

*Full Length Research Paper*

# **Application of fuzzy multi-criteria decision making for choosing the best strategy in joint stock fishing net manufacturing company: A case study in Iran**

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**In the process of strategic planning, time and uncertainty play an important role. Unpredictable changes in the environment have paralyzed many small and medium industries, wiped them out from competition scene and made the forecasts about the future status of the company fallen short. Companies are facing unpredictable new technologies, new products and emerging markets. Under such conditions, the current company strategies, do not meet their needs in this complex and dynamic environment. Small and medium companies in Iran are no exception from this condition and with the importation of foreign goods, these companies face an uncertain and unstable future. This study is focused on the application of fuzzy multi-criteria decision-making method for choosing the best strategy for the company manufacturing industrial fishing net in Zahedan. The studied company is the only fishing net producer in South East of Iran that provides fishing nets of fishing boat-used community. Fuzzy multi-criteria decision making method applies uncertainty information for the determination of indexes' significance, and views of beneficiary participants simultaneously in the strategic decision making. This approach helps the managers of the aforementioned company to use their present oral information in order to determine the best strategy and its execution.**

**Key words:** Fuzzy multi criteria decision making (FMCDM), small and medium enterprises (SME's), strategy ranking.

## **INTRODUCTION**

When the environment is filled with uncertainty and fluctuation, the slash of change could be more humbling for small companies than the large ones. Therefore, the small and large-scale companies, which have good management, have two choices before themselves: to keep themselves away from the fluctuating environment or to face the environment (Ansef, 2002). Therefore, in this ever-changing market and globalization of small companies, the acquisition of merit and scarce resources management is a vital issue for continuing organizational

life (Kim et al., 2008). The experts believe that the Traditional strategic planning, which looks at the environment as a stable and predictable entity, is inefficient once facing the fluctuating environment. Based on the survey which has been carried out by Faster on the experts of planning, the foremost need of strategic planning in today's fluctuating and competitive world has been paying attention to uncertain factors (Hanafizadeh et al., 2006). The recent studies showed that strategic planning could not be stable in the dynamic environment, and consequently, the constant revision and choice of the strategies is inevitable (Ocasio and Joseph, 2008).

Choosing the appropriate strategy after reviewing the process of strategic planning has become a critical task

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for the involved managers in strategy determination for each enterprise. Since uncertainty is in the nature and essence of future, and suitable facing of this future is a critical situation for the managers, it is essential for the managers to investigation environmental borders of the enterprise in respect to the new situations which happens for the enterprise and afterwards re-develop the previous strategies and define new ones according to the emerging situation. In Iran's Sistan and Baluchestan province, industry is at its youth stage, so, it demands plans which takes into consideration both internal and external environments of the enterprise simultaneously. Concerning the accessibility to waters of the Oman Sea and also the accessibility to Chabahar free commercial zone, fishing net production industry had been taken into consideration to pave the way for managers to be able to exist in this highly competitive environment and to be able to keep their performance and efficiency in an acceptable level. The strategy selection approach in this article has combined general approach for developing strategy with uncertainty confrontation tool (for example, qualitative approaches for choosing strategy) to wipe out the difficulties and deficiencies in quantity strategic planning matrix (QSPM) approach, the potential strategies are ranked-ordered for the small companies.

### **Fuzzy multiple criteria decision making in strategic planning for unstable and uncertain conditions**

Our capability in predicting the future is limited, since a very small change in likely unrelated phenomena could lead to a very severe change in all the system; how the companies could set the strategies in such ever-changing atmosphere and environment (Turner, 1998). The traditional approaches of strategic planning lay out the plans based on the unchangeable predictions of the future. In the traditional approaches, the selection of the strategy have benefited from quantitative and unchangeable data, which are not reliable data according to the changing and unstable environment (David, 2004). The more unstable is the environment, the more unpredictable future would be, and hence, the predictable decision makings- which the previous traditional approaches counting on- are unreliable and the probability of their occurrence will become very low. In strategic decision making, mostly qualitative criteria have been used and the complexity of the rules and numerous criteria has made the prevailing decision making models inefficient. This issue have emerged new tools which give insight and equip the well to face the environmental change. One of these tools is fuzzy hierarchical decision making systems, which solves the problems of uncertainty and the incongruence of the strategies with the predetermined goals (Hanafizadeh et al., 2006), and in the dynamic economic and social situations, fuzzy management knowledge which has flexibility could have answers for the questions (Azar and Faraji, 2007).

### **Fuzzy sets theory**

Zadeh introduced fuzzy sets theory in 1965 in a dissertation "Fuzzy Sets - Information and Control". Zadeh introduced its concept and some important ideas, which has a significant role in the evaluation of fuzzy sets theory. Zadeh also introduced many ideas about fuzzy decision makings and fuzzy optimization. The foundation of fuzzy logic is based upon Fuzzy sets and these sets are the expansion of the classic theory of sets in mathematics (Khademizadeh and Abarghouee, 2008). This theory attributes to each number, from the real numbers sets, a number from the range 0 to 1, as the degree of its membership (Azar and Farajee, 2007).

Zadeh, beside Mandami and Assilian, have expanded fuzzy logic and showed a concept of approximate estimations. They showed that logically ambiguous statements provide an algorithm, which could use ambiguous  $\mu(x)$  data for the conclusion from ambiguous deductions (Benitez et al., 2007). In  $\mu$  of this theory, the membership of the members of the set is being determined by function, which  $x$  is the representative of a known member and is a fuzzy function, that determines the membership degree of  $x$  in the relevant set and its quantity is between zero and one. This relation could be shown as follows (Khademizareh and Abarghouee, 2008):

$$\tilde{A} = \{(x, \mu_A(x)) \mid x \in X\}$$

Therefore, since this theory gives us good information about the environment of the knowledge under study, it could be a very beneficial instrument for the automation of human activities according to uncertain information (Wua et al., 2009).

In the analysis of industry, there are many different factors, which are probable and estimating. Two significant factors are the volume of the enterprise and the probability within the gained information, which are paid so much attention (Grassi et al., 2009). Generally, as the probability within the information (which is the specification of fuzzy systems) increases, and the system becomes more complicated, the precision of the system decreases. This relation is as shown in Figure 1 (Kahraman et al., 2007).

### **Fuzzy numbers: Triangular and trapezium fuzzy numbers**

Fuzzy numbers are the natural extension of cardinal numbers (Azar and Farajee, 2007). A fuzzy number is a concave set which has been specified by an interval of cardinal numbers with membership degree between 0 and 1 (Hsu et al., 2009; Wang and Triantaphyllou, 2008) and according to the type of the function and the possibility contribution, we could define infinite fuzzy numbers (Khademizareh and Abarghouee, 1387). Among

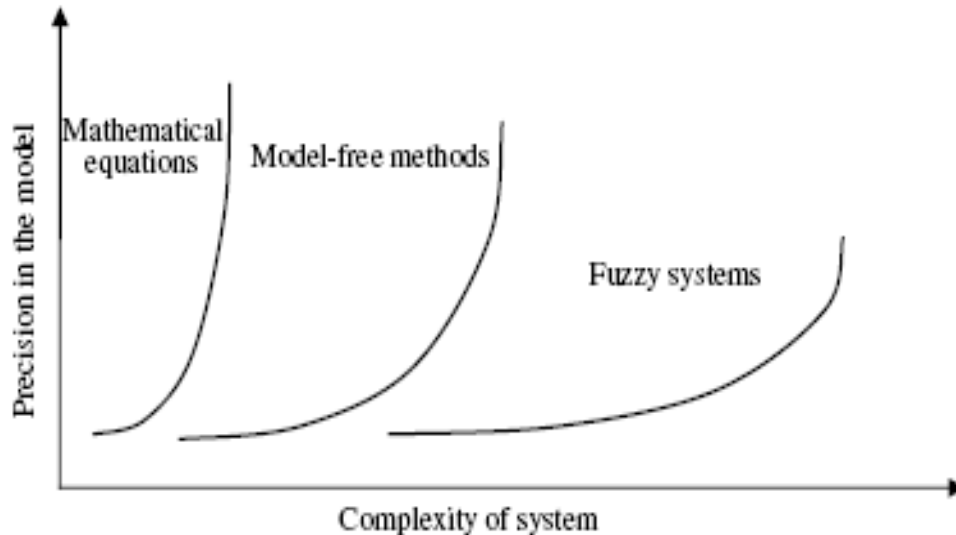


Figure 1. System complexity vs. model's precision

the fuzzy numbers, the triangular and trapezium fuzzy numbers are the most significant ones. A triangular fuzzy number could be shown by a triple order like:

$$X = (x, \alpha, \beta)$$

$X$ , is the central or the most possible quantity

$$(\mu_x(x) = 1)$$

In addition,  $\alpha$  is called the left extreme and  $\beta$  as the right extreme. Figure 2 shows this relation. Trapezium fuzzy number could be shown by:  $(\mu_x(x_1) = \mu_x(x_2) = 1)$ .  $\alpha$  and  $\beta$ , in order, are the left and right extremes. Also, this number could be shown as  $X = (x_1^m, x_2^m, x^p, x^o)$ ,  $(\mu_x(x_1^m) = \mu_x(x_2^m) = 1)$ ;  $X_1^m$  and  $X_2^m$  are the most possible values and  $x^p$  the pessimistic value or the least value ( $\mu_x(x^p) = 0$ ) and  $x^o$  is the optimistic or the most value ( $\mu_x(x^o) = 0$ ). Figure 3 shows this relationship (Khademizareh and Abarkouee, 2008).

### Determine the overall strategy of the company

For the determination of each company's strategy, the common approach of SWOT has been used, which need the following five steps:

1. Determination of the strength, weakness, opportunity, and threat of the company
2. Analysis of the internal and external factors of the company by the application of internal factor evaluation matrix (IFEM) and external factor evaluation matrix (EFEM).

3. Determination of the location of the company in comparison to the rivals by the application of competitive profile matrix (CPM).

4. Determination of the overall location of the company by the application of internal-external matrix (IEM).

5. Determination of overall strategies of the company by the application of SWOT

Each step's instruction is given thus. The derived results of the tables have been stated. From the EFEM, we got a score of 2.071, which is less than 2.5 and shows that the company had not been successful in the application of the opportunities and avoidance of the threats. From the IFEM, the score 2.97 has been derived, which is more than 2.5 and it means that the company has been somewhat successful in the improvement of the weak points.

The derived results from this matrix shows that the company in comparison to its two other rivals has no good situation. The Korean company by the advantage of its forerunning quality could stabilize its own place in the market and grasp a wide share of the market. The Chinese company could also expand its own share in Iran's market by the decrease of the price, up to 60% of Iran's market. Internal-external matrix is for the formulation of the strategy in the company's level and its SBUs, and the various parts of a set or the products of a company, which could be governmental, private or public. In this matrix, the situation and location of a company in a functional environment, and in schematic diagram, comes into scrutiny. The total of the harmonious scores, derived from the evaluation of the IEF and EFE factors are showing that the decrease and the release strategies is favorable for company.

Now for the determination of the detailed and more elaborated strategies of the company, we form the SWOT

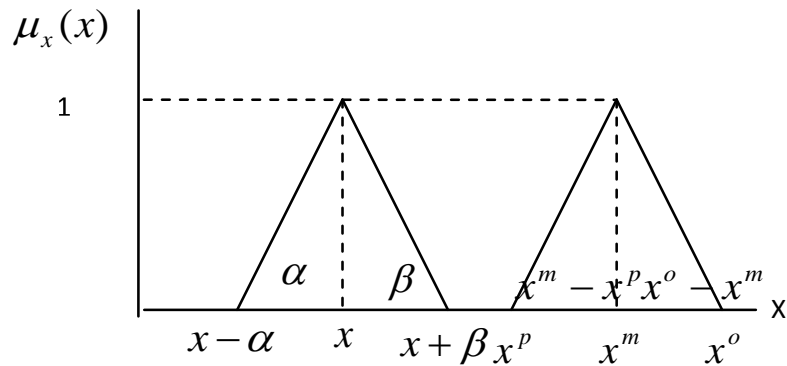


Figure 2. Showing triangular fuzzy number.

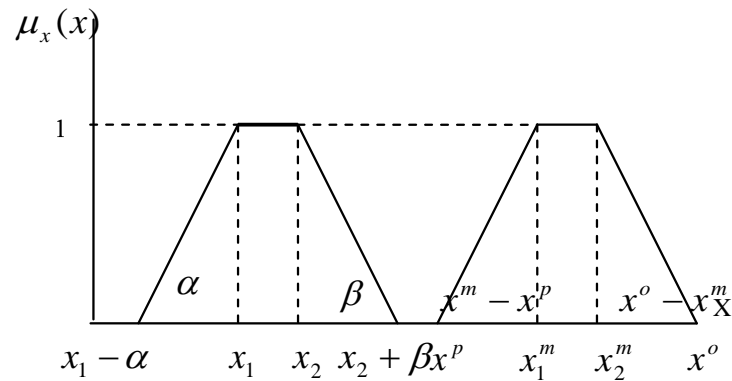


Figure 3. Showing trapezium fuzzy numbers.

matrix, which is our main work. By listing the strong and weak points, opportunities, and threats for different departments, different strategies should be set. At last, all the strategies, by considering all the internal and external factors in setting the strategies, were set and the compound strategies were set in the borders of these strategies.

## METHODOLOGY

For the selection of the appropriate strategy for the company which is manufacturing fishing net, among the six strategies of multi-criteria fuzzy decision making, and by the application of qualitative values, and finally mixing the views of the directing manager, general affairs manager, and the strategist, the suitable strategy for this company is set. These strategies are:

Strategy 1: The decrease of corporate costs to be able to decrease competitive price by the application of experienced staff.

Strategy 2: The enforcement of marketing as well as R&D departments.

Strategy 3: Application of tribal communications and relations, which is prevailing in the province for the increase in the sale.

Strategy 4: The increase of the costumers' loyalty to the products of the company.

Strategy 5: Manufacturing products according to the European standards.

Strategy 6: Establishing vast distribution centers in the strategic regions and having close relationship with these centers.

It is noteworthy to mention that in order to make an agreement between the objectives and the strategies, objectives with different weights have been taken into consideration as the attributes of selection, which are shown in Figure 4, in the hierarchical tree of objectives, attributes and strategies.

In extension analysis (EA) approach, fuzzy triangular numbers are used for paired comparisons. According to the 1/9 to 9 continuum of Saati, which is as shown in Table 1, we can form the paired comparisons as triangular numbers. In this phase, the decision makers, which are directing managers, general affairs and the strategist in our research, declare their preferences by paired comparisons of each level in comparison to the higher levels in a fuzzy way.

Making such tables (Table 2), we asked directing managers, general affairs and the strategist to declare the importance of each scale in comparison to the other one in verbal variables formats, which are afore stated. Then, the equivalent fuzzy values of each one is inserted, and after that, the average of the fuzzy numbers, which are proposed by the aforementioned persons, calculated, and shown in Table 2 (Azar and Farajee, 2007).

For example, for the preference of profit-making in comparison to the productivity, in the directing manager, general affairs and the strategist's point of views respectively, we have: almost to strongly

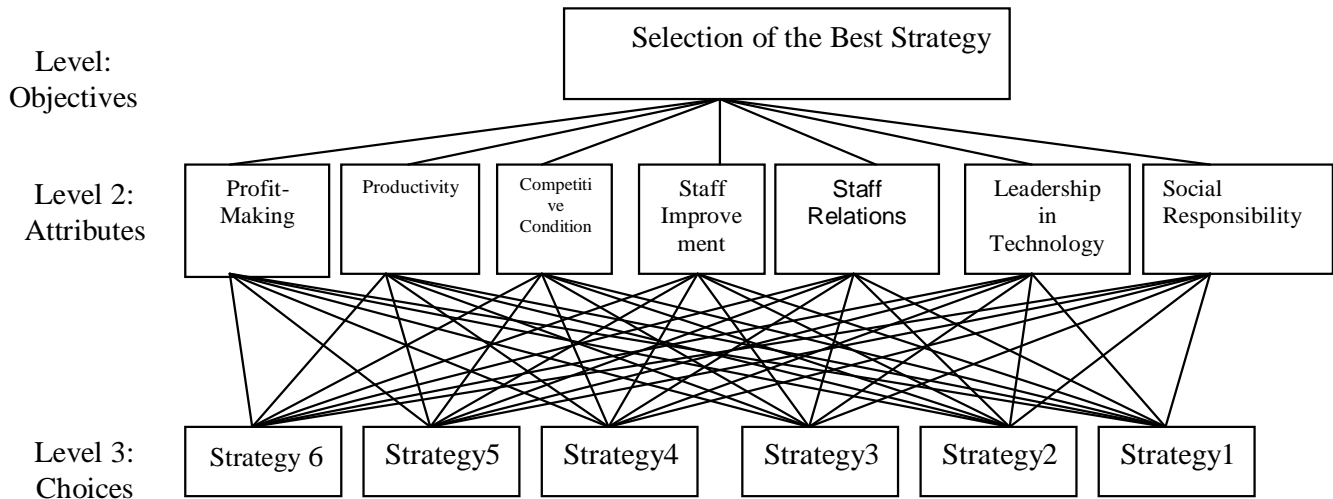


Figure 4. Formation of Hierarchical Tree

Table 1. The scale of two by two comparisons in AHP.

Fuzzy value	Degree of importance in two by two comparison
(1, 1.1, 1.2)	Equal preference
(1, 1.2, 1.3)	Equal to almost preferred
(1.2, 1.3, 1.4)	Almost preferred
(1.3, 1.4, 1.5)	Almost to strongly preferred
(1.4, 1.5, 1.6)	Strongly preferred
(1.5, 1.6, 1.7)	Strongly to extremely strong, preferred
(1.6, 1.7, 1.8)	Extremely strong preference
(1.7, 1.8, 1.9)	Extremely to infinitely preferred
(1.8, 1.9, 2)	Infinitely preferred

preferred, almost preferred, almost preferred with the fuzzy numbers of (1.2 1.3 1.4), (1.2 1.3 1.4), (1.3 1.4 1.5), with the average of:

$$\frac{1.2+1.2+1.1,1.3+1.3+1.2,1.4+1.4+1.3}{3} = (\frac{3.7}{3}, \frac{4}{3}, \frac{4.3}{3}) = (1.23, 1.33, 1.43)$$

In the second step or phase, by the application of the definitions and concepts of fuzzy AHP, the coefficient of each paired comparisons is being calculated. So, we take into consideration Table 2. For the calculation of  $S_k$  's, which are fuzzy numbers themselves, we have:

$$\left[ \sum_{i=1}^m \sum_{j=1}^n M_{ij} \right]^{-1} = (49.405, 53.055, 56.885)^{-1} = (0.0176, 0.0188, 0.0202)$$

$$S_1 = \sum_{j=1}^n M_{1j} \times \left[ \sum_{i=1}^m \sum_{j=1}^n M_{ij} \right]^{-1} = (9.8, 10.5, 11.2) \times (0.0176, 0.0188, 0.0202) = (0.172, 0.197, 0.226)$$

which are the other coefficients in the fuzzy format. Now, we calculate the largeness degree of each of these elements, over the other elements, when M2 is larger than M1, so:

$$V(S_1 \geq S_2) = \frac{u_1 - l_2}{(u_1 - l_2) + (m_2 - m_1)} = 1$$

Moreover, for the calculation of largeness degree of  $S_i$  over the other  $S_i$ 's, we have:

$$V(S_1 \geq S_2, S_3, S_4, S_5, S_6, S_7) = \min(S_1 \geq S_2, S_1 \geq S_3, S_1 \geq S_4, S_1 \geq S_5, S_1 \geq S_6, S_1 \geq S_7)$$

$$V(S_1 \geq S_2, S_3, S_4, S_5, S_6, S_7) = \min(1, 1, 1, 1, 1, 1) = 1$$

$$V(S_2 \geq S_1, S_3, S_4, S_5, S_6, S_7) = \min(0.714, 1, 1, 1, 1, 1) = 0.714$$

$$V(S_3 \geq S_1, S_2, S_4, S_5, S_6, S_7) = \min(0.3, 0.65, 1, 1, 0.97, 1) = 0.3$$

$$V(S_4 \geq S_1, S_2, S_3, S_5, S_6, S_7) = \min(0, 0, 0, 1, 0, 0.33) = 0$$

$$V(S_5 \geq S_1, S_2, S_3, S_4, S_6, S_7) = \min(0, 0, 0, 0.72, 0, 0.015) = 0$$

$$V(S_6 \geq S_1, S_2, S_3, S_4, S_5, S_7) = \min(0.42, 0.72, 1, 1, 1, 1) = 0.42$$

**Table 2.** The combination of paired comparison matrixes in comparison to each other, in the decision maker's eyes.

Scales	Profit-making	Productivity	Competitive condition	Staff Improvement	Staff relations	Leadership in techno	Social responsibility
Profit-making	(1, 1.1, 1.2)	(1.23, 1.33,1.43)	(1.5, 1.6, 1.7)	(1.67, 1.77, 1.87)	(1.8, 1.9, 2)	(1.2,1.3,1.4)	(1.4,1.5, 1.6)
Productivity	(0.7, 0.75, 0.81)	(1 1.1 1.2)	(1.37,1.47,1.57)	(1.5, 1.6, 1.7)	(1.7,1.8, 1.9)	(1.2,1.3, 1.4)	(1.3,1.4, 1.5)
Competitive condition	(0.59,0.625, 0.67)	(0.64,0.68, 0.73)	(1 1.1 1.2)	(1.5, 1.6, 1.7)	(1.5,1.6, 1.7)	(0.59, 0.625, 0.67)	(1.3,1.4, 1.5)
Staff improvement	(0.54,0.57, 0.6)	(0.59,0.625,0.67)	(0.59,0.625, 0.67)	(1 1.1 1.2)	(1.1, 1.2, 1.3)	(0.59, 0.625, 0.67)	(0.67,0.71, 0.77)
Staff relations	(0.5,0.53, 0.56)	(0.53,0.56, 0.59)	(0.59,0.625, 0.67)	(0.77,0.83, 0.91)	(1 1.1 1.2)	(0.56, 0.59, 0.625)	(0.68,0.73, 0.77)
Leadership in techno	(0.59,0.625, 0.67)	(0.71,0.77, 0.83)	(1.2, 1.3, 1.4)	(1.5, 1.6, 1.7)	(1.6,1.7, 1.8)	(1 1.1 1.2)	(1.1, 1.2, 1.3)
Social responsibility	(0.625,0.67, 0.71)	(0.67,0.71, 0.77)	(0.67,0.71, 0.77)	(1.3, 1.4, 1.5)	(1.27,1.37, 1.47)	(0.77,0.83,0.91)	(1 1.1 1.2)

**Table 3.** The verbal variables and their values (Jafarnejad and Usefi, 2008).

Fuzzy numbers	Symbol	Verbal values
(0,0.125,0.25)	VB	Very bad
(0.125,0.25,0.375)	B	Bad
(0.25,0.375,0.5)	MB	Medium bad
(0.375,0.5,0.625)	M	Medium
(0.5,0.625,0.75)	MG	Medium good
(0.625,0.75,0.875)	G	Good
(0.75,0.875,1)	VG	Very good

$$V(S_7 \geq S_1, S_2, S_3, S_4, S_5, S_6) = \min(0.09, 0.113, 0.45, 1, 1, 0.87) = 0.09$$

These numbers show the out of format weights of the scales:

$$w' = [1, 0.714, 0.3, 0, 0, 0.42, 0.09]^t$$

Now, according to this relation:

$$w_i = \frac{w'_i}{\sum w'_i}$$

The values of the formatted weights of the scales are as follows:

$$w = [0.396, 0.28, 0.199, 0, 0, 0.166, 0.036]$$

Now, by the determined scales' weights, the weight of the scales or the objectives of the staff and the staff relation did not pay any attention to none of the decision makers, so they are omitted, and the selection of the strategy, will be done, by considering other scales (Jafarnejad and Usefi, 2008).

Here, Table 4 has been presented. Now, by the combination of the three decision makers, we have:

$$\frac{l_1 + l_2 + l_3, m_1 + m_2 + m_3, u_1 + u_2 + u_3}{3} = (l, m, u)$$

Now, by the application of the following standard approach, the rank of the 'i' Th, is (Jafarnejad and Usefi, 2008):

$$F_i = \left(\frac{1}{n}\right)\{(P_{i1} \times W_{i1}) + (P_{i2} \times W_{i2}) + \dots + (P_{in} \times W_{in})\} \xrightarrow{\text{that}} n = 1, 2, 3, 4, 5$$

The results are presented in Table 6. According to the results, the strategic ranking is presented in Table 7.

Based on the results, the best strategy, considering the objectives and the taste of the costumers is, "establishing wide distribution centers in the strategic regions and having close relation with these centers". The strategy of "the increase in the loyalty and trust of the costumers" has, with a slight place, been chosen as the second strategy, which is applicable any time the management prefers.

**Conclusion**

Until the time when there is no objective for a system (like a company), it does not know where

to go to have a spotlight on the way. If we had a determined objective, there would have been no need to plan afterward; however, the system does not know how to acquire that objective. Therefore, each system that wants to succeed must have obvious objectives and specify the manner and the time (plan) of reaching those objectives, to move towards the objectives according to the plan and to be able to have supervision over its movement to decrease the probable deviations.

Medium and small companies are small systems; they are dynamic in the global economy, which could keep up with large companies, and have considerable role in the global markets, and panoramas of competition. Seemingly, that which can help these companies to be more impressive is to have managerial approaches, especially models and paradigms in the field of strategic planning, because up to now, not many models were developed in this field. After the strategic planning, the selection of a suitable and practical strategy is emphasized. The strategies, which are set according to the internal weakness and strength, and external threats and opportunities, must now be scrutinized. But problems, such as not paying enough attention to the tastes of the decision makers and corporate objectives, using a candid theoretical environment which is ambiguous, caused the selections to be futile. So,

**Table 4.** The importance of the strategies in comparison to each scale, according to directing manager.

Choice	Scale Weight	Social responsibility	Technology leadership	Competitive condition	Productivity	Profit-making
		(0.036)	(0.166)	(0.199)	(0.28)	(0.396)
The decrease of the company's cost to acquire decrease in competitive price by the application old and experienced staff		B	B	M	MG	VG
The enforcement of marketing and R&D department s		M	G	VG	MG	M
The increase in the loyalty and trust of the costumers		G	MG	G	M	VG
Producing more competitive products based on European standards		M	VG	MG	M	M
Applying tribal communication and relations , prevailing in the province		VG	MB	MG	M	G
Establishing wide distribution centers in the strategic regions and having close relation with these centers		MG	M	G	MG	VG

**Table 5.** The combination of the views in comparison to the importance of the strategies relevant to each scale.

Choice	Scale Weight	Social responsibility	Technology leadership	Competitive condition	Productivity	Profit-making
		0.036	0.166	0.199	0.28	0.396
The decrease of the company's cost to acquire decrease in competitive price by the application old and experienced staff		(0.167, 0.292, 0.417)	(0.25, 0.375, 0.5)	(0.5, 0.625, 0.75)	(0.583,0.708, 0.833)	(0.625,0.75, 0.875)
The enforcement of marketing and R&D departments		(0.458, 0.583, 0.708)	(0.542,0.667, 0.792)	(0.75,0.875, 1)	(0.5, 0.625, 0.75)	(0.458,0.583, 0.708)
The increase in the loyalty and trust of the costumers		(0.708, 0.833, 0.958)	(0.375, 0.5, 0.75)	(0.625, 0.75, 0.875)	(0.458,0.583, 0.708)	(0.708,0.833, 0.958)
Producing more competitive products based on European standards		(0.375, 0.5, 0.625)	(0.75,0.875,1)	(0.542,0.667, 0.792)	(0.5, 0.625, 0.75)	(0.417,0.542, 0.667)
Applying tribal communication and relations , prevailing in the province		(0.708, 0.833, 0.958)	(0.25, 0.375, 0.5)	(0.542,0.667, 0.792)	(0.375,0.5, 0.625)	(0.583,0.708, 0.833)
Establishing wide distribution centers in the strategic regions and having close relation with these centers		(0.583, 0.708, 0.833)	(0.375, 0.5, 0.625)	(0.583,0.708, 0.833)	(0.583,0.708, 0.833)	(0.75,0.875, 1)

these facts, reinforces the trend to apply fuzzy approaches, that are based upon uncertain information and verbal variables. However, in

different fuzzy approaches, fuzzy multi-criteria decision-making (FMCDM), because of its ability to wipe the aforementioned problems, and taking

into consideration the taste of the decision makers and corporate objectives, was chosen for this research.

**Table 6.** The importance coefficient of the choices.

Choices	Scales (weights)					Importance coefficient of the choices
	Social responsibility (0.036)	Technology leadership (0.166)	Competitive condition (0.199)	Productivity (0.28)	Profit-making (0.396)	
The decrease of the company's cost to acquire decrease in competitive price by the application old and experienced staff	(0.167, 0.292, 0.417)	(0.25, 0.375, 0.5)	(0.5, 0.625, 0.75)	(0.583, 0.708, 0.833)	(0.625, 0.75, 0.875)	(0.111, 0.1387, 0.1654)
The enforcement of marketing and R&D department s	(0.458, 0.583, 0.708)	(0.542, 0.667, 0.792)	(0.75, 0.875, 1)	(0.5, 0.625, 0.75)	(0.458, 0.583, 0.708)	(0.1154, 0.1423, 0.1693)
The increase in the loyalty and trust of the costumers	(0.708, 0.833, 0.958)	(0.375, 0.5, 0.75)	(0.625, 0.75, 0.875)	(0.458, 0.583, 0.708)	(0.708, .833, 0.958)	(0.1242, 0.1511, 0.1821)
Producing more competitive products based on European standards	(0.375, 0.5, 0.625)	(0.75, 0.875, 1)	(0.542, 0.667, 0.792)	(0.5, 0.625, 0.75)	(0.417, .542, 0.667)	(0.1102, 0.1371, 0.1646)
Applying tribal communication and relations , prevailing in the province	(0.708, 0.833, 0.958)	(0.25, 0.375, 0.5)	(0.542, 0.667, 0.792)	(0.375, 0.5, 0.625)	(0.583, .708, 0.833)	(0.1022, 0.1291, 0.156)
Establishing wide distribution centers in the strategic regions and having close relation with these centers	(0.583, 0.708, 0.833)	(0.375, 0.5, 0.625)	(0.583, 0.708, 0.833)	(0.583, 0.708, 0.833)	(0.75, 0.875, 1)	(0.1319, 0.1588, 0.1858)

**Table7.** Ranking of the strategies.

Strategy	Fuzzy number	Ranking
The decrease of the company's cost to acquire decrease in competitive price by the application old and experienced staff	(0.111, 0.1387, 0.1654)	4
The enforcement of marketing and R&D department s	(0.1154, 0.1423, 0.1693)	3
The increase in the loyalty and trust of the costumers	(0.1242, 0.1511, 0.1821)	2
Producing more competitive products based on European standards	(0.1102, 0.1371, 0.1646)	5
Applying tribal communication and relations , prevailing in the province	(0.1022, 0.1291, 0.156)	6
Establishing wide distribution centers in the strategic regions and having close relation with these centers	(0.1319, 0.1588, 0.1858)	1

Overall, applying fuzzy calculations in ranking and selection of the strategies has the following advantages:

1. The application of the mental inferences of the expert in the model.
2. The adaptability of the attributed weights to the

- criteria of the objective.
3. Acquiring more tangible and factual results in analysis and ranking of the strategies.



In this article, strong approaches about the designing of strategic plans have been applied and a new approach in selection of the strategies has been applied. Finally, the application of fuzzy approaches, instead of common approach of strategic planning matrix, made the results slightly differ. In the application of the traditional and common approach of QSPM, the result, was the implementation of the strategy " increasing in the loyalty and trust of the costumers," but the present result is "establishing wide distribution centers in the strategic regions and having close relation with these centers" and have placed the" increasing in the loyalty and trust of the costumers," in the second row.

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