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A NOVEL FRAMEWORK FOR MODELLING ORGANISATIONAL AMBIDEXTROUS STRATEGIES

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Abstract
This study employs fuzzy logic to model organisational ambidextrous strategies by treating exploration and exploitation not as fixed or strictly opposing orientations, but as partially overlapping and context-dependent strategic capabilities whose interaction may lead to different trajectories of organisational development. Methodologically, the study proposes a structured fuzzy inference model based on two input linguistic variables, triangular and trapezoidal membership functions, IF–THEN rules, interaction coefficients, and an α-level decision criterion. From a managerial perspective, the framework offers a transparent decision-support tool for identifying dominant and secondary strategic options, prioritising capability development, and translating ambiguous expert assessments into actionable strategic recommendations. An empirical case study of Zepter International is used to demonstrate the applicability of the framework. The findings are discussed, and directions for future research are outlined.
Keywords: Organisational ambidexterity; Fuzzy logic; Exploration; Exploitation; Strategic alternatives

1. INTRODUCTION

Organisational ambidexterity refers to an organisation's capacity to balance exploration and exploitation, enabling it to pursue new opportunities and respond to changing market demands while maintaining the efficiency and value of existing operations (Bodwell & Chermack, 2010). In his foundational discussion of organisational learning, March (1991) characterized exploitation as refinement, choice, production, efficiency, selection, implementation, and execution, while contrasting it with exploration, understood as search, variation, risk-taking, experimentation, play, flexibility, discovery, and innovation. Exploration and exploitation are associated with distinct requirements regarding tasks, personnel, culture, structures, resources, roles, product configuration, and overall organizational design (Wilms et al., 2019), and these differences are manifested across both product and market domains. In the product domain, exploration is linked to the development of new capabilities, whereas exploitation emphasizes the refinement of existing ones. In the market domain, exploration is directed toward new customers, whereas exploitation focuses on strengthening relationships with existing customers (Voss & Voss, 2013). The imperative to balance these competing demands is particularly salient for organisations with constrained internal resources or limited access to external ones, as such conditions heighten the need to allocate attention carefully across alternative strategic priorities (Junni et al., 2013). Generally, ambidextrous organizations combine strategic commitment, which supports the effective implementation of chosen product–market strategies through focused managerial attention and resource allocation, with strategic flexibility, which enables adaptation or revision of those strategies in response to feedback (Kouropalatis et al., 2012). Despite its apparent conceptual simplicity, March's exploration–exploitation framework has generated sustained debate regarding how these constructs should be conceptualized, measured, and evaluated (Piao & Zajac, 2016). In empirical research, exploration and

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exploitation are frequently assessed using self-reported Likert-type scales (D'Souza et al., 2017). However, the imprecision and uncertainty involved in evaluating an organization's orientation toward either dimension raise questions about the adequacy of conventional quantitative methods for representing such managerial judgments. Although instruments such as semantic differential, Likert, and Thurstone scales have long been used for this purpose, they do not fully capture the ambiguity of human evaluation, largely because conventional mathematical approaches are not well suited to representing vagueness (Zimmermann, 2011). To address this limitation, fuzzy logic offers a quantitative framework better suited to dealing with uncertainty and imprecision in subjective judgments (Pesic et al., 2024a). In practical applications, domain experts are generally able to express their judgments through fuzzy numbers (Kang, 2012). Fuzzy decision-making is particularly useful in situations in which conclusions must be derived from vague or incomplete information and represented through linguistic values formalized as fuzzy numbers. In this context, a linguistic variable is understood as a variable whose values are expressed as words or sentences in a natural or artificial language (Kahraman et al., 2015). Such variables form the basis of fuzzy IF-THEN rules by expressing input and output values in verbal categories rather than precise numerical terms, thereby enabling approximate reasoning within a fuzzy system (Pesic et al., 2015). Fuzzy IF-THEN rules connect inputs to outputs by specifying the output associated with a particular type of input through fuzzy sets such as "Negative Small" or "Positive Small." Because an input may simultaneously belong to multiple fuzzy sets to different degrees, several rules may be activated at once. These rules may be defined by experts or derived from data, and different rule bases may yield different approximations of the same function (Kosko, 1994). In the fuzzy assessment framework proposed in this paper, two input linguistic variables are defined, each comprising four linguistic terms. Triangular and trapezoidal fuzzy sets are employed to capture the imprecision inherent in managerial judgment, and these inputs are then processed through a set of IF–THEN rules. Based on the analysis of exploration-oriented and exploitation-oriented factors, four distinct strategic alternatives are generated. The proposed approach combines a fuzzy inference framework with a practically interpretable decision rule, whereby the most strongly indicated strategic outcome in the empirical part of the study is identified according to the highest degree of membership of the aggregated fuzzy output. The α-level of the corresponding fuzzy set is then used to identify the final strategic alternative. The empirical application of the framework is illustrated through a case study of Zepter International, a multinational company whose innovation-oriented profile and international business setting make it particularly suitable for examining organisational ambidexterity. The remainder of the paper is organized as follows. Section 2 presents the literature review, Section 3 describes the research methodology, Section 4 reports and discusses the case study results, and Section 5 offers concluding remarks.

2. LITERATURE REVIEW

Since its early conceptualisation, organisational ambidexterity has been developed through several influential perspectives. Duncan (1976) framed it as a sequential process achieved by shifting organisational structures over time in response to evolving strategic demands. Tushman and O'Reilly (1996) advanced the structural view, arguing that exploration and exploitation can be pursued simultaneously through differentiated subunits combined with selective integration at the senior management level. Gibson and Birkinshaw (2004) later introduced contextual ambidexterity, emphasising individuals' capacity to divide their efforts between exploratory and exploitative activities while balancing demands for alignment and adaptation. Extending these foundational approaches, Cao et al. (2009) distinguished between the balance and combined dimensions of ambidexterity, which capture, respectively, the relative alignment and joint intensity of exploration and exploitation. While conceptually distinct and linked to performance through different mechanisms, high levels of both dimensions may generate synergistic benefits. Although originally developed within the broader literature on organisational ambidexterity, these theoretical developments provide an important conceptual foundation for understanding strategic ambidexterity as the simultaneous pursuit of exploratory and exploitative strategic orientations. This perspective has been further developed in studies that explicitly examine strategic ambidexterity across different organisational and market contexts, including Han and Celly (2008), Kouropalatis et al. (2012), Voss and Voss (2013), Wu et al. (2020), Bustinza et al. (2020), and Khan et al. (2022). The strategic management literature examines the antecedents, outcomes, and mechanisms of opportunity-seeking exploratory strategies and advantage-seeking exploitative strategies, suggesting that a balanced application of these strategies can contribute positively to organisational performance (Sirén et al., 2012). In that sense, organisations that successfully integrate exploration and exploitation tend to outperform those that emphasize only one of these strategic orientations (Kassotaki, 2022). Whether emphasis is placed on integrating exploratory and exploitative activities within relatively less specialised organisational arrangements, or on differentiating units or teams with distinct competencies, processes, and cultures dedicated to each orientation, strategic ambidexterity ultimately depends on aligning organisational strategy with the resources and capabilities required to support both exploration and exploitation (Khan et al., 2022). This conceptual diversity also has important methodological implications. The varied ways in which strategic ambidexterity has been defined and operationalised complicate its empirical assessment, particularly when it relies on managers' subjective evaluations. Accordingly, many studies have highlighted persistent measurement difficulties associated with perceptual assessments of ambidexterity. In response, a growing body of research has applied fuzzy-set techniques to ambidexterity-related problems across different organisational contexts, including innovation ambidexterity (Ortiz de Guinea & Raymond, 2020; Mastrocinque et al., 2022; Gouda & Tiwari, 2024), supply chain ambidexterity (Tseng et al., 2022; Shamout, 2023; Primadasa et al., 2025), and its implications for sustainable performance (Gomes et al., 2020; Bui et al., 2021; Belhadi et al., 2022; Munir et al., 2023). Originating in Zadeh's (1965) theory of fuzzy sets, fuzzy logic has proved useful in situations where statistical information is unavailable or incomplete (Pesic et al., 2024b). In the literature, fuzzy logic is understood in both a narrow and a broad sense. In the narrow sense, it denotes an extension of many-valued logic developed within symbolic logic, concerned with syntax through proof and semantics through truth, and requiring soundness and completeness as conditions of validity. This conception provides the theoretical foundation for fuzzy logic in the broader sense, where it refers to a framework of concepts, principles, and methods for approximate rather than exact reasoning, grounded in fuzzy set theory and intended to support inference under conditions of fuzzified uncertainty (Klir, 2006). A substantial body of literature has developed around fuzzy logic in the broader sense, including works by Zadeh (1975), Negoiță and Ralescu (1975), Yager et al. (1987), Kaufmann (1988), Dubois and Prade (1991), Kosko and Isaka (1993), Novák et al. (1999), Hájek (2001), and Piegat (2001). As Zimmermann (2010) observed, fuzzy sets and fuzzy logic have been widely and successfully applied across a broad range of disciplines, from mathematics and formal logic to conventional and advanced engineering, operations research, and management science. The practical relevance is also reflected in numerous real-world applications.

3. RESEARCH METHODOLOGY

The first step involves identification of the relevant exploration-oriented and exploitation-oriented factors. Exploration-oriented factors are labelled as $E_i,\ i = 1,\dots,m$ and exploitation-oriented factors are labelled as $X_j,\ j = 1,\dots,n.$

Then, two input linguistic variables are introduced:

1. The state of exploration-oriented factors
2. The state of exploitation-oriented factors

The states of exploration-oriented and exploitation-oriented factors are described by the following linguistic terms:

1. MW – Major weakness
2. mW - Minor weakness
3. mS – Minor strength
4. MS – Major strength

Triangular and trapezoidal fuzzy sets are utilized to capture the vagueness inherent in managerial judgments. The membership functions of the exploration-oriented and exploitation-oriented factors are presented in Figure 1.

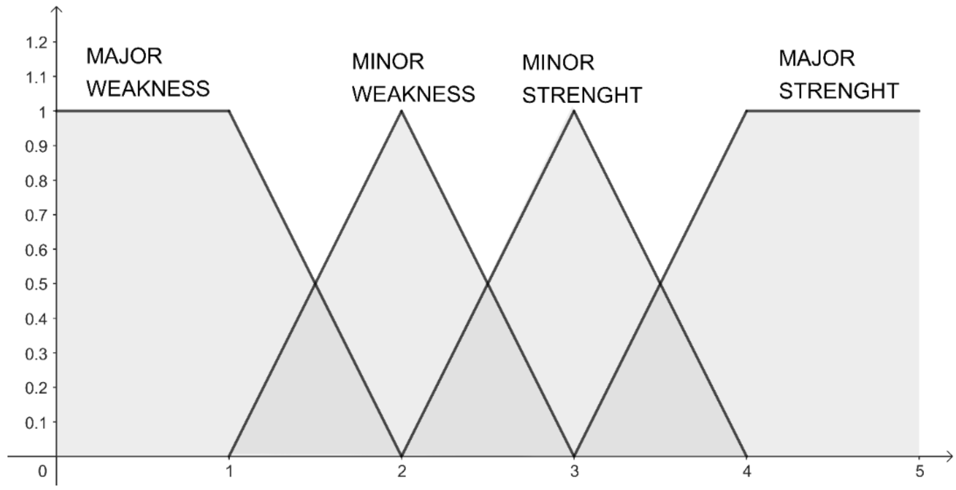

FIGURE 1 – LINGUISTIC VARIABLE: STATE OF EXPLORATION- AND EXPLOITATION-ORIENTED FACTORS

The factors are assessed on the interval [0,5]. Values closer to 5 indicate that a given factor constitutes a major strength, whereas values closer to 0 indicate that it constitutes a major weakness. The input variables are processed by the IF–THEN rules. The number of rules under consideration is $4 \times 4 = 16$. (Table 1)

TABLE 1 – DEVELOPMENT OF STRATEGIC ALTERNATIVES

		Exploitation-oriented factors			
		$\boldsymbol{MW}$	$\boldsymbol{mW}$	$\boldsymbol{mS}$	$\boldsymbol{MS}$
Exploration-oriented factors	$\boldsymbol{MW}$	Min-Min (mm)	Min-Min (mm)	Min-Max (mM)	Min-Max (mM)
	$\boldsymbol{mW}$	Min-Min (mm)	Min-Min (mm)	Min-Max (mM)	Min-Max (mM)
	$\boldsymbol{mS}$	Max-Min (Mm)	Max-Min (Mm)	Max-Max (MM)	Max-Max (MM)
	$\boldsymbol{MS}$	Max-Min (Mm)	Max-Min (Mm)	Max-Max (MM)	Max-Max (MM)

Based on the analysis of exploration-oriented and exploitation-oriented factors, four distinct strategic options may be distinguished:

1. Max–Max strategy ($\boldsymbol{MM}$) or $\boldsymbol{SS}$ strategy, aimed at maximizing both exploration-oriented and exploitation-oriented strengths.
2. Max–Min strategy ($\boldsymbol{Mm}$) or $\boldsymbol{SW}$ strategy, aimed at maximizing exploration-oriented strengths while minimizing exploitation-oriented weaknesses.
3. Min–Max strategy ($\boldsymbol{mM}$) or $\boldsymbol{WS}$ strategy, aimed at minimizing exploration-oriented weaknesses while taking advantage of exploitation-oriented strengths.
4. Min–Min strategy ($\boldsymbol{mm}$) or $\boldsymbol{WW}$ strategy, aimed at minimizing both exploration-oriented and exploitation-oriented weaknesses.

These four strategic alternatives should be understood as analytical archetypes or ideal types rather than as an exhaustive representation of all possible organisational strategies. The purpose is to provide a parsimonious and managerially interpretable structure for identifying the dominant direction of interaction between exploration- and exploitation-oriented factors. In practice, organisations may occupy intermediate positions, combine elements of several alternatives, or move between them over time. The fuzzy membership structure partly accommodates such nuances by allowing a factor combination to activate more than one strategic category to different degrees.

The IF–THEN rules used to determine the most strongly indicated strategic alternative are presented below. The output is derived from the values of the input variables after they have been evaluated through the full rule base, typically involving multiple iterations:

1. IF exploration-oriented factor represents major weakness ($E = MW$) and exploitation-oriented factor represents major weakness ($X = MW$) THEN strategy is Min-Min ($S = mm$)
2. IF exploration-oriented factor represents major weakness ($E = MW$) and exploitation-oriented factor represents minor weakness ($X = mW$) THEN strategy is Min-Min ($S = mm$)
3. IF exploration-oriented factor represents major weakness ($E = MW$) and exploitation-oriented factor represents minor strength ($X = mS$) THEN strategy is Min-Max ($S = mM$)
4. IF exploration-oriented factor represents major weakness ($E = MW$) and exploitation-oriented factor represents major strength ($X = MS$) THEN strategy is Min-Max ($S = mM$)
5. IF exploration-oriented factor represents minor weakness ($E = mW$) and exploitation-oriented factor represents major weakness ($X = MW$) THEN strategy is Min-Min ($S = mm$)
6. IF exploration-oriented factor represents minor weakness ($E = mW$) and exploitation-oriented factor represents minor weakness ($X = mW$) THEN strategy is Min-Min ($S = mm$)
7. IF exploration-oriented factor represents minor weakness ($E = mW$) and exploitation-oriented factor represents minor strength ($X = mS$) THEN strategy is Min-Max ($S = mM$)
8. IF exploration-oriented factor represents minor weakness ($E = mW$) and exploitation-oriented factor represents major strength ($X = MS$) THEN strategy is Min-Max ($S = mM$)
9. IF exploration-oriented factor represents minor strength ($E = mS$) and exploitation-oriented factor represents major weakness ($X = MW$) THEN strategy is Max-Min ($S = Mm$)
10. IF exploration-oriented factor represents minor strength ($E = mS$) and exploitation-oriented factor represents minor weakness ($X = mW$) THEN strategy is Max-Min ($S = Mm$)
11. IF exploration-oriented factor represents minor strength ($E = mS$) and exploitation-oriented factor represents minor strength ($X = mS$) THEN strategy is Max-Max ($S = MM$)
12. IF exploration-oriented factor represents minor strength ($E = mS$) and exploitation-oriented factor represents major strength ($X = MS$) THEN strategy is Max-Max ($S = MM$)
13. IF exploration-oriented factor represents major strength ($E = MS$) and exploitation-oriented factor represents major weakness ($X = MW$) THEN strategy is Max-Min ($S = Mm$)
14. IF exploration-oriented factor represents major strength ($E = MS$) and exploitation-oriented factor represents minor weakness ($X = mW$) THEN strategy is Max-Min ($S = Mm$)
15. IF exploration-oriented factor represents major strength ($E = MS$) and exploitation-oriented factor represents minor strength ($X = mS$) THEN strategy is Max-Max ($S = MM$)
16. IF exploration-oriented factor represents major strength ($E = MS$) and exploitation-oriented factor represents major strength ($X = MS$) THEN strategy is Max-Max ($S = MM$)

Results are weighted by the corresponding coefficients, so that the final value of each strategy reflects the strength of the relevant pairwise correlation. For example, a correlation coefficient of 0.6 means that 60% of the obtained value is incorporated into the final assessment. Identification of the most strongly indicated strategic outcome is based on the highest membership degree in the aggregated fuzzy output.

Selection of the final strategic alternative relies on the α-level of the corresponding fuzzy set, which serves as a decision-support parameter rather than a universally fixed cut-off point. In the empirical application, values of $\alpha \geq 0.70$ indicate strongly supported strategic alternatives, whereas values in the range $0.50 \leq \alpha < 0.70$ are treated as secondary alternatives. The higher threshold retains only options with comparatively strong fuzzy support, while the lower threshold captures strategically relevant alternatives that should not be disregarded. Because the selected α-level may affect the number of retained alternatives, sensitivity analysis is conducted across several threshold values.

4. RESEARCH RESULTS AND DISCUSSIONS

Zepter International was selected as the case study company due to its pronounced focus on innovation and its relevance for examining organisational ambidexterity within a multinational business setting. The company manufactures, sells, and distributes high-quality products worldwide, operating in more than 60 countries across five continents. For more than 36 years, Zepter International has promoted its mission of preserving health by providing effective and innovative solutions aimed at improving people's quality of life.

The evaluation of the company's exploration-oriented and exploitation-oriented capabilities was conducted by a group of ten managers at Zepter International, Belgrade, Serbia. The managers participated voluntarily and were informed about the purpose of the study. The responses were analysed in aggregated form, and no individual respondent was identified in the reporting of the results. The questionnaires were personally distributed and subsequently collected after the managers had completed their assessments. The instrument included six items measuring exploration-oriented capabilities and six items measuring exploitation-oriented capabilities, adopted from the validated questionnaire developed by Lubatkin et al. (2006). Exploration-oriented factors are designated in the following way: E_1 - Seeking novel technological ideas through out-of-the-box thinking, E_2 - Basing success on the ability to explore new technologies, E_3 - Creating products or services that are innovative to the firm, E_4 - Seeking creative ways to satisfy customer needs, E_5 - Aggressively entering new market segments and E_6 - Actively targeting new customer groups.

The exploitation-oriented factors are denoted as follows: X_1 - Commitment to improving quality and lowering cost, X_2 - Continuous improvement of product and service reliability, X_3 - Increasing the level of automation in operations, X_4 - Constantly monitoring existing customer satisfaction, X_5 - Fine-tuning offerings to keep current customers satisfied and X_6 - Penetrating more deeply into the existing customer base.

The next stage of the analysis involved evaluating the selected factors. As the proposed assessment model uses values defined on the interval [0,5], the following results were obtained:

TABLE 2 – THE VALUE OF EXPLORATION-ORIENTED FACTORS

Exploration-oriented factor	E_1	E_2	E_3	E_4	E_5	E_6
Assigned value	1.4	2.1	4.6	4.9	2.7	2.8

TABLE 3 – THE VALUE OF EXPLOITATION-ORIENTED FACTORS

Exploitation-oriented factor	X_1	X_2	X_3	X_4	X_5	X_6
Assigned value	4.2	3.7	2.3	3.1	3.9	2.8

The linguistic variables introduced in the previous section are used to determine the membership degrees of the exploration-oriented and exploitation-oriented factors with respect to the corresponding fuzzy sets. The resulting values are presented in Tables 4 and 5.

TABLE 4 – MEMBERSHIP DEGREES IN FUZZY SETS (EXPLORATION-ORIENTED FACTORS)

Fuzzification	Exploration-oriented factor	E_1	E_2	E_3	E_4	E_5	E_6
Membership degrees in fuzzy sets	MW	0.6	0.0	0.0	0.0	0.0	0.0
	mW	0.4	0.9	0.0	0.0	0.3	0.2
	mS	0.0	0.1	0.0	0.0	0.7	0.8
	MS	0.0	0.0	1.0	1.0	0.0	0.0

TABLE 5 – MEMBERSHIP DEGREES IN FUZZY SETS (EXPLOITATION-ORIENTED FACTORS)

Fuzzification	Exploitation-oriented factor	X_1	X_2	X_3	X_4	X_5	X_6
Membership degrees in fuzzy sets	MW	0.0	0.0	0.0	0.0	0.0	0.0
	mW	0.0	0.0	0.7	0.0	0.0	0.2
	mS	0.0	0.3	0.3	0.9	0.1	0.8
	MS	1.0	0.7	0.0	0.1	0.9	0.0

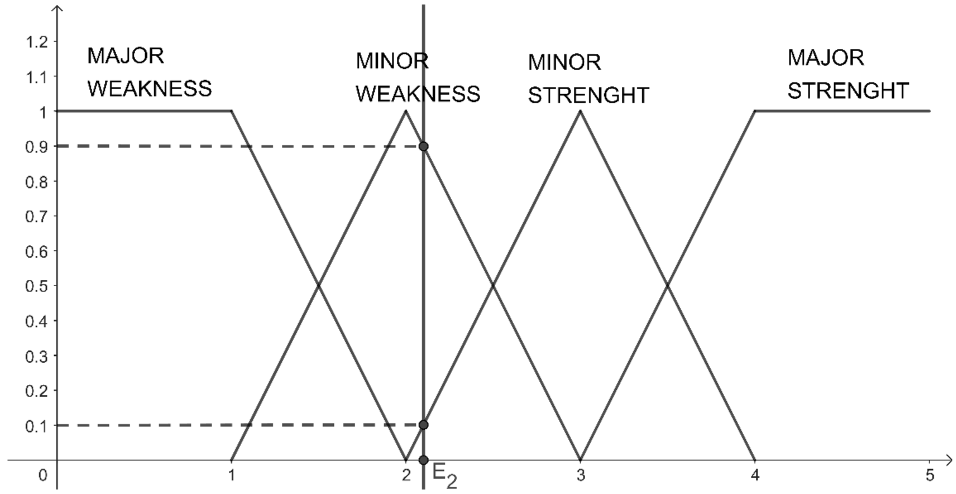

FIGURE 2 – GRAPHICAL REPRESENTATION OF AN EXPLORATION-ORIENTED FACTOR E_2

Subsequently, the strength of the correlations between exploration-oriented and exploitation-oriented factors is assessed using values from the interval [0,1]. The resulting data are presented in the interaction matrix (Table 6).

TABLE 6 – INTERACTION MATRIX BETWEEN EXPLORATION- AND EXPLOITATION-ORIENTED FACTORS

Factors	X_1	X_2	X_3	X_4	X_5	X_6
E_1	0.4	0.5	0.7	0.2	0.3	0.1
E_2	0.5	0.6	0.8	0.2	0.3	0.2
E_3	0.5	0.6	0.4	0.5	0.5	0.4
E_4	0.3	0.4	0.2	0.8	0.9	0.6
E_5	0.2	0.3	0.2	0.4	0.4	0.8
E_6	0.2	0.3	0.2	0.5	0.5	0.9

For each pair $E_i \times X_j$, the activation degree of each applicable rule was calculated by the minimum operator, and the obtained value was then multiplied by the corresponding interaction coefficient ω_{ij}. The dominant strategy for each pair was selected as the strategy with the highest weighted membership degree.

In order to derive the optimal strategies, the next step involved processing the data through the predefined IF–THEN rules by considering each exploration-oriented factor in combination with each exploitation-oriented factor. Table 7 was constructed by combining the membership degrees reported in Tables 4 and 5 with the interaction coefficients presented in Table 6, in accordance with the specified fuzzy IF–THEN rules. For each pair of exploration-oriented and exploitation-oriented factors, the degree of rule activation was first determined using the minimum operator. The following example refers to the combination of factors E_5 and X_6. By considering only a portion of the table and the corresponding decision rules, the following result was obtained:

	$\mu_{mW}(X_6) = 0.2$	$\mu_{mS}(X_6) = 0.8$
$\mu_{mW}(E_5) = 0.3$	$\mu_{mm}(S_{56})$	$\mu_{mM}(S_{56})$
$\mu_{mS}(E_5) = 0.7$	$\mu_{Mm}(S_{56})$	$\mu_{MM}(S_{56})$

Rules that are applied are 6, 7, 10 and 11, and the strength of these rules is determined as follows:

$$\mu_6 = \mu_{mW}(E_5) \wedge \mu_{mW}(X_6) = min(0.3,0.2) = 0.2$$
$$\mu_7 = \mu_{mW}(E_5) \wedge \mu_{mS}(X_6) = min(0.3,0.8) = 0.3$$
$$\mu_{10} = \mu_{mS}(E_5) \wedge \mu_{mW}(X_6) = min(0.7,0.2) = 0.2$$
$$\mu_{11} = \mu_{mS}(E_5) \wedge \mu_{mS}(X_6) = min(0.7,0.8) = 0.7$$

By weighting the obtained strategy values with the corresponding weight $\omega_{56} = 0.8$ from the interaction matrix, the following results are obtained:

$$\omega_{56} \times \mu_{mm}(S_{56}) = 0.8 \times 0.2 = 0.16$$
$$\omega_{56} \times \mu_{mM}(S_{56}) = 0.8 \times 0.3 = 0.24$$
$$\omega_{56} \times \mu_{Mm}(S_{56}) = 0.8 \times 0.2 = 0.16$$
$$\omega_{56} \times \mu_{MM}(S_{56}) = 0.8 \times 0.7 = 0.56$$

The most strongly indicated strategic outcome is Max-Max with degree $\mu_{MM}(S_{56}) = 0.56$.

After completing the described procedure for all combinations of exploration-oriented and exploitation-oriented factors, the resulting fuzzy matrix can be presented as follows:

TABLE 7 – FUZZY MATRIX

Factors	X_1	X_2	X_3	X_4	X_5	X_6
E_1	mM 0.24	mM 0.30	mm 0.42 mM 0.21	mM 0.12	mM 0.18	mm 0.02 mM 0.06
E_2	mM 0.45 MM 0.05	mM 0.42 MM 0.06	mm 0.56 Mm 0.08 mM 0.24 MM 0.08	mM 0.18 MM 0.02	mM 0.27 MM 0.03	mm 0.04 Mm 0.02 mM 0.16 MM 0.02
E_3	MM 0.50	MM 0.42	Mm 0.28 MM 0.12	MM 0.45	MM 0.45	Mm 0.08 MM 0.32
E_4	MM 0.30	MM 0.28	Mm 0.14 MM 0.06	MM 0.72	MM 0.81	Mm 0.12 MM 0.48
E_5	mM 0.06 MM 0.14	mM 0.09 MM 0.21	mm 0.06 Mm 0.14 mM 0.06 MM 0.06	mM 0.12 MM 0.28	mM 0.12 MM 0.28	mm 0.16 Mm 0.16 mM 0.24 MM 0.56
E_6	mM 0.04 MM 0.16	mM 0.06 MM 0.21	mm 0.04 Mm 0.14 mM 0.04 MM 0.06	mM 0.10 MM 0.40	mM 0.10 MM 0.40	mm 0.18 Mm 0.18 mM 0.18 MM 0.72

Table 7 presents the weighted fuzzy outputs, whereas Table 8 reports, for each pair of factors, the most strongly indicated strategic outcome identified on the basis of the highest degree of membership of the aggregated fuzzy output.

TABLE 8 – DEGREE OF INDICATION OF STRATEGIC ALTERNATIVES IN THE ANALYSED CASE

	X_1	X_2	X_3	X_4	X_5	X_6
E_1	mM 0.24	mM 0.30	mm 0.42	mM 0.12	mM 0.18	mM 0.06
E_2	mM 0.45	mM 0.42	mm 0.56	mM 0.18	mM 0.27	mM 0.16
E_3	MM 0.50	MM 0.42	Mm 0.28	MM 0.45	MM 0.45	MM 0.32
E_4	MM 0.30	MM 0.28	Mm 0.14	MM 0.72	MM 0.81	MM 0.48
E_5	MM 0.14	MM 0.21	Mm 0.14	MM 0.28	MM 0.28	MM 0.56
E_6	MM 0.16	MM 0.21	Mm 0.14	MM 0.40	MM 0.40	MM 0.72

As shown by the matrix of the most strongly indicated strategic outcomes in Table 8, the results indicate that the most prevalent strategic outcomes in this case study fall within the MM category, namely those characterized by simultaneously high levels of exploratory and exploitative orientation. This finding implies that the company's strategic potential is not rooted in a trade-off between exploration and exploitation, but rather in their complementary integration.

The threshold $\alpha \geq 0.70$ was used to identify strongly indicated strategic alternatives, whereas alternatives with membership degrees in the range $0.50 \leq \alpha < 0.70$ were classified as secondary strategic options.

Upon applying the threshold value $\alpha \geq 0.70$, three strategies emerge as the most significant:

1. $S_{45} = MM\ 0.81$
2. $S_{44} = MM\ 0.72$
3. $S_{66} = MM\ 0.72$

These results suggest that the strongest strategic options are those that combine established capabilities related to the existing customer base with exploration-oriented activities directed toward innovation and market development.

The most strongly indicated strategic alternative is S45 $= E_4 \times X_5 = MM\ 0.81$, representing the combination of the exploitation-oriented factor related to fine-tuning the company's offerings in order to maintain current customer satisfaction and the exploration-oriented factor concerned with identifying creative ways to meet customer needs. This strategy could be interpreted as a customer-centred innovation strategy, in which the refinement of existing offerings is closely connected with the development of new solutions aligned with customer expectations. In analytical terms, this result indicates that customer satisfaction and offering refinement should not be viewed only as exploitation-oriented activities, but also as a potential basis for identifying new development opportunities. Such a strategy could involve the systematic use of customer feedback, the adaptation of existing products or services, and the transformation of customer insights into inputs for future innovative activities.

The second most strongly indicated strategic alternative is $S_{44} = E_4 \times X_4 = MM\ 0.72$, which combines the exploitation-oriented factor of continuously monitoring existing customer satisfaction with the exploration-oriented factor of seeking creative ways to meet customer needs. This strategy could be understood as a feedback-driven innovation strategy. It suggests that information gathered from current customers could serve not only as a mechanism for monitoring satisfaction, but also as a source of knowledge for the development of new market solutions. In this sense, customer satisfaction monitoring should be considered as more than a control activity; it could also function as a mechanism for identifying unmet needs, strengthening value propositions, and supporting innovative modifications of products or services.

The third most strongly indicated strategic alternative is $S_{66} = E_6 \times X_6 = MM\ 0.72$, representing the combination of deeper penetration into the existing customer base and the active targeting of new customer groups. This configuration could be interpreted as a dual market development strategy. On the one hand, it reflects the exploitation of the existing customer base through deeper market penetration, cross-selling, or more tailored offerings. On the other hand, it also points to the exploration of new customer groups that are related or adjacent to the company's existing market domain. This strategy should therefore be understood as a balanced expansion logic, in which accumulated market knowledge could provide a foundation for the selective exploration of new demand opportunities.

When the lower threshold of $\alpha \geq 0.50$ is considered, several additional strategies may also be identified as relevant, including $S_{31} = MM\ 0.50$, $S_{23} = mm\ 0.56$, and $S_{56} = MM\ 0.56$. Among them, S_{56}, which combines deeper penetration into the existing customer base with aggressive entry into new market segments, can also be interpreted as a meaningful growth-oriented strategic option. Nevertheless, its degree of membership is lower than that of the previously identified dominant strategies, and it may therefore be treated as a secondary strategic priority.

To examine whether the identification of dominant and secondary strategic alternatives depends substantially on the selected cut-off value, a sensitivity analysis was conducted across several α-levels. The results are presented in Table 9.

The sensitivity analysis shows that the number of retained alternatives changes as the α-level becomes more restrictive. At $\alpha = 0.50$, six alternatives are retained: the three alternatives previously classified as dominant and three additional secondary alternatives. When the threshold is increased to values between 0.60 and 0.70, the same three alternatives - S_{44}, S_{45}, and S_{66} - remain selected. At the more restrictive levels of 0.75 and 0.80, only S_{45} remains above the threshold. Therefore, the size of the recommended strategic portfolio is sensitive to the selected α-level, but the substantive conclusion is robust. Although the broader set retained at $\alpha = 0.50$ and $\alpha = 0.55$ includes one Min–Min alternative, the three alternatives retained across the interval from $\alpha = 0.60$ to $\alpha = 0.70$ all belong to the Max–Max category. Moreover, S_{45} remains the highest-ranked alternative throughout the entire sensitivity analysis. Thus, the general strategic emphasis on the joint strengthening of exploration and exploitation remains stable, although the broader strategic portfolio at lower thresholds also captures a weaker defensive alternative.

TABLE 9 – SENSITIVITY OF STRATEGIC RECOMMENDATIONS TO ALTERNATIVE α-LEVELS

α-level	Retained strategic alternatives	Number of alternatives
0.50	$S_{31}, S_{23}, S_{44}, S_{45}, S_{56}, S_{66}$	6
0.55	$S_{23}, S_{44}, S_{45}, S_{56}, S_{66}$	5
0.60	S_{44}, S_{45}, S_{66}	3
0.65	S_{44}, S_{45}, S_{66}	3
0.70	S_{44}, S_{45}, S_{66}	3
0.75	S_{45}	1
0.80	S_{45}	1

The sensitivity analysis therefore indicates that α = 0.70 provides a comparatively selective decision criterion without altering the dominant strategic direction identified by the model. This threshold retains the three most strongly supported alternatives, whereas decision-makers seeking a broader strategic portfolio may also consider the alternatives retained at $\alpha = 0.50$ or $\alpha = 0.55$. Conversely, a more conservative decision rule, based on $\alpha \geq 0.75$, would prioritise only S_{45}. Accordingly, the α-level should be selected in relation to the decision-maker's desired level of selectivity and tolerance for including alternatives with weaker fuzzy support.

Taken together, the results indicate a predominantly offensive and development-oriented strategic profile for Zepter International, rather than a defensive one. The prevalence of MM strategic alternatives points to the company's ability to build on existing market and operational strengths while also seeking new ways to satisfy customer needs and strengthen its market presence.

The interpretation of these results should also take into account the specific organisational and national context in which the study was conducted. Zepter International combines an international market presence with an organisational unit operating in Serbia, and managerial evaluations may therefore reflect both the company's multinational orientation and the characteristics of its local business environment. In addition, the company's strong emphasis on premium products, health-related solutions, customer relationships, and continuous product development may have contributed to the prominence of customer-centred Max–Max alternatives. In organisations with different market positions, customer structures, technological intensity, resource availability, or institutional environments, other combinations of exploration and exploitation may become more strongly indicated. Consequently, the empirical results should be interpreted as a context-specific demonstration of the proposed framework rather than as evidence of a universally applicable strategic configuration.

5. CONCLUSIONS

This paper proposed a fuzzy-logic-based framework for assessing organisational exploration and exploitation capabilities and translating their interaction into strategic alternatives. The main contribution of the study lies in combining a fuzzy inference structure with a clearly interpretable decision rule, whereby the most strongly indicated strategic outcome is identified according to the highest degree of membership of the aggregated fuzzy output. In this way, the framework makes it possible to preserve the vagueness inherent in managerial judgments while still translating them into a clear and practically applicable strategic recommendation. The proposed framework was empirically demonstrated through a case study of Zepter International, Belgrade, Serbia. The case study results showed that the strongest strategic outcomes are predominantly of the Max–Max type, indicating that Zepter International possesses the capacity to build on its existing exploitation-oriented strengths while also pursuing exploration-oriented opportunities. In particular, the most prominent strategies connect customer knowledge, the continuous improvement of existing offerings, and innovation-oriented market responsiveness. These findings suggest that the most promising strategic direction for Zepter International lies not in privileging exploration over exploitation, or vice versa, but in combining both orientations in a complementary manner. Accordingly, the four alternatives are not intended to represent mutually exclusive or exhaustive strategic configurations, but to function as interpretable reference points within a continuous fuzzy strategic space.

From a methodological perspective, the proposed approach is useful because it enables the transformation of subjective managerial evaluations into a structured analytical framework. Rather than forcing crisp assessments at the outset, the model retains ambiguity through fuzzy sets and IF–THEN rules, and only at the final stage identifies the most strongly indicated strategic outcome. This makes the approach suitable for strategic contexts in which precise measurement is difficult, but expert judgment is available and important.

Several limitations qualify the conclusions drawn from the empirical application. Factor assessments and interaction coefficients are based on managerial judgement and may therefore be influenced by respondent perceptions, organisational roles, and contextual conditions. Furthermore, the use of a single-company case limits the external validity of the results and does not permit direct generalisation across industries, organisational forms, or countries. Further research should test the framework in broader and more diverse samples, including both domestic and multinational organisations, and examine cross-industry and cross-national differences. Additional studies could also compare alternative weighting procedures and α-level thresholds, assess the sensitivity of the resulting strategic classifications, and employ longitudinal designs to capture changes in exploration–exploitation relationships over time.

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