



Application of AHP (Analytical Hierarchy Process) Method in Inventory Control at PT. Sumber Rezeki Bersama

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ABSTRACT

Controlling the amount of inventory value is not an easy thing for companies, starting from recording the purchase price of goods, determining prices to presenting these inventories into financial statements. To facilitate inventory control, a decision support system is needed that aims to simplify the inventory control process which is expected to help the problems that exist in the company. The same thing is needed by PT. Sumber Rezeki Bersama. This private company engaged in the distribution of food products also needs a decision support system that can control the inventory of goods so as to facilitate the process of controlling inventory. Previously, inventory at PT. Sumber Rezeki Bersama experienced problems where the company did not prioritize ordering goods, especially those with the highest sales. So that when there are many messages from consumers for these goods, the company cannot fulfill orders on time, given the stock of goods that are not always available (because they are not prioritized).

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1. Introduction

Controlling the amount of inventory value is not an easy thing for companies, starting from recording the purchase price of goods, determining prices to presenting the inventory in financial statements. The same thing is needed by PT. Sumber Rezeki Bersama. Companies engaged in the distribution of food products also need a decision support system that can control inventory so as to facilitate the process of controlling inventory. Previously, inventory at PT. Sumber Rezeki Bersama experienced problems where the company did not prioritize ordering goods, especially those with the highest sales. So that when there are many orders from consumers for these goods, the company cannot fulfill orders on time,

Some of the problems above are summarized into the formulation of the problem in this study, namely how to design and build a system that can help PT. Sumber Rezeki Bersama in controlling the amount of inventory for each item and prioritizing ordering the most sold items (the highest selling items) also speeds up the decision-making process in prioritizing ordering certain items so that consumer goods orders can be realized quickly and accurately. So with this problem, a special application is needed that can make it easier for companies to determine the priority of goods in fulfilling inventory using the AHP (Analytical Hierarchy Process) method.

The AHP method is used because it can choose conflicting criteria so that from these existing criteria it will be processed by the AHP method to produce one of the desired alternatives (Nurhidayat, 2013) (Ningrum, 2020). The working principle of AHP is the simplification of a complex, unstructured, strategic, and dynamic problem into its parts, and arranged in a hierarchy (Gunawan, 2014) (Dianawati, 2015). Then the level of importance of each variable is given a numerical value subjectively about the relative importance of that variable compared to other variables. From these various considerations, a synthesis is then carried out to determine variables that have a high priority and play a role in influencing the results of the system (Nurhidayat, 2013) (Isnian & Suaidah, 2016).

This study aims to build a decision support system for inventory control using the AHP method and can be further developed so as to provide convenience for the user and can assist in making inventory control decisions. And can display inventory reports according to certain criteria.

The benefits that will be obtained are that it will help the company in making decisions for inventory control. It also speeds up the decision-making process in inventory control. And the creation of an easy-to-use system in the inventory control process.

2. Method

2.1 Waterfall Method

Method is a systematic way or technique to work on a case (Alawiah, 2017) (Ade, 2018). Data analysis techniques in making software use the Waterfall software paradigm, which includes several processes, which can be seen in Figure 1:

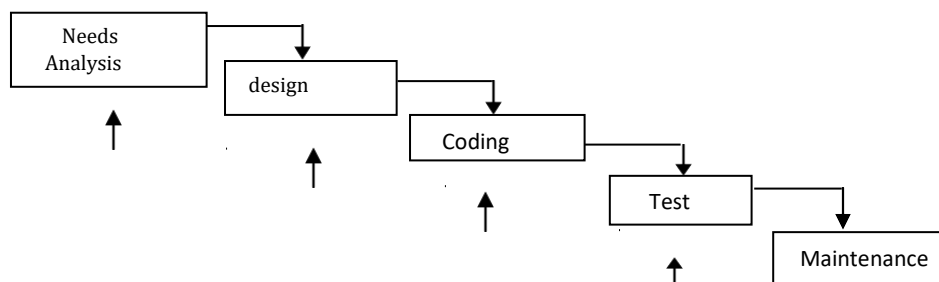


Figure 1. Waterfall Method

The waterfall model is a classical model that is systematic, sequential in building software. This model takes a systematic and sequential approach. It is called a waterfall because the stages that are passed must wait for the completion of the previous stage and run sequentially (Pressman, 2010) (Widianto, Pratama, & Laksmi, 2020).

The steps that must be taken in the Waterfall methodology are as follows:

- a. Software requirements analysis
The requirements gathering process is intensified and focused, particularly on software. To understand the nature of the program being built, software engineering (analysis) must understand the information domain, behavior, performance and interface required.
- b. Design
Software design is actually a multi-step process that focuses on four distinct attributes of a program: data structure, software architecture, interface representation and procedural (algorithm) details.
- c. Coding
Coding is the translation of a design into a language that can be recognized by a computer. Programmer will translate transaction requested by User. If the design is done in a complete way, the code generation can be done mechanically. To be understood by the machine, in this case the computer, the design must be transformed into a form that can be understood by the

machine, namely into a programming language through the coding process. This stage is the implementation of the design stage which will technically be done by the programmer.

- d. Test
Process Testing is done on internal logic to ensure all statements have been tested. Functional external testing to find errors and ensure that the input will give actual results as required.
- e. Maintenance
Maintenance of a software is needed, including development, because the software that is made is not always like that when it is run, there may still be small errors that were not found before or there are additional features that do not exist in the software.

2.2 Analytical Hierarchy Process (AHP) Method

Analytical Hierarchy Process (AHP) is an analysis and synthesis method that can assist the decision-making process. AHP is a powerful and accurate decision-making tool because there is a predetermined scale or weight and uses a hierarchy consisting of three levels, namely goals, criteria and alternatives (Abdullah & Pangestika, 2018) (Jeronimo, 2016).

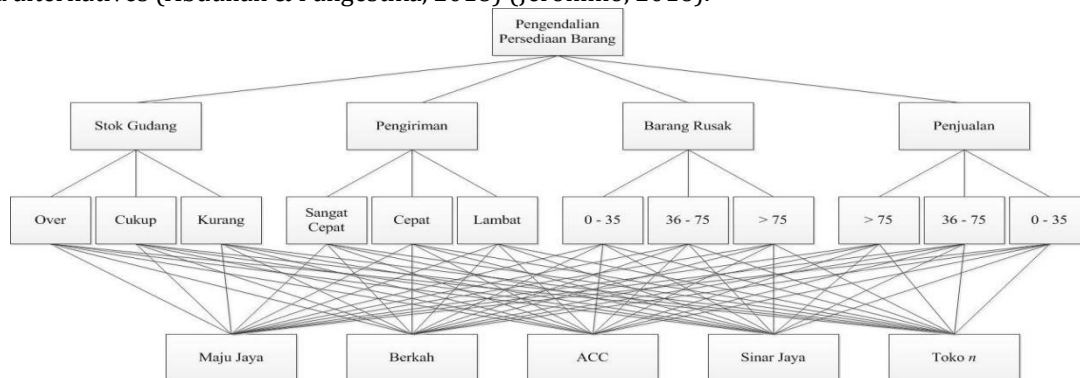


Figure 2. AHP Hierarchy Inventory Control

3. Results and Discussion

Based on the results of the analysis and system design that has been done in the previous chapter, it is continued to the implementation level, implementing application programs using programming languages. Implementation is the stage where the system is ready to operate in the actual state. From here it will be known whether the system created can actually produce the desired goals.

The author designed a program for the application of the AHP Method in Inventory Control using the Microsoft Visual Basic.Net programming language using the Microsoft SQL Server database as the result of the program design as follows:

- a. Login Form Display



Figure 3. Login Form Display

- b. Home Form Display

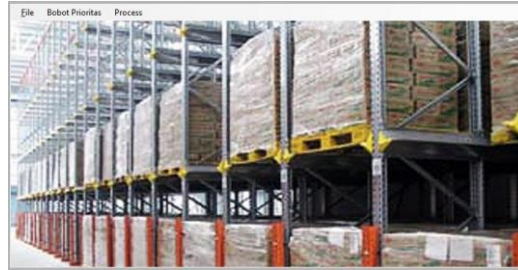


Figure 4. Home Form Display

c. Display Login Data Form

The display of the login data form is a list design from the admin. Serves to display certain forms that act as admin to process important data.

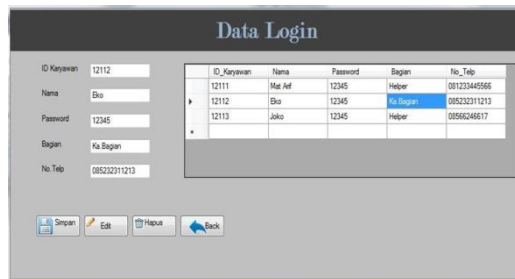


Figure 5. Display Login Data Form

d. Item Data Form Display

The display of the item data form has a function to input the names of the items.

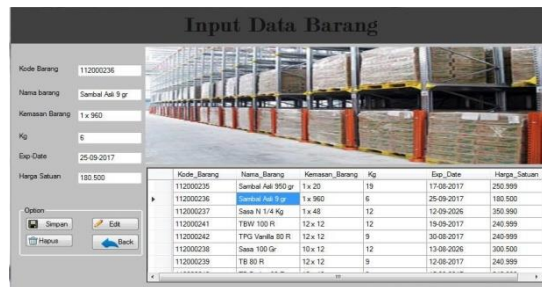


Figure 6. Item Data Form Display

e. Store Data Form Display

The display of the goods layout form has a function to input store names.



Figure 7. Store Data Form Display

f. Criteria Priority Form Display

The appearance of the criteria priority weight form is the form used to enter the criteria weight value to be processed by the system.

Figure 8. Criteria Priority Weight Form Display

g. Sub-Criteria Priority Form Display

The display of the sub-criteria priority weight form is the form used to enter the sub-criteria weight value that will be processed by the system. If the criteria priority weight form is selected, the sub-criteria weight form screen will appear.

Figure 9. Sub Criteria Form Display

h. Appraisal Form Display

The display of the assessment form is a form used to enter an assessment of the accuracy of the store's stock which will be processed by the system so as to produce decisions and information on good inventory.

Figure 10. Appraisal Form Display

i. Store Data Report Display

The store data report displays the store names entered by the admin.

Kode toko	Nama toko	Alamat toko	No. toko
T0001	Maju Jaya	Jln. Pusat Pasar No 36	081233445566
T0002	Kembang Jaya	Jl. Bial	081542389011
T0003	Sinar Jaya	Jl. A. R. Hakim	082378976556
T0004	Berkah	Jl. Setia Budi	083456789211
T0005	Amuzerah	Jl. Tambora	082130005573
T0006	ACC	Jl. Yos Sudarso	081234547788
T0007	Maju Bersama	Jl. Letda Soegono	087769765423

Di Ketahui Oleh

Ka. Basjan

Figure 11. Store Data Report Form Display

j. Review Report View

The assessment report displays the results of the assessment carried out by the admin.

Kode	Alternatif	Nama Bar	Stok Utama	Pengiriman	Barang Fisik	Penjualan	Nilai	Keterangan
112000235	Maju Jaya	Sambal Aci 950	Ovar	Cepat	Baik	Baik	1.1375617480	Stabil
112000236	Maju Jaya	TPG Vanilla 80	Cukup	Cepat	Ovar	Cukup	0.48326671589	Tidak Stabil
112000237	Maju Jaya	Sara N 1.4 Kg	Ovar	Sangat Cepat	Baik	Baik	1.3392871428	Stabil

Di Setujui Oleh

General Manager

Figure 12. Appraisal Report Display

3.1 Discussion

Before the program is used or implemented, the program must first be free from errors. Program errors that may occur include language writing errors, errors during processing, or logical errors. After the program is free from errors, the program is tested by entering data for processing.

TABLES 1.
STORE DATA SYSTEM TRIAL

No	Process Name	Procedure Test	Input	Results Yang Expected	Results Test
1.	Login	Enter the name and password then press the login command	Admin Name and Password	Login Success	Success
2.	Addstore data	Addstore data then press the save command	Store Data	The process of adding store data	Success
3.	Changestore data	Changestore data then press edit command	Store Data	Process of changing store data	Success
4.	Deletestore data	Deletestore data then press delete command	Store Data	Process of deleting store data	Success
5.	Print store data	Print the store data then press the report command	Store Data	The process of printing a store data report	Success

TABLE 2.
BLACKBOX TEST OF PROGRAM ALGORITHM VALIDITY

Alternative	Calculation		Difference
	System	Manual	
Warehouse Stock	0.4824	0.4824	0
Delivery	0.2717	0.2717	0
Damaged goods	0.1575	0.1575	0

Alternative	Calculation		Difference
	System	Manual	
Sale	0.0882	0.0882	0
Number of Alternatives	4 Alternatives		
Total Difference	n		0
Difference Presentation Level	0 x 100%		0%
Accuracy	100% - 0%		100%

4. Conclusion

With the conclusion that can be drawn from a comparison that can finally provide improvements in the future. The conclusion that the authors put forward is, the application that is built is able to handle problem solving in terms of good inventory control for the company. The system that the author built is capable of performing the calculation, inputting, editing and deletion processes. The results of the inventory control decision support system were tested by explaining different criteria by calculating the Analytical Hierarchy Process method. Applications that are built are useful for prioritizing certain items with a fast process.

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