

# Determining the Best Web Designer Using the SMARTER Method (Case Study: Website Development Service Provider)

Lintang Patria<sup>1\*</sup>, Bernad J. D. Sitompul<sup>2</sup>, Nasib Marbun<sup>3</sup>

<sup>1</sup>Program Studi Sistem Informasi, Universitas Terbuka, Indonesia

<sup>2</sup>Fakultas Teknik, Program Studi Teknik Informatika, Universitas Sam Ratulangi, Manado, Indonesia

<sup>3</sup>Teknologi Rekayasa Komputer Grafis, Politeknik Cendana, Medan, Indonesia

Author Email: lintang@ecampus.ut.ac.id<sup>1</sup>, bernadsitompul@yahoo.com<sup>2</sup>, marbunnasib93@gmail.com<sup>3</sup>

**Abstract.** This research aims to solve the problem of determining the best Web Designer objectively for website development service business activists. In this research, the author offers SMARTER as a decision support system method to produce a ranking of the best Web Designer alternatives to be selected by decision makers. The alternatives selected as the best Web Designer in this study consist of 5 candidates (AX1, AX2, AX3, AX4, and AX5). The criteria used in the process of determining the best Web Designer in this study are communication, ability to design websites, discipline, and loyalty. The results of the application of the SMARTER method in this study recommend alternative AX3 to the decision maker to be selected as the best web designer who is entitled to a reward.

**Keywords:** Decision Support System, SMARTER, Web Designer.

## 1 Introduction

The success of a company engaged as a website development service provider cannot be separated from the work of the Web Designer. Web Designer is a group or individual who is given full responsibility in building an elegant website display that will be sold by website development service providers to consumers. Giving rewards to Web Designers is one of the factors that can increase motivation to improve work performance. Giving rewards to an objective Web Designer must be done through the results of an objective Web Designer performance assessment.

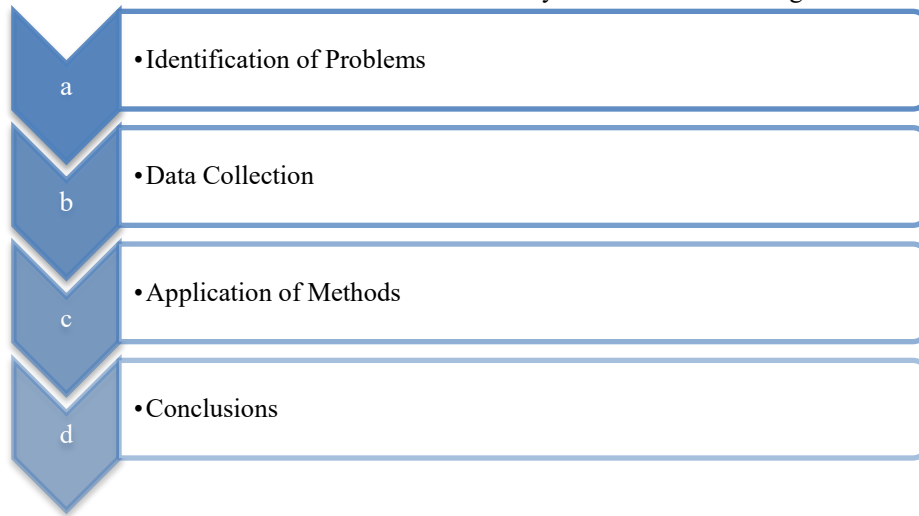
A decision support system is a computerized information system that can be used in providing decision-making support to determine the best alternative from all available alternatives [1–6]. As an effort to improve the accuracy of decision-making using a decision support system, there are several decision-making methods that can be chosen to be applied, such as the SMARTER method [7], MAUT [8], MABAC [9], AHP [10], VIKOR [11], etc. In this research, the authors are interested in applying the SMARTER method as a solution in solving the problem of determining the best Web Designer who is entitled to receive a reward.

The selection of SMARTER to determine the best Web Designer who is entitled to receive a reward in this study is inseparable from SMARTER's past contributions in solving decision-making problems. In previous research by Dito Putro Utomo and Bister Purba (2021), it was concluded that SMARTER can be used in determining the results of the performance assessment of educational staff objectively [12]. In the results of research conducted by Winda Suci Lestari Nasution and Patriot Nusa (2022), it was concluded that SMARTER could help the teacher council in determining the best choice for selecting the Muhammadiyah School Student Council Chair [13]. In other research results by Khairunnisa and Muhammad Reza Fahlevi (2023), it was concluded that SMARTER can facilitate decision makers in selecting prospective recipients of fishing facilities assistance at the Deli Serdang Regency Fisheries Service [14].

## 2 Research Method

### 2.1 Research Stages

The stages of research that the author conducted in this study are as shown in the figure below:



**Figure 1.** Research Stages

The following is an explanation of each stage of the research conducted by the author in accordance with the picture of the research stages above:

a. Problem Identification

At the identification stage the author determines the subject matter that will be resolved using the SMARTER method in this study.

b. Data Collection

1. Literature Study

In the literature stage, the author conducts research on determining the best web designer and the SMARTER method offered to solve the problems that are being researched in this study. The reference sources that the author uses at the literature study stage are scientific papers that have been published in journals in the last 5 (five) years maximum.

2. Field Study

At the field study stage, the author collects sample data related to determining the best web designer at the intended research location. The data collection techniques that the authors use in this field study are interviews and observations.

c. Application of Methods

At this stage the author applies the SMARTER method to solve the problem of determining the best web designer.

d. Conclusions

At this stage the author describes the conclusions from the results of determining the best web designer based on ranking alternatives using the SMARTER method. In the results of decision making using SMARTER, the alternative that has the greatest value is the best alternative recommended as the best web designer.

### 2.2 Metode SMARTER

SMARTER is one of the methods that can be applied to the Decision Support System to provide recommendations to decision makers according to relevant criteria [12,15,16]. The weight value of the criteria in the SMARTER method is determined based on mathematical calculations using Rank Order Centroid (ROC) [14,16,17]. The following is a description of the decision-making process using the SMARTER method [18–20]:

a. Problem identification

b. Determination of criteria and sub-criteria

c. Ranking of criteria weights and sub-criteria weights based on level of importance

d. Determination of criterion weight values and sub-criterion weights using the ROC formula

$$w = \left(\frac{1}{k}\right) \sum_{i=k}^k \left(\frac{1}{i}\right) \dots \dots \dots (1)$$

Description:

1.  $w$  is the criterion weight value
2.  $k$  is the number of criteria data used
3.  $i$  is the alternative value in the sample data

e. Determination of utility value for each criterion

$$u_i(a) = 100\% \times \left(\frac{c_i - c_{min}}{c_{max} - c_{min}}\right) \dots \dots \dots (2)$$

Description:

1.  $u_i(a)$  is the utility value for the  $i$ -th criterion on the  $i$ -th criterion
2.  $c_i$  is the  $i$ -th criterion value
3.  $c_{min}$  is the smallest criteria value compared to other criteria values
4.  $c_{max}$  is the largest criterion value compared to other criterion values

f. Determination of the final score for each criterion

$$u_n = \sum_{k=1}^K w_k u_n(x_n) \dots \dots \dots (3)$$

Description:

1.  $u_n$  is the final score for each criterion
2.  $w_k$  is the  $k$ th criterion weight value
3.  $u_n(x_n)$  is the utility value of the  $k$ th criterion for the  $h$ th alternative.

### 3 Result and Discussion

#### 3.1 Research Data

The research data that the author uses to solve the problem of determining the best web designer in this study is alternative sample data in determining the best web designer obtained from the decision maker at the intended research location. The alternative sample data for determining the best web designer that the author uses in this study can be seen in the table below:

**Table 1.** Alternative Data

Alternative	Criteria Value			
	C1	C2	C3	C4
AX1	Bad	70	Good	Low
AX2	Enough	60	Enough	High
AX3	Good	75	Bad	Medium
AX4	Bad	84	Enough	Low
AX5	Enough	55	Good	Medium

#### 3.2 Application of SMARTER Method

The results of applying the SMARTER method to solving the problem of determining the best web designer in this study can be seen in the description below:

a. Problem Identification

Based on the results of research conducted by the author, it can be seen that the main problem that occurs is that the decision maker has difficulty in determining the best web designer who will get a reward.

b. Determination of Criteria and Sub-Criteria

The criteria and sub criteria for determining the best web designer based on the results of field studies conducted by the author at the intended research location can be seen in the table below:

**Table 2.** Criteria Data for Determining the Best Web Designer

Criteria	Description	Sub Criteria
C01	Communication	Good
		Enough
		Bad
C02	Website Designing Skills	80 – 100
		61 – 79
		0 – 60

C03	Discipline	Good Enough Bad
C04	Loyalty	High Medium Low

- c. Ranking of Criteria Weights and Sub Criteria Weights Based on Level of Importance  
 The results of ranking the weights of criteria and sub-criteria for determining the best web designer based on the level of importance determined by subjective decision makers can be seen in the following table:

**Table 3.** Ranking of Criteria and Sub Criteria Weights Based on Level of Importance

Criteria	Description	Ranking	Sub Criteria	Ranking
C01	Communication	01	Good	01
			Enough	02
			Bad	03
C02	Website Designing Skills	02	80 – 100	01
			61 – 79	02
			0 – 60	03
C03	Discipline	03	Good	01
			Enough	02
			Bad	03
C04	Loyalty	04	High	01
			Medium	02
			Low	03

- d. Determination of Criteria Weight and Sub Criteria Weight using ROC Formula  
 The results of determining the weight value of criteria and sub criteria using ROC used in solving the problem of determining the best web designer in this study can be seen in the table below:

**Table 4.** Determination of Criteria Weight Value using ROC Formula

Criteria	Description	Ranking	ROC Calculation	Weight Value
C01	Communication	1	$W = \frac{(1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4})}{4}$	0.52
C02	Website Designing Skills	2	$W = \frac{(0 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4})}{4}$	0.27
C03	Discipline	3	$W = \frac{(0 + 0 + \frac{1}{3} + \frac{1}{4})}{4}$	0.15
C04	Loyalty	4	$W = \frac{(0 + 0 + 0 + \frac{1}{4})}{4}$	0.06

**Table 5.** Determination of Sub Criteria Weight Value using ROC Formula

Criteria	Description	Sub Criteria	Ranking	ROC Calculation	Weight Value
C01	Communication	Good	1	$W = \frac{(1 + \frac{1}{2} + \frac{1}{3})}{3}$	0.61
		Enough	2	$W = \frac{(0 + \frac{1}{2} + \frac{1}{3})}{3}$	0.28
		Bad	3	$W = \frac{(0 + 0 + \frac{1}{3})}{3}$	0.11
C02	Website Designing Skills	80 – 100	1	$W = \frac{(1 + \frac{1}{2} + \frac{1}{3})}{3}$	0.61
		61 – 79	2	$W = \frac{(0 + \frac{1}{2} + \frac{1}{3})}{3}$	0.28
		0 – 60	3	$W = \frac{(0 + 0 + \frac{1}{3})}{3}$	0.11

C03	Discipline	Good	1	$W = \frac{(1 + \frac{1}{2} + \frac{1}{3})}{3}$	0.61
		Enough	2	$W = \frac{(0 + \frac{1}{2} + \frac{1}{3})}{3}$	0.28
		Bad	3	$W = \frac{(0 + 0 + \frac{1}{3})}{3}$	0.11
C04	Loyalty	High	1	$W = \frac{(1 + \frac{1}{2} + \frac{1}{3})}{3}$	0.61
		Medium	2	$W = \frac{(0 + \frac{1}{2} + \frac{1}{3})}{3}$	0.28
		Low	3	$W = \frac{(0 + 0 + \frac{1}{3})}{3}$	0.11

Based on the results of determining the weight value of the criteria and sub criteria using the ROC above, the criteria value norms for each alternative are obtained as shown in the table below:

**Table 6.** Normalization of Criteria Values for Each Alternative

Alternative	Criteria Value			
	C01	C02	C03	C04
AX1	0.11	0.28	0.61	0.11
AX2	0.28	0.11	0.28	0.61
AX3	0.61	0.28	0.11	0.28
AX4	0.11	0.61	0.28	0.11
AX5	0.28	0.11	0.61	0.28

e. Determination of utility value for each criterion

The results of determining the utility value for each criterion used in solving the problem of determining the best web designer in this study are:

1. Utility Value C01

$$AX1 = 100\% \times \left( \frac{0.11 - 0.11}{0.61 - 0.11} \right) = 0$$

$$AX2 = 100\% \times \left( \frac{0.28 - 0.11}{0.61 - 0.11} \right) = 0.34$$

$$AX3 = 100\% \times \left( \frac{0.61 - 0.11}{0.61 - 0.11} \right) = 1$$

$$AX4 = 100\% \times \left( \frac{0.11 - 0.11}{0.61 - 0.11} \right) = 0$$

$$AX5 = 100\% \times \left( \frac{0.28 - 0.11}{0.61 - 0.11} \right) = 0.34$$

To determine the utility value of each of the next criteria (C02, C03 and C04), the same calculation process is carried out as determining the utility value of C01 above. The results of determining the utility value of C02, C03 and C04 are as can be seen in the table below:

**Table 7.** Results of Utility Value Determination for Each Criterion

Alternative	Criteria Value			
	C01	C02	C03	C04
AX1	0	0.34	1	0
AX2	0.34	0	0.34	1
AX3	1	0.34	0	0.34
AX4	0	1	0.34	0
AX5	0	0	1	0.34

f. Determination of the final score for each criterion

The results of determining the final value for each criterion used in solving the problem of determining the best web designer in this study are:

1. Final Grade C01

$$AX1 = 0.52 \times 0 = 0$$

$$AX2 = 0.52 \times 0.34 = 0.18$$

$$AX3 = 0.52 \times 1 = 0.52$$

$$AX4 = 0.52 \times 0 = 0$$

$$AX5 = 0.52 \times 0 = 0$$

To determine the final value of each subsequent criterion (C02, C03 and C04), the same calculation process is carried out as determining the final value of C1 above, namely multiplying the weight value of the criteria produced using the ROC calculation with the utility value of each criterion owned by the alternative. . The results of determining the final values of C02, C03 and C04 are as can be seen in the table below:

**Table 8.** Final Value of Each Criteria

Alternative	Criteria				Value
	C01	C02	C03	C04	
AX1	0	0.0918	0.15	0	0,2418
AX2	0.18	0	0.051	0.06	0,291
AX3	0.52	0.0918	0	0.0204	0,6322
AX4	0	0.27	0.051	0	0,321
AX5	0	0	0.15	0.0204	0,1704

After successfully determining the final value of each criterion possessed by the alternative, the process of determining the alternative ranking is carried out based on the value of each criterion possessed by the alternative. Based on the provisions of the SMARTER method, the best alternative is determined starting from the largest value in the final value of each criterion possessed by the alternative. The alternative ranking results for determining the best web designer in this research are as shown in the table below:

**Table 9.** Alternative Ranking Results

Alternative	Final score	Ranking
AX1	0.2418	4
AX2	0.291	3
AX3	0.6322	1
AX4	0.321	2
AX5	0.1704	5

In the alternative ranking results shown in Table 9 above, it can be seen that the best alternative is AX3 with a value of 0.6322. Therefore, based on the results of decision making using the SMARTER method, AX3 (0.6322) can be recommended to decision makers to be selected as the best web designer who is entitled to receive a reward.

#### 4 Conclusion

- a. SMARTER can provide recommendations to decision makers in determining the best web designer based on communication criteria, website designing skills, discipline, and loyalty.
- b. The results of the application of the SMARTER method in this study recommend alternative AX3 to the decision maker to be selected as the best web designer who is entitled to receive a reward.

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