ...
- . Research
  - o Algorithms, NFC ...
  - o Motor Insurance and Health Insurance, ... in Vietnam and developed country

b) Program:

- . Main functions

**+ Motor Insurance Card**

- Guest make contract of Motor Insurance with some constraints conditions depending his/her personal information
- The insured one can renewals the Motor Insurance with some constraints conditions
- The insured one can check the card information
- The traffic polices or Police Department can check specified Motor Insurance Card expired or not. They can update the punishment of violator
- ...

**+ Multiple Insurance Card (optional)**

- Apply to the Health Insurance, Life Insurance, ...

c) Other products:

- . All of management functions of the system must be implemented to support the operating system in best

4. Other comment (propose all relative thing if have)

N/A

HCM city, date 14/4/2015 .....

**Supervisor (If have)**

**On behalf of Registers**

*(Sign and full name)*

*(Sign and full name)*

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# Definitions, Acronyms, and Abbreviations

Name	Definition
<b>MIC</b>	Motor Insurance Card
<b>NFC</b>	Near field communication

Table 1: Definitions, Acronyms, and Abbreviations

## A. Introduction

### 1. Project Information

- Project name: **Insurance Card**
- Project Code: **MIC**
- Product Type: **Website & Android Application**
- Start Date: **May 11<sup>th</sup>, 2015**
- End Date: **August 24<sup>th</sup>, 2015**

### 2. Current Situation

When participating in traffic, vehicle owners are required to have compulsory insurance (according to Article 6, Decree on compulsory insurance for civil liability of motor vehicle owners, Decree No. 103/2008/NĐ-CP by Vietnam Government). Therefore, vehicle owners buy insurance from insurance companies or its agents. They pay insurance premium by cash or in online website and receive an insurance certificate with a term of one year, the term can be shorter in some specific situation. When their insurance out of date, they must buy a new insurance, old certificate will be useless. Traffic police will read insurance certificate to check traffic participants.

### 3. Problem Definition

Below are disadvantages of current situation:

- **Forget insurance's expired date:** Vehicle owners usually keeps their insurance certificate in wallet or somewhere on their vehicle. However, except in cases of necessity, people are not often check their insurance so they could forget its expired date. An expired insurance is not good while it be revealed by traffic officers and could get worse in case of traffic accident.
- **Hard for traffic officers to check and verify insurance:** Traffic officers must read insurance certificate to check and verify vehicle owner's information. It can be difficult and hinder their work in some cases as at dark or handwriting illegible on insurance certificate.
- **No mechanism to renew old contract:** customers have to handy register new contract when the old one is expired, this is inconvenient for customers.

- **Insurance certificate made of paper:** It could be torn, wet, smudged and especially is counterfeited.
- **Claim/compensation process is ineffective** between customer and insurance company.
- **Difficult to track and manage number of traffic violations and collisions:** In current scenario, insurance companies almost impossible knows vehicle owner's history to adjust their insurance policy.

According to Vietnam's laws, motor vehicle owners must have insurance contract with fixed term and fixed fee for each type of vehicle.

## 4. Proposed Solution

Our proposed solution is to build an insurance NFC card system named "MIC system" to resolve the current situations and compatible with current laws, we also design the system to be scalable so we can deploy this system to a multiple insurance services company in future plan.

MIC system includes a web application and two mobile applications with following functions:

### 4.1. Feature functions

- Web application:
  - **Register insurance:** user can register a new insurance card with on website using online payment. A staff will contact the user to create contract and sends an insurance NFC card to him/her. If users already have a NFC card, they can use the website to renew current contract.
  - **Check card information:** user can login into the website and check for their card's information.
  - **Request compensation:** user can fill data into the sample fields and sends compensation request to the company.
  - **Make/manage contracts:** staff can make and manage contracts.
  - **Resolve compensation:** staff can receive and resolve compensation requests.
  - **Notify contract state:** system will sendan email to notify the insured one when their insurance is expired.
  - **Notify compensation state:** system will sendan email to info the insured one when their compensation were accepted or rejected.
- Insurance card printer (mobile app):
  - **Simulating NFC card printer:** staff can print NFC card.
- Insurance card checker (mobile app):
  - **Check card:** traffic police and Police Department can check specified motor insurance card expired or not.
  - **Update the punishment of violator:** traffic police and Police Department can update the punishment of violator to the card information.

## B. Software Project Management Plan

### 1. Project organization

#### 1.1. Software Process Model

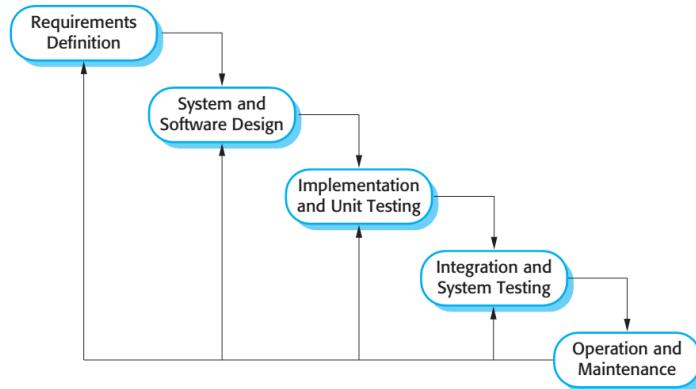


Figure 1: Waterfall model

Reference:Page 30,chapter 2,Software process model, SOFTWARE ENGINEERING 9<sup>th</sup> Edition, by Ian Sommerville.

We customize the waterfall model from the reference to make the process more capable with current situation of our team.

## C. Software Requirement Specification

### 1. User Requirement Specification

#### 1.1. Customer requirement

Customer is user who uses service of system. The customer can use some following functions:

- View history information include:
  - o View payment history
  - o View accident history
  - o View punishment history
- View compensation history
- View contract information
- View personal information
- Create new contract
- New card request
- Renew contract
- Cancel contract
- Request compensation

## **1.2. Staff requirement**

Staff is people who works directly with system to track the information of customer or manages customer, staff can handle directly some problems if it happens from customer. Staff can use some following functions:

- View profile: they can change password of customer
- View customer information
- View card information
- Resolve new card request
- Resolve compensation requests
- Update contract type information
- Manage customer includes:
  - o View customer information
  - o Edit customer information
  - o Create new customer
- Manage contracts includes:
  - o Create new contract
  - o Update contract information
  - o Renew contract
  - o Cancel contract
  - o Update compensation history
  - o Update punishment history
  - o Update accident history
- Print NFC card for customer

## **1.3. Police requirement**

Police is people who is interactive with system for checking information about customer's NFC card and handling in case the customer violates the traffic rule or make accident. Police can use some following functions:

- Verify card validation
- Get contract information
- Update punishment information

## **1.4. Admin requirement**

Admin is people who manages staff. Administrator can use some following functions:

- Manage staff includes:
  - o Remove staff
  - o Add staff

# **2. System Requirement Specification**

## **2.1. System Overview Use Case**

### **2.1.1. Web Application**

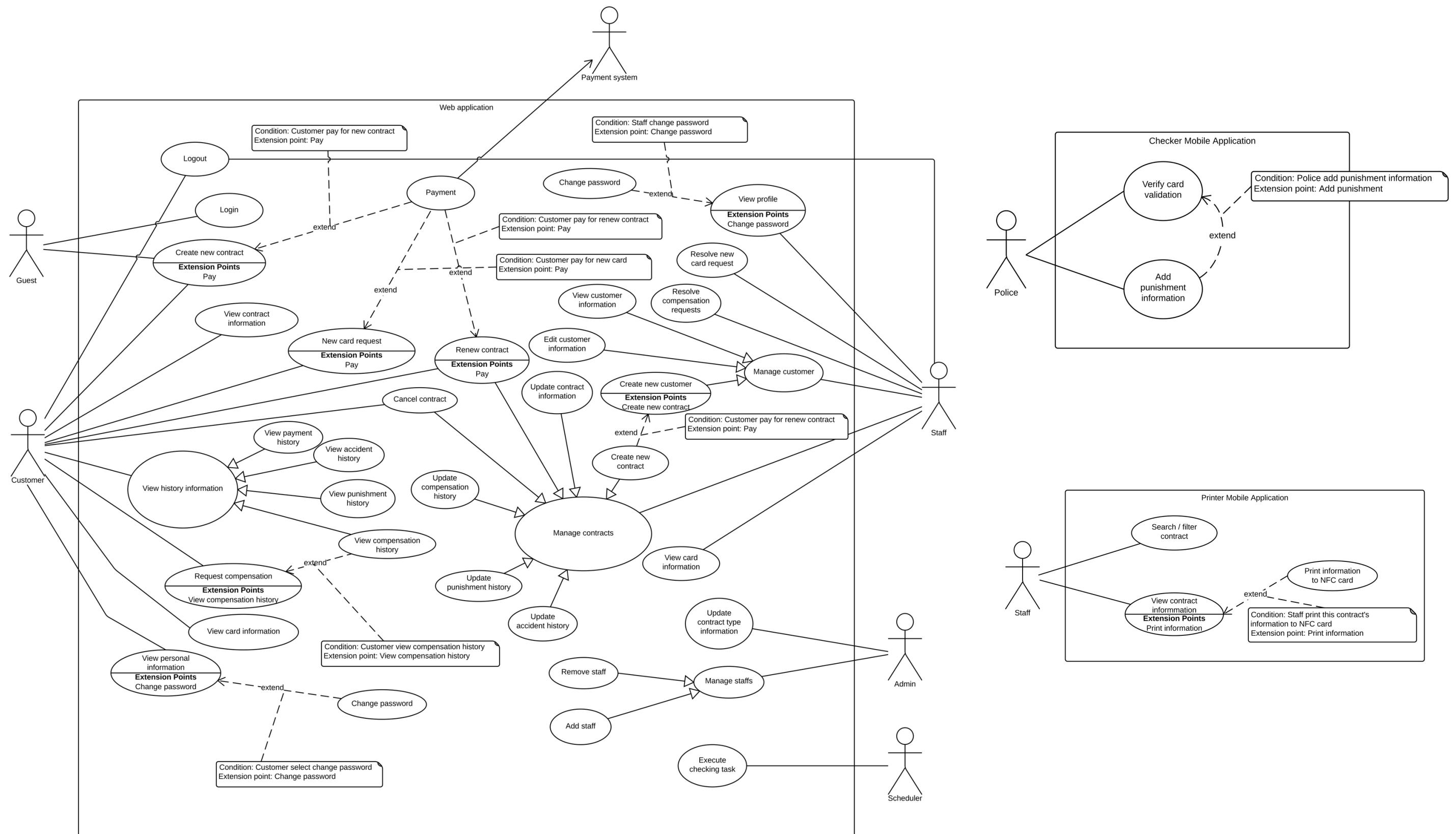
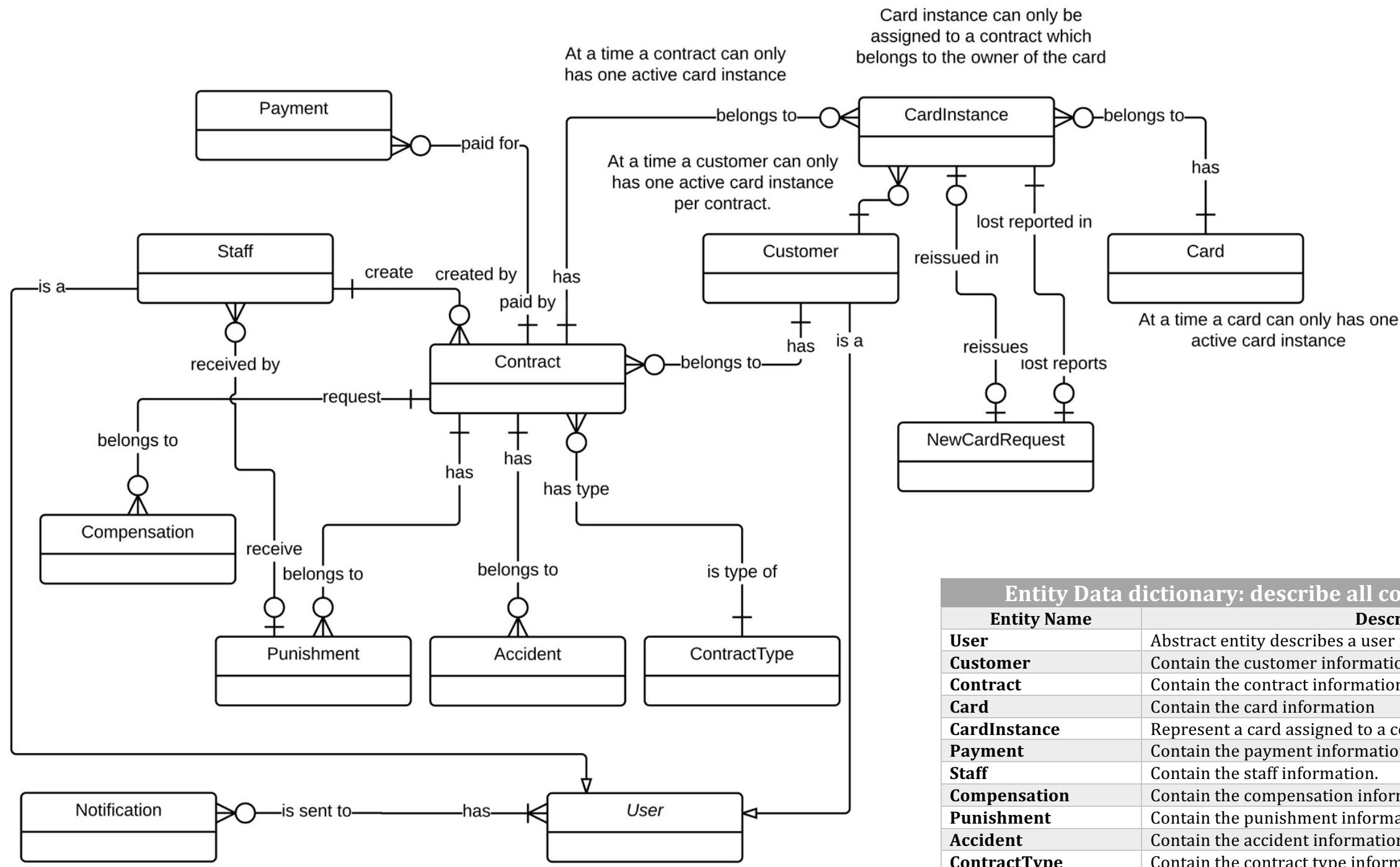


Figure 2: Overview Use Case



### 3. Conceptual Diagram



Entity Data dictionary: describe all content of all entities	
Entity Name	Description
<b>User</b>	Abstract entity describes a user in system
<b>Customer</b>	Contain the customer information.
<b>Contract</b>	Contain the contract information.
<b>Card</b>	Contain the card information
<b>CardInstance</b>	Represent a card assigned to a contract
<b>Payment</b>	Contain the payment information.
<b>Staff</b>	Contain the staff information.
<b>Compensation</b>	Contain the compensation information.
<b>Punishment</b>	Contain the punishment information.
<b>Accident</b>	Contain the accident information.
<b>ContractType</b>	Contain the contract type information.
<b>NewCardRequest</b>	Contain the new card request information.
<b>Notification</b>	Contain the notification information

Figure 3 Conceptual diagram

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## 4. Algorithms

### 4.1. Contract State

The contracts in MIC system is complex and can be managed differently during the operation. The state chart bellow describes all the state of a contract.

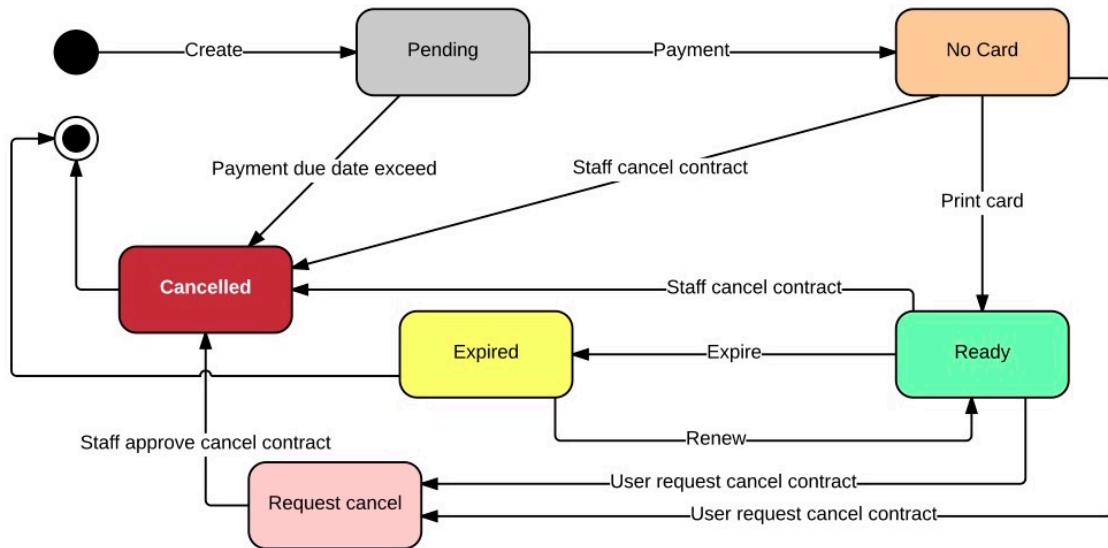


Figure 4 Contract State Chart

State	Description
Pending	The contract is created and do not have payment or the start date is not come yet
No card	The contract had have payment and contract start date is arrived but have not assigned to a card
Ready	The contract is assigned with a card and ready to use
Expired	The contract due date is exceed and no longer valuable
Request cancel	The contract is requested to cancel by customer
Cancelled	The contract is cancelled and no longer valuable

Table 2 Contract State Dictionary

Stimulus	Description	State before	State after
Create	Customer create new contract	N/A	Pending
Payment	Customer pay for the contract via PayPal or direct payment and contract start date is arrived.	Pending	No card
Payment due date exceed	When the payment due date is exceed	Pending	Cancelled

<b>Print card</b>	Staff use mobile app to print the card for customer, the card ID is saved to the system	No card	Ready
<b>Expire</b>	When the contract due date is exceed, system will change the contract status	Ready	Expired
<b>Renew</b>	Customer renew contract via web application or direct payment	Expired	Ready
<b>Staff cancel contract</b>	Staff cancel contract via web application	No card, Ready	Cancelled
<b>Customer cancel contract</b>	Customer cancel contract via web application	No card, Ready	Request cancel
<b>Staff approve cancel contract</b>	Staff approve cancel request from customer via web application	Request cancel	Cancelled

Table 3 Contract State Flow

## 4.2. Notification

### 4.2.1. Definition

Notification is a feature of MIC Web application to notify stakeholders when important events occurs.

### 4.2.2. Notification Methods

- Send email to receiver
- Show notification icon on web interface

### 4.2.3. Notification use cases

Type	Trigger	Receiver	Notify method
1	Customer creates new contract	All staff	Web
2	Customer sends compensation request	All staff	Web
3	Customer sends new card request	All staff	Web
4.1	Contract is nearly expired (send first)	Customer	Web, Email
4.2	Contract is nearly expired (send 2nd time)	Customer	Web, Email
4.3	Contract is nearly expired (send 3rd time)	Customer	Web, Email
5	Contract is expired	Customer	Web, Email
6	Customer sends request cancel	All staff	Web
7	Contract is cancelled because payment due date exceed	Customer	Web, Email

<b>8</b>	Paid Pending Contract start date come	Customer	Web
<b>9</b>	Compensation resolved	Customer	Web, Email

*Table 4 Notification use cases*

- For staffs, every notification has "status" to show that if the notification not resolved or when the notification is resolved and by whom. Except Type 1 notification has no status.
- All the notification can be handedly turned off by clicking Mark as read button
- When a notification is sent to all the staff, each staff has their own "Read" status. That's mean if staff A mark the status as read but staff B still see it as not read.

### 4.3. Concurrency Control

#### 4.3.1. Definition

Concurrency control is a method to handle data which can be accessed and modified from many sources at the same time to prevent conflict and data loss.

#### 4.3.2. Define problem

In web application, one contract might be edited by stakeholders at the same time, this situation may cause an inconsistent state of the contract. We have to find a solution for this problem.

#### 4.3.3. Solution

We defined a list of entity that might be modified by many sources at a same time:

- **Contract:** can be edited/renew by stakeholders at a same time. This includes the information assigned with the contract: Payment, Compensation, Accident and Punishment information.

We use timestamp concurrency control method to solve the concurrency problem. Contract information have a "last modified" value, this value represents the last time the contract is modified. When update the contract information, a validation will run to check if the last modified is changed or not. If it is changed there will be error message to users.

#### 4.3.4. Flow chart

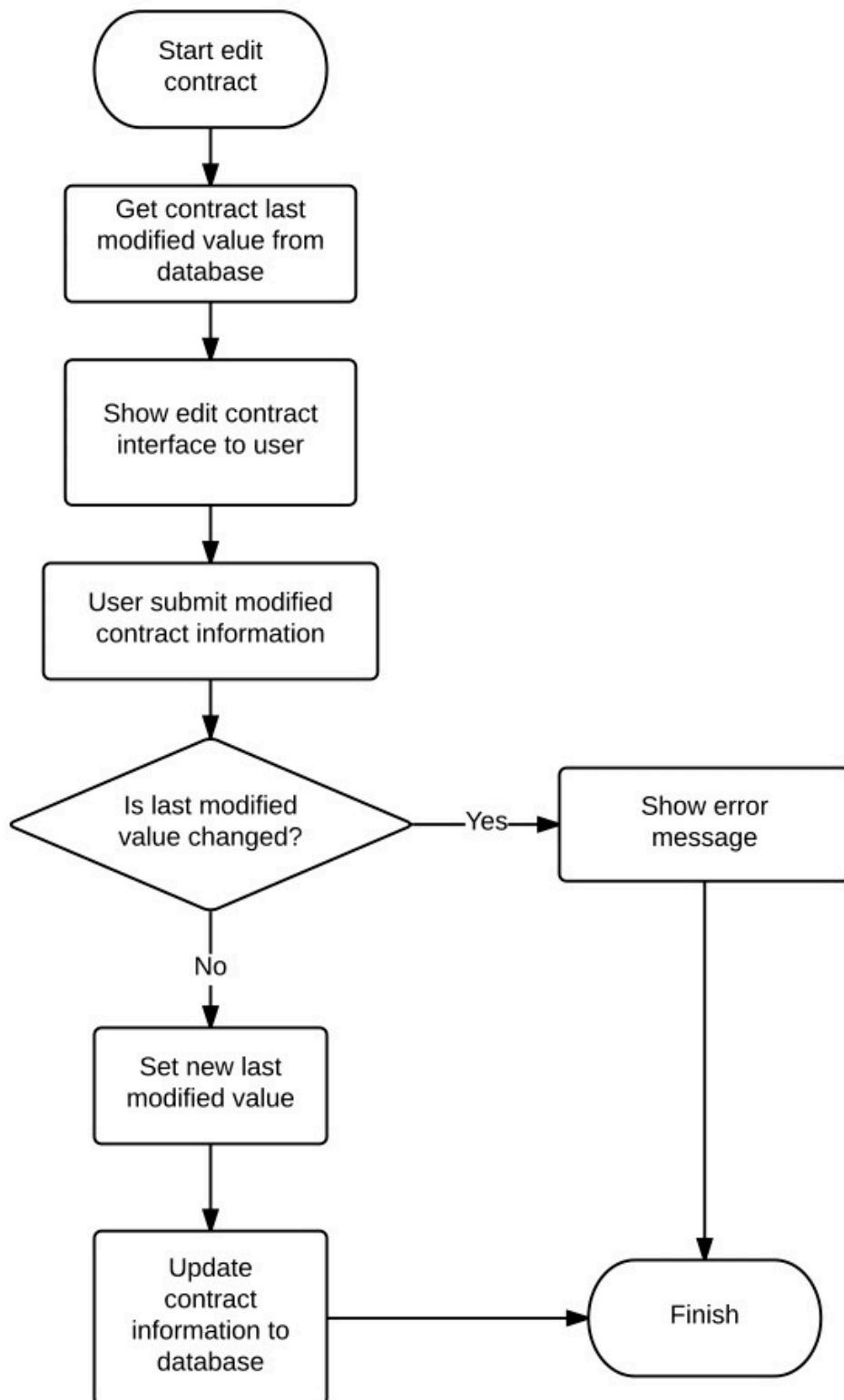
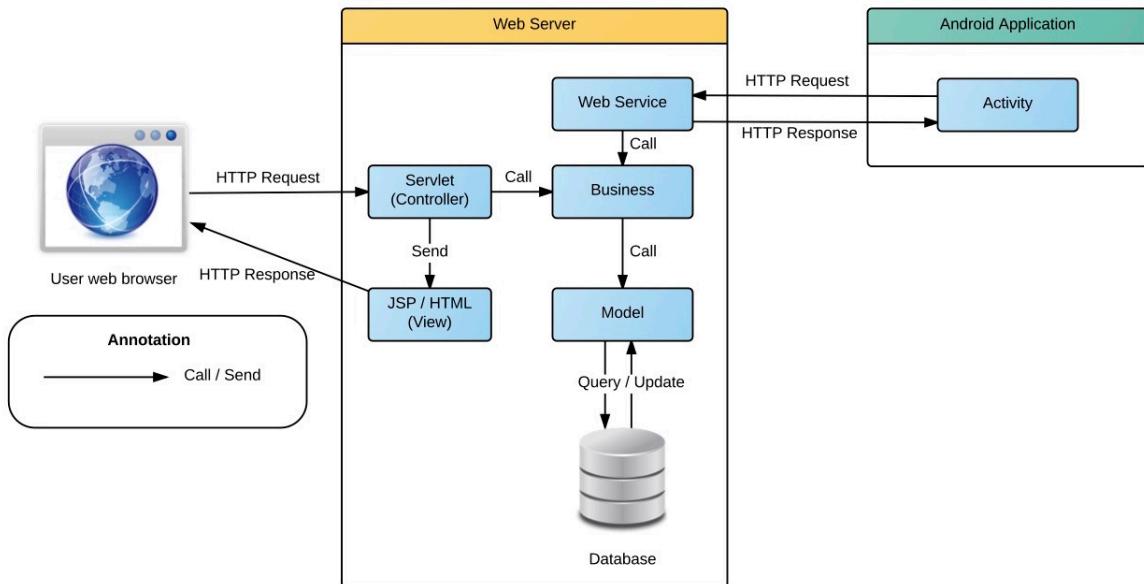


Figure 5 Concurrency control flow

## D. Software Design Description

### 1. System Architecture Design

#### 1.1. Web application architecture design

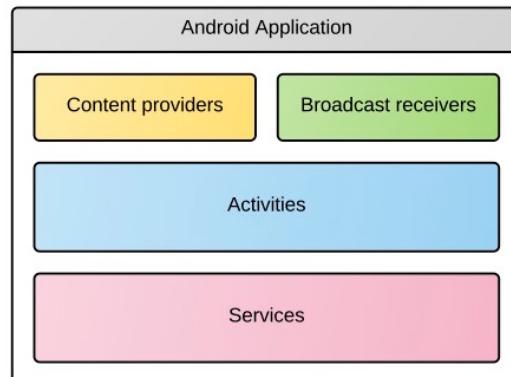


*Figure 6 System architecture design*

This diagram is referenced and modified from an original concept from: Chapter 6 Architecture Design, SOFTWARE ENGINEERING 9<sup>th</sup> Edition, by Ian Sommerville.

#### 1.2. Mobile Application architecture design

The application is developed as an Android native application. In general, the application architecture conforms to Android architecture.



**Reference:**[Android Developer Guide - Application Fundamentals](http://developer.android.com/guide/components/fundamentals.html)

<http://developer.android.com/guide/components/fundamentals.html>

## 2. Component Diagram

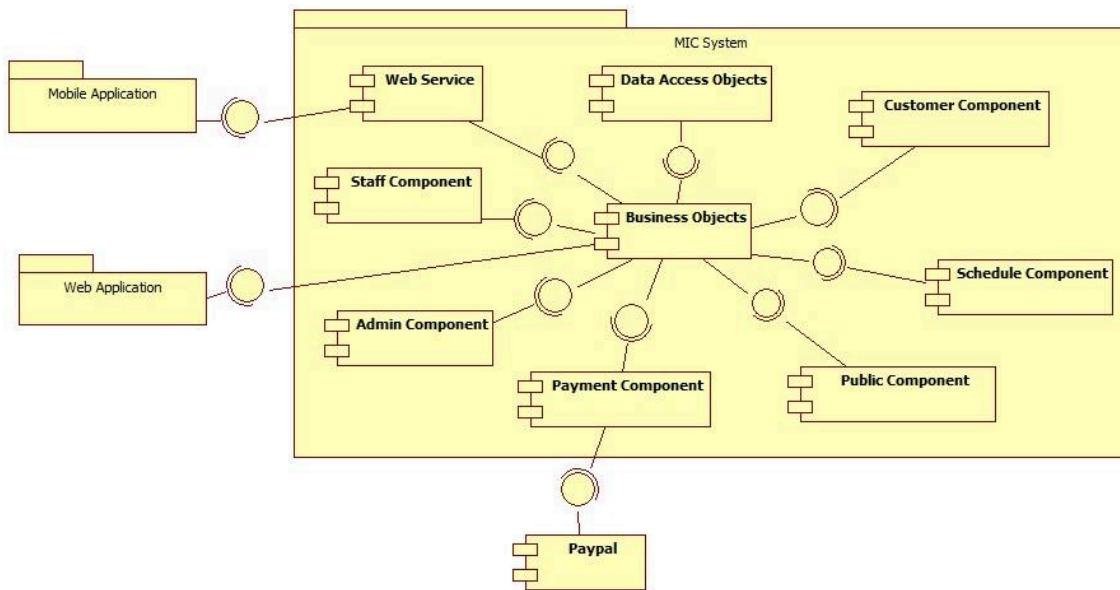


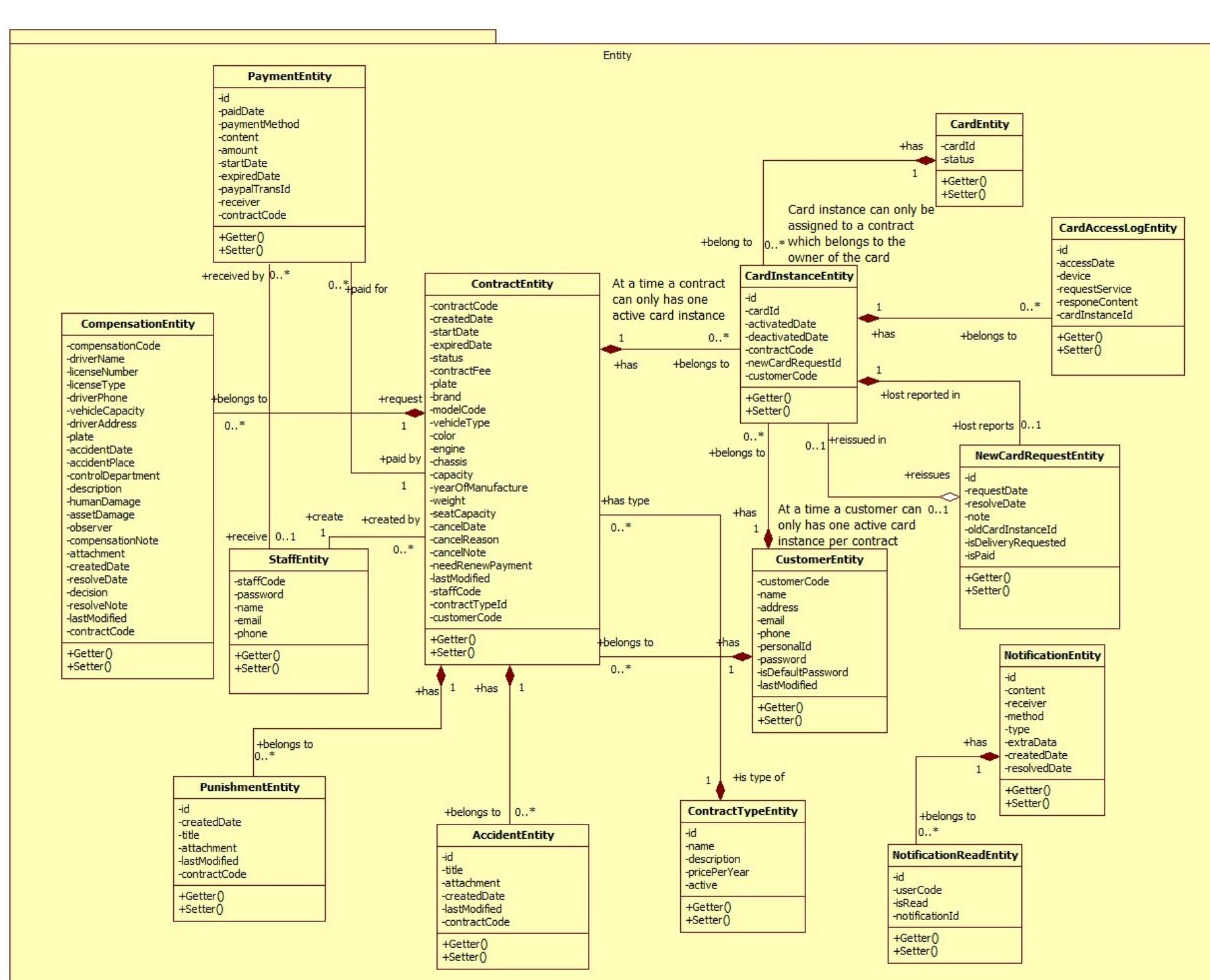
Figure 7 Component Diagram

Component Dictionary: Describes components	
<b>Web Application</b>	Web application package: View, Controller
<b>Mobile Application</b>	Mobile application package
<b>PayPal</b>	Handle payment process with PayPal API
<b>Payment Component</b>	Component to handle payment process
<b>Web Service</b>	Provide API for mobile applications to interact with the system.
<b>Staff Component</b>	Component to handle staff activities in the system
<b>Customer Component</b>	Component to handle customer activities in the system
<b>Public Component</b>	Component to handle guest activities in the system
<b>Admin Component</b>	Component to handle admin activities in the system
<b>Schedule Component</b>	Component to handle scheduler in the system
<b>Business Objects</b>	Common objects to handle domain business operations for each components
<b>Data Access Objects</b>	Component to handle interaction between the system and database

Table 5 Component Dictionary

### 3. Detailed Description

#### 1.1. Class Diagram



Class dictionary: describe Class		
Class Name	Mapping column with Conceptual diagram	Description
<b>PaymentEntity</b>	Payment	Contain the payment information.
<b>CardEntity</b>	Card	Contain the card information.
<b>CardInstanceEntity</b>	CardInstance	Contain the card instance information
<b>CustomerEntity</b>	Customer	Contain the customer information.
<b>ContractEntity</b>	Contract	Contain the contract information.
<b>StaffEntity</b>	Staff	Contain the staff information.
<b>CompensationEntity</b>	Compensation	Contain the compensation information.
<b>PunishmentEntity</b>	Punishment	Contain the punishment information.
<b>AccidentEntity</b>	Accident	Contain the accident information.
<b>ContractTypeEntity</b>	ContractType	Contain the contract type information.
<b>NewCardRequestEntity</b>	NewCardRequest	Contain the new card request information.
<b>CardAccessLogEntity</b>	N/A	Not exist in conceptual diagram. But needed in class diagram to contain the card access log information.
<b>NotificationEntity</b>	N/A	Not exist in conceptual diagram. But needed in class diagram to contain the notification information.
<b>NotificationReadEntity</b>	N/A	Not exist in conceptual diagram. But needed in class diagram to know what notifications is read.

Figure 8 Class Diagram

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Table 6 Class dictionary

## 1.2. Interactive Diagram

### 1.2.1. Create new contract

Summary: this diagram show process of staff creates new contract

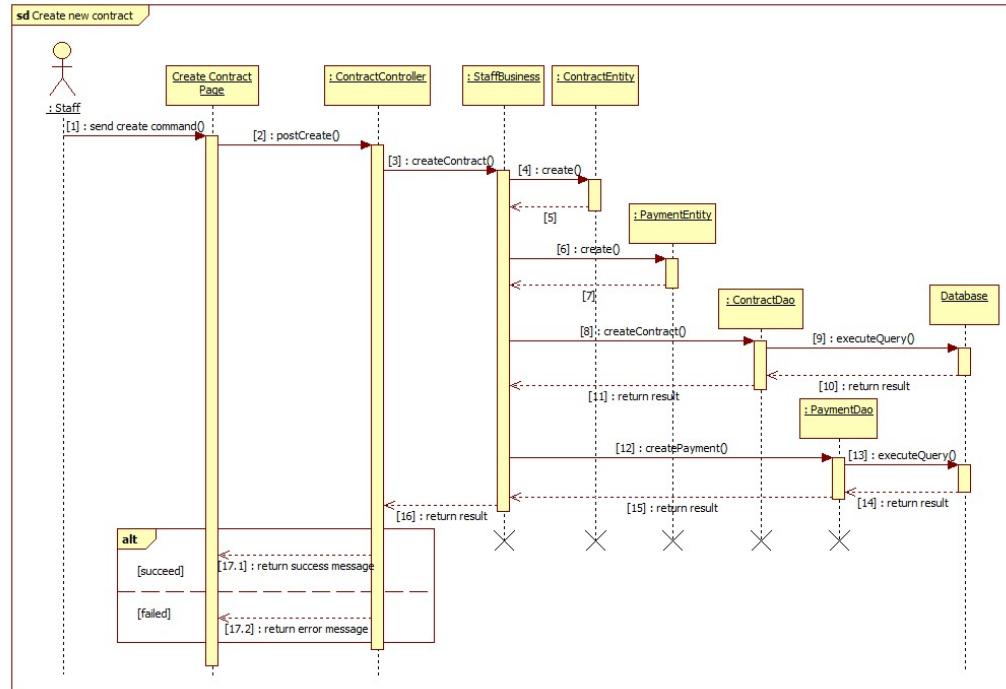


Figure 9 Sequence diagram - <Staff> Create new contract

### 1.2.2. Cancel contract

Summary: this diagram show process of staff cancels contract

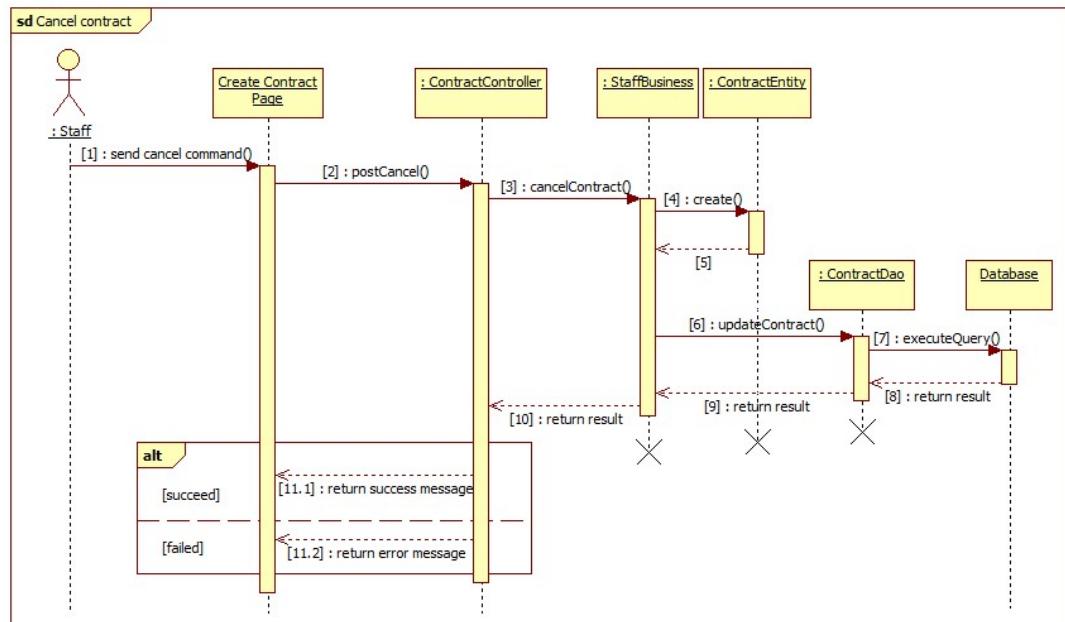


Figure 10 Sequence diagram - <Staff> Cancel contract

### 1.2.3. Renew contract

Summary: this diagram show process of customer renews contract

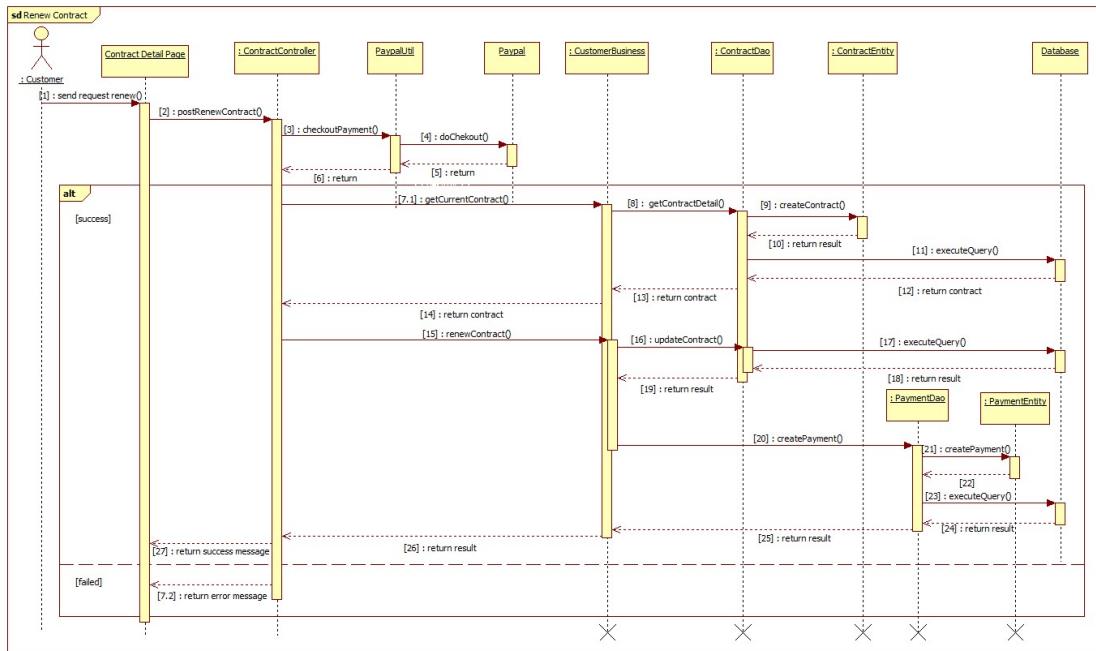


Figure 11 Sequence diagram - <Customer> Renew contract

### 1.2.4. Register new contract

Summary: this diagram show process of guest registers new contract

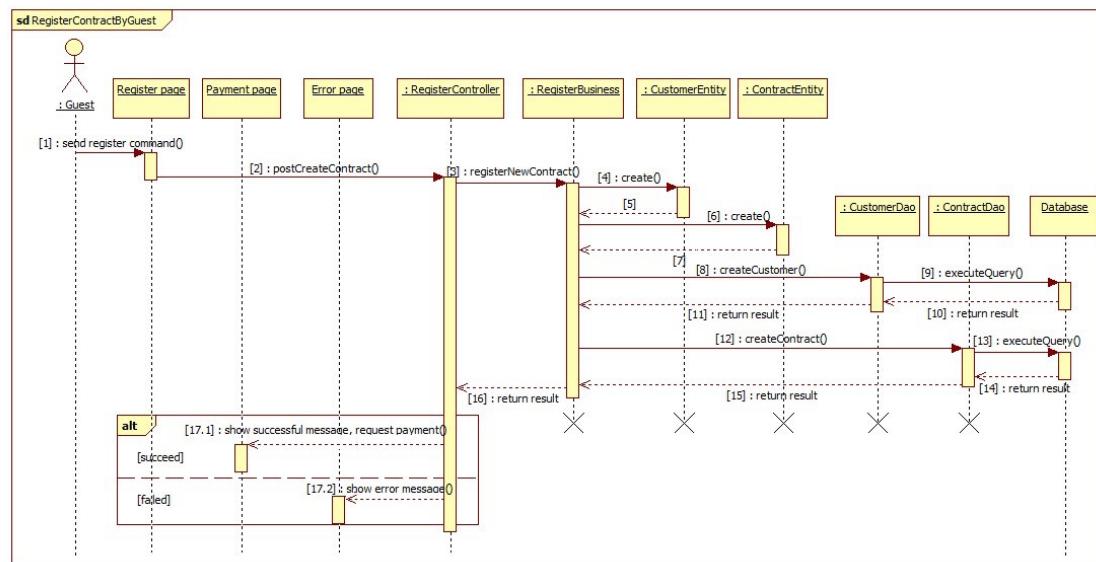


Figure 12 Sequence diagram - <Guest> Register new contract

### 1.2.5. <Police> Verify card validation

Summary: this diagram show process of police checks card validation.

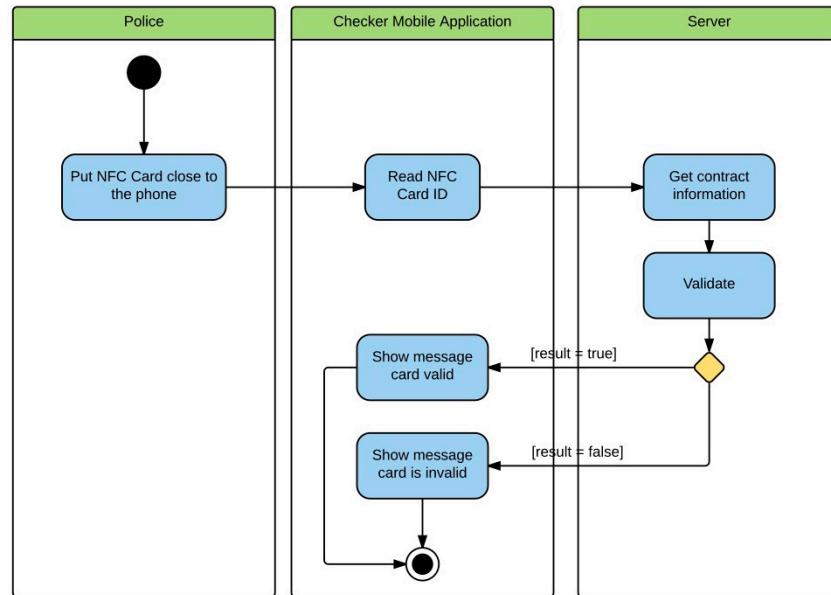


Figure 13<Police> Verify card validation

### 1.2.6. <Police> Add punishment information

Summary: this diagram show process of police adds punishment information.

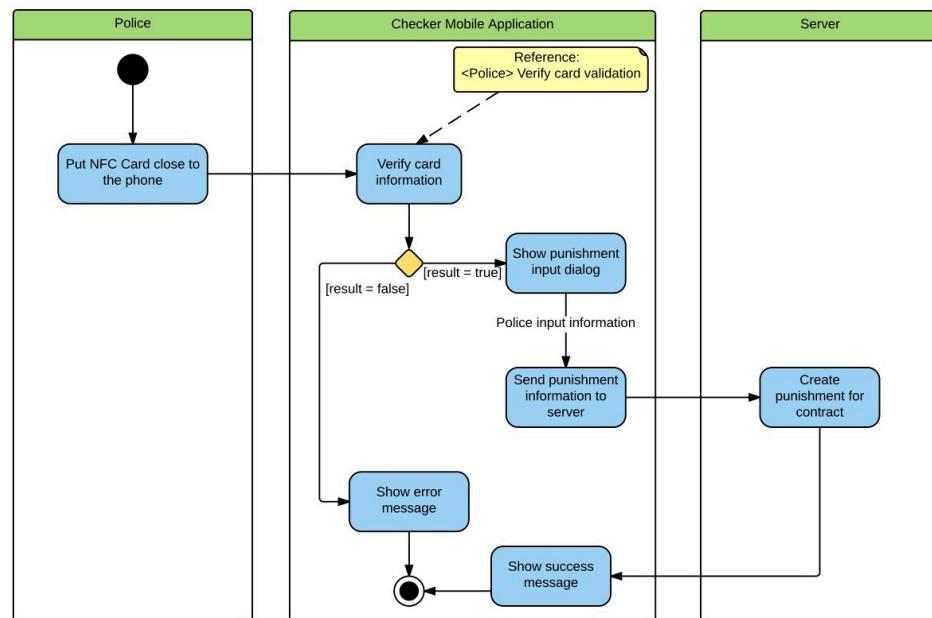


Figure 14<Police> Add punishment information

Reference to full document for complete list of Interactive Diagram

## 1. Communication diagram

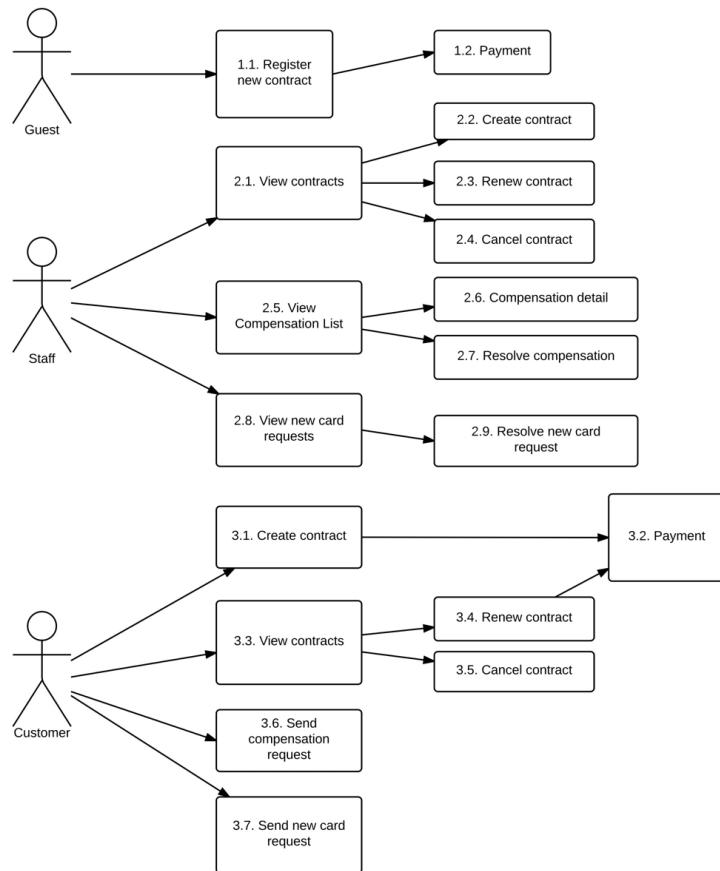


Figure 15 Web Application Communication Diagram

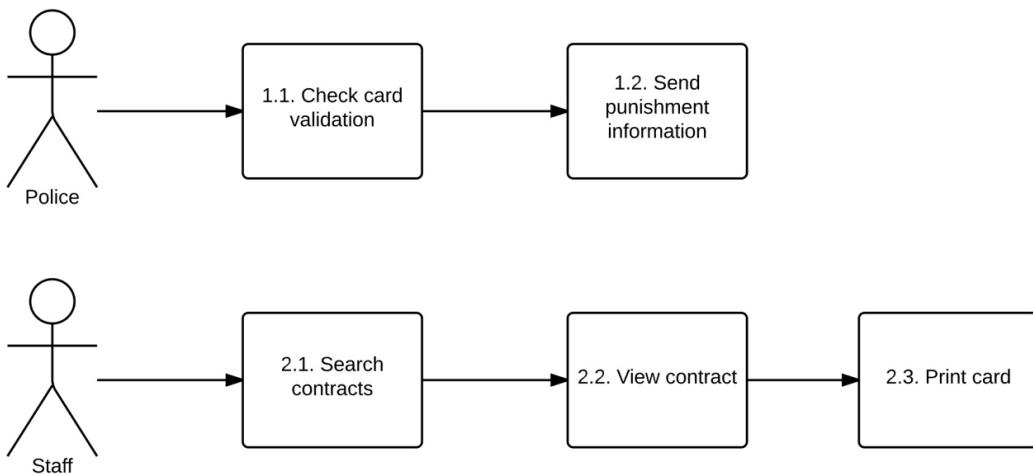
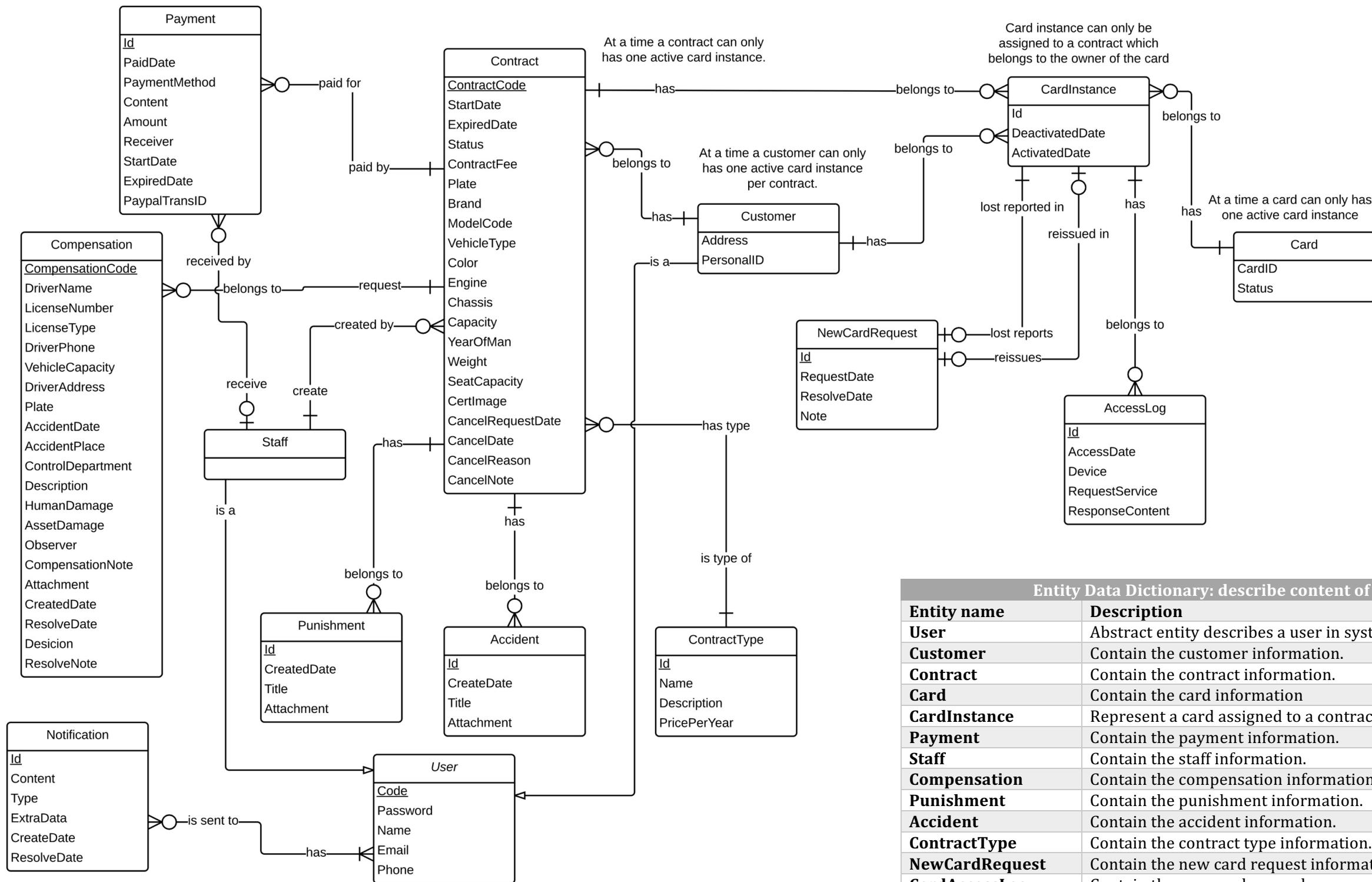


Figure 16 Mobile Applications Communication Diagram

## 2. Database Design

### 2.1. Entity relationship diagram



Entity Data Dictionary: describe content of all entities

Entity name	Description
<b>User</b>	Abstract entity describes a user in system
<b>Customer</b>	Contain the customer information.
<b>Contract</b>	Contain the contract information.
<b>Card</b>	Contain the card information
<b>CardInstance</b>	Represent a card assigned to a contract
<b>Payment</b>	Contain the payment information.
<b>Staff</b>	Contain the staff information.
<b>Compensation</b>	Contain the compensation information.
<b>Punishment</b>	Contain the punishment information.
<b>Accident</b>	Contain the accident information.
<b>ContractType</b>	Contain the contract type information.
<b>NewCardRequest</b>	Contain the new card request information.
<b>CardAccessLog</b>	Contain the new card access log.
<b>Notification</b>	Contain the notification information

Figure 17 Entity relationship diagram

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## 2.2. Physical Diagram

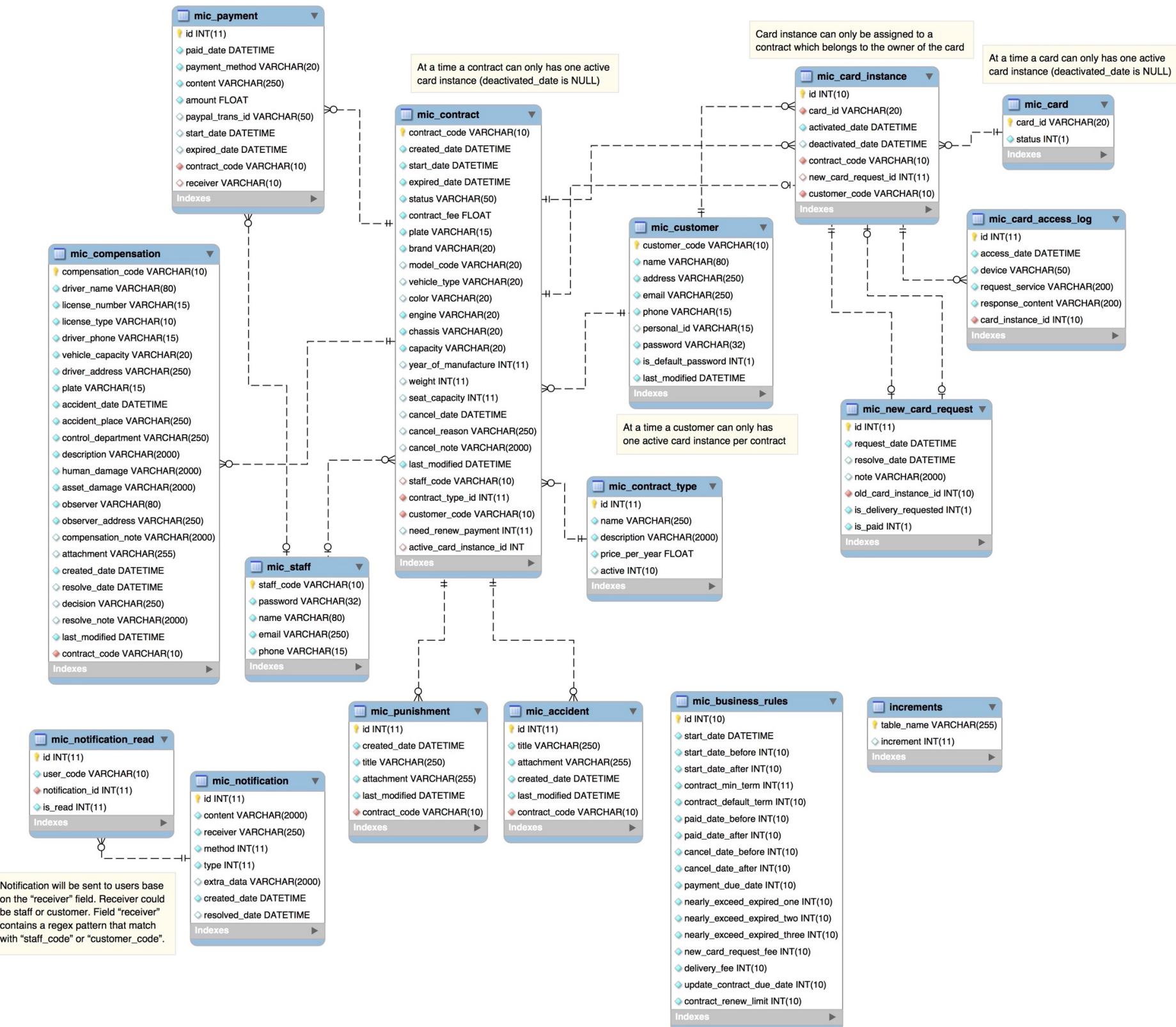


Figure 18 Physical diagram

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## E. Attachments

### 1. Task sheet

No.	Product Deliverables	Task	TrungDQ	PhucNH	TriPQM	KhaNC	Size
1	Report1 - Introduction	Project Introduction		0			1
		Current Situation			0	1	
		Problem Definition			0	1	
		<b>Proposed Solution</b>					
		Feature functions		0			1
		Advantages and disadvantages		0			1
		Functional Requirements		0			1
2	Report2- Software Project Management Plan	Review and merge document	0				2
		<b>Problem Definition</b>					
		Problem Abstract		0			1
		<b>Project Overview</b>					
		Current Situation		0			1
		The Proposed System			0	1	
		Boundaries of the System			0	1	
		Future plans	0				1
		Development Environment			0	1	
		Project organization					1
		<b>Project Management Plan</b>					
		Software development life cycle		0			1
		Phase Detail		0			1
		Task sheet		0			1
3	Report 3- Software Requirement Specification	Review and merge document	0				2
		User Requirement Specification		0			2
		<b>System Requirement Specification</b>					
		External Interface Requirement		0			1
		System Overview Use Case	0				2
		<b>List of Use Case:</b>					
		<Guest> Login	0				1
		<Guest> Create new contract request	0				1
		<Customer> Logout		0			1
		<Customer> Renew contract		0			1

		<Customer> Cancel contract		<b>0</b>		1
		<Customer> View payment history		<b>0</b>		1
		<Customer> View accident history		<b>0</b>		1
		<Customer> View punishment history		<b>0</b>		1
		<Customer> Request compensation		<b>0</b>		1
		<Customer> View compensation history		<b>0</b>		1
		<Customer> New card request		<b>0</b>		1
		<Customer> View card information		<b>0</b>		1
		<Customer> View personal information		<b>0</b>		1
		<Customer> Change password		<b>0</b>		1
		<Staff> View profile			<b>0</b>	1
		<Staff> Change password			<b>0</b>	1
		<Staff> Resolve new card request			<b>0</b>	1
		<Staff> Resolve compensation request			<b>0</b>	1
		<Staff> View customer information			<b>0</b>	1
		<Staff> Edit customer information			<b>0</b>	1
		<Staff> Create new customer			<b>0</b>	1
		<Staff> Create contract			<b>0</b>	1
		<Staff> Renew contract			<b>0</b>	1
		<Staff> Cancel contract			<b>0</b>	1
		<Staff> Update contract information	<b>0</b>			1
		<Staff> Update compensation history	<b>0</b>			1
		<Staff> Update punishment history	<b>0</b>			1
		<Staff> Update accident history	<b>0</b>			1
		<Staff> View cards information	<b>0</b>			1
		<Staff> Update contract type information	<b>0</b>			1
		<Admin> Remove staff	<b>0</b>			1

		<Admin> Add staff	<b>0</b>				1
		<Scheduler> Execute checking task	<b>0</b>				1
		<Payment system> Payment			<b>0</b>		1
		<Police> Verify card information		<b>0</b>			1
		<Police> Add punishment information		<b>0</b>			1
		<Staff> Search / filter contract		<b>0</b>			1
		<Staff> View contract information		<b>0</b>			1
		<Staff> Print information to NFC card		<b>0</b>			1
		Software System Attribute		<b>0</b>			1
		Conceptual Diagram	<b>0</b>				1
		Review and merge document	<b>0</b>				2
<b>4</b>	Report 4- Software Design Description	System Architecture Design	<b>0</b>				2
		Component Diagram	<b>0</b>				1
		Class Diagram			<b>0</b>		2
		Class Diagram Explanation			<b>0</b>		1
		<b>Interactive Diagram</b>					
		<Staff>Create new contract				<b>0</b>	1
		<Staff>Renew contract				<b>0</b>	1
		<Staff>Cancel contract				<b>0</b>	1
		<Customer>Cancel contract		<b>0</b>			1
		<Customer>Renew contract		<b>0</b>			1
		<Guest>Register new contract			<b>0</b>		1
		<Guest>PayPal payment			<b>0</b>		1
		<Police>Verify card validation		<b>0</b>			1
		<Police>Add punishment information		<b>0</b>			1
		<Staff> Search contract	<b>0</b>				1
		<Staff> View contract information		<b>0</b>			1
		<Staff> Print information to NFC Card	<b>0</b>				1
		<b>Interface</b>					
		Web Service Interface Design	<b>0</b>				2
		<b>Staff Interface Design</b>					
		Staff home page				<b>0</b>	1
		Manage customer				<b>0</b>	1

		Create customer			<b>0</b>	1
		Manage contract			<b>0</b>	1
		Create contract			<b>0</b>	1
		Renew contract			<b>0</b>	1
		Cancel contract			<b>0</b>	1
		<b>Customer Interface Design</b>				
		Manage contract	<b>0</b>			1
		Contract detail	<b>0</b>			1
		Cancel contract	<b>0</b>			1
		Renew contract	<b>0</b>			1
		Select payment method	<b>0</b>			1
		<b>Guest Interface Design</b>				
		Guest home page		<b>0</b>		1
		Register new contract page		<b>0</b>		1
		Checker Mobile Application Design	<b>0</b>			2
		Printer Mobile Application Design	<b>0</b>			2
		Database Design		<b>0</b>		2
		<b>Algorithms</b>				
		Contract State	<b>0</b>			2
		Concurrency Control	<b>0</b>			2
		Notification	<b>0</b>			2
		System Scheduler Process	<b>0</b>			2
		NFC Card Data Format	<b>0</b>			2
		Strategy for future expand plan	<b>0</b>			2
		Review and merge document	<b>0</b>			2
5	Report 5 - System Implementation and Test	Introduction				1
		Database Relationship Diagram				2
		Performance Measures				2
		Test Plan				1
		<b>System Testing Test Case</b>				
		Communication Diagrams	<b>0</b>			1
		<b>Test cases</b>				
		<Guest> Register new contract		<b>0</b>		1
		<Guest> Register new contract payment		<b>0</b>		1
		<Staff> View Contracts			<b>0</b>	1
		<Staff> Create Contract			<b>0</b>	1
		<Staff> Renew Contract			<b>0</b>	1
		<Staff> Cancel Contract			<b>0</b>	1

		<Staff> View Compensation List			<b>0</b>	1
		<Staff> Compensation Detail			<b>0</b>	1
		<Staff> Resolve Compensation			<b>0</b>	1
		<Staff> View new card requests		<b>0</b>		1
		<Staff> Resolve new card request		<b>0</b>		1
		<Customer> Create New Contract	<b>0</b>			1
		<Customer> Renew Contract	<b>0</b>			1
		<Customer> Cancel Contract	<b>0</b>			1
		<Customer> Send Compensation Request	<b>0</b>			1
		<Customer> Send new card request		<b>0</b>		1
		Mobile application test cases	<b>0</b>			4
		Test case results statistics	<b>0</b>			1
<b>6</b>	Report 6 - Software User's Manual	Installation Guide	<b>0</b>			2
		<b>User Guide</b>				
		<b>Web Application</b>				
		<Guest> Register contract		<b>0</b>		1
		<Guest> Process payment		<b>0</b>		1
		<Customer> Create new contract	<b>0</b>			1
		<Customer> Cancel contract	<b>0</b>			1
		<Customer> Renew contract	<b>0</b>			1
		<Customer> Create compensation	<b>0</b>			1
		<Customer> Request new card	<b>0</b>			1
		<Staff> Manage contract			<b>0</b>	1
		<Staff> Create new contract			<b>0</b>	1
		<Staff> View contract detail			<b>0</b>	1
		<Staff> Renew contract			<b>0</b>	1
		<Staff> Resolve cancel request			<b>0</b>	1
		<Staff> Cancel contract			<b>0</b>	1

		<Staff> Manage compensation			<b>0</b>	1
		<Staff> Create new compensation			<b>0</b>	1
		<Admin> Add staff		<b>0</b>		1
		<Admin> Add contract type		<b>0</b>		1
		<Admin> Edit business rules		<b>0</b>		1
		<b>Checker Application</b>				
		Validate card	<b>0</b>			1
		Add punishment information	<b>0</b>			1
		<b>Printer Application</b>				
		Print card	<b>0</b>			1
7	Mockup screen	<b>Public pages</b>				
		Home		<b>0</b>		1
		Login		<b>0</b>		1
		Register contract		<b>0</b>		1
		Contract payment		<b>0</b>		1
		<b>Staff pages</b>				
		Staff profile		<b>0</b>		1
		Staff dashboard		<b>0</b>		1
		Customer manage		<b>0</b>		1
		Customer detail		<b>0</b>		1
		New customer		<b>0</b>		1
		Contract manage		<b>0</b>		1
		Contract detail		<b>0</b>		1
		Create contract		<b>0</b>		1
		Compensation manage		<b>0</b>		1
		Compensation detail		<b>0</b>		1
		Card manage		<b>0</b>		1
		Card detail		<b>0</b>		1
		New card request manage		<b>0</b>		1
		<b>Customer pages</b>				
		Customer profile		<b>0</b>		1
		Contract manage		<b>0</b>		1
		Contract detail		<b>0</b>		1
		Create contract		<b>0</b>		1
		Card manage		<b>0</b>		1
		Card detail		<b>0</b>		1
		New card request		<b>0</b>		1
		New card request manage		<b>0</b>		1
		Payment history		<b>0</b>		1

		<b>Admin pages</b>				
		Staff manage		<b>0</b>	1	
		Add staff		<b>0</b>	1	
		Config business rule		<b>0</b>	1	
		Manage contract type		<b>0</b>	1	
		Checker application	<b>0</b>		2	
		Printer application	<b>0</b>		2	
<b>8</b>	Database	Create database schema		<b>0</b>	1	
		Insert default data schema		<b>0</b>	1	
<b>9</b>	Framework	Design project code structure	<b>0</b>		5	
<b>10</b>	Login function	Implement login	<b>0</b>		1	
<b>11</b>	Public component	Guest create new contract		<b>0</b>	1	
		Payment register contract		<b>0</b>	1	
<b>12</b>	Customer component	Edit profile		<b>0</b>	1	
		Change password		<b>0</b>	1	
		Manage contract		<b>0</b>	1	
		Create new contract		<b>0</b>	1	
		View contract detail		<b>0</b>	1	
		Request cancel contract		<b>0</b>	1	
		Renew contract		<b>0</b>	1	
		Request new card		<b>0</b>	1	
		Manage new card requests		<b>0</b>	1	
		Manage cards		<b>0</b>	1	
		View card detail		<b>0</b>	1	
		Payment history		<b>0</b>	1	
		Complete payment		<b>0</b>	1	
		Manage compensation request		<b>0</b>	1	
		Add compensation request		<b>0</b>	1	
		Manage punishment		<b>0</b>	1	
		Add punishment		<b>0</b>	1	
		Manage accident information		<b>0</b>	1	
		Add accident information		<b>0</b>	1	
<b>13</b>	Staff component	Dashboard		<b>0</b>	1	
		Edit profile		<b>0</b>	1	
		Change password		<b>0</b>	1	
		Manage customer		<b>0</b>	1	
		Add customer		<b>0</b>	1	
		View customer information		<b>0</b>	1	
		Edit customer information		<b>0</b>	1	
		Manage contract		<b>0</b>	1	
		Create new contract		<b>0</b>	1	
		View contract detail		<b>0</b>	1	
		Edit contract's vehicle		<b>0</b>	1	

		information				
		Renew contract		<b>0</b>	1	
		Cancel contract		<b>0</b>	1	
		Manage compensation request		<b>0</b>	1	
		Add compensation request		<b>0</b>	1	
		Resolve compensation request		<b>0</b>	1	
		Edit compensation request		<b>0</b>	1	
		Manage punishment		<b>0</b>	1	
		Add punishment		<b>0</b>	1	
		Manage accident information		<b>0</b>	1	
		Add accident information		<b>0</b>	1	
		Complete payment		<b>0</b>	1	
		Add payment information		<b>0</b>	1	
		Manage cards		<b>0</b>	1	
		View card detail		<b>0</b>	1	
		Manage new card requests		<b>0</b>	1	
		Complete new card request payment		<b>0</b>	1	
<b>14</b>	Scheduler component	Initiate scheduler	<b>0</b>			5
		Checking contract status	<b>0</b>			1
<b>15</b>	Admin component	Manage staff	<b>0</b>			1
		Add staff	<b>0</b>			1
		Delete staff	<b>0</b>			1
		Config business rules	<b>0</b>			1
		Manage contract type	<b>0</b>			1
		Add contract type	<b>0</b>			1
		Edit contract type	<b>0</b>			1
<b>16</b>	Payment component	PayPal payment	<b>0</b>			2
<b>17</b>	Web service	Check server status function	<b>0</b>			1
		Search contracts by code or customer name function	<b>0</b>			1
		Update card ID to a contract function	<b>0</b>			1
		Check the validation of the card function	<b>0</b>			1
		Update punishment information to a contract function	<b>0</b>			1
<b>18</b>	Mobile application	Checker application	<b>0</b>			5
		Printer application	<b>0</b>			5
<b>19</b>	Notification component	Implement notification web/email	<b>0</b>			5

**Notes**

No.	Function Types	Function Point Size
1	Insert, Delete, Update, Simple Search, Login, Register, simple function or simple query on one table	1
2	Computed functions or joined query	2
3	Complex functions or multiple subqueries	3
4	Constraint process and data integrity	4
5	Functions with implementing algorithms	5

## 2. Laws References

### 2.1. Laws Paper Reference

STT	Tên đầy đủ	Nguồn
1	Nghị định số 103/2008/NĐ-CP của Chính phủ: Về bảo hiểm bắt buộc trách nhiệm dân sự của chủ xe cơ giới	<a href="http://vanban.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?page=1&amp;class_id=1&amp;document_id=77217&amp;mode=detail">http://vanban.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?page=1&amp;class_id=1&amp;document_id=77217&amp;mode=detail</a>
2	Thông tư số 126/2008/TT-BTC của Bộ Tài chính: Quy định Quy tắc, điều khoản, biểu phí và mức trách nhiệm bảo hiểm bắt buộc trách nhiệm dân sự của chủ xe cơ giới	<a href="http://vanban.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?page=87&amp;class_id=1&amp;document_id=81677&amp;mode=detail&amp;org_group_id=0&amp;org_id=0&amp;type_group_id=0&amp;type_id=0">http://vanban.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?page=87&amp;class_id=1&amp;document_id=81677&amp;mode=detail&amp;org_group_id=0&amp;org_id=0&amp;type_group_id=0&amp;type_id=0</a>
3	Thông tư liên tịch số 35/2009/TTLT-BTC-BCA của Bộ Công an-Bộ Tài chính: Hướng dẫn thực hiện một số điều của Nghị định số 103/2008/NĐ-CP ngày 16 tháng 9 năm 2008 về bảo hiểm bắt buộc trách nhiệm dân sự của chủ xe cơ giới	<a href="http://vanban.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?page=76&amp;class_id=1&amp;document_id=83970&amp;mode=detail&amp;org_group_id=0&amp;org_id=0&amp;type_group_id=0&amp;type_id=0">http://vanban.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?page=76&amp;class_id=1&amp;document_id=83970&amp;mode=detail&amp;org_group_id=0&amp;org_id=0&amp;type_group_id=0&amp;type_id=0</a>
4	Thông tư số 151/2012/TT-BTC của Bộ Tài chính: Sửa đổi, bổ sung Thông tư số 126/2008/TT-BTC ngày 22/12/2008 của Bộ Tài chính quy định Quy tắc, điều khoản, biểu phí và mức trách nhiệm bảo hiểm bắt buộc trách nhiệm dân sự của chủ xe cơ giới và Thông tư số 103/2009/TT-BTC ngày 25/5/2009 của Bộ Tài chính quy định việc quản lý, sử dụng, thanh toán và quyết toán Quỹ bảo hiểm xe cơ giới	<a href="http://vanban.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?class_id=1&amp;mode=detail&amp;document_id=164529">http://vanban.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?class_id=1&amp;mode=detail&amp;document_id=164529</a>

### 2.2. Law References Usages

STT	Nội dung tham khảo	Nguồn	Trích dẫn
1	Loại hình bảo hiểm và phí bảo hiểm	Khoản 3, Điều 9, Mục II, Nghị định số 103/2008/NĐ-CP của Chính phủ	Bộ Tài chính quy định mức phí bảo hiểm
		Điểm 3.1, Khoản 3, Mục II, Thông tư số 126/2008/TT-BTC của Bộ Tài chính	Mức phí bảo hiểm của từng loại xe cơ giới được quy định tại Phụ lục 5 ban hành kèm theo Thông tư này
		Khoản 8, Điều 2, Thông tư số 151/2012/TT-BTC của Bộ Tài chính	Ban hành Phụ lục 1 về Biểu phí bảo hiểm bắt buộc trách nhiệm dân sự của chủ xe cơ giới kèm theo Thông tư này thay thế Phụ lục 5 ban hành kèm theo Thông tư 126/2008/TT-BTC.
		Phụ lục 1, Thông tư số 151/2012/TT-BTC của Bộ Tài chính	

2	Hủy bỏ hợp đồng bảo hiểm	Khoản 1, Điều 11, Mục II, Nghị định số 103/2008/NĐ-CP của Chính phủ	Hợp đồng bảo hiểm chỉ được hủy bỏ trong những trường hợp sau: a) Xe cơ giới bị thu hồi đăng ký và biển số theo quy định của pháp luật; b) Xe cơ giới hết niên hạn sử dụng theo quy định của pháp luật; c) Xe cơ giới bị mất được cơ quan công an xác nhận; d) Xe cơ giới hỏng không sử dụng được hoặc bị phá huỷ do tai nạn giao thông được cơ quan công an xác nhận; xe tạm nhập, tái xuất.
3	Giấy chứng nhận bảo hiểm và hợp đồng bảo hiểm	Điểm 1.1, Khoản 1, Mục II, Thông tư số 126/2008/TT-BTC của Bộ Tài chính	Mỗi xe cơ giới được cấp 1 Giấy chứng nhận bảo hiểm
4	Xây dựng hệ thống cơ sở dữ liệu	Điểm 14.13, Khoản 14, Mục II, Thông tư số 126/2008/TT-BTC của Bộ Tài chính	Hệ thống cơ sở dữ liệu tối thiểu phải cung cấp được các thông tin sau: a) Thông tin chủ xe cơ giới: - Tên chủ xe; - Số Giấy chứng minh nhân dân của chủ xe hoặc số hộ chiếu (đối với chủ xe là cá nhân); - Địa chỉ liên lạc. b) Thông tin về xe cơ giới: - Biển số đăng ký; - Nhãn hiệu; - Loại xe; - Dung tích; - Màu sơn; - Năm sản xuất; - Số máy; - Số khung; - Số giấy chứng nhận bảo hiểm; - Thời điểm có hiệu lực bảo hiểm; - Thời điểm hết hiệu lực bảo hiểm; - Phí bảo hiểm; - Ngày nộp phí; c) Thông tin ghi nhận về số lần gây tai nạn, số lần bị xử lý vi phạm Luật giao thông đường bộ của lái xe cơ giới. - Số lần gây tai nạn (chi tiết thời gian, địa điểm, mức độ vi phạm theo xác định lỗi của cơ quan công an);

			<ul style="list-style-type: none"> <li>- Số lần đã nhận tiền bồi thường, số tiền bồi thường theo từng vụ tai nạn (chi tiết theo từng vụ tai nạn);</li> <li>- Số lần bị xử lý vi phạm Luật giao thông đường bộ của lái xe (nếu có).</li> </ul>
5	Yêu cầu bồi thường	Phụ lục 4, Thông tư số 126/2008/TT-BTC của Bộ Tài chính	
6	Thông tin lưu trữ lịch sử vi phạm, tai nạn giao thông...	Điểm 1.5, Khoản 1, Mục II, Thông tư liên tịch số 35/2009/TTLT-BTC-BCA của Bộ Công an-Bộ Tài chính	Sau khi kết thúc việc xử lý vi phạm, điều tra giải quyết vụ tai nạn giao thông, lực lượng Cảnh sát giao thông, Cảnh sát điều tra có trách nhiệm cung cấp Biên bản giải quyết tai nạn giao thông, trong đó ghi rõ lỗi gây ra vụ tai nạn giao thông, các tài liệu khác có liên quan (nếu có) cho doanh nghiệp bảo hiểm để có căn cứ giải quyết bồi thường theo quy định của pháp luật về bảo hiểm bắt buộc trách nhiệm dân sự của chủ xe cơ giới.
7	Thông báo hết hạn bảo hiểm	Khoản 8, Điều 20, Mục II, Nghị định số 103/2008/NĐ-CP của Chính phủ	Trong vòng 15 ngày trước khi hết thời hạn bảo hiểm phải thông báo cho chủ xe cơ giới về việc hết thời hạn của hợp đồng bảo hiểm.
8	Bảo hiểm tự nguyện	Điểm 4.3, Khoản 4, Mục I, Thông tư số 126/2008/TT-BTC của Bộ Tài chính	Ngoài việc tham gia hợp đồng bảo hiểm bắt buộc trách nhiệm dân sự, chủ xe cơ giới có thể thoả thuận với doanh nghiệp bảo hiểm để tham gia hợp đồng bảo hiểm tự nguyện.
9	Thời hạn và hiệu lực bảo hiểm	Khoản 1, Điều 10, Mục II, Nghị định số 103/2008/NĐ-CP của Chính phủ	Thời hạn ghi trên Giấy chứng nhận bảo hiểm là một năm, trong các trường hợp sau, thời hạn bảo hiểm có thể dưới 01 năm: <ul style="list-style-type: none"> <li>a) Xe cơ giới nước ngoài tạm nhập tái xuất có thời hạn tham gia giao thông trên lãnh thổ nước Cộng hòa xã hội chủ nghĩa Việt Nam dưới 01 năm;</li> <li>b) Niên hạn sử dụng của xe cơ giới nhỏ hơn một năm theo quy định của pháp luật.</li> </ul>