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Web-Based Information System for the Stuff Inventory at UPTD PPD South Bandung Region

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Abstract

The inventory of stuff must be neatly arranged. Using technology supported by an information system, it is hoped that the storage of an item can be neatly arranged. To support broad mobility, a web-based platform is essential. It can provide sufficient integrity for users. This website-based inventory information system is one way to solve problems in the UPTD PPD South Bandung Region. In its design, this system uses qualitative research methods and software development methods of Software Development Life Cycle (SDLC) as well as a system analysis design, namely Data Flow Diagrams (DFD), to determine the flow of the data. The testing was limited to program quality using Blackbox testing to test the program properly.

Keywords: System information, Web-base, Inventory

Abstrak

Inventarisasi barang harus tertata dengan rapi. Penggunaan teknologi yang didukung dengan sistem informasi, diharapkan penyimpanan suatu barang dapat tertata dengan rapi. Untuk mendukung mobilitas yang luas, diperlukan platform berbasis web dan dapat memberikan integritas yang cukup bagi pengguna. Sistem informasi persediaan barang berbasis website ini merupakan salah satu cara untuk mengatasi permasalahan pada UPTD PPD Wilayah Bandung Selatan. Dalam perancangannya, sistem ini menggunakan metode penelitian kualitatif dan metode pengembangan perangkat lunak Software Development Life Cycle (SDLC) serta rancangan analisis sistem yang akan digunakan yakni Data Flow Diagram (DFD) untuk mengetahui aliran data yang mengalir. Pengujian dibatasi pada batas kualitas program menggunakan pengujian Blackbox untuk menguji program dengan baik.

***Kata-kata kunci**: Sistem informasi, Basis web, Iventaris*

1. Introduction

Technology can make it easier for humans to solve various problems in the world. We can depend on technology for individual, group, company, or country problems [1] [2]. Usually, the problem solving is based on a system that can support and manage the overall flow well and is structured. This system allows data or information to be processed and manipulated. However, it should be noted that the system must provide convenience, not difficulties. This will impact the output of the system that has been created. Information systems usually run on desktop, mobile, and web platforms [2]. If you look at the ease of access and mobility that are pretty consistent, then web-based can be used to support systems from light to heavy enough [3] [4].

Sometimes, companies or governments have similar problems with many things implemented using technology [5] [6] [7]. One of the problems that often occurs is the inventory issue. Inventory of goods is a concept of storing goods that are neatly recorded. There might be no problem with this. However, when the company or government deals with a large enough scope and availability of goods, there may be difficulties controlling this manual system [8]. UPTD PPD South Bandung Region is a regional technical implementing unit for provincial tax revenues, especially land and building taxes. Based on the observation, the inventory mapping was not recorded, so there was a possibility of errors occurrance. With the diverse premises above, to solve the inventory problem, this research with the title of: "Web-Based Information System for the Stuff Inventory at UPTD PPD South Bandung Region" was conducted. As a result, with this system, the government, especially the UPTD PPD South Bandung Region, can conveniently manage the existing goods.

2. Method

There are two methods used to support this research: data collection and research methods. There are three methods in the data collection method: interview, literature study, and observation. Meanwhile, the research method was based on a qualitative approach to ensure a qualified quality when the research is implemented [9].

a. Method of collecting data

As previously quipped, the data collection method consisted of direct observation at the UPTD PPD South Bandung Region, interviews conducted with the UPTD PPD South Bandung

Region staff, and literature studies to obtain information and related information research. Below is the understanding and knowledge of the three aforementioned methods.

b. Observation

Observation is observing the behaviour, activities directly, or the way objects solve problems. In this study, comments were limited to staff and admins who recorded the inventory of UPTD PPD South Bandung Region [9].

c. Interviews

Interview is obtaining information for research purposes using questions and answers face to face, either in person or online. In this study, interviews were conducted directly with UPTD PPD South Bandung Region staff. They were limited to staff and admin issues managing the inventory of goods at UPTD PPD South Bandung Region [9].

d. Literature Studies

Literature study is a technique of collecting data by reading valuable sources of information, whether it comes from books, scientific journals, or articles on the internet. A literature study was used to obtain information related to the supporting theory of the required components [9].

e. Research methods

The research method used was qualitative based on the philosophy of post-positivism, which examines natural objects, where the researcher was the key instrument, and the data collection technique was done by triangulation (combined).

To implement the above method, a software development model was designed. The software development was used with the Waterfall SDLC (System Development Life Cycle) model. This model is very advantageous because the software life flow approach is sequential or composed of requirements analysis, system design, software development, Blackbox testing, implementation of new systems, and maintenance of current systems **[10]**. Software Development with the Waterfall SDLC model is presented in **Figure 1**.

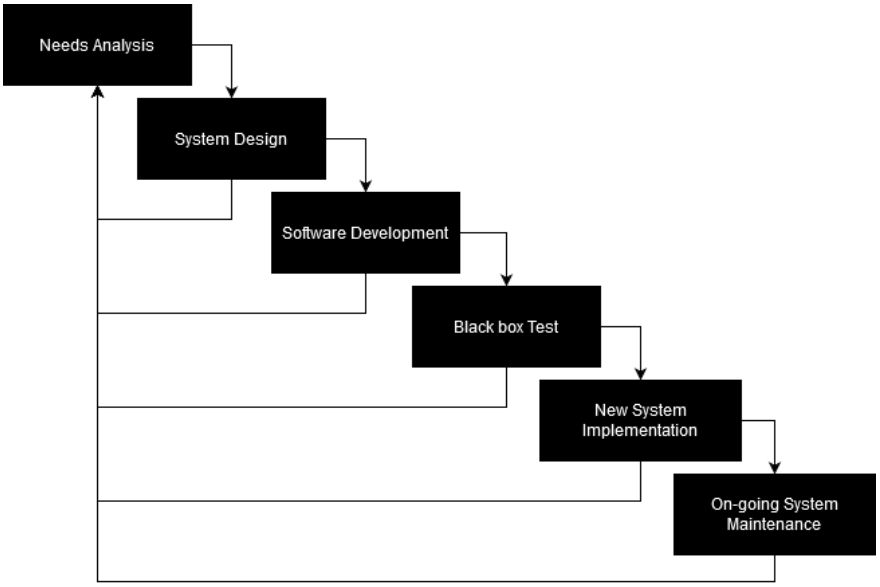

Figure 1. Software Development with the Waterfall SDLC model

1) Needs Analysis

The initial stage was gathering software requirements, such as data flow and relationships between the data. The analysis must help understand the system, visualize the flow, and detail system components. The closest of these criteria is data-based analysis, DFD (Data Flow Diagram) **[11]**.

Hardware and software specifications are needed to support research so that research can run smoothly. The following are the required hardware specifications. The required hardware specification is presented in Table 1.

Table 1. The Required Hardware Specification

No	Name	Specification
1	HDD	10 GB
2	RAM	2 GB
3	Internet	10 Mbps

Table 2 shows the required software specifications.

Table 2. Software Requirements Specification

No	Name	Specification
1	Operating Sistem	Windows 10/ Linux/ macOS
2	PHP CLI	V8.0^
3	Node JS	V16.8
4	Composer	V2^
5	Visual Studio Code	V1.5
6	XAMPP	V8
7	Web Browser	Chrome/Firefox

With adequate needs, at the stage of development and implementation, the system can facilitate and not burden the product being built.

2) System Design

A set of activities must describe in detail how the system will work. To produce research, software needs to solve pharmacist problems on stock management [12].

3) Software Development

In this section, we translated the design and analysis that has been made into software. In this research, we used PHP web-based technology.

4) Blackbox Test

Undoubtedly, programs that have been developed must have good quality, so testing is needed to check if there is an error in the program technically. The appropriate test is Blackbox testing [13]. Blackbox testing flowis presented in Figure 2.

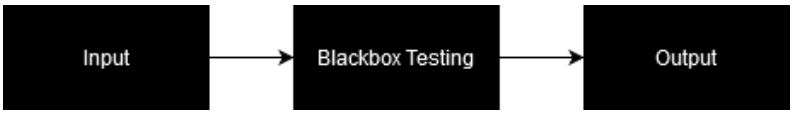

Figure 2. Blackbox Testing Flow

The picture illustrates that the pharmacist inputs data, and in the process, whether it is by the desired expectations, even if it is not by the expectations, then a good program is to provide return values in the form of information for pharmacists [10].

5) New System Implementation

The completed software which was tested by Blackbox and declared to meet the expectations was then fully implemented and ready to be used by pharmacists.

6) On-going System Maintenance

Pre-software running will always be maintained for its quality and redeveloped as an early stage for developing new features or implementing new technologies to outwit better quality.

3. Results and Discussion

As explained in the waterfall stage of SDLC, there must be an analysis design that visually represents the logic and system using DFD. In this section, the results are divided into two, namely the DFD and ERD analysis results and the results of the DFD ERD itself to the user interface.

a. Presenting the Results

1) System Analysis

The system analysis consisted of two. Entity-relationship Diagram (ERD) was used to determine what data were in the information system with the flow of relationships between data tables is known. The second was the Data Flow Diagram (DFD) as a visual design to determine the system's flow based on the flowing data. In this Data Flow Diagram (DFD) are several levels, with the function the higher the level, the more detailed the analysis. In this study were two levels. The first level was an overview of the system and the second level was an additional description of each system process at the first level.

2) ERD

In **Figure 3** are four tables in this Entity-relationship Diagram (ERD) analysis.

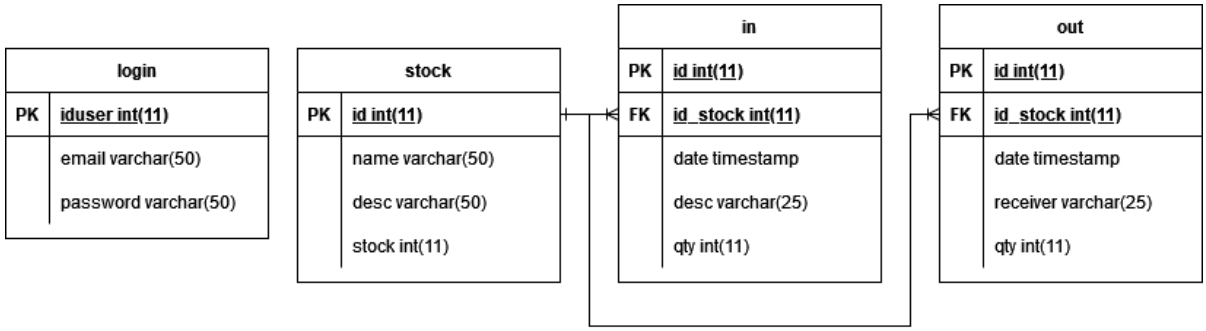

Figure 3. Entity-Relationship Diagram (ERD)

The login table is used to accommodate admin data, in which there is an Iduser, email, and password. The second table is the stock table to accommodate the initial stock of kinds of stuff. The third and fourth tables are related to the stock table with the concept of one to many. Algorithmically, incoming stuff will automatically add to the stock table and the out table. Outcoming elements will reduce the stock of things on the stock table.

3) Context Diagram

A context diagram is a rough idea of who is involved in the system (Entity) and the data flow between the design and the entities. Figure 4 explains that two entities are involved, namely the manager and admin. Managers get information on stock, incoming stock, outgoing stock, and manager's report via a login. Meanwhile, the admin does not only get information as the managers do but also processes that information by sending stock data, incoming stock data, outgoing stock data, and login data. Each data flow will be more evident on level one and two diagrams. Context diagram is presented in **Figure 4.**

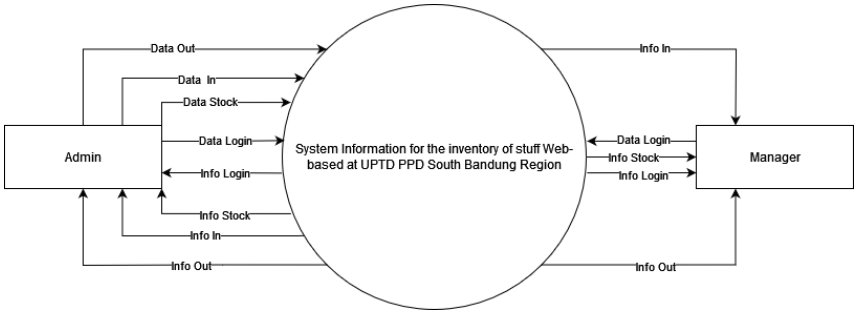

Figure 4. Context Diagram

a) Lv. 1 Diagram

Figure 5 shows three main processes in the first-level Data Flow Diagram (DFD) analysis system: author authentication, information access, and data management.

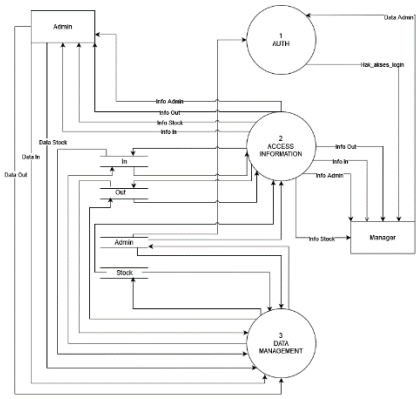

Figure 5. Lv. 1 Diagram

Details of each method will be presented in the next section. The previously created Entity-Relationship Diagram (ERD) table is represented in the form of a data store in the Data Flow Diagram (DFD). Each process will get input and output as needed.

b) Diagram Lv. 2 Authentication

The second level of the first process is authentication, as described in **Figure 6**.

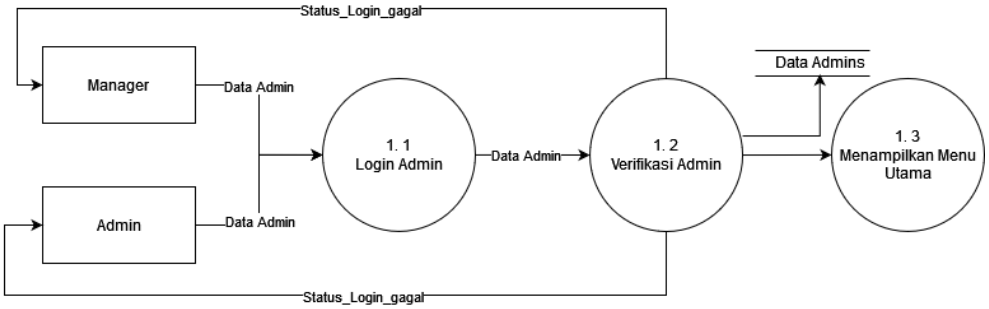

Figure 6. Diagram Lv. 2 Authentication

There are three processes: admin login, admin verification, and displaying the main menu. The entity manager and admin provide data. The data is sent and processed in the first part and followed by admin verification. If the information does not match the database, the admin

verification will inform the manager and admin entities. If flourishing, it then displays the main menu. One datastore is obtained in this section, namely the admin data.

c) Diagram Lv. 2 Access Information

The lv chart. 2 contains information access. There are two processes, namely checking admin information and showing information, which provide information in the form of admin info, info out, info in, and stock info, along with the four data stores needed by the process, which can be illustrated in **Figure 7**.

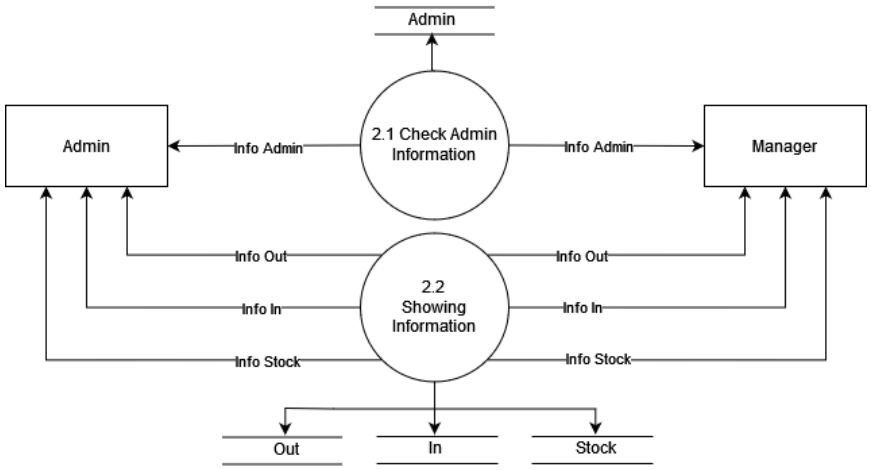

Figure 7. Diagram Lv. 2 Access Information

d) Diagram Lv. 2 Data Management

The last level 2 diagram analysis is data management. In this section, only admins do their job. There are three processes, namely, input, delete, and update. It focuses on stock management, incoming goods, and outgoing goods. Diagram Lv. 2 data management is presented in **Figure 8.**

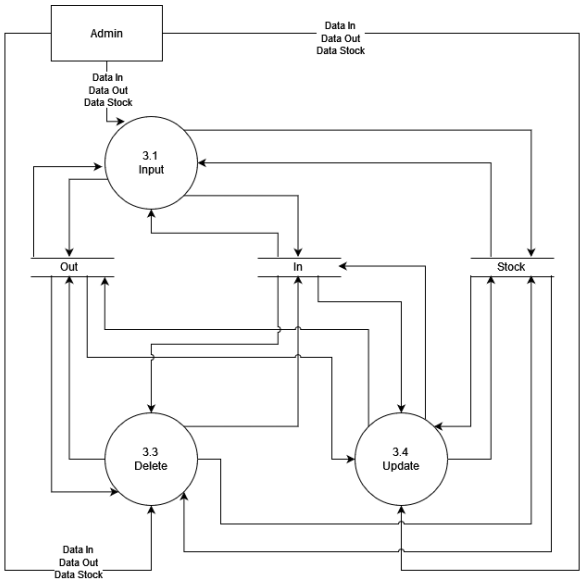

Figure 8. Diagram Lv. 2 Data Management

e) Design user Interface

After the design analysis has been made, software development follows the SDLC waterfall flow. The development results are in the form of a website and presented in user interface login, stock, stock in, and stock out.

b. User Interface of login

The first user interface is the login user interface. Referring to the ERD created, the admin and manager must fill out an email and password input form. The admin and manager will be directed to the following menu if successful. The display is made simple so that admins and managers can easily recognise and log in, as shown in **Figure 9**.

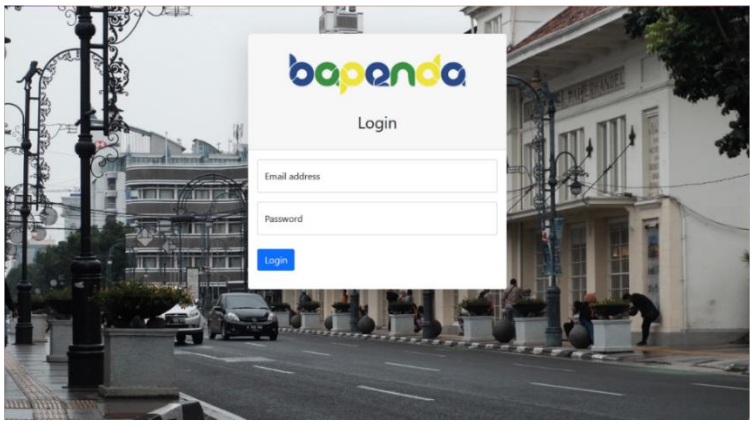

Figure 9. User Interface of Login

c. User Interface of Stock

Figure 10 shows the stock menu display, in which there is a list of information tables of all stock data plus actions to manipulate data, especially edit and delete.

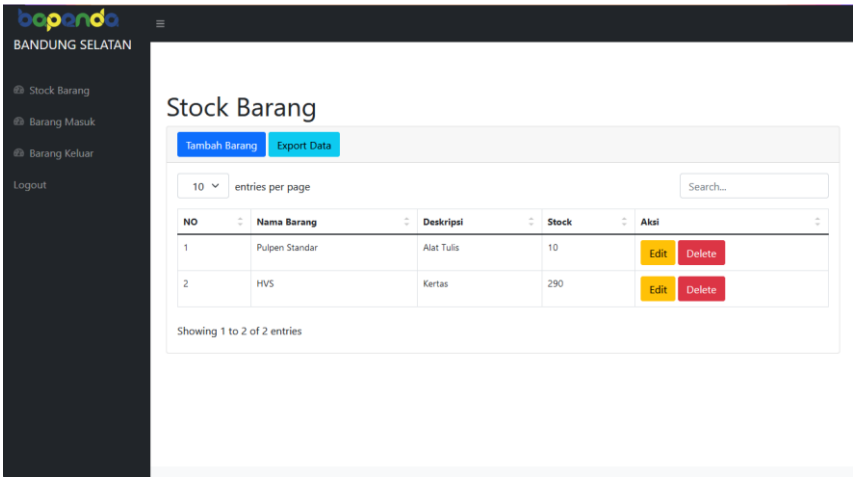

Figure 10. User Interface of Stock

In addition, stock can be added, and a report can be made to be reported to the manager in the form of a pdf.

d. User Interface of Stock In

Incoming goods are displayed in Figure 11; there is a table view of the data for incoming goods starting from the date to the description. There are also actions to edit and delete data and add incoming goods.

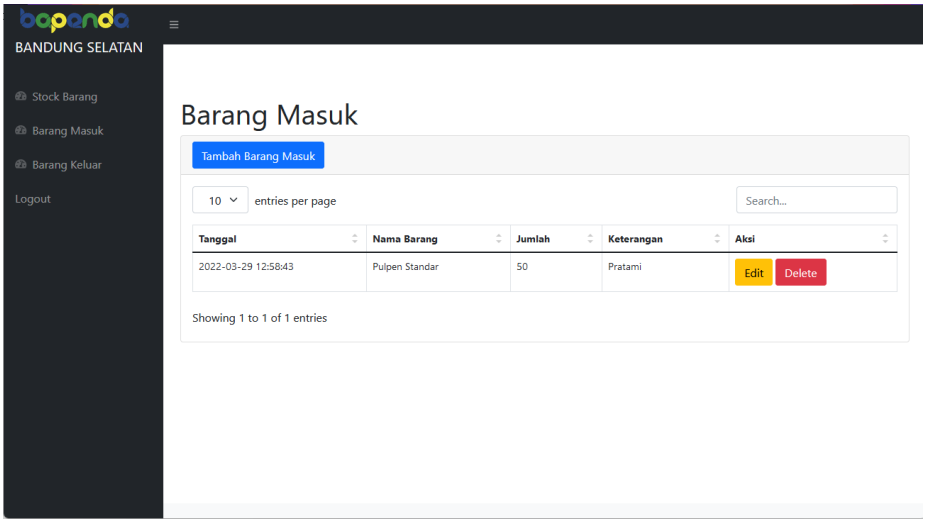

Figure 11. User Interface of Stock In

e. User Interface of Stock Out

The last item is the outgoing item shown in **Figure 12.** It looks similar to Figure 10, starting from the list table, editing, deleting, and adding data.

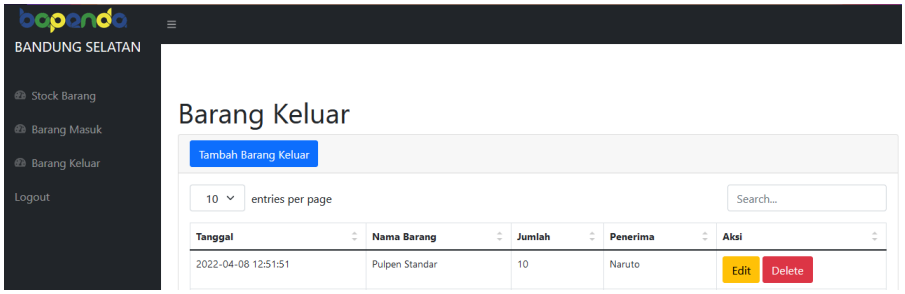

Figure 12. User Interface of Stock Out

2) Blackbox Testing

After the system has been analysed and implemented in the program, the thing that must be done is to test whether the program is running correctly or not. From the premise above, the closest thing to testing is Blackbox testing. Blackbox testing focused on functional activities on login, stock management, and stock entry.

a. Blackbox testing for Login

Based on **Table 3** above, the system has succeeded in overcoming if the email and password are correct, the email and password are incorrect, and the email and password are not entered.

Table 3. Blackbox texting for Login

No	Name of Testing	Result expected	Result
1	Login with the correct email and password	Login success and redirect to Stock	Success
2	Login with the wrong email and password	Login fail	Success
3	Login without email and password	Login fail	Success

b. Blackbox testing for management stock

In this section, the test is based on the concept of CRUD to find out whether one is not running smoothly. It can be seen that the system can handle the program when the data entered is incorrect or the form is not filled out, as shown in **Table 4**.

Table 4. Blackbox texting for management stock

No	Name of Testing	Result expected	Result
1	Add data stock with fill all form	Data successful added	Success
2	Add data stock without filling all form	Data Failed added	Success
3	Edit data stock with fill all form	Data successful updated	Success
4	Edit data stock without filling all form	Data failed updated	Success
5	Delete data whose id exists	Data successful deleted	Success
6	Delete data that id not exist	Data fail deleted	Success

c. Blackbox testing for stock in and out

The last test seen in **Table 5** is testing on incoming and outgoing stock items. The test is devoted to whether the data in the stock table can be added when the same thing is in stock, or if the goods come out, whether the supply is reduced or not.

Table 5. Blackbox texting for stock in and out

No	Name of Testing	Result expected	Result
1	Add stock in	Data on stock increases according to incoming stock	Success
2	Add stock out	Data on stock decreases according to incoming stock	Success
3	Add stock out of range of stock.	Data fail added and give notification for stock out more than stock	Success

4. Conclusion

The analised goods inventory system has been used to implement the UPTP PPT South Bandung Region. With this system, it is easier for staff to record incoming and outgoing goods in detail so that there are no serious errors due to data errors. However, something is underlined

at the UPTD PPT South Bandung Region, and the subsequent developer or researcher needs to be something.

a. This system needs more socialisation because there is a transition from traditional to digital usage, so admins and managers must have sufficient knowledge regarding program operations.
b. This system runs on the internet via hosting. So, there is a possibility that if the server on the hosting dies, the system dies too. The solution is users must always back up data either once a week or once a month.
c. This system is still somewhat incomplete, so it is hoped that it can be re-developed in the future.

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