APPLICATION DEVELOPMENT USING SMART PHARMACIES API MIDTRANS AS PAYMENT GATEWAY ON ANDROID SMARTPHONE

Ivan Reynaldi[1], Irfan Dwiguna Sumitra[2]

[1,2]*Informatics Engineering Program - University Computer Indonesia*
Jl. Dipatiukur 112-114 Bandung
E-mail:ivanreynaldi362@gmail.com1,irfan_dwiguna@email.unikom.ac.id2

ABSTRACT

The existence of pharmacies in the midst of society would be a very important facility. Needs and concerns of people towards their health to make people in need of health facilities such as doctors and pharmacies to obtain drugs. There is still a lack of specific information media to search the location of a pharmacy that is around us, and also can simultaneously see what medications are available such diapotek. Meanwhile, after being in a pharmacy which is sometimes there are long queues to purchase or redeem medications are ordered. Then most of them felt uncomfortable carrying cash. By utilizing the API technology Midtrans, Google Maps and Location Based Service's three technologies can be utilized to obtain the position and store data using Android smartphone devices. After testing and distributing questionnaires, the conclusion obtained is need for applications that can search for drugs and the location of the nearest pharmacy, reducing the number of queues at pharmacies as well as facilitate the users in terms of payment.
Keywords *: Pharmacies, Android, Midtrans API, Google Maps, Location Based Service.*

1. INTRODUCTION

Based on data from RAI (Summary of Pharmacy Indonesia) Ministry of Health of the Republic of Indonesia Year 2018 Number 26.658 population is highest in West Java province with the number 4.298 and the lowest population in the province of North Borneo to 78 [1], This proves that almost all regions in Indonesia population is spread evenly pharmacy. Based on the results of an online questionnaire which was made on 15 September 2018 obtained 128 respondents, 97.7% of people known to never go to the pharmacy, it can be concluded from these data that many people go to the pharmacy. Needs and concerns of people towards their health to make people in need of health facilities such as doctors and pharmacies to obtain drugs. There is still a lack of specific information media to search the location of a pharmacy that is around us, and also can simultaneously see what medications are available such diapotek. It can be seen from as many as 128 online questionnaire respondent that 71.2% of them having trouble finding the location of the nearest pharmacy that provides information such diapotek drugs. From the data known visitors pharmacies still difficult to tell whether there diapotek desired and the price is how and where the nearest pharmacy from the visitor's shoes. Meanwhile, after being diapotek is sometimes there are long queues to purchase or redeem medications are ordered. It is known from the online questionnaire as much as 128 respondents 83.6% of people lined up waiting to buy and pay and prescription medication from a doctor. Based on these data, a lot of people spend time to wait his turn. It makes people feel uncomfortable because they have to set aside time. Then most of them feel uncomfortable in carrying cash, it is known from the online questionnaire as much as 68.8% of 128 respondents answered not comfortable with carrying cash. They need a solution to minimize the problem, then it needs the application of non-cash payments. Based on the exposure of these problems, we need a solution to resolve the issue. Therefore, the authors intend to carry out research to build an application with the title of "Smart Pharmacy Application Development Using the API Midtrans For Payment Gateway On Android Smartphone".

Based on the problems described in the background, doing research purpose is to build applications based on android smart pharmacy in order to facilitate locating a pharmacy and a payment when buying drugs. The purpose of this study as follows:
a.   Make it easy for people to find the location of the pharmacy and see the diapotek drug availability.
b.   Reduce the number of queues of people who will purchase and pay for the drug.
c.   Applying non-cash purchase of the drug in order to minimize the discomfort of people when using cash.

2. CONTENTS OF RESEARCH

2.1 Review of Literature
Here is a theory is used as reference in this study.

2.1.1 Pharmacy
Pharmacy is a means whereby the practice of pharmacy pharmacy services performed by pharmacists. Pharmacy services at a pharmacy standards have been established to guide the implementation of pharmacy services at a pharmacy. In order to achieve the success of the implementation of pharmacy services at a pharmacy standards are very very necessary seriousness and cooperation of all parties. So it will make a standard pharmacy services at a pharmacy, the better and the impact can be felt all the parties that can ultimately improve the quality of healthcare [2],

2.1.2 Android
Android is an open source operating system based on Linux made for touch screen phones such as smartphones and tablet computers. Android was originally created by Android, Inc., with the support of big capital from Google, which Google then took over in 2005. The operating system was officially introduced to the public in 2007, Android was first introduced to the market precisely in October 2008 [3],

2.1.3 Location Based Service
Location Based Service(LBS) is a technology information services that can be accessed via mobile devices by utilizing the mobile network, which has the ability to utilize or use the location features of the mobile device. Location Based Service to function as a service or services to identify the location of a person or an object, such as finding sites or other locations [4],

2.1.4 API Midtrans
Veritrans or Midtrans is a payment gateway that supports E-Commerce (online shop) in Indonesia to receive payments from customers quickly and easily. With Veritrans or Midtrans, the payment process will be easier on the website or mobile apps. Veritrans or Midtrans a hydraulic type of API Key that is used to connect to the e-commerce website or mobile apps to websites or mobile apps that connect with the API Key Veritrans or Midtrans can make payments online. API Key Veritrans or Midtrans can be downloaded for free on the official website veritrans.co.id. or midtrans.com. However Veritrans or midtrans also provide some services provided paid services because

it provides premium features in ease of doing transactions online [5],

2.1.5 Payment Gateway
Payment Gatewayis an infrastructure component that has an important role in ensuring that the transaction took place without any constraints and the total protected through the Internet. All online payments must go through the payment gateway in order to be processed. In theory, payment gateway acts as a third party or intermediary between the website owner and financial institutions to process transactions. Payment gateway provides evidence would then direct the payment details in the safest environment between the various parties and the relevant bank. Another function of a payment gateway as a secure, encrypted channel for sending transaction details from buyers who use personal computers to the bank for approval [5],

2.1.6 Google Maps
Google Maps is an online map service provided by Google. This service can be accessed via the websitehttp://maps.google.com,
Google Maps Application Programming Interface (API) is an application released by Google to allow users that will connect to the website Google Maps users by displaying the user's own data points. In order for the Google Maps app can appear on a particular website, the needed API key. API key is a unique code created by Google for a specific website, so that servers can be connected to Google Maps. Google Maps API has provided a basic template that can be used by users to develop [6],

2.1.7 JSON (JavaScript Object Notation)
JSON (JavaScript Object Notation) is a lightweight data interchange format, and easily readable and writable by the user, and easily defined and created by the computer. JSON is a text format that is not dependent on any programming language for wearing style programming language commonly used by programmers family C including C, C ++, C #, Java, JavaScript, Perl, Python etc. Therefore having these properties, make JSON-suited as a data exchange language [7],

2.1.8 Object Oriented Programming (OOP)
Object Oriented Programmingis a programming paradigm that uses objects and their interactions to create applications and computer programs. OOP is still little used before the early 1990s. But now it has been transformed into something that is already widely used. Other programming languages such as Microsoft dotNet (Visual Basic.Net, Visual C #, and Visual J), Borland Delphi, Java, Python, PHP version

5 and above, C ++ and many others is a programming language that supports OOP concepts [8],

2.1.9 Web Service

web serviceis a software created to support interoperability and interaction between systems on a network. The web service is used as a facility provided by a web site to provide services (in the form of information) to other systems, so that other systems can be connected to the system through the services (service) provided by a system that provides a web service. The web service will store data information in XML format, so that this data can be used by other systems, although different platforms, operating systems, compilers and language. Web service aims to improve collaboration between programmers and companies, which have the purpose of a function in the Web Service can be borrowed by other applications without the need to understand the details of programming in it [9],

2.2 Research Methods

The research method is a process used to solve a logical problem, which required the data to support the implementation of the study. The research phase consisted of two phases of data collection and application development. For data collection was done by questionnaire and literature study. While the method of application development by using waterfall method.

2.2.1 Data Collection Methods

Data collection methods used in the study as follows:

a. *Study of literature*
    The study of literature is a technique of data collection by collecting literature, journals, search the internet and reading materials related to this research
b. *questionnaires*
    The questionnaire is a technique of collecting data by distributing questions to 128 respondents, especially users who will use this application.

2.2.2 Software Development Methods

The method used in the development of software in this study is a Waterfall [10], Waterfall method contained in Figure 1 below.
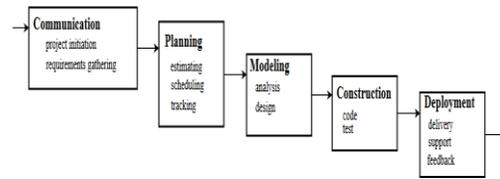
Picture 1 Waterfall method

2.3 Results and Discussion

The following is a discussion of the research that will be built along with the results of his research.

2.3.1 Analysis System

The analysis system can be interpreted as an explanation of a complete information system into its component parts in order to understand and evaluate the opportunities, barriers that occur and the expected needs, so that it can be proposed as an improvement. Analysis discusses some analysis system including problem analysis, analysis procedures running system, architecture analysis, technology analysis, analysis of non-functional requirements and functional needs analysis. Here the problems of analysis done:

a. *Many people still have difficulty in finding the location of the pharmacy.*
b. *Many people are still in line when going to buy and pay for the drug.*
c. *Many people are not comfortable using cash to make the purchase of drugs.*

2.3.2 System Architecture

Here is a system architecture that is built. There is a system architecture in Figure 2 below.
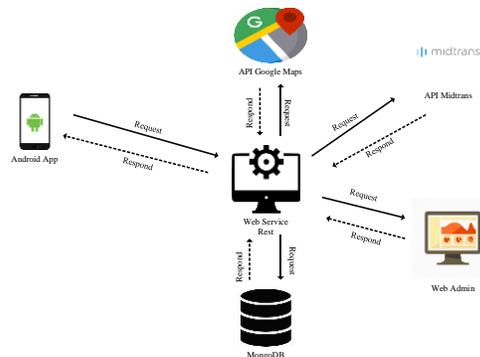
Figure 2 System Architecture

2.3.3 Payment Methods Analysis Using Midtrans

Analysis method of payment is to discuss the application menggukanan midtrans as a third party in payment or payment gateway. Transaction Flow Midtrans contained in Figure 3 below.
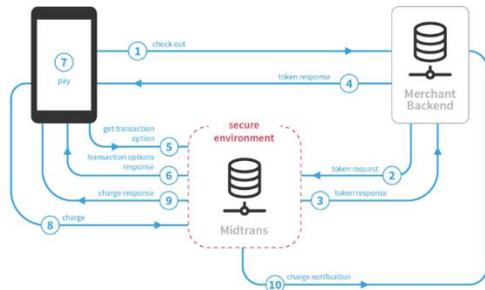
Figure 3 Transaction Flow Midtrans

2.3.4 Analysis of Software Requirements Specification

Software requirements specification is built divided into two requirements of functional requirements and non-functional.

2.3.4.1 Functional Requirements Specifications

Here are the specs of functional requirements. SKPLF website contained in Table 1.

table 1 Website Functional Requirements Specifications

code SKPL	Functional Requirements Specifications
SKPL-F-01	The website has a facility system login to the admin
SKPL-F-02	The website has a facility system manages drug data for admin
SKPL-F-03	The website has a facility system to manage data Pharmacy for admin
SKPL-F-04	The website has a facility system to manage data Pharmacists for admin
SKPL-F-05	The website has a facility systems Customer data management for admins
SKPL-F-06	The website has a facility system to manage data transactions for admin

While Android SKPLF in Table 2 below.

table 2 Functional Requirements Specifications Android

code SKPL	Functional Requirements Specifications
SKPL-F-07	Android system has facilities login, forgotten password, Register Accounts and Edit Profiles for the Pharmacist and Customer
SKPL-F-08	Android system has the facility to access drug data for Pharmacists
SKPL-F-09	Android system has a search facility location and find a cure for Customer
SKPL-F-10	Android system has facilities for Customer Transactions

2.3.4.2 Non-Functional Requirements Specifications

The following are non-functional requirements specification. Specification of hardware requirements in Table 3

table 3 Specifications Hardware Requirements

Computer specs	Smartphone specifications
Minimum Processor @ 1.8 GHZ	Minimum Smartphone Android 5.0 Lollipop
Minimum 2 GB of DDR3 RAM	Minimum RAM 2 GB
Minimum Hard Drive 500 GB	GSM / CDMA
Minimum VGA 1GB	Minimum 3G connection
Minimum Screen Resolution Monitor 1024 x 768 pixels	GPS
Connected Internet	Connected Internet

While the software requirements specification presented in Table 4

table 4 Software Requirements Specification

Computer specs	Smartphone specifications
OS Operating System Windows 10	OS Operating System Android 5.0 Lollipop
browser : Google Chrome, Mozilla Firefox, Internet Explorer	

2.3.5 Functional Requirements Analysis

Analysis of functional requirements describe the process of the activities to be implemented in a system and explain the system needs required for the system to run properly as needed [11].

2.3.5.1 Use Case Diagram

Use case diagrams are used to describe the relationship between the actor and the system. Use case diagram in Figure 4 contained website.

Figure 4 Use Case Diagram Website

While there Andoroid use case diagram in Figure 5 below.

Figure 5 Use Case Diagram Andorid

2.3.5.2 Use Case Scenarios

Use case scenarios aim to help explain each step by step process contained in the use case diagram. There is a diagram use case scenarios Table 5 below.

table 5 Use Case Scenarios Drug Data Wiping

action Actor	reaction System
Normal scenario	
1. Choosing a drug data to be deleted	
	2. Removing drug data
	3. Displaying drug data messages have been successfully deleted
Alternative scenario	
1. Choosing a drug data to be deleted	
	2. Removing drug data

	3. Displaying messages selected drug data can not be deleted

2.3.5.3 Class Diagram

Class diagram intended to explain clearly the classes associated with the system. Class diagram in Figure 6 there website and android are class diagram in Figure 7 below.

Figure 6 Class diagrams website

While there android class diagram in Figure 7 below.

Figure 7 Class diagrams android

2.3.5.4 Sequence Diagram

Sequence diagram is an overview explanation of the interaction between objects involved, which has the function as the communication objects. Sequence diagram contained in Figure 8 below.

Figure 8 Sequence Diagram for Drug Data

2.4 System Design

2.4.1 Menu Structure Design

The following is the menu structure of the web site, customer android and android pharmacist. There website menu structure in Figure 9.
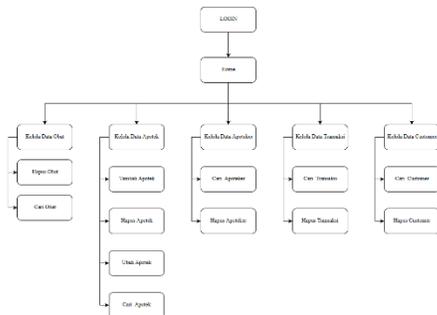
Figure 9 Website Menu Structure

While there is a customer android menu structure in Figure 10 below
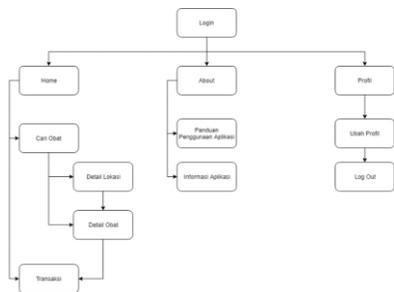
Figure 10 Android Menu Structure Customer

While there pharmacist android menu structure in Figure 11 below
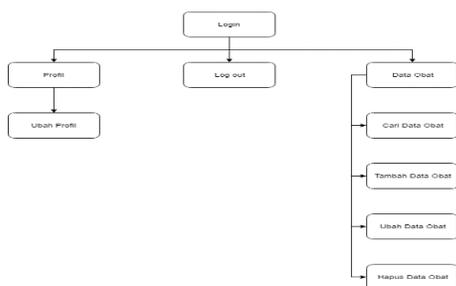
Figure 11 Android Menu Structure Pharmacists

2.4.2 Interface Design

Here is a website interface design and android. The main view web pages contained in Figure 12.
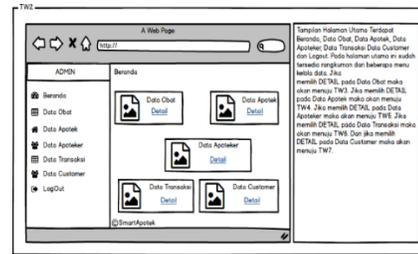
Figure 12 Main Display Page Website

While management views the website drug data contained in Figure 13 below
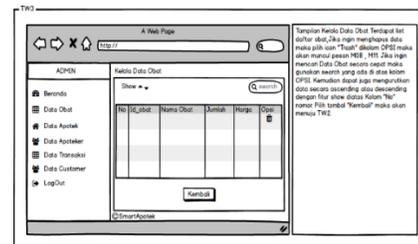
Figure 13 Manage Views Data Drug Website

While pharmacy website to see the data governance contained in Figure 14 below
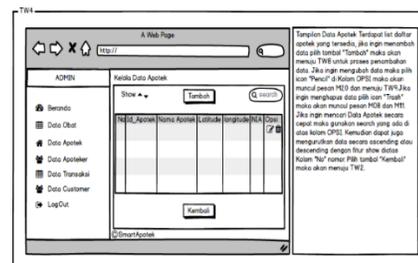
Figure 14 Display Data Manage Pharmacy

While the drug search page views customer android contained in Figure 15 below

Figure 15 Search Page View customer Drug android

While the data page to see android pharmacist medication contained in Figure 16 below
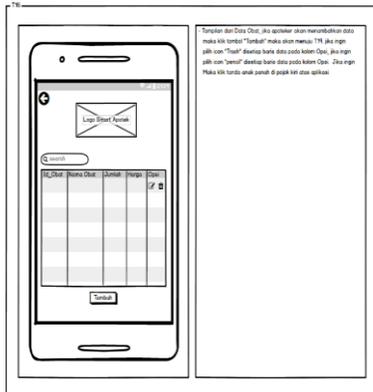
Figure 16 *Pharmacists Drug Data page display Android*

While the android login page views contained in Figure 17 below
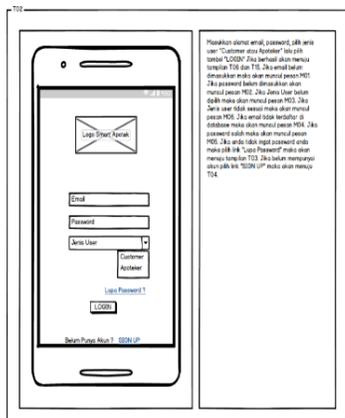
Figure 17*Android Login Page Views*

2.5 Testing the system

2.5.1 Test Design Alpha (Black-box)

In the black-box testing phase, the construction of the pharmacy smart application using the API midtrans as a payment gateway on android smartphone tested in the functional suitability. Here is a black-box testing phase that started with application development testing plan accordingly by getting cases and outcomes.

2.5.2 Test Design Beta

Beta testing is testing performed directly in the actual environment. Users provide an assessment to the application made through questionnaire method. Based on the results of the questionnaire it can be concluded whether the application is built in accordance with the purpose or not.

2.5.3 Conclusion Testing Black-box

Based on test results conducted applications it could be concluded that SmartApotek application on android platform created is going according to what is expected both in terms of validation and error pennyelesaian process.

2.5.4 Conclusion Beta Testing

Based on the results of beta testing, it can be concluded that:

a. Customer agrees that this application makes it easy to search for drugs and the location of the nearest pharmacy.

b. Customer agrees that this application can reducing the number of queues of people who will purchase and pay for the drug.

c. Customer agrees that this application could ease when making a payment.

3. CLOSING

3.1 Conclusion

Based on test results SmartApotek application on android platform, after the analysis, design and impelemntasi then obtained or can be deduced as follows:

a. SmartApotek application already can facilitate drug seeking and the location of the nearest pharmacy. Making it easier for customers to search for pharmacies search for drugs and desired location without wondering whether there are available drugs is desired.

b. SmartApotek application can reduce the number of queues of people who will purchase and pay for the drug. So that customers no longer need to queue at the pharmacy.

c. SmartApotek application already can ease when making a payment. So that customers no longer need to pay with cash.

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