General Sir John Kotelawala Defence University

Faculty of Engineering

Department of IT

Smartphone Based Motor Vehicle Claim Settlement Solution

Proposal of the Software Engineering Project undertaken in partial fulfillment of the requirements for the Bachelor of ICT Degree program

By

WMIL Wasalage

ICT/12/0121

Under the Supervision of

Mr. Nandana Pathirage

Contents

Table of Figures

Abbreviations

SBMVCS - Smartphone Based Motor Vehicle Insurance Claiming Solution

1.0 Situation Overview

Over past years, the use of automobiles have become more common with the increasing complexity of human lives. In Sir Lanka for any vehicle, it is must to have a motor vehicle insurance before using the vehicle. The growth in the automobiles usage in the country has led to the establishment of several insurance companies and it has become a competitive market segment in the industry where there is constant cash flows. In any motor vehicle insurance company, one of the key process is the claim settlement of their customers in case of an accident. It can be seen that cost savings and efficient process improvements in claims management business processes have a great impact on the key performance indicators of insurers.

When a motor vehicle meets with an accident, in the past the traditional way was to wait till the police produce a report of the accident which may take usually more than 2 weeks. Therefore sometimes vehicle owners have to bear the cost of repair on his own before getting the insurance money. As a solution the 'on the spot' policy was introduced. In the on the spot claim settlement process, after an accident has happened a field agent from the insurance company has to go to the accident location and do the preliminary assessment depends solely on the discretion of the insurance agent to complete the claim settlement. Whether it is a on the spot or not an assessment should be done on the accident location. Agents should use his experience and knowledge to assess the damage. There are problems arisen with this scenario which will be discussed in the next section.

1.1 Presenting Problem

Insurance companies has become a major revenue generator in the business sector over the past years. Their main business is handling life and general insurance policies and under the general insurance solutions insurers usually provide motor, fire, marine, personal, engineering, medical, title, and miscellaneous insurance solutions. The growth in the automobiles usage in the country has led to the establishment of several motor insurance departments in these companies and it has become a competitive market segment in the industry where there is constant cash flows.

Even though there is several companies competing in the industry, they are confronted with a gradual decrease of motor policy renewals which has caused a decline in revenue. This has caused due to the inherent loopholes in the vehicle claiming procedure. In the current procedure of claim settlement, on the scene of an accident, an insurance agent does a preliminary assessment of the damage to the vehicle. This preliminary assessment depends solely on the discretion of the insurance agent. He uses his experience and knowledge to assess the damage. Typically, customers are not satisfied with the assessment of the damage

and there are no prescribed criteria or template on which the assessment is based. In most instances assessments are inadequate and customers are left with no choice but to bear the loss.

Furthermore, the process of doing a preliminary assessment, verifying the documents and photographs in the scene of accident and the process of approving the claim and reprocessing the documents in the branch/head office to settle the claim causes hefty delays. These loopholes caused clients to leave the company effecting a decline of motor policy renewals.

To insurance companies, issues regarding the vehicle claim procedure is of utmost importance as motor policies are their top income earner and responsible for their considerable market share. As a solution for the delays 'On the spot' motor vehicle claiming procedure was introduced. In this methodology also several loopholes were seen similar to the earlier process due to the fact, the agent had limited access to the company database or any other resources. Hence, the need to re-engineer the existing motor vehicle claim management process using newer technologies is made apparent.

1.2 Application Proposal

In view of above mentioned problems the proposed solution is to develop a smartphone based motor vehicle insurance claiming solution (SBMVCS) in order to enhance the information communication between the office and the field agents to minimize the loopholes in the current procedure. The solution will consist of 2 main components as the online web application for the use of ground office staff and the smartphone application for the use of field agents to assist with the assessment process. Thus the solution will allow the agents to provide real time updates and maintain the end to end connectivity with the company database.

1.2.1 Functional Requirements

This section contains the functional requirements required of the smartphone based solution for vehicle insurance claim settlement procedure. In the solution there are 2 main components namely the online web application and smartphone application. The requirements in this section specify the functions that each component must be capable of performing.

Online web application component is designed for the use of operating staff at the ground office. When a client need to buy an insurance, operating agents needs to register new customer and create account acquiring the relevant information. It will involve the following key functions.

- The users shall be able to create, view and update customer profiles by filling customer details such as first name, last name, date of birth, phone number, company details etc.
- The users shall be able to add, view and update insurance vehicle details such as model, manufacturer, engine number etc. as per the customers' vehicle.
- The users shall be able to add, edit and view insurance policies in to the system database.
- The system shall be able to add, view and update spare parts details relative to various manufactures and vehicle models.
- The system shall be able to produce reports regarding the customers, insurance policies, claims history and etc.

The other component is the smartphone application which will aid the field agent with the assessment process. When an accident happens, once the agents goes to the location, the person can access the following key functions using the smartphone application via a web service.

- Develop and host a web service architecture to communicate with the main web system through the smartphone.
- The user shall be accessed to the insurance policy details of the customer from the database.
- The user shall be able to access the insurance vehicle details and the details of the clients on the system database.
- The user shall be able to access and assess the drivers' insurance history.
- The user shall be able to complete the assessment of the accident by entering the details such as drivers' details of the caused accident, accident location details, cause of accident and damages to the vehicle.
- The users shall be able to attach photos regarding to the accident to the record using smartphone camera.
- The system shall be able to complete the assessment by calculating the damage by involving the database and the web server.

1.2.2 Non-Functional and Performance Requirements

In the below discussed are the non-functional and performance requirements to be considered when implementing the motor vehicle claim settlement solution.

When considering the performance, this would depend on factors such as the network connection involved. As the field agents should move to the accident location, the network

data transfer speeds will depend on the signal strength received to the particular location with the network provider.

In today's smart devices market, there are several major OS platform which the devices work on. Since initial mobile application is developed for the Windows platform, Mobile application will require a smart device running on Windows OS platform.

In considering the smart devices, another important factor which should be considered is the hardiness of the device. It is important to remember that this will be used outdoors and taken in the Sri Lankan tropical climate necessary precaution should be taken to protect the device.

System will be tested for identifying and reducing bugs to the minimum. If any bug may appear they will be debugged using demo test. Finally reliable software system will be introduced to provide real time information. The company database should also be updated with the current vehicle component values in the market and there should be constant updating done on the part of the head office.

The system will have its own security to prevent unauthorized write/ read/delete access along with its authentication module. Apart from that necessary steps would be taken to back up the database periodically.

1.2.3 Technical Requirements

Following are the technical requirements to be considered when implementing the vehicle insurance claim settlement solution.

- System will be developed in the Visual Studio ASP.Net environment integrating Telrik framework along with SQL will be used as database management system.
- System will be implemented in a web application server with its central database.
- System can be accessed through a standard web browser regardless of the OS platform.
- Mobile application will be designed to work on smart devices running Window OS.

1.3 Overview of the System Architecture

The proposed software solution will be stored in a web application server providing access to the system through a standard web browser. As for the mobile application, it will access the system and the database via mobile networks through a web service. Overall system will be split in to three layers names as application layer, data layer and presentation layer. Following diagram describes the overview architecture of the proposed system.

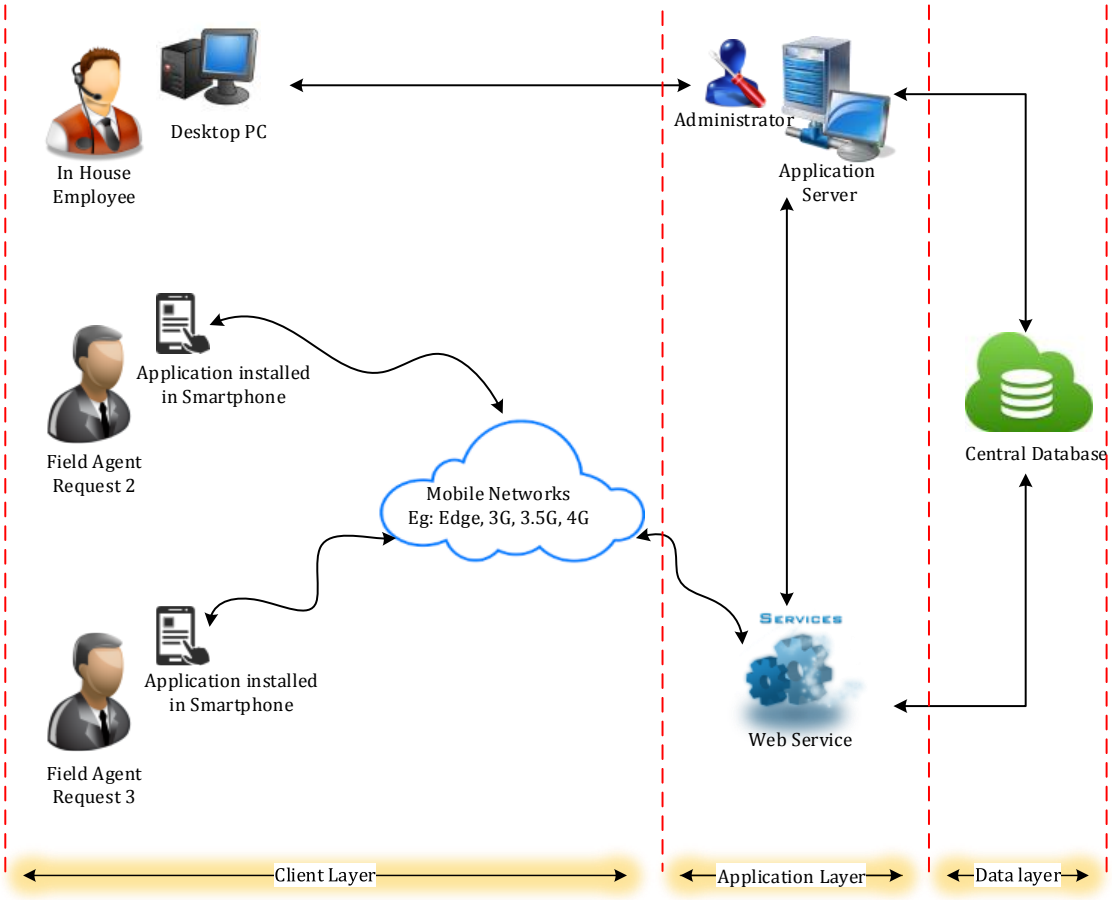

Figure 1.0: Overall Architecture of the Proposed Solution
Source: Author

1.4 Strategic IT Value

In the below it is explained about the Strategic IT value that can be gained in three perspectives namely Economical, Technical and Social perspectives.

1.4.1 Economical Perspective

Use of such mobile solution in the claiming procedure will financially benefit both client and the company. As discussed earlier lack of proper information to conduct the preliminary assessment of the accident can lead to two major failures. By allowing the insurance agent to access the updated information, it allows him to estimate the damage cost with a lowest margin of error. So it will prevent customers from suffering loss as well as the company from paying over the amount of actual value. Although there will be an initial cost for setting up the back office system hardware/software requirements, hosting costs, smartphones and

other necessary devices, it will gradually decrease and come to an lower value. It is also possible that costs will increase during maintenance processes of the system from time to time.

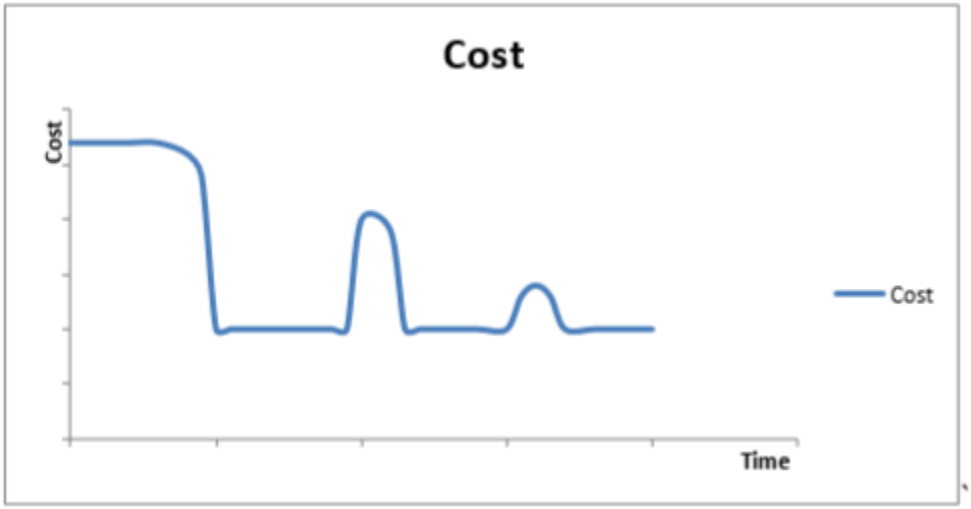

Figure 2.0: Time vs Cost
Source: Author

1.4.2 Technical Perspective

Merging with the trend of using innovative technology with the passage of time is imperative to any industry in order to achieve success in their business processes. And even nowadays people are eyeing forward for an application which satisfies their needs even more simply and in a fast manner. An agent needs to carry out and review lots of documents in order perform an accurate claiming process. All the documents can be replaced by a smartphone which includes the pre-installed application to access the company database. Not only that these technologies will help to access and update data real time without any delays.

Furthermore, insurance agent needs several instruments such as cameras in order to perform an accurate claiming process. And also take considerable amount of time to approve the claiming amount by the claiming officer at the head office. But using smartphone within built camera, this tasks can be done easily and upload the details instantly.

1.4.3 Social Perspective

Reduction of time during the entire claiming process is considered as an advantage of using the smartphone based solution for motor vehicle insurance claiming. The efficiency which is

created by the solution makes both clients and the company satisfied by providing means to conduct an accurate assessment on the accident that would benefit both the parties.

1.5 Aim

To develop a smartphone based software solution to streamline the extant motor vehicle claim assessment and settlement procedure in order to benefit both the insurer and the client.

1.6 Objectives

To achieve the above mentioned aim, followings are the key milestones which needed to be achieved successfully during the project.

- To identify the weaknesses in phases of existing motor vehicle claim settlement procedures.
- To investigate similar researches and projects steered to mitigate identified weaknesses with the aid of technological advancements.
- To develop the web application linked with a central database and host in a server such that employees can access the system through a standard web browser.
- To develop and host a web service along with web system in order to allow any platform smartphones to connect to the system.
- To develop smartphone application to access the main system as well as the database through the hosted web service.
- To provide means to make assessments of damages more effectively and efficiently through access to an online central database.
- To improve customer satisfaction by the reduction of misjudged claims.

2.0 Research Methodology

As inductive approach will be used as the main approach according to which the research is conducted, research techniques such as, questionnaires, interviews, case studies, observations and document reviews are appropriately collaborated. To make the research more in depth and productive a combination of quantitative and qualitative methodologies will be employed as the research style. Moreover the emphasis of quantitative research is on collecting and analyzing numerical data. The design initially is usually highly detailed, structured and results can be easily collected and will be presented statistically.

On the other hand qualitative research is more subjective in nature than quantitative research and involves examining and reflecting on the less tangible aspects of a research subject. Interviews observation of workflow in sites is examples for qualitative methods which will be used in the project. Such a combination would allow the researcher to discern the techno-economic implications of a smartphone based solution for motor vehicle claim settlement procedure.

2.1 Research Design

The above mention research approach will be executed according to the dynamic system development life cycle on agile development methods as depicted in figure 11.

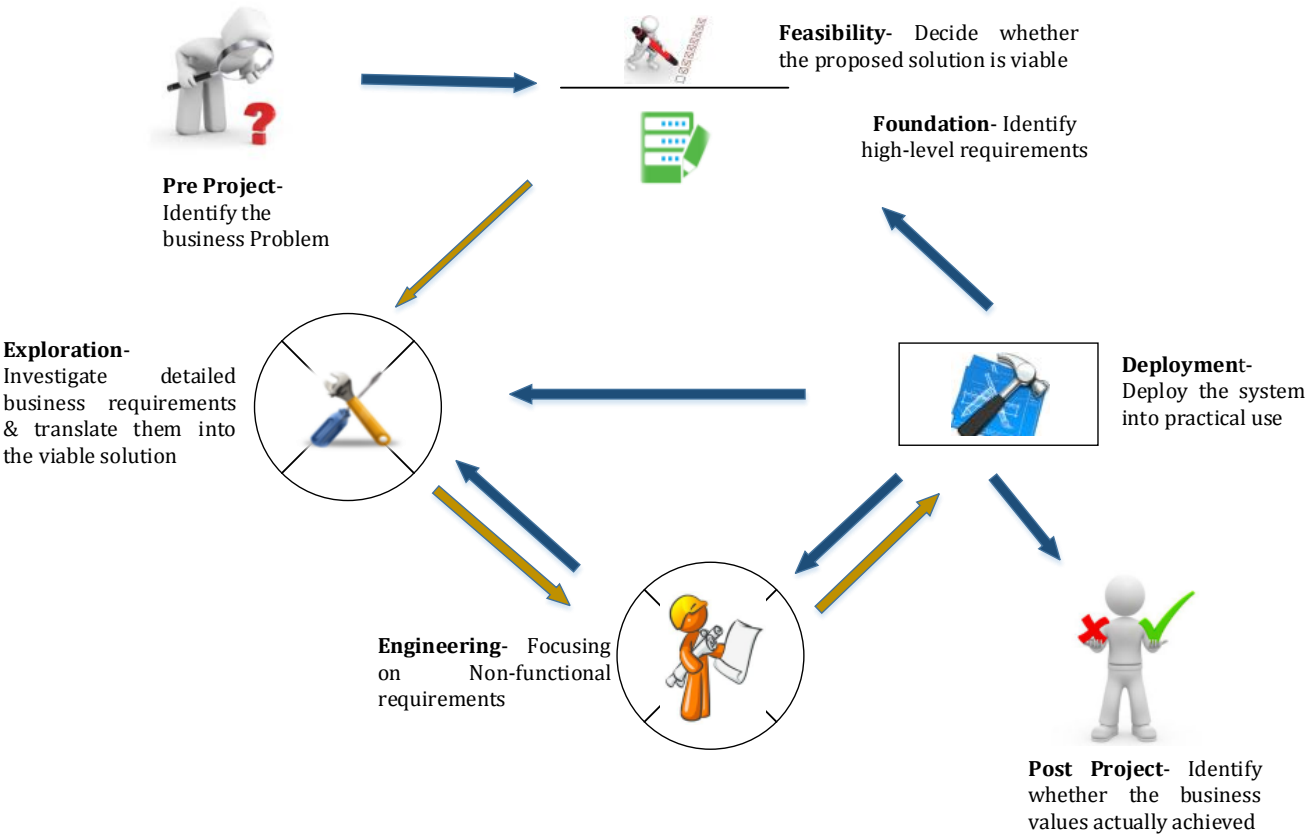

Figure 3.0: Research Design
Source: Author

2.2 Primary Data Spotlight and Actors

Since proposed software solution is intended for the use of any motor vehicle insurance companies, several leading insurance companies who provides motor vehicle insurances are selected as locations to collect essential information required to develop the system. Several employees from managerial positions to ground level employees who deal with the extant system at daily basis will be targeted.

2.3 Data Collection Protocols

Following methods are supposed to be used in the data collection process in order to gather quality quantitative and qualitative data required for designing the requirement specification for the new system.

2.3.1 Questionnaires

Primary data is collected through questionnaires. Questionnaires facilitate the collection of data by asking a sample of people, to respond to the same questions. Questionnaires will be prepared such that they are short as possible and include all the questions which need to cover subject areas and they will be distributed among the employees who are directly involved with the claim settlement procedure to gather information regarding the extant procedure and their opinions of it and the proposed solution.

2.3.2 Interviews

Interviews are another effective method used to collect data and ideas of the clients since it enables the researcher to get instant feedback and allow to ask follow up questions. Focus groups are used to gather data, usually in the forms of opinions, from a selected group of people on a particular and pre-determined topic. Interview types such as Face to face (Individual, Group), online (Chat, Skype) and over the phone will be used according to the availability of the clients. As the clients wide range of officials from managerial positions to ground level employees who deal with the extant system at daily basis will be selected. Apart from officials from companies, some of the clients will be interviewed in order to obtain the realistic picture of the extant system.

2.3.3 Observations

As a data gathering method in this research project, visiting work sites and observing the work process is also included. It can be used in association with other research approaches or as the primary way of gathering qualitative data. It would be greatly helpful participating

in a live claim settlement procedure in order to understand the extant procedures field work as well to understand the data flow within the organization.

2.3.4 Document Reviews

Documentary analysis is chosen in this research as it involves a variety of sources and is expected to yield reliable data. This will help to get an idea about what kind of data should be stored in the database and their relationships with each other. Collected data will greatly aid in designing the central database for the system.

2.4 Data Analysis

In order to develop a successful system, gathered data must be analyzed in a proper way. Quantitative data gathered will be analyzed using software such as Microsoft Excel. Various graphs and charts will be produced using quantitative data analyzing software. On the other hand data gathered using qualitative methods such as interviews will be analyzed using previous experience of the researcher and by identifying patterns and categorizing the data according to the prescheduled criteria.

2.5 Ethical Overview

In the proposed system, various confidential information related to the policies and personal information of the employees and customers will be stored in the database. It is guaranteed that all the gathered information is secured and will only be used for system purposes.

Throughout the data collection process maximum priority will be given to meeting highest ethical standards of research. Data security will be a high priority and anonymity of data will be protected at all costs. At the research initiation, participants will be fully briefed regarding their liberties, obligations and will be given a detailed explanations of how their responses are going to be used. They will be given the opportunity to withdraw from the research at any time. All data collection procedures will be conducted only after obtaining informed consent from the authorities of the company and relevant parties.

3.0 Project Scope & Constraints

The scope of this project is to develop an online web application integrated with a smartphone application to address the loopholes in the motor vehicle insurance claiming procedure. The solution will be specifically targeted for the motor vehicle insurance claiming procedure only.

When developing the system there will be some constraints that the developer will have to face. In technical perspective the main issue would be the technical knowledge base of the developer in variety of development sectors since this project will require knowledge in developing web applications, database management, web services and also smartphone application development.

Apart from that, hosting the web services, web application and databases in cloud servers will incur costs. Time constraint may be critical due to the gathering requirements, data analysis etc. which runs a lengthy time.

4.0 Project Plan

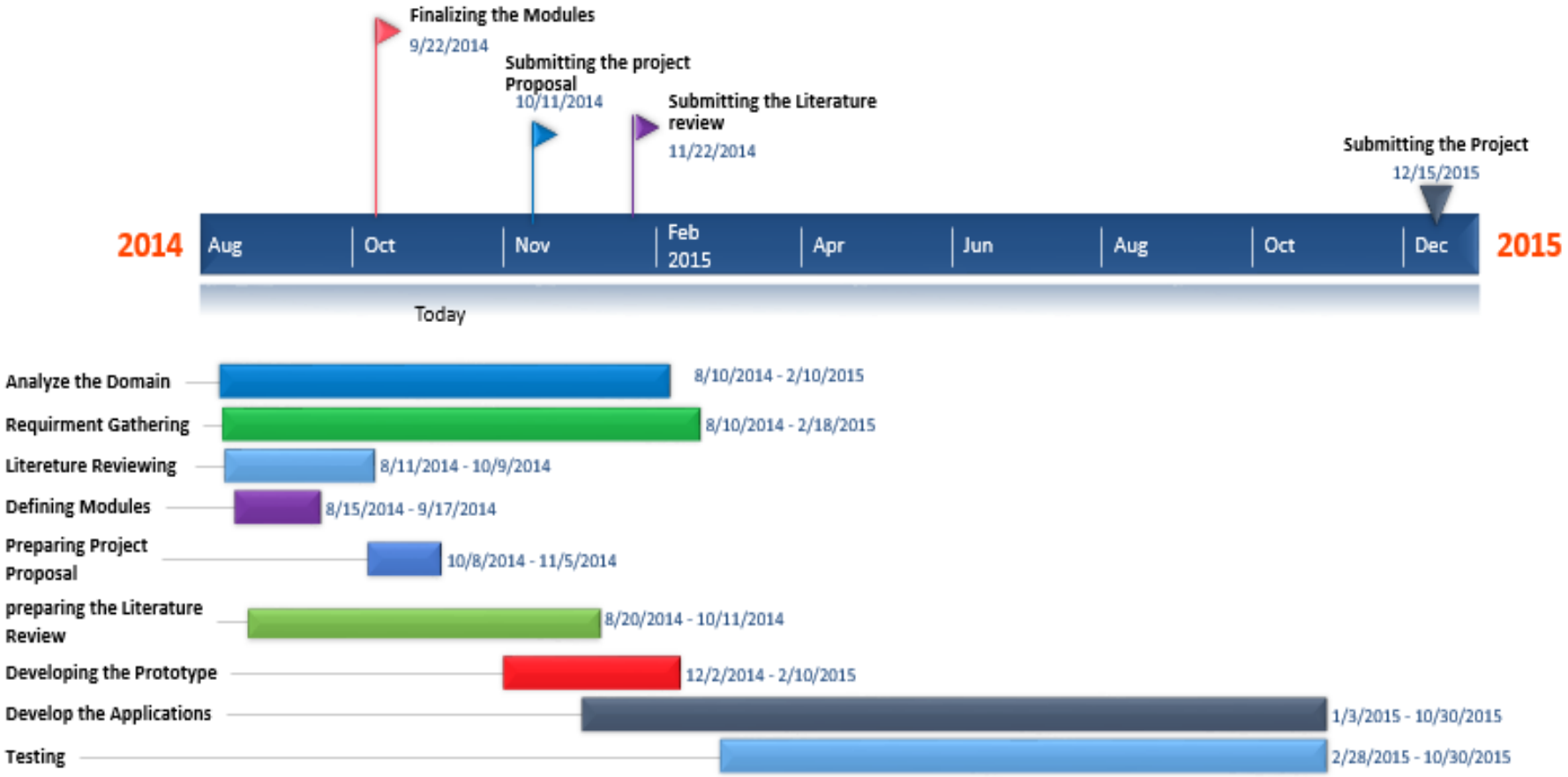

Figure 4.0: Project Plan
Source: Author

References

Baecker, O., & Bereuter, A. (2010), *Technology-Based Industrialization of Claims Management in Motor Insurance,* Institute of Technology Management, University of St. Gallen. Retrieved September 10th 2014, from the University of St. Gallen i-lab website: http://www.i-lab.ch/docs/04_technology based_industrialization_of_claims_management_in_motor_insurance.pdf

Baecker O., Fleisch E., Ackermann W., Ackermann L 2010, Mobile Claims Management: Smartphone Apps in Motor Insurance, Trendmonitor 4 . 2010

Barry D., K. n.d*, Web Services Explained,* Viewed 9th December 2014 http://www.service-architecture.com/articles/web-services/web_services_explained.html

Capegemini 2013, Mobile Solutions for Claims Management, Viewed 10th October 2014 http://www.capgemini.com/resource-file-access/resource/pdf/mobile_solutions_for_claims_management_0.pdf.

Dialog Axiata 2014, *Coverage Map,* Viewed 26th November 2014 http://www.dialog.lk/support/mobile/coverage-service-points/coverage-map/

Flitch Ratings 2013, *2014 Outlook: Sri Lanka Insurance Sector,* Outlook Report. Retrieved September 17th 2014 from www.fitchratings.lk/download-article-216.pdf

'Gartner' 2014, *Gartner Says Annual Smartphone Sales Surpassed Sales of Feature Phones for the First Time in 2013,* Viewed 29th October 2014 http://www.gartner.com/newsroom/id/2665715

IBM 2009, Fast path claims from IBM. Viewed 10th October 2014 http://www-03.ibm.com/industries/financialservices/doc/content/solution/1231013103.html.

Iqbal I. 2014*, Rapid Growth of Mobile Internet Usage in Sri Lanka,* Viewed 25th November 2014 http://infasiqbal.com/rapid-growth-of-mobile-internet-usage-in-sri-lanka/

Lee C, Cheng H., K., Cheng H. 2007, an empirical study of mobile commerce in insurance industry: Task-technology fit and individual differences, Decision Support Systems.

Mobitel 2104, *Mobitel GSM and 3G Coverage,* Viewed 26th November 2014

http://www.mobitel.lk/images/English/common/Srilanka_GSM_Coverage%2030112013.jpg

Nielsen 2013, Sri Lanka 2013 review and opportunities in 2014, Viewed 10th October 2014 http://www.nielsen.com/lk/en/insights/reports/2014/sri-lanka-2013-in-review-and-opportunities-in-2014.html

Susan W. 2013, Widespread *Adoption of Tablets and Smartphones Is Driving Growth in the Internet of Things,* Viewed 29th October 2014 https://www.scisbo.com/web/business-solutions/blog/-/blogs/widespread-adoption-of-tablets-and-smartphones-is-driving-growth-in-the-internet-of-things

TDK Global 2012*, Devising Total Solution for Condensing a Multitude of Function within a Limited Space,* Viewed 29th October 2014 http://www.global.tdk.com/ir/ir_library/annual/2012/html/strategy/str01.htm

Trading Economics 2014, *Mobile cellular subscriptions in Sri Lanka*, Viewed 29th November 2014 http://www.tradingeconomics.com/sri-lanka/mobile-cellular-subscriptions-wb-data.html

w3schools 2104, *Introduction to Web Services*, Viewed 9th December 2014 http://www.w3schools.com/webservices/ws_intro.asp

Want R 2009, When Cell Phones Become Computers, IEEE Pervasive Computing.