

ANDROID APPLICATION FOR PARKING MANAGEMENT AND SECURITY SYSTEM

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ABSTRACT

Nowadays the number of personal vehicles usage in Indonesia is increasing rapidly. People prefer use personal vehicle to commute than public transportation. This study aims to provide a dynamic solution by introducing a design of an Android Application for Parking Management and Security System that regulates the number of vehicles parking with the help of QRcode. The system is basically designed for a college parking which can further be extended as required. The results have shown that (1) multiple vehicles with one QRcode (2) real-time reports (3) parking space quota (4) can photograph vehicles that exit from the parking area and (5) average execution time for QRcode process is 3.8 second.

1. INTRODUCTION

Large organizations today are being challenged to do more with less to deliver higher levels of services at lower costs with fewer resources workforce management systems can help achieve this seemingly impossible goal. Currently, there are many organizations especially college which apply the manual parking system in Indonesia. By distributing parking card at the entrance and at the exit returns while showing genuine STNK to match the plate number of the vehicle, and often requires a lot of manpower to distribute parking card in order to avoid the long queues that cause congestion. Therefore needed a simple application for information system management and security parking.

The application is basically designed for a college parking which can further be extended as required, this system enhances the component of existing parking system available in the colleges. Application-based parking system is android client server operating system with a smartphone camera to scan QRCode can exist in student and

employee cards. The system can also record the time of each vehicle entry and exit, and then be able to analyze and provide various reports required by the management. In addition, this application has the advantage to know the capacity of parking in the parking area.

2. RESEARCH METHODE

2.1. Quick Response Code (QRCode)

QR (quick response) codes are two dimensional images that when scanned by a smart phone's camera, prompt the smart phone to open a web-page or display an image, video, numeric, or text [A]. QRcode scanner application is able to decode information encryption in QRcode[B]. QRcode is use for scanning student and employee cards. Hence this research focuses on use of user interface including navigations for enhancing efficiency of parking system.



Figure 1. Scanning QRcode

2.2. Android

Android is a mobile device in the operating system for mobile phones based on Linux. [X]. This android application is created using AppInventor. The android applications are developed using the Kawa Language Framework based visual programming block. The parking information system application will be installed on smartphones that use Android-based operating system.

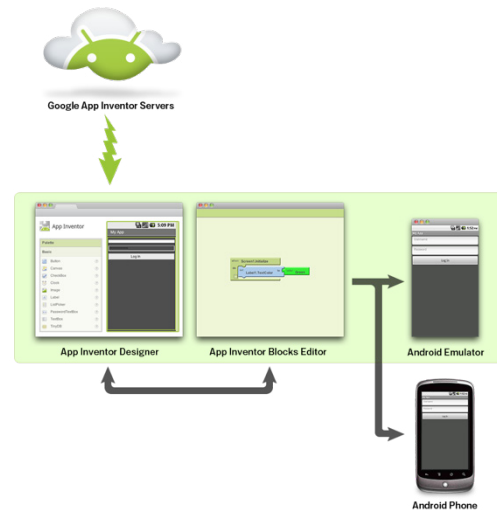


Figure 2. AppInventor for Android

2.3. Architecture Design

In generally, the way the system works is to scan the card QRcode students and employees with a smartphone camera, and then encoded using the parking information system applications and matched as existing in the database.

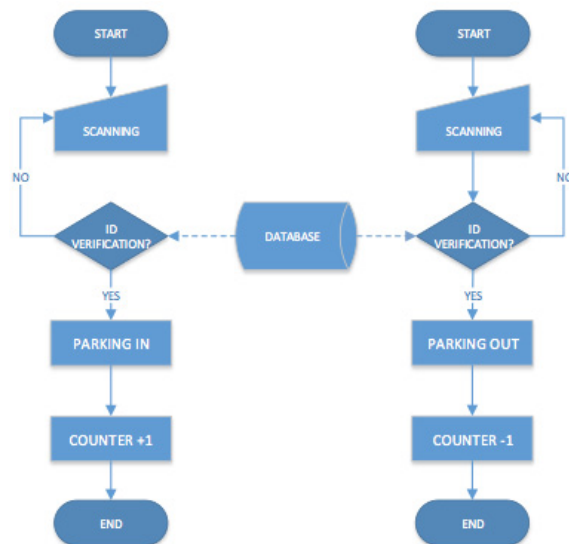


Figure 3. Flowchart parking information system

The Flowchart parking information system shown, there are two flowchart are

connected to single database as server. user comes to scanning QRCode for verification, if the ID card is not registered in the database, the user must perform the scanning process again, but if the user is already registered in the database then the vehicle can enter the parking area. then the system would counter, so that if there are vehicles coming later, but it is over the counter will display a notification that the parking area is full. Similar to the park entrance, the parking process out is only depending on the process of reducing the counter so that the user can know the capacity of parking of vehicles.

This application system development using the linear sequential. This method is the method most widely used by software developers. This method is commonly called the waterfall method which execution of a system carried out sequentially or linearly

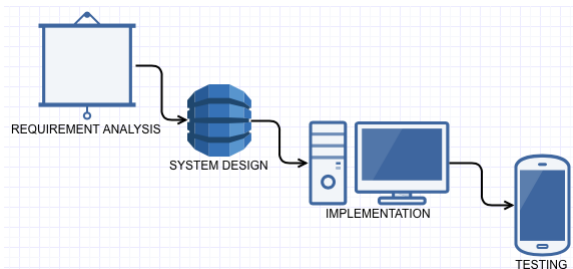


Figure 4. Waterfall Mthod – System Development Life Cycle

2.4. Ideologi behind application

This parking information system application is based on the client- server architecture. Client- server is a system that performs both the functions of client and server so as to promote the sharing of information between them. It allows many users to have access to the same database at the same time, and the database will store much information [C]. Each smartphone will be installed this parking information system applications as client

The client is provided with an interactive Android based user interface for the process

of pre-booking of parking slot. The server side processing will be enabled using PHP and MySQL. The client requests the server for an ID data record and the server responds with capacity and data member.

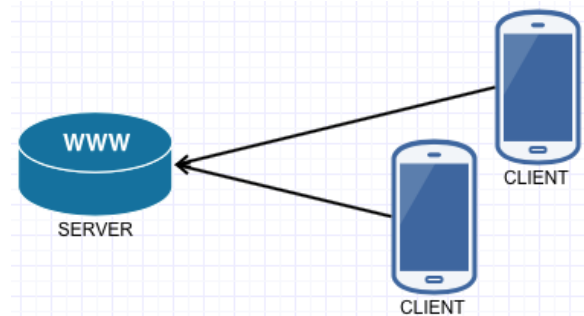


Figure 5. Client Server Architecture

3. Results and Analysis

In the experiment online, the parking system application process QRCode scanning and entering a vehicle number plate takes on average 3,8 seconds.

3.1. Starting the application

The user needs to install the “PPIS” application on his Android based device. After installation, the icon of the app will feature on the Home Screen of the user’s device. “PPIS” welcome screen will be flashed to the user on opening the application.

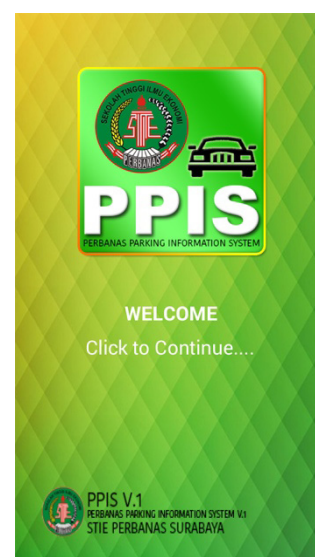
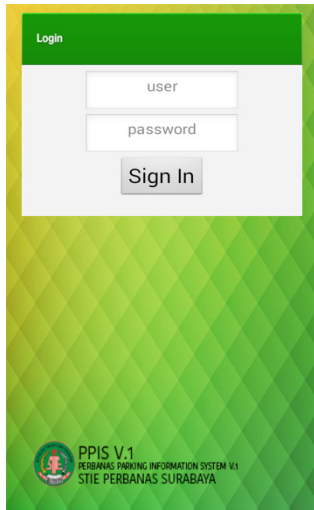


Figure 6. Splash Screen

3.2. Login

There are two type of user, administrator and user. Admin charge for setting up the application, including: setting up the client smartphone used at the entrance or exit, setting up the capacity of the parking area, and in this menu can also display a track record out of the vehicle.



(a)



(b)



(c)

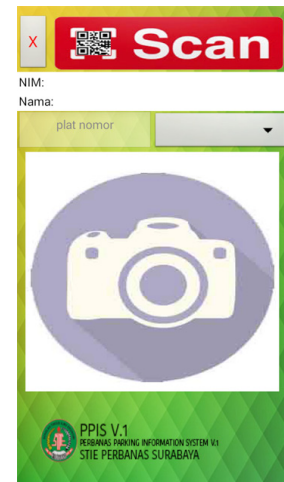
Figure 7. Login (a) Login Form, (b) Admin Form, (c) Combo Button

3.3 Parking Entrance and exit

How to use the parking entry form, by pressing the scan button for scanning QRCode process, after which it will appear ID and name, then the officer to enter license plate numbers and select the save button. How to use parking out the form, by pressing the scan button for scanning QRCode process, after which it will appear the data nim, name, and license plate number, and select the save button.



(a)



(b)

Figure 8. Parking, (a) Entrance Form, (b) Exit Form

3.4 Report

	A	B	C	D	E	F	G
1	Timestamp	inout	nim	nama	plat	file	action
2	29/03/2016 12:12:45	in	nim	nama	pl	fil	act
3	29/03/2016 13:51:01	sdtsdf	sdtsdf	sdtsdf	sdtsdf		
4	29/03/2016 13:55:18	in		2015710576 FANIRA PUTRI DEWANTI yyy			
5	29/03/2016 17:23:11	in		2008310012 ANDREW NOVANTO RAT W 9988 ZZ			
6	29/03/2016 21:56:34	OUT		2008310012 ANDREW NOVANTO RAT W 9988 ZZ	W 9988 ZZ 2008310012.png		
7	30/03/2016 12:36:58	in		2015710424 MIFTAKHUL ANDI HIDAY tes			
8	30/03/2016 12:41:37	in		2015710424 MIFTAKHUL ANDI HIDAY tes			
9	30/03/2016 12:42:34	in		2015710424 MIFTAKHUL ANDI HIDAY tes			
10	30/03/2016 13:00:36	OUT		2015710424 MIFTAKHUL ANDI HIDAY tes	tes.2015710424.png		
11	30/03/2016 14:48:22	in		2008310116 UTUYA HANIS	L 2008 QQ		
12	30/03/2016 14:50:07	OUT		2008310116 UTUYA HANIS	L 2008 QQ	L 2008 QQ 2008310116.png	
13	30/03/2016 15:37:19	in		2013310777 MOCHAMAD DIMAS PRA W 12345 QQ			
14	30/03/2016 15:29:28	OUT		2013310777 MOCHAMAD DIMAS PRA W 12345 QQ	W 12345 QQ 2013310777.png		
15	30/03/2016 17:35:52	in		2008310149 HANGGA DIMAS PARKIN L 9999 QQ			
16	30/03/2016 17:39:08	OUT		2008310149 HANGGA DIMAS PARKIN L 9999 QQ	L 9999 QQ 2008310149.png		
17	30/03/2016 17:46:31	in		2008310510 ACHMAD RIZAL ZULMI L 5555 WW			
18	30/03/2016 17:47:26	OUT		2008310510 ACHMAD RIZAL ZULMI L 5555 WW	L 5555 WW 2008310510.png		
19	31/03/2016 6:58:37	in		2012210991 INTAN DINA SYAGITA L 9999 WW			
20	31/03/2016 7:00:23	OUT		2012210991 INTAN DINA SYAGITA L 9999 WW	L 9999 WW 2012210991.png		
21	31/03/2016 7:01:56	in		2012210994 KUNTI TEDJOKESUMUDE W 1234 LL			
22	31/03/2016 7:02:48	in		2012210998 DONA RAHMAWATI NAB L 6666 WW			

The button “view of data” on the form are useful admin reports to display the outgoing and incoming vehicles online for the management. From this report management can view date, time in, time out, ID and Name user and plate license number.

4. Conclusion

Application of this parking system capable of changing the original manual processes into automated, making it easy to manage and search for the required vehicle data, and provides the recording and reporting of entry / exit vehicle for the management. Application of this parking system takes an average of 3.8 seconds to process the entry of vehicles, from the scanning process by inputting QRCode plate number of the vehicle. whereas in a manual process by distributing parking card, takes an average of 1.5 seconds.

In terms of speed of service, the manual process is faster, but rather requires a lot of officers to give the card, lacking in terms of security, and reporting of managerial reports.

5. Future Scops

The system can further be enhanced by providing various options. By addition reservation online, GPS for empty space parking area by maps, payment of bill by various modes such as credit card etc.

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