

Analysis And Design of Android-Based Guestbook Management Applications

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ABSTRACT

In increasing security in residential areas, it is not enough to improve security standards regarding incoming and outgoing guests, housing managers need to optimize the use of digitalization in standardizing security systems, one of which is by designing applications that can control incoming and outgoing guests, in order to prevent the occurrence of crime in cluster-type housing. This will be applied to the central and cluster Mallorca Phuket housing located in the Parung Panjang area, where in the process security monitoring can be carried out in real time from the cellphone by the manager. The application made is an android-based application that inputs incoming or outgoing guest data and take photos of the guest when entering and leaving. The database used is a spreadsheet, so that it is easy to read or make reports directly by most people if they want to directly access the database without the need for special skills such as SQL and so on. Application design uses codular which is open source and can make applications faster because it reduces the program coding process.

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I. Introduction

According to data from the Indonesian Statistics Agency regarding the number of crime incidents that occurred in 2021, it shows that the crime rate of theft is higher than the number of other crimes. This may be because the covid 19 pandemic has not ended and the economic stability in Indonesia is one of the causes of the crime rate, especially theft of vehicles or personal belongings at home.

In the housing environment, clusters that have one entrance access are still vulnerable to loss, be it in the form of goods or vehicles. In addition to making good standard operating procedures (SOPs) related to incoming guests that need to be improved and CCTV installation is also carried out, there needs to be an application that can control incoming guests or guests who leave the residential area, in order to prevent the loss of vehicles, especially in cluster-type housing. Cluster-type housing is usually surrounded by a wall that separates from the surrounding residential areas and there is only one entrance and exit to the residential area or known as one gate system housing. Although it is quite safe because it only has one access door to exit or enter the residential area, it does not rule out the possibility of theft in the residential area.

Sentraland paradise cluster housing Mallorca Phuket is one of the housings in Parung Panjang cluster type which only has one entrance and exit access and is guarded by two security people each shift. In order to prevent unwanted things from happening, especially the loss of the owner's vehicle in the cluster, the security and the management of the relevant RT have implemented SOPs or good procedures in receiving guests and controlling guests who leave the residential area. The current procedure is that when guests enter the residential area, they will be asked for their identity cards and recorded biodata and their needs in the book, as well as leave the guest's identity card at the security post which can later be taken when the guest leaves the residential area.

The procedure is good, but there are several obstacles that occur, including when the guest goes out, sometimes the time of departure is not immediately recorded and it is also not recorded whether



the entry and exit are carried with the same vehicle. The second is a guest who often rushes out so that he forgets to take his ID card which causes his ID card to be left behind. Third, when there is a guest who feels that he has lost his identity and feels that his identity is left at the security post, while his identity card is not there, both parties cannot prove the truth of their prejudices. Is it indeed lost at the security post, or is it lost somewhere else. Fourth, when you want to see guest data related to when he enters or leaves the residential area, it will take a rather long time in the process of searching for his data. For this reason, an application is needed to cover the shortcomings of the current procedures and also further improve security, so that the relevant parties in this case are security and RT administrators can see incoming guests and their needs and guests who leave in real time from their cellphones anywhere and anytime needed without having to ask every time to the security guards who guard the entrance at that time.

The application made is an android-based application that inputs data on incoming or outgoing guests and takes photos of the guest both when the guest enters the residential area and when the guest leaves or leaves the residential area. For the database itself, it is used to use google spreadsheets, so that it is easy to read or make reports directly by most people if they want to directly access the database without the need for special skills such as SQL and so on[1]. In the photo storage, it is uploaded to google drive so that no cost is required to create a domain in the storage of both the photo or the database[2]. The creation of this application uses open-source code and can create applications faster as needed because it reduces the complicated process of coding programs.

In the development of android-based software that is open source rapid application development (RAD) using the Kodular framework as an application without coding and spreadsheets to display data in applications[3], it has been widely used in petrifying daily activities both in the office environment, education and for individual activities, this aims to make it easier and more efficient in helping daily activities[4]. Some of the research that has been carried out includes the development of the Validation Information System Munaqasyah Exam Registration Based Android application, in this research application development aims to make it easier for students to register for the Munaqasyah exam and obtain information about the status of the registration that has been carried out. It is also easier for students to see announcements or information related to the Munaqasyah exam that have been submitted by the study program admin. In addition, this information system can also help the study program information system admin to check and validate the registration of the Munaqasyah exam that has been carried out by students and convey information or announcements to students easily and quickly through android smartphones[5]. Furthermore, the development of the Android-Based Application Design and Build Application to Inventory State Property carried out by a team of recorder officers and BMN inventors, in the process the officers scan with a QR Code from each BMN through a smartphone with such a process is expected to facilitate the BMN monitoring function[6].

In another study, an android-based application was also developed with code, namely the Utilization of Mobile-Based Technology for Company Vehicle Usage Reports with the aim of helping employees' work to be more effective and efficient. The data collection technique carried out was by conducting observations and interviews. After conducting the research, the author implemented the research results by using the RAD system development method and the Kodular platform as a medium to create android and airtable applications as a database to enable applications to run online[2]. On the basis of the above problems, the author conducted a study with the title "Design and build an android-based guest reception application using Kodular and google spreadsheets" which is expected to cover the shortcomings of the current system so that residents feel safer staying at home and calm when leaving their homes because the guests who enter and exit can be controlled directly.

II. Method

In this study, several stages of research methodology were carried out from the beginning of the research to the completion of this research. Here are some of these methodologies.

A. Studi Literature

At this stage, the researcher carried out several activities in preparation before the research started, including:

1. Literature review is by conducting a study of the material and theory that will be used in this research.
2. Interviews were conducted with security officers, RT administrators and residents, both as guests and residents of the Mallorca-Phuket cluster.

Based on the results of the literature review and interview process, it was found that the application was made using the android operating system, which is a device for Linux-based smartphone applications[7]. In the development of application development, it is determined by the Rapid Application Development (RAD) method, which in the process is able to develop with a relatively short duration of time[8]. RAD also uses a iterative method in its development[9]. RAD Method more faster than traditional method[10].

B. Design

At this stage, the researcher makes designs and applications according to the needs of existing problems to be able to solve and reduce these problems. The prototype uses kodular created from an open source website page that provides tools for creating android applications with block programming[11]. Data storage and processing use Spreadsheets to manipulate data, display data, and capture data[12].

C. Implamentation

After the application passes the test and is ready to be used, the next stage is implementation by providing training to users in using the application that has been developed.

D. Testing

The tests carried out in this study were carried out using the blackbox testing method which in the process carried out tests based on the functions in the application[13].

E. Evaluation

The last stage is the evaluation stage, which is to ask for reviews and input from users on the application that has been created.

III. Results and Discussion

The following is the flow of the design of the guest book application which is made based on the need to improve security standardization in the housing environment of Sentraland Cluster Mallorca Phuket with the use of information technology.

A. Application Design

In the creation of the guest book application in improving security standardization, first design as a flow of the guest book application which includes use case diagrams, activity diagrams, in the activity diagram consists of activity diagram checkin, activity diagram checkout, activity diagram viewing guest list, activity diagram changing the help form, and activity diagram changing user data. All app designs can be seen as follows:

1. Use case diagram

A use case diagram is a type of UML diagram that describes the relationship between an application user and his or her application[14]. The use case for this guest book application can be seen in figure 1 below:



Fig 1. Use Case Guestbook management diagram

Use Case Description:

- a. Admin covers
 - 1). Admin logs in by entering username and passwords
 - 2). Admin manages checkin and checkout guest
 - 3). Admin manages guest data
 - 4). Admin manages security data
 - 5). Admin logout
- b. Security
 - 1). Security logs in by entering username and passwords
 - 2). Security manages checkin and checkout guest
 - 3). Security manages guest data
 - 4). Security logout

2. Activity Diagram

Activity diagrams are one of the types of UML diagrams which is a development of the use case diagram that has been created[15]. Activities in this study include guest checkin, guest checkout, viewing guest lists, and maintenance form help (input, view, update).

a) *Guest Checkin Activity diagram*

Activity diagram where the process of receiving or checking guests who want to enter the residential environment can be seen in figure 2, namely the Activity diagram Checkin Guest:

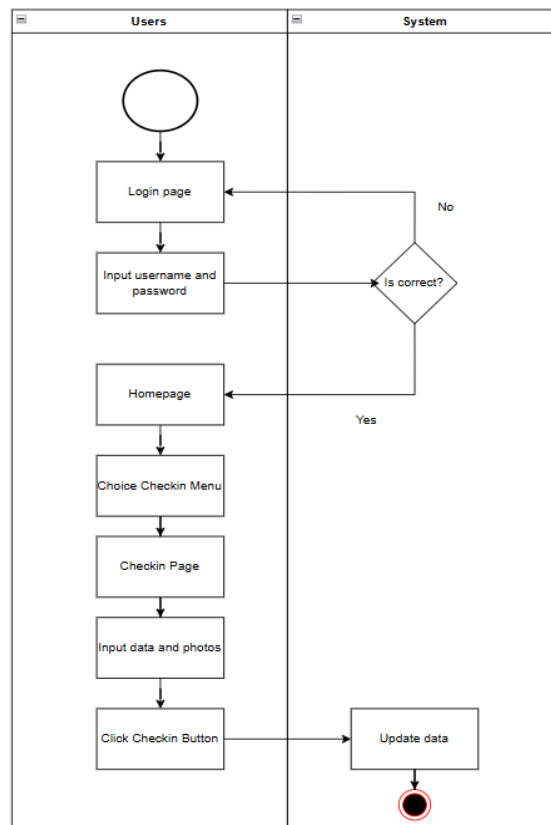


Fig 2. Activity diagram of guest checkin

b) *Guest Checkout Activity diagram*

The activity diagram after the guest visits the residential environment can be seen in figure 3, namely the Activity diagram of Guest Checkout:

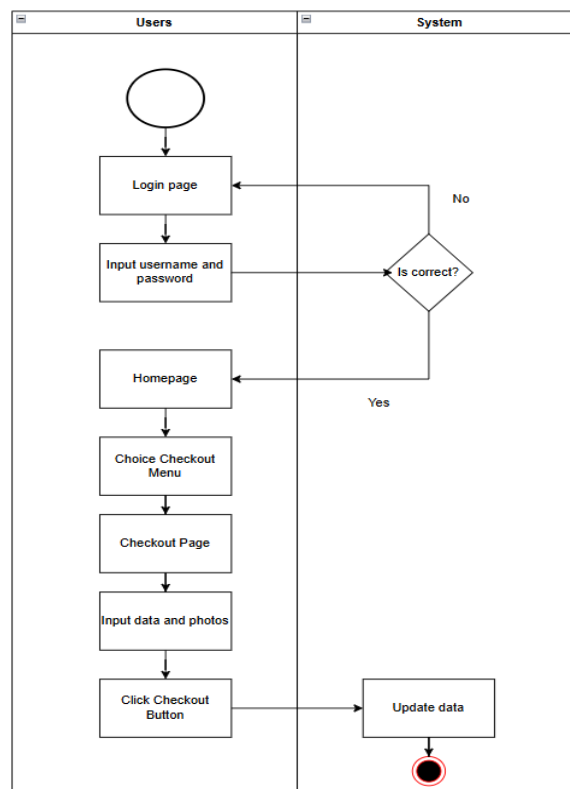


Fig 3. Activity Guest checkout diagram

B. Application Implementation

Application implementation is a stage where the system already has features with an interface based on the results of analysis and design. Here are some of the guest book app interfaces.

1. Homepage

On the main page there are two features, namely the main page as a manager in this case the RT administrator in figure 4, and a page for users or security guards in figure 5.

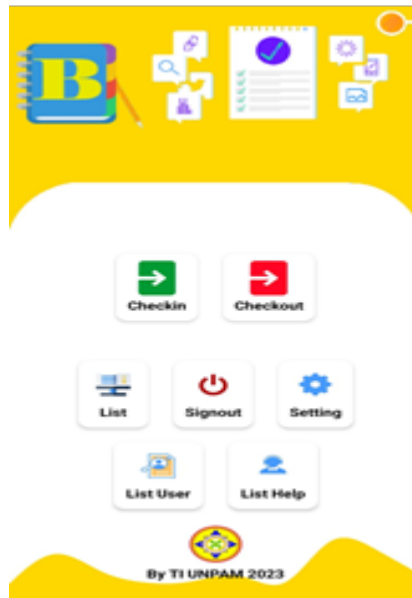


Fig 4. The main page of the application as a administrator

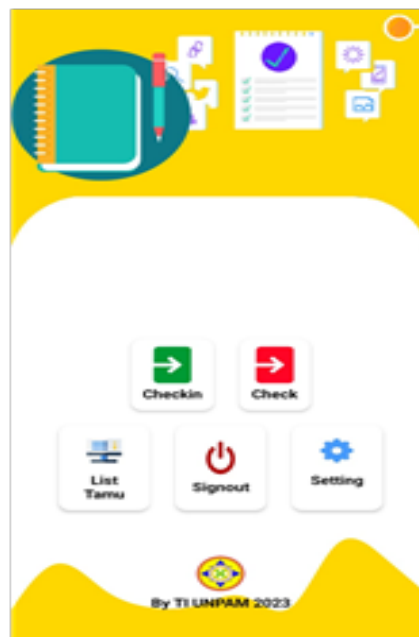
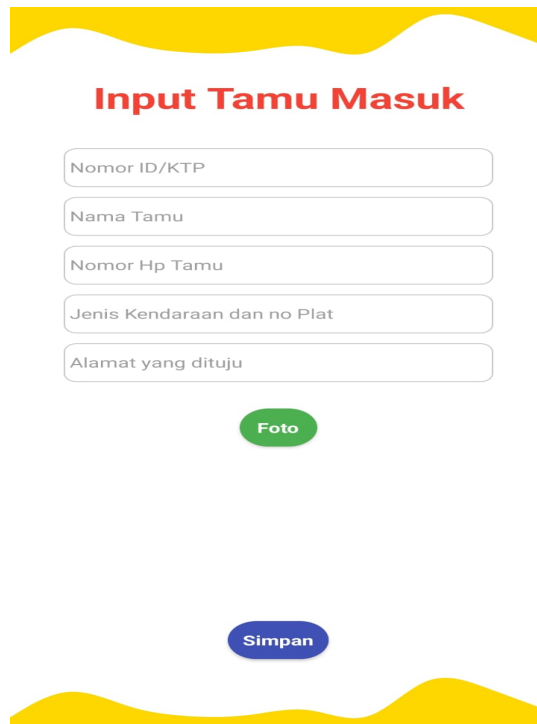


Fig 5. The main page of the application as a security

2. Guest check-in page

On the guest checkin page, users or security officers input guest data via smartphone, the following figure 9 is a display of the guest checkin page.



Input Tamu Masuk

Nomor ID/KTP

Nama Tamu

Nomor Hp Tamu

Jenis Kendaraan dan no Plat

Alamat yang dituju

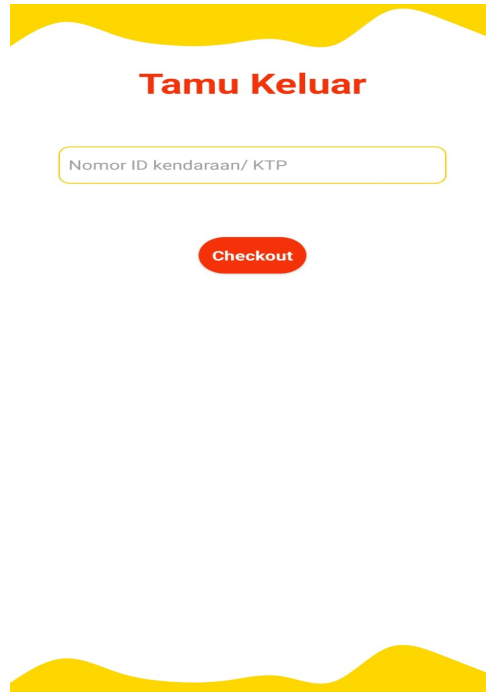
Foto

Simpan

Fig 6. Guest checkin page

3. Guest Checkout Page

On the guest checkout page, the user or security officer only needs to input the guest ID number that will go out where the idea number has been entered before when the guest enters, figure 10 is the display of the guest's checkout page.



Tamu Keluar

Nomor ID kendaraan/ KTP

Checkout

Fig. 7 Guest checkout page

C. Application Testing

In application testing, it is carried out by manual testing on applications that have been installed on smartphones with Android operating systems, testing using the blackbox testing method. Table 1 is the result of the guest book application testing.

Table 1. Guest Book Application Testing Results with Black Box Testing

No	Test	Test summary	Action step	Expected result	Actual result	Status
1	Install Guestbook APK File	Install Guest Book App APK File on Android 12 Smartphone	1. Open the Guestbook APK File 2. Allow Guestbook APK Files 3. Click Install	1. Install successfully 2. "Welcome" appears 3. Login Page	Successfully Install and appear "welcome" and Display login page	PASSED
2	Login	Log in with the correct username and password	1. Login Halaman Login 2. Input "Username: admin" 3. Input "Password: admin" 4. Click Login	Successfully log in and appear on the Home page	Successfully log in and get to the main page	PASSED
3	Login	Login with the wrong username and password	1. Login Halaman Login 2. Input "Username: test" 3. Input "Password: test" 4. Click Login	1. Failed login 2. Display a "user not registered" popup	Failed login and "user not registered" popup appears	PASSED
4	Checkin	Guest Checkin process data saved YES	1. Click Checkin 2. Enter the "Incoming Guest Input" page 3. Input "ID/KTP No: 3603302809270010" 4. Input "Guest Name : Agus Heri" 5. Input "Guest Phone Number: 0812010300821" 6. Input "Vehicle Type and Plate No: Suzuki XL7 B.12345.VOO" 7. Input "Intended Address: Block A No.9" 8. Click Photo 9. Click Save 10. Click Yes on the Save popup	1. Display the Incoming Guest Input Page 2. After input and photo of the vehicle then save the data popup popup "Save, Are you sure the data is saved? No Yes", if Yes the data is stored in the Guest list, otherwise the data is not saved	Successfully Appear on the Guest Input page Log in and save popup appears "Save, Are you sure the data is saved? No Yes" and the data is stored in the Guest list	PASSED
5	Checkin	Guest Checkin Process Data is NOT stored	1. Click Checkin 2. Enter the "Incoming Guest Input" page 3. Input "ID/KTP No: 3603302809270010" 4. Input "Guest Name : Agus Heri" 5. Input "Guest Phone Number: 0812010300821" 6. Input "Vehicle Type and Plate No: Suzuki XL7 B.12345.VOO" 7. Input "Intended Address: Block A No.9" 8. Click Photo 9. Click Save	1. Display the Incoming Guest Input Page 2. After input and photo of the vehicle then save the data popup popup "Save, Are you sure the data is saved? No Yes", if Yes the data is stored in the Guest list, otherwise the data is not saved	Successfully Appear on the Guest Input page Log in and save popup appears "Save, Are you sure the data is saved? No Yes" and the data is not saved in the Guest list	PASSED

No	Test	Test summary	Action step	Expected result	Actual result	Status
6	Checkout	Guest Checkout Process	10. Click No on the Save Popup			
			1. Click Checkout	1. Display the Outgoing Guest Page and the ID/KTP input field and checkout button	Successfully log in to the Guest page and the ID/KTP column and checkout button and successfully	PASSED
			2. Log in to the Guest Page Exit	2. Display the Exit Guest Input Page and the data of the outgoing guest ID/KTP as well as the type of vehicle and the record column 3. The "data was successfully updated" popup and enter the Guest Data List with the Checkout caption	Displayed: The Guest Input page exited with the Guest's ID/ID data and vehicle type and record column, then a popup "data successfully updated" appeared in the Guest data list with a checkout description	
			3. Input ID/KTP No: 3603302809270010			
			4. Click Checkout			
			5. Log in to the Guest Input Page			
7	Logout	Logout process after the Login application	Click Logout	Successfully log out and appear on the Login Home page	Successfully log out and go to the main page Login	PASSED

Based on the test results in table 1, the guestbook application as a whole can run well. Where of the 12 tests carried out on the application features, all were passed or successful according to the flow of the predetermined guest book application.

IV. Conclusion

The conclusion of the results of this study is that the application of an android-based guest book system application can improve security standards in the residential environment, and RT managers or administrators and security officers can supervise guests entering or exiting. The application can also monitor guests entering or exiting in real time from anywhere and at any time, and can monitor guests entering or exiting without having to leave their ID cards at the security post. Rather, it is only in the form of a photo without having to leave the identity card. So that the risk of blaming each other due to the loss of guest identity cards can be prevented and housing security can be maintained properly and provide comfort for residents in the residential environment.

The purpose of this research will connect the application with video cameras or CCTV in the residential environment with the detection of vehicles entering or exiting. So that activities or activities in the residential environment can be viewed through the application.

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