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Decision Support System for the Eligibility of Motorcycle Loans at the Yoyo Showroom Using the Analytical Hierarchy Process (AHP) Method

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ABSTRACT

This research is about Decision Support System for Motorcycle Credit Eligibility Application at Yoyo Showroom. The method used is Analytical Hierarchy Process (AHP). AHP is applied in determining the Eligibility of applying for Motorcycle loans with the criteria of Personality, Down Payment, Ability, Guarantee, condition. The system was built using the Visual Basic 2008. Net programming language with Microsoft Access 2007 database. The result of the research is the application of a motorcycle loan eligibility decision support system that can assist the leadership in the Yoyo showroom in determining the feasibility of applying for a motorcycle loan.

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1. INTRODUCTION

Information Technology (IT) is the entire means to provide goods needed for the survival and comfort of human life. The use of technology by humans at the beginning with the conversion of natural resources into simple tools [1].

According to ITTA (Information Technology Association Of America), the notion of information technology is a study, design, implementation, development, support or management of computer-based information systems, especially in computer hardware and software applications. Information technology utilizes electronic computers and computer software to securely convert, store, process, protect, transmit and obtain information [2] [3] [4].

The development of information technology is currently almost penetrated in all aspects of human life. This is triggered because today's technology has helped a lot in human daily work. The benefits of human work become faster, lighter and more accurate without reducing the desired results. Information technology is very helpful for companies or agencies in processing job data to get accurate information to make decisions [5] [6] [7]. Just like in the Yoyo Showroom which realize motorcycle loans to the community. Information is a very valuable factor, this is understandable because information is the main reference for making company policies. In this case, regarding the

policy of providing motorcycle loans to customers at the Yoyo Showroom. Designing a decision support information system for a good credit application requires an analysis of the information needs required by the company. The company establishes policies in providing credit, including setting standards to accept or reject credit risk, namely determining who is entitled to receive credit that has met the five C requirements, how the customer's character (Character), capacity to pay off credit (Capacity), the ability of the customer's capital (Capital),

Companies doing credit sales mean there are receivables in the company. Due to increasing credit sales, receivables are also increasing and tighter supervision is needed on customers. The existence of complete data regarding the customer in the capacity to pay off his receivables, and other conditions will facilitate the decision to grant further credit to the customer.

The Yoyo showroom has its own policy pattern, where the existing policies are sufficient to meet the five Cs: Character, Capacity, Capital, Collateral.

and Condition, all of this information can be obtained from meetings with credit associations or from external information, such as data reports that can be used in analyzing credit and ratings of companies. Another source of information is quantitative which describes the possibility of customers paying on time or being unable to pay or going bankrupt. In determining in advance credit standards and credit terms.

The data obtained as credit conditions include: KTP, Family Card (number of family members), husband/wife approval and have assets that can be guaranteed if one time the customer has an installment disability then a field survey will be carried out and the survey results will be analyzed, after that the results of the analysis are submitted to decision making. The creditworthiness assessment carried out by the company still uses manual methods and the databases used are still in paper form, so it takes a long time for processing and the biggest obstacle is the difficulty in storing or searching archives that have been stored if they are to be matched with the information/guidelines that have just been obtained, and don't forget the problem of making reports that are late sometimes also hampers the storage of information to company leaders.

Decision Support System (DSS) is used as a tool for decision makers to expand the capabilities of decision makers [8] [9] [10]. The system created will use the Analytic Hierarchy Process method or better known as AHP, Analytic Hierarchy Process (AHP) is a method that can solve these complex problems [11] [12].

The problem is solved into groups arranged into a hierarchy. The AHP method is a multi-criteria decision making, while the decision to give motorcycle loans requires criteria such as five C's, how is the customer's character (Character), the capacity to pay off credit (Capacity), the ability of the customer's capital (Capital), collateral owned the customer to bear the credit risk (Collateral) and the customer's financial condition (Condition). By looking at the criteria used to make decisions, it is very appropriate to use the AHP method with multiple criteria. This method is able to choose the best alternative from a number of alternatives, the alternative in question is the provision of motorcycle loans based on specified criteria.

2. RESEARCH METHODS

2.1. Description of the AHP

Basically, the procedure or steps in the AHP method include [13] [14] [15]:

a. Define the problem and determine the desired solution, then arrange a hierarchy of the problems encountered.
b. Specifies the priority of the element.
   The first step in determining the priority of elements is to make a pair comparison, which is to compare elements in pairs according to the given criteria. The pairwise comparison matrix is filled in using numbers to represent the relative importance of an element to other elements.
c. Synthesis

The considerations for pairwise comparisons are synthesized to obtain overall priorities. The things that are done in this step are:

Add up the values of each column in the matrix, divide each value from the column by the corresponding column total to obtain a normalized matrix, and add up the values from each row and divide by the number of elements to get the average value.

d. Measuring Consistency

In decision making, it is important to know how good the consistency is because we don't want a judgmental decision with low consistency. The things that are done in this step are: Multiply each value in the first column by the relative priority of the first element, the value in the second column by the relative priority of the second element, and so on, add up each row, the result of the row sum divided by the corresponding relative priority element. , and add the quotient above with the number of elements, the result is called max.

e. Calculate Consistency Index (CI)

with the formula:

$$CI = (\lambda \text{ max-n})/n \quad \ldots\ldots (1)$$

where : n = number of elements.

f. Calculate Consistency Ratio (CR)

with the formula:

$$CR = CI/RC \quad \ldots\ldots (2)$$

where:

CR = Consistency Ratio

CI = Consistency Index

IR = Random Consistency Index

g. Check hierarchy consistency.

If the value is more than 10%, then the data judgment assessment must be corrected. However, if the consistency ratio (CI/RI) is less or equal to 0.1, then the calculation results can be declared correct.

3. RESULTS AND DISCUSSION

3.1 System Implementation

The following activities are carried out in designing and implementing the design of a decision support system application. The initial stage is carried out in order to install what equipment is needed to make the application.

3.2 System Implementation Stages

Interface implementation using the Visual Basic programming language. Net 2008, the steps that must be taken for the implementation of the system on the computer, starting from the preparation stage for the application on the computer to testing the application so that it is ready for use along with general instructions for using the application which is described on the main screen of the computer.

Interface implementation is an interface design that will be used as an intermediary between the user and the software used. The interface implementation of the application design of this decision support system is as follows:.

a. Login Form

In the login form design, the admin ensures that the user and password are validated into the database, where to enter this application, it must be guaranteed to be safe from the hands or irresponsible persons. So that the processed data is guaranteed to be safe to its validity. The implementation of the login form design from the decision support system application design uses the Unfied Modeling Language (UML) method. The login form is used to enter the user and password to enter the main menu.

1). The login button functions for the admin to enter the main menu of the system.

2). The cancel button functions to cancel the admin from entering the system's main menu.

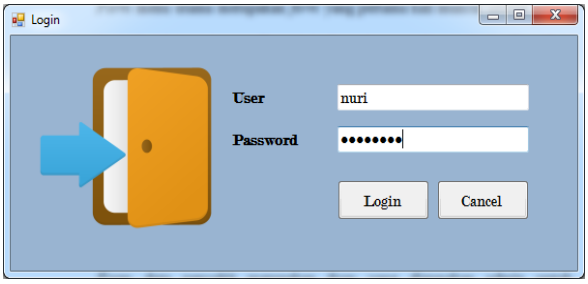

Figure 1. Login Form

b. Main Menu Form

By using the form, the main menu of the program is created which has several parts of the program menu, namely: Data, Process, Reports, Exit where in each program menu there are several other supporting sub menus that function to display the required forms and their reports.

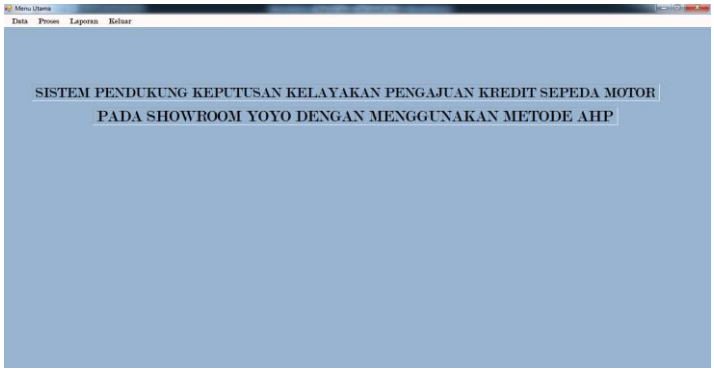

Figure 2. Main Menu Form

c. Alternative Data Form

This view contains alternatives that function as a medium for entering new alternative data and also changing and deleting alternative data. Here is how it looks:

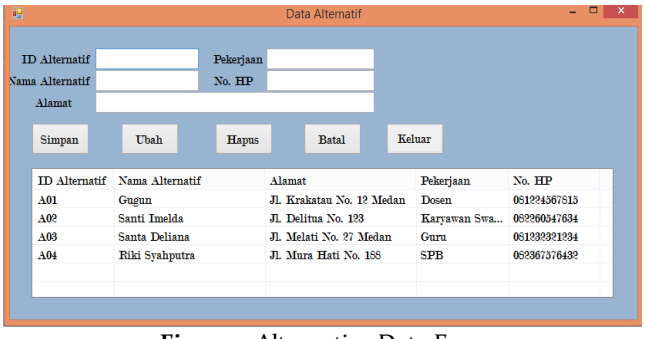

Figure 3. Alternative Data Form

The functions of the buttons contained in the form are:

1). The save button is used to store data from the system input into the database.
2). The change button functions to change the data you want to replace
3). The delete button is used to delete data stored in the database.
4). Cancel button serves to cancel the existing execution on the system.

5). The exit button is used to exit the alternative form

d. Criteria Data Form

Criteria data form is a form used by admin to input, change and delete criteria data;

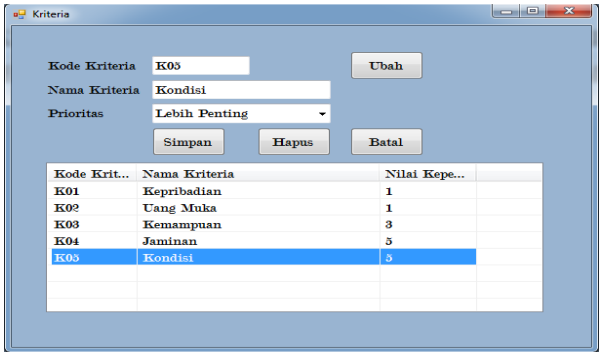

Figure 4. Criteria Data Form

e. Assessment Data Form

The assessment data form is the form used by the admin to input, change and delete assessment data.

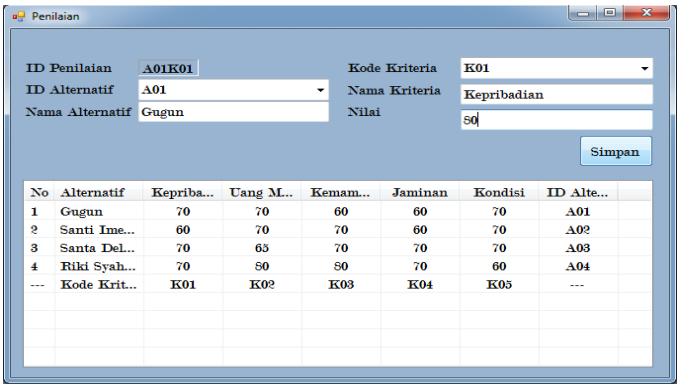

Figure 5. Assessment Data Form

f. AHP Calculation Analysis Process Result Form

The assessment data form is the form used by the admin to input, change and delete assessment data.

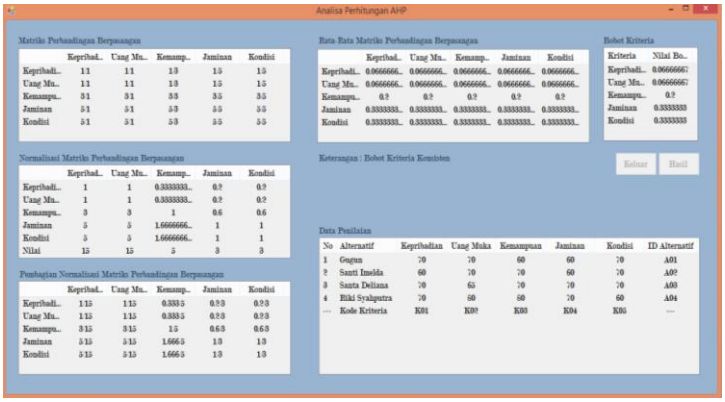

Figure 6.AHP Calculation Analysis Process Result Form

In designing the "Decision Support System for the Eligibility of Motorcycle Loans at the Yoyo Showroom Using the Analytical Hierarchy Process (AHP) Method", the author uses the Microsoft Access 2007 programming language as the database.

The facilities in the Decision Support System for the Eligibility of Motorcycle Credit Applications at the Yoyo Showroom Using the Analytical Hierarchy Process (AHP) method are divided into several menus, namely data, process, report, and exit. The data menu consists of 3 submenus, namely alternative data, criteria data, the assessment will display several alternative data that will become alternative data for credit eligibility, criteria data will display criteria data that will be inputted later, the assessment will display alternatives that have been rated against the criteria by value from 0-100 by company. The process menu consists of the AHP analysis submenu which will display the process of calculating credit application eligibility. The report menu consists of a submenu of the AHP results report. Exit menu to end the program

4. CONCLUSION

Conclusions that can be drawn in making a decision support system for credit eligibility include; The application of the AHP method to the credit eligibility decision support system through several data transformation processes starting from determining the priority scale of each criterion, to getting the final score and whether or not the customer is eligible for credit. The design of a credit eligibility decision support system can be done using the Unified Modeling Language (UML) modeling language which consists of use case diagrams, class diagrams, activity diagrams and is built using Microsoft Visual Basic 2008 and using Microsoft Access 2007.

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