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# The Design of Goods Data Storage Application Based on Android using Barcode Scanner

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Sri Ipnuwati<sup>1</sup>, Andino Maselena<sup>2</sup>, Bastyan Dimas Prayoga<sup>3</sup>

<sup>1\*,2,3</sup>Department of Information Systems, STMIK Pringsewu, Lampung, Indonesia.

Corresponding Email: <sup>1\*</sup>nengachie@gmail.com

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*Abstract: Currently, technology and information system undergoes developing process rapidly. The meeting of information need is also very important, especially since the information produced contains useful, fast, and accurate value. Therefore, anyone who uses this information can deal with various occurring problems. An application is a very important thing to support various issues, one of which is in terms of goods data information systems. The use of data information system application is not only an automation process for accessing information, but also provides speed, accuracy, and completeness of an application system. The reality in the real life, especially for the middle to lower class entrepreneurs, shows that there are lacks of efficient and accurate data information system application. A store that still doesn't have the application is Toko Irawan. Toko Irawan is a department store that sells various kinds of home needs. This shop is still doing a manual recording, namely by recording the name of the item and its price in a notebook. Moreover, when the large number of items was being sold, they sometimes forgot the price of certain items. Therefore, an Android-based goods data storage application was designed using a Barcode Scanner to simplify checking names and prices of goods process easily and quickly. This application is designed based on Android using the App Inventor, so that the shop owner can input goods data and prices easily via a smartphone.*

**Keywords:** Barcode Scanner, Android, App Inventor, Application

## 1. INTRODUCTION

### A. Background Study

Currently, an application is one of important things as the support for various things, one of which is in terms of goods data information systems. For an entrepreneur, of course, they must own an application for the information system of goods data because it is very significant and the data information system will need quick and precise process. An



information can be obtained more easily and quickly, supported by the information technology [1].

The technological development from time to time continues to accelerate various innovations such as smart phones, where these phones can be carried anywhere easily. With the development of technology, the industry, school, and university times and activities will become more time-saving and easier.

The use of data information system applications is not only an automated process for accessing information, but also creates speed, accuracy, and completeness in an application system [2]. The reality, especially the lower middle class entrepreneurs, shows that there are lacks of efficient and accurate data information system application program in simplifying the buying and selling transactions in stores.

One of stores that still does not have the application is Toko Irawan. Toko Irawan is a department store that sells various kinds of home needs such as basic necessities. This shop is located in East Pajaresuk Village, Pringsewu, Lampung, which still implement manual recording, namely by recording the item name and price in a notebook, moreover because of the large number of items was being sold, they often forgot the certain item price.

To overcome the above problems, an Android-based Goods Data Storage Application was made using a Barcode Scanner. This information system is based on Android so that shop owners can input goods data and prices easily via a smartphone. This application is designed to support the information technology progress and simplify the store data of goods and the prices at 'Toko Irawan'.

Barcode is a collection of several codes with black and white bar lines where the barcode contains data which is usually in the form of numeric and letter data, and the barcode is scanned by a device as a reader liaison, it is called a scanner [3]. There are various types of scan tools that are traded in nearby shops, but before buying the scan tool we must have a computer so that we can see what information is scanned in the barcode. To minimize the funds spent and avoid to buy a PC (computer) and scanner, a barcode scanner application is designed that can view the goods data information by only using a smartphone. Barcode reading via a smartphone has been available in which it has been designed to have a barcode scan feature. The results of information after scanning the new barcode will come out after we enter the item data into the data input feature into the database. The database here uses TinyDB, where this database is used to store application data on App Inventor into an android smartphone.

Therefore, in this study, the researchers wanted to provide a problem solving for Toko Irawan by designing an Android-based Goods Data Storage Application at Toko Irawan by using a Barcode Scanner in order to facilitate pricing for the sales transaction process. Then there will be no errors in the pricing process when the shop owner forgets the item price.

## **B. Research Question**

With the background problems above, the research question used in this study are:



1. How to design the android-based Goods Data Storage Application at 'Toko Irawan' using a Barcode Scanner?
2. How is the implementation of the android-based Goods Data Storage Application at Toko Irawan using a Barcode Scanner?

### **C. Research Purpose**

The aims of this research are:

1. Designing an Android-based Goods Data Storage Application at Toko Irawan using a Barcode Scanner.
2. Implementing an Android-based Goods Data Storage Application at Toko Irawan using a Barcode Scanner.

### **D. Benefits of research**

Helping shop owners to avoid some mistakes while pricing the goods. With the item scan application, it is expected to improve the store service and get the required price information validly and quickly.

### **E. Research Limitation**

Seeing the research question above, the limitations of this study are:

1. This Barcode Scanner design is only for reading the name and price of the goods through the barcode.
2. The design of this application uses iMIT App Inventor

## **2. THEORETICAL BASIS**

### **A. Android**

Android is a free-open operating system based on Linux with an open platform for programmers to create applications [4]. The Android operating system is predicted to compete with other OS companies such as Microsoft Mobile, PLAM OS or iPhone. The Android program code is released by Google with a license under Apache. The open source code and licensing on Android will allow the software to be freely modified and distributed by application developers, device developers, and wireless operators.

### **B. Application**

The android application is an open operating system on a Linux-based smartphone [5]. A mobile application is a program that can be accessed using a mobile phone or smartphone. Mobile applications can also help all daily activities such as selling, playing games, and completing schoolwork and office work [6].

### **C. Barcode**

Barcode is several code collections with black and white bars where it has data usually in the form of numbers and letters. Barcode can be read by an optical scanner which is scanned from an image object by special software [6].



#### **D. App Inventor**

App Inventor is a web-based software for developing an application on an Android smartphone that uses a web browser which is connected to an emulator or phone. This App inventory is based on visual block programming, so that it can compose, view, use and drag drop block as the command and function symbol to create application programs that can be used on the android system. In this case, App Inventor can be an integrated system for blog-based application design. With the App inventor, users can apply computer programming to create software applications that are applied to smartphones without adding source code or programming language codes [7].

#### **E. TinyDB**

TinyDB is a local database contained in the App App Inventor location where this database is used to store application data on App Inventor into a smartphone. The data stored on TinyDB will always be there every time the application runs [8].

#### **F. Database**

The database is a container for storing data from several collections of data items in the form of symbols, letters, numbers, text, sounds, and also images. Archive / data management is the main principle of the database. Speed and ease of data transfer is the main goal [9].

#### **G. Toko Irawan**

Toko Irawan is one of the shops in Pringsewu which is located on Jl. Gotong Royong, Pajaresuk Timur, Pringsewu Selatan, Kecamatan Pringsewu, Kabupaten Pringsewu, Lampung. This location is easy to reach because it is near the main road. This shop is open every day from 07.30 am to 22.00 pm. This shop does not have employees so that the shop owner takes over to run this shop. 'Toko Irawan' sells various kinds of daily necessities such as basic necessities, snacks, drinks, and others.

### **3. RESEARCH METHODOLOGY**

Techniques in collecting data used in this research were:

#### **A. Data Collection Techniques**

##### **1) Observation**

With this method, the researcher went directly to the Toko Irawan and recorded the data item. In addition, the researcher also observed directly the buying and selling transaction service process between buyers and sellers so that the researcher can understand the problems that will be used as the research material.

##### **2) Interview**

The researcher conducted an interview or asked questions to the shop owner related to the constraints and problems that occur during the process of buying and selling services, so that the researcher can determine the solution.

## B. Waterfall Method

The system design model in this application was the Waterfall model. The Waterfall method or also called SDLC (Systems Development Life Cycle) in this method explains that a process in developing a software is carried out sequentially and systematically, where each stage continues to flow downward (like a waterfall) through phases such as analysis, design, coding, implementation and testing [10]. The steps in this research can be seen in Figure 1.

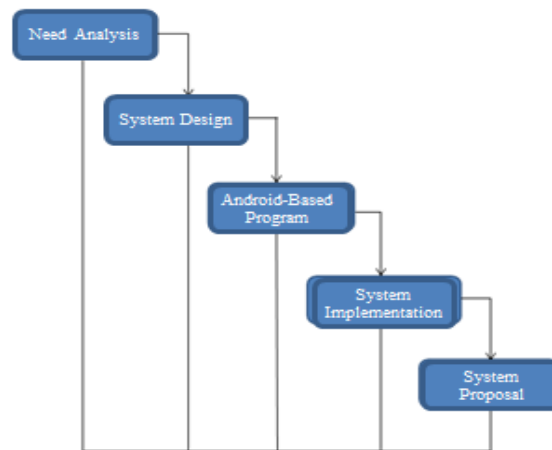


Fig. 1 Waterfall Method

Description of the research stages:

1) Need Analysis

At this stage, gathering the needs and problems obtained from direct interviews with the shop owner. The goal is to find out what their needs are, so that the author can design applications according to their needs.

2) System Design

After conducting a needs analysis, the system was designed. It designed an Android-based goods data storage application using a barcode scanner.

3) Android-Based Application

The barcode scanner application was designed with android-based programming, App Inventor is needed to create smartphone applications using a web browser and connected to a smartphone as the emulator, while TinyDB as the database.

4) System Implementation

This stage is the stage of using the system that was carried out by the shop owner and obtaining approval that the application was ready to be operated.

5) System Testing

This stage is the final stage to monitor whether the designed application program is good or not, and also to find out whether the functions of the elements created are functioning normally, so that obtaining the desired results.

## 4. DISCUSSION

### A. System Design

System design is a complete design description, as a guide for programmers in making application programs [11]. The designs used are use case diagram and class diagrams.

#### 1) Use Case Diagram

This use case diagram is designed to understand the relationship and activities between the user and the system. Use case is the construction to describe how the system will look in the eyes of the user, while use case diagram facilitates the communication between analysts and users as well as between analysts and clients [12]. The use case in Figure 2 is intended to explain the interaction of the Toko Irawan's owner with the system, starting from the goods input process to the completion.

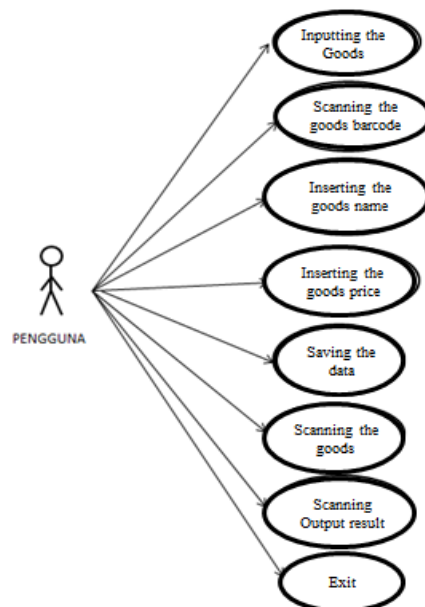


Fig. 2 Use Case Diagram

Description:

- a. Case of Inputting the Goods Menu, in this case, the user can entry the item data to be displayed in the scanning goods input menu.
- b. Case of Scanning the Goods Barcode, in this case, the user is required to scan the goods barcode in the Inputting goods menu.
- c. Case of Inserting the Goods Name, in this case, the user is required to entry the goods name the want to input.
- d. Case of Inserting the Goods Price, in this case, the user is required to entry the price of the inputted goods.
- e. Case of Saving the Data, in this case, the user can choose to save or store data items or not.
- f. Case of Scanning Goods Menu, in this case, the user can scan goods they want.

- g. Case of Scanning Output Result, in this case, the user can see the desired scan results.
- h. Case of Exit, in this case the user can use it to leave the application.

## 2) Class Diagram

To find out the relationship between these database classes, a Class Diagram was made. In Figure 3, it will be shown the relationship between database classes that are connected each other.

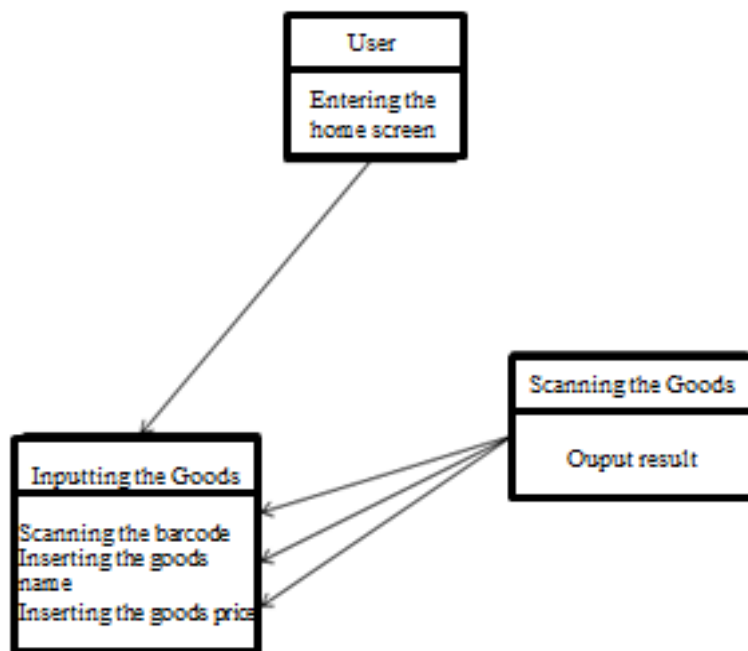


Fig. 3 Class Diagram

## B. Implementation

The implementation and discussion at the design stage of this Goods Data Storage Application uses an Android emulator from App Inventor. To try the application, the Smartphone used is the Realme 5 which uses the Android operating system.

### a. Home Menu Display

The home menu display contains 3 menus such as Goods Input, Goods Scan, and Exit Menu, where the 3 menus have their respective functions. The goods input menu functions to input the goods data such as the goods code, goods name, and also goods price. The goods scan menu serves to display the output results of the goods data that has been inputted. In addition, there is also an exit menu that the user can choose to exit from the application. The following is a display of the home menu and the display of the block coding of the application in Figure 4 and Figure 5.





Fig. 4 Home Menu

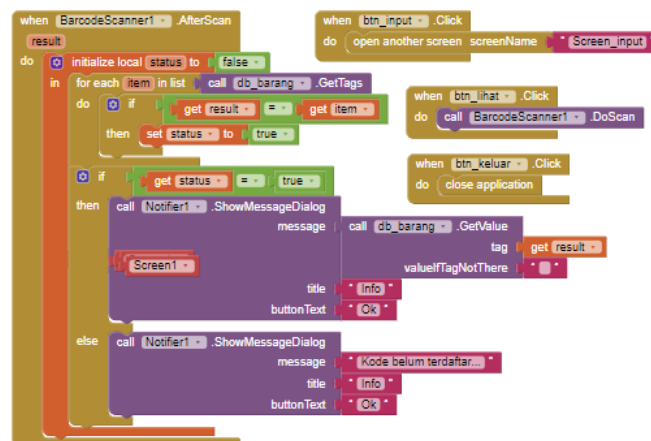


Fig. 5 Block Coding of Home Menu

### b. Goods Input Menu Display

The goods input menu display contains 3 command fields such as scanning barcodes, inserting the goods names, and also inserting the goods prices. The barcode scan command serves to scan the code of the goods you want to input. In addition, there is a command column to insert the goods name and price you want to input. The following is the display of the goods input menu and the block coding of goods input menu display in Figure 6 and Figure 7.





Fig. 6 Goods Input Menu

Description:

- Case of Scanning Goods Barcode, in this case the case is required to scan the goods barcode in the goods input menu.
- Case of Inserting the Goods Name, in this case the user is required to insert the goods name they want to input.
- Case of Inserting the Goods Price, in this case the user is required to insert the goods price they want to input.
- Case of Search list, in this case the user can search for the goods that have been inputted.
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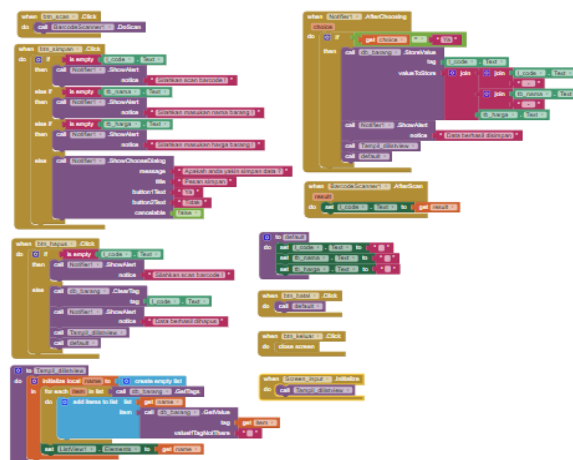


Fig. 7 Block Coding for Goods Input Menu

### c. Goods Scan Menu Display

This goods scan display is used to scan the goods the users want to view the data. The results of this goods scan output contain data of the goods code, name, and price. Here is the display which presented in Figure 8 and Figure 9.



Fig. 8 Display of Goods Scan

As in Figure 8 above, this goods scan menu displays how the barcode process on a packaged item that has been labeled with this barcode is scanned.

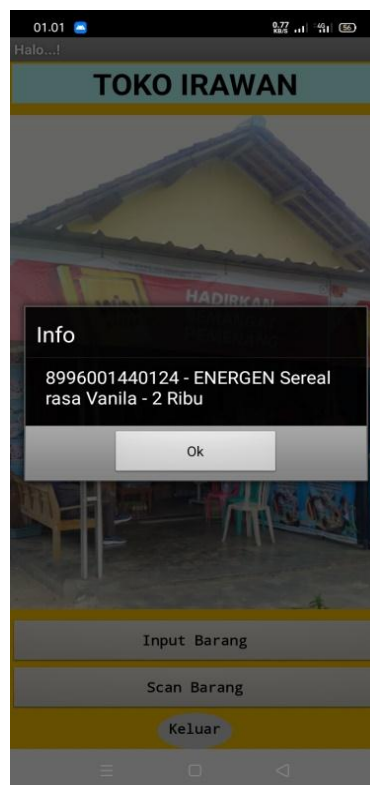


Fig. 9 Goods Output Result

Figure 9 above is a display of the goods output from the scanning menu. This output result displays the goods code, name, and price.



## 5. CONCLUSIONS

After analyzing the design and discussing the implementation that has been done in the Design of Android-Based Goods Data Storage Applications at Toko Irawan Using a Barcode Scanner, it can be concluded as follows:

1. The author has successfully designed and built an application system for storing goods data using barcode scan. This application can input the goods data such as the goods code, name, and also price.
2. In the testing implementation, this application has simplified accessing the goods data, especially the goods code data, names and prices quickly. Because according to the results of interviews with shop owners, this application simplifies to check the goods name and the price while the transaction process at the shop.

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