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Implementation of The Simple Additive Weight (SAW) Method for Recommendation of the Order of Survey Cities on Company Project

Julio Warmansyah[1*], Agus Susanto[2]
[1]Sistem Informasi/Universitas Binaniga Indonesia
Email: rajib@stikombinaniaga.ac.id
[2]Sistem Informasi/ Universitas Binaniga Indonesia
Email: agussusanto1977@gmail.com

ABSTRACT

DEKA has multiple expertise in the market research industry by conducting various types of research through qualitative and quantitative methods to generate valuable and actionable insights, guiding clients in the process of reviewing, learning, and developing strategic marketing plans, as well as customer-oriented organizational transformation. Deka also provides data-driven strategies and recommendations, taking into account the key purchase drivers for customer acquisition, brand revitalization, product/service, innovation, price optimization, and marketing communication strategies. To obtain quality data, it must also be carried out in an appropriate manner starting from project preparation by compiling a Job summary, conducting kick-off meetings both externally and internally, preparing the team in the field, compiling a budget plan, consolidating with the teams involved through briefings and making the implementation guidelines and the timeline.

Keywords*: Alternative; Criteria; AHP.*

A. INTRODUCTION

DEKA is the first agency in Indonesia to achieve ISO 20252 for market, opinion, and social research. DEKA is an active member of local and international associations. Our founder, Ms. Irma Malibari was invited by LISH (Laboratory for Innovation Science at Harvard) as a speaker to share insightful case studies of social innovation in 2018. DEKA is also recognized internationally, as evidenced by being honored to be present at the ESOMAR Asia Pacific Conference for three years. consecutively (2014, 2015 Days and 2016). We won the Esomar Apac Best Paper Award, with our study of individualism in Indonesia, entitled The Emerging of I in Indonesia. Predetermined weights. The process of weighting is the result of field observations that have succeeded in getting the assumption value on each criterion.

The Simple Additive Weight (SAW) model can provide a ranking assessment of the alternatives that have been given, on these alternatives by giving weight to each criterion that will affect each existing choice or with the alternative to be chosen.

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Table 1. Sample Target

TARGET SAMPEL															
CITY															
	TOTAL	Jakarta	Bandung	Surabaya	Medan	Makasar	Padang	Denpasar	Malang	Baklipapan	Tasikmalaya	Yogyakarta	Manado	Cirebon	Madiun
GENDER	**2900**	**390**	**200**	**200**	**200**	**200**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**
Laki- Laki	1450	195	100	100	100	100	95	95	95	95	95	95	95	95	95
Wanita	1450	195	100	100	100	100	95	95	95	95	95	95	95	95	95
SES	**2900**	**390**	**200**	**200**	**200**	**200**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**
A	580	78	40	40	40	40	38	38	38	38	38	38	38	38	38
B	580	78	40	40	40	40	38	38	38	38	38	38	38	38	38
C1	725	97	50	50	50	50	48	47	48	47	48	47	48	47	48
C2	725	98	50	50	50	50	47	48	47	48	47	48	47	48	47
DE	290	39	20	20	20	20	19	19	19	19	19	19	19	19	19
AGE	**2900**	**390**	**200**	**200**	**200**	**200**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**
18-24	870	117	60	60	60	60	57	57	57	57	57	57	57	57	57
25-34	870	117	60	60	60	60	57	57	57	57	57	57	57	57	57
35-44	580	78	40	40	40	40	38	38	38	38	38	38	38	38	38
45-55	580	78	40	40	40	40	38	38	38	38	38	38	38	38	38

From Table 1, it can be seen that there is a sample target that must be met by each city in each project implementation, this is a must as a target reference for each project.

Table 2. Actual Sample

ACTUAL SAMPEL															
CITY															
	TOTAL	Jakarta	Bandung	Surabaya	Medan	Makassar	Padang	Denpasar	Malang	Balikpapan	Tasikmalaya	Yogyakarta	Manado	Cirebon	Madiun
GENDER	**2900**	**390**	**200**	**200**	**200**	**200**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**
Laki laki	1446	195	100	100	100	96	94	101	95	93	92	95	95	95	95
Perempua	1454	195	100	100	100	104	96	89	95	97	98	95	95	95	95
SES	**2900**	**390**	**200**	**200**	**200**	**200**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**
A	569	78	39	41	39	40	39	42	37	38	24	38	41	37	36
B	593	78	43	41	40	35	37	48	39	38	44	38	34	38	40
C1	753	97	50	51	51	58	51	53	48	47	54	47	48	48	50
C2	717	98	50	48	50	48	47	38	48	48	52	48	46	49	47
D	266	39	16	19	20	19	16	9	18	19	16	19	21	18	17
E	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0
DE	268	39	18	19	20	19	16	9	18	19	16	19	21	18	17
AGE	**2900**	**390**	**200**	**200**	**200**	**200**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**
18 – 24 ta	865	117	59	61	60	62	53	53	56	55	60	57	58	57	57
25 – 34 ta	880	117	60	60	60	61	59	63	58	59	58	57	54	57	57
35 – 44 ta	588	78	42	40	40	41	42	39	38	38	38	38	38	38	38
45 – 55 ta	567	78	39	39	40	36	36	35	38	38	34	38	40	38	38
PENETRAT	**2900**	**390**	**200**	**200**	**200**	**200**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**	**190**
Main Respond	1940	256	149	130	110	90	133	113	125	156	144	121	133	148	132
Respond en	960	134	51	70	90	110	57	77	65	34	46	69	57	42	58
PENETRAT	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Main Respond	67%	66%	75%	65%	55%	45%	70%	59%	66%	82%	76%	64%	70%	78%	69%
Respond en	33%	34%	26%	35%	45%	55%	30%	41%	34%	18%	24%	36%	30%	22%	31%

(Source: DEKA Insight, 2020)

Describes the achievement of the actual sample based on the actual targets that have been determined and the achievements of each city as a whole

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B. METHOD

The Simple Additive Weight (SAW) method is often also known as the weighted addition method. The basic concept of the SAW method is to find the weighted sum of the performance ratings on each alternative of all attributes.

1. Determine the alternative (candidate), namely Ai.
2. Determine the criteria that will be used as a reference in making decisions, namely Cj
3. Provide the value of the suitability rating of each alternative on each criterion.
4. Determine the weight of preference or level of importance (W) on each criterion W = (W1, W2 , W3……, Wj) (1)
5. Create a match rating table for each alternative on each criterion.
6. Make a decision matrix X which is formed from the suitability rating table of each alternative on each criterion. The value of X for each alternative (Ai) on each criterion (C) that has been determined, where i=1, 2,.m and j=1.2…n
7. Normalize the decision matrix X by calculating the normalized performance rating value (rij) from the alternative (Ai on criteria Cj. Figure description A It is said to be a profit criterion if the xij value provides benefits for decision making. On the other hand, the cost criterion if xij causes costs for decision makers b. If it is a profit criterion, then xij is divided by the matrix value (xij) of each column divided by the value of xij
8. The results of the normalized performance rating value (rij) form a normalized matrix (R).
9. The final result of preference (Vi) is obtained from the sum of the normalized matrix row elements (R) with preference weights (W) corresponding to the matrix column elements (W). The calculation result of a larger Vi value indicates that the alternative Aj is the best alternative.
10. Determine the Indication value. The indication value is carried out on the hidden layer which functions as the market value of used cars using sales, price, year criteria.
11. The rankings are carried out by multiplying the SAW value by the indicated value and the final result of the value will be ranked according to the order of the results that have the largest value to the smallest.

Based on the problems faced, namely the recommendation for the order of survey cities that have not been effective and not accurate at the time of conducting the survey process, it is necessary to have a way to overcome these problems.

In theory, look for the weighted sum of the performance branches in the alternative order of survey cities based on experience in previous projects, including the Simple Additive Weight (SAW) method. the ranking results that have been determined through the final weighting value of each project to determine the top to bottom ranking.

Based on the author's disclosures, it can be determined that the hypothesis that the Simple Additive Weight (SAW) method is thought to be able to provide ranking recommendations from top to bottom to determine the order of the survey cities to be selected.

C. RESULT AND DISCUSSION

1. Result

In determining the order of submitting a survey city which was not based on a basis or reference. Through reference to journals, many variables are used, one of which is the speed of uploading data, accuracy of Data Upload and Data DO,

The data used in this study is the Deka Insight Sunrise Data Project which was carried out in 2021 with a sample of 2900 respondents which was carried out in 14 cities in Indonesia.

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Table 4. Analityc SAW

No	KOTA	Kecepatan	Ketepatan data	Jumlah Ketepatan data	DO
1	Jakarta	20.40	0	1	25
2	Bandung	25.27	10	11	15
3	Surabaya	3.47	8	9	14
4	Medan	10.33	1	2	1
5	Makasar	65.73	30	31	30
6	Padang	35.87	2	3	2
7	Denpasar	59.20	8	9	8
8	Malang	13.53	4	5	4
9	Balikpapan	41.53	32	33	32
10	Tasikmalaya	59.33	7	8	7
11	Yogyakarta	12.60	7	8	7
12	Manado	39.93	23	24	23
13	Cirebon	4.13	10	11	10
14	Madiun	9.93	5	6	5

in the assessment above, each city is different in the speed of data input, the accuracy of data entry, the amount of data accuracy and the DO of each.

Table 5. SAW

No	Kota	Kecepatan	Ketepatan	DO
1	Jakarta	0.17	1.00	0.04
2	Bandung	0.14	0.09	0.07
3	Surabaya	1.00	0.11	0.07
4	Medan	0.34	0.50	1.00
5	Makasar	0.05	0.03	0.03
6	Padang	0.10	0.33	0.50
7	Denpasar	0.06	0.11	0.13
8	Malang	0.26	0.20	0.25
9	Balikpapan	0.08	0.03	0.03
10	Tasikmalaya	0.06	0.13	0.14
11	Yogyakarta	0.28	0.13	0.14
12	Manado	0.09	0.04	0.04
13	Cirebon	0.84	0.09	0.10
14	Madiun	0.35	0.17	0.20

In this assessment, each value will be normalized in accordance with applicable regulations, such as a maximum value for a positive assessment and a minimum value for a cost assessment.

Table 6. Result Rank

No	Kota	Kecepatan	Ketepatan	DO	Hasil	Rangking
1	Jakarta	6.80	35.00	1.00	42.80	3

No	Kota	Kecepatan	Ketepatan	DO	Hasil	Rangking
2	Bandung	5.49	3.18	1.67	10.34	9
3	Surabaya	40.00	3.89	1.79	45.67	2
4	Medan	13.42	17.50	25.00	55.92	1
5	Makasar	2.11	1.13	0.83	4.07	14
6	Padang	3.87	11.67	12.50	28.03	5
7	Denpasar	2.34	3.89	3.13	9.36	11
8	Malang	10.25	7.00	6.25	23.50	7
9	Balikpapan	3.34	1.06	0.78	5.18	13
10	Tasikmalaya	2.34	4.38	3.57	10.28	10
11	Yogyakarta	11.01	4.38	3.57	18.95	8
12	Manado	3.47	1.46	1.09	6.02	12
13	Cirebon	33.55	3.18	2.50	39.23	4
14	Madiun	13.96	5.83	5.00	24.79	6

In the above assessment, it appears that the ranking that occurs after using SAW, so that in the pattern of filling in the values, it will appear that the order of cities gets priority

2. Discussion

In the assessment system above, it can be confirmed that this assessment is part of the research project development to find out the scientific model of a research. This is intended to get the real value for each data and the proper analysis process on the incoming data. The incoming data can be of various models, the system will process samples on each object to be examined.
In this assessment, a target sample model is used which is used to achieve targets for each data collection or data collection. This process is a model that is needed to control the achievement of revenue on data. so you get data that is focused and doesn't stop in the middle of the road In this assessment, a target sample model is used which is used to achieve targets for each data collection or data collection. This process is a model that is needed to control the achievement of revenue on data. so that data is obtained that is focused and does not stop in the middle of the road.
This model uses an actual sample where the data obtained is data collected from data that has been uploaded
Some important things that need to be considered are the existence of problematic data known as DO

D. CONCLUSION

Based on the results of research conducted, conclusions that can be described include:

1. Assisting Admin in determining the order of city survey cities on company projects using the Simple Additive Weight (SAW) method
2. Provide recommendations for determining the order of city survey cities on company projects appropriately
3. By applying the Simple Additive Weight (SAW) Method, can be used as a decision support system for determining survey cities on company projects.
4. By applying the Simple Additive Weight (SAW) method, it is possible to measure accuracy using the rapid miner application to test the results with a value of 83.46% which can be concluded that this application is feasible to use.

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