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Decision Support System Of Micro Business Credit Using The SAW Method At Bank Mandiri Pematangsiantar Sudirman Branch Based On Web-Based

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Abstract

Bank Mandiri Pematangsiantar Sudirman branch is a banking financial institution that accepts deposits, savings, or other forms and distributes funds as a business. At Bank Mandiri Pematangsiantar, there is always a graduation requirement for prospective debtors to be able to apply for credit/loans. Prospective debtors must meet the requirements to meet the criteria for applying for microcredit at the Sudirman branch of Bank Mandiri Pematangsiantar. And to determine prospective debtors who are entitled to receive credit, bank employees must determine several criteria that must be met by prospective debtors. This problem can be solved by the simple additive weighting (SAW) method in determining criteria and making decisions. This method will provide an alternative weighting with the largest weight being the choice that will be determined as a new prospective customer at Bank Mandiri Pematangsiantar.

Keywords: Bank Mandiri, Credit, Debtor, SAW Method

1. Introduction

According to the Law of the Republic of Indonesia Number 20 of 2008 concerning micro, small and medium enterprises. Micro-enterprises are productive businesses owned by individuals and/or individual business entities that meet the criteria for micro-enterprises as stipulated in this Law. micro-enterprise criteria are as follows:

a. have a net worth of at most Rp. 50,000,000.00 (fifty million rupiah) excluding land and buildings for business premises; or
b. have annual sales of a maximum of Rp.300,000,000.00 (three hundred million rupiah).

Banks are usually known as financial institutions whose main activity is accepting demand deposits, savings, and time deposits. Banks are also known as institutions that lend money (credit). Banks as credit distribution institutions are very dominantly needed by the business community from various segments including Wholesale (large/corporate), Middle (Medium), Retail and Micro (Small). This dependence is felt by entrepreneurs who need fresh loan funds in capital loans. Banks will respond to requests by trying to expand credit according to the requests of prospective creditors. One type of credit that has a lot of demand is micro-enterprise credit (KUM).

Bank Mandiri is one of the banks that provide micro-business credit facilities to the business community. The higher the public's interest in obtaining micro-business loans, the banks need software to help determine who is entitled to get credit. To produce a proper feasibility analysis, it is necessary to use a method in making decisions to overcome these problems so that the determination of who is entitled to receive credit does not take a long time and is efficient in reducing credit risk. loan customers, namely the

decision support system (SPK) whether the prospective customer is eligible or not eligible to receive business capital loans.

Therefore, the author took the initiative to design a system that can assist the Bank in determining the eligibility of Micro Business Credit (KUM) recipients so that it can be more efficient in its implementation. Based on the description above, the authors are interested in discussing the problem by choosing the title "Decision Support System for Micro Business Loans Using SAW at Bank Mandiri Pematangsiantar Sudirman Branch"..

2. Method

The Simple Additive Weighting SAW method is a method that performs weight calculations. The steps for the Simple Additive Weighting SAW Method are as follows:

a. Determine the criteria that will be used as a reference in making decisions.
b. Determine the suitability rating of each alternative on each criterion.
c. Make a decision matrix based on criteria, then normalize. matrix based on an equation that is adjusted to the type of attribute (profit attribute or cost attribute).
d. Create a normalization matrix.
e. The ranking process..

3. Results and Discussion

3.1 Determining the Weighting of Each Criterion

Based on an interview with the Head of the Micro Business Credit Unit at Bank Mandiri Pematangsiantar Sudirman branch, it is known that the criteria used in determining the debtor who is entitled to receive a credit loan include 6 criteria, namely: Income, Collateral, Loan Limit, Installment, Length of Business, and Number of Dependents. below is a table of criteria and alternatives that will be tested using the Simple Additive Weighting (SAW) method.

Tabel 1. Tabel Daftar Kriteria

Criteria Code	Criteria	Criteria Type
C1	Income	Benefit
C2	Grace	Benefit
C3	Loan Limit	Benefit
C4	Installment	Benefit
C5	Business Length	Benefit
C6	The number of dependents	Cost

From the six criteria, the manager determines the importance or weight rating of each criterion based on the importance of the criteria in decision making. In table 2 are the weight values with a subjective approach:

Table 2. Criteria Weight Table

Criteria Weight	Criterion Code
C1	20%
C2	20%
C3	20%
C4	20%
C5	10%
C6	10%

3.2 Alternative Data

Table 3. Alternate Fit Rating

Alternatif	Kriteria					
	C1	C2	C3	C4	C5	C6
A1	3	3	3	5	5	3
A2	2	5	3	5	5	3
A3	4	5	3	5	2	3
A4	2	4	2	5	5	3
A5	4	5	4	5	5	3
A6	2	5	2	3	1	1
A7	3	5	4	5	3	4
A8	3	5	3	5	5	3
A9	3	5	4	5	3	3
A10	2	5	2	3	4	2

To make a decision matrix X, a match table is made as follows:

$$x = \begin{Bmatrix} 3 & 3 & 3 & 5 & 5 & 3 \\ 2 & 5 & 3 & 5 & 5 & 3 \\ 4 & 5 & 3 & 5 & 2 & 3 \\ 2 & 4 & 2 & 5 & 5 & 3 \\ 4 & 5 & 4 & 5 & 5 & 3 \\ 2 & 5 & 2 & 3 & 1 & 1 \\ 3 & 5 & 4 & 5 & 3 & 4 \\ 3 & 5 & 3 & 5 & 5 & 3 \\ 3 & 5 & 4 & 5 & 3 & 3 \\ 2 & 5 & 2 & 3 & 4 & 2 \end{Bmatrix}$$

After making the decision matrix X, first, normalize the X matrix to calculate the value of each criterion based on predetermined criteria. From the calculation results, the normalized matrix can be seen in the following table:

Table 4. Normalized Matrix

Borrower Code	Name	C1	C2	C3	C4	C5	C6
1107010812930001	muhammad	0.75	0.60	0.75	1.00	1.00	0.33
1272020109670001	Wargini	0.50	1.00	0.75	1.00	1.00	0.33
1272020306700001	Marwan	1.00	1.00	0.75	1.00	0.40	0.33
1272021204630001	Usman	0.50	0.80	0.50	1.00	1.00	0.33
1272021406670004	Suparmen	1.00	1.00	1.00	1.00	1.00	0.33
1272022004920002	Ari Afriandi Batubara	0.50	1.00	0.50	0.60	0.20	1.00
1272022409710001	Dendi Junaidi	0.75	1.00	1.00	1.00	0.60	0.25
1272022502700001	Adek Lubis	0.75	1.00	0.75	1.00	1.00	0.33
1272023112600027	Ediwirman	0.75	1.00	1.00	1.00	0.60	0.33
1272024111720003	Hariani	0.50	1.00	0.50	0.60	0.80	0.50

Next, the W X R matrix multiplication and the addition of the multiplication results will be made to obtain the best alternative by ranking the largest values. Sorting based on the preference values obtained, from the largest to the smallest.

Table 5. Alternative Ranking

No	Borrower Code	Borrower Name	Reference Value
1.	1272021406670004	Suparmen	9,33
2.	1272023112600027	Ediwirman	8.43
3.	1272022409710001	Dendi Junaidi	8.35
4.	1272022502700001	Adek Lubis	8.33
5.	1272020306700001	Marwan	8,23
6.	1272020109670001	Wargini	7.83
7.	1107010812930001	muhammad	7.53
8.	1272021204630001	Usman	6.93
9.	1272024111720003	Hariani	6.50
10.	1272022004920002	Ari Afriandi Batubara	6.40

3.3 System Implementation

The login display is the first page that will appear when the program is run and this page is an entry to the application of the decision support system for micro-credit granting using SAW at Bank Mandiri Pematangsiantar Sudirman branch.

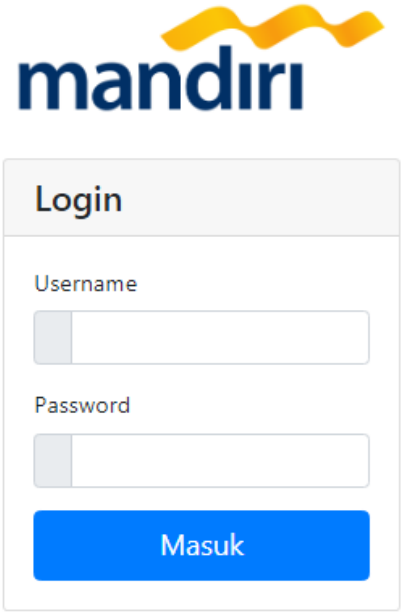


Figure 1. Login Display

The period data page is a data processing center because all data from each alternative and criteria will be displayed on this page, to enter the period data, the user only needs to select the period data menu on the home page. The picture of the period data page can be seen in Figure 2 which is below.

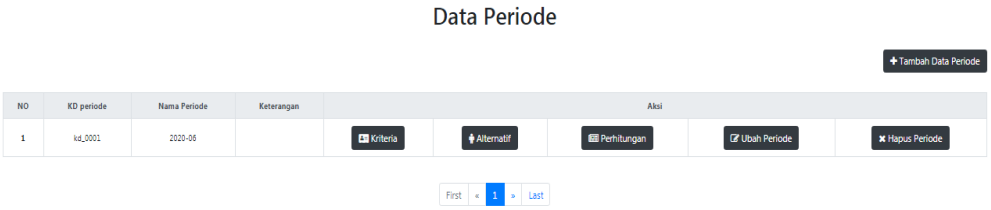


Figure 2. Display of Period Data

The criteria data page will display all the criteria data needed by the system in classifying all alternatives, to enter the criteria page, the user must first open the period data page then the user clicks the criteria menu on the page, then the criteria data display will appear that can be seen in Figure 3 below.

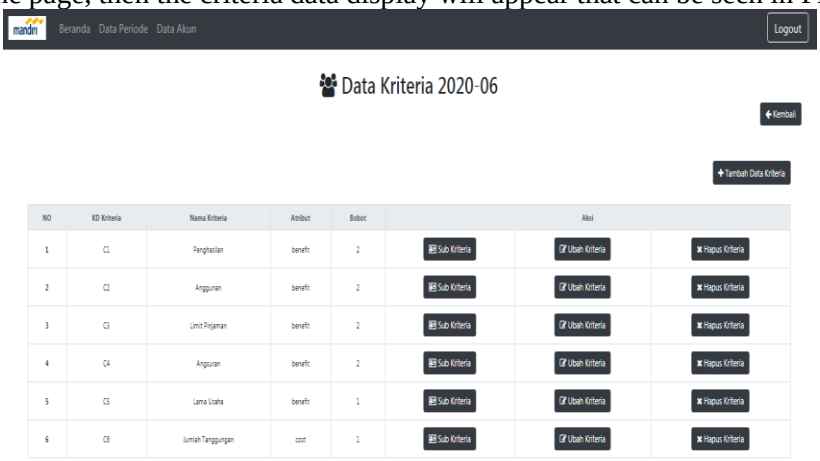


Figure 3. Criteria Data Display

The calculation page serves to display the calculation results from the analysis of the decision support system. There are several tables that will be displayed, including the criteria table, alternative table, normalized data table, normalized matrix data table, calculation table and alternative calculation table. In Figure 4 below, the criteria assessment table will be displayed along with the following:
with the weight of each criterion.

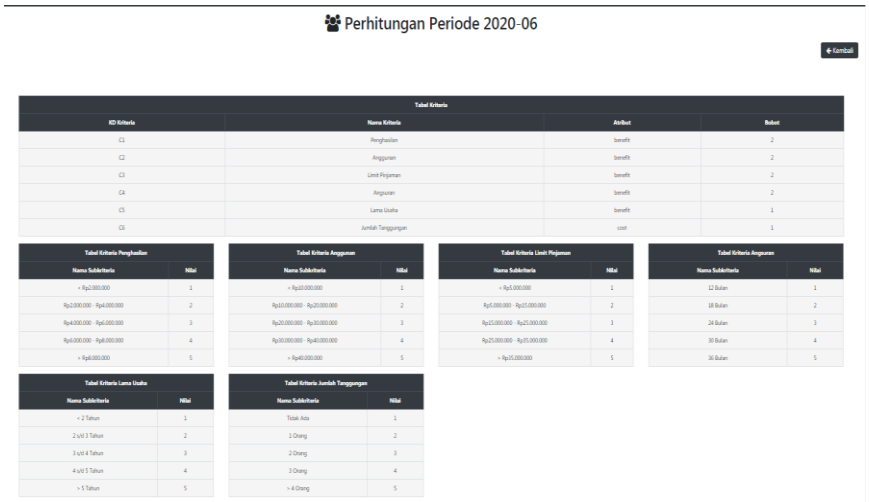
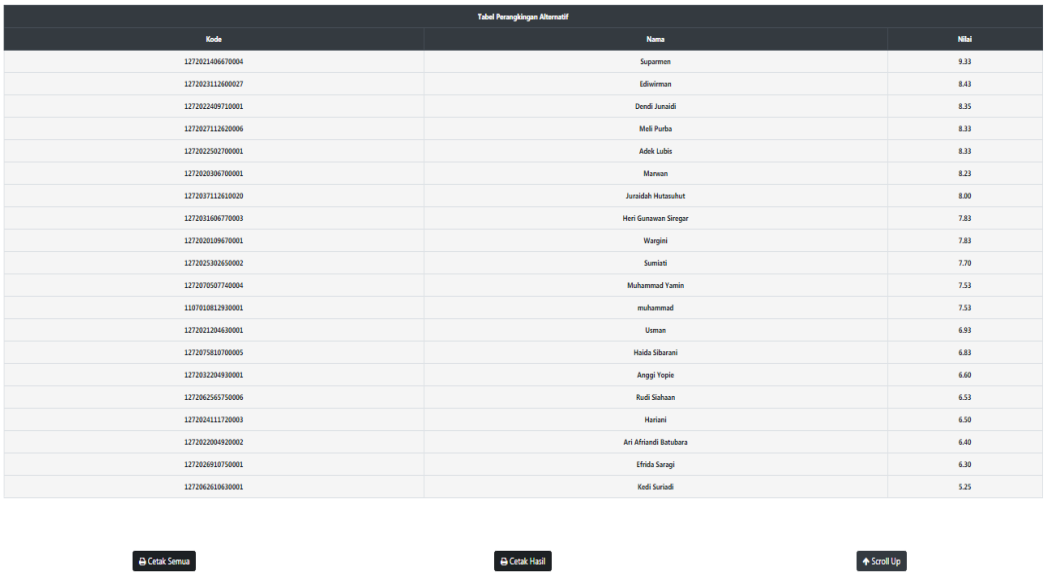


Figure 4. Display of the Criteria Assessment Table

The ranking table display will appear when the user scrolls down, for the ranking table view can be seen in 5 below.



Tabel Perangkingan Alternatif

Kode	Nama	Nilai
1272021406670004	Suparmen	9.33
1272023112600027	Ediwirman	8.43
1272022409710001	Dendi Junaidi	8.35
1272027112620006	Meli Purba	8.33
1272022502700001	Adek Lubis	8.33
1272020306700001	Marwan	8.23
1272037112610020	Juraidah Hutasuhut	8.00
1272031606770003	Heri Gunawan Siregar	7.83
1272020109670001	Wargini	7.83
1272025302650002	Sumiati	7.70
1272070507740004	Muhammad Yamin	7.53
1107010812930001	muhammad	7.53
1272021204630001	Usman	6.93
1272075810700005	Haida Sibarani	6.83
1272032204930001	Anggi Yopie	6.60
1272062565750006	Rudi Siahaan	6.53
1272024111720003	Hariani	6.50
1272022004920002	Ari Afriandi Batubara	6.40
1272026910750001	Efrida Saragi	6.30
1272062610630001	Kedi Suriadi	5.25

Cetak Semua Cetak Hasil Scroll Up

Figure 5. Display of Ranking Table

4. Conclusions

a. The decision support system that is applied using the Weight Product method can make it easier to determine majors at SMK GKPS-3
b. The results of manual calculations compared with the output of the Decision Support System has the same results. This shows that the Decision Support System that is designed can process the selection of new student admissions well.
c. The designed SPK operates properly and correctly and is 100% accurate because the evaluation results of the comparison of the results of manual analysis and overall DSS analysis are appropriate.
d. This system is only a tool for decision-makers, the final decision remains in the hands of the decision-maker.

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