

# The “Reminder” and “Online Booking” Features in the Android-Based Motorcycle Repair Shop Marketplace

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**Abstract:** Generally, vehicle service is a must for the vehicle owner. However, due to tight work routines, people often forget to service their vehicles. In addition, the service process is still using a manual system, such as taking a queue number which leads to the long queue of the service time. An Android-based Motorcycle Repair Shop Information System provides a solution to remind people to do a regular service on their vehicles with a reminder feature and make online bookings. The system development uses the SDLC (System Development Life Cycle) method. The implementation process requires an Android smartphone and a computer device by using MySQL as data storage, Firebase as a notification sender, React native and Visual Studio Code are used for developing the system. The results of the UAT test (user acceptance testing) from 20 users show 55,8% answered agree to the display, features and flow of the system, 39,5% answered strongly agree to the three question parameters, and 4,7% answered disagree with the flow and display of the system.

**Keywords:** Information Systems, Reminders, Online Booking, Motorcycle Repair Shop, Android

## 1. INTRODUCTION

Indonesian people have a tight routine activities in their work and daily lives. They mostly use a motorcycle as their vehicles in their daily activities or going to work. The reason people choose motorcycle than cars are due to the heavy traffic that postpone them from getting to their destination. Along with the busy routine activities and work, most motorcycle riders often forget to do service for their vehicles which should be done routinely. They also complained about the long service queue time that makes them ignore the time for vehicle service. The factors that cause this problem are due to time constraints which disrupt work time. In addition, forgetting the schedule of vehicle service is another factor that often happened by motorcycle riders in general.

## 2. LITERATURE REVIEW

Various research and solutions related to online reminders and bookings have been done by Patil Apurva A., Patil Gautami R., Patil Mansi S., Patil Renuka H. It explains the application to solve the problem for a long time waiting in the restaurant. The application will display information about various restaurants that are nearby or far. This application will track the user's current location by using GPS and provide a list of the closest restaurants from their current location [1].

Other studies on Android-based applications is conducted by Deepti Ameta, Kalpana Mudaliar and Palak Patel. It implements an automatic alarm system for the patients, therefore they do not need to recall the time to take their medicines and they can set an alarm at the dose timing. The alarm can be set for several medicine and time settings, including date, time and description of the medicine [2].

A research conducted by I Gusti Made Satriya Wibawa develops an expired reminder system application with the Android platform. It is built and equipped with GIS (Geographic Information System) features to store and access locations that users need [3].

A research conducted by Mamay Syani, Nindi Werstantia explains about an android-based catering ordering application

that aim to help customers in booking process of the catering without necessarily come to the location. This application is also developed for time and energy efficiency, as well as to get accurate information [4].

A research concerned with an Android-based Futsal Field Rental Application by Dwi Ratnasari, Hayatulloh Firman Hadi, and Jian Budiarto aims to help booking process and down payment directly on the application [5].

The next research is conducted by Findra Kartika Sari Dewi, Theresia Devi Indriasari, Yoris Prayogo regarding to an application of academic activity schedule reminders for lecturers and students. The application will provide a notification if there is a change in schedule on academic activities [6].

Kamaruddin Tone also conducted a research about an android-based class reminder application that aims to remind students about exam schedules, lecture schedules and assignment deadline schedules [7].

A research conducted by Ade Reza Pahlevi, Nur Ismawati, ST, M.Cs developed an android-based music application that aims to remind the preferred musician's gig schedule [8].

A research conducted by A research by Marlince N.K Nababan, Ricky Sandi Putra, Novi A.D Hutagaol discussed an Android-based hotel room booking applications that aims to help the people in ordering and obtaining information about vacant hotel rooms [9].

Another research by Fani Panca Sari discussed an Android-based chef food ordering application that aims to help users in choosing a chef and food to be cooked as well as bring it home [10].

The next research is from Mr. Swapnil S. Nate, Mr. Pravin S. Navele, Mr. Vikas B. Mote, Prof. Laxman S. Naik which explains about the features which consist of three types of reminders namely basic reminders, schedule reminders and medication intake reminders, which will later work according to the schedule specified by the user. The main purpose of this application is to allow users to create reminders based on location and will later notify them automatically [11].

A research conducted by Prof. VB Dhore, Surabhi Thakar, Prajakta Kulkarni, Rasika Thorat aims to design and implement a food ordering system remotely, where customers can order food before visiting the restaurant, in addition, ordering tables and also payments [12].

Andy Fred Wali and Len Tiu Wright conducted a research that can be used as a reference and support in implementing the reminder features and online booking features found in the Motorcycle Repair Shop application by learning how to apply CRM effectively to improve service quality in accordance with the research [13].

A research conducted by Susmitha Shree Lakshmi.S discusses an Android application that aims to establish communication between hospitals and patients. Customers can send requests to hospitals, therefore they can communicate by using the token number that has been given to the application. They also can find a list of hospitals that are nearby [14].

Based on research that has been done before, this study aims to design and build a motorcycle repair shop information system by applying the reminder and online booking features. The reminder feature aims to remind users who often forget to do service, while the online booking feature aims to make online booking services to reduce the length of vehicle service queues at a repair shop.

### 3. RESEARCH METHODS

Motorcycle repair shop information system uses the SDLC (System Development Life Cycle) waterfall model as a system design. The SDLC method is a process for developing information systems consisting of 5 stages. The stages in the waterfall model are Analysis, Design, Implementation, Testing, and Maintenance. The stages of the research can be seen in Figure 1. [15]

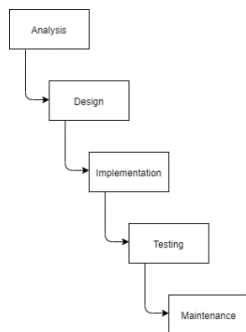


Figure 1. Research Stages

Figure 1 is the stage of system development by using the waterfall model SDLC (System Development Life Cycle) method. The analysis is the stage performed to determine the design of the application in order to answer all the needs needed by both parties, namely the repair shop and the customer. The second stage is design or UI display of the repair shop information system that uses native-based as a layout in the design or display of the system. The third stage is the creation of a motorcycle repair shop information system. The implementation process requires an Android smartphone and computer devices by using Web Service, SQLYog, Firebase, Visual Studio Code and React Native. The fourth stage is testing the developed system. It will be tested to find out the error contained in the system, and if there are many errors or malfunctions in it, a redesigning workflow will be performed to fix the system errors, therefore they can run as expected. The fifth stage is the maintenance of the system to keep the system

running properly, improve the system and the performance of the developed system.

### 3.1 General Overview of the System

The research applications for Android-based Motorcycle Repair Shop Information Systems have a general overview that can be seen in Figure1.

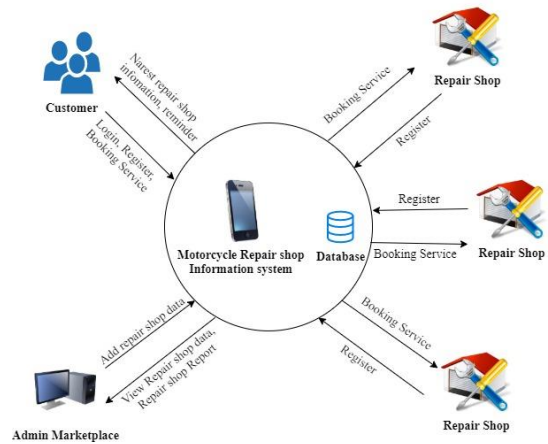


Figure. 2 General Overview of the System

Figure 2 is a general description of the system of android-based motorcycle repair shop information system. It explains the flow in making a booking service by using the application. The customers can book service through the application by registering or logging in if they already have an account. The motorcycle repair shop information system displays some of the closest repair shop locations and the customers can choose the suitable one. Furthermore, payment of the booking service is done at the repair shop chosen by the customer. The application also has a 'reminder' feature that will remind customers to service their vehicles regularly. It is in the form of a pop-up notification that will appear on the user's phone. The repair shop can register themselves on the application. The admin will confirm their registration and it will be displayed in the application. The data of the registered repair shop will be stored in the application database.

### 3.2 Context Diagram

A context diagram illustrates the whole process in the system. The scope of the Motorcycle Repair Shop Information System is presented with a context diagram. The context diagram will be explained in Figure 3.

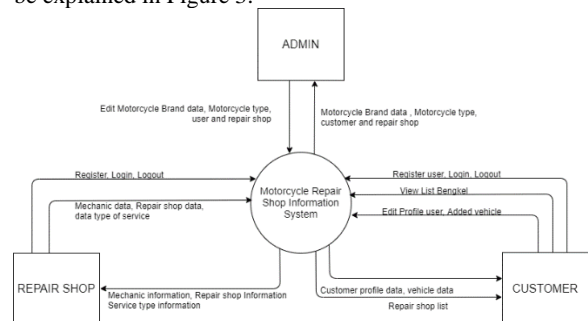


Figure. 3 System Context Diagram

Figure 3 is the context diagram of the Motorcycle Repair Shop Information System. The application will be used by 3 actors namely the Repair shop, the Customer and the Admin. The repair shop can use the system to register, log in to the system,

log out of the system, input mechanical repair shop data, manage repair shop and service type data. In addition, they can obtain mechanic information, repair shop information and their available service type. The customer can use the system to register, log in to the system, log out of the system, view the list of repair shop, manage customer profiles, and add customer vehicles. In addition, they can get customer profile information, customer vehicle data and repair shop list. The admin can use the system to edit data of motorcycle brand, motorcycle type, customer and repair shop. In addition, they can obtain data in the form of motorcycle brand data, type of motorcycle, registered customer data and registered repair shop data in the Motorcycle Repair Shop Information System.

## 4. CONCEPTS AND THEORIES

This section contains concepts and theories that support in conducting the research. They are including Reminder, Android, MySQL, Firebase, React Native and Cloud computing. It will be discussed as follows.

### 4.1 Reminder

'Reminder' is a message feature that can help people in remembering something, it is usually found on a mobile phone or other recording media. The 'reminder' is different from the alarm that only rings at a certain time. It can be set at a certain time while displaying messages that have been written previously. The 'reminder' application can show notifications and sounds from mobile devices that aims as reminders of a schedule or agenda. In general, it is usually set by the customer based on the time when it is appeared. Notifications also can appear at certain hours or days based on the agenda entered by the customer [16].

### 4.2 Android

Android is a Linux-based operating system used for cellular phones (mobile), such as smartphones and tablet computers (PDAs). Android provides an open platform for developers to create their own applications that are used by various mobile devices. Since its appearance on 9<sup>th</sup> of March 2009, Android has come with version 1.1 until the last version named 5.0 Lollipop [3].

### 4.3 MySQL

MySQL is a popular database management system (DBMS) that has a function as a relational database management system (RDBMS). The MySQL software is an open source application. Furthermore, the MySQL database server has a very fast, reliable as well as easy to use performance and it works with client server architecture or embedded systems. It is suitable for demonstrating the database replication process due to the factor of open source and popularity.

MySQL is a database that contains one or a number of tables. The table consists of a number of rows and each row contains a table or more. The table consists of a number of rows and each row contains a table or more.

### 4.4 Firebase

Firebase is a back-end cloud service provider based in San Francisco, California. It makes a number of products for developing mobile or web applications. It was founded by Andrew Lee and James Tamplin in 2011 and was launched with a realtime cloud database in 2012. The main product of Firebase is a database that provides an API to enable developers to store and synchronize data through multiple clients. This company was acquired by Google in October 2014 [17].

## 4.5 React native

React Native is a JavaScript-based framework for creating mobile-based applications, both Android and iOS. It is a collection of JavaScript-based libraries developed by Facebook. Native React Syntax is a combination of JavaScript and XML which can be called as JSX. The React Native is a framework developed by Facebook in 2015. It was created with the aim of making it easier for web developers to create mobile-based applications, both Android and iOS. In addition, it has similarities with React for the web (ReactJS) [18].

## 4.6 Cloud Computing

Cloud Computing can be interpreted as a model that allows networks to be accessed easily as needed in various locations. It allows to collect computing resources, such as networks, servers, storage, applications and services in one container. According to a paper published by IEEE Internet Computing in 2008, Cloud Computing is a paradigm where information is permanently stored on a server (on the Internet) and temporarily stored in a customer's computer (client) including desktops, tablet computers, notebooks, sensors, etc [19].

## 5. RESULT AND DISCUSSION

The results and discussion of the Motorcycle Repair Shop Information System application contains the results of testing the system directly, the results of Black Box testing and the results of the analysis of data development. These three results will be discussed as follows.

### 5.1 System Testing

The Motorcycle Repair Shop Information System has two main features, namely the online booking feature for online booking service and the reminder feature to remind the users of their regular service. These features will be explained as follows.

#### 5.1.1 Booking Online Feature

The customer can choose the repair shop and the time in the motorcycle repair shop application. A test to make online bookings is shown in Figure 4.

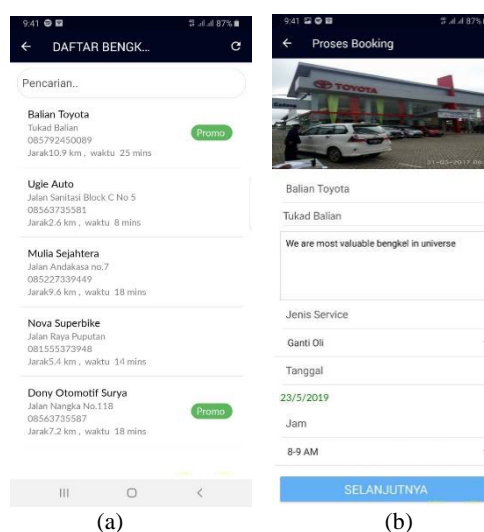


Figure. 4 Repair shop list and booking hours

The customer can choose the existing repair shop in the application as shown in figure 4 (a) after choosing it, they choose the type of service to be performed on their vehicles and

then choose the time that is available to make a booking as shown in figure 4 (b). Confirmation of booking receipt from the repair shop will be displayed in Figure 5.

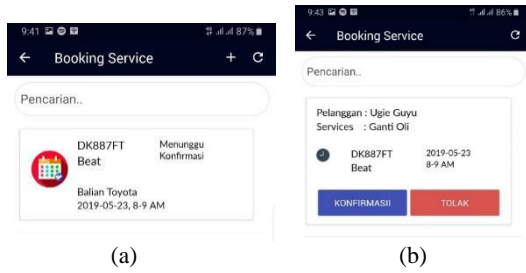


Figure. 5 Customer online booking

Figure 5 (a) explains that the customer will wait for confirmation from the workshop after filling in the data to make an online booking that has been shown in Figure 4 (b). the workshop can accept or reject bookings made by the customer as shown in Figure 5 (b).

### 5.1.2 Reminder Feature

The reminder feature is a feature on a motorcycle repair shop application that aims to remind users of doing regular service on motor vehicles. It will be displayed in figure 6.

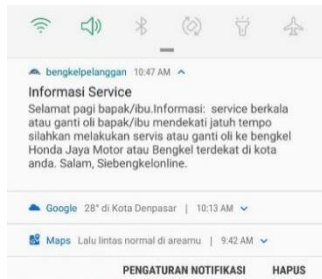


Figure 6. Reminder feature

Figure 6 is a notification display that will be received by the user within the specified time after making a booking service on the information system. The users will receive a notification after the first service is done and it is set by default by the repair shop which is in the next two months. The next reminder will be received by the user based on the average service time performed by that user.

### 5.2 UAT (User Acceptance Testing)

User Acceptance Testing is a stage of testing the system made in a number of questions to the user to find out the deficiencies of the develop system. Question UAT (user acceptance testing) can be seen in table 1.

Table 1. UAT questions

No	Question	SS	S	TS	STS
1.	Is the form on the application (login, registration, booking service, etc.) easy to understand?				
2.	Do the icons in the application present their				

	functions and are easy to understand?				
3.	Is the overall button layout in this application good?				
4.	Is the information displayed on the application easier to understand?				
5.	Is the color combination displayed on this application comfortable to see?				
6.	Overall, is the display of this application good?				
7.	Does the Transaction History feature in the application describe your transaction history?				
8.	Can the Online Booking feature on the application help you with your service?				
9.	Is the profile feature on the application able to describe yourself fully?				
10.	Does the Reminder feature help you as a reminder of service time?				
11.	Can the Deposit feature on the application help you make payments?				
12.	Is the My Vehicle feature in the application useful for you to find out the next service time?				
13.	Does the process for creating a new account on this application have an easy and fast process?				
14.	Does the process of booking a service (with or without promotion) take a little time and is not complicated?				
15.	Does the process for managing personal vehicle data (add, edit, delete) on the application have a complicated process?				
16.	Is the process for rating / reviewing workshops easy to do?				
17.	Does the process for adding a deposit balance to the application have an easy and fast process?				
18.	Is the application able to run responsively and there are no system errors when using the application (error, force closed, data not saved, etc.)?				

### 5.3 The result of UAT

The result of UAT (user acceptance testing) is based on the result of application testing towards the customer (user). The test was distributed to 20 customers (users) with 18 questions divided into 3 parameters namely display, features and system flow related to the Motorcycle Repair shop Application. The results showed 55,8% answered agree to the display, features, system flow, 39,5% answered strongly agree to the three parameter questions, and 4,7% answered disagree with the flow and display of the system.

**Table 2. The result of UAT (user acceptance testing)**

No	Stongly Agree (SS)	Agree (S)	Disagree (TS)	Strongly Disagree (STS)
1	9	11	0	0
2	7	12	1	0
3	6	12	2	0
4	8	12	0	0
5	6	13	1	0
6	7	10	3	0
7	5	14	1	0
8	11	9	0	0
9	8	11	1	0
10	14	6	0	0
11	7	11	2	0
12	9	10	1	0
13	6	14	0	0
14	9	11	0	0
15	7	13	0	0
16	6	14	0	0
17	9	8	3	0
18	8	10	2	0
Total UAT Percentage: 39,5% Strongly Agree, 55,8% Agree, 4,7% Disagree				

### 6. CONCLUSION

An Android-Based Motorcycle Repair Information System with ‘reminder’ and ‘online booking’ features are designed and applied in the form of a mobile application. The motorcycle repair shop application is designed as a media to remind service time and reduce the length of service queues. The motorcycle repair shop information system is built specifically on mobile devices with the Android platform that can be used by customers (users). It was developed using the SDLC (System

Development Life Cycle) method. The process of storing and processing data the system uses MySQL to support database services. The Android-based motorcycle repair shop information system with ‘reminder’ feature utilizes Firebase as a media for sending reminder notifications to the application on Android mobile devices for customers and the system development uses React Native and Visual Studio Code. The result of UAT (user acceptance testing) from 20 users showed 55,8% answered agree to the display, features, system flow, 39,5% answered strongly agree to the three parameter questions, and 4,7% answered disagree with the flow and display of the system.

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