

The Analysis of Determining Credit Worthiness Using Weighted Product and SMART Methods in SPB Cooperatives

A I Warnilah ^{*1}, I N Hawa ², Y S Mulyani ³

^{1,2,3} Department of Information System, Universitas Bina Sarana Informatika

E-mail: ai.aiw@bsi.ac.id ^{*1}, intanmagdelaine@gmail.com², yani.ymn@bsi.ac.id³

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Abstrak. Koperasi Simpan Pinjam Simpeunan Pameungkeut Banda adalah koperasi yang didirikan di Tasikmalaya. Sistem penyaluran kredit yang saat ini digunakan di Koperasi Banda Simpeunan Pameungkeut masih manual, sehingga pengelolaannya membutuhkan waktu yang cukup lama. Selain itu, koperasi belum memiliki sistem yang mendukung penentuan keputusan kelayakan kredit. Dengan demikian, kredit tidak tepat sasaran, karena tidak sesuai dengan kriteria yang ditentukan. Untuk alasan ini, penulis membuat penelitian tentang *weighted product* dan *smart methods* dalam menentukan kelayakan kredit di Koperasi Banda Pameungkeut. Tujuan penelitian adalah untuk menentukan siapa yang memenuhi syarat dan siapa yang tidak memenuhi syarat untuk mendapatkan kredit. Hasil analisis menggunakan metode *weighted product* diperoleh nilai tertinggi 0,067 dan nilai terendah 0,032, sedangkan metode *SMART* memperoleh nilai tertinggi 79,2 dan nilai terendah 25. Hasil penelitian menunjukkan bahwa metode *SMART* lebih efektif dalam menentukan kelayakan kredit.

Kata kunci: perancangan; pemilihan; peminjaman; *Simple Multi Attribute Rating Technique* (SMART); *Weighted Product*; koperasi

Abstract. The Savings and Loan Cooperative of Simpeunan Pameungkeut Banda is a cooperative that has been established in Tasikmalaya. The system of lending currently used at Simpeunan Pameungkeut Banda Cooperative is still manual, so the management requires quite a long time. Besides that, the cooperative has not had a system that supports in determining the credit worthiness decision. Thus, the credit is not on target, because it does not fit the specified criteria. For this reason, the writers were to make a research on the comparison of weighted product and smart methods in determining credit worthiness in Pameungkeut Banda Cooperative. The purpose of research was to determine who were eligible and who were not eligible to get the credit given the criteria that have been determined using the Weighted Product method and SMART methods. The results of the analysis using the Weighted Product method obtained the highest value of 0.067 and the lowest value of 0.032, while SMART method obtained the highest value of 79.2 and the lowest value of 25. The results show that SMART method is more effective in determining credit worthiness.

Keywords: design; selection; borrowing; *Simple Multi Attribute Rating Technique* (SMART); *Weighted Product*; cooperative

1. Introduction

The term of cooperative must be familiar among the people of Indonesia. A Cooperative is a business entity that has a legal entity in Indonesia. Law No. 25 of 1992 explained the meaning of cooperatives as a business entity that consists of people or cooperative legal entities that underlie their activities on cooperative principles as well as a people's economic movement based on the principle of kinship [1].

The Savings and Loan Cooperative of Simpenan Pameungkeut Banda (KSP-SPB) Tasikmalaya located on Jalan R. Ikik Wiradikarta No. 45, Tawang Sari Village, Tawang District, Tasikmalaya City, is one of the cooperatives that focuses on the savings and loan sector. The cooperative has been running since 1933, which makes the Savings and Loan Cooperative of Simpenan Pameungkeut Banda (KSP-SPB) becomes the oldest cooperative in Tasikmalaya.

According to [2] [3], the principles of granting credit include analysis of 5C Character, Capacity, Capital, Collateral (credit guarantee), Conditions of economics, and 7P is the first step Personality, Party, Purpose, Prospect, Payment, Profitability, and Protection. One of the problems occurring in the Simpeunan Pameungkeut Banda Cooperative is the credit that is not on target and causes loss to the cooperative since the members cannot pay their obligation properly. Therefore, it is very necessary to have a decision support system that can determine the best decisions of prospective borrowers in accordance with predetermined criteria such as deposits, income, character, collateral, conditions of collateral.

2. Theoretical Framework

2.1 Weighted Product Method

Weighted Product (WP) according to Sianturi Ingot seen in [4] conclude that “Weighted Product (WP) Method is one of the methods used to solve problems. The Weighted Product (WP) method uses Multiplication to link the attribute values (criteria), where the value of each attribute must be raised first with the corresponding attribute weights”. Weighted Product (WP) is one of the decision support system methods to help solve the problem of determining the provision of credit with predetermined criteria based on the amount of deposits, income, character, collateral, conditions of collateral [5].

According [4] [5] [6], the steps in the calculation using the Weighted Product method are as :

1. Determine the criteria that will be used as a reference in making decisions
2. Determine the suitability rating of each alternative on each criterion
3. Determine the weight of preference for each criterion
4. Transfer all the attributes for an alternative with the weight as a positive rank for the profit attribute and the negative rank weight for the cost attribute.
5. The multiplication results are summed to produce a value of V for each alternative

$$S_i = \prod_{j=1}^n x_{ij} w_j, i=1,2,\dots,m \quad (1)$$

Where :

S : Alternative preference is analogous to vector S

x : Criteria value

w : Criteria Weights

i : Alternative

j : Criteria

n : Number of criteria

$$\sum_{j=1}^n w_j = 1 \quad (2)$$

w_j is a positive value for profit attribute and negative value for cost attribute. The relative preferences of each alternative are given as follows :

$$V_i = \frac{\prod_{j=1}^n x_{ij} w_j}{\prod_{j=1}^n (x_j) w_j} ; i = 1, 2, \dots, m \quad (3)$$

Where :

V : Alternative preferences analogous to vector V

x : Value of the criteria

i : Alternative

A : Criteria

n : Number of criteria

* : Number of the criteria that have been assessed in the vector

2.2 SMART Method

According to [7], [8], SMART is a method in multi-criteria decision making that was developed by Edward in 1997. This multi-criteria decision making technique is based on the theory that each alternative consists of a number of criteria that have values and each criterion has a weight that describes how important it is compared to other criteria. This weighting is used to assess each alternative in order to obtain the best alternative. SMART uses a linear additive model to predict the value of each alternative. SMART is a flexible decision-making method. SMART is more widely used because of its simplicity in responding to the needs of decision makers and how to analyze responses. The steps to use SMART method are as follows:

1. Determine the number of criteria and sub-criteria (parameters)
2. Determine the weight of each criterion
3. Normalization of criteria weights

Normalization:

$$W_j = \frac{x_j}{\sum w_j} \quad (4)$$

4. The information:

W_j : weight of a criterion

$\sum w_j$: total weight of all criteria

Calculating the utility value for each criterion.

$$u_i(\alpha_i) = 100 \frac{(C_{max} - C_{out i})}{(C_{max} - C_{min})} \% \quad (5)$$

The information:

value of the 1st criteria utility for the i criteria

C_{max} : maximum criterion value

C_{min} : minimal criterion value

$C_{out i}$: i-th criterion value

5. The information : Calculate the final value of each using the formula from the SMART method

$$u(a_1) = \sum_{j=1}^m w_j u_i(a_i), \quad i = 1, 2, \dots, m \quad (6)$$

Where:

w_j = value of the jth criteria weighting

$u_i(a_i)$ = i-criterion utility value

3. Methodology

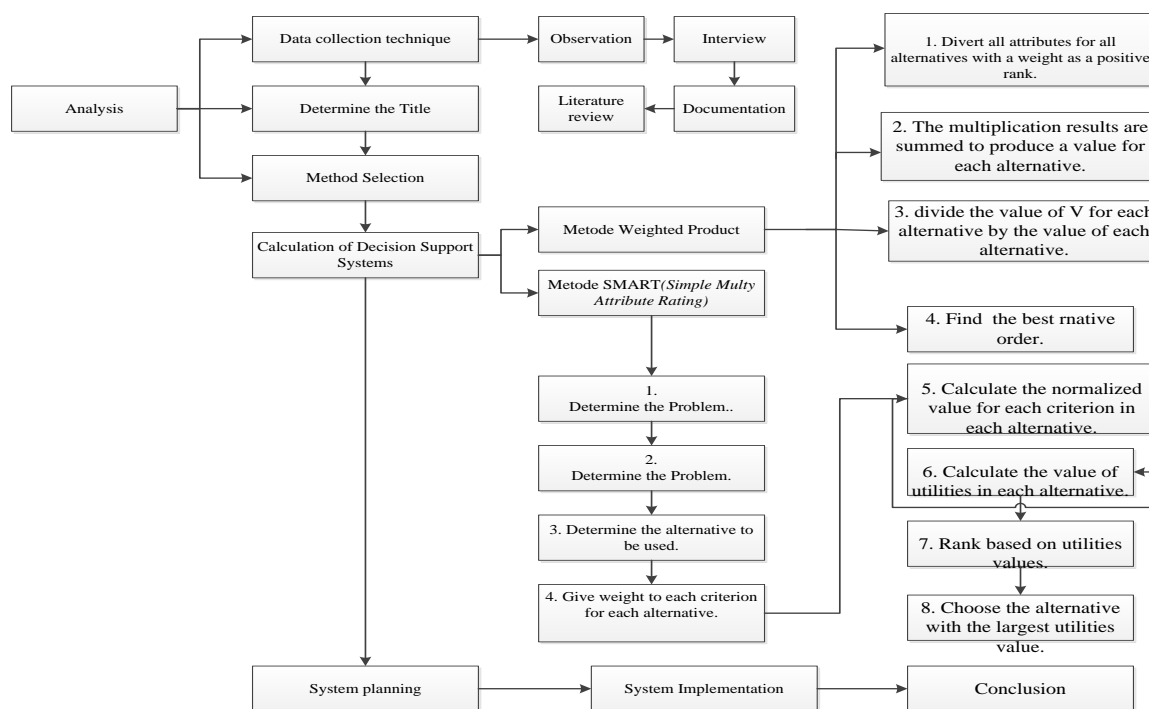


Figure 1. Research Frame

1. Data Collection Techniques

The data were obtained by doing observation, interviews, and literature study. The authors make observations directly to the place of research and conduct interviews. Then, literature study was conducted to gather various information and documents needed in this research. The results obtained using this data collection technique were in the form of a running system in Simepeunan Pameungkeut Banda Cooperative, problems to be studied, and important documents needed.

2. Determine the Title

For the first step Had been taken Had been Carried out that has been taken from the results of data collection techniques that have been carried out in Savings and Loan Cooperative of the Pameungkeut Banda Simepeunan with the title Analysis of the Weighted Product Method and SMART (Simple Multy Attribute Rating Technique) in Determining Lending to the SPB Cooperative.

3. Method Selection

for the first step of determining this title, the authors determine the results of research at the research site that had been taken from the results of data collection techniques that had been carried out in Savings and Loan Cooperative of the Simepeunan Pameungkeut Banda.

4. In the Calculation of Decision Support Systems, the authors analyze the data using weighted product method and the SMART (Simple Multy Attribute Rating Technique) method.

5. System Design

The system design is carried out in accordance with the data that has been analyzed.

6. System Implementation

In the implementation of this system, the authors implement the development of a new system from the old system, where problems that occur in the old system are expected to have been resolved in the new system. The authors make the design of a proposed system using the Decision Support System (SPK) Weighted Product Method and the SMART Method (Simple

Multy Attribute Rating Technique) as a decision maker in granting credit to the Pameungkeut Banda Simpeunan Cooperative.

7. Conclusions

At this step the authors tried to find out which method is more effective in determining the provision of credit to the Simpeunan Pameungkeut Banda Cooperative members.

4. Results and Discussion

4.1 Weighted Product Method

1. Determine The Criteria

C1 = Deposit amount is the required deposit amount that must be owned by the borrower using the formula as below:

- 1) Deposits 2,000,000 x 4 = 8,000,000
- 2) Deposits 3,500,000 x 3 = 10,500,000
- 3) Deposits of 5,500,000 x 2.5 = 13,750,000
- 4) Deposits of 8,000,000 and above x 2 = up to 16,000,000

This means if the borrower has a saving of 2,000,000, the saving is multiplied by 4 so that the maximum amount that can be borrowed is 8,000,000. If the borrower has 3,500,000 deposits, it will be multiplied by 3 so that the maximum amount that can be borrowed is 10,500,000. If the borrower has a savings of 5,500,000 then it will be multiplied by 2.5 so that the maximum amount that can be borrowed is 13,750,000. If the borrower has deposits of 8,000,000 and above, it will be multiplied by 2 so that the maximum amount that can be borrowed is 16,000,000 or more.

C2 = Income derived from the work of the borrower

C3 = Character is an assessment of the borrower’s attitude, seen whether previously there was a delinquent payment, or difficulties in paying the bill.

C4 = Collateral is the assets of the borrower promised to the lender. If the borrower cannot return the loan, the lender can have the collateral.

C5 = Condition is the condition of the proposed guarantee, whether or not it is still feasible to be used as collateral.

2. Determine the compatible rating for each criterion. Match branches are the value of each criterion, each criterion is valued in numbers from 20 to 100. In the table below is a compatibility branch that has values of 20 (very bad), 40 (bad), 60 (sufficient), 80 (good) 100 (very good). The lowest value of the above criteria is 20 and the highest is 100 :

Table 1. Compatible Rating

The level of each criterion	Value
Very bad	20
Bad	40
Sufficient	60
Good	80
Very well	100

Table 2. Criteria Weight

Id	Name of criteria	Value weights
C1	Deposit Amount	100
C2	Income	60
C3	Character	60
C4	Guarantee	80
C5	Guarantee	60

Table 2 explains the names and values or weights in the loan-lending requirements at Pameungkeut Banda Savings and Loan Cooperative. Later, the order in the system of giving credit decisions based on the highest priority is the amount of deposits and subsequently collateral, income, collateral conditions and character.

3. Determine the weighting of each criteria

After determining the value of the next stage, criteria are made a level of criteria based on alternatives (borrower's criteria) that have been determined into value. The following table represents the faithful compatibility of alternative ratings on each criterion:

a. Criteria For Amount Of Deposit

Criteria for Amount of Deposit In table 3 below explains the assessment of the criteria for the amount of deposits. If the loan amount is 8,000,000 then the minimum amount of deposits owned by the borrower is 2,000,000. If the loan amount is 10,500,000 then the minimum amount of deposits owned by the borrower is 3,500,000. If the loan amount is 16,000,000 and above then the minimum amount of savings owned by the borrower is 8,000,000.

Table 3. A Weight of Deposit Amount

Loan Amount	Minimum of deposit amount	Value
8.000.000	<= 2.000.000	30
	= 2.000.000	70
	>= 2.000.000	100
10.500.000	<= 3.500.000	30
	= 3.500.000	70
	>= 3.500.000	100
13.750.000	<= 5.000.000	30
	= 5.000.000	70
	>= 5.000.000	100
Up to 16.000.000	<= 8.000.000	30
	= 8.000.000	70
	>= 8.000.000	100

b. Income Criteria

Table 4. The Quality of Income Value

The Criteria of Borrower	Value
500.000 – 1.999.999	20
2.000.000 – 3.999.999	40
4.000.000 – 5.999.999	60
6.000.000 – 9.999.999	80
>=10.000.000	100

In the table above it explains about the value of wages criteria, wages borrower must be minimum up to 500.000 and maximum limit from income is >= 10.000.000

c. Character Criteria

Table 5. The Quality of Character Value

The Criteria of borrower	Value
Very bad	20
Bad	40
Sufficient	60
Good	80
Very good	100

The table explains the assessment of character criteria. The value is based on data from credit lenders. Value of 100 is the highest value of the criteria which is a very good borrower. 80 is good, 60 is good, 40 is less and 20 is very less.

d. Guarantee criteria

The table explains the collateral criteria. These criteria are obtained from the Simpeunan Pameungkeut Banda Cooperative. The Simpeunan Pameungkeut Banda cooperative only accepts BPKB motorbikes, car BPKB guarantees, paddy field and pond certificates, land certificates and house certificates. Minimum year of vehicle warranty is 2008.

Table 6. The Quality of guarantee value		Table 7. The Quality of Guarantee Condition	
Guaranteed Value	Weight Value	Match Rating	Value
BPKB Motorcycle	40	Very less	20
BPKB car	60	Less	40
Paddy field and pond certificate	60	Enough	60
Land Certificate	80	Good	80
House Certificate	100	Very Good	100

e. The Criteria of Guarantee Condition

The Table 7 explains the conditions of collateral to be submitted by the borrower. Here the cooperative employees analyze the conditions of the collateral eligibility. The following must be checked against the conditions of guarantee:

1. Very less is a condition when the collateral condition a motorbike or a car is not feasible, the name of the ownership documents does not conform the credit borrower's name, and the rice fields / ponds, land, houses are state-owned land, or are still in dispute
2. Enough is a condition when the collateral condition of a motorbike or a car is reasonable, the name of the ownership documents does not conform the borrower's name, the house still has arrears / not paid off (semi-permanent), and the land owned by the borrower also has arrears.
3. Good is a condition when the collateral condition of a car or a motorcycle is feasible, but the documents do not belong to the borrower. The house is permanent but not in the name of the borrower and the land is privately owned and paid in full, but the certificate is not in the borrower's name.
4. Very Good is a condition when the credit guarantees condition of a motorbike or car is feasible and the documents belong to the credit borrower. The house is a private residence with the borrower's name in the certificate of title. The land certificate is in the name of the borrower and has been fully paid / no arrears.

Table 8. Input of Applicant Data

Name	Deposit Amount	Income	Character	Guarantee	Conditions of Guarantee
Diana	<8000000	5000000	Pretty good	soil	very less
Feri Jalias	>8000000	6000000	Very good	house	very less
Herni	=8000000	2000000	Very good	rice fields	very good
Ida Dahlia	=8000000	4000000	good	soil	very good
Ihat Solihat	>8000000	6000000	Very good	motorcycle	very good

After the borrower's table is input, then the next step is to convert the data into match table in Table 9 that has been specified previously. The following table matches the values based on the input:

Table 9. Match Value Table

Name	Data Utility Value Criteria				
	Deposit Amount	Income	Character	Guarantee	Conditions of Guarantee
Diana	30	20	60	80	20
Feri Jalias	100	80	100	100	20
Herni	70	40	100	40	100
Ida Dahlia	70	60	80	80	100
Ihat Solihat	100	80	100	20	100

5. Weight Correction

Weight improvement is done by calculating the initial weight that has been determined at the cooperative (Table 3.) where the initial weight is $W = (5,3,3,4,3)$ and will be corrected to :

$$W_j = \frac{x_j}{\sum w_j} \tag{7}$$

$$W_1 = \frac{100}{100+60+60+80+60} = 0.278$$

$$W_2 = \frac{60}{100+60+60+80+60} = 0.167$$

$$W_3 = \frac{60}{100+60+60+80+60} = 0.167$$

$$W_4 = \frac{80}{100+60+60+80+60} = 0.222$$

$$W_5 = \frac{60}{100+60+60+80+60} = 0.167$$

Table 10. Weight Correction

Criteria Name	Weight	Weight Repair
Deposit Amount	100	0.278
Income	60	0.167
Character	60	0.167
Guarantee	80	0.222
Conditions Of Guarantee	60	0.167

Table 11. Data Si Vector Calculation

Name	Vector Vi Score
Diana Azizah	37
Feri Jalias S	74
Herni Marlina	63
Ida Dahlia	76
Ihat Solihat	67

After getting the value of the improvement of the weights of each alternative above, then the next step is to do the Si Vector and Vi Vector calculations.

6. Vector Calculation of Si

1. Diana Azizah
 $S_1 = (30^{0.278})(20^{0.167})(60^{0.167})(80^{0.222})(20^{0.167}) = 37$
2. Herni Marlina
 $S_2 = (70^{0.278})(40^{0.167})(100^{0.167})(40^{0.222})(100^{0.167}) = 63$
3. Feri Jalias S
 $S_3 = (100^{0.278})(80^{0.167})(100^{0.167})(100^{0.222})(80^{0.167}) = 74$
4. Ihat Solihat
 $S_4 = (100^{0.278})(80^{0.167})(100^{0.167})(20^{0.222})(100^{0.167}) = 67$
5. Ida Dahlia
 $S_5 = (70^{0.278})(60^{0.167})(80^{0.167})(80^{0.222})(100^{0.167}) = 76$

7. Vector Calculation of S

$$Vi = \frac{\prod_{j=1}^n x_{ij} w^j}{\prod_{j=1}^n (X_j)w^j} \quad (8)$$

1. Diana Azizah

$$V6 = \frac{37}{\frac{58 + 61 + 55 + 56 + 64 + 37 + 47 + 74}{+63 + 76 + 67 + 54 + 60 + 59 + 68 + 40} = 0.032}$$

2. Herni Marlina

$$V9 = \frac{63}{\frac{58 + 61 + 55 + 56 + 64 + 37 + 47 + 74}{+63 + 76 + 67 + 54 + 60 + 59 + 68 + 40} = 0.056}$$

3. Feri Jalias S

$$V8 = \frac{74}{\frac{58 + 61 + 55 + 56 + 64 + 37 + 47 + 74}{+63 + 76 + 67 + 54 + 60 + 59 + 68 + 40} = 0.064}$$

4. Ihat Solihat

$$V11 = \frac{67}{\frac{58 + 61 + 55 + 56 + 64 + 37 + 47 + 74}{+63 + 76 + 67 + 54 + 60 + 59 + 68 + 40} = 0.059}$$

5. Ida Dahlia

$$V10 = \frac{76}{\frac{58 + 61 + 55 + 56 + 64 + 37 + 47 + 74}{+63 + 76 + 67 + 54 + 60 + 59 + 68 + 40} = 0.067}$$

Table 12. Data of Calculating Vi

Name	Vector Vi
Diana Azizah	0.032
Feri Jalias S	0.064
Herni Marlina	0.056
Ida Dahlia	0.067
Ihat Solihat	0,059

From the results of the calculation in addition to determining the credit worthiness of the Simpeunan Pameungkeut Banda Cooperative using the Weighted Product method of a sample of 20 selected borrowers, with a value limit of 0.045, show the results of 16 borrowers who are eligible for credit loans, and 4 members who are not eligible for credit loans. The results of these calculations are in accordance with predetermined

4.2 SMART Method

In the SMART method the steps taken in Determining Number of Criteria, Determining Criteria Weight, Determining the weighting of each criterion, Borrowing Data Input, and Normalizing Criteria Weight are the same as the Weighted Product method. So here the authors will immediately explain in the next step

1. Calculating utility value

$$u_i (a_i) = 100 \frac{(C_{out\ i} - C_{min})}{(C_{max} - C_{min})} \quad (9)$$

Information :

- $u_i (a_i)$: The value of the 1st criteria utility for the i iteration
- C_{max} : Maximum criterion value
- C_{min} : Minimum criterion value
- C_{out} : The i value criterion

1. Diana Azizah

$$\begin{aligned} \text{Deposit Amount} &= 100 \frac{(30 - 30)}{(100 - 30)} \\ &= 100 \frac{0}{70} = 0 \end{aligned}$$

$$\begin{aligned} \text{Character} &= 100 \frac{(60 - 20)}{(100 - 20)} \\ &= 100 \frac{40}{80} = 50 \end{aligned}$$

$$\begin{aligned} \text{Income} &= 100 \frac{(20 - 20)}{(100 - 20)} \\ &= 100 \frac{0}{80} = 0 \end{aligned}$$

$$\begin{aligned} \text{Guarantee} &= 100 \frac{(80 - 20)}{(100 - 20)} \\ &= 100 \frac{60}{80} = 75 \end{aligned}$$

$$\begin{aligned} \text{Conditions of Guarantee} &= 100 \frac{(20 - 20)}{(100 - 20)} \\ &= 100 \frac{0}{80} = 0 \end{aligned}$$

2. Dian Muharam

$$\begin{aligned} \text{Deposit Amount} &= 100 \frac{(100 - 30)}{(100 - 30)} \\ &= 100 \frac{70}{70} = 100 \end{aligned}$$

$$\begin{aligned} \text{Character} &= 100 \frac{(80 - 20)}{(100 - 20)} \\ &= 100 \frac{60}{80} = 75 \end{aligned}$$

$$\begin{aligned} \text{Income} &= 100 \frac{(60 - 20)}{(100 - 20)} \\ &= 100 \frac{40}{80} = 50 \end{aligned}$$

$$\begin{aligned} \text{Guarantee} &= 100 \frac{(80 - 20)}{(100 - 20)} \\ &= 100 \frac{60}{80} = 75 \end{aligned}$$

$$\begin{aligned} \text{Conditions of Guarantee} &= 100 \frac{(20 - 20)}{(100 - 20)} \\ &= 100 \frac{0}{80} = 0 \end{aligned}$$

3. Ida Dahlia

$$\begin{aligned} \text{Deposit Amount} &= 100 \frac{(70 - 30)}{(100 - 30)} \\ &= 100 \frac{40}{70} = 57.1 \end{aligned}$$

$$\begin{aligned} \text{Character} &= 100 \frac{(80 - 20)}{(100 - 20)} \\ &= 100 \frac{60}{80} = 75 \end{aligned}$$

$$\begin{aligned} \text{Income} &= 100 \frac{(60 - 20)}{(100 - 20)} \\ &= 100 \frac{40}{80} = 50 \end{aligned}$$

$$\begin{aligned} \text{Guarantee} &= 100 \frac{(80 - 20)}{(100 - 20)} \\ &= 100 \frac{60}{80} = 75 \end{aligned}$$

$$\begin{aligned} \text{Conditions of Guarantee} &= 100 \frac{(100 - 20)}{(100 - 20)} \\ &= 100 \frac{80}{80} = 100 \end{aligned}$$

4. Ihat Solihat

$$\begin{aligned}
 \text{Deposit Amount} &= 100 \frac{(100 - 30)}{(100 - 30)} = 100 \frac{70}{70} = 100 \\
 \text{Character} &= 100 \frac{(80 - 20)}{(100 - 20)} = 100 \frac{60}{80} = 75 \\
 \text{Income} &= 100 \frac{(80 - 20)}{(100 - 20)} = 100 \frac{60}{80} = 75 \\
 \text{Guarantee} &= 100 \frac{(80 - 20)}{(100 - 20)} = 100 \frac{60}{80} = 75 \\
 \text{Conditions of Guarantee} &= 100 \frac{(100 - 20)}{(100 - 20)} = 100 \frac{80}{80} = 100
 \end{aligned}$$

5. Feri Jalias S

$$\begin{aligned}
 \text{Deposit Amount} &= 100 \frac{(100 - 30)}{(100 - 30)} = 100 \frac{70}{70} = 100 \\
 \text{Character} &= 100 \frac{(100 - 20)}{(100 - 20)} = 100 \frac{80}{80} = 100 \\
 \text{Income} &= 100 \frac{(80 - 20)}{(100 - 20)} = 100 \frac{60}{80} = 75 \\
 \text{Guarantee} &= 100 \frac{(100 - 20)}{(100 - 20)} = 100 \frac{80}{80} = 100 \\
 \text{Conditions of Guarantee} &= 100 \frac{(20 - 20)}{(100 - 20)} = 100 \frac{0}{80} = 0
 \end{aligned}$$

2. Calculating Final Value by SMART method

$$u(a_i) = \sum_{j=1}^m w_j u_j(a_i) \quad (10)$$

1. Diana Azizah
 $(0.278 \times 0) + (0.167 \times 0) + (0.167 \times 50) + (0.222 \times 75) + (0.167 \times 0) = 25$
2. Dian Muharam
 $(0.278 \times 100) + (0.167 \times 50) + (0.167 \times 75) + (0.222 \times 75) + (0.167 \times 0) = 65.3$
3. Ida Dahlia
 $(0.278 \times 57.1) + (0.167 \times 50) + (0.167 \times 75) + (0.222 \times 75) + (0.167 \times 100) = 70.0$
4. Ihat Solihat
 $(0.278 \times 100) + (0.167 \times 75) + (0.167 \times 100) + (0.222 \times 0) + (0.167 \times 100) = 73.6$
5. Feri Jalias
 $(0.278 \times 100) + (0.167 \times 75) + (0.167 \times 100) + (0.222 \times 100) + (0.167 \times 0) = 79.2$

From the results of the calculation in addition to determining the credit worthiness of the Simpeunan Pameungkeut Banda Cooperative using the SMART method of a sample of 20 selected borrowers, with a limit on the value of eligibility 45 gets the results of 16 borrowers who are eligible to get credit loans, and 4 members who are not eligible to get credit loans. These calculations are in accordance with predetermined criteria. From the results of the analysis, the authors conclude that the SMART method is more effective in determining eligibility

5. Summary

Based on the analysis that has been presented, the decision support system for creditworthiness selection can optimize the work of cooperative employees. The results of the Weighted Product calculation method to select prospective borrowers shows the highest value of 0.067 and the lowest value of 0.032. Besides that, the SMART method has the highest value of 79.2 and the lowest value of 25. To conclude, the SMART method is more effective in determining the provision of creditworthiness because the results of calculations with existing data are more valid.

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