Selecting a Social Network for Interactive Marketing Activities Using a Multidisciplinary Approach

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Abstract

Background: In the modern digital era, social networks are central to interactive marketing strategies that foster two-way communication between companies and consumers. For small enterprises like Iceled, selecting the most effective platform for such engagement is essential for maintaining market leadership. **Objectives:** This study aims to identify the most suitable social network for implementing interactive marketing at Iceled, a leading ice producer in Bosnia and Herzegovina. **Methods/Approach:** A multidisciplinary methodology was used, integrating fuzzy LMAW and fuzzy CORASO methods to evaluate ten social networks across ten marketing-related criteria using expert assessments. **Results:** The results indicate that "targeted advertising" is the most significant criterion. Among the networks evaluated, Facebook emerged as the most effective platform for interactive marketing based on expert ratings and fuzzy logic calculations. **Conclusions**: Facebook is recommended as the primary platform for Iceled's interactive marketing efforts due to its extensive user base, targeting capabilities, and alignment with critical marketing criteria. The adopted methodology demonstrates a robust decision-making framework applicable to similar small business contexts.

Keywords: social networks; interactive marketing; consumers; fuzzy logic; multi-criteria decision making

JEL classification: M31, D83, C63
Paper type: Research article

Received: 25 July 2025
Accepted: 3 July 2026

Citation: Puška, A., Bosna, J., & Barić, F. (2026). Selecting a Social Network for Interactive Marketing Activities Using a Multidisciplinary Approach. *Business Systems Research, 17*(2), 192-212.
DOI: https://doi.org/10.2478/bsrj-2026-0025

Introduction

Social networks have emerged as essential instruments for executing interactive marketing strategies (Lim et al., 2023). These networks facilitate effective business communication with customers. By utilizing social media, companies can advertise their offerings and foster collaborations with customers. Considering the extensive variety of social media platforms available (Balcarová et al., 2025), companies encounter the difficulty of identifying those that will most successfully aid in cultivating customer relationships through interactive marketing efforts. An appropriately selected communication channel allows for optimal interaction between the company and its customers.

Social networks are revolutionizing the manner in which companies interact with their clients (Saputra et al., 2024). These networks facilitate two-way communication between companies and their customers. Establishing this communication is crucial for gathering insights from customers (Kanimozhi & Sengottuvel, 2024). Furthermore, it allows for the observation of customer behaviours and preferences. Armed with this data, companies can more effectively tailor their offerings to meet customer needs. Additionally, this information is instrumental in shaping business strategies and enhancing interactive marketing efforts. Such a strategy can bolster customer loyalty, cultivate product branding, and enhance a company's overall performance. Engaging with customers through social media can strengthen relationships (Bradshaw, 2024), particularly when personalized content that emphasizes user experience is incorporated into the communication (Matić Šošić, 2024).

Social networks extend beyond merely facilitating the marketing efforts of companies. They provide a platform for customers to voice their opinions, complaints, or commendations. Furthermore, by leveraging these networks, companies foster interaction, transparency, and openness with their customers. These platforms enable businesses to connect with customers regardless of their location. When utilized effectively, social networks can lead to a reduction in the expenses associated with designing marketing campaigns (Wibowo et al., 2024). There is a growing trend for companies to select social networks as their primary medium for introducing new products (Meena & Santhanalakshmi, 2025). This is particularly true when targeting younger demographics, as they are more responsive to narrative-driven and emotionally resonant messages that greatly impact their decision-making processes (Zubiel & Waligórska, 2023).

The utilization of social networks presents certain challenges as well. Marketing strategies ought to concentrate on the benefits that a specific social network offers. It is essential to evaluate which marketing activities are appropriate for a given social network, as each of these platforms possesses its own unique characteristics (Huque & Kumar, 2024). Improper use of social networks can result in adverse effects on the company's operations. In the most severe scenarios, unfavourable perceptions may arise among customers regarding the product or the company itself. Disregarding customer feedback or failing to acknowledge customer criticism can foster a negative reputation for the company (Oliinyk, 2024). It is vital for companies to effectively leverage social networks to fulfil their objectives. Each social network has distinct features that companies must adapt to.

The presence of numerous social networks complicates the selection of the most suitable platform for interactive marketing needs. This decision is intricate, as each social network possesses unique characteristics along with its own set of benefits and drawbacks. Consequently, it is crucial to identify the social network that will effectively support the company's objectives through its marketing efforts. The motivation for this research stems from the necessity for companies to implement interactive marketing

on social networks to enhance their business performance. These networks allow the company to enhance its engagement with interest groups and to bolster its reputation. Social networks function as public service entities, leaving no margin for error in the execution of interactive marketing on these platforms. Consequently, it is prudent for the company to concentrate its efforts on a single social network and to devote greater attention to that particular network. Other networks may be utilized solely to augment marketing initiatives in the execution of interactive marketing.

Social networks play a significant role in the growing globalization of business, which in turn heightens market competition. Companies are in a constant struggle for each customer. There is little margin for mistakes among companies. Consequently, selecting the appropriate social network is crucial for the success of Iceled, which must enhance its market presence and establish direct communication with consumers through these networks. The selection of the Iceled Company was made because it serves as a quintessential illustration of a small manufacturing enterprise. Furthermore, due to its product, it emerged as the leading ice producer in Bosnia and Herzegovina (BaH), capitalizing on the fact that no other company had previously engaged in ice production within BaH. However, inspired by the achievements of this company, other firms began to enter the ice production market. To sustain its leading position, Iceled opted to leverage social media for its interactive marketing efforts. This marketing approach enables the company to gather essential feedback from customers regarding product quality and distribution. Such insights would assist Iceled in achieving effective marketing outcomes with limited resources while retaining and attracting new clientele. To accomplish this, given its smaller workforce, the company must concentrate on a single social network that will facilitate these efforts. In doing so, Iceled can also encourage other companies to emulate its strategy and select a social network that will aid them in executing interactive marketing.

The objective of this paper is to employ the multi-criteria decision-making method (MCDM) to select the primary social network that will facilitate the Iceled company in executing interactive marketing activities aimed at enhancing its business. The implementation of MCDM methods will be conducted in a fuzzy format to effectively assess qualitative criteria using linguistic terms. Furthermore, the fuzzy set enables decision-making even in the presence of vague and ambiguous information. Alongside the primary objective of the research, particular research goals are also established:

- RO1. Create a decision-making model for selecting the main social network to carry out interactive marketing initiatives.
- RO2. Identify the criteria and social networks that will be incorporated into this model.
- RO3. Assess the significance of the criteria for the Iceled company utilizing the fuzzy LMAW approach.
- RO4. Analyse social networks in terms of their effectiveness for executing interactive marketing activities.
- RO5. Provide guidelines and recommendations on which social network should be prioritized for conducting interactive marketing efforts for the Iceled company.

In light of the aforementioned research objectives, the subsequent research questions are posed:

- RQ1. In what ways can interactive marketing be executed through social networks?
- RQ2. What key criteria should be considered when assessing social networks for the implementation of interactive marketing?

- RQ3. Which social network is likely to be the most effective for executing interactive marketing?

To achieve these objectives, the initial hypothesis of this study is proposed, stating: By employing the MCDM approach, one can select the most efficient social network for executing interactive marketing.

In light of the aforementioned points, this research offers several contributions. Firstly, it will develop a novel model for assessing social networks in the context of interactive marketing. Secondly, it enhances the comprehension of how interactive marketing is implemented via social networks. Thirdly, selecting the main social network lowers business expenses and aid in the enhancement of Iceled's operations. Lastly, the findings will provide valuable insights for other companies in selecting the primary social network for their interactive marketing efforts.

To achieve these objectives and contributions, this paper is organized into relevant sections. Initially, the introduction outlines the subject, problem, and objectives of this research. In the literature review, comparable studies are showcased, thereby validating the rationale for this research. In the methodology section, the company considered is detailed, along with the criteria and alternatives employed in the selection of interactive marketing. The results section applies chosen MCDM methods to assess social networks and identify those that will yield optimal outcomes for the implementation of interactive marketing. In the discussion section, the results are further substantiated, providing explanations for the outcomes observed. Finally, the conclusion summarizes the key findings of this research.

Relationship between Region and Business Performance

Literature review

Engaging in interactive marketing through social media has emerged as a crucial marketing strategy for companies seeking to establish two-way communication with their customers and enhance audience participation. This type of marketing relies on digital platforms that facilitate rapid and personalised interactions, fostering increased consumer engagement and brand loyalty.

Interactive marketing is defined as a form of digital marketing that facilitates two-way communication between businesses and consumers through online platforms, primarily social media (Gurău, 2008). This approach allows brands not only to promote their products but also to directly interact with users, respond to their inquiries, and actively engage in dialogue. According to Evans and McKee (2010), the evolution of Web 2.0 has significantly transformed consumers from passive recipients of messages into active participants who share and create content. Krishen et al. (2021) examined the oversight of interactive digital marketing, and this study enhances the comprehension of digital interactive marketing within social networks.

Social media platforms such as Facebook, Instagram, Twitter, and TikTok have become central to interactive marketing, enabling businesses to target specific user groups more precisely and tailor their communication to users' interests and behaviors (Mangold & Faulds, 2009). This shift has led to the development of personalized experiences that enhance engagement and improve brand perception. For interactive marketing to be effective, companies must implement strategies that include creating high-quality and engaging content, utilizing visual elements, collaborating with influencers, and continuously monitoring and analysing data (Ashley & Tuten, 2015).

One key strategy is storytelling-creating narratives that emotionally connect users with the brand (Pulizzi, 2012). Additionally, video content has proven to be particularly effective, as it generates higher engagement and sharing rates on social media

compared to other formats (Hollebeek et al., 2014). Another important tactic is influencer marketing, where product recommendations from influencers can significantly affect consumer perception and purchase decisions (De Veirman et al., 2017). Furthermore, analytical tools allow businesses to track campaign effectiveness and adjust their strategies based on user behaviour data.

One of the primary advantages of interactive marketing is that it enables companies to quickly address issues and adapt their offerings based on consumer feedback (Kaplan & Haenlein, 2010). This approach increases consumer loyalty and enhances the overall customer experience. Additionally, social media marketing allows for precise audience targeting based on demographic and psychographic data, optimizing marketing budgets and improving campaign efficiency (Lipsman et al., 2012). Consumers also frequently share content within their networks, leading to a viral effect that increases message reach at no additional cost (Berthon et al., 2012).

Despite its numerous advantages, interactive marketing on social media faces certain challenges. One key issue is managing negative comments and crises on social media, which can significantly impact a brand's reputation (Grégoire, Salle & Tripp, 2015). Another challenge is the frequent algorithm changes on social media platforms, which often limit organic content reach, forcing businesses to invest more in paid advertisements to reach their target audiences (Tafesse & Wien, 2018). Moreover, maintaining high engagement levels requires continuous production of quality content, which can be an operational challenge for smaller companies with limited resources. In this context, Gortan-Carlin et al. (2023) assert in their research that a multidisciplinary approach is essential for content design (encompassing artistic, sensory, and economic elements) to enhance user engagement significantly.

Interactive marketing significantly influences consumer behaviour by increasing brand awareness, trust, and purchase intent (Hudson et al., 2016). Research shows that brands that actively communicate with users on social media build stronger emotional connections with consumers, leading to greater loyalty and recommendations through electronic word-of-mouth (e-WOM) (Erkan & Evans, 2016). Furthermore, studies have shown that interactive content, such as polls, quizzes, and contests, increases user engagement and fosters a sense of community, further strengthening brand attachment (Cvijikj & Michahelles, 2013).

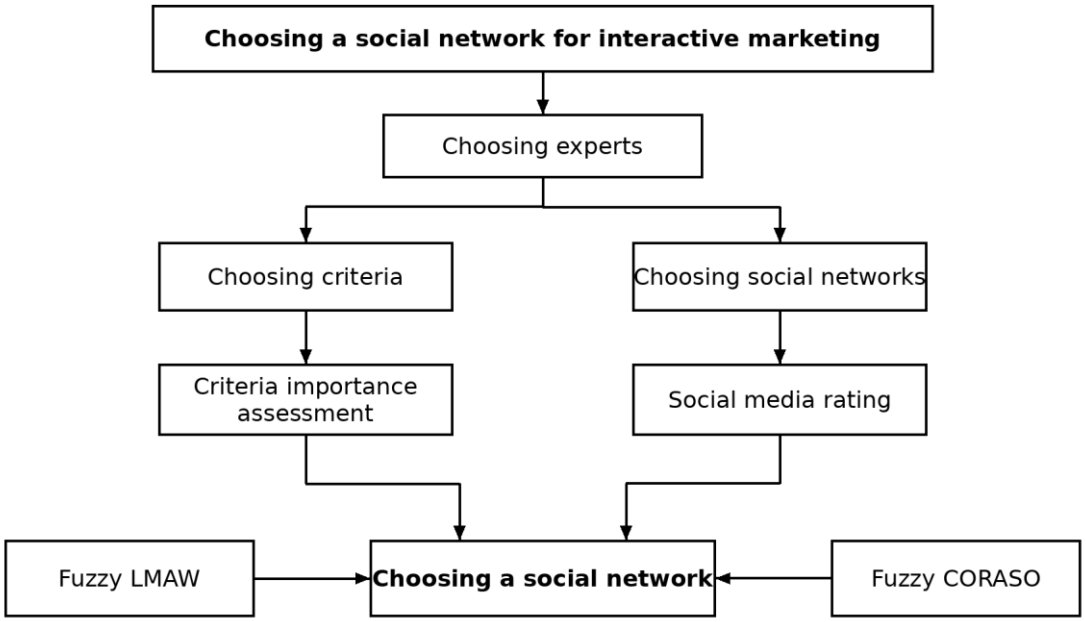
Interactive marketing on social media is one of the most critical modern digital marketing strategies. Its ability to facilitate two-way communication, increase engagement, and build long-term consumer relationships makes it an indispensable tool in marketing campaigns. However, successful implementation requires continuous trend monitoring, adaptation to market changes, and efficient management of challenges in the digital environment. The previously mentioned research indicates that selecting social networks for interactive marketing is an essential measure to enhance the company's operations, facilitating the retention of current customers while attracting new ones. Consequently, this approach would lead to an improvement in product sales and the overall business performance of the companies in the market.

Research methodology

The company Iceled specialises in the production and distribution of ice. It is recognized as the first ice producer in Bosnia and Herzegovina. The company has a weekly production capacity of 14 tons of ice, which is distributed through gas stations and sold in supermarkets. Furthermore, Iceled offers catering services and home delivery of ice. To enhance its business operations, Iceled plans to adopt interactive marketing strategies, which will be executed via social networks. Selecting an

appropriate social network poses a challenge for the company. The chosen platform should facilitate the implementation of interactive marketing to achieve improved marketing outcomes. Given the multitude of social networks available online, which can be assessed based on various criteria, it is essential to address this research issue using MCDM methods. The research methodology is illustrated in Figure 1.

Figure 1
Research Methodology



Source: Research authors

To select a social network that serves as the foundation for interactive marketing, it is essential to first identify the decision makers responsible for evaluating the criteria and the social networks. Given that Iceled is a small company, three employees have been appointed as experts. These individuals are directly engaged in the execution of marketing activities and occupy the roles of company director, head of production, and sales associate. For them to make an informed selection, it was crucial to establish the criteria and social networks that could be utilised for these objectives. In determining the criteria, it was taken into account that the impact of interactive marketing occurs when messages are disseminated through social networks. Consequently, ten criteria were selected (see Table 1).

Table 1
Criteria for Evaluating Social Networks

Id	Criteria	Description	Reference
C1	User base size	The quantity of users that can receive a marketing message	Huang et al. (2024); Abu-Shanab et al. (2024)
C2	Demographic compatibility	The matching of user profiles with the intended audience	Duh & Akasreku (2024); Mombeuil (2024)
C3	Interaction level	The capacity to respond to the content of the message	Abu-Shanab et al. (2024)
C4	Cost-effectiveness	The attainment of results in relation to the budget allocated	Huang et al. (2024); Duh & Akasreku (2024)

C5	Targeted advertising	The precise targeting of the message to particular groups	Abu-Shanab et al. (2024); Slavic et al. (2024)
C6	Security and privacy	The degree of safeguarding of user data and privacy	Duh & Akasreku (2024); Mombeuil (2024)
C7	Content customization	The formats and tools available for tailoring content to the platform	Huang et al. (2024)
C8	Integration with other channels	The capability to integrate with other marketing channels	Huang et al. (2024); Duh & Akasreku (2024)
C9	Degree of personalization	The customization of advertisements and communications for users	Abu-Shanab et al. (2024); Slavic et al. (2024)
C10	Speed of feedback	The time required to get feedback	Mombeuil (2024)

Source: Authors' work

To select a fundamental social network for executing interactive marketing, suitable networks available in Bosnia and Herzegovina have been identified. These networks include:

- Facebook (SN1), the largest social network with a diverse user base. Its application is evident through targeted advertisements, surveys, and live events.
- Instagram (SN2), a platform that is particularly popular among the youth. Its utilization is demonstrated through interactive posts.
- TikTok (SN3), a platform dedicated to short videos. Its usage is characterized by viral trends, entertaining video content, and collaborations with influencers.
- LinkedIn (SN4), a professional social network designed for business contacts. Its application is seen in B2B campaigns through the dissemination of expert content and networking opportunities.
- WhatsApp (SN5) serves as a direct messaging and chat application. The utilization of this platform is evident in personal notifications, promotional communications, and customer support interactions.
- YouTube (SN6) stands as the largest platform for video content. The application of this platform is demonstrated through video content and user engagement via comments.
- Viber (SN7) is a widely used messaging and calling application that offers various group functionalities. Its usage is apparent in localized promotional messages, chatbot assistance, and group notifications.
- Snapchat (SN8) functions as a platform for ephemeral visual content. The use of this platform is showcased through creative filters, AR advertising, and promotional activities.
- Pinterest (SN9) serves as a source of inspiration and ideas. The application of this platform is reflected in visual product presentations and the generation of shopping concepts.
- Reddit (SN10) operates as a discussion platform. The usage of this platform is evident in participation within relevant subreddits, fostering trust, and the distribution of user-generated content.

Once the criteria and social networks have been identified, a questionnaire was developed. To assess the significance of the criteria, the first section of this questionnaire presents the criteria that require importance evaluation, ranging from Absolutely bad to Absolutely good. Subsequently, the second section of the questionnaire provides alternatives that must be assessed according to the selected

criteria. The evaluation of these alternatives was conducted using the same value scale applied in the criteria assessment. Once the questionnaire was prepared, it was distributed to experts for their assessment of the significance of the criteria and the evaluation of social networks in relation to the requirements of interactive marketing. Given that this is a small company, the chosen experts were able to converse with one another, which raises the possibility that they reached a consensus on how to complete this questionnaire. This issue is common in small companies where experts are personally acquainted and collaborate closely. During the evaluation of criteria and social networks, evaluations will be conducted using linguistic terms. This method is employed because qualitative criteria are being utilized. The results will be obtained through a fuzzy approach, which enables the assignment of fuzzy numbers to linguistic terms, thereby representing the membership function (Table 2). Once the experts had completed the questionnaires, they submitted them for coding and analysis.

Table 2
Linguistic Evaluations and Membership Function

Linguistic value	Code	Fuzzy number
Absolutely bad	APB	(1, 1, 2)
Very bad	VEB	(1, 2, 3)
Bad	BAD	(2, 3, 4)
Medium bad	MEB	(3, 4, 5)
Medium	MED	(4, 5, 6)
Medium good	MEG	(5, 6, 7)
Good	GOO	(6, 7, 8)
Very good	VEG	(7, 8, 9)
Absolutely good	AGO	(8, 9, 9)

Source: Authors' work

After evaluating the criteria and social networks, it is essential to first process the gathered data and prepare it for analysis. The analysis in this study utilizes the fuzzy methods LMAW and CORASO. These methods were selected due to their unique characteristics. When assessing the significance of criteria using alternative methods, it is essential to consider the ranking of the criteria, their interrelationships, and the comparison with specific criteria. Utilizing the fuzzy LMAW method requires experts to first assess the importance of the criteria independently, without considering other supplementary analyses that may be necessary with different methods. Subsequently, the fuzzy LMAW method enables experts to assign linguistic values in the form of ratings, which simplifies the process regarding qualitative criteria, as demonstrated in this study. Moreover, this method accounts for the balancing of the subjective evaluations provided by the experts. The fuzzy CORASO method was selected because its steps are related to other methods; however, its application has demonstrated that it functions as an independent method that produces clear results. Furthermore, the ranking is conducted in relation to the best and worst values of the alternatives, which affects the ranking process. The outcomes of this method can range from one to negative one, thereby enhancing the scope and facilitating a more comprehensive comparison of alternatives. For these reasons, among others, these methods were chosen for this research.

The fuzzy LMAW method will assess the significance of the criteria by calculating their respective weights. This approach is designed to subjectively establish the weights of criteria based on evaluations from experts. The LMAW method was introduced by Pamučar et al. (2021). The procedure for this method includes:

Step 1 Assessing the significance of criteria using linguistic terms. In this step, experts identify a specific linguistic value to utilize it for assessing the significance of these criteria.

Step 2 Creating fuzzy numbers by utilising the membership function. In this step, linguistic values are converted into fuzzy values, and for each linguistic value, a fuzzy number is subsequently established, which is characterized by the membership function. Utilizing this membership function, the linguistic values are converted into a triangular fuzzy number ($\tilde{\gamma}_{Cn}^{e} = \gamma_{Cn}^{(l)e}, \gamma_{Cn}^{(m)e}, \gamma_{Cn}^{(r)e}$). This is carried out to acquire numerical values regarding the significance of the criteria.

Step 3 Establishing the fuzzy anti-ideal value ($\tilde{\gamma}_{AIP}$Y), which is defined as being less than the smallest fuzzy number. When identifying the anti-ideal value, the initial step involves locating the smallest fuzzy number. Subsequently, this value is established as the first value that is smaller than the identified smallest fuzzy number. For instance, if the smallest fuzzy number is 2, the corresponding anti-ideal value would be 1.9.

Step 4 Specifying the fuzzy vector. In this step, all fuzzy numbers that have a specified anti-ideal value are divided. This action is taken because the natural logarithm will be utilized in the subsequent step, thereby diminishing the value of each individual criterion and highlighting the distinctions in grades.

$$\tilde{\mu}_{Cn}^{e} = \left(\frac{\tilde{\gamma}_{Cn}^{e}}{\tilde{\gamma}_{AIP}}\right) = \left(\frac{\gamma_{Cn}^{(l)e}}{\gamma_{AIP}^{(r)}}, \frac{\gamma_{Cn}^{(m)e}}{\gamma_{AIP}^{(m)}}, \frac{\gamma_{Cn}^{(r)e}}{\gamma_{AIP}^{(l)}}\right) \quad (1)$$

Step 5 Definition of the weight vector. In this step, the natural logarithm of each individual value is computed, and this figure is then divided by the natural logarithm of the product of all criterion values. This step is performed to derive the individual criterion weights for each expert.

$$\widetilde{\omega}_{j}^{e} = \left(\frac{\ln(\tilde{\mu}_{Cn}^{e})}{\ln(\prod_{j=1}^{n}\tilde{\mu}_{Cn}^{e})}\right) = \left(\frac{\ln(\tilde{\mu}_{Cn}^{(l)e})}{\ln(\prod_{j=1}^{n}\tilde{\mu}_{Cn}^{(r)e})}, \frac{\ln(\tilde{\mu}_{Cn}^{(m)e})}{\ln(\prod_{j=1}^{n}\tilde{\mu}_{Cn}^{(m)e})}, \frac{\ln(\tilde{\mu}_{Cn}^{(r)e})}{\ln(\prod_{j=1}^{n}\tilde{\mu}_{Cn}^{(l)e})}\right) \quad (2)$$

Step 6. Calculation of aggregated fuzzy vectors utilizing the Bonferroni aggregator. This step is taken to align the individual weights of the criteria set by the experts.

$$\widetilde{\omega}_{j} = \left(\frac{1}{k(k-1)}\sum_{\substack{i,j=1 \\ i\neq j}}^{k}\widetilde{\omega}_{i}^{(e)p}\widetilde{\omega}_{i}^{(e)q}\right)^{\frac{1}{p+q}} \quad (3)$$

The Bonferroni aggregator operator's role is to diminish the impact of individual expert evaluations, thereby balancing subjective judgments in the process of establishing the weights of the criteria.

Once the weights of the criteria have been established, the alternatives are ranked. In this study, this can be accomplished through the fuzzy CORASO method. The fuzzy CORASO method is intended to assess the deviation concerning alternative solutions that signify the maximum or minimum values of the alternatives for a specific criterion (Puška et al., 2024).

This method comprises the following steps:

Step 1. Assessment of alternatives

Step 2. Creation of fuzzy numbers through the application of the membership function. This is accomplished in a manner similar to the fuzzy LMAW method.

Step 3. Standardization of fuzzy numbers. In this step, it is essential to determine the type of criterion you are working with, and subsequently apply an alternative method for normalization. Normalization helps make the different values of the alternatives match up so they can be compared, especially when they're measured in different units.

$$n_{ij} = \frac{x_{ij}^{l}}{\max x_{j}^{u}}, \frac{x_{ij}^{m}}{\max x_{j}^{u}}, \frac{x_{ij}^{n}}{\max x_{j}^{u}} \text{ ; applicable for benefit criteria} \quad (4)$$

$n_{ij} = \frac{\min x_j^l}{x_{ij}^n}, \frac{\min x_j^l}{x_{ij}^m}, \frac{\min x_j^l}{x_{ij}^l}$; applicable for cost criteria (5)

Where: $x_{j\,min}$ – the lowest value of a specific criterion, and $x_{j\,max}$ – the highest value of a specific criterion

Step 4 Calculation of alternative solutions. It is essential to compute both the maximum and minimum alternative solutions. For the maximum, the highest normalized values of the alternatives for each criterion are utilized, whereas for the minimum alternative solutions, the lowest normalized values for each criterion are considered individually. The identification of alternative solutions is influenced by the potential minimum or maximum value of the alternatives concerning specific criteria.

Step 5 Increasing the complexity of alternatives and alternative solutions. In this step, the normalized values are multiplied by their respective weight values.

$\tilde{v}_j = \tilde{w}_j \cdot \tilde{n}_{ij}$ (6)

Step 6 Formation of aggregate values. In this section, the total of all alternative values is computed, encompassing alternative solutions. In this step, the weights of the criteria are incorporated to ensure that all employed criteria are not regarded equally, as experts believe they hold varying significance in determining the outcomes of the CORASO method.

$\tilde{S}_j = \sum_{i=1}^{n} \tilde{v}_j$ (7)

Step 7 Derogations from alternative solutions. In this step, the aggregate value of the separate alternatives is divided by the highest alternative solution, or the lowest alternative solution is divided by the individual values of the total alternatives. This method establishes a relationship between the individual values and the minimum or maximum values of the alternatives.

$\tilde{R}_j = \frac{\tilde{S}_j}{\tilde{S}_{j\,max\,AS}}$ (8)

$\tilde{R'}_j = \frac{\tilde{S}_{j\,min\,AS}}{\tilde{S}_j}$ (9)

Step 8. Defuzzification of the aggregate values of challenging alternatives. This step is done to obtain a crisp value.

$R_{j\,def} = \frac{R_i^l + 4R_i^m + R_i^u}{6}$ (10)

$R'_{j\,def} = \frac{R'_i{}^l + 4R'_i{}^m + R'_i{}^u}{6}$ (11)

Step 9. Computation of the value of the CORASO method.

$Q_i = \frac{R_j - R'_j}{R_j + R'_j}$ (12)

The optimal alternative is the one that possesses the highest value according to the CORASO method, and conversely.

Results

To select the primary social network for executing interactive marketing, it is essential to first assess the significance of the criteria and subsequently rank these social networks. This ranking is based on evaluations provided by selected experts. The initial phase in assessing the importance of criteria through the fuzzy LMAW method involves experts evaluating the significance of these criteria. The evaluation process is structured so that experts select the linguistic value of the criteria according to their perspectives. Consequently, the experts assigned ratings that could vary from completely poor to completely excellent (Table 3).

Table 3
Linguistic Assessment of the Importance of Criteria

Expert	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
Expert 1	GOO	VEG	MEG	GOO	VEG	MED	GOO	MEG	GOO	MEG
Expert 2	MEG	GOO	MED	MEG	GOO	MEB	MEG	MED	MEG	MED
Expert 3	MEG	GOO	MEG	GOO	VEG	MED	GOO	MEG	GOO	MEG

Source: Authors' work

Once the experts gathered the ratings, the subsequent phase involved creating fuzzy numbers derived from the membership function. For instance, the linguistic term 'very good' is converted into a fuzzy number represented as (7, 8, 9). By utilizing the established membership functions, a fuzzy decision matrix is generated. The following step is to ascertain the anti-ideal value. To identify this value, it is essential first to determine the smallest fuzzy value across all criteria, which is 3. Consequently, the anti-ideal value is set below this figure, assumed to be 2.9. Subsequently, all fuzzy numbers are divided by this value. For example, to calculate the fuzzy vector for the linguistic term 'very good', the computation will be:

$$\frac{7}{2.9} = 2.41, \frac{8}{2.9} = 2.76, \frac{9}{2.9} = 3.10$$

Dividing by the anti-ideal value yields the value of the fuzzy vector. Subsequently, the weight vector is determined by dividing the logarithmic values of the fuzzy vector by the logarithm of the product of all fuzzy number values for each individual expert. For instance, considering criteria C1 and expert 1, the calculations are as follows:

$$\tilde{\omega}_1^1 = \frac{\ln(2.07)}{\ln(16230)} = 0.07, \frac{\ln(2.41)}{\ln(3945)} = 0.11, \frac{\ln(2.76)}{\ln(755)} = 0.15$$

Ultimately, the final weight value is derived using the Bonferroni aggregator. For criterion C1, the calculation is performed as follows:

$$C_1 = \sqrt{\left(1/3(3-1)\cdot\left((0.07\cdot 0.07) + (0.07\cdot 0.06) + \cdots (0.07\cdot 0.06)\right)\right)} = 0.066,$$

$$\sqrt{\left(1/3(3-1)\cdot\left((0.11\cdot 0.11) + (0.11\cdot 0.09) + \cdots (0.11\cdot 0.09)\right)\right)} = 0.102,$$

$$\sqrt{\left(1/3(3-1)\cdot\left((0.15\cdot 0.19) + (0.15\cdot 0.14) + \cdots (0.19\cdot 0.14)\right)\right)} = 0.160$$

Utilizing the Bonferroni aggregator, findings were derived indicating that, as per expert opinion, criterion C5 - Targeted advertising holds the highest significance, succeeded by C2 - Demographic compatibility, whereas criterion C6 - Security and privacy is deemed the least significant (see Table 4).

Table 4
Importance of Criteria in the Form of Weights

	C1	C2	C3	C4	C5
w	(0.066, 0.102, 0.160)	(0.085, 0.122, 0.183)	(0.051, 0.087, 0.143)	(0.073, 0.109, 0.168)	(0.091, 0.127, 0.189)
	C6	**C7**	**C8**	**C9**	**C10**
w	(0.022, 0.061, 0.114)	(0.073, 0.109, 0.168)	(0.051, 0.087, 0.143)	(0.073, 0.109, 0.168)	(0.051, 0.087, 0.143)

Source: Authors' work

These findings illustrate that the capacity to target advertising by selecting demographic indicators of message recipients is paramount for interactive marketing conducted via social networks. The results indicate that specific criteria were assigned

identical weights, as the experts provided the same ratings for these criteria. This situation arises from the limited number of experts involved, who collaborate within the same company, allowing for mutual interaction during the evaluation of the criteria. Essentially, this is a consequence of the company's small size, which facilitated interaction among the experts.

Once the significance of the criteria is established, social networks that meet these criteria are assessed. The assessment is conducted similarly to the evaluation of the criteria, allowing experts to provide evaluations using linguistic terms based on their perception of how well the social network satisfies the established criteria (Table 5). Subsequently, fuzzy numbers are generated in the same manner as when determining the weight of the criteria, leading to the creation of a fuzzy decision matrix. To ensure that the opinions of the experts are equally valued, a collective decision-making matrix was developed using the geometric mean, to which the steps of the CORASO method were applied.

Table 5
Evaluation of Social Networks by Experts

Expert 1	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
SN1	AGO	VEG	GOO	GOO	AGO	MED	VEG	AGO	VEG	GOO
SN2	VEG	VEG	VEG	GOO	VEG	MED	VEG	VEG	GOO	GOO
SN3	GOO	GOO	AGO	MEG	GOO	MEB	GOO	GOO	MEG	VEG
SN4	MEG	MED	MED	MED	MED	GOO	MEG	GOO	MED	MED
SN5	GOO	MEG	MEG	VEG	MED	MEG	MED	MEG	MED	VEG
SN6	VEG	VEG	VEG	GOO	VEG	MEG	GOO	VEG	GOO	GOO
SN7	MEG	MED	MED	GOO	MEB	MEG	MEB	MED	MEB	GOO
SN8	MEG	MEG	GOO	MEG	MEG	MED	MEG	MEG	MED	GOO
SN9	MEG	MED	MED	GOO	MED	MEG	MEG	MEG	MED	MEG
SN10	GOO	MEG	VEG	MEG	MED	MED	MEG	MEG	MED	GOO
Expert 2	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
SN1	VEG	GOO	MEG	MEG	VEG	MED	GOO	VEG	GOO	MEG
SN2	VEG	GOO	GOO	MEG	GOO	MED	GOO	GOO	MEG	MEG
SN3	MEG	GOO	VEG	MED	MEG	MEB	MEG	MEG	MED	VEG
SN4	MED	MED	MEB	MED	MED	GOO	MED	MEG	MED	MEB
SN5	GOO	MEG	MED	GOO	MED	MEG	MED	MED	MED	GOO
SN6	GOO	GOO	GOO	MEG	GOO	MED	GOO	MEG	GOO	MEG
SN7	MED	MED	MED	MEG	MEB	MEG	MEB	MED	MEB	MEG
SN8	MEG	MEG	GOO	MED	MED	MED	MEG	MED	MED	MEG
SN9	MED	MED	MEB	MEG	MEB	MED	MED	MED	MED	MED
SN10	MEG	MED	GOO	MED	MEB	MED	MED	MED	MED	MEG
Expert 3	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
SN1	VEG	GOO	GOO	MEG	VEG	MEB	GOO	VEG	GOO	MEG
SN2	GOO	GOO	GOO	GOO	GOO	MEB	GOO	GOO	MEG	MEG
SN3	GOO	MEG	VEG	MEG	GOO	BED	MEG	MEG	MED	GOO
SN4	MED	MEB	MEB	MEB	MEB	MEG	MED	MEG	MEB	MEB
SN5	MEG	MED	MEG	GOO	MEB	MED	MEB	MED	MEB	GOO
SN6	GOO	GOO	VEG	MED	GOO	MED	MEG	VEG	MEG	GOO
SN7	MED	MEB	MEB	MEG	BED	MED	MEB	MEB	BED	MEG
SN8	MED	MED	MEG	MED	MED	MEB	MED	MED	MEB	MEG
SN9	MED	MEB	MEB	MEG	MED	MED	MED	MED	MEB	MED
SN10	MEG	MED	GOO	MEG	MED	MEB	MEG	MEG	MEB	GOO

Source: Authors' work

When normalizing the data within the collective decision matrix, the highest values of the fuzzy number for a specific criterion are initially identified, followed by dividing the values of that criterion by this number. This approach is adopted due to the use of qualitative criteria, necessitating benefit normalization. For instance, in the case of criteria C1 and social network SN1, the normalization calculation is executed:

$$n_{11} = \frac{7.32}{9.00} = 0.81, \frac{8.32}{9.00} = 0.92, \frac{9.00}{9.00} = 1.00$$

Subsequently, alternative solutions are established for each criterion. Taking criterion C1 as an example, the maximum alternative solution is (0.81, 0.92, 1.00), whereas the minimum alternative solution is (0.48, 0.59, 0.70). These represent the largest values of fuzzy numbers (maximum alternative solutions) and the smallest values of fuzzy numbers (minimum alternative solutions) for a given criterion. Following this, all values are weighted. In this phase, the normalized values are multiplied by the assigned weight of the criteria. In the same example, the weighting calculation is performed as follows:

$$\tilde{v}_{11} = 0.07 \cdot 0.81 = 0.05, 0.10 \cdot 0.92 = 0.09, 0.16 \cdot 1.00 = 0.16$$

The subsequent step involves calculating the aggregate values, which are derived by summing the individual fuzzy numbers across all criteria. Following this, the deviation from the alternative solutions is determined. In the case of the social network SN1, the calculation process is executed as follows:

$$\tilde{R}_1 = \frac{0.43}{1.58} = 0.27, \frac{0.77}{0.87} = 0.88, \frac{1.37}{0.48} = 2.88$$

$$\widetilde{R'}_1 = \frac{0.24}{1.37} = 0.18, \frac{0.49}{0.77} = 0.63, \frac{1.37}{0.43} = 2.20.$$

Subsequently, defuzzification is carried out, which is computed as follows:

$$R_{1\,def} = \frac{0.27+4\cdot0.88+2.88}{6} = 1.11 \quad R'_{1\,def} = \frac{0.18+4\cdot0.63+2.20}{6} = 0.82$$

Ultimately, the value of the CORASO method for SN1 is calculated as follows:

$$Q_i = \frac{1.11 - 0.82}{1.11 + 0.82} = 0.153$$

The findings from the fuzzy CORASO method indicate that, based on expert assessments, the highest-rated social network is Facebook (SN1), succeeded by YouTube (SN6), whereas the lowest-rated social network is Viber (SN7) (see Table 6). It is important to highlight that these findings were derived solely for the company Iceled and within the geographical context of Bosnia and Herzegovina. This ranking may vary when considering other companies and countries.

Table 6

Ranking of Social Networks Concerning the Implementation of Interactive Marketing

	$\tilde{S}_j$	$\tilde{R}_j$	$\widetilde{R'}_j$	$R_{j\,def}$	$R'_{j\,def}$	Q_i	Rank
SN1	(0.43, 0.77, 1.37)	(0.27, 0.88, 2.88)	(0.18, 0.63, 2.20)	1.11	0.82	0.153	1
SN2	(0.40, 0.74, 1.33)	(0.25, 0.84, 2.80)	(0.18, 0.66, 2.33)	1.07	0.86	0.111	3
SN3	(0.36, 0.67, 1.22)	(0.23, 0.77, 2.57)	(0.20, 0.72, 2.59)	0.98	0.95	0.016	4
SN4	(0.30, 0.60, 1.16)	(0.19, 0.69, 2.44)	(0.21, 0.81, 3.13)	0.90	1.10	-0.101	8
SN5	(0.33, 0.64, 1.20)	(0.21, 0.73, 2.53)	(0.20, 0.76, 2.80)	0.95	1.01	-0.030	5
SN6	(0.40, 0.74, 1.34)	(0.25, 0.84, 2.82)	(0.18, 0.66, 2.33)	1.07	0.86	0.112	2
SN7	(0.28, 0.57, 1.11)	(0.18, 0.65, 2.34)	(0.22, 0.85, 3.29)	0.86	1.15	-0.147	10
SN8	(0.32, 0.61, 1.14)	(0.20, 0.70, 2.41)	(0.21, 0.80, 2.97)	0.90	1.06	-0.083	7
SN9	(0.30, 0.59, 1.12)	(0.19, 0.67, 2.36)	(0.22, 0.83, 3.13)	0.87	1.11	-0.118	9
SN10	(0.32, 0.61, 1.15)	(0.20, 0.70, 2.42)	(0.21, 0.79, 2.94)	0.91	1.05	-0.076	6
MAX AS	(0.48, 0.87, 1.58)						
MIN AS	(0.24, 0.49, 0.94)						

Source: Authors' work

Discussion

With the advent of the Internet, various social networks emerged (Razak et al., 2025). These networks are characterized by the ability of multiple users to communicate in diverse ways. The rise of social networks has facilitated the growth of interactive marketing, as companies can convey messages to their customers and obtain feedback through interactions on these platforms (Mahmoud Alfdool et al., 2025). Given the significance of gathering information from customers and other stakeholders via social networks, it is essential for every company to leverage these platforms. Nevertheless, the extent of social network usage is often influenced by the size of the company. Large corporations employ a greater number of individuals involved in marketing efforts, allowing them to utilize a wider array of social networks. Consequently, smaller companies must select one or two social networks for their use. Merely having a presence on multiple networks without proper maintenance is not a viable solution (Popescu, 2024). Furthermore, companies have the option to engage specialized firms to handle their social media and oversee interactive marketing initiatives. Nevertheless, it is essential to first determine which social network will serve as the primary platform for executing interactive marketing.

When selecting a social network, it is essential to establish the objectives that these networks aim to achieve through interactive marketing (Demir, 2025). These objectives are articulated as criteria that the social networks must satisfy. Nevertheless, in practice, it frequently occurs that a single network is unable to adequately address all the requirements of businesses. Consequently, companies are compelled to devise a compromise solution (Şimşek et al., 2026) and opt for the social network that can provide the most assistance compared to others. To address this issue, MCDM methods were employed, which identify a specific alternative when multiple criteria are being evaluated (Trung et al., 2024). The assessment of the specified criteria and chosen social networks was conducted by the company Iceled. Due to its small size, only three employees were selected, as the company does not employ a large workforce. These individuals were chosen for their decision-making roles and significant influence within the organization. Their initial task was to identify which of the established criteria was most beneficial to them and which would be prioritized over the others. Subsequently, they assessed the identified social networks based on these criteria, thereby evaluating how effectively each social network aligns with the established standards. The evaluation utilized linguistic terms, as the qualitative criteria posed challenges for numerical assessment. Employing linguistic terms allows for decision-making even in the absence of complete information regarding individual social networks. This is particularly relevant since the employees are not specialists in the utilization of these networks and therefore lack comprehensive knowledge about the functionalities of each network. They possessed basic information that was adequate for making this selection.

The application of linguistic terms led to descriptive ratings, and to facilitate the implementation of MCDM methods, a fuzzy approach was adopted. This methodology allows for nuanced assessments where the fuzzy number is expressed as three or four digits, contingent upon the chosen approach. In this study, a triangular fuzzy number was utilized, incorporating a three-digit fuzzy number into each linguistic statement via the membership function. Once the matrix containing fuzzy numbers was established, the procedures of the fuzzy LMAW and CORASO methods were employed. A notable characteristic of the fuzzy LMAW method is its capability to rank alternatives. Nevertheless, this feature has not been extensively utilized in practice, and the method emerged primarily as a means for the subjective determination of weight coefficients that signify the significance of criteria (Radovanović et al., 2024).

The uniqueness of this method lies in the fact that experts assess the criteria according to their significance, without needing to compare or rank them prior to evaluation. In this method, experts utilize linguistic expressions to evaluate the importance of the criteria. The findings derived from their evaluations and the implementation of fuzzy LMAW indicate that the primary advantage is that social networks facilitate targeted advertising based on demographic traits. These findings revealed that considerations of security and privacy are not as critical when selecting social networks. This may be attributed to the possibility that all social networks are perceived as secure, or that the security levels across all platforms are comparable, rendering this criterion less significant (Goswami et al., 2023).

The fuzzy CORASO method was selected to promote its application. This method is relatively new and has not been extensively utilized in previous research. Consequently, it was employed in the selection of drones (Puška et al., 2024), the choice of suppliers in the food industry (Tufan & Ulutaş, 2026), the selection of CRM programs (Puška, 2025), and as one of the methods in comparative analysis (Katrancı et al., 2026). These studies demonstrated that this method is competitive with other MCDM methods, and its use is recommended for future research. The uniqueness of this method is evident in the development of alternative solutions and the assessment of how these alternatives deviate from the established solutions. Each alternative should aim to be as near as possible to the optimal alternative solution while distancing itself from the least favourable alternative solution to achieve a superior outcome. The distinct characteristic of this method is that its values can range from one (1) to negative one (-1). When alternatives are nearer to the optimal alternative solution, the resulting value will approach one (1); conversely, if they are closer to the least favourable alternative solution, the resulting value will trend towards negative one (-1). The findings of this approach indicate that Facebook yields the most favourable outcomes. This can be attributed to the extensive demographic structure of the platform, which boasts the highest number of users and is presently the most utilized social network in Bosnia and Herzegovina. Furthermore, this platform provides opportunities for targeted advertising and the collection of information from customers and various interest groups. It also facilitates the incorporation of visual content and the uploading of videos.

These research findings align with previous scientific studies that affirm Facebook's status as the most effective social network for interactive marketing objectives. Specifically, various studies have indicated that Facebook excels in terms of reach, user engagement, and its impact on consumer behaviour (Ruita et al., 2025; Dube & Nemashakwe, 2024; Jamil et al., 2022). Furthermore, it leads among the networks utilized by businesses to foster growth (Yousef et al., 2021) and is consistently acknowledged as a premier network in academic literature (Alalwan et al., 2017).

The social network that holds the second position is YouTube. In contrast to Facebook, this platform is mainly designed for video uploads. The optimal strategy for the company Iceled was to link these two social networks. The networking approach involves uploading videos to YouTube and subsequently sharing the same videos on Facebook. This method would ensure that both networks are utilized effectively, leading to the best possible outcomes. In their study, Unnava and Aravindakshan (2021) indicate that consumer engagement is fostered when brands disseminate content across various social media platforms, such as Facebook and YouTube. They further highlight that posting on a single platform can positively influence user engagement on another platform, implying a complementary relationship among different social networks. Utilizing identical video content on both platforms can enhance audience reach and engagement.

The social network Viber has received the least favourable results because it is not a traditional social network; rather, it serves as an application for mobile conversations. However, it does offer the capability to create groups, allowing it to function as a social network as well.

Utilizing social networks enables the Iceled company to gather essential information from its customers, which will contribute to enhancing the company's operations. By leveraging this information, the company can adjust to customer needs, thereby boosting its competitiveness. Iceled is the pioneering company in ice production within Bosnia and Herzegovina, establishing itself as the market leader. Recently, other firms have begun to enter this sector, making it crucial for Iceled to utilize social networks to maintain its leading position in the market.

In the course of this research, three specialists were engaged. The rationale for this choice lies in the scale of the chosen company. Furthermore, this study aims to demonstrate the importance of incorporating the perspectives of a broader range of employees, rather than solely relying on directors, in the decision-making process. This approach is essential as it is crucial to gather diverse opinions and viewpoints regarding a specific issue to arrive at a decision concerning the selection of a social network. A limited number of experts can lead to questions about the reliability of the sample. Nevertheless, in the context of group decision-making utilizing the MCDM method, the quantity of respondents does not play a critical role in the decision-making process, as not every employee participates in the decision within a specific organization; only the managers do. While they may seek the professional insights of employees, the final decision rests with them. Consequently, the selection of experts for this study is appropriate. The results are credible due to the notable differences observed in the ranking of social networks.

This study has demonstrated the ways in which social networks can be selected for the purpose of executing interactive marketing. This method of identifying social networks can similarly be applied to other companies as examples. Nevertheless, it is essential to tailor this strategy to the specific needs of a company to achieve its established objectives. Consequently, it is imperative to modify the criteria employed. Therefore, this strategy could be beneficial for small manufacturing firms, as they typically have a limited number of employees who may possess expertise in research. Furthermore, this approach could also be utilized by service-oriented companies, not exclusively by those in production.

Conclusion

The research conducted focuses on the selection of social networks for implementing interactive marketing at the Iceled company. This organization specialises in the production and distribution of ice within Bosnia and Herzegovina. To maintain its leading position in the market, it has opted to enhance its marketing efforts by utilising social networks for this purpose. Ten criteria were established to assess the chosen social networks. A total of ten social networks were identified based on their usage in Bosnia and Herzegovina. According to the evaluations provided by the employees of the Iceled company and the outcomes derived from the fuzzy LMAW method, the most significant criteria identified are targeted advertising and demographic compatibility. The application of the fuzzy CORASO method demonstrated that employing interactive marketing on Facebook would yield the most favourable results.

Like any other study, this research has specific limitations that need to be addressed in subsequent investigations. The primary limitation of this research lies in the selection of criteria utilized to define interactive marketing. Both in theory and practice, there

exists a multitude of criteria, and the challenge is to identify the appropriate criteria for a particular study. Consequently, it is essential to align the criteria with the research objectives to select suitable criteria. Future research may concentrate solely on the criteria, and based on their evaluation, determine the most appropriate criteria for selecting a social network. Another limitation of this research could be the selected research methodologies. The Fuzzy LMAW and CORASO methods were chosen due to their demonstrated effectiveness in practice and their minimal deviation from alternative methods. In future studies, it may be beneficial to explore other methodologies to derive the findings of these investigations.

The methodology that was implemented demonstrated significant flexibility, allowing for the same ratings to be utilized for both criteria and alternatives. Moreover, the application of these methods is straightforward and aids the experts in their evaluations of criteria and alternatives. During the assessment of the criteria, it was essential to ascertain the importance of each individual criterion for the decision-making process, without considering the influence of other criteria. When evaluating other criteria, the individual criteria are also taken into account. Consequently, this methodology should be employed in future research whenever decisions need to be made based on multiple criteria.

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