

IMPLEMENTATION OF THE MOORA METHOD DETERMINING THE FEASIBILITY OF SAVING AND LOANS CONCEPT

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Vol.17 No.2 | June, 2023

Submit :

13/03/2023

accept :

18/06/2023

Publish :

19/06/2023

Abstract

Cooperative is a business entity that is a legal entity and is based on the principle of kinship and also the principle of economic democracy and consists of several members. Cooperatives based on the type of business are divided into four types, namely savings and loan cooperatives, multi-business cooperatives, production cooperatives and consumer cooperatives. The savings and loan cooperative "Doni Jaya Cooperative" is a savings and loan cooperative that provides solutions in helping to provide and for various needs in a fast and easy loan process. As a business institution in the banking sector, the Doni Jaya Cooperative has business products, namely savings and loans. The problem with the Doni Jaya Cooperative in loan business products is that it takes a long time to select them and there is no application system that supports prioritizing loan recipients. Overcoming this problem, a decision support system is needed that can provide a real and objective assessment of prospective loan recipients. One of the methods in a decision support system is the MOORA (Multi-Objective Optimization by Ratio Analysis) method. The programming language used is PHP and MySQL database.

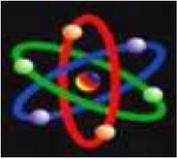
Keywords: Decision Support System, Moora, Cooperative

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<http://publikasi.lldikti10.id/index.php/jit>

DOI : <https://doi.org/10.22216/jit.v17.i2>

PAGE : 352-356



INTRODUCTION

Information technology has brought very fundamental changes to both private and public organizations. One of the results of the development of information technology is the Decision Support System (DSS) or Computer Based Decision Support System (DSS), which is a part of an information system that is useful for increasing the effectiveness of decision making. [1][2]. Problems that are commonly used as objects in Decision Support Systems are semi-structured or structured [3].

Cooperative is a business entity that is a legal entity and is based on the principle of kinship and also the principle of economic democracy and consists of several members. Cooperatives are one of the activities of economic organizations that work in the field of resource potential movements that have the goal of welfare for their members. The economic resources that exist in cooperatives are limited so that they prioritize the welfare and progress of their members first. In order for a cooperative to run smoothly, it must be able to work efficiently and follow existing economic principles and rules.

Cooperatives based on the type of business are divided into 4 (four) types, namely savings and loan cooperatives, multi-business cooperatives, production cooperatives and consumer cooperatives. This type of savings and loan cooperative is a type of cooperative that is widely followed by the community. The concept of this cooperative is that members who save their money in the cooperative will get rewards for saving and members who make loans will be subject to services. Services charged by members who borrow

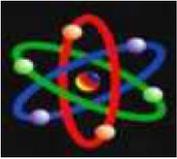
are in the form of small interest when making payments on the money borrowed. Therefore the cooperative funds come from the members, by the members and the results will be returned to the members.

The savings and loan cooperative “Doni Jaya Cooperative” is a savings and loan cooperative that provides solutions in helping to provide funds for various needs quickly and with an easy loan process. As a financial business institution, the Doni Jaya Cooperative has business products, namely savings and loans. The basic criteria for evaluating loans at the Doni Jaya Cooperative are guarantees, employment, income, number of dependents, and loan amount[9].

Regarding the loan process at the Doni Jaya Cooperative, many credit applicant members often complain that the credit application process is long and too convoluted. Currently, the maximum time limit from the registration stage to the credit realization stage, set by the Doni Jaya Cooperative, is a maximum of 7 (seven) working days. There are many credit arrears originating from borrowers[10].

The increase in the ratio of delinquent loans has forced the Doni Jaya Cooperative to be more careful and selective in extending credit to its members, while the Doni Jaya Cooperative is required to cover the credit realization target every month. Overcoming this problem, we need a decision support system that can provide a real assessment and objective to prospective loan recipients. Decision support systems are systems that are part of a computer-based information system including knowledge-





based systems that are used to support decision making in an organization or company.

RESEARCH METHODS

The research method used in this research is quantitative research. Quantitative method is a research method that uses a lot of numbers. Starting from the data collection process to its interpretation. The following is an algorithm for completing the MOORA method, namely [4] [5]:

$$X = \begin{bmatrix} X_{11} & X_{12} & X_{1n} \\ X_{21} & X_{22} & X_{2n} \\ X_{m1} & X_{m2} & X_{mn} \end{bmatrix} \quad (1)$$

Changing the criterion value into a decision matrix serves as a performance measurement of the I th alternative on the J th attribute, M is the alternative and n is the number of attributes and then a ratio system can be developed where each performance of an alternative on an attribute is compared with the denominator which is representative for all alternative to this attribute [6].

$$X^*_{ij} = X_{ij} / \sqrt{\sum_{i=1}^m X^2_{ij}} \quad (2)$$

The normalization of the MOORA method can aim to unite each matrix element so that the elements in the matrix have a uniform value [7].

$$Y_i = \sum_{j=1}^g W_j X^*_{ij} - \sum_{j=g+1}^n W_j W^*_{ij} \quad (3)$$

Reducing the maximax and minimax values to indicate that a more important

attribute can be multiplied by the appropriate weight (significance coefficient) [8].

RESULTS AND DISCUSSION

The following data is used in determining the recipient of a revolving capital loan at the Doni Jaya Cooperative. As for alternative data (prospective customers), criteria (as a condition for applying for credit), namely:

Defenition	Value	Weight
Very Important	1	0,1
Not Important	2	0,2
Hesitant	3	0,3
Important	4	0,4
Very Important	5	0,5

Table 1. Criteria Description

$$X^*_{ij} = X_{ij} / \sum_{i=1}^m X^2_{ij}$$

$$A1 = V1/10 = 0.1$$

$$A2 = V2/10 = 0.2$$

$$A3 = V3/10 = 0.3$$

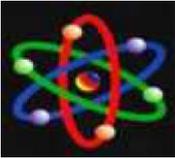
$$A4 = V4/10 = 0.4$$

$$A5 = V5/10 = 0.5$$

The ranking results are based on calculations as follows:

Criteria	Scale	Value
Guarantee (C1)	House Certificate	5
	Certificate of Employment	4
	Car Ownership Certificate	3
	Motorcycle Ownership Certificate	2
	Money Savings	1
	Dependents (C2)	1
	2	4





	3	3
	4	2
	5	1
Work (C3)	Government Employee	5
	Retired Employee	4
	Employee	3
	Farmer	2
	Factory Worker	1
Income (C4)	> 6 million	5
	4.1-5 million	4
	3.1-4 million	3
	2-3 million	2
	1.9 million	1
Loan (C5)	50 million	5
	40 million	4
	30 million	3
	20 million	2
	10 million	1

Table 2. Terms of Credit Submission

Moora Calculation Results

The MOORA Method calculation results form is a display of the results of the criteria and alternative values.

Kode	Nama	Jaminan (C1)	Pekerjaan (C3)	Penghasilan (C4)	Jumlah Tanggungan	Jumlah Pinjaman
A01	Farida Hanum	5	3	3	3	3
A02	Masdar	5	3	4	3	3
A03	Rafli	4	2	4	1	2
A04	Nasir Chan	3	2	2	3	2
A05	Herlis	1	2	3	3	2
A06	Enny Rosnaini	4	3	4	1	2
A07	MN, Simonangkir	3	3	5	3	2
A08	Edy Suctpto	5	5	5	4	3
A09	Idham Chalik	5	4	3	3	3
A10	M. Akhyar	1	2	2	2	3
A11	Berliana Sihotang	5	4	1	4	3
A12	Masri	5	5	4	4	3
A13	Oberlin	1	3	2	2	3
A14	A. Rakhman	5	4	5	3	3
A15	Suhartono	3	5	1	2	3
A16	Juliana	1	1	1	1	3
A17	Syamsur Tanjung	3	3	5	3	3
A18	Darmawan	5	5	4	3	3
A19	Alkmal	3	5	3	2	3
A20	Jurmiah	1	3	5	3	3

Figure 1. Moora Calculation Results

Moora Calculation Report

The print report form for the calculation of the MOORA Method is a display of the results of the criteria and alternative values.

Kode	Nama	Jaminan (C1)	Tanggungan (C2)	Pekerjaan (C3)	Penghasilan (C4)	Pinjaman (C5)
A01	Farida Hanum	0.298	0.189	0.122	0.234	0.163
A02	Masdar	0.298	0.189	0.245	0.234	0.245
A03	Rafli	0.238	0.126	0.245	0.078	0.163
A04	Nasir Chan	0.179	0.126	0.122	0.234	0.163
A05	Herlis	0.06	0.126	0.306	0.234	0.163
A06	Enny Rosnaini	0.238	0.189	0.245	0.078	0.163
A07	MN, Simonangkir	0.179	0.189	0.306	0.234	0.163
A08	Edy Suctpto	0.298	0.314	0.306	0.311	0.245
A09	Idham Chalik	0.298	0.251	0.184	0.234	0.245
A10	M. Akhyar	0.06	0.126	0.122	0.156	0.245
A11	Berliana Sihotang	0.298	0.251	0.061	0.311	0.245
A12	Masri	0.298	0.314	0.245	0.311	0.245
A13	Oberlin	0.06	0.189	0.122	0.156	0.245
A14	A. Rakhman	0.298	0.251	0.306	0.234	0.245
A15	Suhartono	0.179	0.314	0.061	0.156	0.245
A16	Juliana	0.06	0.063	0.061	0.234	0.245
A17	Syamsur Tanjung	0.179	0.189	0.306	0.234	0.245
A18	Darmawan	0.298	0.314	0.245	0.234	0.245
A19	Alkmal	0.179	0.314	0.184	0.156	0.245
A20	Jurmiah	0.06	0.189	0.306	0.234	0.245

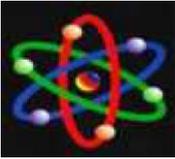
Figure 2. Moora Calculation Report

CONCLUSION

There are several things that can be observed in the decision support system for recipients of revolving fund loans at the Doni Jaya Cooperative using the Moora method, namely:

1. The decision support system for recipients of revolving fund loans can help the Doni Jaya Cooperative by using the Moora method.
2. Help select and analyze data on prospective customers for revolving fund capital loans at the Doni Jaya Cooperative which are selected based on alternative criteria and assessments.
3. This system is created dynamically in the sense that it determines the design





and analysis of policies using the help of a computer, so that if there are changes or additions to the decision support system for recipients of revolving loan funds it can be done easily.

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