

Decision Support System for Providing Customer Reward Using Profile Matching Method

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Article Info

Article history:

Received Feb 18, 2021

Revised Mar 25, 2021

Accepted Jun 13, 2021

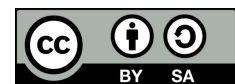
Keywords:

Decision Support System
Profile Matching Method
Customer Reward

ABSTRACT

The proliferation of goods delivery services business makes business competition increasingly tight. It takes the right strategy in increasing the number of customers and increasing profits. One of the strategies that is usually applied is to give appreciation in the form of reward to one of the best customers. This research, aims to facilitate the company PT. Atlas Jakarta in determining the best customers to be rewarded. Metode used is a profile matching method that can be used as one of the supporters of decision PT. Atlas Jakarta in determining its best customers. Profile matching is a mechanism in making a decision by assuming that there is an ideal level of predictor variables that must be met by the subjects studied, not only a minimum level that must be met or passed. In the profile matching method of assessment and calculation of GAP value based on the intensity of delivery, the number of shipments, the length of subscription, and the status of payments. The last step of the profile matching method is the ranking in which shows that the higher the ranking result, the more likely it is for customers to receive rewards. The results showed that with profile matching method can be implemented in a decision support system to determine the reward to customers and facilitate PT. Atlas in making decisions according to the criteria that have been determined.

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1. INTRODUCTION

The digital era is marked by the increasing development of methods and system information, especially in the field of business and business, brings developments to the pattern of life of Indonesian society, in particular transaction patterns and delivery of goods. Indonesian society is very facilitated and spoiled in getting the desired goods and services. This development was due from the spread of online shopping provider sites and marketplaces in Indonesia, which can be accessed through smartphones and computers. The rapid development in online shopping makes a variety

online shopping provider sites are starting to emerge and present a variety of alternatives offer discounts for customers. This also affects businesses in the shipping service sector.

The rapid development of industry in Indonesia, especially in big cities resulted in industrial companies relying on shipping services to supply the needs of the community to the regions, as well as the delivery of goods from certain regions to other regions. Coupled with the large number of online businesses spread throughout Indonesia. Utilization of purchasing services through the Internet, in addition to presenting many advantages for businesses, also presents many benefits for online customers[1][2]. In online transactions of course requires delivery services or expeditions to deliver goods to customers. This is because notall businesses can arrange their own transportation affairs in the company it manages. This relates to the price required transportation division in the business is quite large. Therefore, expedition companies or freight services play an important role in the business world.

One of the strategies that is commonly applied is to choose one customer to be the main customer. This main customer will be given reward from the expedition[3]. This reward is a special price given to customers [4]. This reward will divert customers to remain subscribed with one expedition, with the provision of the expedition must also maintain the quality of service provided to customers in a long period of time, so that it creates loyal consumers and eventually benefits [5]. Because customer satisfaction is the main factor so that the business can run continuously [6].

Previous research conducted by Ahdiana et. al stated "The Profile Matching method is a method that uses a comparison model which has the ability to compare the competencies of employees with existing provisions so that differences in competence are obtained or are called gaps. The smaller the resulting gap, the greater the weight of the value, which means that it has a greater chance of being recommended to be selected [33].

Other research by Diaz and Sulindawaty states that "Decision Support System is implemented in the problem of selecting candidates for Paskibraka participants in Karo Regency. There are aspects and criteria in the conditions that allow using the Profile Matching method. The provisions applied to the lead become a reference for matching profiles. Gap values, Core Factor and Secondary Factor affect ranking. The total value of the ranking will decide the candidate candidate Paskibaraka participants [34].

According to Paryanti et. al in his research stated that "Profile Matching is a method that can compare the competencies of employees with the competencies determined by the company so that differences in competence are obtained or called gaps. generated, the greater the weight of the value which means that the employee has a greater chance of getting the reward" [35].

The calculation process in the Profile Matching method begins with defining the minimum value for each assessment variable. The difference between each value of the testing data against the minimum value of each variable is the gap which is then weighted. The weight of each variable will be calculated on the average based on the Core Factor (CF) and Secondary Factor (SF) variable groups. The composition of CF plus SF is 100%, depending on the interests of the user of this method. The last stage of this method is the process of accumulating CF and SF values based on the values of the data testing variables. Weighting in the Profile Matching method is a definite value that is firm on certain values because the existing values are members of a crisp set. In a strict set, the membership of an element in the set is explicitly stated, whether the object is a member of the set or not by using the characteristic function.

The important thing in the process of the Profile Matching Method (and also in all Decision Support System (DSS) implementations is to determine the variables and their magnitude that play a role in the problem to be resolved. In general, the criteria / aspects that are measured and the weighted values used are a set of variables that have been determined by the authorized expert or person / institution. (Types of criteria, aspects, factors, weights, rating scales, and other quantities calculated are NOT the authority / determined by the programmer). For other cases, the type of criteria, aspects, grading scale, weighting and so on may be different; We recommend that you consult with an authorized expert / person / institution or from the literature that has become a reference standard.

In this case there are difficulties in determining the main customer on PT. Atlas delivery services, due to the large number of customers and not computerized. PT. Atlas is a company engaged in shipping services with routes Jakarta-Surabaya and vice versa, which is located at Kapuk Kamal Raya street, No. 40, Pluit Business Complex Blok L-12 Penjaringan, North Jakarta. Therefore, this research aims to apply Profile Matching Method in determining reward to the best[7]. Profile Matching Method is a very important process in HR management where first determined competencies (abilities) are needed in order to obtain maximum results from several criteria [8][9]. This capability needs to be seen from the main customers at PT. Atlas. In determining the main customer, decision making at PT. Atlas based on several criteria, namely:

1. Length of subscription
2. Delivery intensity
3. Number of shipments
4. Payment status

2. RESEARCH METHOD

2.1 Data Collection Methods

Data collection is very important in research because data is needed for the data[10] Some techniques used in this research, among others:

1. Observation
Observation is a data collection technique, researchers make observations directly to the object of research [11]. In this study, observations were made on PT. Atlas to find out the mechanism of rewarding customers.
2. Interview
Interview is done by question and answer between researchers and resource persons using a tool called interview guide [11]. In this research, the interview was conducted with the Head of PT. Atlas, what's going on?
3. Study library
The library study was conducted by collecting several references sourced from journals and books.
4. Questionnaire
Questionnaire designed in the form of likert scale based on profile matching method that has sub-criteria aspect value that is very good value 5, good value 4, worth enough 3, less value 2, very less value 1.

2.2 Population and Research Samples

Population is the entire subject of research, whether in the form of people, objects, or something that serves to provide information (data)research. While the sample is part of the number and characteristics of a population[12]. The population in this study are customers who will be rewarded by PT. Atlas. Taking sampel as many as 10 customers at PT. Atlas, what's going on?

2.3 Profile Matching

Research on profile matching is a recommendation of the selection of key customers at PT. Atlas, which determines the suitability between customer competency values. Of these, the total value will be[13]. Profile matching is a decision-making mechanism assuming that there is an ideal level of variable[14][15]. This profile matching process is done by comparing the alterantif (customer profile) into several criteria needed so that the difference (called GAP) can be known [16]. The minimum value for each existing valuation variable. The result of difference of each test data value against the minimum value of each variable, into a gap that will then be weighted. These

weights are calculated on average based on the Core Factor (CF) and Secondary Factor (SF) variable groups. The composition of CF plus SF is 100%. This method ends with the process of collecting CF and SF values based on the data testing variable values [17][18].

Based on the predetermined criteria, namely the length of subscription, the intensity of the delivery, the number of shipments, and the status of the payment, steps are taken based on the profile matching method as follows:

a. Weighting value on each criteria (value target)

The first stage in profile matching is the weighting of the value of each criterion by determining the weight of the value of each criterion[19]. Weighting the criteria value (target value) is the first step in this method. The scale used is the ordinal scale. An ordinal scale is a scale based on rank, whether sorting from a higher level to the lowest level or vice versa Ordinal scale used for each kriteria, namely:

- 1 = Very less
- 2 = Less
- 3 = Enough
- 4 = Good
- 5 = Excellent

b. Weighting GAP value

In the Profile Matching process is an outline of the process of comparing between each assessment criteria in a proposed research proposal submitted so that it is known the difference in score (also called GAP (Gains AcrossProduct)) [20]. The smaller the GAP generated, the greater the value weight which means it has a greater chance of eligibility/graduation priority. Gap is a tool used to evaluate [21] to see the difference between the profile owned by each alternative and the standard profile .

$$\text{GAP} = \text{value attribute} - \text{value target} [6]$$

The next step is to determine the GAP weight based on the gap value weighting table as follows [6]:

Table 1. GAP Weight Value

Difference (GAP)	Weight value	Description
0	5	No difference (Competence as needed)
1	4,5	Individual competence excess 1 level
-1	4	Individual competence lacks 1 level
2	3,5	Individual competence excess 2 levels
-2	3	Individual competence lacks 2 levels
3	2,5	Individual competence excess 3 levels
-3	2	Individual competence lacks 3 levels
4	1,5	Individual competence excess 4 levels
-4	1	Individual competence lacks 4 levels

c. Core factor calculation

After determining the weighting of GAP value for each value, then the next step is to group each value into 2 groups namely Core Factor and Secondary Factor[6][22], to calculate core factor can use the equation as follows [23][24]:

$$NCF = \frac{\sum NC(i,s,p)}{\sum IC}$$

Description:

- NCF :Average core factor value
- $NC(i, s, p)$:Total core factor value
- IC :Number of core factor items

Core Factor is the main factor that stands out and is used as a reference so as to produce optimal performance formulated [25].

d. Secondary factor calculation

Secondary factor is the supporting factor [25]. Secondary factor are items other than aspects of the core factor [26]. To calculate secondary factor can use the equation as follows [6][23]

$$NSF = \frac{\sum NS(i,s,p)}{\sum IS}$$

Description:

NSF :Average value of secondary factor

$NS(i, s, p)$:Total number of secondary factor values

IS :Number of secondary factor items

e. Calculation of total value

Calculation of total value based on core factor and secondary factor used as assessment criteria that affect the feasibility of getting rewarded[6]. Calculations can be performed using the following equations [27]:

$$Ni = (x)\%NCF + (x)\%NSF$$

Description:

Ni :Final value

NCF :Average core factor value

IC :Average value of secondary factor

f. Ranking determination

The final result of the profile matching process is the ranking of the candidates submitted. After each candidate gets the final grade, it can be determined the rank or rank of the candidate based on the greater the value of the final result so that the greater the chance to get the reward that will be given to the applicant [6], the ranking calculation is done using the equation as follows:

$$Rangking = (x)\%N1 + (x)\%N2 + (x)\%Nn$$

Description:

$N1, N2, Nn$: Total value of critique

$(x)\%$: Prosentase of criteria values

3. RESULTS AND DISCUSSION

In this profile matching method, the first step is weighting the criteria (value target) for each criterion. Here are the criteria:

Very less = 1, Less = 2, Simply = 3, Good = 4, Excellent = 5

3.1. Weighting the value on each criteria (target value)

On table 2. Contains the target value of each criteria that has been determined based on the criteria value. Where the target value becomes the benchmark for weighting gap value in the next step.

Table 2. Weighting Criteria (value target)

Criteria	Value Target
Delivery Intensity	5
Number of Shipments	4
Subscription Length	3
Payment Status	3

3.2. Customer Questionnaire Data

This customer questionnaire data is obtained from questionnaire results that have been filled by respondents[28], which then we average the total assessment results of each criterion.

Table 3. Customer Questionnaire Data

Customer's Name	Delivery Intensity	Number of Delivery	Length of Subscription	Payment status
PT. Bazic Sukses Abadi	1	2	4	2
PT. Prima Mitra Berjaya	4	4	4	3
PT. Altus Nusa Mandiri	4	5	4	4
PT. Asian Motor	1	2	4	2
PT. Atali Makmur	5	5	4	5
PT. Bintang Kalbar	3	3	2	3
PT. Gunindo	3	3	4	2
PT. Kenko Sinar Indonesia	4	3	5	5
PT. Lima Motor Cemerlang	4	1	5	3
PT. Tunas Jaya Abadi	4	4	4	5

3.3. Weighting Gap Value

Based on customer questionnaire data contained in table 3, the next step is the calculation of GAP value. Where GAP value is the difference from attribute value and target value so that each criteria weighted [6][29].

Table 4. Weighting GAP Value

Customer's Name	Delivery Intensity	Number of Delivery	Length of Subscription	Payment status
Target Value	5	4	3	3
PT. Bazic Sukses Abadi	-4	-3	-1	-3
PT. Prima Mitra Berjaya	-1	-1	-1	-2
PT. Altus Nusa Mandiri	-1	0	-1	-1
PT. Asian Motor	-4	-3	-1	-3
PT. Atali Makmur	0	0	-1	0
PT. Bintang Kalbar	-2	-2	-3	-2
PT. Gunindo	-2	-2	-1	-3
PT. Kenko Sinar Indonesia	-1	-2	0	0
PT. Lima Motor Cemerlang	-1	-4	0	-2
PT. Tunas Jaya Abadi	-1	-1	-1	0

GAP value can be determined by using GAP weight value data, as seen in customer data number 4 namely PT Altusnusa mandiri where in the data based on the questionnaire, the number of shipments has a value attribute = 5, while the target value for the number of shipments is 5, then the difference between the attribute value and the target value is 0, then if based on the gap weight value data, the difference with the result of 0 has a weight of 5 values, which means there is no difference (competency as needed).

3.4. Core Factor Calculation (CF)

Based on gap value in table 3, then the next step is to divide the criteria into two groups, namely core factor and secondary factor.[30]. Where the criteria that include the core factor are the intensity of delivery and the number of shipments. After the next grouping of criteria is to calculate the core factor value.

Table 5. Customer Core Factor Calculation

Customer Name	Description	Delivery Intensity	Number of Shipments	Core Factor
PT. Bazic Sukses Abadi	GAP Value	-4	-3	1
	Value weighted result	1	1	
PT. Prima Mitra Berjaya	GAP Value	-1	-1	3,5
	Value weighted result	4	3	
PT. Altus Nusa Mandiri	GAP Value	-1	0	4
	Value weighted result	4	4	
PT. Asian Motor	GAP Value	-4	-3	1
	Value weighted result	1	1	
PT. Atali Makmur	GAP Value	0	0	4,5
	Value weighted result	5	4	

PT. Bintang Kalbar	GAP Value	-2	-2	2,5
	Value weighted result	3	2	
PT. Gunindo	GAP Value	-2	-2	2,5
	Value weighted result	3	2	
PT. Kenko Sinar Indonesia	GAP Value	-1	-2	3
	Value weighted result	4	2	
PT. Lima Motor Cemerlang	GAP Value	-1	-4	2
	Value weighted result	4	0	
PT. Tunas Jaya Abadi	GAP Value	-1	-1	3,5
	Value weighted result	4	3	

3.5. Secondary Factor (SF) Calculation

For the calculation of the core factor, first take a number of criteria from each of the most important aspects and later it will be used as the core factor for the rest will be used as a secondary factor. Criteria that include secondary factor are length of subscription and payment status.

Table 6. Customer Secondary Factor Calculation

Customer Name	Description	Subscription Length	Payment Status	Secondary Factor
PT. Bazic Sukses Abadi	GAP Value	-1	-3	1
	Value weighted result	2	0	
PT. Prima Mitra Berjaya	GAP Value	-1	-2	1,5
	Value weighted result	2	1	
PT. Altus Nusa Mandiri	GAP Value	-1	-1	2
	Value weighted result	2	2	
PT. Asian Motor	GAP Value	-1	-3	1
	Value weighted result	2	0	
PT. Atali Makmur	GAP Value	-1	0	2,5
	Value weighted result	2	3	
PT. Bintang Kalbar	GAP Value	-3	-2	0,5
	Value weighted result	0	1	
PT. Gunindo	GAP Value	-1	-3	1
	Value weighted result	2	0	
PT. Kenko Sinar Indonesia	GAP Value	0	0	3
	Value weighted result	3	3	
PT. Lima Motor Cemerlang	GAP Value	0	-2	2
	Value weighted result	3	1	
PT. Tunas Jaya Abadi	GAP Value	-1	0	2,5
	Value weighted result	2	3	

After the core factor and secondary factor are obtained, the total value of the overall indicator (Final Value) is calculated.

3.6. Final Value Calculation

The next step is to calculate the total value which is the percentage of core factor and secondary factor, calculated by using the equation[31]. Core factor is 60% and secondary factor is 40%.

Table 7. Final Value Calculation

Customer Name	Core Factor	Secondary Factor	Final Value
PT. Bazic Sukses Abadi	1	1	1
PT. Prima Mitra Berjaya	3,5	1,5	2,7
PT. Altus Nusa Mandiri	4	2	3,2
PT. Asian Motor	1	1	1
PT. Atali Makmur	4,5	2,5	3,7
PT. Bintang Kalbar	2,5	0,5	1,7
PT. Gunindo	2,5	1	1,9
PT. Kenko Sinar Indonesia	3	3	3
PT. Lima Motor Cemerlang	2	2	2
PT. Tunas Jaya Abadi	3,5	2,5	3,1

Based on the calculation results of each of the above criteria, the total value is calculated based on the percentage of core factor and secondary factor that is estimated to affect the performance of each profile [26].

3.7. Ranking Determination

At this stage will be done ranking determination which is the final stage of profile matching method [28][32], ranking is determined based on the calculation of total value as seen in table 8. Then the value is calculated which is then sorted from the largest to the smallest.

Table 8. Ranking Result Data

Customer Name	Final Value	Ranking
PT. Bazic Sukses Abadi	1	9
PT. Prima Mitra Berjaya	2,7	5
PT. Altus Nusa Mandiri	3,2	2
PT. Asian Motor	1	10
PT. Atali Makmur	3,7	1
PT. Bintang Kalbar	1,7	8
PT. Gunindo	1,9	7
PT. Kenko Sinar Indonesia	3	4
PT. Lima Motor Cemerlang	2	6
PT. Tunas Jaya Abadi	3,1	3

In Table 8 is the data of the results of the warkingan. In the data, the highest final value is obtained by PT. Atali Makmur with a final value of 3.7, then if we sort it in the form of a table is as follows:

Table 9. Ranking Order Data

No	Nama Pelanggan	Rangking
1	PT. Atali Makmur	1
2	PT. Altus Nusa Mandiri	2
3	PT. Tunas Jaya Abadi	3
4	PT. Kenko Sinar Indonesia	4
5	PT. Prima Mitra Berjaya	5
6	PT. Lima Motor Cemerlang	6
7	PT. Gunindo	7
8	PT. Bintang Kalbar	8
9	PT. Bazic Sukses Abadi	9
10	PT. Asian Motor	10

Based on the results of data processing using the profile matching method, the final results show that there is a data ranking as shown in Table 9. PT. Atali Makmur has the highest-ranking result which means that the value of the criteria obtained is good, and is entitled to a reward as a loyal customer of PT. Atlas Jakarta.

4. CONCLUSION

Based on the research that has been done, it is concluded that:

1. A decision support system using the Profile Matching method can be used in selecting the best customer for the company management in deciding which customer will be awarded the award
2. Overcome the problem of subjective assessment conducted by decision makers, namely by filling out questionnaires that have been provided by researchers for several respondents, and then done perhitungan from questionnaire results in order to produce accurate data.
3. To solve the problems that occur, a decision support system is designed to create a more effective and efficient decision. With the new system, it is hoped that it will make it easier to find data, calculate the best customer selection assessment, and make decisions.

ACKNOWLEDGEMENTS

The author thanks PT. Atlas Jakarta that has supported and helped the implementation of research and or article writing.

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