

# Domestic Services Management System: A Sri Lankan Perspective

SHYS Wickramaratne<sup>1#</sup>, N Wedasinghe<sup>1</sup>,

<sup>1</sup>Faculty of Computing, General Sir John Kotelawala Defence University, Ratmalana, Sri Lanka

<sup>#</sup>[yasiru\\_first@hotmail.com](mailto:yasiru_first@hotmail.com)

**Abstract** – *Technology has granted many opportunities for the people in need of employment around the world. It has created marketplaces as well as marketspaces providing a stable economic benefit. However, in this modern society which have plethora types of media & mass communication approaches, so far it still failed to deliver swift and convenient methods to request domestic services. Home repairing services, beauty, and health-related services, events organizing related services and business services are few services still discoverable through newspapers and yellow pages in Sri Lanka. This leaves a necessity to create a solid platform for the skilled micro employees to provide their services continually as per the customers' services requests. A mobile App-based service marketplace will be a good enhancement for the current context to locate, categorize, and provide rates and feedback about nearby micro employees who are willing to provide their services for the domestic customer's request. This system will categorize their jobs and its work providing more niches to the customer's request. The main objective of this paper is to emphasize that mobile technologies can be used to enhance the human life by helping them to hire services using a convenient platform. As for the results, this system can influence the 4.7 of an unemployment rate of Sri Lanka (Labour Force Survey, 2015) by creating a separate easily accessible marketplace without any entry barriers for the micro employees who are willing to start their own businesses.*

**Key Words:** Smartphone, Services, Domestic, Micro-Employees, Android, Unemployment, Cloud-Platform

## I. INTRODUCTION

The growing capacity of smartphones and in related technologies have opened up a vast new avenue for the communication and e-commerce sectors, prompting many to evolve from using desktop or laptop computers to handheld mobile devices. 2015 Central Bank reports show that every 100 people in Sri Lanka own 113 mobile phones and 13 fixed lines by the end of the year 2015 (Annual Report Central Bank, 2015). And latest statistics issued by the Internet World Stats emphasize 27.4% of the Sri Lankan population has access to the internet (IWS, 2016). And this statistics correlates that people are using mobile devices as a simplicity to achieve their daily tasks more and more. The application of mobile apps to daily activities are not entirely new to this generation. People

tend to buy goods more through mobile apps compared to past decade. But unfortunately in Sri Lanka for the service sector, there are limited ways to request services for any domestic needs. This Domestic Services Support System – Android App will be a good addition for the people to interact and find about more and more about what kinds of services are available out there or nearby. These applications will be a native Android app which will run on any smartphone running on Android OS without a hassle to use a web application separately. The back end of this application will be controlled by the Google firebase cloud server which gives more control over the application which performs following tasks. And there will be two separate apps for customers and service providers to make it more comfortable and convenient to operate their tasks.

Domestic Support System includes following features:

- Friendly in UI and UX sections

Attractive and user-friendly interfaces will guide the users and service providers to use the application more often. Both the apps will start with introductory slides to educate the parties on apps features.

- User Base Authentication

The service provider identification will be thoroughly checked according to their information provided as for the security measures.

- Categorized job market

In the current service sector of Sri Lanka propose the wide variety of services to the market such as health care, cleaning, tradesman ships, consultancy, builders etc. By using this application the customers can access and choose the exact service for their needs.

- Connects parties more efficiently

The customer app will provide the nearest service provider according to their service request, making more time efficient and less stressful for the customer. The customer location will be taken to determine the service provider location around him.

- Rate service providers

After the service or services are provided the customer can give rates for a service provider according to his or her performance. This option will be more helpful for the other customers to decide whether they need the service from that particular service provider.

- Real-time service provider tracking

This application will provide real-time tracking option for the customer to keep track of the service provider until he or she arrives at their premises.

- Feedback Monitoring

The customers can also add feedbacks about the service providers' performance along with the rating. This open opinions will help other customers to decide their options available more straightforwardly. The feedback will also be useful for the customer to make quick accurate decisions.

- Creates professional labor pool

In the long run of this application can actually help the micro employees to become more work efficient at their work and be professionals.

## II. RELATED WORKS

### A. Services Vs Goods

Goods and services are the main things people request in their daily economic life. Sri Lanka shows a very high growth rate in the service sector and its holds 62.5% out from other main economic activities. (Annual Report, 2015) IT knowledge advancements and computer literacy increment have been a direct influence on its growth. Goods are sold around the country vastly using many media (Internet, TV, Internet, Mobile apps). We could find many mobile apps for websites such as eBay, AliExpress, Amazon etc. (Ebayinc.com, 2017). But unfortunately, there is no single mobile application in Sri Lanka to provide categorization for Micro employees. However, this system fills out the void that created it. Providing a better marketplace and a marketplace to both of the parties.

### B. Server selection

Most of the mobile app developers are tended to use Amazon Web Services (AWS) as the backbone to their mobile app nowadays. It provides quite a number of options for the developers serving as a cloud computing structure. And this is the backbone of Urbanclap (similar services providing app). Even though this has so many features it lacks library updates and deprecated functions. Here in this Domestic Services Support System as the backbone it will run along with Google Firebase. The

Firebase was recently acquired by the Google and it provides seamless support for the app development in many platforms (Android, iOS, C++, Unity).

### C. Database

A Database is an organized collection of data. Databases can be stored locally on your computer or can be stored in cloud storages. Every application whether Android, iOS or web application, it has its own database (W. Cao, 2014). In the Android app, we can create databases using SQLite, shared preferences, websites or some cloud-based storage sites. Firebase is also providing database structure backend for Android, iOS and web applications (Firebase, Online). Using only the inbuilt SQLite functions of Android apps is not enough for an app. It is because in the long run the stability of the app gets affected by the data accumulated on a daily basis. As for the solution, Google Firebase database will be used which is NoSQL and scalable database (C. WODEHOUSE, 2017). And it will not use any query based SQL languages instead it will use JSON nodes for index information (*Json.org*, 2017). This real-time database will use cloud technologies to share information across the applications. The moment the data being updated the app in that instance will be updated according to the data entered.

### D. Convenience

A limited number of websites are available for micro employees in Sri Lanka such as hodabaas, Mason, Salondhammi and findbas. But unfortunately, all of these sites are restricted to their own categories and the categories are also limited (e.g.: Beauty and Construction) But Domestic Support System will combine all the available services together to one place and improve the convenience to the customers to access them by using a single mobile app. This system will look into more market niches. This includes Entertainment services, Event services, Health related services, Education related services (Piano lessons, Guitar lessons and etc.) And much more other services out there in Sri Lanka. (Hodabass.lk, 2017) (findabaas.lk, 2017) (findbass.lk) (*Salondhammi.com*, 2017) (masons.lk, 2017)

### E. Authenticity

As we search through the web we can find many people who are willing to provide their services. But when it comes to services sector security of the people is a major concern for the developers if they are going to add service provider information's to the system. That is why this system has introduced two separate mobile applications. One for the consumer and another app for the service provider. By using the service provider app, the service providers can list their service to the customer. The mentioned process will undergo go many authentication steps. Unlike above websites, this system will use OAuth 2.0 (*Oauth.net*, 2017) and OpenID (*Openid.net*, 2017) which will improve the security along with this process

time. Most of the service providing websites only request National Identity card information. This will create questions at the service providers' knowledge on their field of work. This can be overcome in this system due to its thorough processes. Unlike in customer's app, the service provider app will include security checks and information validations.

#### F. Real-time Tracking

After ordering a good/thing it is a normal to wait till it arrives. Likewise, customers will observe the arrival of the service provider. In Urbanclap app (Urbanclap.com, 2017) after the customer request a service they wouldn't able to find out whether the service provider is going to provide their service certainly. But in this Domestic Services Support System, it will be integrated with features to track the real-time location of the service provider. This will help customers to proceed to their other duties until the service provider arrives (M Singhal, 2012). By using Google Maps API and new Google Maps location share functions the whereabouts of the service provider can be easily tracked. Unlike those websites, this app will search the surrounding area by Google location services not showing entire labor workforce to that area.

#### G. Rating

Rating, voting and other feedback mechanisms are heavily used in today's mobile apps, app markets (Google Play) and in social media systems, allowing users to express opinions about the content they used and still using. Web sites providing odd jobs and other services do not provide workers past worked history information or customer experience by any sort of ratings and feedbacks. These problems can be neutralized by Android native rating libraries and integrating feedback features.

### III. ANALYSIS & FINDINGS

To examine the demand for the services a face-to-face interview was conducted around the Galabadha Waththa, Malapall, and Kottawa area. In this interview, most of the people have mentioned the difficulty in finding a skilled worker for their needs. The majority of them rely on newspaper and neighborhood community to find a worker (J. Cheng, 2014). This current process consumes time for the customer. And because of this service providers scarcity, the customer may have to pay a higher price for their work they trying to fulfill.

This proves that people who are willing to request services are going for this sort of extent to find their suitable worker.

Similarly, there is also service bill for guitar lessons, individual tuition classes, piano lessons, event planning consultancies.

### IV. METHODOLOGY

#### A. Logical architecture

The user-friendly user interface will be the main concern of this application because by making a good impression on the people at the first glance, can improve the usage of this mobile application. And Hassle-free registration process along with service requesting process is the second highest prioritized function will be running inside this application. The following three-tier architecture diagram summarizes the system's basic processes (Fig 1).

As mentioned two separate mobile apps coordinate the two parties. As shown in above architecture. At the beginning, the customer requests the services through a mobile application and from application layer it will redirect into services and database layer. In this layer, all the JSON nodes requested through application layer will be submitted and requested output will be generated. Google Firebase will then redirect this request to the service provider through service provider application. In the end, the service provider read the request and confirm the request to provide services. The admin monitoring presence or the Google firebase dashboard will help the developers to monitor and analyse service providers and customers' application usage history. And admin will be in charge of removing any suspicious or unskilled workers if any customer complaints him or her through the rating system or from feedbacks.

#### B. Technical architecture

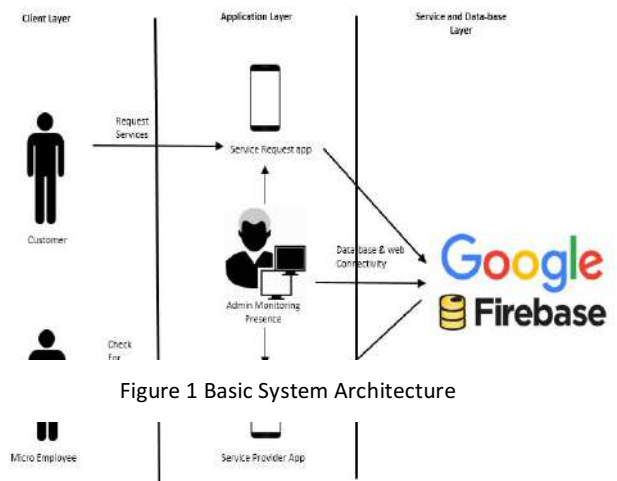
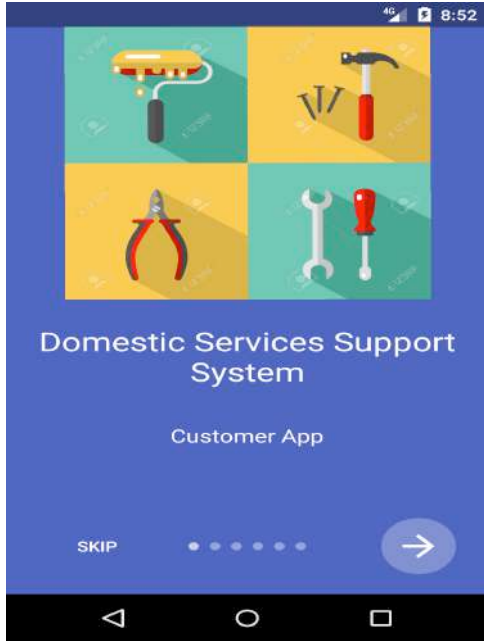


Figure 1 Basic System Architecture

These two mobile apps are developed using Android Studio. Which is an integrated development environment (IDE) created by Google Inc. (Developer.android.com, 2017) Java, XML and SQL languages will run in these apps core. Most of this application's core functions will be written using Java language (Docs.oracle.com, 2017). Extensible mark-up language (XML) will be used to design the overall user interface of both of the Android apps. Google firebase will hold its own real-time database

procedures to update the customer requests and service



provider.

Figure 2. Interface of the Android app

### C. Database Tier

The structure of this applications' database will be different from traditional databases. Because the structure of this database will not use traditional relational database schema. Instead, the structure of this database will be built using document-oriented database architecture. The following (Fig 3) brief about how data stored in the relational database and non-relational database differ from each other. (C. WODEHOUSE, 2017)

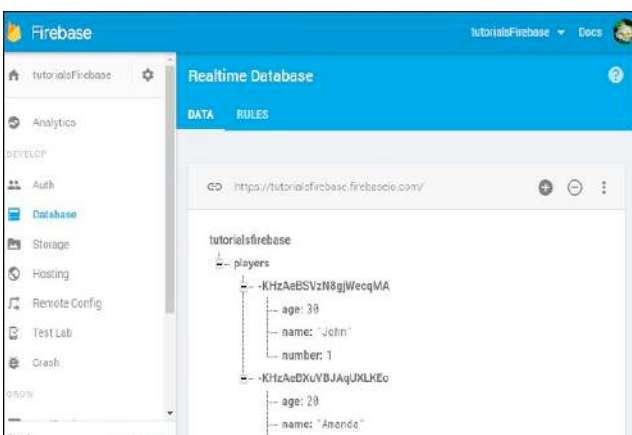


Figure 3. Firebase

The following reasons have influenced over the selection of NoSQL database. (S. Chickerur, 2015)

- Data Structure Issues

Having many different types of data can be influence the overall structure of the database. In NoSQL database this issues may occur but with document oriented databases this issue can be overcome by storing data in one place without the need of defining the type of data it has to store in.

- Cloud computing benefits

Google firebase supports development of the mobile app with many good features. It provides real-time database, file storage and hosting services in one single place. With this scaling up the database will not be an issue. Mostly the cost will be effectively affected, this would help to save considerable cost.

- Rapid development.

If the development of the app within a limited time frame, turning out quick iterations or requiring to make regular updates to the data structure without a lot of interruption between versions, a relational database will slow you down.

Document-oriented database does not need to be prepared ahead of time.

## V. DISCUSSION

The idea for this application was first laid out by the world's corporate giants like eBay, Amazon, etc. They successfully provided a solid base for the sellers and consumers to come out and sell their products more freely. But they also trying to fills the gap between the needs of services to the customer. In Sri Lankan context also we can see this void located in heavily E-commerce sector. In order to set itself apart from traditional classified sites and other directories, this application will provide matchmaking results for the JSON nodes requested that guides and help users to sort through a large array of services in their city, but also make sure providers get good leads that result in good business connections. This will make very simple and convenient to the user to hire a trusted service professional. Thus it is essential to develop a solid index to match corresponding service provider to the needs of the requesting customer. The mentioned technologies and mentioned application of android technology and its combined technologies have proven to be very resourceful in real life. Many positive outcomes were achieved by this application of android technology.

## V.CONCLUSION

The demand for the customers' service request will continually grow along with the development of the country. By using Domestic Services Support System, customers will be able to find individuals with the experience and knowledge (Professionals) regarding the service they require more conveniently in a shorter period of time. And furthermore, it brings the portability to the users saving their time and money. The unemployment issues also will be addressed through this system and problems of micro employees will be considerably reduced. For the upcoming technologies, these Android-based apps can be implemented and upgraded as it grows.

## VI. REFERENCES

- Abraham E. Eviwiekpaefe, "The Trend and Challenges of Cloud Computing: A Literature Review". *International Letters of Social and Humanistic Sciences*; Vol. 16, pp. 13-20, 2014
- Android guide Firebase <<https://firebase.google.com/docs/>>
- Amazon Web Services<<https://aws.amazon.com/what-is-aws/>>
- "Annual Report 2015", *Cbsl.gov.lk*, 2017. [Online]. Available: <[http://www.cbsl.gov.lk/pics\\_n\\_docs/10\\_pub/\\_docs/efr/annual\\_report/AR2015/English/content.htm](http://www.cbsl.gov.lk/pics_n_docs/10_pub/_docs/efr/annual_report/AR2015/English/content.htm)>. [Accessed: 15- Apr- 2017].
- C. Electrical wiring for House and Industries, P. PPR, T. service, H. Experts, C. Installation, K. Services, H. Welding Bass, E. Electrical and D. Engineering, "Home", *Find A Baas!*, 2017. [Online]. Available: <<http://findabaas.lk/>>. [Accessed: 25- Mar- 2017].
- J. Cheng, C. Danescu-Niculescu-Mizil, and J. Leskovec, "How community feedback shapes user behavior," *arXiv preprint arXiv: 1405.1429*, 2014.
- "Sri Lanka Labour Force Survey Annual Report", <http://www.statistics.gov.lk>, 2017. [Online]. Available: <[http://www.statistics.gov.lk/sampleurvey/LFS\\_Annual%20Report\\_2015.pdf](http://www.statistics.gov.lk/sampleurvey/LFS_Annual%20Report_2015.pdf)>. [Accessed: 15- Apr- 2017].
- "Masons!", *Masons!*, 2017. [Online]. Available: <<http://www.masons.lk/>>. [Accessed: 26- Mar- 2017].
- Manav Singhal, Anupam Shukla '*Implementation of Location-based Services in Android using GPS and Web Services* ', *IJCSII International Journal of Computer \*Science Issues*, Vol. 9, Issue 1, No 2, January 2012 ISSN (Online): 1694-0814
- "Introduction — OAuth", *OAuth.net*, 2017. [Online]. Available: <https://oauth.net/about/introduction/>. [Accessed: 26- Mar- 2017].
- T. Xiteb, "Hodabass.lk - The BEST place to FIND a Bass!" *Hodabass.lk*, 2017. [Online]. Available: <http://hodabass.lk/>. [Accessed: 25- Mar- 2017].
- Urbanclap.com*, 2017. [Online]. Available: <https://www.urbanclap.com/about>. [Accessed: 26- Mar- 2017].
- W. Ltd, "Salon Dhammi | Professional Bridal Service in Sri Lanka", *Salondhammi.com*, 2017. [Online]. Available: <http://www.salondhammi.com/>. [Accessed: 26- Mar- 2017].
- "What is OpenID? | OpenID", *Openid.net*, 2017. [Online]. Available: <http://openid.net/get-an-openid/what-is-openid/>. [Accessed: 26- Mar- 2017].
- "Who We Are - eBay Inc.", *Ebayinc.com*, 2017. [Online]. Available: <https://www.ebayinc.com/our-company/who-we-are/>. [Accessed: 25- Mar- 2017].
- M. Studio, "Meet Android Studio | Android Studio", *Developer.android.com*, 2017. [Online]. Available: <https://developer.android.com/studio/intro/index.html>. [Accessed: 16- April- 2017].
- "Java Platform SE 8", *Docs.oracle.com*, 2017. [Online]. Available: <http://docs.oracle.com/javase/8/docs/api/index.html>. [Accessed: 01- May- 2017].
- "JSON", *Json.org*, 2017. [Online]. Available: <http://www.json.org/>. [Accessed: 01- May- 2017].
- C. WODEHOUSE, "SQL vs. NoSQL: What's the difference?" *Hiring / Upwork*, 2017. [Online]. Available: <https://www.upwork.com/hiring/data/sql-vs-nosql-databases-whats-the-difference/>. [Accessed: 22- April- 2017].
- S. Chickerur, A. Goudar and A. Kinnerkar, "Comparison of Relational Database with Document-Oriented Database (MongoDB) for Big Data Applications," *2015 8th International Conference on Advanced Software Engineering & Its Applications (ASEA)*, Jeju, 2015, pp. 41-47. Doi: 10.1109/ASEA.2015.19