International Journal of Business, Law, and Education
Publisher: IJBLE Scientific Publications Community Inc.
Volume 6, Number 2, 2025
https://ijble.com/index.php/journal/index

Micro, Small, and Medium Enterprises Eligibility and Financial Institutions Selection for Provision Capital

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ABSTRACT
Some of the obstacles to Micro, Small, and Medium Enterprises (MSMEs) existence include difficulty in obtaining additional capital from banking institutions due to lack of employee knowledge and unfulfilled requirements. This research purpose is to determine MSMEs feasibility and selection of appropriate financial institutions to apply for additional capital using a decision support system. There are 25 MSMEs samples in Karanganyar City to be used as research material. Decision tree algorithm is used to calculate initial decisions in specify MSMEs suitability to be given capital. AHP method is used as final decision to decide an appropriate financial institution to carry out additional capital. Accuracy level testing decision tree algorithm implementation to determine MSMEs feasibility resulted in 86.67%. Accuracy level of testing AHP method to decide financial institutions suitability resulted in 76.91%. From the test results, it can be concluded that developed system is good or accurate.

Keywords:
AHP;
Capital;
Decision Tree;
MSMEs Feasibility;
Financial Institutions.

INTRODUCTION

Parameter for increasing regional development is cities ability, provinces and all elements of society to manage their resources and build partnerships between provinces and cities to open new jobs and encourage economic growth in a region (Mihardjo & Ningtyas, 2023). MSMEs is one of factors that contributes to Indonesia's economic growth. MSMEs are business units run by individuals or small entrepreneurs who do not have large amounts of capital (Gustriani et al., 2023). Based on various data sources, 88.8% to 99.9% of business forms in ASEAN are MSMEs. Existence of MSMEs, they are able to absorb a large number of workers ranging from 51.7 to 97.2 percent. Based on these facts, current presence of MSMEs cannot be underestimated, let alone underestimated (Utami, 2023). MSMEs also more resistant to crises even though their productivity is not as high as large-scale companies. MSMEs have a simpler organizational structure and fewer employees, allowing them to adapt and respond to market changes. With this flexibility, MSMEs can be used as the main source of income for most people (Khusaini et al., 2022). This indicates that MSMEs play a very important role in increasing new jobs. If we can further increase the strength and number of MSMEs, unemployment problem will definitely be resolved, because SMEs have been proven to be able to stimulate the economy in region (Indrayani, 2024). Various initiatives and efforts continue to be carried out to make MSMEs even stronger, whether carried out by the government as policy holder, banks that really care about MSMEs or community as a driving force for stable entrepreneurship (Nadliroh et al., 2025).

Behind MSMEs presence, there are several obstacles in managing these businesses, including difficulty in obtaining loans from banks due to existing employees knowledge lack, lack of development in information technology, and

several conditions that cannot be met. The Government's solution in decision making is participation in providing capital financing (Tamba et al., 2022). Bank makes every effort to provide conditional financing arrangements to MSMEs that urgently need funds to continue their operations. This appointment is related to considerations of financial conditions and how big impact of the Covid-19 pandemic is (Setiawan et al., 2023). Government is preparing plans to expand financial institutions to provide credit funds for people's businesses and facilitate access to financing for MSMEs. Based on KUR distribution data for September 2020 (https://kur.ekon.go.id/realization_kur/2020/9), it is known that less than 60% of KUR distribution was absorbed into the production sector. This is due to cautious attitude of banks regarding the possibility of large scale non performing loans in MSMEs sector (Putri et al., 2023). Therefore, MSMEs owner, especially those that have just been established, may not have full access to these capital facilities. The problems faced by MSMEs are that banks fail to serve the wider community, prices received are inefficient, startup cash flow has a short profit sharing payment period, and access to capital for entrepreneurs is limited. They do not have enough funds to hold assets as collateral (Nurchayati, 2025).

From many problems that have been described, there needs to be a solution, one of which is to develop a decision support system that can assist in determining capital for MSMEs, especially those in Karanganyar city. Decision support system (DSS) created in this research uses the decision tree method and Analytic Hierarchy Process (AHP). DSS is a system that provides structured or unstructured problem solving and can communicate to solve certain problems (Afriadi et al., 2022). DSS is designed to be easy to use and operate, even for people with only basic computer skills. DSS results from the implementation of highly competent adaptation and can therefore be used as an alternative means of decision making (Ebrahimi et al., 2023). Selection of alternatives provided is based on facts and is carried out using a systematic approach so that it can provide recommendations for the best solution to management is called decision making (Shaqina et al., 2024).

Decision trees are a data mining method that is often used as a solution in classification. Decision trees are a classification method that uses a tree structure (Handayani et al., 2023). Each node represents an attribute, a branch represents an attribute value, and a leaf represents an existing class. Decision trees use criteria as connected nodes to form a tree structure to find a solution to a problem (Eldora et al., 2024). A decision tree is a predictive model of decision making using a hierarchical or tree structure. Concept of data in a decision tree is that data is represented in the form of a table consisting of attributes and records (Rianti et al., 2022). AHP is a psychology and mathematics-based method used to help make complex decisions (Kartika Salsabilla Wulandari et al., 2024). AHP allows problems to be measured fairly and alternative solutions can be evaluated through pairwise comparisons. AHP is implemented to produce consistent weights for each criterion and sub-criteria that have been determined (Suprapto & Danuwidodo, 2024). The search for appropriate or consistent criteria weights is carried out using AHP because this method will create a pairwise comparison matrix and consistency ratio to check whether the resulting weights are consistent or not (Setyadi & Perbawa, 2024). In this research, the decision tree method is used to solve problems in making decisions about MSMEs feasibility obtaining loans based on existing requirements. AHP is used to select appropriate

financial institutions for MSMEs to borrow capital by considering an appropriate criteria in applying for capital loans from each financial institution.

Previous research published in journal entitled Decision Support System for Receiving Assistance from Micro Business Actors for MSMEs Using Electre (Elimination and Choice Translation Reality) Algorithm produced a system that functions to provide recommendations for recipients of BPUM assistance for MSMEs at Ponorogo Regency Trade Office (Patnandi et al., 2022). There are four criteria used, that are initial capital, production, turnover and business location. Based on system created results, there are 38 MSMEs that are entitled to receive assistance from 44 alternative MSMEs. Based on existing facts, only 20 MSMEs received BPUM assistance, so there is a difference between the facts and system recommendations. This difference is due to the fact that there was no filtering based on certain criteria carried out by Ponorogo Regency Trade Service. Journal of research results with the title Assessment of the Feasibility of Providing Assistance to Small and Medium Enterprises Using the Fuzzy Moora Method (Case Study: Kolaka Regency SMEs Cooperative Service), aims to provide recommendations for the most appropriate potential MSME recipients of grant assistance. This research uses six criterias, including legal aspects, marketing aspects, historical aspects of aid and turnover, technical aspects, management aspects and socio-economic aspects. There are six MSMEs as alternatives that will be ranked. Based on test results comparing system and manual calculations, system created has a suitability of 98% (Tajsam et al., 2022).

METHOD

1. Data Collection

Activity at this stage is collecting data by observing and interviewing several MSMEs owners in Karanganyar city. Observations were carried out to find information about the reasons for running an MSMEs business and the reasons for needing capital or requiring additional capital. Interviews with entrepreneurs or MSMEs owners who can better explain the importance of capital requirements in their business and the forms of capital that are more needed in developing MSMEs businesses that meet the criteria. In this research, sample data of 25 MSMEs in Karanganyar city were used as respondents. This data will be calculated manually using decision tree method.

2. Method Implementation

Data from observations obtained three criterias for capital, that are type of business, amount of capital required, and smooth cash flow. Three criterias obtained will be used as analysis material in decision tree method for validation and selection process for entrepreneurs suitability in obtaining capital. Decision tree results process are then used as the basis for AHP method process for resulting decisions effectiveness. At this stage, three criteria weights and alternative weights for each selected criterion are calculated. If criteria weight values are known, then a consistency test is carried out on paired matrix. Consistency value should not exceed 0.1. If consistency value is greater than specified value, it must be repeated again. Apart from that, criteria weights were also multiplied by alternative weights which functioned to evaluate the effectiveness of capital provision decisions for MSMEs entrepreneurs in Karanganyar city.

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3. System Design

System design is carried out to provide an overview of the system before it is created. In this research, two methods will be used to determine decisions regarding MSMEs capital issues. The system design in this research is presented in Figure 1.

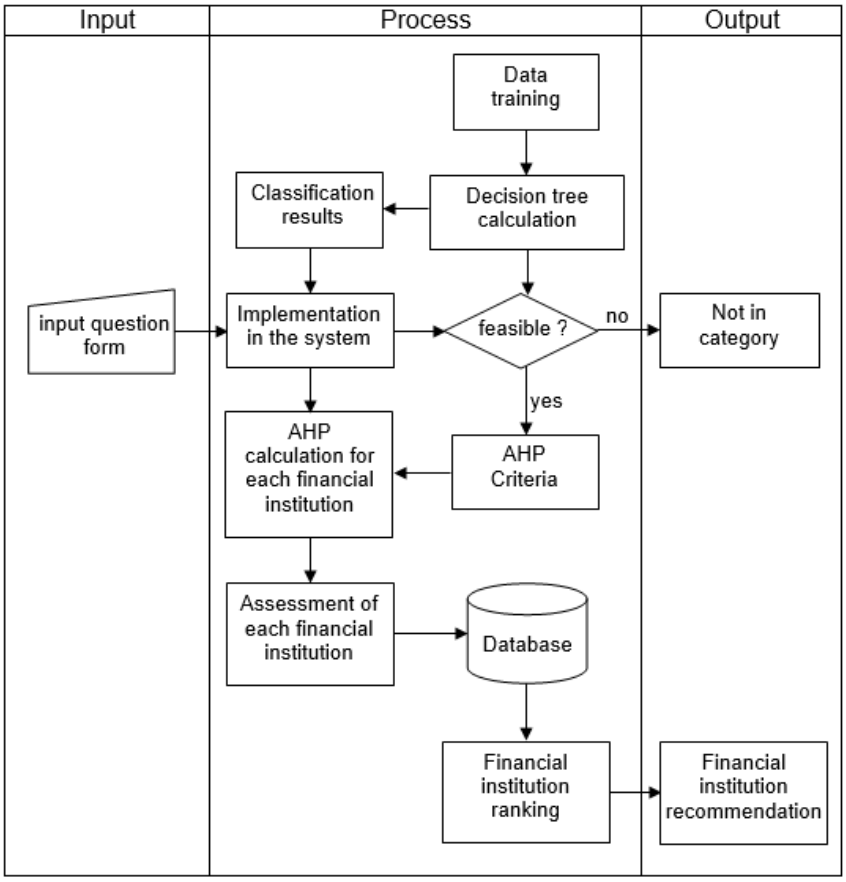


Figure 1. System Design Flow

From Figure 1 it can be seen that the system developed applies two methods, are decision tree method for calculating initial decisions in determining MSMEs suitability to be financed and AHP method as final decision for determining an appropriate financial institution to carry out additional capital. Decision tree obtained is used as a reference in implementing classification results in system by implementing the program code in the system. Data input used in system is input from MSMEs owners and consists of decision tree decision attributes and AHP criterias. Borrowers fill out a form which consists of several questions, including: BI checking status, SIUP ownership, outstanding loans, age of MSMEs, collateral type, monthly income, monthly expenses and amount of capital requirements.

When applicant debtor enters data into system, then carries out a decision tree classification process which produces a decision of " qualify " or "not qualify ", which allows applicant debtor to carry out capital loan transactions with financial institutions. If classification results " qualify " then it will proceed to the AHP calculation process for each financial institution. AHP calculation is based on a comparison matrix between the criteria and intensity of the criteria for each financial institution. Reference strength can be determined by default or manually by system. AHP calculation results are in form of a relative priority matrix which will be used for the assessment process at each

financial institution and stored in database system. After that, an assessment of each financial institution is carried out, and assessment results of each financial institution are determined. System uses ratings to determine recommendations for financial institutions that are suitable for prospective debtor.

RESULTS AND DISCUSSION

Decision Tree Method Implementation

1. Data Training

Training data used in this first stage is presented in Table 1. Status column shows the cases generated based on the existing attribute conditions. A status column with a value of "Yes" indicates that it is suitable and suitable for carrying out loan transactions, while a status column with a value of "No" indicates that it is not suitable and is not suitable for carrying out loan transactions.

Tabel 1. Data Training

MSMEs	BI *Checking*	SIUP	Debt history	Guarantee < loan	Age < 6 months	Status
Sakinah Catering	Yes	Yes	No	No	No	Yes
Itonk Coffe	Yes	Yes	No	No	No	Yes
Wedangan Dagen	Yes	No	Yes	No	Yes	No
Nillamat Shop	No	No	No	Yes	No	No
Ayu Juice	No	No	Yes	Yes	Yes	No
Susilo Shop	Yes	Yes	No	No	Yes	No
Dodo Refill Water	Yes	Yes	Yes	No	No	No
Srabi Nototuman	Yes	No	No	Yes	No	No
Fresh Milk Golis	Yes	No	No	Yes	No	No
Takat Snacks	Yes	No	Yes	No	No	No
Flyover Coffee	Yes	Yes	No	No	No	Yes
Lilis Taylor	Yes	Yes	Yes	Yes	No	No
Byarpet Screen Printing	Yes	Yes	Yes	No	No	No
Nurul Craft	Yes	Yes	Yes	No	No	No
Resik Laundry	Yes	No	No	No	No	No
Queen printing digital	Yes	Yes	No	No	No	Yes
Ikun Toast	Yes	Yes	No	No	No	Yes
Risole House	No	Yes	No	No	No	No
Klenting Bike Shop	Yes	No	No	No	No	No
Tini Bakery	No	Yes	No	No	No	No
Raras Jumbo Tea	Yes	Yes	Yes	Yes	No	No
Basuki Food Stalls	Yes	Yes	No	No	No	Yes
Dayu Bakery	No	Yes	No	No	No	No
Nugroho Bike Shop	No	No	No	Yes	No	No
Manteb Jumbo Tea	Yes	Yes	No	Yes	No	No

2. First Node Search Calculation

At this stage, entropy will be calculated for all data in Table 1. Number of cases indicates the number of states (can be seen from the number of rows in the status column in Table 1). Number of Cases - No (S1) indicates the number of statuses that have the value "No". Number of Cases – Yes (S2) indicates the number of statuses that have the value “Yes”. The following are the results of the total entropy calculation. Total sample = 25, total ‘no’ status (S1) = 19, total ‘yes’ status (S2) = 6

$$\text{Entropy (S)} = -\frac{S1}{S} \; x \; log_2 \; \frac{S1}{S} \pm \frac{S2}{S} \; x \; log_2 \; \frac{S2}{S} \qquad (1)$$

(Sembiring Pelawi & Saikhu, 2025)

Entropy (S)= $-\frac{19}{25}\ x\ log_2\ \frac{19}{25} + -\frac{6}{25}\ x\ log_2\ \frac{6}{25} = 0{,}795$

The next step is to calculate entropy, gain, splitinfo and gain ratio for all attributes. Below is how to calculate the entropy of attribute T1 which has a case value = 'yes'.

Total cases = 19, total cases – 'no' = 13, total cases – 'yes' = 6

Entropy (S)= $-\frac{13}{19}\ x\ log_2\ \frac{13}{19} \pm \frac{6}{19}\ x\ log_2\ \frac{6}{19} = 0{,}9$

Below is how to calculate the entropy of attribute T1 which has a case value = 'no'.

Total cases ( ) = 6, total cases – 'no' = 6, total cases – 'yes' = 0

Entropy (S)= $-\frac{6}{6}\ x\ log_2\ \frac{6}{6} \pm \frac{0}{6}\ x\ log_2\ \frac{0}{6} = 0$

Gain (S,A)=Entropy(S(all))– $\frac{S(yes)}{S(all)}$ x Entropy(yes)+ $\frac{S(no)}{S(all)}$ x Entropy(S(no)) (2)

(Sembiring Pelawi & Saikhu, 2025)

Gain (S,A)=0,795 – $\frac{19}{25}$ x 0,9 + $\frac{6}{25}$ x 0 = 0,11

Split info (S,A)= $-\frac{S(yes)}{S(all)}$ x $\log_2\ \frac{S(yes)}{S(all)}$ + $-\frac{S(no)}{S(all)}$ x $\log_2\ \frac{S(no)}{S(all)}$ (3)

Split info (S,A)= $-\frac{19}{25}$ x $log_2\ \frac{19}{25}$ + $-\frac{6}{25}$ x $log_2\ \frac{6}{25} = 0{,}795$

Split ratio (S,A)= $\frac{Gain(S,A)}{Split\ info\ (S,A)}$ (4)

(Sembiring Pelawi & Saikhu, 2025)

Split ratio (S,A)= $\frac{0{,}11}{0{,}795} = 0{,}14$

The above calculations results are classified for the process in next stage. The classification results and calculations are presented in Table 2.

Table 2. First Node Calculation Results

Atribut	Status	Total	S1	S2	*Entropy*	*Gain*	*Split info*	*Gain ration*
T1	No	6	6	0	0	0,11	0,795	0,14
	Yes	19	13	6	0,9			
T2	No	9	9	0	0	0,18	0,943	0,195
	Yes	16	10	6	0,954			
T3	No	17	11	6	0,937	0,16	0,904	0,175
	Yes	8	8	0	0			
T4	No	17	11	6	0,937	0,16	0,904	0,175
	Yes	7	8	0	0			
T5	No	22	16	6	0,845	0,05	0,529	0,097

ased on Table 4, it is known that attribute T2 has the largest gain ratio value, so attribute T2 (SIUP) will be in the first node. Attribute T2 with 'yes' status still has an element of doubt because there are no cases with a value of 0. The element of doubt indicates that it must be done again for finding process next node, namely node T2 with 'yes' status.

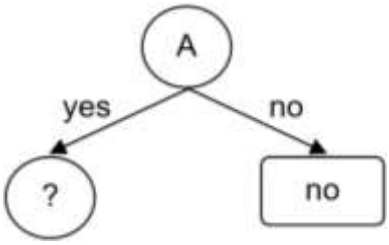


Figure 3. First Node Decision Tree

3. Second and Third Node Calculation

Data used in searching for the second node is based on training data (Table 1). To search for the second node, an exception will be made to T2 attribute. Data to search for the second node will also be grouped based on rows that only have T2 attribute with 'yes' status. From the same calculation as search for the first node, calculation results are classified and then presented in table 2 which is needed for the next stage of calculation. The second node that has been obtained is then used as basis for calculating the third node. To carry out calculation process for the third node, an exception will be made to T2 and T3 attributes. Data used in calculating the third node is also grouped based on rows that only contain T3 attribute with 'no' status. Table 3 presents calculation in searching for the third node. From the same calculation as search for the second node, calculation results are classified into a table form which is presented in Table 4, which will be used as basis for calculating the next stage.

Table 3. Grouping and Calculation Results of the Second Node

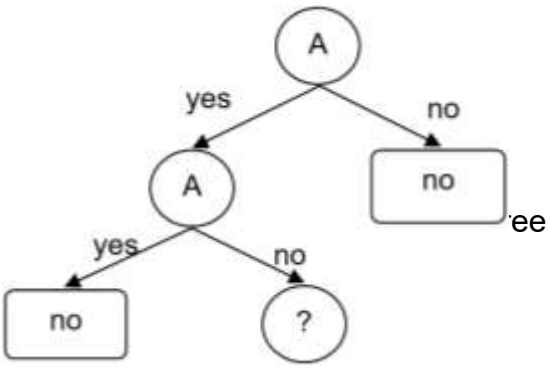
Atribut	status	Total	S1	S2	Entropy	Gain	Split info	Gain ratio
T1	No	3	3	0	0	0,18	0,696	0,258
	Yes	13	6	7	0,996			
T3	No	11	4	7	0,946	0,338	0,896	0,378
	Yes	5	5	0	0			
T4	No	13	6	7	0,996	0,18	0,696	0,258
	Yes	3	3	0	0			
T5	No	15	9	6	0,971	0,078	0,337	0,233
	Yes	1	0	1	0			

From Table 3, a decision tree can be made which is presented in Figure 4.

Table 4. Grouping and Calculation Results of the Third Node

Atribut	Status	Total	S1	S2	Entropy	Gain	Split info	Gain ratio
T1	No	3	3	0	0	0,55	0,845	0,651
	Yes	8	1	7	0			
T4	No	10	3	7	0,544	0,145	0,439	0,329
	Yes	1	1	0	0			
T5	No	0	0	10	6	0	0,063	0,439
	Yes	0	0	1	1			

From Table 4, a decision tree is produced which is presented in Figure 5.



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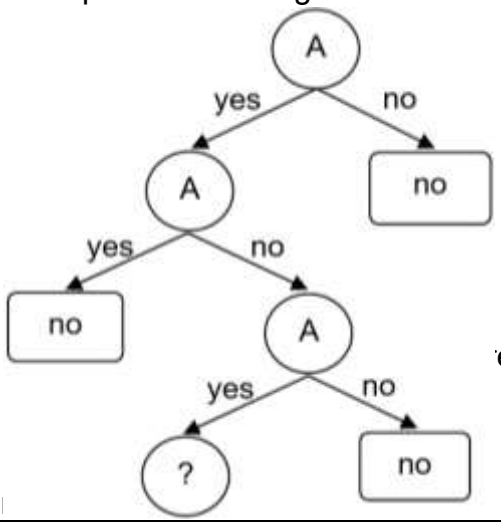

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4. Fourth Node Search Calculation

Table 5. Grouping and Calculatio

Atribut	Status	Jml	S1	S2	Entropy	Gain	Split info	Gain ratio
T4	No	7	0	7	0	0,544	0,544	1
	Yes	1	1	0	0			
T5	No	7	1	6	0,592	0,026	0,544	0,048

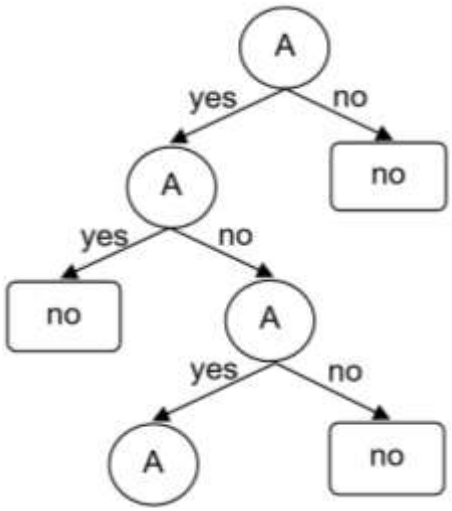


Figure 6. Fourth Node Decision Tree

AHP Method Implementation

Pairwise comparison matrix between 3 criteria is presented in Table 6. C1 is income criterion, C2 is expenditure criterion and C3 is capital requirement criterion. Normalization matrix is made by dividing each value in each column by each value in each column. Weight is found by calculating average of each row. Normalization matrix calculation result is presented in Table 7.

Table 6. Paired Comparison

Criteria	C1	C2	C3
C1	1	3	5
C2	0.33	1	3
C3	0.2	0.33	1
Sum	1.53	4.33	9

Table 7. Normalization Matrix

Criteria	C1	C2	C3	Weight
C1	0.65	0.69	0.56	0.63
C2	0.22	0.23	0.33	0.26
C3	0.13	0.08	0.11	0.11

Consistency matrix is calculated by multiplying each value in comparison matrix by corresponding weight in normalization matrix. Consistency matrix calculation results are presented in Table 8.

Table 8. Consistency Matrix

Criteria	C1	C2	C3	Sum
C1	0.63	0.78	0.53	1.95
C2	0.21	0.26	0.32	0.79
C3	0.13	0.09	0.11	0.32

Each row sum in the consistency matrix is divided by corresponding weight to obtain quotient value. Quotient values for each criterion are 3.07, 3.03, and 3.01. From an average quotient, value of λmax = 3.04 is obtained. The next step is to calculate a consistency index using equation (5).

$$\mathrm{CI} = \frac{\lambda\mathrm{max} - \mathrm{n}}{\mathrm{n} - 1} \quad (5)$$

(Nguyen & Tuyen, 2025)

$$CI = \frac{3{,}04 - 3}{2} = 0{,}019$$

Once a consistency index is known, a consistency ratio can be calculated using equation (6).

$$\mathrm{CR} = \frac{\mathrm{CI}}{\mathrm{IR}} \quad (6)$$

(Nguyen & Tuyen, 2025)

n=3, IR value is 0.58 so CR value is:

$$\mathrm{CR} = \frac{0{,}019}{0{,}58} = 0{,}033$$

CR value is less than 0.1, so it is consistent so that the resulting weight can be used.

System Implementation

This stage is the implementation of a system that is completely developed from two elements, they are software and hardware.

Figure 7. Establishment and MSME Eligibility Results Display

Figure 7 is a MSME eligibility page display whose data can be inputted by users as data in determining MSME eligibility process which is an application of decision tree algorithm and MSME eligibility results display in the form of information in determining MSMEs eligibility which contains data on name and eligibility status of MSMEs.

Figure 8 is a display of the pairwise comparison matrix in AHP process that can be input by user as initial data in finding each existing criteria weight to provide recommendations for financial institution type that is appropriate for MSMEs that have been determined to meet a requirements.

Figure 9 is a results display determining financial institution type which is final result of AHP method application. The information displayed is name and financial institution type that is suitable for qualified MSMEs.

Figure 10 is a AHP results method display analysis consisting of several AHP method matrices in determining recommendations suitability of financial institutions types for MSMEs.

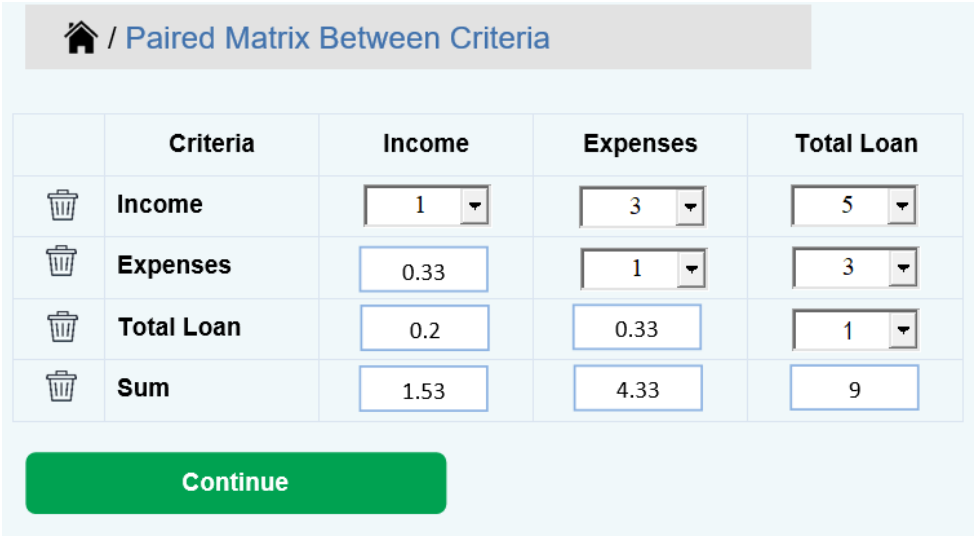
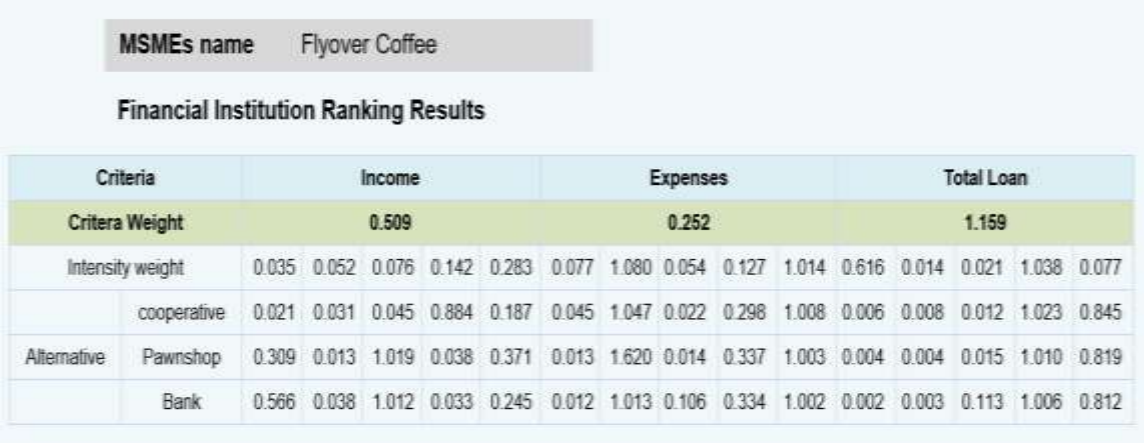


Figure 8. Pairwise Comparison Matrix Display



Criteria		Income					Expenses					Total Loan				
Critera Weight		0.509					0.252					1.159				
Intensity weight		0.035	0.052	0.076	0.142	0.283	0.077	1.080	0.054	0.127	1.014	0.616	0.014	0.021	1.038	0.077
	cooperative	0.021	0.031	0.045	0.884	0.187	0.045	1.047	0.022	0.298	1.008	0.006	0.008	0.012	1.023	0.845
Alternative	Pawnshop	0.309	0.013	1.019	0.038	0.371	0.013	1.620	0.014	0.337	1.003	0.004	0.004	0.015	1.010	0.819
	Bank	0.566	0.038	1.012	0.033	0.245	0.012	1.013	0.106	0.334	1.002	0.002	0.003	0.113	1.006	0.812

Figure 9. Financial Institution Determination Results Display

International Journal of Business, Law, and Education
Publisher: IJBLE Scientific Publications Community Inc.
Volume 6, Number 2, 2025
https://ijble.com/index.php/journal/index

/ AHP Analysis

No	MSMEs	Income	Expenses	Capital Need
1	Takad Snacks	10.000.000	8.000.000	100.000.000
2	Nurul Craft	20.000.000	8.000.000	100.000.000
3	Dodo Refil Water	20.000.000	8.000.000	100.000.000
4	Nillamat Shop	5.000.000	2.500.000	10.000.000
5	Lilis Taylor	20.000.000	10.000.000	50.000.000
6	Resik Laundry	10.000.000	8.000.000	100.000.000
7	Ikun Tooast	20.000.000	10.000.000	50.000.000
8	Klenthing Bike Shop	20.000.000	8.000.000	10.000.000
9	Raras Jumbo Tea	10.000.000	5.000.000	60.000.000
10	Basuki Food Stalls	15.000.000	7.000.000	800.000.000
11	Manteb Jumb Tea	10.000.000	8.000.000	100.000.000

	Pairwise Comparison Matrix			Normalization Matrix			Relative Priority
Criteria	Income	Expenses	Total loan	Income	Expenses	Total loan	Eigen Vektor
Income	1	3	5	0.65	0.69	0.56	0.63
Expenses	0.33	1	3	0.22	0.23	0.33	0.26
Total loan	0.2	0.33	1	0.13	0.08	0.11	0.11
Sum	1.53	4.33	9.00	1.00	1.00	1.00	1.00

	Income Intensity Comparison Matrix					Normalization Matrix					Relative Priority
Income	<=10jt	<=30jt	<=50jt	<=100jt	>100jt	<=10jt	<=30jt	<=50jt	<=100jt	>100jt	Eigen Vektor
<=10jt	1	0.5	0.33	0.25	0.25	0.07	0.05	0.04	0.06	0.10	0.067
<=30jt	2	1	0.5	0.33	0.33	0.14	0.11	0.06	0.09	0.14	0.107
<=50jt	3	2	1	0.33	0.33	0.21	0.21	0.13	0.09	0.14	0.155
<=100jt	4	3	3	1	0.5	0.29	0.32	0.38	0.26	0.21	0.289
>100jt	4	3	3	2	1	0.29	0.32	0.38	0.51	0.41	0.382

Figure 10. Analysis AHP Page Display

System Testing

To accuracy level measure in decision tree implementation algorithm for determining the eligibility of MSMEs process, a testing process is carried out to measure accuracy level. Measuring accuracy level of a decision tree algorithm will obtain level of success results or recommendations suitability from a system with a recommendations from an expert. An expert in this testing process is an employee of a financial institution who has the authority to determine MSMEs that are eligible for capital. There are 15 MSMEs data that will be used as test data presented in Table 9.

Table 9. System Data Test Using Decision Tree

MSMEs	T1	T2	T3	T4	T5	System Result
Sakinah Catering	yes	yes	yes	no	no	feasible
Itonk Coffe	yes	yes	no	no	no	feasible
Wedangan Dagen	yes	yes	no	no	no	feasible
Nillamat Shop	yes	yes	yes	yes	no	unfeasible
Ayu Juice	yes	yes	no	no	no	feasible
Susilo Shop	yes	yes	yes	no	no	feasible
Dodo Refill Water	no	yes	no	no	no	not feasible
Srabi Nototuman	no	no	no	yes	no	not feasible
Fresh Milk Golis	yes	yes	no	yes	no	not feasible
Takat Snacks	yes	yes	yes	no	no	feasible
Flyover Coffee	yes	yes	no	no	no	feasible
Lilis Taylor	yes	yes	no	no	no	feasible
Byarpet Screen Printing	yes	yes	yes	no	no	feasible
Nurul Craft	yes	no	yes	no	no	not feasible
Resik Laundry	yes	yes	no	no	yes	not feasible

Tabel 10. Decision Tree Accuracy Testing

MSMEs	Expert Result	System Result	Compatibility
Sakinah Catering	feasible	feasible	suitable
Itonk Coffee	feasible	feasible	suitable
Wedangan Dagen	feasible	feasible	suitable
Nillamat Shop	not feasible	not feasible	suitable
Ayu Juice	feasible	feasible	suitable
Susilo Shop	not feasible	feasible	not suitable
Dodo Refill Water	not feasible	not feasible	suitable
Srabi Nototuman	not feasible	not feasible	suitable
Fresh Milk Golis	not feasible	not feasible	suitable
Takat Snacks	not feasible	feasible	not suitable
Flyover Coffee	feasible	feasible	suitable
Lilis Taylor	feasible	feasible	suitable
Byarpet Screen Printing	feasible	feasible	suitable
Nurul Craft	not feasible	not feasible	suitable
Resik Laundry	not feasible	feasible	not suitable

From test results presented in table 10, an accuracy can be calculated using formula (7).

$$\text{acuracy} = \frac{\text{correct data count}}{\text{test data count}} \text{ X } 100\% \quad (7)$$

$$\text{acuracy} = \frac{12}{15} \text{ X } 100 = 80\%$$

Test measures AHP method accuracy producing a conformity level of system's recommendation results for financial institution type with recommendation results from an expert. There are 13 data from MSMEs that have met the requirements from decision tree results.

Table 11. AHP Method Accuracy Testing

MSMEs	AHP Result	Expert Result	Compatibility
Sakinah Catering	Bank	Bank	suitable
Itonk Coffe	Bank	Pawnshop	not suitable
Wedangan Dagen	Cooperative	Cooperative	suitable
Nillamat Shop	Bank	Bank	suitable
Ayu Juice	Cooperative	Cooperative	suitable
Susilo Shop	Cooperative	Cooperative	suitable
Dodo Refill Water	Pawnshop	Pawnshop	suitable
Srabi Nototuman	Bank	Cooperative	not suitable
Fresh Milk Golis	Bank	Bank	suitable
Takat Snacks	Bank	Bank	suitable
Flyover Coffee	Pawnshop	Bank	not suitable
Lilis Taylor	Cooperative	Cooperative	suitable
Byarpet Screen Printing	Bank	Bank	suitable

From conformity results in table 11, there are three cases that are not suitable, so the accuracy level can be calculated as = 76.9%.

CONCLUSION

Decision tree algorithm used in this research aims to determine MSMEs eligibility to obtain loans based on existing requirements. AHP method is used to select appropriate financial institutions for MSMEs to borrow capital based on several appropriate criteria in submitting capital loans from each financial institution. System developed by implementing the decision tree algorithm in the form of a function. An application of AHP method in developed system starts from inputting data on an interest ratio to calculating resulting weights consistency. System results are tested to measure accuracy or success decision tree algorithm implementation level in

determining MSMEs eligibility. an accuracy calculation system level created is 80%. From this accuracy level, the system developed is accurate. The second test aims to determine accuracy or success level of AHP method application to decide financial institutions suitability for MSMEs. An accuracy calculation level of system created is 76.91% and can be said to be good or accurate.

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