

Evaluation of Determining the Best Product Promotion Media Decisions for MSMEs with ROC Ranking Technique and SAW Ranking Method

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ABSTRACT

Micro, Small, and Medium Enterprises (MSMEs) face challenges in determining effective promotional media to increase sales of their products. This research aims to evaluate and determine the best promotional media for MSMEs using the ROC (Rank Order Centroid) ranking technique and the SAW (Simple Additive Weighting) method. The criteria used include Advertising Costs, Target Market, Promotion Time, and Brand Image. Based on the calculation of criteria weights with the ROC technique and evaluation of alternatives with the SAW method, Social Media was found to be the best promotional media, followed by Search Engines and Product Collaboration. Social Media has advantages in low cost, wide target market reach, and promotional flexibility and effectiveness. Search Engines and Product Collaboration also showed good results in reaching the target market and promotional flexibility. In contrast, Print Media ranked the lowest due to limited reach and high costs. This research provides guidance for MSMEs in choosing the right promotional media and optimizing resources for maximum promotional results.

Keywords: Multi Attribute Decision Making; Best Promotion Media; ROC (Rank Order Centroid); SAW (Simple Additive Weighting); MSMEs

1. INTRODUCTION

Micro, Small and Medium Enterprises or what we often know as MSMEs have been able to show their existence in helping the Indonesian economy. MSMEs are small companies owned and managed by a person or owned by a small group of people with a certain amount of wealth and income. The increase in the number of MSME business actors in Indonesia must be supported by several factors so that the business can continue to grow. These factors include business conditions, environmental facilities, infrastructure, and technology. In terms of using technology, MSME businesses can use various fields such as promotion and marketing of the products produced (Hasyim et al., 2023; Sirat et al., 2023). However, despite having great potential, MSMEs often face various challenges in trying to market their products. One of the main challenges is determining the most effective promotional media to reach the right target market and increase product sales. Properly selected promotional media can have a major impact on the success of MSMEs, but inappropriate selection can result in wasted resources and suboptimal results (Jabid, Soleman, et al., 2023; Ramli et al., 2022; Safrida, 2023). Therefore, a method is needed that can help MSMEs in determining the best promotional media effectively and efficiently.

The problems faced by MSMEs in determining the best promotional media are very complex and multidimensional. Each promotional medium has its own characteristics, advantages and disadvantages that must be carefully considered. For example, social media may be more effective for reaching younger market segments, while advertisements on television or radio may be more effective for a wider audience. In addition, budget constraints are also a significant obstacle for MSMEs in choosing promotional media (Saputra et al., 2024; Suandana et al., 2024; Sutono, 2023). Without a structured method, MSMEs often rely on intuition or trial and error, which risks resulting in sub-optimal decisions. This can result in inefficient spending and inadequate promotional results. The marketing carried out by the business is still on a small scale, because it is not well known by the outside community (Jabid, Abdurrahman, et al., 2023; Jabid,

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Syahdan, et al., 2023a, 2023b), therefore promotional media facilities are needed.

One of the promotional media that can be used by everyone is by utilizing online media as a means of promotion, considering that the internet is the center of information today. Online media can be enjoyed by all circles. Almost every day people use the internet, especially online media such as Social Media, email, search engines and so on. The urgency of this problem is given the increasingly fierce competition in the market and the limited resources owned by MSMEs. The selection of the right promotional media not only has the potential to increase sales, but also can increase brand awareness and customer loyalty (Nursini, 2020; Piantari et al., 2024; Wijaya et al., 2022). In today's digital era, where changes in consumer behavior occur very quickly, MSMEs must be able to adapt by choosing promotional media that best suits market dynamics. The inability to adapt and choose the right promotional media can result in MSMEs losing market opportunities and falling behind more aggressive and informed competitors.

Internet media has many types, therefore it is necessary to assess and measure each type. To measure each type of social media that is appropriate as a means of promotion, a method is needed to evaluate and determine the best product promotion media for MSMEs using the ROC (Rank Order Centroid) ranking technique and the SAW (Simple Additive Weighting) ranking method. By utilizing the ROC technique (Santika et al., 2022; Widjaja et al., 2024), this research will identify the weights of relevant criteria. Furthermore, the SAW method will be used to rank various alternative promotional media based on predetermined criteria. With this approach, it is expected to provide more accurate and data-based recommendations for MSMEs in choosing promotional media that best suits the needs and characteristics of MSME products.

2. LITERATURE REVIEW

To determine the best product promotion media decisions for Micro, Small, and Medium Enterprises (MSMEs), a combination of the Rank Order Centroid (ROC) ranking technique and the Simple Additive Weighting (SAW) ranking method can be employed. The ROC method, as proposed by (Varshney, 2024), is a Multi-Criteria Decision Making (MCDM) technique that can effectively determine weights for sub-objective functions. Additionally, the SAW method, as discussed by (Lubis et al., 2020), is useful for attribute weighting in decision-making processes across various fields. (Mahendra et al., 2023; Soleman, 2019; Sudipa et al., 2022). In the context of decision support systems for selecting the best alternatives, the ROC method has been utilized in various studies. For example, (Rifqi, 2023) applied the ROC method in combination with the Weighted Aggregated Sum Product Assessment (WASPAS) method to select staff for account receivable positions (Fahri, 2022). Similarly, Soares (2024) used the ROC approach in conjunction with the WASPAS method to assist in selecting Internet Service Providers. (Soares, 2024). Moreover, the SAW method has also been widely applied in decision-making scenarios. Widyassari (2023) compared the SAW and Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS) methods in selecting recipients for basic food assistance, demonstrating the efficacy of decision support systems in producing rankings. (Widyassari, 2023). Furthermore, (Vu, 2023) successfully applied the SAW method in multi-criteria decision-making processes in various fields. By combining the ROC and SAW methods, MSMEs can leverage the strengths of both techniques to make informed decisions regarding product promotion media. The ROC method can assist in determining weights for different criteria, while the SAW method can help in attribute weighting and overall evaluation of alternatives. This combined approach can provide MSMEs with a structured and effective way to evaluate and select the best product promotion media strategies.

3. METHODS

This study used 25 MSME respondents. There are several question indicators in the interview and observation process that discuss the use of promotional media in helping MSMEs in the sales and promotion process and determining the assessment parameters in choosing media. After collecting data, then identify the problem so that a solution can be formulated by applying decision-making techniques with the SAW and ROC methods. The research flow can be seen in Figure 1 below.

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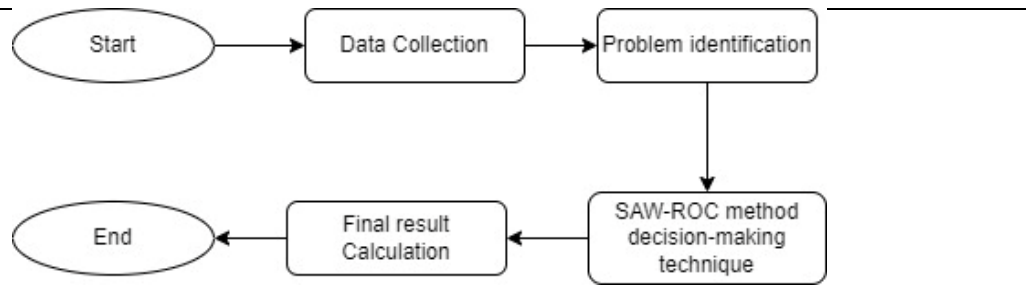


Fig. 1 Research flow

Based on Figure 1, it can be explained that the data collection stage is obtained from the observation process and interviews with MSME respondents to find out the promotional media that have been used. This process is continued with problem identification to determine alternative promotional media that can be used by MSMEs and determine assessment criteria in choosing promotional media. Data related to alternative promotional media and assessment criteria are also obtained from the observation and interview process. After identifying alternative promotional media, analysis and implementation of selection calculation techniques using the SAW-ROC (Simple Additive Weighting - Rank Order Centroid) method are carried out. The SAW method is used to rank alternatives based on the weight of the criteria that have been determined using the ROC technique. The assessment criteria used include several important factors such as Advertising Cost, Target Market, Promotion Time, and Brand Image. By applying the SAW-ROC method, each alternative promotional media is comprehensively evaluated based on the weight of the criteria and the predetermined rating scale. After the calculation is complete, the ranking results show the best promotional media alternatives for MSMEs. This process helps MSMEs to make more informed and strategic decisions in choosing the most effective, efficient, and suitable promotional media according to the needs and characteristics of MSME products.

Advantages of SAW Method

The Simple Additive Weighting (SAW) method is one of the multicriteria decision-making techniques that is simple and easy to implement. The main advantage of the SAW method is its ability to provide a comprehensive solution by considering various relevant criteria in the decision-making process(Sudipa, Kharisma, et al., 2023). This method allows flexible weighting of criteria, so that each criterion can be given weight according to its level of importance. In addition, the SAW method is very efficient in calculating and ranking alternatives based on the total value obtained from the summation of calibrated values against each criterion(Kharisma et al., 2023). This makes the SAW method very suitable for use in the context of MSMEs that need quick and practical solutions in determining the best promotional media.

Advantages of ROC Technique

The Rank Order Centroid (ROC) technique is an effective method for determining criteria weights in a multicriteria decision-making process. The main advantage of the ROC technique is its simplicity in allocating weights based on the order of importance of the criteria. This technique does not require complex mathematical calculations, making it easier for users to determine weights quickly and accurately(Sudipa, Wardoyo, et al., 2023). ROC also reduces subjectivity in weighting because the weights are calculated based on the specified order, rather than absolute values. Thus, the ROC technique can help MSMEs to objectively identify the most important criteria in choosing promotional media, resulting in more structured and data-driven decisions.

4. RESULT

Research Results

In this research, we use the Rank Order Centroid (ROC) technique to determine the weight of each criterion and

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the Simple Additive Weighting (SAW) method to rank alternative promotional media. The criteria used are Advertising Costs, Target Market, Promotion Time, and Brand Image, with the following rating scale 5: Very Good, 4: Good, 3: Fair, 2: Less, 1: Very Less

Calculation of Simple Additive Weighting (SAW) Method

The application of the SAW method is a stage carried out for calculations in decision making on a decision support system to determine the selected promotional media. Alternative data is promotional media data that will be selected for problem solving. The criteria data that will be used in this study can be seen in Table 1 below.

Table 1
 Criteria Data

Criteria	Criteria Name	ROC Weight	Criteria Type
C1	Advertising Costs	0.52	Benefit
C2	Target Market	0.27	benefits
C3	Promotion Time	0.15	Benefit
C4	Brand Image	0.06	Benefit

From each criterion C1, C2, C3 and C4 are given an assessment using a Likert scale to make it easier to score alternative values on each criterion with a value range of 1 to 5.

Table 2
 Criteria Attribute Value

Criteria Attribute Value	Description
5	Very good
4	Good
3	Simply
2	Less
1	Very Less

Alternative Performance Rating Value on Criteria

Table 3
 Alternative Suitability Rating on Criteria

Alternative (A)	Criteria			
	C1	C2	C3	C4
Social media (A1)	4	5	4	3
Print media (A2)	2	3	2	4
Television Advertisement (A3)	1	4	3	5
Search Engine (A4)	3	4	5	4
Product collaboration (A5)	5	3	3	3

Calculation of Final Value of each Alternative

SAW scores are calculated by multiplying the criterion values by their weights and summing up the results for each alternative. Here is the calculation:

$V1 = (4 \times 0,52) + (5 \times 0,27) + (4 \times 0,15) + (3 \times 0,06) = 4,21$
 $V2 = (2 \times 0,52) + (3 \times 0,27) + (2 \times 0,15) + (4 \times 0,06) = 2,39$
 $V3 = (1 \times 0,52) + (4 \times 0,27) + (3 \times 0,15) + (5 \times 0,06) = 2,35$

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$$V4 = (3 \times 0,52) + (4 \times 0,27) + (5 \times 0,15) + (4 \times 0,06) = 3,63$$

$$V5 = (5 \times 0,52) + (3 \times 0,27) + (3 \times 0,15) + (3 \times 0,06) = 4,04$$

Based on the above calculations with the SAW method, the results of ranking all alternatives can be seen in the following 4.

Table 4
Final Ranking Result

Alternative	Final Grade	Ranking
Social media (A1)	4,21	1
Product collaboration (A5)	4,04	2
Search Engine (A4)	3,63	3
Television Advertisement (A3)	2,39	4
Print media (A2)	2,35	5

Based on table 4, it can be explained that there is the best alternative promotional media for MSMEs, namely alternative A1, namely social media with a value of 4.21. Then followed by the second rank with alternative A5, namely product collaboration with a value of 4.04. And the third rank is A4, namely Search Engine with a value of 3.63. From the selection results, 3 alternatives to promotional media were selected which can be an alternative for MSMEs. With the results of this ranking, it can prove that the SAW method can be applied in solving promotional media selection problems for MSMEs and can provide decision considerations for MSMEs.

4. DISCUSSION

The results of this study show that Social Media is the best alternative promotional media for MSMEs, followed by Search Engines and Product Collaboration. Social Media gets the highest score because it has the advantage of reaching a wide and relevant target market at a relatively lower cost compared to other media. In addition, the flexibility and effectiveness of Social Media in delivering promotional messages also contributed to the high scoring. Search Engines also ranked high due to their ability to effectively reach the target market through focused and targeted advertising. In addition, Search Engines have flexible and fast promotion times, allowing MSMEs to customize promotional campaigns as needed. Product Collaboration also shows good results, mainly due to its low advertising costs and flexibility in execution. However, its effectiveness in improving brand image and reaching the target market still needs improvement. In contrast, Print Media ranked the lowest due to its limitations in reaching a wider target market and relatively high advertising costs. While Print Media can have a positive impact on brand image, its effectiveness in the current digital context is lower compared to other promotional media. This research provides useful guidance for MSMEs in choosing the promotional media that best suits their product characteristics and target market. By using the ROC technique and SAW method, MSMEs can make more structured and data-based decisions, so as to optimize existing resources to achieve maximum promotional results.

5. CONCLUSION

The conclusion of the research shows that in evaluating and determining the best product promotion media for MSMEs using the ROC (Rank Order Centroid) ranking technique and the SAW (Simple Additive Weighting) ranking method. The results show that Social Media is the best promotional media alternative, followed by Search Engines and Product Collaboration. Social Media excels due to its relatively low cost, ability to reach a wide target market, and flexibility and effectiveness in delivering promotional messages. Search Engines rank high due to their ability to effectively reach the target market and flexibility in promotion timing. Product Collaboration is also effective with its low cost and flexibility

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of execution, although it still needs improvement in brand image effectiveness and target market reach. In contrast, Print Media ranked the lowest due to its limitations in reaching a wide target market and high advertising costs. This research provides useful guidance for MSMEs in choosing the promotional media that best suits their product characteristics and target market, as well as optimizing existing resources to achieve maximum promotional results.

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