Design of a Web-Based Village Asset Information System in Waimbidi Village

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Abstract

The village is one of the government agencies responsible for the process of managing village assets in an area. Waimbidi Village, Kambata Mapambuhang District, East Sumba Regency, currently managing village assets still uses manual methods by recording in master books, so that making reports takes a long time or even the required reports are incomplete. Recording using books can result in reports piling up, making it difficult to find data and taking a long time if one day it is needed. Based on these problems, a system is needed that can manage village assets. With the aim of being able to store village asset data permanently in a database. The system development method used in research is the waterfall method which starts from the process of planning, analysis, design and system implementation. The results of this research can create a Web-based Village Asset Information System in Villages, which can help the Waimbidi Village government manage asset data so that it can be more efficient and structured.

Keyword: Database, Information System, Village Assets, Waterfall, Website

1. INTRODUCTION

The rapid development of technology from time to time makes it easier for humans to do various things. The rapid progress of technology is also creating new things in the world of computing [1]. Almost every activity uses computers, one technology that can be applied in the government sector is the development of information systems or web-based applications [2]. In the government sector, information systems or web-based applications can be used to manage village asset data so that all assets can be recorded properly [3]. In managing village asset data, many villages use manual methods, namely by recording asset data in a master book to manage village assets spent by the village.

Village assets are village property that originates from the village's original assets, purchased or obtained at the expense of the Village Revenue and Expenditure Budget (APBDes) or the acquisition of other legal rights [4]. In managing village assets and all wealth in the use of existing assets must be managed well and transparently so that there is no misuse that does not comply with the provisions of applicable laws and regulations. Village assets can be village treasury land, customary land, village buildings, village water springs, and other assets belonging to the village. Sources of village income consist of Village Original Income (PADes), Village Funds (DD), Village Fund Allocation (ADD), Tax Profit Sharing Funds (BHP) and Regional Tax and Retribution Income (BHPRD) [5].

Waimbidi Village is one of the villages in Kambata Mapambuhang District, East Sumba Regency which has an area of 120 km2, has 2 hamlets, 4 RWs, 8 RTs with a population density in Waimbidi Village of 597 people. Waimbidi Village is one of the villages that still uses manual methods in managing village asset data, namely recording asset data in a master book. However, this is less effective in the work of Waimbidi Village officials, in this case village managers often experience difficulties in the process of recording property data in the form of reports such as reports on movable and immovable assets. Recording using books can result in reports that are piled up, making it difficult to find data and takes a long time if one day it is needed. Another drawback is that a poor archiving process will result in asset archiving errors and even data loss.

Based on existing problems, a web-based village asset information system is needed. With the aim of implementing a website-based information system in Waimbidi Village to increase the effectiveness of the work of village officials in managing village assets and to be able to store a database of village assets

permanently in the system. To support village asset management properly, the village government needs to have or develop a more complete village asset management information system.

2. MATERIALS AND METHODS

2.1. Information Systems

An information system is a system within an organization that unites systematically and regularly to create and shape the flow of information that will support decision making and control the running of the company [6]. Based on the explanation above, it can be concluded that the definition of an information system is a combination of people, facilities or tools, technology. Media procedures and controls to build an information system network that meets daily needs, supports managerial operations and provides information contained in the system for everyone who needs that information, both individually and in groups or organizations.

2.2. Previous Research

Previous research is a reference in conducting research to look for other sources from various sources of research information related to the title[7]. Based on the definition above, previous research is a reference in conducting research and can be used as a reference for conducting research so that the author can add insight and theoretical basis used in previous research. Both journals, articles, books and pre-existing theses, with the aim of wanting to know and compare the results obtained as material for consideration and a basis for the theories that will be used in writing the thesis. There are several village asset management information systems, of course with different methods and media. The following is previous research in the form of journals related to the research that the researcher will carry out, which can be seen in Table 1.

Table 1. Previous Research

No	Title and Author	Method	Results
1	Web-Based Village Asset Management Information System in Purwosari Village [8].	*Waterfalls*	The Purwosari Village Office, Purwodadi District, Purworejo Regency, currently in managing existing village assets still uses a manual system, namely using notebooks and will recapitulate them to make reports. This research aims to design and build a village asset management information system.
2	Application of a Computer-Based Information System to Design and Build an Android-Based Village Asset Management System in Pompengan Village [9].	*Waterfalls*	The conclusion is that the village asset management system design application was built and designed using UML, activity diagrams, sequence diagrams, class diagrams and Android Studio software in Java language and integrated with the MYSQL database. The system development method used is the waterfall method and tested using the black box testing method. The application can run on the Android operating system with versions Android 5.0 (Lollipop) to Android 10 (Q)
3	Village asset management strategy based on the "SIPEDES" village asset management system application in Karang village, Jaladri, Parigi sub-district, Pangandaran Regency [10].	*Waterfalls*	Village asset management strategy based on the "SIPADES" village asset management system application in Karang Jaladri Village, Parigi District, Pangandaran Regency, namely: lack of direction from social services, community and village empowerment regarding guidelines for using the village asset management system application, there is no special emphasis on using the system application village asset management, there is no updating of the village asset management system application every year. The aim of this research is to determine village asset management strategies based on the "SIPADES" village asset management system application in Karang Jaladri Village, Parigi District, Pangandaran Regency.
4	Management of village information systems in Pasirmukti village, Cineam sub-district, Tasikmalaya district [11].	*Waterfalls*	Efforts are made by the village government to overcome obstacles in managing the village information system by providing information not only through websites, but using other social media, by making billboards or print outs for each village, so that the information conveyed is quickly received by all village communities. Pasirmukti.

2.3. Use Case Diagrams

A use case diagram isis a type of diagram in UML that describes interactions between systems and actors. A use case diagram is a diagram that describes the interactions that usually occur between users and the system through how the system is used. Use case diagrams consist of use cases, actors, subject boundaries, associations, includes, extensions, and generalizations [12].

Table 2. Use Case Diagram Components

No	Name	Symbol	Information
1.	*Association*		Reciprocal communication that occurs between actors and use cases.
2.	*Extend*		Use case relationships that can stand alone even if not with other use cases.
3.	*Generalization*		The relationship between two use cases but one use case has a general function.
4.	*Including*		A use case relationship that requires another use case to carry out its function.

2.4. Waterfall Method

The waterfall method is a systematic research method model that is applied in conducting research, because this method presents step by step which is very appropriate to the conditions in the field [13]. This development model is linear from the initial stage of system development, namely the planning stage, to the final stage of system development, namely the maintenance stage [14]. The next stage will not be implemented if the previous stage is not completed and will not return or repeat the previous stage. There are several stages in the waterfall method described.
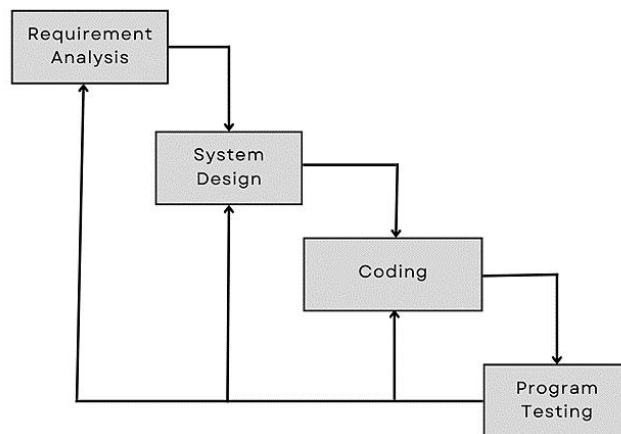

Figure 1. Waterfall Method

On picture1. Above are the general stages of this process model. To divide this model into 4 stages, even though they are broadly the same as the stages of the waterfall model in general [15]. The following is an explanation of the stages carried out in this model:

1. Needs Analysis
   In this step the author analyzes system requirements, starting with analyzing user needs. After that, an analysis of the software and hardware requirements to be used is carried out. One example of a document is the Product Requirement Document (PRD). This document contains a kind of checklist about what is involved in the application process.

2. System design
   This stage is the stage for translating the needs and data that have been analyzed into a form that is easily understood by users. In this step the author creates a system design, starting with creating a process, context diagram, Data Flow Diagram (DFD). The next stage is designing the data model and designing the user interface to see an overview of the system design in the Figma design application and all the functionality required by system users. The design must be able to implement the needs mentioned in the previous stage. Like the previous 2 activities, this process must also be documented as a software configuration.

3. Coding
   The coding stage is the stage of translating data that has been designed at the design stage into a predetermined programming language. This coding stage must be completed completely before proceeding to the testing stage. In this step the author writes the program code, where the author will translate the system design of the system into the PHP and MySQL programming languages as a database management system. To be understood by hardware, in this case a computer, the design must be converted into a form that can be understood by machines, namely into a programming language

through the coding process. This stage is the implementation of the design stage which is technically carried out by the programmer.

4. Program Testing

The testing stage is the stage of testing the system or program after it is created. This stage aims to find out whether the system still has errors/bugs and whether the system runs according to the commands requested by the user or not. After writing the program code is complete, the author will test the system that has been created. Any system created must be tested. Likewise with software. All software functions must be tested, so that the software is free from errors, and the results must truly comply with predetermined requirements.

2.5. Research Flow

The stages carried out in designing and building a web-based village asset management information system in Waimbidi Village, Kambata Mapambuhang District, East Sumba Regency, start with several stages, namely problem identification, data collection, modeling system requirements, system requirements analysis, coding, system testing, implementation and system evaluation [16].The research flow implemented by the author can be seen in Figure 2.
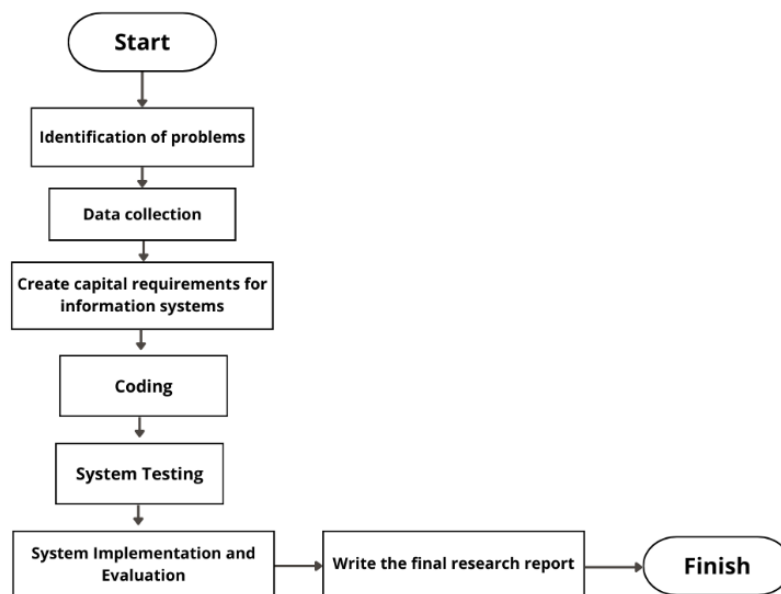

Figure 1. Research stages

The information from the research framework above is:

1. Identification of problems

Problem identification is the first step taken in this research. At this stage the researcher formulates the scope of the problem to be discussed. in this research. At this stageformulationThe problem in Waimbidi Village is the most important stage which aims to determine the problems raised in the research in the form of data processingassetvillage at the Waimbidi Village office.

2. Data collection

As supporting material which is very useful for researchers to search for or collect datarequiredin this research. The data sought must be in accordance with the researcher's objectives. At this stage, researchers collect data by observation. Observations were made by directly observing all activities and participating in work at the Waimbidi Village office.

3. Modeling information system requirements

In this research, system modeling is carried out on how to build an information systemmanagementvillage assets at the Waimbidi Village office using design tools such as Unified Modeling Language (UML) for modeling system structure and workflow and Entity Relationship Diagram (ERD) for modeling database structure.

4. Coding
At the system coding stage, researchers will apply the HTML, PHP, CSS, JavaScript and MySQL database programming languages [17].

5. System testing
This stage is application testingmanagement assetvillage at the Waimbidi Village office where the results of testing the program that has been built. It is hoped that this application can help and resolve existing problems at the Waimbidi Village office, so that it can assist the head of the service section in processing all existing data.

6. System implementation and evaluation
At this stage, after being tested, there is no further processing*error*or errors, the next stage is implementation and evaluation of the system.

3. RESULTS AND DISCUSSION

In conclusion, this research succeeded in achieving its objectives by designing and implementing an effective and efficient web-based application. This application can facilitate the process of processing village asset data. Thus, this research makes an excellent contribution in improving the quality and efficiency of village asset data processing in Waimbidi village. The successful implementation of this web application shows that the proposed solution is able to overcome the identified problems well, provide a positive impact, and provide a strong basis for further development at the thesis title submission stage in the future.

3.1. System Design

A use case diagram is a type of diagram in Unified Modeling Language (UML) that is used to describe interactions between actors and use cases in a software system or other system. Use case diagrams help in modeling system functionality from the user's perspective and show how actors interact with the system [18].
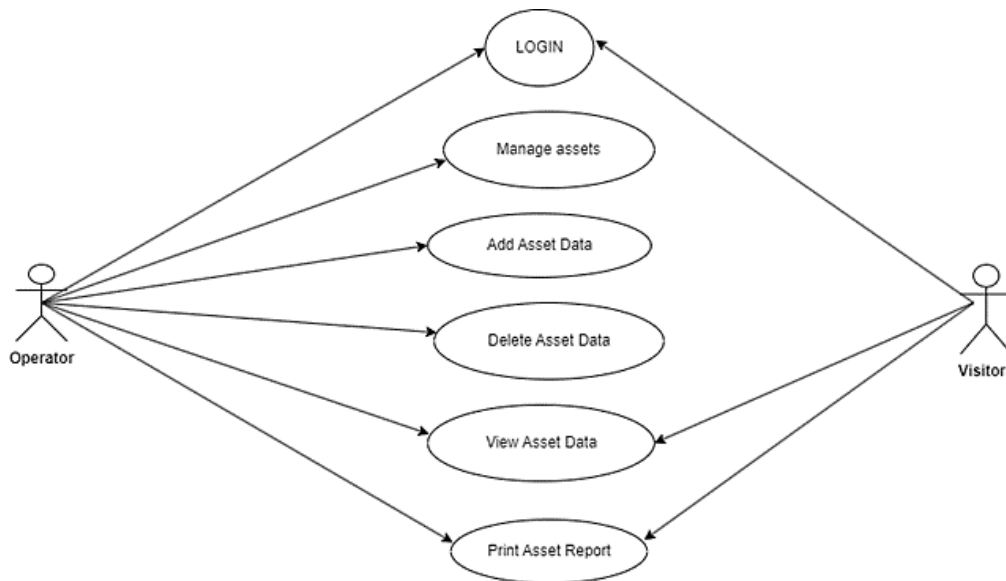

Figure 3. Use case diagrams

Figure 3 is a use case diagram which is used to describe the internal and external relationships of the system or the relationship between the system and actors. Use cases are used to find out every function in the system that will be built together with system users. The use case diagram above illustrates the relationship between several actors and activities involved in the village asset system. Operators and visitors must log in and be validated by the system before they can access subsystem functions. Visitors can only view and print village asset reports, while operators can manage the system, namely adding, editing, deleting, viewing and printing reports.

3.1.1 Class Diagrams

A class diagram is a type of diagram in UML (Unified Modeling Language) that is used to describe the static structure of a software system [19]. Figure 4 showsrelated to several tables containing class names and attributes along with methods. There are twelve class tables, namely operator table, user table, login table,

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registration table, goods table, book table, land table, warehouse table, loan table, roles table, role permissions table, and report print table. Some diagrams will display subsets of classes and their relationships. Usually, several class diagrams are created for a single system. Several diagrams can be created as desired to get a complete picture of the system being built.
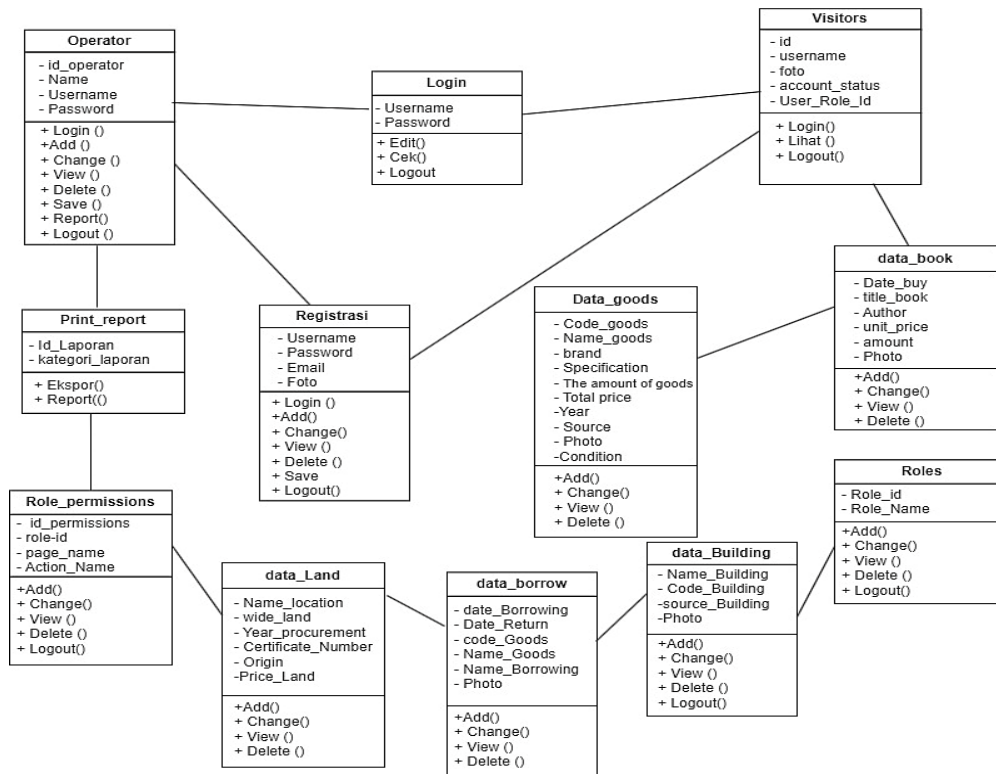

Figure 4. *Class Diagrams*

3.1.2 Activity Diagram LoginVisitors and Add Asset Data

An Activity Diagram is a type of diagram in Unified Modeling Language (UML) that is used to describe work flow or activities in a process or system. This diagram helps in modeling business processes, user scenarios, or internal workflows of a system [20].
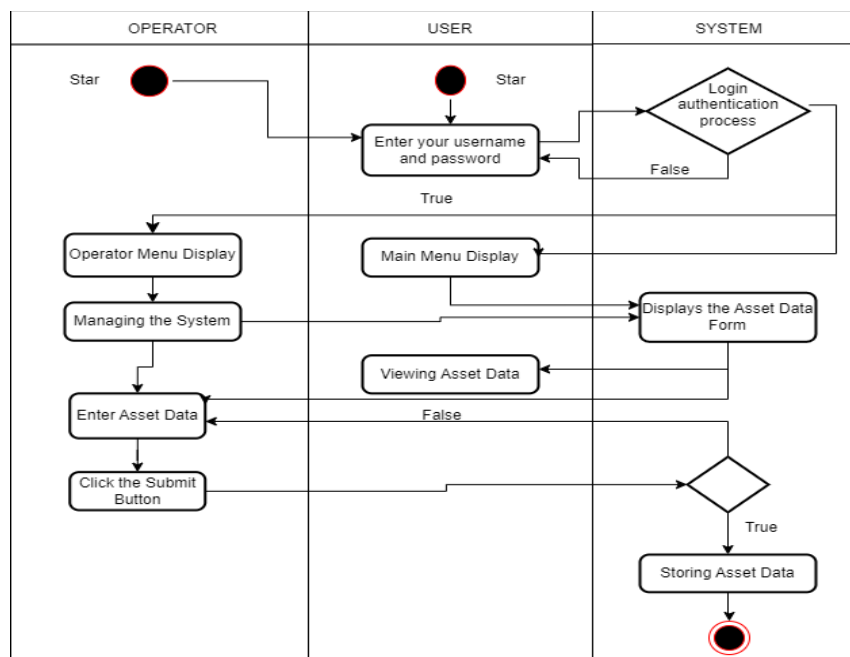

Figure 5. Activity Diagram Login visitors and add asset data

Based on Figure 5, it is explained that operators or visitors must log in by entering their username and password. Before that the operators andvisitors carry out the registration process which is validated by the system, if the username and password entered are correct then the login is valid and then it will go straight to the main menu display, but if the username and password are incorrect it will return to the first page to fill in the username and password again. After that, visitors can log in and enter their username and password. After successful login, the system will display the main page which can be accessed by operators and visitors. After that, the operator goes to the main menu and then manages detailed data, namely data on goods, books, land, buildings, loan assets, visitor data, role permissions and roles. operators in managing the system, namely adding assets, editing, deleting, viewing, printing reports and saving data. then after pressing the save button, the total details of all village assets will be displayed. In contrast to users/visitors, only those who can see and if the operator allows visitors can manage the system.

3.2. System Implementation
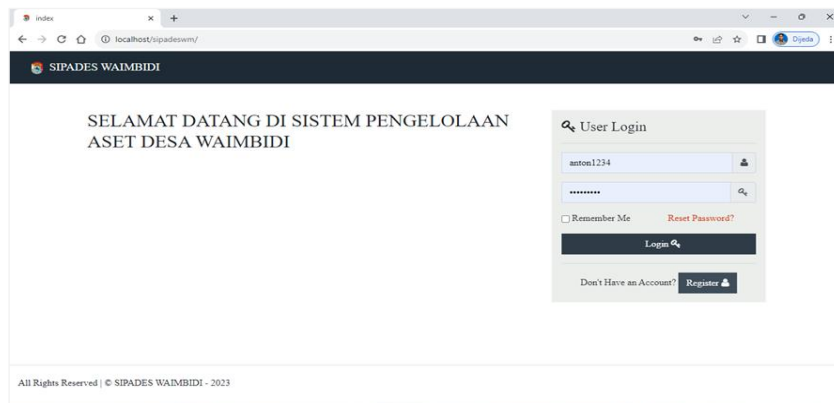### 3.2.1 Login Page

Figure 6. Login page

In Figure 6, the login menu design on the user display. This display will be displayed before going to the main display. This page can only be accessed by users of the system for which it was created. so it is fully functional to regulate operators who have the right to access the system. In this structure, the system asks the user to enter the registered user's username and password. The login form consists of a username and password which must be filled in by the user to enter the system. If the user enters the username and password incorrectly, a notification will appear. If the login is successful, the system will display the main page. However, if the login fails, the system will ask the user to re-enter their username and password.

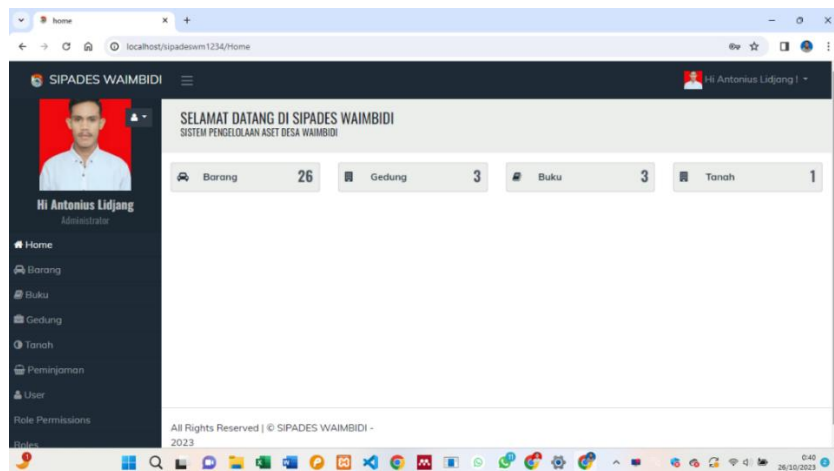### 3.2.2 Operator Dashboard Page

Figure 7. Operator Dashboard Page

In Figure 7 is the home menu design on the operator display. The operator's main page is the main page display which is the initial page after successfully entering the username and password. The page that appears

when the operator successfully logs in to the information system. This menu displays various menus that can be accessed by operators, namely; data on total items, total rooms, total books, and total borrowers.
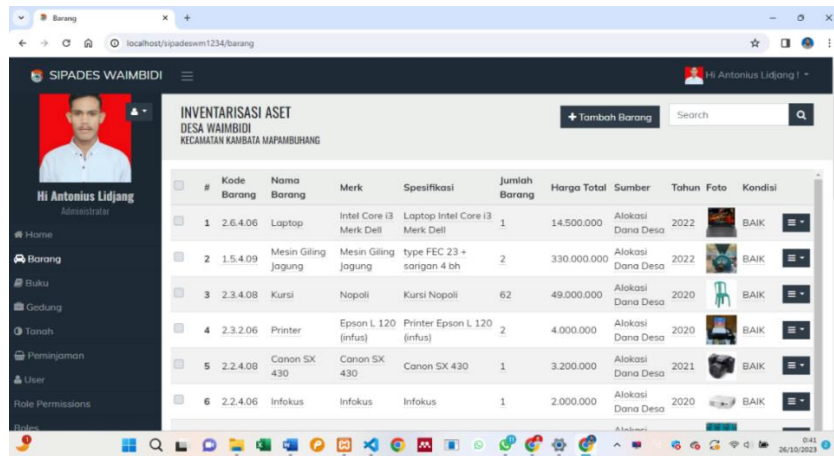
3.2.3 Item Data Page

Figure 8. Item Data Page

In Figure 8 is the page used to store item data on the operator's display. The item data page is a page that appears when the user selects the item menu on the system. On this page the operator can add or change and delete item data. To add item data, the operator can select the view data button, add data, edit data, delete and print an item data report. This page also provides search facilities for data that has been entered into the system.

3.2.4 Add Item Data page

Figure 9 shows the page display for adding item data to the operator display. This menu displays various menus that can be accessed by operators and visitors, namely; item code, item name, brand, specifications, number of items, total price, photo condition, source year and updated item data. If the data is successfully saved, a successful data saving notification will appear.
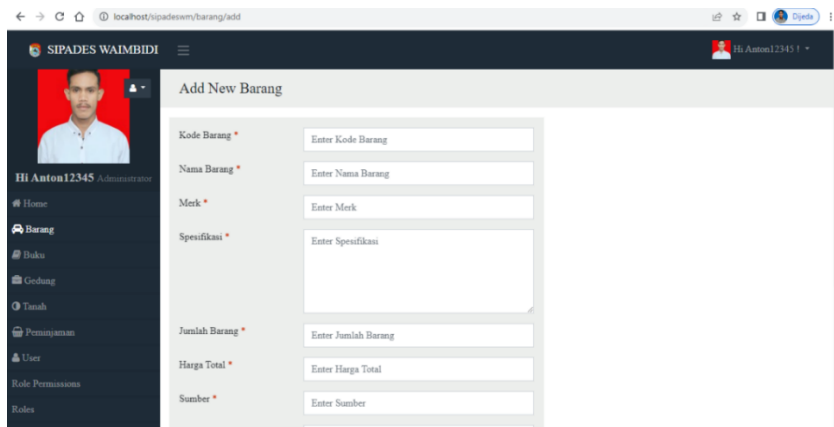

Figure 9. Add Item Data page

3.3. Testing

Testing of the village asset information system in Waimbidi Village was carried out using black box testing, the results of the village testing can be seen in the table below:

Table 3. Black Box Testing Results

Function Name	Information	Expected results	Test result
Data entry menu	Users can enter their username and password to log in to the system.	The system is able to display the user login page and after that the system will display home.	Success
	The user entered the wrong username and password.	The system will display the message "incorrect username and password" and display a login form to be filled	Success

Function Name	Information	Expected results	Test result
		in with the correct username and password.	
Registration data menu	Displays the user account registration menu.	The user account registration menu is used to add new user data, where the user data to be entered is username, password, password confirmation, email, photo and user role ID.	Success
Home data menu	Displays the home menu.	This system will display the home menu. The page that appears if the operator successfully logs in to the village asset information system.	Success
CRUD item data	Displays CRUD data items.	This system will display the item data menu. The item data page is the page that appears when the user selects a menu item in the System.	Success
CRUD build data	Displays the building data CRUD building data menu.	This system will display a building data menu when the operator and visitor select the building data button.	Success
CRUD book data	Displays CRUD book data CRUD book data.	This system will display a book data menu when the operator and visitor select the book data button.	Success
CRUD land data	Displays CRUD land data.	This system will display a land data menu when the operator and visitor select the land data button.	Success
CRUD user data	Displays CRUD user data.	This system will display a user data menu when the operator and visitor select the user data button when the operator wants to view user data.	Success
CRUD data role permissions	*Displays CRUD role permission data.*	This system will display a role permission data menu. If the operator wants to see all village asset data, the operator will press the role permission button.	Success
The role of CRUD data	*Displays CRUD role data.*	This system will display a data menu when the operator wants to view user data registered in the system.	Success
CRUD report data	Display and print CRUD report data, village asset data reports.	The system is able to display asset data reports according to the keywords entered.	Success
CRUD Out Data	Users can exit the system by clicking the logout button.	The user selects logout and the system logs back in.	Success

Based on black box testing, it is explained from several tests carried out, namely, testing user account login menu, user account registration menu, CRUD goods data, CRUD building data, CRUD book data, CRUD land data, CRUD goods borrower data, CRUD user data, role permissions CRUD data, CRUD data roles, print reports and logout. everything has been successfully implemented, meaning that all the features built are as expected.

4. CONCLUSION

Based on the results of the analysis that the author has carried out, the author can draw conclusions regarding the website-based village asset information system in Waimbidi village as follows:

1. Can make it easier for village officials to manage assets owned by the Waimbidi Village government.
2. It can make it easier to find out the total number of assets or inventory items owned by the Waimbidi village government, as well as being able to find out the source, location, person responsible for the goods, amount of acquisition and year of acquisition as well as the total. wambidi village assets.
3. Having a database can provide security for village asset data if in the future the asset data is used for urgent needs, so that there is no need to collect asset data which takes a long time and can also avoid errors in village asset data collection.

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