Data Management System Design Website-Based Waste Bank (Case study: DLHK Karawang Regency)

Vikri Khoerul Rabani¹, Bayu Priyatna²*, Baenil Huda³, Firtia Nurapriyani⁴, Dudi Awaludin⁵

¹ Department of Information System, Universitas Buana Perjuangan Karawang, 41361, Indonesia
² Department of Information System, Universitas Buana Perjuangan Karawang, 41361, Indonesia
³ Department of Information System, Universitas Buana Perjuangan Karawang, 41361, Indonesia
⁴ Department of Information System, Universitas Buana Perjuangan Karawang, 41361, Indonesia
⁵ Department of Information System, STMIK ROSMA Karawang, 41361, Indonesia

bayupriyatna@ubpkarawang.ac.id

Abstract

The Karawang district environmental and sanitation service development in the environmental sector is now at the heart of all government decisions and policies at the central and regional levels. Garbage is divided into 2 types of waste, namely organic and inorganic waste. Organic waste is waste that generally decomposes and easily decomposes naturally. Inorganic waste is general waste that is difficult to decompose, in particular: metal, iron, glass, plastic. A waste bank is a bank for saving in the form of waste that has been grouped according to its type. The waste bank data management system as a data management medium is designed using the waterfall method to solve constraints on management and transaction data.

Keywords: Data Management System, Garbage Bank, Waterfall, Transactions.

1. Introduction

Information technology is growing, and the development of information technology can get many benefits. With the development of information technology, it makes almost all areas of work and sales[1]. In the sales sector, it can also be used as a communication tool in purchasing, selling and managing activities. Garbage is divided into two types, namely organic waste and inorganic waste[2]. Organic waste is general waste that can decompose and decompose easily naturally, for example, food scraps, leaves, fruits, and so on. Meanwhile, inorganic waste is general waste that is difficult to decompose, in particular: metal, iron, glass, plastic, etc. The Karawang district environmental and sanitation service, development in the environmental sector is now at the heart of all government decisions and policies, both at the central and regional levels.

Along with the waste service that started in 2017, it has become a side activity on environmental issues[3]. Based on data from the Sanitation and Environment Office of Karawang Regency, there are around 1,100 to 1,200 tons of trash in a week. A waste bank is a place where waste is collected based on its type[4]. The savers in the waste bank can be called customers, the
savers will get a savings book that contains the value of the money from the waste they save and can be withdrawn into money[5].

However, in every phenomenon, waste data management has yet to take advantage of technological developments and management that is still carried out conventionally. Therefore, the design of a waste bank data management system[6] will make it easier for the public in buying and selling waste to view transactions that have been made by accessing the waste bank information system website that will be provided[7]. This website is also an opportunity for the community to become a broad economic value so that revenue can be increased.

2. Literature Review

The system is a collection of interconnected objects that interact with each other and become a unit to achieve a goal[8]. System characteristics include system components, system boundaries, system external environment, system interfaces, system inputs, system outputs, system processes, and system objectives. Information is the processing of computer results that have a certain value and can be useful for the recipient, information can be interpreted from the results of data processing into a perfect form and more meaningful for the recipient, describing actual events that are used for decision making[9].

A website is a collection of web pages distributed on the internet with a domain name/url (Uniform Resource Locator) available to all internet users by typing in the address[10]. This is possible thanks to World Wide Web (WWW) technology, web pages which are usually documents written in hypertext markup language (HTML) format, can be accessed via HTTP[11]. HTTPS is a protocol that sends information from a web server to be displayed to users via a browser web[12].

SDLC is the stage of developing and modifying software systems that use patterns and methodologies that everyone runs in developing previous software systems (based on established, well-tested best practices or methods)[13]. PHP is a programming language for creating server scripts. PHP has a dynamic nature; PHP can be run on many operating systems, namely Windows, Linux and Mac OS. PHP also supports various other web servers, namely the PWS web server, Microsoft ISS, and Caudium. PHP can use databases in creating dynamic web pages. The most commonly used database management system with PHP is MySQL[14].

3. Research Method

In this study, the authors used the waterfall system design or development model because the waterfall system[15] has the advantage of having sequential processes and cannot overlap to develop the system according to needs. This research phase involves several processes: planning, problem identification, design, and testing. The research flow procedure can be seen in Figure 1

The steps for making a system using the waterfall development method include requirements analysis, system design, program code, and testing. Requirements analysis is a step that allows to determine the requirements criteria that will be implemented in the system that must be met[16]. The data collection method is carried out by asking a number of simple questions to obtain results from related parties.

The program code to create the system uses a predefined programming language such as: php, css and MySQL[17]. The testing phase is the testing phase of the system to be made. Tests performed on the function of each system feature. Testing this system will be carried out using whitebox and blackbox testing[18]. The purpose of testing the system is to ensure that the system is according to the design and to find out if the system functions that have been implemented can
be used for the process of making and designing a waste bank data management system.

4. Results and Discussion

4.1. System Analysis

This stage will explain the running system and troubleshooting solutions. Problem-solving solutions or system proposals will be designed using UML and provide an overview of the application up to the testing stage [19]. After observing and interviewing the management section, some problems occur from the current system, including customers who do not know the total amount of savings, so it is difficult to see actual data and waste transaction data is still difficult to manage because duplicate data is often found [20]. The use case diagram describes an interaction between the actor and the system to be created. The use case diagram design is shown in Figure 2.

4.2. System Design and Implementation

The login page is displayed before entering the main page. To enter the main page, you must enter the correct username and password. The login page is shown in Figure 3.
The main page is displayed after a successful login. The main page is shown in Figure 4.

A Garbage data page is a display page that will display waste data, on this page the user can input, update and delete data. The garbage data page is shown in Figure 5.

A purchase data page is a display page that will display purchase data, on this page the user can input, update and delete data. Purchase data page can be seen in Figure 6.

The savings page is a page display that will display savings data, on this page the user can input, update and delete data. The savings page is shown in Figure 7.
4.3. Testing

The system that has been built is tested using black box testing to find out whether the system is running correctly or not. Login page testing is shown in Table 1.

<table>
<thead>
<tr>
<th>No</th>
<th>Test Scenario</th>
<th>Desired Result</th>
<th>Results Displayed</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The user enters the correct username and password</td>
<td>The user has successfully entered the main page</td>
<td>The user has successfully entered the main page</td>
<td>Success</td>
</tr>
<tr>
<td>2</td>
<td>The user enters the correct username and password</td>
<td>The user failed to enter the main page</td>
<td>The user fails to enter the main page and is given an incorrect username and password notification</td>
<td>Success</td>
</tr>
</tbody>
</table>

Then testing the garbage data page is shown in Table 2.

The report data page is a page display that will display report data; on this page, the user can input, update and delete data. The report data page is shown in Figure 8.

The customer data page is a display page that will display customer data; on this page, the user can input, update and delete data. The customer data page is shown in Figure 9.

The sales data page is a display page that will display sales data; on this page, the user can input, update and delete data. The sales data page is shown in Figure 10.
Testing of Purchase Data Pages is shown in Table 3.

### Table 3. Purchase Data Page Test

<table>
<thead>
<tr>
<th>No</th>
<th>Test Scenario</th>
<th>Desired Result</th>
<th>Results Displayed</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Admin adds purchase data</td>
<td>The added data has been successfully saved</td>
<td>The added data has been successfully saved</td>
<td>Success</td>
</tr>
<tr>
<td>2</td>
<td>Admin changes the purchase data</td>
<td>Successful change of data</td>
<td>Successful change of data</td>
<td>Success</td>
</tr>
<tr>
<td>3</td>
<td>Admin deletes purchase data</td>
<td>Data deleted successfully</td>
<td>Successful change of data</td>
<td>Success</td>
</tr>
</tbody>
</table>

Testing of Savings Data Pages is shown in Table 4.

### Table 4. Savings Data Page Test

<table>
<thead>
<tr>
<th>No</th>
<th>Test Scenario</th>
<th>Desired Result</th>
<th>Results Displayed</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Admin adds savings data</td>
<td>The added data has been successfully saved</td>
<td>The added data has been successfully saved</td>
<td>Success</td>
</tr>
<tr>
<td>2</td>
<td>Admin changes the savings data</td>
<td>Successful change of data</td>
<td>Successful change of data</td>
<td>Success</td>
</tr>
<tr>
<td>3</td>
<td>Teacher BK deletes Savings data</td>
<td>Data deleted successfully</td>
<td>Successful change of data</td>
<td>Success</td>
</tr>
</tbody>
</table>

Testing of Sub Criteria Pages is shown in Table 5.

### Table 5. Testing of Sub-Criteria Pages

<table>
<thead>
<tr>
<th>No</th>
<th>Test Scenario</th>
<th>Desired Result</th>
<th>Results Displayed</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Admin adds Sub-Customer data</td>
<td>The added data has been successfully saved</td>
<td>The added data has been successfully saved</td>
<td>Success</td>
</tr>
<tr>
<td>2</td>
<td>Admin changes customer data</td>
<td>Successful change of data</td>
<td>Successful change of data</td>
<td>Success</td>
</tr>
<tr>
<td>3</td>
<td>Admin deletes customer data</td>
<td>Data deleted successfully</td>
<td>Successful change of data</td>
<td>Success</td>
</tr>
</tbody>
</table>

### 4. Conclusion

Based on the discussion that has been described in each chapter, the final project entitled Decision support system for selecting study programs to continue their studies at tertiary institutions using the simple additive weighting (saw) method can be concluded that the waste bank data management system built is a system built to overcome data management problems so that the risk of losing significant amounts of data is not lost. The system provides information needed by the waste bank and information needed by customers, such as transaction data and customer savings data. This feature makes it easier, faster, and more accurate for administrators or managers to process data from the system. With this system, customers can make it easier to sell waste and easily withdraw sales proceeds.
Authors' Declaration

Authors' contributions and responsibilities – The authors made substantial contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation, and discussion of results. The authors read and approved the final manuscript.

Funding – No funding information from the authors.

Availability of data and materials – All data are available from the authors.

Competing interests – The authors declare no competing interest.

Additional information – No additional information from the authors.

References


