Queuing Management Using Android Application

Leena Bashier Eltayeb Bashier¹, Dr. Mohamed Abaker Hussein²
¹, ²Telecommunication Engineering, Al-Neelain University, Khartoum, Sudan

Abstract: Queuing in Sudan banks is an approach that entails lining up of customers in bank hall in order to be served by bank personnel at each terminal (server). Customer have to stay inside bank hall until their turn come without knowing time needed to be spent some Customers even leave bank hall before being served. This and other obstructions result to much delay in customers waiting time. The aim of this research is to minimize waiting time in queue by proper queue management and thereby maximizing throughput. We developed an Android Application that will allow customers will join a virtual queue via mobile phone allowing them to check their turn without the need to be present at the bank hall, also providing an estimated time that gives the customer's proper idea when their turn will start.

I. INTRODUCTION

1.1 Android platform
Android is an open source mobile platform provided by Google [1]. And for mobile devices it is considered to be a software stack which contains an operating system, based on Linux kernel modified version. Applications development framework the developers in this stage use the virtual machine called emulator and java programming language to enable them to use the recourses, the runtime Environment and library Every Android application works in its own process, with its own example of the Dalvik virtual machine. Dalvik has been written so that a device can work multiple virtual machines VMs efficiently. Android includes a set of C/C++ libraries used by various components of the Android system. The main core libraries are: Web Kit, Media Framework, SGL, Free Type, SQLite, OpenGL ES etc.

1.2 Mobile banking services
Mobile banking is a system that allows customers of a financial institution to conduct a number of financial transactions through a mobile device such as a mobile phone or personal digital assistant. You can transfer your funds, verify your balance, pay your bills to provision of banking and commercial services associated with mobile device you can access your account and pay whenever where ever you are [2].

1.3 Queuing Systems
Queues (or waiting lines) are seen in everyday life like in the waiting lists in the hospitals, gas stations counters, bank, bus stations and e-filing offices etc. Queues are formed when customers (human or object) demanding service are more than the serving offices; or the facility does not work efficiently or takes more than the time prescribed to service a customer [3].

II. THE METHODOLOGY
Banks always suffer from waiting line problem due to the presents of customers at the bank hall until their service starts. The new system has been designed in such a way that it limits number of customer inside bank hall giving customer the opportunity to benefit from their time without the need to worry about missing their turn, the process happened in the whole design will be explained in figure (1).
Customer joins a virtual queue by inserting the queue number then the application display’s the virtual queue allowing the customer the monitor changes accurse in the queue, when customer turn approaches application send notification informing customer to be ready. And the process happened in the design shown in figure (2).

2.1 Qmanag will eliminate waiting line
- Customers will join a virtual queue via mobile phone allowing them to check there turn without the need to be present at the serving area.
- Customers can now make better decision about where to spend their time.
- Customers will be present at serving area only when they're notified that their turn has come.

2.2 System Input:
Processing Input will take the user requested service and queue number
To match them with the queue which the user belongs to below are required inputs:
- Queue Number
- Requested Service

2.3 System output:
User will join a virtual queue, notifications will be sent informing the user that his service has started.
- Automatic Graph
- Notifications

![Fig. (1): shows the overall design](image-url)
III. RESULTS

Implementation of Qmanag:
Qmanager app is a user friendly app and it's easy to use, such that is only required from the user to select her required services along with her queue number. Has been tested in the real life and we get the results shown in figure below. In this section we enable the customer to log in into our application with insert unique queue number then choose any row that belongs to him.

Fig. (3): Main Interface of the Application
IV. CONCLUSION

This work covered how to achieve customer satisfaction by the lowest costs by using mobile application technology to manage waiting line in banks. The application was coded and designed using Android Studio to simulate the bank queue. Results were that the application helped in managing waiting time by allowing the customer to observe changes that accrue in the queue; it was easy to use and managed queue's successfully and flexibly.

REFERENCES: