Android-based Queue System Application

Joko Risanto1*, Zaiful Bahri2

1,2 Computer Science Department, Universitas Riau

jokorisanto@unri.ac.id

*Corresponding Author
Received: 9 October 2017, Accepted: 6 November 2017
Published online: 25 February 2018

Abstract: The queuing system application designed in this research is different from the desktop-based queuing system. The application of queue system based on android has advantages that is queue simply upload queue application that has been prepared and installed on smartphone device. Next, the queue prints itself the queue number after it takes it to the service counter. The queue can find out the queue number that is being served at the queue counter through the smartphone, so it can decide itself whether to wait or leave the queue location first to return later. Thus, it will provide benefits for both parties that the queue does not lose a long time to wait queue and the company or service agencies will not be crammed by a lot of queue and should not prepare large waiting room.

Keywords: Queue System; smartphone; android.

1. Introduction

In the last few decades, the telecommunication equipment industry thrives and they are competing to enter the Indonesian market. The intensive competition among the producers of information and communication technology, inevitably has triggered technological innovations in which the results have been felt by the public. The presence of technology gadgets and smartphones increasingly pamper its users. With a variety of types and brands of diverse and increasingly cheap prices make smartphone communication technology is in great demand by all walks of life and make its presence as a communication and information needs. On the other hand, the phenomenon of information technology advances also affects business governance activities in the industry and service sectors or public service (public) governance in the government sector, namely the change of service paradigm from the manual system (off-line) into a system that integrated and internet-screened (on-line). The on-line system is favored because it is viewed by the community as more promising of convenience, generosity, transparency and certainty (time or cost). Public queuing governance for example in the office has been implemented many queues based on information technology (IT).

Although the IT-based queuing system has greatly assisted the effectiveness of services for the organization and time efficiency for the consumers or the communities served but in many cases it is considered not maximized in implementation. small number of personnel / service attendants, inadequate waiting room, consumer time or queue wasted and so on. These problems are certainly an obstacle for organizations to be competitive in services. How could a customer in the bank for example have to be patient to wait call queue long enough while the customer has an interest to complete other work.

The queuing system application that will be designed in this research is different from the desktop-based queuing system. The purpose of this application is to provide benefits for both parties namely institutions and queue. The queue does not lose a long time waiting for the queue while the company
Android-based Queue System Application

(institution) does not need to prepare the queue waiting room that is too big. The application of queue system based on android has advantages that is flexibility of time. The queue simply uploads a queue app that has been created and installs (installs) it on the smartphone device.

In such a context, the certainty of time becomes unpredictable so that the queue has no choice but to choose "standby" in place to wait for a call or choose to cancel other matters that are also important. Many such cases are encountered in both government and private agencies so from the initial observation it is necessary to research to create new innovations. The idea that may be true is to create a queuing system that can be accessed on line by the user. With an on-line application a queue simply register the queue number from a laptop or mobile phone and can monitor from the cell phone queuing order that is being serviced at the office or its intended agency. Thus the queue does not take time and energy to wait long.

2. Related Works

2.1 Application Program

A program is a group of instruments that make a computer perform a specific task. The first step in creating a program is to use an editor to write commands called source programs. The program will be software for the computer or the so-called software. Software is a collection of programs used to run certain applications on a computer. Software is grouped into two groups based on their function ie system software (system program) and application software (application program). Application software or often also called an application package is software that is ready to use. This software is made by a particular software company (software house). An application program is created to help solve relatively common problems as well as special issues. Specific problem solving should be done by designing an application program that suits the characteristics and needs of the user.

2.2 Queue System

Queuing system is required for convenience and fairness to the queue in getting service by the officer. Orderly queue provides a comfortable and quiet atmosphere so that service can be maximized. Conversely, irregular queues will trigger a variety of problems and discomfort. One of the methods that can be used is a computer-based queue system where the first queue prints the queue card in the printer and automatically gets the sequence number in the order of arrival. The counter clerk simply clicks a button on the computer to automatically queue the number and the queue number that is dialed and the sound will be displayed according to the queue number called. Using such a method will eliminate frequent fraud by the counter and queue officers so that the tranquility and comfort of the patient queuing can be created. However, when service personnel are very few and the number of queue very much then such a system still leaves the problem that is the length of time of calls for queue and the capacity of the waiting room is not adequate. This can be solved by creating a queue system on-line so that it can be monitored remotely like using a web-based system or android based system [1].

2.3 Android Programming

Android is basically an operating system (OS) for smart phone devices, where the first smart phone is the Nokia 9000 series that came out in 1996, then continued by the popular line of Palm smart phones in the 2000s. In 2001, Microsoft announced the Windows CE Pocket PC Operating System, which marked the birth of a smartphone powered by the Microsoft Windows operating system. Initially android was a small upstart made by Andy Rubin. Then their team works to create a dedicated operating system for smartphones where the OS must be able to work effectively within limited power and memory limits such as those on smartphones. Due to the popularity of smart phones based on android in the community then eventually Google companies began to be interested in adopting android until the result is android applications can collaborate with the application on Google [2].

The evolution of Android version is as follows:

a. Version 1.5 Cupcake pada (April 2009)
b. Version 1.6 atau Donut (October 2009)
c. Eclair 2.0/2.1 (October 2009)
d. Froyo 2.2.x (Mei 2010)
e. Gingerbread 2.3 (December 2010)
f. Honeycomb 3.x (February 2011)
g. Ice Cream Sandwich 4.0.x (October 2011)
h. Jelly Bean 4.1 (May 2012)
i. KitKat 4.4 (October 2013)
j. Lollipop (Android L) (June 2014)
k. Android Marshmallow.

From many versions above, there are some versions that are special or different from others. For example: Android Honeycomb version is the first OS designed for Android tablet, then the Ice Cream Sandwich version is designed to perfect Honeycomb, which can run both on smartphones and tablets. The Android app is written in the Java programming language (code). The Java code is compiled together with the resource files required by the application, where the process is hacked by a tool called "apt tools" into the Android package resulting in a file with the Apk extension. This Apk file is called and can later be installed on mobile devices.

3. Methodology

The research was conducted at Distributed System Laboratory of Computer Science Department, Faculty of Mathematics and Natural Sciences, University of Riau. The data used are in the form of primary data type and secondary data. Primary data are average number of queue per day, average number of officer of service counter per day, average length of service time per person and data of queue participant complaint. Secondary data that is in the form of data about queuing method, specification of android operating system and test result of new system based on android. The data sources comes from several types. The primary data is from result of observation at research location. The research will take some queue location as a place of observation that is in government institution (Puskesmas Simpang Tiga Pekanbaru) and a banking company in Pekanbaru. The second data source is from interview of two employees and two community members from each observation locations as respondents. Secondary data is taken from the relevant reference books as literature and references in this study.

The study is divided into five stages. Stages of research conducted are as follows:

a. Problem Analysis
b. Application Design
c. Preparation of coding
d. Compiling and Debugging
e. Testing

4. Results and Discussion

Business process of queuing system is taken at a government bank and the procedure is as follows (see Figure 1):

a. Officers prepare a number of queue cards according to the service counter
b. Customers come to the Bank
c. Officers asked the purpose of service (Customer Service, Teller service or, Credit service)
d. Officer gave queue number
e. The customer is waiting for the call
f. The counter clerk called the queue
g. Customer shows proof of queue
h. The counter officer serves the customer
i. The counter attendant recorded service activities
The results of the analysis of the current system there are some weaknesses for both the organization (Bank) and for the customer. For example banks need to prepare a large waiting room, need to provide a queue print device, need to provide queue officers. As for the customer is the occurrence of customer congestion, inconvenience and loss of long time because they have to wait. So a new system flow for the on-line queue system was created as illustrated by Figure 2.

The output of the system is:
- Report Number of Visitors Per day
- Report of Service Amount per unit (per service counter)
- Report on average service time per service unit
- Print Service Form
Android-based Queue System Application

• Print queue card
• Monitoring the running queue

![Use case diagram](image)

**Figure 3.** Use case diagram

To meet the above output, required input is designed as follows:
• Main Interface
• Input Register
• Call Input
• Service Note Input

The design of the application using two platforms are web platform for the company side (queue counter officer) and android platform on the customer side (Figure 3). The output on the company side is a web-based application with the main menu depicted by Figure 4 and Figure 5.

![Menu of registration](image)

**Figure 4.** Menu of registration

Application creation on the customer side begins with data input applications. Input data using `JoptionPane` method. As known in Java other than using `JoptionPane`, data input can also use `BufferedReader`. The `JoptionPane` method is chosen because the resulting interface can be Graphical User
Android-based Queue System Application

Interface (GUI) so it makes it easier for users. Figure 6 is a GUI template to determine the amount of the queue. While the output on the customer side is the initial display:

![Figure 5. Menu Application](image)

The duration of the loading process depends on the specification of the computer used in the development stage. In the development of this time, the computer used has a dual core processor with 2 GB of memory. Here’s the look of the android operating system after the emulator loading process is complete. Figure 7 is the main menu view of android apps.

![Figure 6. User Interface in Android Application](image)

![Figure 7. Menu in Android Application](image)

Open the apps menu at the bottom to display the apps list. Because the program is created using Java programming language based on windows operating system, then before the application installed on the windows operating system first done building software into applications (APK). The process is done on App.MitInventor2 software that can be accessed via the internet. After going through building APK then generated file program of APK extension. Save the program file on the computer folder that has been prepared. This research uses bluestack emulator application that has been active, install APK program
through APK menu. Wait for the installation is complete and when the installation is successful, then the emulator android emulator that we have will be listed list of android apps as in Figure 8.

5. Conclusion

Desktop-based queue flow is visible when a queue has to leave the queue location (since the call is still long). It is possible that it will come repeatedly to the service location to check whether the queue number is approaching to be called or not. The situation is very inefficient in terms of time.

On an android-based system, if the queue number is still long from its call schedule then the queue can leave the queue location to do other work and it can monitor the progress of the queue from smartphone so that it simply comes back at the right time. The queue has a certain time of service so it can effectively manage time for other work.

References