

Promotion Media Recommendations on The Acceptance of New Students In Private Educations With The Simple Additive Weighting Method

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Abstract

Ensuring the existence of private universities (PTS) is the number of new students who enroll in each new academic year. One of the ways that private universities STMIK Pelita Nusantara to attract new student candidates is through promotion. Promotion is a communication activity carried out to introduce something to the public and simultaneously influence the wider community to buy and use the product. The purpose of this study was to determine which promotional media was more effective which had an impact on the number of new student enrollments at the private tertiary education institution STMIK Pelita Nusantara using the SAW method as a measuring instrument. The steps taken are: determining the value of the criteria for each alternative, determining the weight, normalizing the matrix, and normalizing the decision matrix to a scale that is compared to all the alternative ratings. The result of the research is the promotion mix with the alternative Worth of Mouth promotion as the best media with a value of 1.

Keywords: Promotion, Media Promotion, STMIK, Pelita Nusantara, SAW Method

1. Introduction

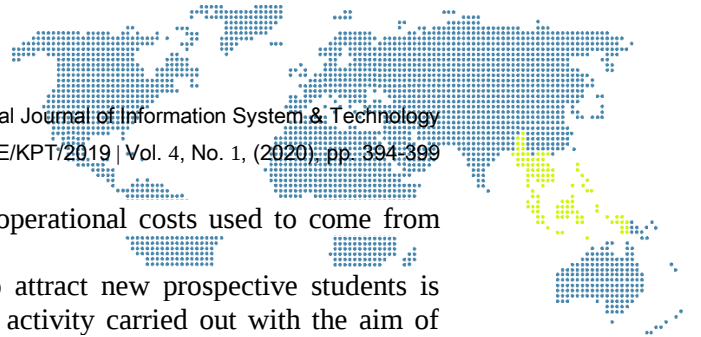
The educational learning process in reorganizing and reconstructing experiences to educate and develop potential in students. In general, it is divided into two, namely formal education and non-formal education. Formal education starts at the levels of Elementary School (SD), Junior High School (SMP), Senior High School (SMA), and Higher Education. Higher education is categorized into two parts, namely State Universities (PTN) and Private Universities (PTS).

Table 1. Table List of 2016-2020 SMA-SMK Graduates

Year	Student Graduates		Total	Register with PTN	Accepted at PTN	Prospective Students at PTS
	High school	SMK				
2020	3,679,607	980,226	4,659,833	489,601	96,496	393,105
2019	5,036,748	140,234	5,176,982	478,608	92,331	386,277
2018	4,946,157	133,519	5,079,676	586,155	110,946	475,209
2017	4,869,023	129,978	4,999,001	517,166	101,906	415,260
2016	4,634,652	123,610	4,758,262	645,202	115,178	530,024

(source: dapo.dikdasmen.kemdikbud.go.id, www.ristekbrin.go.id)

Ensuring the existence of private universities (PTS) is the number of new students who enroll in each new academic year. The number of private universities in Indonesia in 2019 was recorded at 4,253 private universities (<http://forlap.ristekdikti.go.id>). If the number of students obtained is lacking, the quality of private universities does not have sufficient resources to improve academics which include facilities and infrastructure and maintain



the teaching and learning process.[1]. Because all operational costs used to come from students who pay tuition fees[2].

One of the ways that private universities do to attract new prospective students is through promotion. Promotion is a communication activity carried out with the aim of introducing something to the public and at the same time influencing the wider community to buy and use the product[3][4][5]. Pelita Nusantara College of Informatics and Computer Management (STMIK PENUSA) is one of the private universities that need to choose the right promotional media to be able to inform, introduce and persuade consumers to choose STMIK Pelita Nusantara as a campus to climb the computer-based higher education level.

2. Research Methodology

The SAW method is often also known as a weighted addition method. The basic concept of the SAW method is to find the weighted sum of the performance ratings for each alternative on all attributes. The SAW method requires a decision matrix normalization process (X) to a scale that can be compared with all available alternative ratings[6][7][8].

The steps for completing the Simple Additive Weighting method:

- Give the value of each alternative (A_i) on each predetermined criterion (C_j), where the value of $i = 1, 2, \dots, m$ and $j = 1, 2, \dots, n$.
- Provide a weighted value (W) which is also obtained based on the membership value.
- Normalizing the matrix by calculating the normalized performance rating value (r_{ij}) of the alternative A_i on the C_j attribute based on the equation adjusted for the type of attribute (attribute benefit / benefit = maximum or attribute cost / cost = minimum). If it is a profit attribute, the membership value (r_{ij}) of each attribute column is divided by the Max (max) membership value of each column, while for the cost attribute, the Min (min) membership value of each attribute column is divided by the membership value (r_{ij}) of each column.
- Perform a ranking process for each alternative (V_i) by multiplying the weight value (w_j) by the normalized performance rating value (r_{ij}).

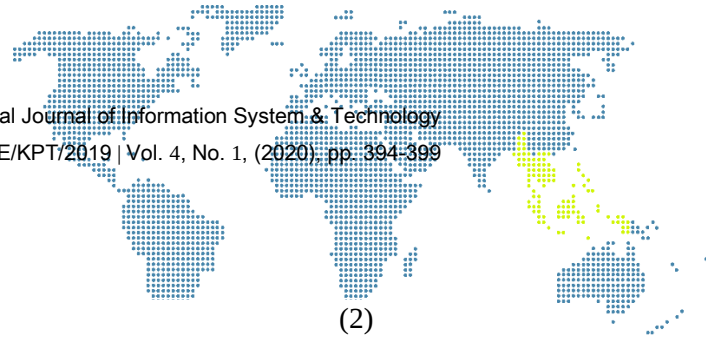
The formula for carrying out the normalization is:

$$r_{ij} = \begin{cases} \frac{X_{ij}}{\max X_{ij}}; & \text{if } j \text{ is attribute of benefit} \\ \frac{\min X_{ij}}{X_{ij}}; & \text{if } j \text{ is attribute of cost} \end{cases} \quad (1)$$

Where:

- r_{ij} : normalized performance rating value
 $\max X_{ij}$: the maximum (greatest) value of each criterion
 $\min X_{ij}$: the minimum (smallest) value of each criterion
 X_{ij} : attribute value that belongs to each criterion
Benefit : if the greatest value is best
Cost : if the smallest value is best

With r_{ij} is the normalized performance rating of the alternatives A_i on attribute C_j ; $i = 1, 2, \dots, m$ and $j = 1, 2, \dots, n$. Preference value for each alternative (V_i) [9][1] given as follows:



$$V_i = \sum_{j=1}^n w_j r_{ij}$$

(2)

Where:

V_i : Score the end of the alternative

W_i : The weight has been determined

r_{ij} : Normalization of the matrix

A larger value indicates that the alternative A_i is preferred. V_i [10].

3. Results And Discussion

The data source used in this study was obtained from the student registration form database owned by STMIK Pelita Nusantara Medan. The data obtained in this study are qualitative and quantitative data where the data collected is data from students who registered for the 2018/2019 academic year, namely 319. The data obtained were grouped according to predetermined criteria and carried out data analysis using statistical techniques. After the data is collected, the next stage is to select data or filtering to get the right or clean data which will be used in the next stage. In this data collection stage, the elimination of incomplete information on the student registration form is carried out.

The flow of the process in selecting promotional media is carried out using the Simple Additive Weighting method starting from determining alternatives and criteria, where alternatives to promotional media are advertising, sales promotion, personal selling, public relations, and direct selling. Meanwhile, the criteria consist of market segment, time, the scale of promotion, and cost. The next process is to determine the Fuzzy suitability value of each criterion, after which it will be processed so that the normalized value for each criterion is obtained [11][6]. After getting the normalized value, the next step is to calculate the preference value where the value is obtained from the comparison between the criteria for the promotional media and the maximum value of the criteria, which is then multiplied by weighted preference results. *Weighted* is the weight of the importance of each criterion. Thus the total value is obtained by using the formula until the ranking of the recommended selection of promotional media is finally obtained.

3.1. Analysis of Alternative Data Needs

There are four alternatives and the four criteria used in the selection of promotional media used in this study as shown in table 2 and table 3.

Table 2. Table Alternative Media Promotion

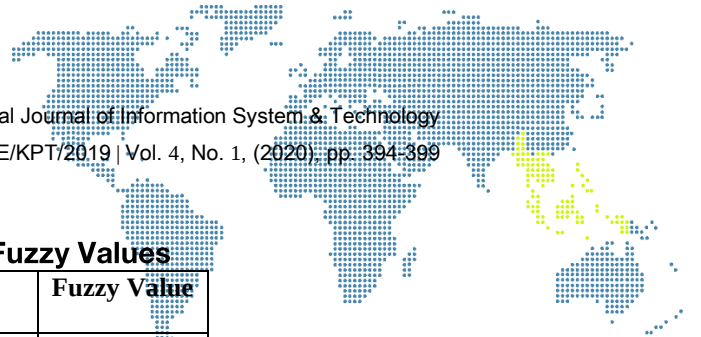
No.	Alternative Media Promotion
1	Brochure (A1)
2	Foster / Spansuk (A2)
3	Social Media (A3)
4	Worth of the Mouth (A4)

Table 3. Table Criteria and Weights

Criteria	Attribute	Weighted Importance Value (Weighted)
Time (C1)	Benefit	0.1
Promotion Frequency (C2)	Cost	0.1
Target Market (C3)	Benefit	0.5
Budget (C4)	Cost	0.3

3.2. Analysis of Critical Data Needs

The four criteria used in the selection of promotional media in this study, each reach value or weight is as follows:



a) Time

Table 4. Table Time and Fuzzy Values

Time (C1)	Information	Fuzzy Value
0 - 10 minutes	Not Long (TL)	5
11 - 20 Minutes	Long enough (CL)	20
21 - 30 minutes	Old (L)	35
> 31 Minutes	Very Long (SL)	50

b) Promotion Frequency

Table 5. Table Value of Promotion and Fuzzy Frequency Criteria

Promotion Frequency (C2)	Information	Fuzzy Value
0-10 Week	Very Rare (SJ)	5
11-20 Sunday	Rarely (J)	20
21-30 Sunday	Often (S)	35
> 31week	Very Often (SS)	50

c) Target Market

Table 6. Table Value of Fuzzy and Target Market Criteria

Target Market (C3)	Information	Fuzzy Value
0 - 20 Km	Very Particular (SD)	5
21 - 40 Km	Close (D)	20
41 - 100 Km	Far (J)	35
> 100 Km	Very far	50

d) Budget

Table 7. Table Value of Budget and Fuzzy Criteria

Budget (C4)	Information	Fuzzy Value
0-25 million	Low (R)	5
26 - 50 million	Medium (S)	20
51 - 100 million	Height (T)	35
> 100 million	Very High (ST)	50

3.3. Recapitulation of calculation data from each of the promotional media criteria

Data recapitulation based on the criteria used in the selection of promotional media that is more effective and efficient.

Table 8. Recapitulation of the Value Criteria for Promotion Media

No.	Promotion Media Name	Mean Value Criteria			
		Target Market	Time	Promotion Frequency	Budget
1	Brochure	0.19	1.25	0.78	2.85
2	Foster / Spansuk	0.23	3.33	1.31	3.57
3	Social media	0.32	1.66	3.94	2.14
4	Worth of the Mouth	0.25	3.75	2.63	1.42

3.4. Simple Additive Weighting (SAW) Analysis Method

a) Alternative Match Ratings

Table 9. Table Match Rating

No.	Alternative	Criteria			
		C1	C2	C3	C4
1	A1	20	20	20	20
2	A2	35	50	5	20
3	A3	50	20	50	5
4	A4	50	50	35	5

After making a rating according to the criteria with the values obtained from the table above, then the values are grouped into a matrix, as follows:

$$X = \begin{pmatrix} C_1 & C_2 & C_3 & C_4 \\ 20 & 20 & 20 & 20 \\ 35 & 50 & 5 & 20 \\ 50 & 20 & 50 & 5 \\ 50 & 50 & 35 & 5 \end{pmatrix} \quad R = \begin{pmatrix} C_1 & C_2 & C_3 & C_4 \\ 0,4 & 1 & 0,4 & 0,25 \\ 0,7 & 0,4 & 0,1 & 0,25 \\ 1 & 1 & 1 & 1 \\ 1 & 0,4 & 0,7 & 1 \end{pmatrix}$$

In the Simple Additive Weighting (SAW) method, it requires a matrix normalization process by calculating the value of the alternative rating against the criteria based on the adjusted weight value. From the results of the above calculations are ranked in table form as follows:

Table 10. Results of the SAW Method Ranking

Promotion media	Score
Social Media (A3)	1
Worth of the Mouth (A4)	0.79
Brochure (A1)	0.415
Foster / Banner (A2)	0.235

4. Conclusion

The results obtained are recommendations for effective and efficient promotional media in promoting private universities based on the criteria of Target Market, Time, Frequency of Promotion, and Budget and based on Brochures, Foster / Banners, Worth of the Mouth and Social Media is Social Media. which was followed by Worth of the Mouth, Brochures, and Posters / Banners.

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