



IMPLEMENTATION OF WATERFALL METHOD IN PD INVENTORY INFORMATION SYSTEM ADIWANGI KARAWANG

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ABSTRACT

In the era of Information Systems, development changes, especially in the field of sales, have changed very rapidly. *AdiWangi* Trading Company is one of the companies engaged in the sale of staple goods. In providing services to customers and the general public, *PD AdiWangi* has not been able to fulfill information needs optimally. The process of data collection is still done manually, so it takes a long time to complete it. With the current process, customers often feel that they have been served a long time and for the company itself there are often differences between the items in the data recorded and the items stored in *PD AdiWangi*, so that why this research uses waterfall method. The design stages used include program planning, program design, database, and program development. Inventory Information System with manual record by inputting into excel and record incoming goods. Whereas, outgoing goods recorded rarely, employees are not taken for placement on shelves. It has become a habit until now so that inventory of goods also not observed. From the results of the study, it can be concluded that the program design made named Inventory program design at *PD AdiWangi*. It is expected to facilitate the process of data collection, as well as making reports quickly and accurately compared to systems manually.

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1. Introduction

Inventory is a very important part of a company, because in this section it recorded the supply of goods. In other words, inventory is a valuable asset in a company. Inventory of goods is one of the activities of the company which is very important for the development of the company. The problem was faced by company is

there are frequent errors in recording transaction data for orders and sales of goods, resulting in difficulties to control inventory. The increasing of types of goods supply is several problems arise, such as inventory information cannot be presented quickly, precisely and accurately [2]. *PD Adiwangi* is a groceries company. It located at Jl. Raya Kosambi no.15 Klari-Karawang. The existing system in *PD Adiwangi* is still manually. *PD Adiwangi* maintain sales operation by availability of inventory in the warehouse. The Problems found at *PD Adiwangi* are the risk of fraud, errors in recording stock items caused by negligence of *PD Adiwangi* employees, loss or scrap of goods data files.

Inventory of goods is one of the company's important activities for developing company. The problem is often faced by company is there are frequent errors in recording transaction data for orders and sales of goods, resulting in difficulties in controlling inventory of goods [3]. The cause of this problem is the processing of transaction data which requires several steps and frequent errors in recording invoices, forms, and reports. In addition, processing transaction data into inventory information is often delayed by staff in the inventory section. To overcome this problem, it is necessary to have an inventory information system that is appropriate and as needed.

This research aims to build a decision support system for inventory control of goods with the waterfall method and can be further developed to provide convenience for the user. This information system can assist in making inventory control decisions and it is hoped can be useful for *PD Adiwangi* Karawang goods inventory in running business activities.

2. Research Methods

In developing an inventory information system, the research method used software development methods and data collection techniques.

2.1 Software Development Methods

In developing the model used waterfall model or often called as linear sequential model. The Waterfall model is a sequential software process, seen as continuously flowing downward (like a waterfall) through the phases of planning, modeling, implementation and testing [4].

The waterfall model provides sequential approach to analyse, design, code, test, and support steps. The steps of the waterfall model according to [5], as following:

1. Software Requirements Analysis

The process of collecting requirements is carried out intensively to specify software requirements so that the user can understand what kind of software is needed by the user. Specifications of software requirements at this step need to be documented.

2. Design

Software design is a multi-step process focuses on the design of a software program including data structures, software architecture, interface representations, and coding procedures. This step translates the interface, and the coding procedure. This step translates the device requirements from the requirements analysis step to the design representation to be implemented into a program.

3. Program Code

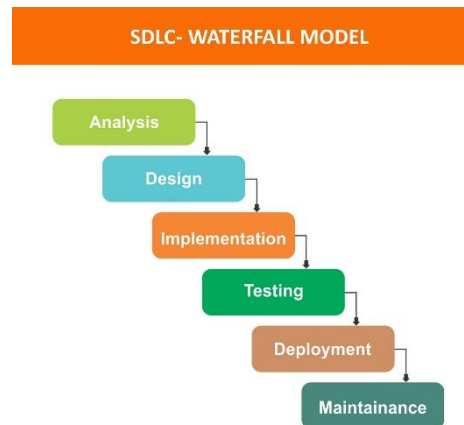
The design must be translated into a software program. The result of this step is a computer program in accordance with designs on design step.

4. Testing

Testing focuses on the software from a logical and functional point of view to ensure that all parts have been tested. This is done to minimize errors and ensure the resulting output.

5. Support or maintenance

It is possible software can change when it was sent to the user. Changes can occur due to errors and undetected damage during testing or new environment for the software to adapt. The support or maintenance phase can repeat the development process from specification analysis to change existing software, but not to creating a new software.



Source: <https://medium.com/>

Gambar 1. Metode Waterfall

2.2 Data Collection Techniques

In a research, data collection technique is one of the most important parts of the study, therefore, this step cannot be wrong and must be done carefully according to the procedure [6]. The data collection technique in this research is as follows:

1. Observation

Observation is also one of the most common data collection techniques in qualitative research methods. Observation was conducted to obtain a phenomena or incident to answer research questions [6]. The researchers took direct observations to the *PD Adiwangi Karawang* company to obtain problem was faced and collect data related to the inventory data processing system of *PD Adiwangi Karawang* goods.

2. Interview

Interview is a process of communication or interaction to collect information by means of question and answer between researchers and informants or research subjects [6]. In this method, the researchers conduct question and answer verbally with Mr. Saripudin as assistant to the owner of the company *PD Adiwangi Karawang*, the finance and sales department to obtain data related to the research object.

3. Documents

Documents of *PD Adiwangi karawang* company such as letters, notes, photo archives, meeting results, souvenirs, activity journals etc is needed to know the information in the pas [6]. The method aim to obtain data through intermediary media or books as compared between the problems to be discussed.

3. Results and Discussion

3.1 Needs Analysis

Based on the existing problems, a web-based product inventory program design application is needed to provide solutions the existing problems. The following is the specifications of the requirements of inventory program design application at *PD Adiwangi Karawang*.

The Administrator page

1. Can login and logout.
2. Can add and change customer data
3. Can add and delete merchandise data.
4. Creating a data item report per period

This non-functional requirement is a needs analysis which contains tools or support tools used to support the system. To design a new employee recruitment program was required support equipment to support and test the program.

1. Software

For the software needed :

- a. Microsoft Windows 7 (64bit)
- b. Adobe Dreamweaver CS 5
- c. Xampp version 1.7.7-VC9

2. Hardware

The hardware needed :

- a. Processor: E2-6110 APU and R2 Graphics
- b. Memory (RAM): 2GB
- c. HDD: 500GB

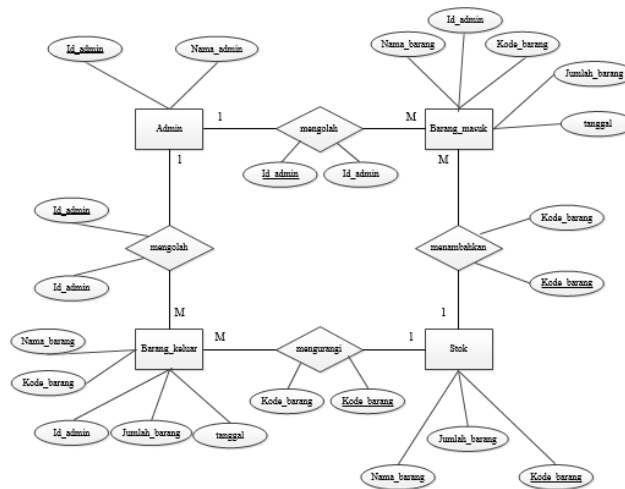
3.2 Supporting Tools

A. Database Design

1. Entity relationship diagram (ERD)

According to Indrajana in the journal [7] states that "Entity Relationship Diagram (ERD) is a top-bottom approach in database design to identify important data or entities and the relationship between these entities is described in a model or diagram. "

Diagram (ERD) is an image or diagram shows information made, stored, and used in business systems [8]

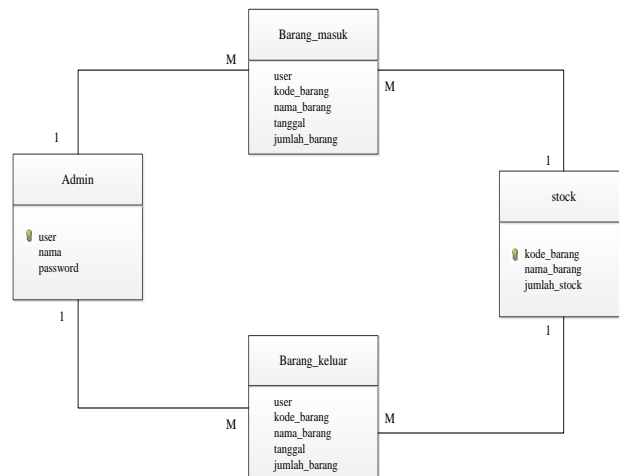


Gambar 2. Entity relationship Diagram (ERD)

2. Logical Record Structure (LRS)

Logical Record Structure is "a representation of the structure records in tables formed from the results between the set of entities, determining the cardinality, number of tables, and Foreign Key" [9].

Meanwhile, according to Friyadie in [8] explains that "Before the table is formed from fields or attributes of the physical entity or the internal level, so relational model must be made logically or at an external level and a concept, from that statement needed which is called by Logical Record Structure (LRS) ".



Gambar 3. Logical Record Structure (LRS)

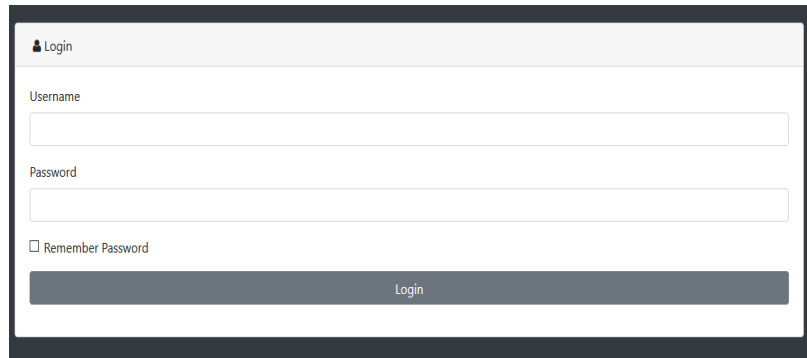
B. Interface Design

The analyzed and designed system begins to be translated into machine language through a programming language. It consists of two processes, namely program code and program interfaces for system navigation [10].

This implementation make the users understand how to work the program. The following is an implementation of the web-based inventory program design [11].

1. Display Login Page

The login page is a page to go to admin page, where only andmins registered to the system can log in.



Gambar 4. Tampilan login

2. Admin Main Page Display

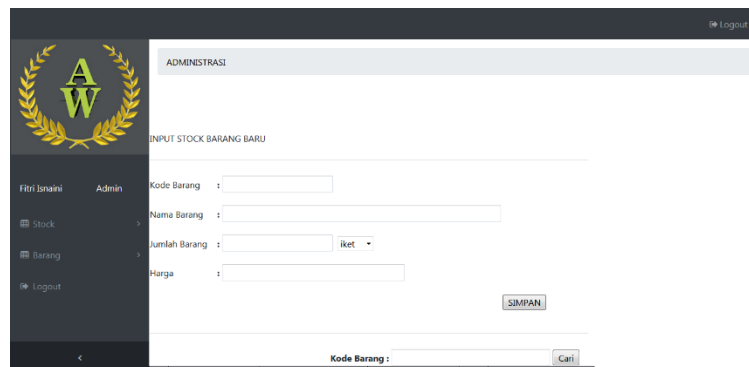
The index page is the first page when the system is run in a web browser. The main menu page display can be seen in Figure 5



Gambar 5. Tampilan halaman Utama admin

3. Display Input stock

The new stock item input page is a page has function to add new stock or goods.



Gambar 6. Tampilan Input Stock

4. Item Demant Display

This page is used by the admin if there is a request or demand for additional items to input and add the data of goods ordered.

Gambar 7. Tampilan Input Stock

5. Display approval of goods demand

This page is used as a control from the owner's side if the admin enters the inventory of goods where the requested item must be approved by the owner first.

No	Nama	Jabatan	Username	Password	Action
1	Syarip Hidayat	Owner	fisy1901	fisy1901	EDIT HAPUS
2	Saripudin	Admin	saripudin10	saripudin10	EDIT HAPUS
3	Fitri Isnaini	Admin	fitri1901	fitri1901	EDIT HAPUS

Gambar 8. Tampilan Persetujuan owner

C. Unit Testing

Testing is an important part of the software development cycle. Tests are carried out to ensure quality and also find out the weaknesses of the software. The purpose of testing is to ensure that the software was built has reliable quality to be able interpret the main studies of the specifications, analysis, design and coding of software. Testing this software uses the Black Box testing method that focused on the functional requirements of the software being made.

Black-Box Testing is testing software in terms of functional specifications without testing the design and program code. Testing is intended to determine whether the functions, input and output of the software are in accordance with the required specifications [12].

Login testing using the blackbox method make validation of the entered data username password and access rights. If the input data is valid then the login is successful, but if the input data is invalid the login fails.

Tabel 1. Testing Result of Black Box Testing Halaman Login

No.	Testing Scenario	Test case	Expected Result	Testing Result	Conclusion
1.	Username and Password (valid)	Username : (.....) Password: (.....)	System denied user access and display "invalid data"	As expectation	Valid
2.	Type username and do not type password, then klik login	Username: 1001 Password : (.....)	System denied user access and display "invalid data"	As expectation	Valid
3.	Username untype (.....) and type password, then klik login	Username: (.....) Password: 1998-03-31	System denied user access and display "unknown data"	As expectation	Valid
4.	Type right username and wrong password, then klik login	Username: 1001 (valid) Password: 1998-03-31 (wrong)	System denied user access and display "invalid data"	As expectation	Valid
5.	Type right username and right password, then klik login	Username: 1001 (valid) Password: 1998-03-31 (valid)	System accepted login access and will display main menu.	As expectation	Valid

4. Conclusion

The results of writing the implementation of Inventory program design *PD Adiwangi* Karawang, the researchers make the following conclusions:

1. Analysis of the inventory program of goods currently running on *PD. Adiwangi* Karawang is still manual, make the employees feel difficult when any errors writing in warehouse of the company.
2. Design of inventory program at *PD. Adiwangi* Karawang aims to ensure the total of goods and to solve the incoming or outgoing goods report effectively and accurately.
3. Implementation inventory program at *PD. Adiwangi* Karawang can operate new program together with the old system for certain period until the old system is no longer used.
4. Testing the inventory program software can run properly, free of errors and functionally produce the expected results.
5. There is special training for program users or inventory program application users to operate the program system.

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