A Research to Design, Develop and Implementation of Android Application System for Waste Bank Sharia Community at Kampung Hijau Kemuning

R Destriana*, N Handayani, S M Husain and A T P Siswanto

Department of Information, University of Muhammadiyah Tangerang, Banten, Indonesia 15118

*Corresponding author: rachmat.destriana@ft-umt.ac.id

Abstract. The problem of garbage is a behavioral problem, therefore the need for a change in public behavior to discipline throwing garbage in place, and the problem of garbage becomes one of the problems in major cities and other metropolitan cities, including in Tangerang area. Household waste is one type of garbage that can cause increasing problems facing the government in dealing with it. Kampung Hijau Kemuning is one of the residential settlements in Binong Village, Curug Sub-District that manages sharia-based waste banks aimed at encouraging environmental rescue to be green, clean, reduce waste and become an additional source of income for the residents of Kampung Hijau Kemuning. In the process of waste bank management requires the development of either the use of computer applications based on android or in the process of financial management that is clean and free from usury in accordance with islamic (sharia) rules. The purpose of this research is to build an Android-based Sharia Waste Bank application with a user-friendly view using the Waterfall method. The waterfall model provides a sequential or sequenced approach to software life flow. The results of this research will help the process of managing innovative waste bank activities and become input to increase the empowerment of micro-business communities in an activity, especially in Tangerang area.

1. Introduction

The issue of garbage has become a global concern as all countries face such problems [1]. The problem of garbage is a behavioral problem, hence the need for a change in public behavior to discipline throwing garbage in place, and the problem of garbage becomes one of the problems in major cities and other metropolitan cities, including in Tangerang area. Household waste is one type of garbage that can cause increasing problems facing the government in dealing with it [2]. The Regent of Tangerang, stated that it is increasingly difficult to control and manage garbage. In Tangerang Regency, the volume of household waste every day is around 1,500 tons.

Law No. 18 of 2008 on Waste Management and Government Regulation No. 81 of 2012 mandates the need for a fundamental paradigm change in waste management, namely from the paradigm of garbage collection to processing that focuses on waste reduction and waste management, namely by implementing waste arising restriction activities, recycling and waste reuse or better known as
Reduce, Reuse and Recycle (3R) through smart, efficient and programmatic efforts. People are starting to move to take advantage of the garbage. Both dry and wet garbage.

Rahmadi and Mulyani (2016) [3] presented Sharia-based waste banks as methods or means of waste management in residential areas or residential complexes. Managed at the Waste Bank only covers dry waste and can still be recycled into other goods, such as plastics, bottles, cardboard and other goods that each have economic value and in accordance with religious rules. The Financial Management System of Waste Bank is sharia-based, due to the increasing public demand for a financial system that conforms to religious rules because the majority of Indonesians are Muslims. Society demands a clean and usury-free financial or banking system.

Kampung Hijau Kemuning is one of the residential settlements in Binong Village, Curug Sub-District that manages sharia-based waste banks aimed at encouraging environmental rescue to be green, clean, reduce waste and become an additional source of income for the residents of Kampung Hijau Kemuning. The processed waste comes from household waste (organic or non-organic) that has been sorted and then deposited into garbage collectors and some waste is made from recycled waste. Proceeds from the sale of non-organic waste in the form of customer savings with an agreement of 85% for customer savings and 15% for environment and operational costs [4]. The current waste bank management system is still conventional, namely the process of recording customer data, garbage data, savings data from garbage sales is still recorded in the book.

The increasing demands of the people of Kampung Hijau Kemuning in the process of managing waste banks so that it requires the development of either the use of android-based computer applications or in the process of financial management that is clean and free from usury in accordance with islamic rules. The need for android-based computer applications is urgently needed in managing the administration of sharia waste banks both in the process of recording junk data, customer data to know savings balances that can be accessed anywhere and anytime using smartphones. The purpose of this research is to build an Android-based Sharia Waste Bank application with a user-friendly view and can assist in the process of managing innovative waste bank activities and become an input to increase the empowerment of micro-enterprises in a community in an activity especially in Tangerang area.

Empowerment is essential for the integral economy of the people who have an important position and must be held thoroughly, optimally and continuously through conducive climate development, the provision of opportunities to strive, support the protection and development of the widest range of businesses, in order to increase the position, role, and potential of Micro Enterprises. In realizing economic growth, and can increase people's incomes, create jobs and reduce poverty

2. Literature Review

Ogedebe (2002) found that in the analysis and design of the system, especially for the transaction process, where the dialog displayed is easier to understand [5]. The greater the interaction between the computer and the user, the greater the benefits gained when the information system development process will be faster and make the user more interactive in the development process [6]-[8]. The systematic approach in waterfall, as follows [9-10]:

1. Communication

This step is an analysis of the needs of the software, and the stage of conducting data collection by conducting meetings with garbage banks, or collecting additional data in journals, articles, and the internet.
2. Planning

The planning process is a continuation of the communication (analysis requirement) process [8]. This stage generates a user requirement document which can be said as data about the user’s desire in the creation of android-based applications, including plans to be carried out. Where the data can be in the form of junk bank savings book as well as data on garbage weighing transactions that will be processed by the garbage bank admin.

3. Modeling

This modeling process will translate the data that has been obtained in the previous phase to be processed into a software engineering design. The process focuses on structured design of data, software architecture, user interface representation, and procedural details. This stage will generate a document called software requirement.

4. Construction

Construction is the process of creating an application through the Coding process. Coding or coding is a translation of a design in a language recognized by a computer. The programmer translates the transaction requested by the user. This stage is the real stage in working on the creation of software, meaning the use of computers can be maximized in this stage. Once the encoding is complete, the next test will be tested against the application that has been created. The purpose of testing is to test all the functions in the application to be improved.

5. Deployment

This stage can be said to be the final stage in the creation of a software or application. After performing analysis, design, coding then the finished system will be used by the user i.e. the garbage bank and finally the software should be maintained periodically.

3. Methodology

3.1 Current System Analysis

From the results of interviews and observations that have been conducted in Kampung Hijau Kemuning, in accordance with the discussion taken about the management of waste bank data in Kampung Hijau Kemuning such as data collection of garbage transactions, sorting garbage until savings still use semi computer i.e. using Microsoft Excel. The current environment activity and current UseCase can be seen in Figure 1 and Figure 2.

The needs that users need are obtained from the results of interviews conducted by researchers to the admin of Kampung Hijau Kemuning, namely to analyze the needs of the system to be made, researchers get the following conclusions:

1. It is necessary an information system that can know the update of junk data as well as the savings balance of each customer.
2. A system is needed that can facilitate the documentation of garbage data calculations, garbage transactions to the savings balance of each customer.
3. Can provide the necessary reports quickly, accurately and accurately to admins and customers.
4. Results and Discussion

4.1 Proposed System Program Design

Visual modeling that enables the development of the system makes blue prints of its vision in its default form by creating use case Diagrams, Activity Diagrams, Sequence Diagrams and Class Diagrams (see Figures 3-5).
1. Use Case Diagram application of Sharia Waste Bank Kemuning

![Use Case Diagram](image)

**Figure 3.** Future Design for UseCase Diagram

2. Activity Diagram application of Sharia Waste Bank Kemuning.

![Activity Diagram](image)

**Figure 4.** Future Design for Activity Diagram
3. Sequence Diagram application of Sharia Waste Bank Kemuning.

![Customer Sequence Diagram - Sort Waste](image)

**Figure 5.** Future Design for Sequence Diagram

4.2 The Development of the Sharia Kemuning Waste Bank - Android based.

Part of the system design is the concept of interface design, process and data with the aim of producing system specifications that suit the needs. Here’s a look at the design of Android-based Sharia Kemuning Waste Bank application.

This is the page for everyone who want to go to the application at the first time (see Figures 6).

![Login Menu](image)

**Figure 6.** Login Menu

This is a menu for users when they want to use the menus in the garbage bank application, there are several menus such as the customer menu, the waste sorting menu, the transaction menu, the savings menu and the reports menu.

This is the main menu when we are going to make transactions, whether it's sorting waste or saving transactions (see Figures 7 and Figure 8).
Figure 7. Customer Menu

Figure 8. Transaction Menu

This is the report menu for the waste bank transaction and saving report transaction (see Figures 9 and Figure 10).

Figure 9. Report Menu of waste bank

Figure 10. Report Menu saving
4.3 System Testing

At this testing stage, it is carried out using black box testing for all functions of the Android-based waste bank application carried out by the waste bank. The results of testing using the black box method can be seen in Table 1.

| No | Input                        | Expected Output                                      | Actual output                        | Conclusion |
|----|------------------------------|------------------------------------------------------|--------------------------------------|------------|
| 1  | Login                        | Application showing form login                       | showing login form                   | Valid      |
| 2  | Existing email and password  | Application showing HomeScreen                       | showing Homscreen                    | Valid      |
| 3  | View waste Item              | Application showing List Nasabah                     | showing List of Customer             | Valid      |
| 4  | View waste Item              | Application showing Menu Sorting Trash              | showing Menu of waste collecting     | Valid      |
| 5  | Saving transaction           | Application showing Menu of saving transaction and Input saving transaction | showing Menu of saving transaction and saving | Valid |
| 6  | Saving history               | Application showing History                          | showing History of saving transaction | Valid      |
| 7  | Saving transaction menu      | Application showing Menu of saving transaction and Input waste transaction | showing Menu of saving transaction and Input waste | Valid |
| 8  | Saving transaction           | Application showing History of waste transaction     | showing History of waste transaction | Valid      |
| 9  | Saving transaction           | Application showing report of waste transaction      | showing report of waste transaction  | Valid      |

5. Conclusion

The research conclusions of Sharia Waste Bank based on Android Kampung Hijau Kemuning are as follows:

a. Waste bank data management, savings data from garbage sales and sales of craft products from garbage that can be used as value is input to the Android-based Sharia Waste Bank Application that very use full for the people on that area.

b. As result for user, to see the proceeds of garbage sales and the sale of craft works from garbage, customers can directly access to the android-based sharia waste bank application on their smartphone with access as a customer. The information displayed on the application can see the customer's savings balance, savings transactions, and data related to the activities of sharia waste bank kampung hijau kemuning.
References

[1] Bezama A, Agamuthu P 2019 Addressing the big issues in waste management Waste Management & Research 37 (1) 1-3
[2] Dahlén L and Lagerkvist A 2009 Evaluation of recycling programmes in household waste collection systems Waste Management & Research 28 (7) 577-586
[3] Rahmadi and Mulyani D 2016 Model Sistem Informasi Keuangan Bank Sampah Sharia Jutisi: Jurnal Ilmiah Teknik Informatika dan Sistem Informasi 5 (3) 1199-1204
[4] Amaral R E C, Brito J, Buckman M, Drake E, Ilatova E, Rice P, Sabbagh C, Voronkin S and Abraham Y S 2020 Waste Management and Operational Energy for Sustainable Buildings: A Review Sustainability 12 1-21
[5] Ogedebe P M and Jacob B P 2012 Software Prototyping: A Strategy Touse when User Lacks Data Processing Experience ARPN Journal of Systems and Software 2 (6) 219-224
[6] Destriana R, Permana A, Legawa S, Yanuardi and Irawan H 2019 Security system development for vehicle using the method of “mail notification” at villa Rizki Ilhami Tangerang residential IOP Conference Series: Materials Science and Engineering 508 012124
[7] Petersen K, Wohlin C and Baca D 2009 The Waterfall Model in Large-Scale Development Lecture Notes in Business Information Processing 32 86-400
[8] Costabile M F 2001 Usability in the software life cycle Handbook of Software Engineering and Knowledge Engineering 1 179-192
[9] Bassil Y 2012 A Simulation Model for the Waterfall Software Development Life Cycle International Journal of Engineering& Technology(iJET) 2 (5) 1-7
[10] Kulkarni R H, Padmanabham P and Basee K K 2015 Critical Review of Extended Waterfall Model International Journal of Scientific & Engineering Research 6 (11) 425-432