REAL TIME MOTOR INSURANCE CLAIM SETTLEMETN APP

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Abstract *— Mobile phones indeed have become indispensable in our daily lives. Almost everyone possesses a mobile phone and people without mobile phones are considered to be aberrant. More varieties are introduced into mobile applications second by second and existing applications are being enhanced and broadened. Due to the rapid growth it is the right time to motor insurance professionals to tap into the power of mobile context to provide correct information effectively, efficiently, keeping the customers loyalty and faith. Mobility will be contributing in changing the way of motor insurance companies' market to provide an immense service, as well as it will open up a series of fine opportunities. Customers currently seek for non-complicated and convenient financial services which are faster and cheaper simultaneously. Anybody may get into a vehicle accident, vehicle tire punch or vehicle breakdown at any time at anyplace unexpectedly and unintentionally. One of the major things which you should follow up after this kind of matter occurs is reporting the incident to your insurer, police or if anyone in a falling health conditions we have to contact an ambulance service or hospital. Traditional way is we have to find phone numbers and inform the related parties according to the incident. Through this research paper, we focus on the potential implications of improved efficient motor vehicle claim settlement procedure, customer agent communication, service delivery rather than manual slow procedure and assists consumers and their insurance agent in an expedient way diminishing the obstacles of traditional procedure. Finally, this research paper provides useful insights into the anatomy of insurance field and provide some directions and opportunities in this area.*

***Keywords*— Mobile application, Cloud computing, Motor insurance, Location based services, Web services**

I. INTRODUCTION

In this new technological era world people have proposed software solutions as a main way of manipulate real world problems. Software solutions can be used to intensify the efficiency, accuracy, cost effectiveness, mobility, reusability and many more aspects of a manual process. With the evolutionary concepts such as IOT(Internet of Things) and headway in networking people are connected *in a global village* with each other more than ever. Among other software technologies programming, databases, web and multimedia have been the most widely used for development of software applications in order to present solutions to various industries.

Nowadays numerous software engineering technologies, tools, platforms are available for development of software applications for enterprises. This research paper presents a project to develop a software solution for the domain of motor insurance claim settlement procedure.

A. Problem in brief

Anybody may get into a car accident at any time at anyplace unexpectedly and unintentionally you may be on your way to home, on your way to work, on a trip with family or on errands. After a car crash occurs regardless of who's at fault you are required to take care of few things. One of the major things which you should follow up after a collision is reporting the incident to your insurer. You ought to provide them general background information of the accident including location, vehicle number, accident type and NIC number. All parties involved and insurance information as well. You must do this within a reasonable amount of time. Thereafter you will get informed about the process and the next steps by your insurance provider and a nearby agent will be sent to the place where the accident took place.

The conflict with location accuracy begins hereafter. If the victim (The person who met with the accident) has not the slightest idea about the place where the accident has occurred how he or she is supposed to report the exact location to the insurer. On the other hand, if your agent couldn't seize the exact current location how he is supposed to assure the location and arrive at the destination in a certain amount of time. This obviously wastes time. There are number of such incidents reported in past decade which the agents couldn't find the locations where the accidents took place. Partly it damages the reputation of the insurance company and customer loyalty.

II. LITERATURE REVIEW

A. Overview of motor insurance field

Research conducted by Vikash Singh, Ramesh V.Darbha and Sree Rama Edara, They have analysed and presented how mobile phone industry is witnessed rapid growth in different areas like marketing, advertising, and applications for users. They represented the need of mobile solutions in motor insurance and described the benefits of adoption of mobile technologies. As they

described increased revenue, Enhanced customer experience, reduce claim costs and improved operational efficiency are the benefits that can be mainly achieved. Furthermore, they have done a mobile claim solution trend analysis over Europe and Asian countries. It shows how rapidly increase the technology adoption and what applications they implemented.[1]

Customers need to do their works simpler, faster and cheaper than ever before. According to this research mobile penetration rate is growing up from 4.7 billion in 2009 and 5.4 billion in 2010. Mobile application downloads also have been increased. Consumers downloaded 18 billion apps from apple app store and google play store past few years. Consumers use mobile devices more than ever according to analytics US consumers are tapping into this ready convenience to research, buy, and service their financial needs, including insurance. Below figure shows how people interact with mobile to do insurance activities such file or check on an insurance claim, pay insurance bills and manage almost financial matters.[2]

Claim status and tracking,24x7 support, claim representative/Expert contact, claim submission, Company contact, premium payment, View policy documents, view ID card, Roadside assistance, report claim are the researched features that should be on a mobile claim settlement application. Improve customer communication and engagement, improve claim efficiency, reduce costs and improve revenues are the main aims that is going to achieve from this. [3]

B. Mobile and internet usage in Sri Lanka

According to digital marketer website Sri Lankan went on to subscribe to 1.5 million cellular mobile connections and over 300,000 broadband and dial-up internet connections, increasing Sri Lanka's internet penetration to a 30% and to our total internet users to a 6.1 million. Since Sri Lanka government has removed the telecommunication service tax up to 15%, mobile and internet users are drastically increased during past few years. Therefore, it is possible to move to a mobile solution reducing the existing system difficulties.[4]

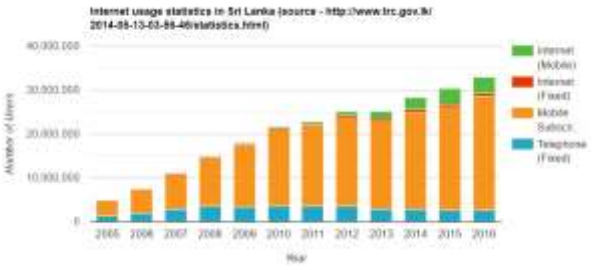

Fig 1 – Internet usage statistics in Sri Lanka

B. Technologies

A location-based service is a service based on the geographical position of a mobile handheld device. Researcher researched and explained the capability of using location-based services on different mobile operating systems and the work flow. He has explained accurately how web services and google maps APIs can use in different projects. He has explained how the core basement should be implemented with coding samples. [6]

Fig 2 – How GPS location service works

Most of the mobile based taxi services use GPS location-based services to track the customer location and taxi vehicle location. Due to increase of smartphone and tablets over the world this mobile integrated GPS/A-GPS trend can be used in any field. It uses location-based services to find the best vehicle available to the customer.

As Felipe A L Reis, e A L Reis and Paulo E. M. de Almeida described earlier taxi services used broadcasting method that uses radio signal to locate the taxis was not successful due to its lack of correctness. According to test results they have done google maps API was successfully used to allocate the time and locate the taxis. So the goal of decreasing the waiting time was achieved by the GPS technology than broadcasting method. [7]

Google maps was firstly built for Europe countries only. At the very first it only available for United Kingdom. Now a days it is available in each and every country with the facility of viewing high resolution pictures of cities, streets and many objects. Google maps provide facility to use it in your own websites or mobile applications with their own data points.

As Wojciech Zabierowski described with the use of web services it can be easily connect with your own application. JavaScript provides ease of modifying the API to do marker management, filling the map, Communication and different tasks. According to this research google maps can be used to do a project is can be done without a doubt,

only thing we need is coming up with a good plan and keen on handling events. [8]

Telematics is a new trend in insurance field. Telematics is a branch of information technology which deals with the long-distance transmission of computerized information. Telematic data used to identify behaviour of the policy holder and their driving behaviour. According to these data insurance company predict the risk and suggest the best insurance plan for the customers. Telematics one of main feature is GPS data transmission to get the location. Major drawback of this method is GPS location is changed due to different climates and weather situations. But due to technology advancement location is calculated using GPS and internet both. Therefore, location accuracy is pretty much improved than previous methods.

Everyone use smartphones, if we aren't receiving an alert Realtime it would be a problem sometime for a urgent message. In motor insurance field Realtime response is an essential fact. Qusay Mohammad Ibrahim Al-Zoubi has done a research on how Realtime notification is important to university communication which is related to motor insurance field as well. Real time notification systems are implemented for Local Area Networks (LAN's).

This is based on centralized server that can select and deliver notifications. Moreover, researcher has researched about MS SQL server notification service technology how works and send notifications to the subscribed users, How SOAP message formatting works with webservices to send push notifications and etc. (Mobile based notification system)

Efficiency and speed are major non-functional factors that evaluate the quality of a software. Hatem Hammad, Motaz Saad, Ramzi Abed researched and evaluated restful web service for mobile devices, where we developed RESTful and the performance evaluation results show the advantages of using RESTful web services over conventional web services for mobile devices conventional SOAP benchmarking web service. Advantages of using RESTful services are less message time and quick response time. Results of performance comparison between conventional SOAP and RESTful show the obvious high performance RESTful over SOAP

D. Past researches

Report AXA CS Motor claim mobile application is a motor insurance app that was built for UK based customers. It allows users to submit accident details and pictures. Main aim of this app is to reduce the time taken to submit the file the claim from the time of the accident since it is crucial in gathering accurate information. Liberty mutual mobile app was developed for liberty mutual clients to provide ability to create profile with their policy and pay their premiums through it.

These related systems don't have Interaction with ground agents (Accessor). That is an essential feature for Sri Lankan insurance companies. Therefore, according to their regulations claim assessment should be done by experienced assessor. Client and claiming agent both side mobile app should be developed. [5]

III. METHODOLGY

Considering the project nature to provide sufficient process disciplines to deliver the functionalities required for software success, A combination of qualitative and quantitative methodologies was used. The qualitative part generates theory, which is verified later on in a quantitative section of the research. The main perk of using such mix of two methodologies is providing feasibility to develop an extensive software solution that cover the all the conditions of motor insurance claim settlement process.

Starting from the management layer to ground agent layer employees who deal with the system will be examined. In the requirement analysis phase data gathering techniques such as questionnaires, interviews and surveys were used to gather qualitative and quantitative data required for create the requirement specification for the motor insurance claim settlement application.

Architectural design defines the overall structure and the connections in between components of the solution before moving on to the detail design or the low-level design which includes the design of specific components details. The architectural design is given according to the layered architecture where overall design is spilt in to three layers of Client layer, Application layer and Data layer. The overall system architectural design for the proposed system is as follows.

Below diagram illustrates company office web portal is build and hosted in a cloud server along with a central database. A web service is attached to the web application in order for agent mobile and client mobile app to connect with the company web portal. Web service is accessible through internet or data communication media.

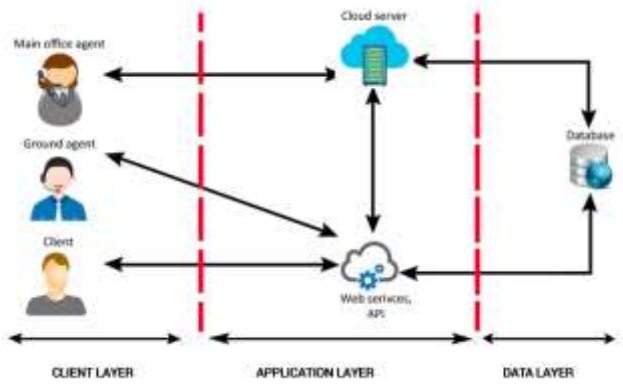

Fig 3 – System overall architecture

The software architecture is mainly developed in 3 layers. They are client layer, Application layer and data layer. Client layer consist with client side, ground agent side and Main office agent. Client and ground agent connect with the system using android app. Main office agent connects the system through a web portal. Operating interfaces are developed in this layer .The control over the database ad interfaces are handle in the application layer. It establish a connection between client layer and data layer. Layered architecture logic stored in this layer.

Fig 4 – Agent-client communication architecture

Android app uses geo locations and google maps libraries to track each client and ground agent location by transferring data through web services. Insurance policy information and other vehicle records All processes are communicating and process on a cloud server. Real time updates are provided using cloud server and APIs.

Methodology of developing the system RAD(Rapid application development) developing approach was used. RAD development methodology provides ease to assess the scope 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. A prototype was developed using the obtained requirements and it was developed throughout the project. Unit and component testing were conducted along with the development. Developing partial system was given to the clients and their rapid feedback was used to cater certain that the development is going along with scope to achieve the project final goal.

IV. TECHNOLOGY

A. Google Fire Base

A firebase database is a real time database in which the data is stored in JSON format. It provides an API that allows developers to store and sync data across multiple clients. In this Realtime motor insurance claim settlement project, Mobile application database mainly developed based on firebase and geo fire. Login module is connected with firebase to authenticate users to the app. By default, only authenticated users have read/write access but this can be made public through the configuration. Ground agents and clients are given access by mobile app login module. Each user has distinct privileges and access to each specified module after they are logged in.

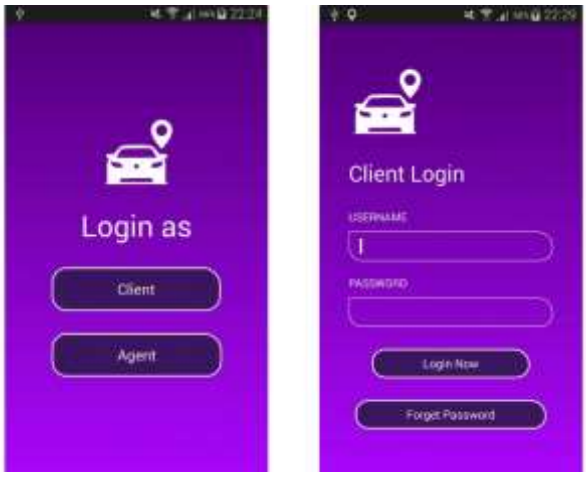

Fig 5 – Mobile app login

B. Geo Fire & google maps API

In the map module each user geo location movements are updated real timely. Firebase is used by Geofire for data storage, allowing query results to be updated in real time as they change. GeoFire does more than just measure the distance between locations; it selectively loads only the data near certain locations, keeping your applications light and responsive, even with extremely large datasets.

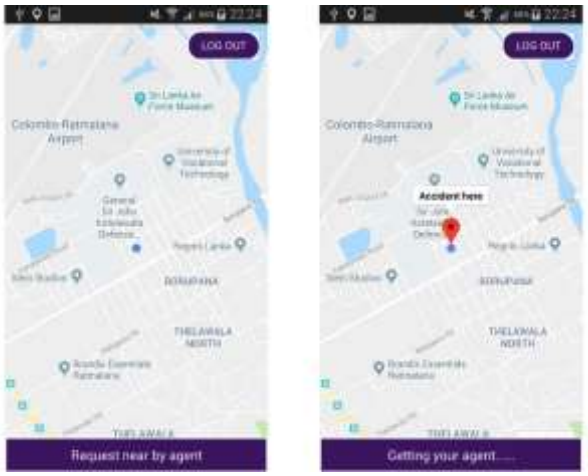

Fig 6 – Accident Reporting map activity(Client side)

C. Android studio

Android Studio is the official IDE(integrated development environment) for develop android apps for android OS. It is available for download on many platforms Windows, macOS and Linux. It is purpose is to improve the android development and help to build the highest quality optimized applications. Mobile app is mainly developed for android OS as the beginning. It provides many useful libraries and frameworks to ease the development of apps.

V. Evaluation & Conclusions

Main objective of having an evaluation is to confirm that system is fulfil the requirements of the real users. In this section planned evaluation process is described extensively. Evaluation is a study in which research procedures are used in a systematic way to judge the quality or worth of a service or intervention, providing evidence that can be used to improve it. It should fulfil question like "Is it the software is developing in the right direction?" or "Is it the software met the user requirements?" are conducted through the software evaluation stages. System evaluation can divide into Summative evaluation and Formative evaluation. Formative evaluation improves the system while its being evaluated. It helps to keep it up with the quality standards.

Summative evaluation is evaluation of a project that is finished. It is used to evaluate the success of the final product. Outcomes of the system helps to evaluate the functional requirements and user requirements are executed during the software development life cycle.

Once the motor insurance claim settlement system is developed, then the whole system is tested by unit testing, integration testing and accepting testing. Each phase protypes are delivered to clients and according to their feedbacks each prototype is improved and tested. Until up to map module development stage smaller amount of short comes are found and reported. Reasons for those short outcomes are lack of vast knowledge on motor insurance field and their market.

Researched area is still lack of technological influence and this motor insurance claim settlement app will be the first ever cloud based real time system in motor insurance industry in Sri Lanka.

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