JAIA – Journal Of Artificial Intelligence And Applications
Journal Homepage : http://jurnal.sar.ac.id/index.php/JAIA/

Smart Method To Determine Home Ownership Credit Financing Liquidity Facility For Housing Financing (KPR FLPP) For Low-Income Communities In Medan City (Case Study : Bank Syariah Indonesia)

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Article Info

Received : Apr 7, 2021
Revised : Apr 20, 2021
Accepted : Apr 30, 2021

Keywords :
Subsidied Housing
Smart Method
Decision Support System

Abstract

Population growth in Indonesia is always increasing every year so that the number of residential needs also increases. Higher house installaments make people think twice before buying a house. The lack of information about subsidied housing makes people think that the prices of some houses are relatively expensive so people choose to contract which will certainly drain income. Subsidied housing is an untaxed plus house with low interest. On the research this time using a Decision Support System that is called the option-based housing support system, using the smart method, which is able to help people select subsidied housing to fit the need. The implementation of this method aims to facilitate the selection of subsidied housing based on calculations from the criteria used as locations, public facilities, access to locations, the quality of buildings and the credibility of developers. The results of this system provide solutions in the form of the best alternatives to be determined based upon the ranking of smart calculations.

1. Introduction

The government has a Housing Finance Liquidity Facility Housing Credit (KPR FLPP) program, which is a collaborative program of the Ministry of Public Housing with various parties to build subsidized houses for low-income people who do not yet own a house. Subsidized housing is a residence that is not subject to plus taxes and has low interest rates. This program will greatly help people who do not have a house because the installments are cheaper than the regular mortgage installments. Generally, subsidized housing prices have been pegged at a certain price range. Assuming affordable payments per month and a long tenor of 10 to 20 years

At this time, population growth in Indonesia is always increasing every year so that the demand for housing needs also increases. This is proven by the increasing number of new housing complexes being built to meet the housing needs of the community (Widyassari & Yuwono, 2019). Many young people and newly married couples who have just got a job already want to own a new home rather than rent a rented house. However, the installments for houses

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that are higher than for rented houses have made the people who do not own this house think twice about making a decision.

Lack of information about subsidized housing makes people think that house prices are relatively expensive so that people choose to rent, which will certainly drain their income. In addition, many developers build subsidized housing, but the quota for subsidized housing is limited so that people who want to buy a house from a developer are forced not to buy the house. Based on the above problems, a system is needed to assist in the selection of subsidized housing in Medan City. One of the right ways is to create a decision support system using the Smart method. The smart method was chosen because this method determines the weight value of each predetermined criterion, then proceed with a ranking that will select the best subsidized housing alternative from a number of existing alternatives

2. Research Methods

2.1. Related Work

Analysis Of Mineral Water Selection And Best Recommendation By Method Smart (Simple Multy Attribute Rating Technique)

Everyone needs drinking water which is increasing in line with the increasing population of Indonesia, however, while the quantity and content of drinking water is decreasing, people are looking for other options get healthy drinking water and good levels. major developments in the sale of bottled drinking water, along with the arrival of many product stamps of bottled drinking water scattered throughout the country competition is getting fiercer among packaged drink sellers The variety of prices has a good and advanced impact against purchasing decisions. With the Simple multy attribute rating technique you will be able to find out mineral water best according to the selected criteria. The purpose of this study was to test the levels of both the product, price and the introduction of drinking water purchases becomes a decision in purchasing bottled water. This research results that various product qualities have a positive and significant effect on purchasing decisions in the community buy bottled water

Decision Support System For Subsidized Housing Using The Fuzzy Saw Method In Palembang City

Population growth in Indonesia is always increasing every year so that the number of residential needs also increases. Higher house installaments make people think twice before buying a house. The lack of information about subsidied housing makes people think that the prices of some houses are relatively expensive so people choose to contract which will certainly drain income. Subsidied housing is an untaxed plus house with low interest. On the research this time using a Decision Support System that is called the option-based housing support system, using the fuzzy saw method, which is able to help people select subsidied housing to fit the need. The implementation of this method aims to facilitate the selection of subsidied housing based on calculations from the criteria used as locations, public facilities, access to locations, the quality of buildings and the credibility of developers. The results of this system provide solutions in the form of the best alternatives to be determined based upon the ranking of fuzzy saw's calculations.

Web-Based Decision Support System For Café Selection Using The Smart Method (Simple Multi-Attribute Rating Technique) (Case Study: Samarinda City)

Cafe is one of the fast growing businesses in the city of Samarinda. The

speed The development of cafes in Samarinda has not been accompanied by significant technological developments. This makes consumers still feel confused, and need information to decided to visit a café that suits you. The purpose of this research is build a decision support system for cafe selection using the Simple Multi method Attribute Rating Technique with several criteria, namely facilities, cost, location, and menu variations. This system is designed using the Simple Multi Attribute Rating Technique method quantitative in decision making, where each criterion is weighted later calculated using the Simple Multi Attribute Rating Technique

(SMART) formula. Technique This multi-criteria decision making 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 the criterion is to other criteria. The results of the research are in the form of system output recommended café name. The benefit of this research is to provide retrieval information media the decision for consumers to decide on the right café choice in accordance with their wishes consumers, make it easier for café consumers to determine the location of a suitable café

2.2. Material And Method

A. Decision Support System

According to Kusrini (2007), a decision support system is one type of system that is very popular among company management, namely a Decision Support System. This Decision Support System is information that is expected to assist management in the decision-making process. The thing that needs to be emphasized here is that the state of the Decision Support System is not to replace the duties of the leadership, but to become a supporting target for them. Decision support systems are implementations that have been introduced by sciences such as operations research and management science. The only difference is that if in the past it was to find a solution to the problem at hand, now it has offered the ability to solve the same problem in a relatively short time. Decision support systems are a set of specific classes of computerized information systems that support business and organizational decision-making activities.

B. SMART (Simple Multy Atribute Rating Technique)

SMART is a multi-attribute decision-making method. This multi-attribute decision-making technique is used to assist stakeholders in choosing between several alternatives. Each alternative consists of a set of attributes and each attribute has values, these values are averaged on a certain scale. Each attribute has a weight that describes how important it is compared to other attributes. With SMART attribute weighting is done in two steps, namely: 1. Sorting the importance of an attribute from the worst level to the best level. 2. Make a comparison of the importance ratio of each attribute with other attributes under it. SMART is more widely used because of its simplicity in responding to the needs of decision makers and the way it analyzes responses. The analysis involved is transparent so that this method provides a high level of understanding of the problem and is acceptable to the decision maker. The weighting of SMART uses a scale between 0 and 1, making it easier to calculate and compare the value of each alternative. Models used in SMART [3]:

$$u(a1) = \sum_{j=1}^{m} wjuj(ai) \quad ,$$

Information:
wj is weighted value of the j-criteria and k criteria
u (ai) is utility value of the ith criterion for the ith criterion Decision selection is to identify which of the n alternatives has the greatest function value.

C. Tehnique SMART (Simple Multi Attribute Rating Tehnique)

According to Kustiyahningsih, Anamisa, and Syafa'ah (2013), the SMART technique is as follows:
Step 1: determine the number of criteria
Step 2: the system by default gives a scale of 0-100 based on the input priority then normalizes.

$$\text{Normalisasi} = \frac{wj}{\sum wj}$$

Information :
Wj : the weight of a criterion
∑wj : total weight of all criteria

Step 3: assign a criterion value to each alternative.
Step 4: calculate the utility value for each criterion.

$$ui(ai) = 100\frac{(Couti - Cmin)}{(Cmax - Cmin)}\%$$

Information :
ui (ai): the utility value of the 1st criterion for the i-th criterion
Cmax: maximum criterion value
Cmin: minimum criterion value
Cout i: the value of the i-criteria 5.

Step 5: calculate the final score for each [3]

3. Results and Discussion

To complete the Smart Method to Determine Home Ownership Credit Financing Liquidity Facility for Housing Financing (KPR FLPP) for Low-Income Communities in Medan City, criteria and weights are needed to perform the calculations so that the best alternative will be obtained, in this case the intended alternative is the customer in Bank Sumut Syariah

Code	**Criteria**	**Weight**	**Normalize**
C1	Income	40%	40/100 = 0,40
C2	Residence	20%	20/100 = 0,20
C3	Ages	20%	20/100 = 0,20
C4	number of family members	20%	20/100 = 0,20

from other published articles be provided to provide more context and to reinforce claims of novelty.

A. Criteria and Weights

In the Smart method (Simple Multy Attribute Rating Technique) there are criteria and weights that will be used as calculation material in the ranking process, as for the criteria and weights that are taken into consideration by mineral water customers can be seen in table 1, as follows

Step 1, must make the criteria and weight first, the highest weight is the most important criterion. Can be seen from table 1 below:

Table 1. Criteria and Weights

Code	**Criteria**	**Weights**
C1	Income	40%
C2	Residence	20%
C3	Ages	20%
C4	number of family members	20%

Code	Criteria	Sub Criteria	Value *Utility*
C1	Income	>=1.800.000	5
		< 1.000.000	3
		< 8.00.000	1
C2	Residence	Not feasible	5
		Well worth it	2
C3	Ages	>45 year	5
		<45 year	1
C4	number of family members	>4	5
		<4	2

Step 2, making sub criteria and the value of each sub-criteria can be seen in table 2 below:

Table 2. Sub Criteria

Step 3, which is to normalize the weight as shown in Table 3 below:

Table 3. Normalize The Weight

Step 4 is to calculate the utility value weight for each criterion - each utility value for each criterion is calculated using the following formula:

$$ui(ai) = 100\frac{(Couti - Cmin)}{(Cmax - Cmin)}\%$$

Table 4. Value of each criterion (utility)

Code	Name Customer	C 1	C 2	C3	C 4
S001	Dedi Novandi	1	1	0,75	1
S002	Uis Nurjannah	1	1	0,5	0,75
S003	Hari Setiawan	1	0,5	1	0,5
S004	Dedek Irawan	1	0,8	0,5	0,75
S005	Saiman	1	1	0,5	0,5

The final value is calculated using the following formula:

$$u(a1) = \sum_{J=1}^{m} wjuj(ai) \quad , \quad i =$$

1. S001 = (0.40*1)+(0.20*1)+(0.20*0.75)+(0.20*1)
   = 0.40+0.20+0.15+0.20
   = 0.95 (Entitled)

2. S002 = (0.40*1)+(0.20*1)+(0.20*0.5)+(0.20*0.75)
   = 0.40+0.20+0.10+0.15
   = 0,85 (Entitled)

3. S003 = (0.40*1)+(0.20*0,5)+(0.20*1)+(0.20*0.5)
   = 0.40+0.10+0.20+0.10
   = 0,80 (Entitled)

4. S004 = (0.40*1)+(0.20*0.8)+(0.20*0.5)+(0.20*0.75)
   = 0.40+0.16+0.10+0.15
   = 0,81 (Entitled)

5. S005 = (0.40*1)+(0.20*1)+(0.20*0.5)+(0.20*0.5)
   = 0.40+0.20+0.10+0.10
   = 0,80 (Entitled)

Table 5. Ranking

Code	Name Customer	Value	Ranking
S001	Dedi Novandi	0,95 (Entitled)	1
S002	Uis Nurjannah	0,85 (Entitled)	2
S003	Hari Setiawan	0,80 (Entitled)	4
S004	Dedek Irawan	0,81 (Entitled)	3
S005	Saiman	0,80 (Entitled)	5

4. Conclusion

In this research using a decision support system with the title Smart Method To Determine Home Ownership Credit Financing Liquidity Facility For Housing Financing (Kpr Flpp) For Low-Income Communities In Medan City (Case Study: Bank Sumut Syariah) which is able to assist the community in selecting the appropriate subsidized housing by necessity. The application of this method aims to make it easier choose subsidized housing based on the calculation of the criteria used such as income, residence, age, number of family members and developer credibility. The results of this system provide a solution in the form of the best alternative that has been determined based on the ranking of smart calculation method

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