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Selection of Online Sales Platforms for MSMEs using the OCRA Method with ROC Weighting

Bagus Kusuma Wijaya[1*], I Gede Iwan Sudipa[2], Devi Valentino Waas[3], Putu Praba Santika[4]

[1,2,3,4] *Institut Bisnis dan Teknologi Indonesia, Denpasar 80225, Indonesia*

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ABSTRACT

MSMEs are required to utilize technology to facilitate sales transactions. Multiple online sales platforms have been made available, but they must be adapted to the needs of MSMEs. The objective of this research is to apply decision support techniques using the Competitiveness Rating Analysis (OCRA) method in the final ranking process combined with the Rank Order Centroid (ROC) weighting technique, with the resulting weight value based on the priority order of the criteria, to assist MSMEs in determining online sales platforms. The research data employs six evaluation criteria: application usability (C1), transaction features completeness (C2), personal data security (C3), simplicity of payment process (C4), ease of delivery process (C5), and partner service fee providing (C6). The selection process conducted on 5 alternative online sales platforms that are widely used by MSMEs, resulting in the ranking of the best alternative online sales platforms: Tokopedia with a value of 0.423, followed by Shoope with a value of 0.207, Instagram with a value of 0.121, Facebook marketplace with a value of 0.109, and WhatsApp as the final ranking order. Identifying the online sales platform can aid MSMEs in determining the most suitable sales platform for promoting greater sales and facilitating transaction processes.

Corresponding Author:

Bagus Kusuma Wijaya,
Program Studi Teknik Informatika,
Institut Bisnis dan Teknologi Indonesia,
Tukad Pakerisan Number.97 Street , Panjer, South Denpasar, Denpasar City, Bali, 80225, Indonesia.
Email: bagus.kusuma@instiki.ac.id

1. Introduction

The internet's role in technology 4.0 has changed sales, especially. From electronic information sharing to corporate strategy applications including marketing, sales, and customer service. The internet has shifted many buying and selling companies to digital transactions, which affects MSMEs (Micro, Small and Medium Enterprises). MSMEs are one of the foundations of the people's economy and can support the nation's economy since they give livelihoods and direct and indirect employment to individuals with low levels of education and skills. MSMEs have been hit hard by the COVID-19 pandemic since buyer demand has plummeted and direct sales are no longer possible (Kusuma et al., 2021). MSME enterprises must adapt to technology like online sales platforms in the new normal. Business competition in the digital era is one of the references in MSMEs to make changes in sales strategies, where technological applications, especially in the field of transactions, have become part of the ease of the transaction process. If the sales strategy does not keep up with developments in the digital era, MSMEs cannot compete in sales, which is also a concern of the government to encourage MSME sales str Several studies

on MSME sales techniques, notably in surviving the pandemic (Alfrian & Pitaloka, 2020; laura Hardilawati, 2020; Tirtayasa et al., 2021), can provide fresh knowledge about MSME difficulties in various locations and ways to enhance the sales process. Research on the influence of digital sales services on consumer loyalty (Alfin, 2021; Andayani et al., 2021) supports this. MSMEs can survive the pandemic by choosing the correct sales approach to meet targets and react to digital changes (Hardilawati et al., 2019). (Cakranegara, Butarbutar, et al., 2022) studies sales methods for MSMEs in the new normal period, and (Cakranegara, Zuana, et al., 2022) proposes options for MSMEs to utilize e-commerce to increase sales. Technology can assist MSMEs increase sales (Apriadi & Saputra, 2017; Asana et al., 2022; Wiratama et al., 2022) because the sales process is crucial to MSME firm operations (Handika & Santika, 2020).

In actuality, there are still many MSMEs that are not proficient in utilizing technology in the promotion process to the sales transaction process; this should be a concern in providing knowledge transfer in providing alternative solutions for MSMEs to support increased sales turnover, as the primary problems faced by most MSMEs, particularly in Ubud during the current COVID-19 pandemic, are declining sales, lack of capital, and impeded distribution (Mariani et al., 2022).. Numerous MSMEs engaged in a variety of product sales have felt the effects of the covid pandemic. The majority of MSMEs are unable to conduct transactions due to transaction media that only rely on offline transaction patterns and do not optimally utilize technology in the process, so that customers cannot see the products being sold. In light of the difficulties in assisting MSMEs to pick online sales platforms, the purpose of this research is to apply decision support approaches to the problem of selecting online sales platforms that are suited for MSMEs. The application of decision support techniques is intended to aid micro, small, and medium-sized enterprises (MSMEs) in selecting the best alternative sales platform. In supporting the sales process, decision making methods can be applied to the selection of alternatives based on multiple criteria or indicators that influence decision making(Mahendra & Nugraha, 2020).

This study presents a decision support model for performance evaluation (Azhar, 2019; Nainggolan et al., 2022) based on the Operational method Competitiveness Rating Analysis (OCRA) (Indini et al., 2021). Several previous studies have applied the OCRA method to a variety of multi-criteria problems (Batu et al., 2022; Hasibuan, 2021; Toruan, 2021). The OCRA method has the advantage of producing rankings based on the competitive value of alternative Using the Rank Order Centroid (ROC) technique to determine the weight value of criterion since ROC can identify the weight value of criteria based on the priority order of criteria(I Gede Iwan Sudipa, 2018; Sudipa et al., 2022; Sudipa & Puspitayani, 2019). In order to determine the weight value objectively in multi-criteria problems, ROC uses a simple equation.

2. Method

2.1. Operating Competitiveness Rating Analysis (OCRA) Method

The Operational Competitiveness Rating Analysis, often known as OCRA, is a method for analyzing relative performance that is based on a nonparametric model (Madić et al., 2015; Wang, 2006). A tool that is both very effective and very easy to use for evaluating and contrasting the many different decision units and sectors. In addition, the ability to monitor and evaluate the performance of decision units throughout the course of a period of time. The objective of the OCRA technique is to perform an independent evaluation of alternatives based on benefit and cost criteria, and then to combine these two aggregate ratings to arrive at a competitive rating, which helps the decision maker avoid losing knowledge during the process of decision making (Lukic & Hadrovic Zekic, 2021). In order to accomplish this objective, the OCRA technique was developed. More specifically, the stages of the OCRA approach(Cakranegara, Budiastuti, et al., 2022).

1. Form a decision matrix X. In the row of the matrix, alternative decisions are placed, while criteria are placed in the column. In this matrix, xij indicates the performance of alternative I with respect to criterion j.

$$X= [X_{ij}]_{mxn} = \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{mj} & \cdots & x_{mn} \end{bmatrix}; i = ,...m, j =1,2,...n \quad (1)$$

Information
M = number of alternatives
N = number of criteria
Xij = alternative performance value on each criterion

2. Determining the preference rating by calculating solely the performance value of the alternatives for the cost criteria.

$$\bar{I}_i = \sum_j^g wj \frac{\max(x_{ij}) - x_{ij}}{\min(x_{ij})} (i=1,2...,m\ j=1,2...,g) \quad (2)$$

3. Determine the linear preference ranking of each alternative based on the criteria to be minimized (cost).

$$\bar{I}_i = \bar{I}_i - \min(\bar{I}_i) \quad (3)$$

4. Calculating the preference rating by calculating simply the performance value of the option for the maximal criteria (benefit).

$$\bar{O}_i = \sum_{j=g+1}^n wj \frac{x_{ij} - \min(x_{ij})}{\min(x_{ij})} (i=1,2...,m\ j=g+1,g+2...,m) \quad (4)$$

5. Determine the linear preference rating for each choice based on the criteria that will be maximized (benefit).

$$\bar{O}_i = \bar{=}_i - \min(\bar{O}_i) \quad (5)$$

6. Calculate the total preference value for each alternative.

$$P_i = (\bar{I}_i + \bar{O}_i) - \min(\bar{I}_i + \bar{O}) \ i = 1,2, \ldots m \quad (6)$$

2.2. Research Flow

This study utilizes ten MSME respondents from the Ubud, Bali region. Several question indicators in the interview and observation process address the usage of platforms to assist MSMEs in the sales process and the determination of evaluation criteria for selecting a platform. After collecting data, identify the problem in order to design a solution using the OCRA method's decision-making procedures. The research process is depicted in Figure 1.

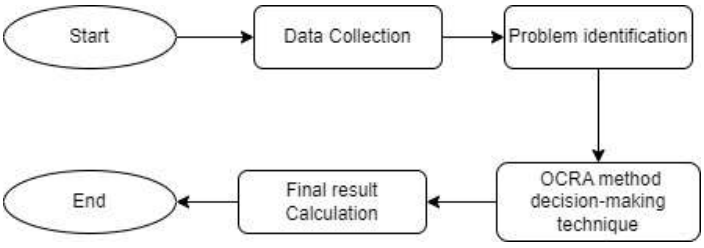

Figure. 1. Research flow

Based on Figure 1, it can be explained that the stages of data collection are obtained from the observation process and interviews with MSME respondents to determine the sales platform that has been used, followed by problem identification to determine alternative sales platforms that can be used by MSMEs and determining the assessment parameters in choosing a sales platform, obtained from the observation process and interviews with MSME respondents to obtain data related to alternative sales platforms. On the basis of a problem analysis, there will be an analysis and execution of selection calculation procedures using the OCRA method. Once the OCRA method has been successfully calculated, the ranking of the best alternative sales platforms for MSMEs will be determined. After analyzing and

implementing the selection calculation process using the OCRA method, based on the problem analysis, the ranking of the best alternative sales platforms for MSMEs is determined.

3. Results and Discussions

3.1. Calculation of Operating Competitiveness Rating Analysis (OCRA) Method

The implementation of the Operational Competitiveness Rating Analysis (OCRA) approach is a step in calculating decision support systems in order to determine the optimal online sales platform. The assessment criteria data consists of six criteria that have been identified as benefit or cost criteria: application usability (C1), transaction features completeness (C2), personal data security (C3), ease of payment process (C4), ease of delivery process (C5), and provision of partner service fees (C6). Using the ROC weighting method, weights are assigned to criteria. Table 1 provides specific information about the criteria.

Table 1
Detail Criteria

Criteria	Criteria Name	ROC Weight	Criteria Type
C1	Application usability	0.408	Benefit
C2	Transaction features completeness	0.242	Benefit
C3	Personal data security	0.158	Benefit
C4	Ease of payment process	0.103	Benefit
C5	Ease of delivery process	0.061	Benefit
C6	Provision of partner service fees	0.028	Cost

From each criterion C1, C2, C3, C4 and C5 are given an assessment using a linkert scale to make it easier to score alternative values on each criterion with a value range of 1 to 5.

Table 2
Attribute Value of Criteria C1-C5

Attribute Value	Information
5	Very good
4	Well
3	Enough
2	Not enough
1	Very less

Meanwhile, the C6 criteria value uses an attribute scale with a value of 1 to 2.

Table 3
Attribute Value of Criteria C6

Attribute Value	Information
2	There is a fee
1	No cost

3.2. Alternative Performance Rating Value on Criteria

Alternative data comprises of five alternative sales platform data that will be used for problem-solving and decision-making in the process of recommending the best online sales platform for MSMEs. The various values for each criterion are detailed in Table 4 below.

Table 4
Alternative Suitability Rating on Criteria

Alternative	Alternative Name	Criteria					
		C1	C2	C3	C4	C5	C6
A1	Instagram	5	3	5	2	1	1
A2	Whatsapp	4	2	5	2	1	1
A3	Marketplace Facebook	4	4	5	4	2	1
A4	Tokopedia	4	5	5	5	5	1
A5	Shoope	3	4	5	5	5	1
	Max	5	5	5	5	5	1
	Min	3	2	5	2	1	1

3.3. Perform Preference Calculation of minimized criteria (cost), namely Criteria C6

$\bar{I}_1 = \sum (0.028 \frac{1-1}{1}) = 0$
$\bar{I}_2 = \sum (0.028 \frac{1-1}{1}) = 0$
$\bar{I}_3 = \sum (0.028 \frac{1-1}{1}) = 0$
$\bar{I}_4 = \sum (0.028 \frac{1-1}{1}) = 0$
$\bar{I}_5 = \sum (0.028 \frac{1-1}{1}) = 0$

3.4. Calculate the minimized linear preference ranking

$\bar{I}_1 = 0 - 0 = 0$
$\bar{I}_2 = 0 - 0 = 0$
$\bar{I}_3 = 0 - 0 = 0$
$\bar{I}_4 = 0 - 0 = 0$
$\bar{I}_5 = 0 - 0 = 0$

3.5. Calculating the Preferences of the criteria that are maximized (benefits), namely Criteria C1, C2, C3, C4, C5

$\bar{I}_1 = \sum (0.408 \frac{5-3}{3}) + (0.242 \frac{3-2}{2}) + (0.158 \frac{5-5}{5}) + (0.103 \frac{2-2}{2}) + (0.061 \frac{1-1}{1}) = 0.393$
$\bar{I}_2 = \sum (0.408 \frac{4-3}{3}) + (0.242 \frac{2-2}{2}) + (0.158 \frac{5-5}{5}) + (0.103 \frac{2-2}{2}) + (0.061 \frac{1-1}{1}) = 0.272$
$\bar{I}_3 = \sum (0.408 \frac{4-3}{3}) + (0.242 \frac{4-2}{2}) + (0.158 \frac{5-5}{5}) + (0.103 \frac{4-2}{2}) + (0.061 \frac{2-1}{1}) = 0.381$
$\bar{I}_4 = \sum (0.408 \frac{4-3}{3}) + (0.242 \frac{5-2}{2}) + (0.158 \frac{5-5}{5}) + (0.103 \frac{5-2}{2}) + (0.061 \frac{5-1}{1}) = 0.695$
$\bar{I}_5 = \sum (0.408 \frac{3-3}{3}) + (0.242 \frac{4-2}{2}) + (0.158 \frac{5-5}{5}) + (0.103 \frac{5-2}{2}) + (0.061 \frac{5-1}{1}) = 0.479$

3.6. Calculate the Preference Rank that will be maximized

$\bar{O}_1 = 0.393 - 0.272 = 0.121$
$\bar{O}_2 = 0.272 - 0.272 = 0$
$\bar{O}_3 = 0.381 - 0.272 = 0.109$
$\bar{O}_4 = 0.695 - 0.272 = 0.423$
$\bar{O}_5 = 0.479 - 0.272 = 0.207$

3.7. Calculating Total Preference Value

$P_1 = (0 + 0.121) - 0 = 0.121$
$P_2 = (0 + 0) - 0 = 0$
$P_3 = (0 + 0.109) - 0 = 0.109$
$P_4 = (0 + 0.423) - 0 = 0.423$
$P_5 = (0 + 0.207) - 0 = 0.207$

Based on the above calculations with the OCRA method, the results of ranking all alternatives can be seen in table 5 below.

Tabel 5
Final Alternative Ranking Result

Alternative	Alternative Name	Final Value	Rank
A4	Tokopedia	0.423	1
A5	Shoope	0.207	2
A1	Instagram	0.121	3
A3	Marketplace Facebook	0.109	4
A2	Whatsapp	0	5

In Table 4, it can be explained that the results of the calculation of the final value of the OCRA method have alternative A4, namely Tokopedia as the best alternative online sales platform as the 1st rank with a value of 0.423, then alternative A5, namely Shoope as the 2nd rank with a value of 0.207, followed by alternative A1, namely Instagram as the 3rd rank with a value of 0.121, followed by alternative A3 as the 4th rank alternative with a value of 0.109, and alternative A2 as the final rank with a value of 0. These conclusive results demonstrate that the calculation model using the OCRA approach may complete the selection of online sales platform. According to the results of the analysis of the appropriateness rating value, the maximum and minimum values, as well as the weight value of each criterion, influence the final value used to choose the best online platform.

4. Conclusion

The conclusion of the study is that the application of the OCRA method has been demonstrated to be able to solve the problem of identifying suitable online sales platforms for micro, small, and medium-sized enterprises (MSMEs) by using 6 assessment criteria based on the ease of use of the application, payment process, delivery process, completeness of system features, additional cost provisions, and data security to produce the best alternative from 5 widely used alternative sales platforms. By considering the nature of the cost or benefit criteria, as well as determining the weight of the priority order of the criteria using the ROC technique, an analysis is obtained that determining the max and min values and the weight of the criteria affects the final result of alternative ranking, with the determination of online sales platforms assisting MSMEs in determining the most appropriate platform.

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