**MINISTRY OF EDUCATION AND TRAINING**

**FPT UNIVERSITY**

Capstone Project Document

**Insurance Card**

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| --- | --- |
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| **Ext. Supervisor** | N/A |
| **Capstone Project Code** | MIC |

- Ho Chi Minh City, 12 May 2015 -

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Definitions, Acronyms, and Abbreviations

|  |  |
| --- | --- |
| Name | Definition |
| MIC | Motor Insurance Card |
| NFC | Near field communication |
|  |  |

Table : Definitions, Acronyms, and Abbreviations

# Introduction

## Project Information

* Project name: **Insurance Card**
* Project Code: **MIC**
* Product Type: **Website & Android Application**
* Start Date: **May 11th, 2015**
* End Date: **September 5­th,2015**

## Introduction

In this document we introduce a solution for motorbike insurance company. Current insurance company systems have some problems like delayed in renew contracts for customer or inconvenient in checking insurance card validation process. Based on our researches and analysis, we proposed a solution for insurance company in Vietnam and other developed countries.

We build a system which help the insurance companies to solve current problems. In the process of analysis we believe the NFC cards is capable to resolve the problem by using NFC card to save information about insurance contract. NFC cards are convenient to manage the contract information and checking, validating process. Beside of that we also provide an information system to manage NFC cards so that insurance companies will manage the contracts easier.

This document also describes our working process in 4 months includes our perspective in the system, component designs and detailed core workflows. We hope the system and our solution will help resolve the problems from insurance companies in Vietnam and other developed countries.

## 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.
* **Insurance certificate made of paper:** It could be torn, wet, smudged and especially is counterfeited.
* **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.

## Proposed Solution

The proposed solution is to build an insurance NFC card system, include a web application and 2 mobile applications with following functions:

### 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 send 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 send 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 send an email to notify the insured one when their insurance is expired.
  + Notify compensation state: system will send an 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.

### Advantages and disadvantages

* Advantages:
  + The interaction between the insured one and the insurance company: the insured one and the company now are easier to communicate through the website when each person has an account.
  + Reduce risk of insurance card made of paper: the NFC insurance card will not be torn, wet or smudged. And it is difficult to be counterfeit than insurance card made of paper.
  + Support police to check valid insurance card easier.
* Disadvantages:
  + At the present time, not consistent with the law of Vietnam about insurance card issues.
  + Checking the valid of card can take a long time when the internet is slow.

## Functional Requirements

Function requirements of the system are listed as below:

* **User component:**
  + New contract request
  + Check card information.
  + Renew contract.
  + Request compensation.
* **Staff component**
  + Create new contracts
  + Manage contracts.
  + Resolve compensation requests.
* **System component** 
  + Manage contract states
* **Payment system**
  + Process order
* **Notify component**
  + Notify contract expiration.
  + Notify compensation states (approved / rejected).
* **Checker mobile application**
  + Check card validation.
  + Update punishment information.
  + Retrieve card information.
* **Printer mobile application**
  + Get contract information from server.
  + Print NFC insurance card.

## Roles and Responsibility

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Full Name | Role | Position | Contact |
| 1 | Kiều Trọng Khánh | Project Manager | Supervisor | khanhkt@fpt.edu.vn |
| 2 | Đinh Quang Trung | Developer | Leader | trungdqse60994@fpt.edu.vn |
| 3 | Nguyễn Hữu Phúc | Developer | Member | phucnhse60749@fpt.edu.vn |
| 4 | Phùng Quang Minh Trí | Developer | Member | tripqmse60746@fpt.edu.vn |
| 5 | Nguyễn Chí Kha | Developer | Member | khanc60351@fpt.edu.vn |

Table Roles and Responsibility

# Software Project Management Plan

## Problem Definition

### Name of this Capstone Project

* **Official name**: Insurance Card
* **Vietnamese name**: Thẻ bảo hiểm
* **Abbreviation**: MIC

### Problem Abstract

As current in Viet Nam customer use Motor Insurance Certificate Paper when they get problems with their motor. Using the Motor Insurance Certificate Paper is inconvenient, for example it can be wet or to insert or update the information in to insurance certificate paper is complicate. So we use the NFC card we call it is insurance card to handle it. The NFC card is supplied by insurance company when the customer buy insurance. The card contain the information of customer, if the customer join with many insurance service they just use only one card.

We provide a software to check the validation of card, the deadline of card and some insurance services that customer joined. We also provide some other advantage that can help save time and costs in some process of company. For example, the software can automatic extend the insurance service, update the information about accidents of motor. In addition we also provide a system software to manage the information of customer via some insurance card we bought, this software will deploy at insurance company.

### Project Overview

#### Current Situation

(similar to risks, technical difficulties, resource. Example NFC security)

In current insurance services, especially for motorbike insurance services in Vietnam, we have some problems that need to be improved:

* **Vehicle owners forget about insurance expired date:** current insurance services in Vietnam have no method to notify their customer about the expired insurance card, therefore there are many situation when vehicle owners have problem with traffic police officer when their insurance card have expired.
* **Inconvenient to buy/renew insurance card:** when a vehicle owner has his/her insurance card expired, they have to go to an insurance agent shop to register a new one which is very inconvenient and take worthless effort. We need to improve this work.
* **Inconvenient to check/verify insurance card validation**: when traffic police officers check an insurance card they need to take looks and compare by bare eye, this process might be difficult in some situations like when the card is old and difficult to read or the paper is damaged by water or burned. Beside that this process might include a risk of fake insurance card or hijacked/modified expired date on an old insurance card.

#### The Proposed System

Based on the current situation, Vietnam Insurance Law and researches about the cutting edge technologies related. We came up with a proposal of a system which can help the insurance companies to solve those problems in a convenient way.

According to the technology researches, we found out that the NFC technology is very capable of resolve the current situations in insurance companies. The basic idea is to use a NFC tag (or NFC “card”) as an insurance card instead of paper card currently.

Our system includes three main subsystems: an online website for company’s staffs, a mobile application for police officers and a mobile application to simulate the card printer.

##### Website

Website is a common communication portal for insurance company’s staffs and users (customers). Website provide following features:

* For users (customers):
  + Users can create *(new insurance contract request)* with online payment.
  + Users can look up information about their insurance card: compensation history, punishment history, expired date…
  + Users can renew current insurance contract with online payment.
  + Users can request compensations to insurance company when an accident occurs.
  + Users will be notified by emails when insurance card is nearly expired or a compensation request is approved/rejected.
* For staffs:
  + Staffs can create new contract for customer.
  + Staffs can manage contracts, see all insurance cards published and see statistics
  + Staffs can update compensation requests, resolve a compensation request when the case is done.

Beside above, website system also provides an API interface for two mobile applications to retrieve, update data from mobile applications.

##### Checker Mobile Application

This mobile application is used by traffic officer. This application do followings:

* Check if an insurance card (NFC card) is valid or not.
* Send punishment if the customer has law violations. Punishment information will be updated in server.

##### Printer Mobile Application

This is a simulating application to simulate the work of Card Printer. In reality the company who deploy this system need to have a NFC Card Printer to write information about the insurance company and customer information into an NFC card. However our system currently only support this as a simulating application. This application is used by company’s staffs and do followings:

* Retrieves insurance contract information and write data to a physical NFC card.

#### Boundaries of the System

This section suppose that the government law in local area supports the method of using NFC cards as insurance cards, and accept NFC insurance cards are legal.

* Every company who has Information System infrastructure can deploy this system.
* Companies who deployed this system has to equip enough devices for the system to run, includes:
  + Computer system with internet connection.
  + Smartphone devices with built-in NFC technology.
  + *(NFC card)*
* The language of this system is Vietnamese
* The complete product includes:
  + Website application for staffs and users
  + Printer mobile application for staffs.
  + Checker mobile application for traffic police officers

#### Development Environment

##### Hardware requirement

* For continuous integrating server:

|  |  |  |
| --- | --- | --- |
| Hardware | Minimum Requirements | Recommended |
| Internet Connection | 512Kbps | 8 Mbps |
| Operating System | Ubuntu Server 12 LTS | Ubuntu Server 14.04.2 LTS |
| Computer Processor | Intel® Core 2 Duo | Intel® Core(TM) i5 CPU , M 460 @ 2.53GHz |
| Computer Memory | 2GB RAM | 3GB or more |

Table Hardware requirement for continuous integrating server

* For web development:

|  |  |  |
| --- | --- | --- |
| Hardware | Minimum Requirements | Recommended |
| Internet Connection | 512Kbps | 8 Mbps |
| Operating System | Window XP, Vista, 7, 8 | Window 7, 8 |
| Computer Processor | Intel® Core 2 Duo | Intel® Core(TM) i5 CPU , M 460 @ 2.53GHz |
| Computer Memory | 2GB RAM | 3GB or more |

Table Hardware requirement for web development

* For mobile development:

|  |  |  |
| --- | --- | --- |
| Hardware | Minimum Requirements | Recommended |
| Internet Connection | Wi-Fi Connection 2MB | Wi-Fi Connection 12MB |
| Operating System | Android 4.0 | Android 5.0 |
| Hardware | NFC supported | NFC supported |
| Memory | 1 GB RAM | 2 GB or more |

Table Hardware requirement for mobile development

##### Software requirement

|  |  |
| --- | --- |
| Software | Name / Version |
| Operating system | Windows 7 or above |
| Environment | Java EE 6 |
| Modeling tool | Microsoft Visio 2013 |
| IDE | Netbeans 7.2.1, Intellij IDEA 14.1 |
| DBMS | MySQL 5.6 |
| Source control | TortoiseSVN 1.8.11 |
| Web browser | Chrome 42 or above |

Table Software requirement

## Project organization

### Software Process Model

This project is developed under waterfall model. We choose this model because the following reasons:

* This project is 4 months long due to the FPT University Capstone Project timeline, which can be consider a short project.
* The requirements of this project are stable, clear, fixed and well understood by all team members.
* We have strong background knowledge about technologies used in this project.



Figure Waterfall model

More information about waterfall model:

<http://www.tutorialspoint.com/sdlc/sdlc_waterfall_model.htm>

### Roles and responsibilities

|  |  |  |  |
| --- | --- | --- | --- |
| No | Full name | Role in Group | Responsibilities |
| 1 | Kiều Trọng Khánh | Supervisor / Project Manager | - Clarify user requirement.  - Technical support and business analysis.  - Tracking development process.  - Review document and product. |
| 2 | Đinh Quang Trung | Team leader, BA, Developer, Tester | - Tracking process.  - Planning project, distribute tasks.  - Requirement analysis.  - Database design.  - Documentation.  - GUI Design.  - Coding.  - Testing.  - Deploy product. |
| 3 | Nguyễn Hữu Phúc | BA, Developer, Tester | - Requirement analysis.  - Database design.  - Documentation.  - GUI Design.  - Coding.  - Testing. |
| 4 | Phùng Quang Minh Trí | BA, Developer, Tester | - Requirement analysis.  - Database design.  - Documentation.  - GUI Design.  - Coding.  - Testing. |
| 5 | Nguyễn Chí Kha | BA, Developer, Tester | - Requirement analysis.  - Database design.  - Documentation.  - GUI Design.  - Coding.  - Testing. |

Table Roles and responsibilities

### Tools and Techniques

|  |  |
| --- | --- |
| Tool / Technique | Name / version |
| Frontend | HTML, CSS, JavaScript, jQuery, Bootstrap |
| Backend | JavaEE, Servlet, JSP, Hibernate |
| Web server | Apache Tomcat 7 |
| Development tool | Netbeans 7.2.1, Intellij IDEA 14 |
| DBMS | MySQL 5.6 |
| Source control | TortoiseSVN 1.8.11 |
| Modeling tool | Microsoft Visio 2013 |
| Document tool | Microsoft Word 2013 |

Table Tools and Techniques

## Project Management Plan

### Tasks

Below are all the major tasks that need to be performed sequentially during the development of the system.

#### Task 1: Initiating

|  |  |
| --- | --- |
| Task name | Initiating |
| Description | - Research laws of compulsory insurance for vehicle owners and insurance companies supply this insurance services in Vietnam, find out the unsolved problem of current system.  - Offer team’s solution, declare its pros and cons, introduce some core function of the new system. |
| Deliverables | Report No.1 Introduction |
| Resource needed | 20 man-days |
| Dependencies and constraints | N/A |
| Risk | - Missing requirement.  - Project’s scope can be unclear.  - Lack of member share and understand. |

#### Task 2: Planning

|  |  |
| --- | --- |
| Task name | Planning |
| Description | - Review team’s solution, verify project’s scope and determine project organization  - Create project management plan |
| Deliverables | Report No.2 Software Project Management Plan |
| Resource needed | 16 man-days |
| Dependencies and constraints | - Base on Report No.1 Introduction.  - Planned project must be completed in 14 weeks |
| Risk | - Lack of experience  - Plan may not fit yet |

#### Task 3: Specifying requirements

|  |  |
| --- | --- |
| Task name | Specifying requirements |
| Description | Identify and clarify software requirements. |
| Deliverables | Report No. 3 Software Requirement Specification |
| Resource needed | 20 man-days |
| Dependencies and constraints | Base on Report No.2 Software Project Management Plan. |
| Risk | - Misunderstood or unclear system’s requirement  - Lack of practical experience |

#### Task 4: Designing database

|  |  |
| --- | --- |
| Task name | Designing database |
| Description | Design database in conceptual, logical and physical |
| Deliverables | Physical database and SQL script. |
| Resource needed | 12 man-days |
| Dependencies and constraints | Base on Report No. 3 Software Requirement Specification |
| Risk | Lack of practical experience leading to unreasonable database design |

#### Task 5: Create Software Design Description

|  |  |
| --- | --- |
| Task name | Create Software Design Description |
| Description | Decide software architect and clarify software detail design. |
| Deliverables | Report No. 4 Software Design Description |
| Resource needed | 40 man-days |
| Dependencies and constraints | Base on Report No. 3 Software Requirement Specification and designed database |
| Risk | Lack of practical experience leading to unreasonable software design |

#### Task 6: Implementing

|  |  |
| --- | --- |
| Task name | Implementing |
| Description | Implements all functions of system. |
| Deliverables | Software package. |
| Resource needed | 80 man-days |
| Dependencies and constraints | - Base on Software Requirement Specification and Software Design Description.  - Coding try to follow coding convention. |
| Risk | - Member does not performs unit test.  - Lack of practical experience |

#### Task 7: Testing

|  |  |
| --- | --- |
| Task name | Testing |
| Description | - Create test plan  - Perform integration test and system test. |
| Deliverables | Report No. 5 System Implementation & Test |
| Resource needed | 40 man-days |
| Dependencies and constraints | Implementation is finished |
| Risk | - Lack of testing experience leading to lack of test cases.  - Not enough time for performing test. |

#### Task 8: Creating User’s Manual

|  |  |
| --- | --- |
| Task name | Creating User’s Manual |
| Description | Create the user’s manuals to instruct users using system. |
| Deliverables | Report No.6 Software User’s Manual |
| Resource needed | 12 man-days |
| Dependencies and constraints | Testing is finished |
| Risk | User’s manual may be difficult for user to understand and confuse. |

### Task sheet

Refer to “Task sheet” folder.

### All Meeting Minutes

Refer to “Meeting minutes” folder.

## Coding Convention

This project follows “Code Conventions for the Java TM Programming Language, by Sun Microsystems, rev April 20, 1999”.

<http://www.oracle.com/technetwork/java/codeconventions-150003.pdf>

*Reference:*

* *S*
* *D*
* *F*
* *G*
* *H*

*(List all used conventions here)*

# Software Requirement Specification