

ANDROID BASED LIBRARY APPLICATION DEVELOPMENT USING SQLITE CRUD

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ABSTRACT

In the digital era like today, technology is developing very rapidly, especially on smartphones. The rapid development of smartphone technology has a positive impact on humans. These positive impacts include speed, ease of access, and convenience in carrying out daily activities. There have been many applications on smartphones that have been created to facilitate human daily activities, for example library applications. With the library application, users can easily determine which books they want to borrow or search for. Often students are confused where the book is placed. Based on these problems, a mobile-based library application was built to make it easier for students to find books without having to come directly to the library location. The research method used is SDLC (Software Development Life Cycle) with the waterfall technique. This library application is based on Android using the Java programming language, MySQLite database. For the application testing method using the Black Box Testing method. The results of the Black Box Testing of the Android-based library application using this show that all the functions contained in this application have successfully run according to their functions.

Keywords ; Android, MySQLite, Java, SDLC.

INTRODUCTION

Students are individuals who participate in learning activities to gain knowledge. Students are a very important asset for a country. Because the next generation of the nation is expected to be students who later can become individuals who can advance religion, nation and state. In addition, students are expected to be the generation that will be able to make social interactions even better. A good student must be able to place himself well in the community. Because as a student, the knowledge and skills he has acquired or learned must be able to show that he is better than others. This is what demands that students behave politely and have good qualities which can later be imitated or imitated by people who have low education or those who are not educated.

Problems related to students are very diverse. These kinds of problems have led to the emergence of various efforts in understanding how and what students want.

The development of technology is increasing rapidly in this era. One technology that cannot be separated from today's society is communication technology using smart phones or better known as *smartphones* . *Smartphones* have several features including cameras, internet, and others.

Based on the description above and existing research, the authors are interested in developing an android-based library application. With this application, it is hoped that it can help students and students.

The purpose of this application is to make it easier for students to borrow books without having to come to the library location. To avoid a widespread discussion, this journal sets out the limitations of the problem with the following matters:

1. This application is built for Android *smartphone users* .
2. This app runs on Android versions JellyBean 4.3 to Pie 9.
3. This application was built for elementary to high school students and college students.
4. The data used is not the actual data (*dummy*).
5. This research intends to design and create applications that can facilitate students.

THEORETICAL FRAMEWORK

A. Java

Java is a pure object programming language because all program code is wrapped in classes. Java stands for an interpreter engine called the Java Virtual Machine (JVM). This JVM will read the bytecode in the .class file of a program as a direct representation of the program that contains machine language. Therefore, Java is called a portable programming language because it can run on various operating systems, as long as there is a JVM on the operating system.

B. MySQLite

A database is a collection of information stored in a computer systematically so that it can be checked using a computer program to obtain information from the database. Database Management System or DBMS is a software used to create, maintain, control, and access databases practically and efficiently. While RDBMS or Relationship DBMS is one of the DBMS that supports the relation or relationship between tables. MySQLite is a multi-threaded, multi-user SQL DBMS database management system software, with approximately 6 million installations worldwide.

C. Android

Android is an operating system for mobile phones based on Linux. Android provides an open platform for developers to create their own applications so that they can be used by various mobile devices. What is needed to start programming Android is the Android SDK (Software Development Kit) and also the JDK (Java Development Kit) and requires a Java IDE which is used to write Android coding, as well as an Emulator to run the applications that have been created.

D. Blackbox Testing

Blackbox testing is software testing in terms of functional specifications without testing the design and program code. Testing is intended to determine whether the functions, input, and output of the software are in accordance with the required specifications. Blackbox testing is done by making test cases that are trying all functions using the software whether it is in accordance with the required specifications.

SYSTEM PLANNING

To complete this journal, the Software Development Life Cycle (SDLC) is used, which is the process of developing or changing a software system using the models and methodologies used by people to develop previous software systems. One of the models owned by SDLC is the waterfall technique. The waterfall technique provides a sequential software lifeflow approach starting from the analysis, design, coding, testing and support stages. This chapter explains what is used in the implementation of this research, where the end result is an android-based library application developed using the waterfall SDLC method.

A. Application System Design

In describing the system requirements, Use Case Diagrams are used. For application requirements can be seen in Figure 1.

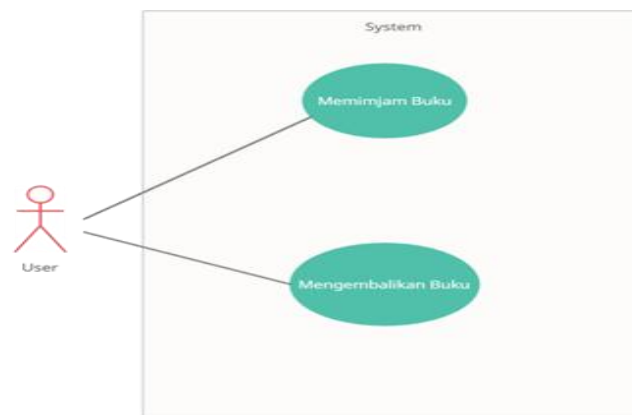


Figure 1. Use case diagram of the system

In Figure 1, it can be seen that there are actors, namely *users*, then there are 2 *use cases*, namely borrowing books, and returning books. To describe the behavior of the system and the activities that occur when the system is run. The activities and behavior of this application are depicted in two activity diagrams, namely the *activity diagram* of borrowing books, and the *activity diagram* of returning books. As depicted in Figure 2 to Figure 3

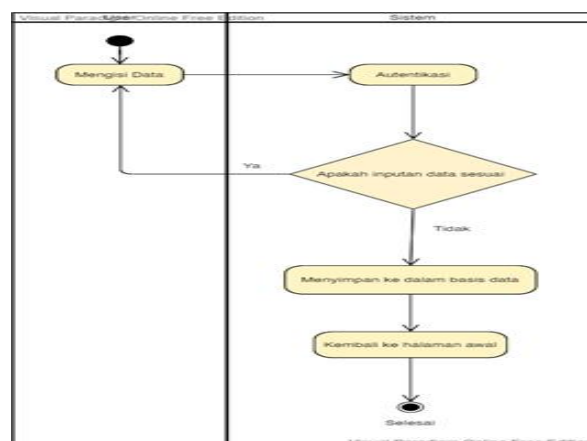


Figure 2. Activity diagram of borrowing a book

Figure 2 illustrates how the *user process* for borrowing books

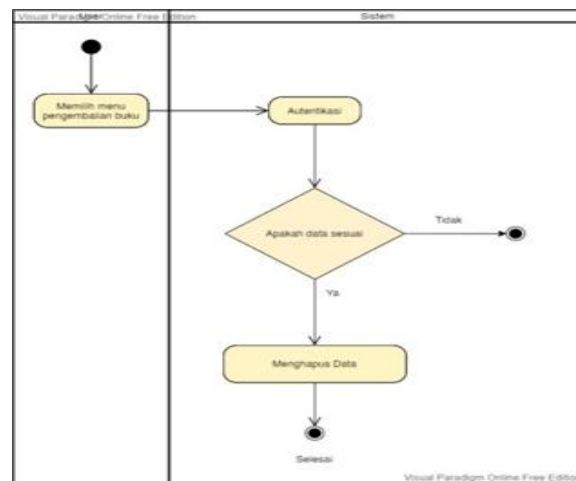


Figure 3. Activity diagram of returning books

Figure 3 illustrates how the user process returns books.

B. Database Design

Database creation is done through localhost/phpMyAdmin which later the table will be uploaded to the web hosting. Data storage will involve two tables, namely the tbl_user table to store user data, and the tbl_buku table to store book data. To illustrate the database in this application can be seen in Figure 4.

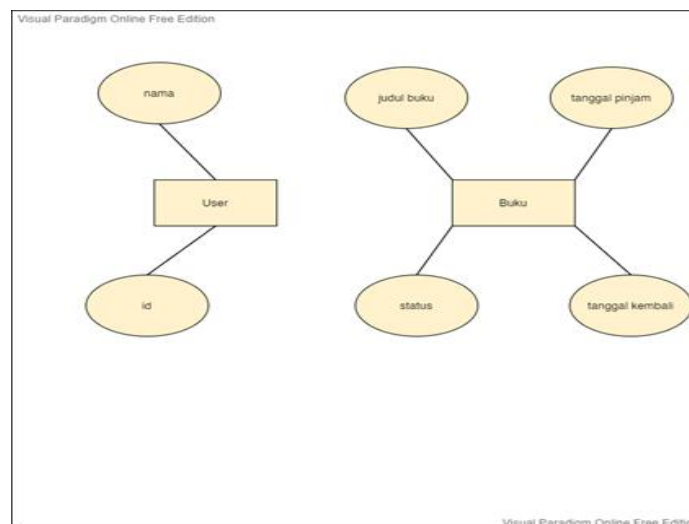


Figure 4. ERD Design

From design which has made generated structure table. Like on table 1 to table 3.

Column	Type Data
id	varchar(15)
name	varchar(30)

Table 1. Table structure tbl_user

Column	Type Data
Title book	varchar(30)
Date borrow	date
Date return	date
Status	varchar(15)

Table 2. Table structure tbl_buku

C. Interface Design

Interface layout design is the next step, interface layout design aims to provide a general description of the application to be built. Interface layout design is an important stage, because the appearance will affect the user both in terms of comfort and ease of use of the application. As shown in Figure 5 to Figure 6 .

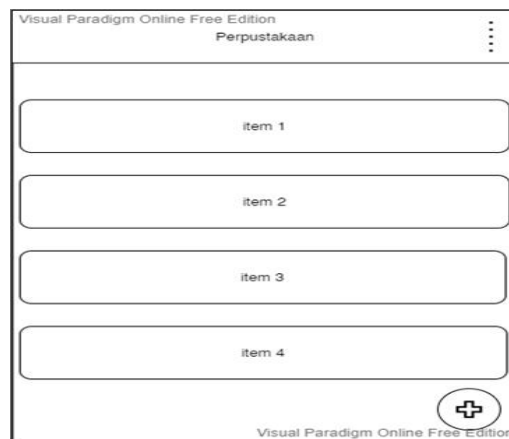


Figure 5. Design of the home page interface

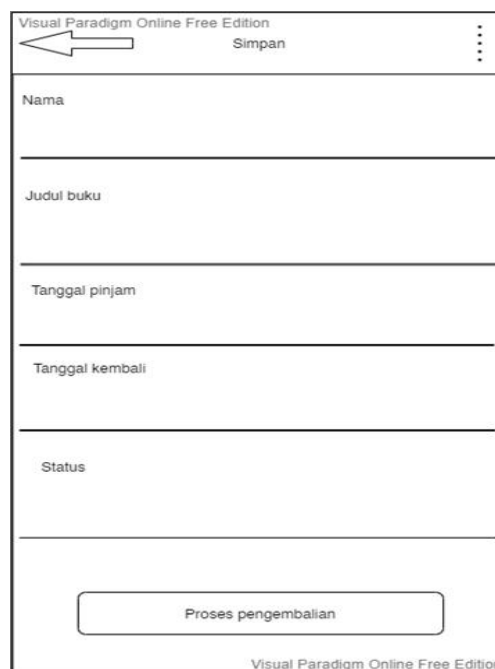


Figure 6. Interface design of book borrowing and returning pages

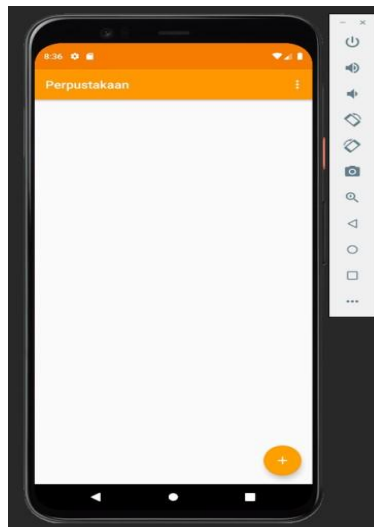


Figure 7. The initial appearance of the application

The next stage is to create a book lending page for users. Book borrowing page is used to borrow books for users. The display of the book lending page when the application is run is shown in Figure 8.

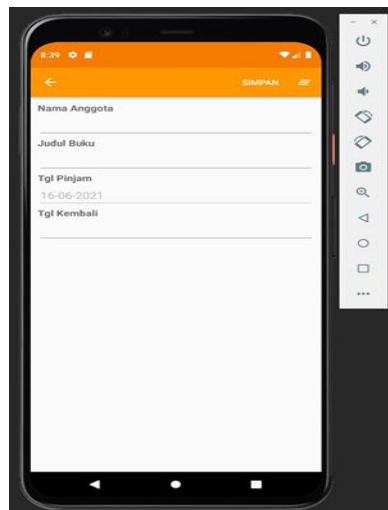


Figure 8. Display of borrowing books

IMPLEMENTATION

A. Implementation

The implementation and testing stages are carried out sequentially based on the needs of the system, the first stage is the creation of the database followed by the stage of making the application layout.

1. Database Creation Stage

Database creation is done using the phpMyAdmin application. PhpMyAdmin provides a GUI database creation service, by selecting several database options can be created. PhpMyAdmin also provides SQL menus which are used to execute queries directly to the database.

2. Application Development

In making the application, the first thing to do is create the main page. This page is the start page when the user starts the application. The initial page display when the application is run is shown in Figure 7.

The next stage is to create a book return page for users who want to return books that have been borrowed. The display of the book return page when the application is run is shown in Figure 9.

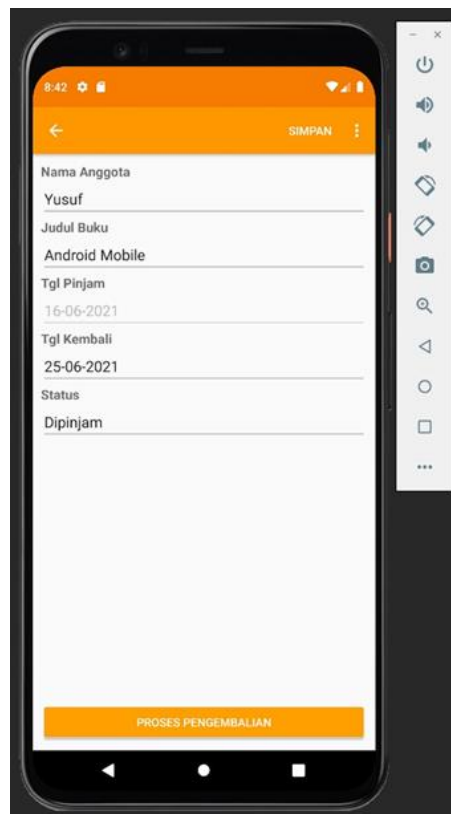


Figure 9. Book return display

B. Testing

Testing is done by using the *black-box method*. Testing is emphasized on the functionality of the application. This stage contains a series of testing functions and buttons of the application. The results of the test can be seen in table 3

Function which Tested	Condition Beginning	Condition End Which Expected	Results examinern
Test Application	User not yet operate application	Sign in to Application and show n pages beginning	Succeed
Test page main	User is at what's up page main application	Showing n page main on application	Succeed
Test loan book	User is at on page loan book	Going to page loan book when succeed	Succeed
		run app	
n book return test	User is on return page n book	Go to the return page of the book when successfully running application	Succeed

Table 3. Black-bo test results

CONCLUSION

Based on the results of testing and analysis of making applications, it can be concluded as follows:

1. The application made in this assignment can borrow and return books so that it can make it easier for students.
2. Based on the tests carried out, the application made for this task can be run on mobile devices with the Jelly Bean and Pie versions of the android operating system.
3. In this task, the application is made using Android Studio.

Based on testing and analysis of this android-based application, the author provides several suggestions for future application development.

1. Added a login feature to find out the user of the application.
2. Added the forgot password feature for users.
3. Application development to run on various platforms, such as iOS, Windows Phone, and Blackberry.

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