

Smart Tablet Based Motor Vehicle Claim Settlement Solution

WMIL Wasalage^{#1}, N Pathirage¹ and SPP Pakshaweera²

¹General Sir John Kotelawala Defence University, Ratmalana, Sri Lanka

²Army Camp, Panagoda, Sri Lanka

[#]isankalakshan@gmail.com

Abstract— In motor vehicle claim settlement procedure, the 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. In order to overcome of above mentioned problems this paper discuss a software solution 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 consists 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. The proposed software solution is stored in a web application server providing access to the system through a standard web browser. As for the mobile application, it accesses the system and the database via mobile networks through a web service. Overall system is divided in to three layers names as application layer, data layer and presentation layer. Thus the solution will allow the agents to provide real time updates and maintain the end to end connectivity with the company database.

Keywords— Smartphones, Claiming, Web Services

I. INTRODUCTION

Over past years, the use of automobiles has become more common with the increasing complexity of human lives. In Sri Lanka for any vehicle, it is must to have 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 a constant cash flows. In any motor vehicle insurance company, one of the key processes 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.

A. Presenting Problem

Insurance companies have 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 are constant cash flows.

Even though there are 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 affecting 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.

II. LITERATURE REVIEW

A. Motor Vehicle Insurance Industry: An overview

Over past years, the use of automobiles has become more common with the increasing complexity of human lives. In Sri Lanka for any vehicle, it is must to have motor vehicle insurance before using the vehicle. The growth in the automobiles usage in the country has led to the establishment of insurance companies and it has become a competitive market segment in the industry. In the Fitch ratings it is stated that "Intense pricing competition in the motor segment is likely to hold the combined ratios in non-life above 100%". Due to fall in imports with increased customs duty and unfavorable exchange rate movements, growth in the motor sector has dropped to 16.49 % in 2012 (2011: 29.56%). Yet, the influence of the motor segment in non-life remained high at 63.64% and will remain the major GWP contributor in non-life (Fitch ratings, 2014).

B. An Overview on Web Services

In the development of the proposed solution web services technologies will be used to connect the main system with the smartphone application. Web services can be identified as application components which communicate using open protocols (XML, SOAP, WSDL and UDDI) over an Internet protocol backbone. Web services are self-contained and self-describing. They can be discovered using UDDI and can be used by other applications (w3schools, 2014). It runs totally without any intelligence or input by a human being. One of the main ideas in developing such systems is that the human involvement is to a minimum and the human error is

dealt to a nullity.

Loss Ratio - Non Life

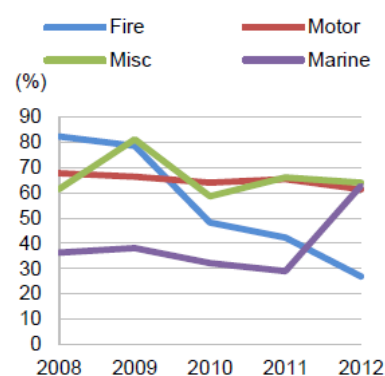


Figure 1.0: Loss Ratio - Non Life
Source: Fitch Ratings (2014)

When the claiming agent conducts the assessment, the data has to be retrieved and also synchronized with the main database. This happens through the web server. Extensible Markup Language (XML) which is derived from Standard Generalized Markup Language (SGML) is a simple, flexible text format which is used for the development of the web server. There are no pre-defined tags in XML; user has to design their own tags. Document type definitions or XML Schema files are used by XML in order to describe data. XML works as a message carrier in web services.

C. Examination of Past Research

In a research conducted by Baecker and Bereuter (2010), they have presented an analysis of claims management processes in motor insurance, and identified several areas for technology-based process improvements. They have categorized the areas such as Mobile loss report, Partner management, Status notification and Customer feedback. In order to establish the technical foundation for identifies areas, they have designed and implemented a service-oriented architecture and has used it to develop a demonstrator, which illustrates the identified process improvements. The demonstrator they have developed incorporates three major components namely Mobile phone application, Service-oriented integration architecture and Claims management enterprise system.

Furthermore they have discussed in the paper about the benefits of a mobile claims assistance application for customers involved in a car accident as well as for insurance companies. In addition, with the aid of demonstrator they have demonstrated that mobile phones are technically capable of reporting claims into commercial claims management enterprise systems.

In 2008, Kaeslin and El Hage conducted a research with the aim of identifying the possible cost reductions for claims management in motor insurance sector. As a result it was observed that the delays in claim settlement can largely be averted by automating the process. In addition to that it states that, it is vital to have proactive contacts between the all the relevant parties throughout the claim settlement process. Kaeslin and El Hage also argues that one of the major challenges that insurance companies have to address in order to improve control over the claims management processes is the lack of adequate IT solutions in the process.

In another research conducted by Lee and colleagues (2007), they have studied about possible strategies and applications for M-commerce in the insurance industry. After conducting a survey among insurance agents in order to explore mobile solutions which are applicable in the business process and to identify the possible benefits for the agents' tasks, researchers concluded that personal digital assistant (PDA) technology is appropriate for the insurance industry and highlighted the potential for improvements of customer care and claims management. Although in that era PDA was the popular mobile device which could fit into business solutions, in today's world smartphone are much more powerful than PDAs and can be much more helpful than PDAs. Since, the entire business world moving towards a virtual market place, the integration of M-strategies with insurance tasks will definitely hold the key for insurance industry in future.

Moreover, IBM (2009) conducted a similar study on process automation in claiming sector. The research investigated the potential effects of automating some steps in a claiming procedure on the quality of customer service. The research concluded that 60% of claiming time can be reduced by the automation which eliminated "low- to no-touch management" in several phases. It is stated by Want (2009) that while the applications such as eCall are currently deployed in motor vehicles, similar applications will become available for mobile phones as their computational power increases, additional sensor technology becomes available, and the necessity to integrate mobile phones with enterprise wide systems will rise.

As the above researches indicates the interest of academics of the possibilities of integrating smartphone technologies to enhance claim management processes and shows the necessity for further research in this area considering the competitive nature of the motor insurance industry which demands the integration of such mobile technologies.

III. METHODOLOGY

Considering the nature of the research, as the chosen research methodology for the research, a mix of quantitative and qualitative methodologies was used. The characteristics of the quantitative and qualitative methodologies and the variables of the research necessitate a coherent synthesis between these two methodologies. The main stimulus behind using such a combination is that the research demands the predictive generalization of the feasibility of developing a comprehensive solution covering all the aspects of motor vehicle insurance claiming procedure. Several leading insurance companies who provide 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. Data gathering techniques such as interviews, questioners, observations and document reviews were 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.

As per the methodology of developing the system an agile developing approach was used. Agile development methodology provides opportunities to assess the direction of a project throughout the development lifecycle. From the very start of the project requirements at a high level was identified and development was initiated. An initial prototype was developed using the requirements and it was developed throughout the project. Unit testing were conducted along with the development. Developing system was presented to the clients and their constant feedback was used to make certain that the development is going in the correct direction to achieve the project aim.

IV. TECHNOLOGY DESIGN

The software solution is stored in a web application server providing access to the system through a standard web browser. As for the mobile application, it accesses the system and the database via mobile networks through a web service. Overall system is split in to three layers names as application layer, data layer and presentation layer. Application layer is the back end performing the business logics while data layer is in charge with connecting to the database and performing database operations such as inserting and data retrieval. Presentation layer means the graphical user interfaces which will be used to interact with the end users. As the development language c# was throughout the main web component as well as the tab application. Web services were used to connect the two components.

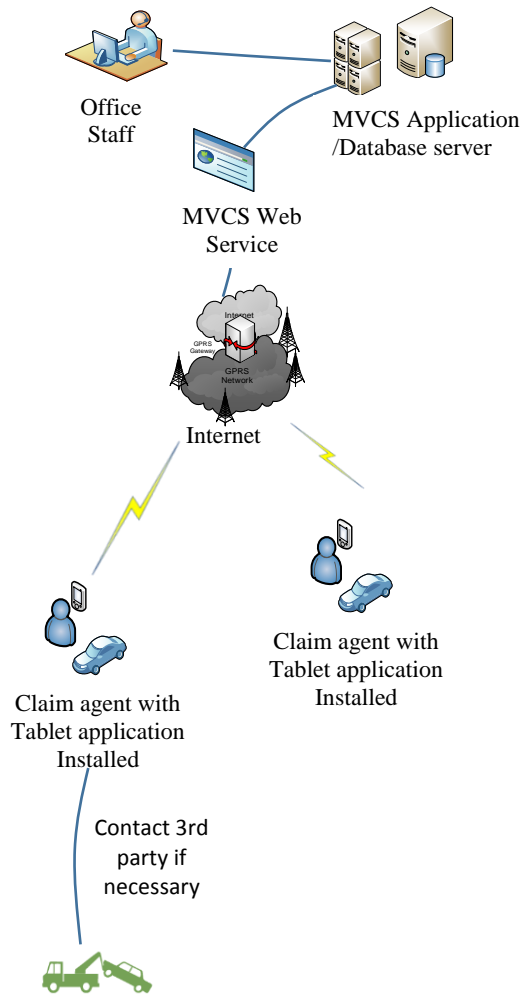


Figure 2. Overall Architecture

Web services can be identified as application components which communicate using open protocols (XML, SOAP, WSDL and UDDI) over an Internet protocol backbone. Web services are self-contained and self-describing. They can be discovered using UDDI and can be used by other applications (w3schools, 2014). It runs totally without any intelligence or input by a human being. One of the main ideas in developing such systems is that the human involvement is to a minimum and the human error is dealt to a nullity. Following figure demonstrate the technology model of the proposed solution.

V. MODULE ARCHITECTURE

In the web application for the office staff available modules are indicated below.

- Login Module
- Insurance Module
- Vehicle Details Module
- Garage & Tow Truck Services
- Claim Settlement Module

- Report Generation Module
- Administration Module

In the respective Tablet application included modules are

- Login Module
- Claim settlement Module
- Garage and Tow Truck services
- Profile Details Module

In both web application and tablet application, initial access to the system must be done with a valid username and a password.

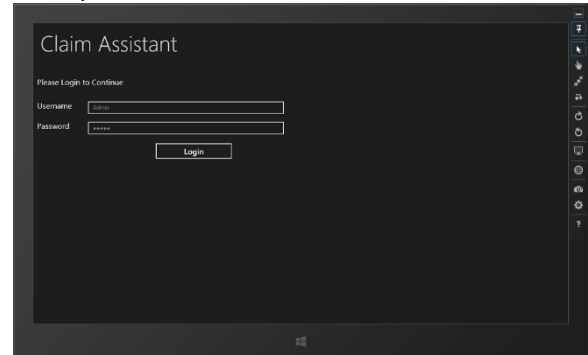


Figure 3. Login Screen

In the web application when the user enters a username and a password it will directly communicate with the database to check the validity of the combination. On the other hand tab application will use the means of web services to confirm the validity of combination through the web application. Upon the successful login to the system tablet application will direct to the main screens as indicated in figure2

One of the major tasks in the web application is to create new insurance records for customers. This can be achieved thorough selecting the new insurance tile and filling up the necessary details which will be requested by the system. Upon the successful completion of the necessary details record will be added to the database.

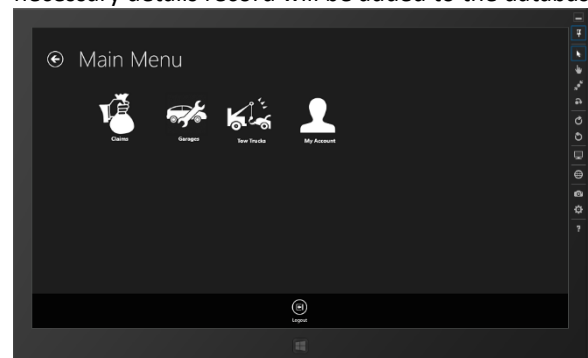


Figure 4. Main Menu Screen

The key function of the complete system is to conduct the real time claiming procedure of an accident. In order

to conduct the claiming, from the tabs main menu select the claim function.

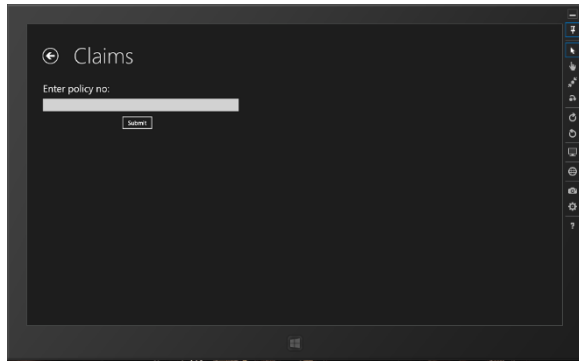


Figure 5.Claim ID Entering Screen

Then the system will require the policy number which is a unique ID for each insurance record. Once the number is entered tab application will request and show the data such as customer details, insurance details, vehicle details etc. from the database through the web service.

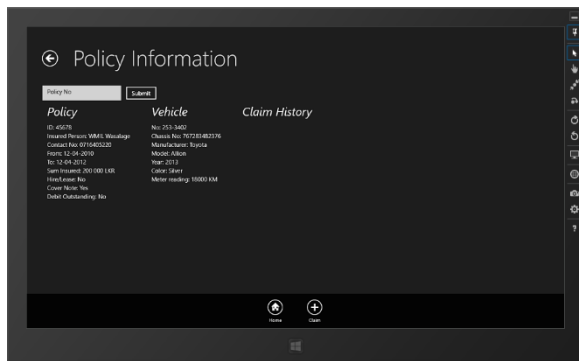


Figure 6.Policy details display screen

Insurance agent can check for the necessary details and move forward with the claiming process by pressing the claim button. With the next emerging screens he will be able to fill the claim details such as damages, cause of accident, venue, and driver details and so on. Upon the completion of the details agent can submit the information to the database to complete the claim settlement.

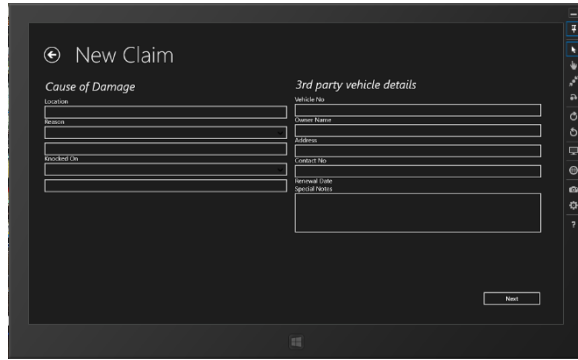


Figure 7.Claim settlement form 1

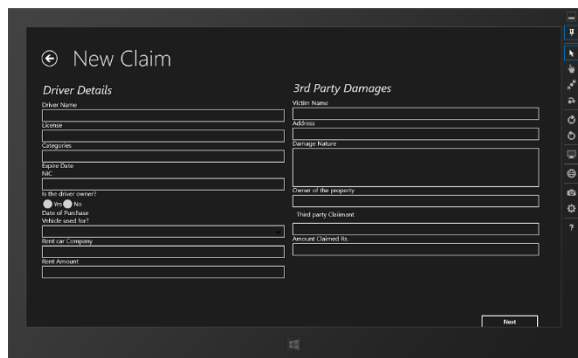


Figure 8.Claim settlement form 2

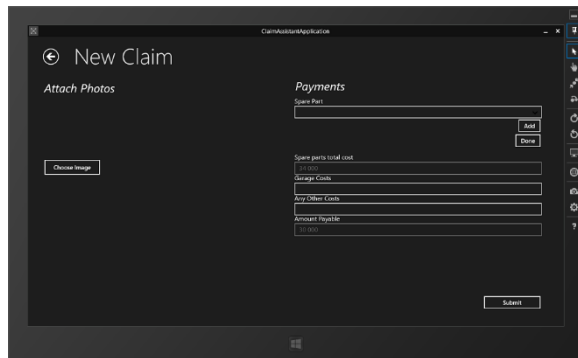


Figure 9.Claim settlement form 3

When the record has being successfully entered to the database system will indicate it by the following screen.

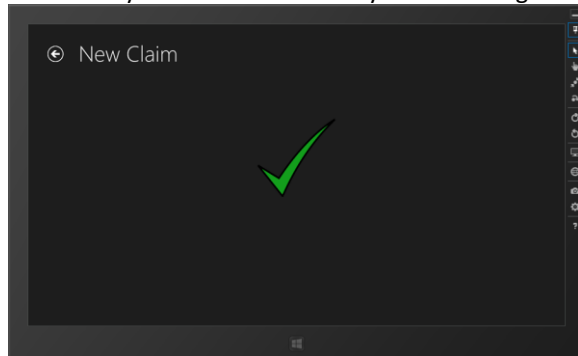


Figure 10.Claim settlement success screen

Some extra features that are added to the tab application are, agent can access a set of company approved garages and tow truck services and select the most appropriate service required.

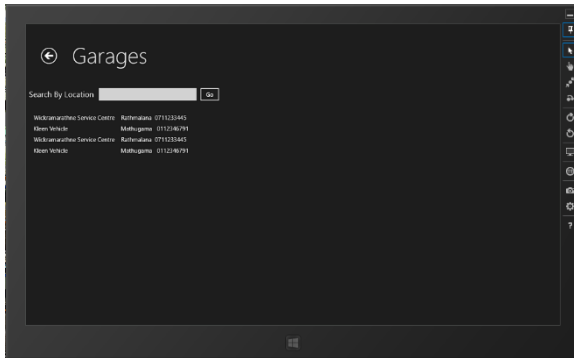


Figure 11. Display garage details screen

VI. EVALUATION & CONCLUSION

Main reason for conducting an evaluation phase is to recognize on how a system fulfills the requirements of the real users. In this subsection overall evaluation process of the MVCS is presented progressively. Evaluation is a systematic process of acquiring and assessing the system related information in order to provide useful feedback about system. Questions such as “whether the current system process is in the right track and meeting the users’ requirement?” or “whether the developed system has met the user requirements?” are answered by conducting system evaluation at different stages of the development. Formative Evaluation and Summative Evaluation are two types of evaluations performed during the system development.

Formative evaluations strengthen or improve the system being evaluated. They help form it by examining the delivery of the program or technology, the quality of its implementation, and the assessment of the organizational context, personnel, procedures, inputs, and so on. Summative evaluations, in contrast, examine the effects or outcomes of some object. This is done on finished system in order to assess the success of it. High-fidelity prototype method which uses the materials that are similar to the finished product, is use to perform the summative evaluation in order to measure the success of the system.

The key purpose of the product evaluation is to check whether the system is operating as expected and has achieved the objectives. Outcomes of the product evaluation helps to determine whether the functional requirements or the user requirements of the new system had being executed during the stage of development. The functional evaluation is used to evaluate the outcomes of

the project. Functionality tests are carried out by using several groups such as user group and evaluators in order to make sure whether the system had continuously attempted to meet the functionalities and to find out any faults that could be occurred during the functionality of the new system.

As an overall by using the tablet application agent were able to access and confirm the policy details real time in a speedy manner. Another functional requirement was to provide agent with the real updated value of the vehicle parts avoiding the estimating the market value of spare parts according to the agents experience. It was also successfully achieved through allowing the agent to access the exact market price by accessing to the company’s database via the web service. Agent can be easily accessed to the database and get the details of added vehicle component of a particular vehicle. All the documents that the agent needs to carry out are replaced by a small portable tablet application which includes connects with the company database. Photos which are used to perform the claim process accurately can take instantly via that tablet application and can be uploaded to the companies’ database at that instance.

Evaluation of project practices is mainly performed to assess the process and actions in order to evaluate how it was done, to assess the level of success, find out any alternative ways of doing process & actions and to figure out any limitations that were arise at the each stage of the software development. Since the agile approach was used in developing the system, requirement gathering, designing, development, testing was conducted concurrently. Several meetings were conducted with the clients to get the requirements and then a working prototype was developed. By demonstrating the prototype to the clients feedback was obtained for the prototype as well as the additional requirements. By adapting to this method developers were able to identify the erroneous places in the requirements at the early stage in module wise. Not only that but also client feedback about the design gathered in order to provide them with more user friendly interfaces. Less complex UML techniques were also used in designing the system during development process. They were also demonstrated to customer to get the feedback. By doing so developer was able to fine tune the requirements to exactly what the client wants and it led to saving lot of development time.

Once the MVCS is developed, then system was tested with the use of different types of system strategies such as unit testing, integration testing, system testing and acceptance testing. Testing was done concurrently with

the development of the system before conducting the meeting with clients. Several test cases were designed in order make sure system behaves as the client requested. After identifying the necessary changes to the system prototype was again fine-tuned with the changes before the next meeting. This whole process was conducted iteratively until clients were satisfied with the developed system. In general, the customer feedback meetings were successfully accomplished though smaller amount of shortcomings were reported. The shortcomings that were found out were mainly due to the short of knowledge on insurance industry, motor vehicle market and also for not having a similar system in the industry or any other industry at the present in Sri Lanka.

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.capegemini.com/resource-file-access/resource/pdf/mobile_solutions_for_claims_management_0.pdf
- Fitch 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.
- 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>
- 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.