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Use of AHP Method in Cooperative Information System KJKS BMT Cangkeh Padang Village in the Provision of Medium and Lower Venture Capital Assistance

Ali Akbar Ritonga[1], Budianto Bangun[2], Iwan Purnama[3], Ibnu Rasyid Munthe[4], Windo[5]

[1,2,3,4,5] Program Studi Teknologi Informasi, Universitas Labuhanbatu, Rantauprapat, 21418, Indonesia

E-mail: aliakbarritonga@gmail.com[1], budiantobangun44@gmail.com[2], iwanpurnama2014@gmail.com[3]
ibnurasyidmunthe@gmail.com[4], yen.hui26@gmail.com[5]

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ABSTRACT

Final entitled "Decision Support System Aid Medium-down venture capital in the Cooperative KJKS BMT Sub Cangkeh" created with the goal of Top That makes a Software Planned Hearts Able to help managers assess eligibility Decision A Customers obtain the loan. Software Singer is a venture capital decision-support framework. The authors use the Analytical Hierarchy Process (AHP) as a weighting tool to construct this scheme. The loan size, High turnover, and Dependants used three simple criteria. The decision support framework technology venture capital provision is the web-based programming language PHP and MySQL as database. The framework is structured to provide recommendations for customer eligibility with each requirement based on AHP calculation. With this framework, it is expected that managers can find the suitability of a customer's decision on a loan

1. Introduction

In the advancement of information technology and the development of the business world, entrepreneurs in the race to be able to compete rapidly, easily and more credible, in the world of cooperative business customers, the drivers of the cooperative's smoothness are more and more customers and the cooperative rises, but also the business of a manager in the bus. To solve the problem, a mechanism will be in place to assist the manager in the decision-making phase whenever and wherever a manager is located using the Decision Support System to Provide Business Capital Assistance using the Analytic Hierarchy Process (AHP) method to provide a comprehensive, directional and non-deviant source of what has been mentioned.

The limitations of the author's issue include:

a) Decision support is a tool for managers to assess the viability of supplying customers with business capital assistance.
b) The essential requirements in the decision support system are Loan Number, Dependents, Monthly Turnover
c) The decision-making model to use is the analytical Hierarchy Process Model (AHP).

2. Method

2.1 Decision Support System

Decision Support System (DSS) provides problem-solving tools and collaboration capabilities for semi-structured and unstructured situation issues.[1] The method supports decision-making in semi-structured situations and unstructured situations where nobody knows exactly how to make decisions

2.2 Phase of the Decision-Making Process

a) Intelligence Phase
b) Problem Identification
c) Clarification of The Problem
d) Ownership Issues
e) Design Phase
f) Choosing a preferred principle
g) Developing alternatives

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h) Measuring results
i) Option phase
j) Implementation phase
k) Krakteristic and system capabilities
l) System advantages
m) System components

2.3 *Analytical Hierarchy Process* (AHP) Method

Anality Hierarchy Process (AHP) is a method of solving a complicated unstructured situation into multiple components in a hierarchical order by relatively giving subjective values of each variable's significance and set which variables have the highest priority to influence outcomes in those situations. [2] AHP's essential tool is a functional hierarchy, with its main feedback on human interpretation of preferences between components. The presence of a hierarchy allows complicated or unstructured problems to be divided into sub-sub-problems and organized into a hierarchy. [3] See Figure 2.1 in the hierarchy.

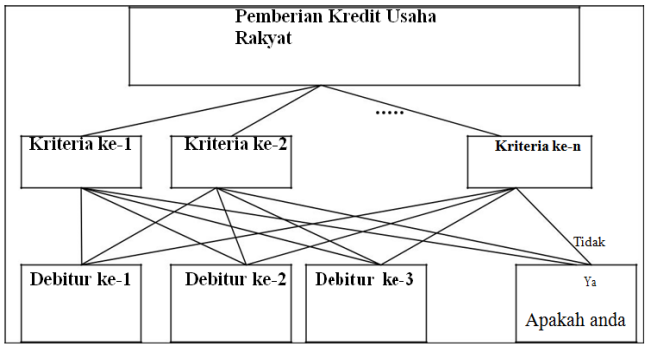

Fig 1 AHP Hierarchy Structure on Lending SPK

2.4 Web Concepts

The website or site can be interpreted as a series of pages used to view text, still or motion content, animations, sounds, and or a combination of static and dynamic buildings, each linked to a network of pages.. [4]. Web types are based on their properties:

a) A dynamic website is a website that offers continuously evolving information or content. Programming languages used include PHP, ASP, NET, or MySQL databases.
b) A static website is a website whose content never changes. The programming language used is HTML, not using the database.

PHP (Hypertext Pre-Processor) is a web-based programming language capable of dynamically processing data. PHP can be a server-side embedded script language, meaning the server will execute all syntax and written program commands. However, it can be used on standard HTML pages. PHP variables are not declared and are dynamic, or some call them variants, similar to javascript. Most commonly used in PHP are:

a) Integer, an integer variable, aims to store many fractional and integers (excluding the number's fractional part and rank).
b) Double is used to store fractional numbers and numbers.
c) A string is a type of data and character stored as a number in computer memory. The stored value is the character's ASCII value.
d) Set, a set of variables having the same data type. The array contains an element portion. Elements of an array are stored in a memory spot.
e) An object variable type is based on an image of a real-world object with "status" and "actions." An object variable stores its variable status, and its action is a parameter.

2.5 Database Concepts

A database is a set of records or information fragments. A database has a formal description of fact types stored in it. This explanation is called a schema. There are several ways to organize a schema or model a database structure: it is known as a database model or data model. A widely used model now is the relational model representing all the knowledge in interconnected tables where each table consists of rows and columns (the actual description uses mathematical terminology). In this model, table relationships are defined using the same table values. A multi-threaded, multi-user MySQL database management system or DBMS program is a long-term derivative of one of the core database principles, SQL (Structured Query Language). SQL is a database operating term, particularly for data collection or selection and entry, enabling easy data operation. [6] The reliability of a database system (DBMS) can be known from how its optimizer

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works in performing SQL commands. A database system's reliability (DBMS) can be known from how its optimizer operates in executing SQL commands generated by the user and application programs. As a database server, MySQL is arguably superior to other data query server databases. It is proven for single-user queries, MySQL query speed maybe ten times faster than PostgreSQL, and five times faster than Interbase

This research is a study developing a decision-making mechanism to help cooperative customers. The study was conducted at The Sharia Financial Services Cooperative BMT Cangkeh Village Padang, from October 2016 to January 2017. System design aims to meet system users' needs or users to define the current system design and simulate the system to be built. The device workflow can be thoroughly defined through context diagrams. Context Diagram is a global system design tool that shows the system as a whole and parts of the system involved, interconnectedness, and interaction between subsystems. See In Figure 3.1.

Fig 2 System Design Diagram

3. Results and Discussion

3.1 Analytical Hierarchy Process (AHP) Method

A. Problems, criteria, and sub-criteria (if any), and alternative options.

a) Issue: Determining the priority of the borrower.
b) Criteria: Guarantee, Loan Amount, Turnover, Dependents
c) Subcriteria : Warranty in the form of goods, property, or motor vehicle letter but in value based on rupiah value (Medium : 15,000,000-24,999,999 , Enough : 1 – 14,999,999, None = 0) Loan Size (Large 15,000,000 – 50,000,000, Medium = 8,000,000 – 14,999,999 , Enough : 1,000,000 – 7,999,999) Monthly Turnover (Large 7,000,000- 15,999) Turnover per month (Large 7,000,000- 15,000000,000, Medium = 3,000,000 – 6,999,999 , Enough : 1,000,000 – 2,999,999) CAT : Jumah criteria and sub criteria, minimum 3. Because if only two will affect the CR value (see consistency index/RI ratio table)

B. Form a *Matrik Pairwise Comparison*, criteria. First, perform a comparative assessment of the criteria. (Comparison stipulated by observing policies adopted by assessors) are:

a) The Loan Criteria is 3 times more important than turnover, and 5 of the dependents.
b) Turnover criteria are twice as critical as dependents and just as crucial as dependents.

The comparison of criteria between Matrik Pairwise is, therefore, the product of weighting criteria used in the calculation of priority criteria and subcriteria obtained from results in the company's policy from the company data having the following criteria:

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	Besar Pinjaman	Omset	Tanggungan
Besar Pinjaman	1	3	4
Omset	1/3	1	2
Tanggungan	¼	1/2	1

Fig 3 Criteria Table

Set requirements in the form of vector priority (also referred to as vector standardization). Change the matrix for pairs to the decimal form and add each column. Compression table in pairs

	Besar Pinjaman	Omset	Tanggungan
Besar Pinjaman	1	3	4
Omset	0,333333	1	2
Jaminan	0,2	1	2
Tanggungan	0,25	0,5	1
Jumlah	1,783333	5,5	9

Fig 4 Compression Matrix Table

Then divide the elements of each column with the corresponding column

	Besar Pinjaman	Omset	Tanggungan
Besar Pinjaman	0,55918	0,545455	0,44444444
Omset	0,186393	0,181818	0,22222222
Tanggungan	0,139795	0,090909	0,11111111

Fig 5 Column Element Division Table

Calculate a standard vector using its own: a sum of each row then divided by the number of criteria. In this case, the number of parameters is 3.

	Besar Pinjaman	Omset	Tanggungan	Jumlah Baris	Eigen Vektor Normalisasi
Besar Pinjaman	0,55918	0,545455	0,44444444	2,21574563	0,553936408
Omset	0,186393	0,181818	0,22222222	0,723767062	0,180941765
Tanggungan	0,139795	0,090909	0,11111111	0,408481862	0,102120466

Fig 6 Vector Eigen Table

Calculate the consistency ratio to see if the criteria comparison assessment is consistent.-specifies the maximum Eigenvalue (λmaks). Λmaks is obtained by multiplying the number of Pairwise Comparison matrix columns to decimal shapes with vector even normalization. Λmaks = 0.553936408 X 1.783333 + 0.180941765 X 5.5 + 0.162302433 X 7.5 + .102120466 X 9 = 4.119385223 Calculates Consistency Index (CI) CI = (λmaks-n)/n-1 = 0.039 consistency Ratio =CI/RI, RI value for n = 3 is 0.90 (see Random Consistency Index List (RI)) CR = CI/RI = 0.039/0.90 = 0.043333 Because cr < 0.100 weighting preference is consistent For the Matrik Pairwise Comparison sub-criterion, I assume it has the same value as the Matrik Pairwise Comparison criteria. can try changing the weighting value if want to understand the formation of this matrix better. Calculation of Loan Large Sub Criteria
Sub Criteria Calculation Results Table

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	Besar Pinjaman	Omset	Tanggungan	Jumlah Baris	Eigen Vektor Normalisasi
Besar Pinjaman	0,55918	0,545455	0,44444444	2,21574563	0,553936408
Omset	0,186393	0,181818	0,22222222	0,723767062	0,180941765
Tanggungan	0,139795	0,090909	0,11111111	0,408481862	0,102120466

Fig 7 Sub Criteria Calculation Results Table

The last is to rank the alternates by calculating the vector Eigen for each criteria and sub-criteria.

	Bobot Besar Pinjaman	Bobot Omset	Bobot Tanggungan	Hasil
Raudha	2	3	3	0,795881
Nungki	1	1	1	0,376356

Fig 8 Ranking Table.

More To find the consumer's highest value for a loan, use a weighted formula multiplied by the value of Eigen Vector Standardization, and then again multiplied with Eigen Vector Standardization criteria.

3.2 Entity Relationship Diagram (ERD)

ERD is a diagram used for representing data structure models and data relations. In order to understand quickly the data model or structure that is available in the mining of information systems, ERD development uses some accepted symbols. Can be seen in figure 3. 7.

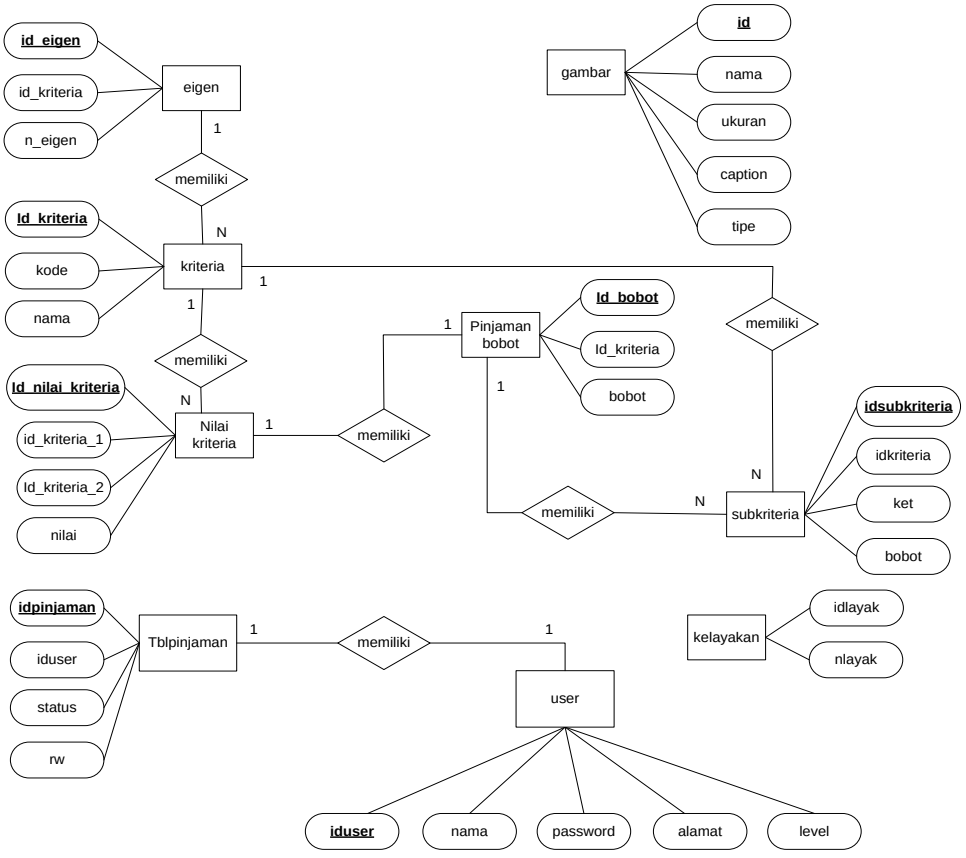

Fig 9 Entity Relationship Diagram

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3.3 Program Testing

The support framework for capital assistance decisions is checked using criteria and sub-criteria entered into the database. To assess the priority order, the criteria and sub-criteria are contrasted with a scale comparison of 1-9 moments.

a) Criteria Selection

It is a page that is used in the comparison of parameters to assess goals. Each criterion is compared and scored with a scale of 9 for a comparison of these criteria.

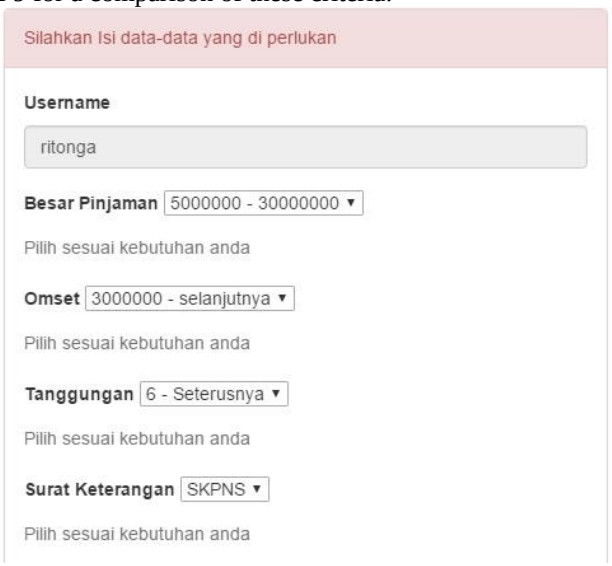

Figure 10 Criteria Selection

b) Criterion Assessment Results

Is the outcome of the criterion comparison evaluation continued if the comparison generates CR>0.5?

c) Sub Criteria Assessment

It is a comparison sub-criteria page used to determine a priority in the suggested priority comparison.

d) Sub Criterion Assessment Results

Comparison of subcriteria with CR > 0.5

e) Preferred Results

The results page is the result of the election for the AHP estimate. Results in the inference of prospective customers' loan value who are the manager's alternative decision. AHP process estimation.

Fig 11 Results of the evaluation of subcriteria

Fig 12 Verification outcomes

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4. Conclusion

Based on the problem descriptions and discussions of the support structure of the decision to AHP (Analytical Hierarchy Process) medium or small business capital assistance system in the previous chapter, the method AHP (Analytical Hierarchy Process) can be used to support decisions on business capital assistance by determining the highest priorities of some of the criteria and alternatives The calculation results with AHP are based on the weighting of the value of the criteria and of the sub-criteria which occur at the evaluation stage and the subcriteria which will result in the priority value the criteria have.

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