

DECISION SUPPORT SYSTEM USING MOTOR CREDIT FEASIBILITY METHOD SAW (System Additive Weighting) (Case Study: PT. Federal International Finance)

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ABSTRACT

Leasing company stands with a variety of services that offer a variety of financing. In analyzing the lending process, the company formed a special division called Credit Analyst (CA). In the process of granting credit, the method used by CA is still conventional and prone to abuse of authority. In addition, the large number of credit applicants with different economic conditions and criteria also demands individual foresight in making decisions. One of the problems faced in granting credit is the risk of default in payments, which hinders the pace of company development, even in extreme conditions it can cause losses. To prevent the risk of bad credit, companies must ensure the feasibility of potential creditors before the credit agreement is approved. This process requires an analysis that involves many assessment factors.

With the existence of a decision support system for the eligibility of motorcycle loans using the SAW method, it can be seen from the Condition of Economy, Character, Capital, Capacity, and Collateral of each prospective customer who applies for a loan. Based on the average results of the two methods used, it can be said that the AHP method is the best method because it has a value close to zero, namely 0.19359 compared to SAW 1.12896 and for prospective customers approved by the AHP method with 43 prospective customers, and the SAW method with candidates approved by 44 customers.

Keywords: Decision Support System, Credit Analyst.

1. INTRODUCTION

In the current era of globalization, modernization occurs in all aspects of life, as well as technology which is developing so rapidly. With the development of technology, so many facilities are provided in helping people work. It's no wonder, especially in the current information age, so many companies are very dependent on technology, more specifically information technology. so is the case with finance As a company engaged in the world of loan credit, of course, it really depends on information technology to make work easier.

In finance, in making credit worthiness decisions based on the completeness and validity of manual data obtained from credit administration activities, namely credit analysis activities and approval from the section head. to obtain loan credit and the applicant or prospective debtor must follow the established credit lending procedure finance, that is, the prospective debtor first applies for credit in the credit section and then discusses with the prospective debtor the terms and conditions and negotiates the loan application, then the applicant (prospective debtor) will be recorded according to the files entered.

So far, credit administration activities which include quantitative and qualitative analysis activities are carried out manually and are often not objective. one of the factors that causes decision-making activities to seem long because there is no system that helps the performance of credit analysis in conducting studies in the context of making decisions besides that debtor credit agreement data has not been managed properly because data storage is still done manually so that this

hinders the process of searching for debtor data when problems occur in the future besides other weaknesses from this still manual process the data is prone to being scattered or lost as a result if the credit agreement data is lost then when a problem occurs in the future it can make withdrawing collateral difficult.

Therefore, based on the existing problems, it is necessary to have an application that can assist in the process of making decisions on creditworthiness of loans as well as processing debtor data and this application in completing the decision making of the author using the SAW method. It is hoped that it can answer the problems that exist in the author's research area.

1.1 Problem Limitation

1. This research will only discuss the calculation of creditworthiness, not discussing the process of paying off and collecting credit.
2. Only as a tool to speed up the credit analysis part in decision making, does not discuss the policies that will be taken by the company.
3. Granting credit or financing uses 5 criteria and each has sub-criteria, namely the criteria Character with very less, less, good and very good sub-criteria, criteria Capacity with very less, less, good and very good sub-criteria, criteria Capital with DP subcriteria <15%, 16-20%, 21-25%, 26-30% and >30%, criteria Collateral with the rental house sub-criteria, accompanying parents and own house and for criteria Condition Of Economy with sub-criteria Very less, less, enough, good and very good.

1.2 Problem Formulation

1. How can credit analysts be able to determine the creditworthiness of prospective borrowers quickly, and standardized by applying the SAW method (Simple Additive Weighting) in decision making?
2. How to deal with slow and unobjective decision makers.
3. Analyze comparisons using the AHP and SAW methods in case studies of feasible borrower decision support systems for financial institutions.

1.3 Research Objectives

1. Makes it easier to determine the feasibility of applying for a motorcycle loan.
2. Minimizing time in assessing and analyzing consumer credit applications.
3. Make an SPK application to determine the feasibility of applying for a motorcycle loan, create a decision support system application for the eligibility of accepting motorcycle loans.
4. As a material consideration for financial institutions in determining an appropriate borrower's decision support system.

2. BASIC FOR THEORY

2.1 Decision Support System

Decision Support System is an interactive system that supports decisions in the decision-making process through alternatives obtained from the results of data processing, information and model design. Then the characteristics can be determined, among others:

1. Support the decision-making process, focusing on management by perception.
2. There is interface humans / machines where humans (users) still hold control of the decision-making process.
3. Support decision making to discuss structured, semi-structured and unstructured issues
4. Having integrated subsystems in such a way that they can function as a single item.
5. Requires a comprehensive data structure that can serve the information needs of all levels of management.

In a decision support system there are three levels of hardware and software decisions. Each level is based on the level of ability based on different levels of technique, environment and tasks to be carried out at the three levels, namely:

1. Decision Support System (Specific DSS)
2. Decision support system generator (DSSGenerator)
3. Decision support system tools

In a decision support system there are three types of decisions, namely:

- Structured decisions
Structured decisions are decisions that are made repeatedly and routinely. The information needed is specific, scheduled, narrow, interactive, real time, internal, and detail. The procedure used for decision making is very

clear. This decision is mainly made at lower level management. For example: the decision to order goods, determine the eligibility of overtime, and offer credit to customers.

- **Semi-structured decisions**
 Semi-structured decisions are decisions that have the characteristic that some decisions can be handled by a computer and others must still be made by the decision maker. The information needed is folus, specific, interactive,internal, real time, and scheduled. Examples: Evaluating credit, production scheduling and inventory control, and developing departmental budgets.
- **Unstructured decisions**
 Unstructured decisions are decisions whose handling is complicated because they do not occur repeatedly or do not always occur; these decisions require experience and a variety of sources that areexternal. This decision generally occurs at the top level of management. The information needed is general, broad,internal, andexternal. Examples: development of new technology, decision to merge with another company, executive hiring.

2.2 Method Simple Additive Weighting (SAW)

Method Simple Additive Weighting (SAW) is a method used to find optimal alternatives from a number of alternatives with certain criteria. Metode Simple Additive Weighting (SAW) is often also known as the weighted sum method.

The basic concept of the SAW method is to find the weighted sum of the process criteria for each alternative on all attributes (Fishburn, 1967) (MacCrimmon, 1968). The SAW method requires a process of normalizing the decision matrix (X) to a scale that can be compared with all existing parameters. This method is the most well-known and most widely used method of dealing with situations Multiple Attribute Decision Making (MADM). MADM itself is a method used to find the optimal alternative from a number of alternatives with certain criteria.

This SAW method requires the decision maker to find the weight for each attribute. The total score for the alternative is obtained by adding up all the multiplication results between the rating (which can be compared across attributes) and the weight of each parameter, the rating for each parameter must be dimension-free in the sense that it has passed the previous matrix normalization process.

The formula for normalizing is:

$$r_{ij} = \begin{cases} \frac{X_{ij}}{\text{Max } X_{ij}} & \text{If } j \text{ is the attribute advantage (benefit)} \\ \frac{\text{Min } X_{ij}}{X_{ij}} & \text{If } j \text{ is the cost attribute (cost)} \end{cases}$$

Where :

1. Queue : normalized performance rating
2. Max_{ij} : the maximum value of each row and column
3. Min_{ij} : the minimum value of each row and column
4. Lesson : rows and columns of the matrix

With r_{ij} is the normalized performance rating of alternative A_i on attributes

C_j ; $i = 1, 2, \dots, m$ day $j = 1, 2, \dots, n$

The preference value for each alternative (V_i) is given as:

$$V_i = \sum_{j=1}^n W_j r_{ij}$$

Where :

- V_i = Final value of the alternative
- W_j = Predetermined weight
- r_{ij} = Normalized matrix

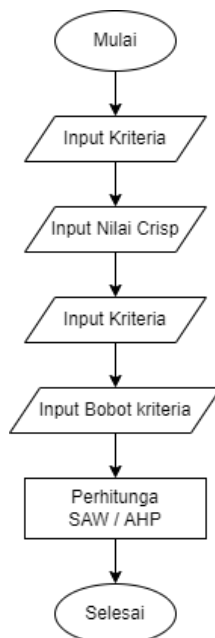
A larger V_i value indicates that alternative (A_i) is more selected

3. ANALYSIS AND DESIGN SYSTEM

3.1 System Flowchart

Flowchart is a chart with certain symbols that describe the sequence of processes in detail and the relationship between a process (instructions) and other processes in a program. In design flowchart actually there is no formula or standard that is absolute (certain). It is based on flowchart (flow chart) is a picture of the results of thinking in analyzing a problem in.

Flowchart the system made is Flowchart intended for admins. Another function of the flowchart is to simplify a series of procedures to make it easier to understand the information. Following Flowchart which is used for the program to be made.

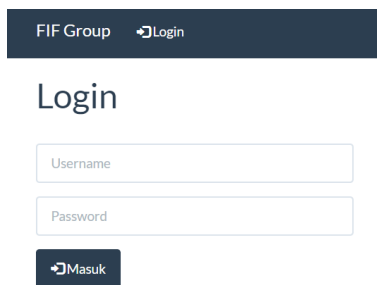


Picture 3.1 Flowchart System

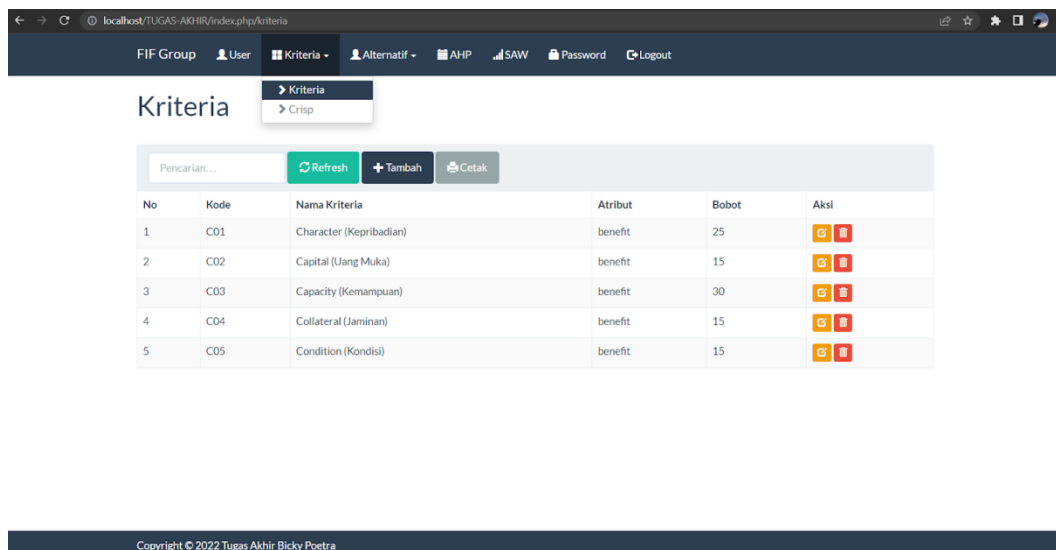
4. RESULTS AND DISCUSSION

4.1 Test Results

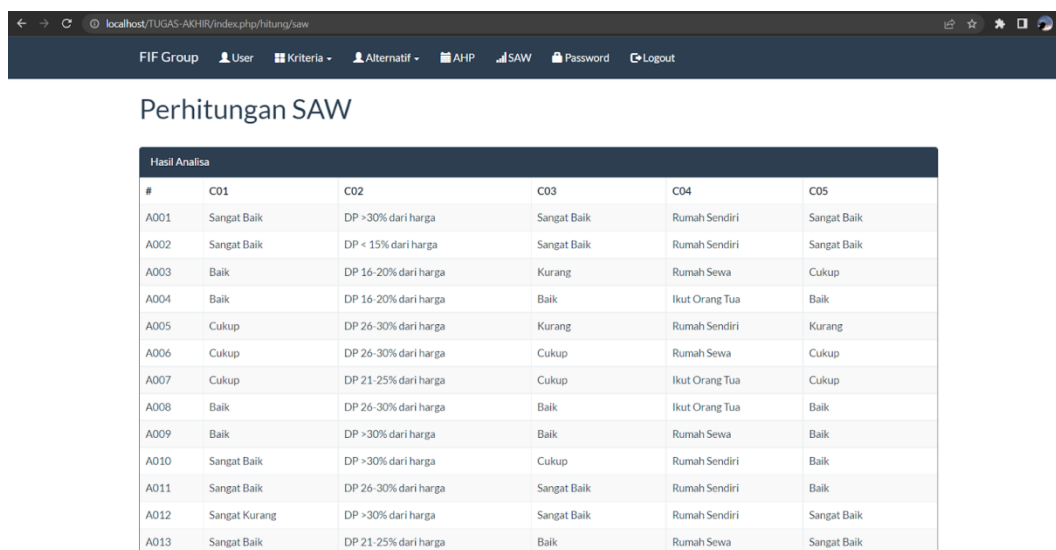
The following are the results where testing occurs when testing the path or flow of the application decision support system using motor credit feasibility method saw (system additive weighting) case study of PT. Federal International Finance will be explained in detail for the functions that happen.



Picture 4.1 Login



Picture 4.2 Criteria View Page



Picture 4.3 Result SAW Calculation Display

5. CLOSING

5.1 Conclusion

From the results of the discussion in the previous chapter, it can be obtained that this research can complete the Creditworthiness Decision Support System using the SAW Method inPT. Federal International finance can be seen from the Condition of Economy, Character, Capital, Capacity, and Collateral of each prospective customer who applies for a loan.

Comparative analysis using the Euclidean Distance yields the result that the AHP method is the best method in selecting the business capital loan selection process for customers compared to the SAW method.

Based on the alternative choices of the 5 prospective customers who apply for loans, it can be obtained that customers who have the highest priority will get loans. Nonetheless, to obtain representative results, it is necessary to add other assessment criteria such as the results of checking customer status from BI Checking, Turnover, Required Capital, Business Stability and Collateral

5.2 Suggestions

Based on the research conducted, there are several suggestions given to develop this research:

1. In the credit worthiness decision support system that will be built, it is better if it has the function of storing data by date or month.

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