Ranking the Key Factors of Success in Strategic Thinking and Management by Using MCDM-FAHP Technique

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Abstract. The role of managers in the process of strategic planning and decision making depends on how they are thinking. Strategic planning frameworks only provide questions to be answered; the answers depend on executives' methodologies for decision making. Strategic thinking plays a critical role in today's business survival.

The aim of this paper is key factors to success in in strategic thinking and management by using Fuzzy Analytical Hierarchy Process (FAHP) method has been ranked in terms of importance as one of the multi criteria decision making (MCDM) approaches. In this way at the first different experts and elites of main criteria are classified and ranked by interview in three general groups including factors of systemic, individual, and organizational. In the next phase, on the basis of literature review of various sub-criteria which had placed in the subset of each main criterion, they were studied and ranked. The results of research show that between the main criteria, organizational factors and between the sub-criteria, risk tolerance have the most importance.

Key words: strategic thinking, success, fuzzy analytical hierarchy process, ranking.

1. Introduction.

Strategy has never been more challenging, or more important, than in today's environment of global competition, in which, corporate strategies must transcend the borders of nations and markets. Too many organizations try to be everything to everyone, wasting resources in markets that may never provide a worthwhile return on investment. The role of managers in the process of strategic planning and decision making depends on how they are thinking. Strategic planning frameworks only provide questions to be answered; the answers depend on executives' methodologies for decision making. Strategic thinking plays a critical role in today's business survival.

Strategic thinking is a process that defines the manner in which people think about, assess, view, and create the future for themselves and others. Strategic thinking is an extremely effective and valuable tool. One can apply strategic thinking to arrive at decisions that can be related to your work or personal life. Strategic thinking involves developing an entire set of critical skills.

Strategic Thinking is a planning process that applies innovation, strategic planning and operational planning to develop business strategies that have a greater chance for success.

More and more organizations are learning that past experience is not always the best basis for developing future strategies. Executives need to thoughtfully consider how to create value for customers. The exercise of strategic planning, while important, tends to answer the "how" and "when" of business planning and rarely captures the essence of what it means to think strategically. That's where strategic thinking comes in. Strategic thinking is the "what:" and "why" of the planning process. It answers the question, "What should we be doing, and why?"

The purpose of Strategic Thinking is to create a strategy that is a coherent, unifying, integrative framework for decisions especially about direction of the business and resource utilization. To do it, Strategic Thinking uses internal and external data, qualitative synthesis of opinions and perceptions. It is conscious, explicit, and proactive and defines competitive domain for corporate strategic advantage.

Strategy is a key outcome of a relevant strategic thinking process. Tregoe and Zimmerman outlined the relationship between strategy and operations in their work on strategy, "Top Management Strategy: What It Is and How to Make It Work".

Strategic Thinking is the combination of Innovation, Strategy Planning, and Operational Planning. The process begins with Innovation. We try to create the ideal future and consider the plans needed to achieve them and to see them through. Innovation helps us to move outside our comfort zone into the possibilities of exceeding customer and organizational requirements and expectations.

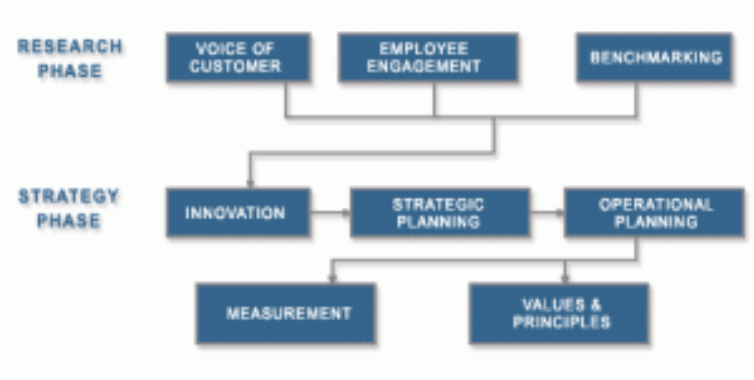
Innovations are then articulated into a series of strategies. This is a part of the entire Strategic Planning process. However, in Strategic Thinking, we incorporate the needs of our customers, the organization and our staff in the process. We incorporate Benchmarking to ensure that industry best practices are included in our vision of the future.

Employee Involvement at each stage of the Strategic Thinking process is key to ensuring that they stay involved in the execution of the Operational plans. This is where Operational Planning comes to play. It is the process of taking the strategies (the outcomes of the Strategic Planning process) and developing them into action

plans that are achievable and involve staff throughout the organization in ensuring that the needs of the customer and the organization are met.

The last part of Strategic Thinking is Measurement. There must be an on-going process of measuring the effectiveness of the plans and verifying that they are implemented as planned. Measurement is also used to benchmark the original needs against the implemented actions.

To successfully implement strategic change, initiated through the strategic thinking process, it is important for all levels of employees to fully incorporate the change in everything they do. We do this by identifying and establishing Values and Principles to ensure the organization is successful at achieving its strategic goals.



Mintzberg describes strategic thinking as a distinct way of thinking that utilizes intuition and creativity with the outcome being "an integrated perspective of the enterprise" (Mintzberg, 1994). Goldman et al. apply Mintzberg's definition to a business context, suggesting that effective strategic thinking leads to competitive advantage:

Strategic thinking is an individual thinking activity that benefits organizations. Its purpose is to discover competitive strategies to position the organization significantly differently from the present. Thinking strategically is not the same as preparing a strategic plan, which details tactics to be taken to achieve goals and objectives. Strategic thinking is thinking that contributes to broad, general, overarching concepts that focus the future direction of an organization based on anticipated environmental conditions (Goldman et al, 2010).

In distinguishing strategic thinking from strategic planning, Mintzberg suggests that each requires different types of thinking: strategic planning requires linear, analytical processes, and strategic thinking necessitates more intuitive and open-ended cognition (Mintzberg, 2009). Ohmae also describes strategic thinking as the "ultimate nonlinear thinking tool," in contrast to conventional, systems-based approaches of thinking (Ohmae, 1982). Maxwell cites one dictionary definition of strategy as "the science of planning and directing large-scale military operations, specifically (as distinguished from tactics) of maneuvering forces into the most advantageous position prior to actual engagement with the enemy" (Maxwell, 2003); applied in business, strategy becomes a maneuver for competitive success. Game theorists define strategic thinking as the art of outdoing an adversary, knowing that the adversary is trying to do the same to you (Amitabh and Sahay, 2007); others such as Moore suggest this approach is too simplistic in our complex and interconnected environment (Moore, 2009).

Heracleous and Liedtka (2009) each view strategic thinking as a highly creative, innovative, and unconventional method of thinking. Strategic thinking should be viewed as "central to creating and sustaining competitive advantage" and is the tool to get done what most leadership competencies seek to do – move an organization forward, innovate, streamline, and evoke greater productivity. Strategic thinking is commonly deployed in areas of problem solving and decision-making and with thought to envisioning the organization's future. Heracleous describes the purpose of strategic thinking as "to discover novel, imaginative strategies which can rewrite the rules of the competitive game, and to envision potential futures significantly different from the present." Rouse suggests that initiating new innovations and solutions is the "most difficult task faced by executives and senior managers … [but] if done well, it challenges assumptions and creates new mental models of markets, offerings, and organizations" (Rouse, 1997).

Kaufman et al. view strategic thinking as "practical dreaming" in the way in which people in an organization assess, view, and create the future for themselves and their associates by defining and envisioning results that add value (Kaufman et al, 2009). Strategists Mintzberg, Liedtka, Linkow, and Graetz, among others, have contributed to the view of strategic thinking as a synthesizing activity that can be developed in individuals across all levels of an organization, so that their creativity and innovation may become integrated into the formal organizational strategic planning process. Senge describes the importance of learning across an organization:

…work must become 'learningful.' It is no longer sufficient to have one person learning for the organization, a Ford or a Sloan or a Watson or a Gates. It's just not possible any longer to figure it out from the top, and have everyone else following the orders of the 'grand strategist.' The organizations that will truly excel in the future will be the organizations that discover how to tap people's commitment and capacity to learn at all levels in an organization.

The Center for Applied Research similarly sees strategic thinking as "focused on finding and developing unique opportunities to create value by enabling a provocative and creative dialogue among people who can affect a company's vision. As part of strategic thinking Mintzberg sees pattern as the sense of a stream of actions taken by members of an organization to evoke a new outcome (Mintzberg, 1987).

2. Method.

The approach used in this paper for prioritization of factors affecting to success in strategic thinking and management is based on a combination of multi-criteria decision making and fuzzy theory. Since there is no value for qualitative criteria their assessment is based on the linguistic values of decision makers. Weighted values used in this paper for weights of criteria and sub criteria (equivalent with fuzzy ones) are as table 1 below.

Decision making is very difficult for vague and uncertain environment. This vagueness and uncertainty can be handled by using fuzzy set theory, which was proposed by Zadeh (1965). A fuzzy set is defined by a membership function that maps elements to degrees of membership within a certain interval, which is usually [0, 1]. If the value assigned is zero, the element does not belong to the set (it has no membership). If the value assigned is one, the element belongs completely to the set (it has total membership). Finally, if the value lies within the interval, the element has a certain degree of membership. In particular, to tackle the ambiguities involved in the process of linguistic estimation, it is a beneficial way to convert these linguistic terms into fuzzy numbers. In practice, linguistic values can be represented by fuzzy numbers, and the TFN is commonly used.

Table1. fuzzy values of linguistic variables to prioritize factors in relation to each other

Linguistic variables	Positive three-dimensional fuzzy numbers	Positive bilateral three-dimensional fuzzy numbers
Complete and utter Priority or importance	$(\frac{5}{2},3,\frac{7}{2})$	$(\frac{2}{7},\frac{1}{3},\frac{2}{5})$
Much stronger preference or importance	$(2,\frac{5}{2},3)$	$(\frac{1}{3},\frac{2}{5},\frac{1}{2})$
Stronger Priority or importance	$(\frac{3}{2},2,\frac{5}{2})$	$(\frac{2}{5},\frac{1}{2},\frac{2}{3})$
Low priority or importance	$(1,\frac{3}{2},2)$	$(\frac{1}{2},\frac{2}{3},1)$
Almost Equal Priority or importance	$(\frac{1}{2},1,\frac{3}{2})$	$(\frac{2}{3},1,2)$
Exactly equal Priority or importance	(1,1,1)	(1,1,1)

2.1. Fuzzy Analytic Hierarchy Process.

Analytic Hierarchy Process (AHP) is a multi-criteria decision making tool first proposed by Saaty (14). Since it was introduced, AHP have been one of the most useful multi-criteria decisions making tool available to decision makers and researchers. Although AHP is sophisticated in recording knowledge, the conventional AHP is unable to veritably reflect the way human thinks (15) although it uses a precise yardstick to compare the opinions of decision makers, the conventional AHP becomes confusing. AHP is criticized for using lopsided judgment scales and its inability to properly consider the inherent uncertainty and carelessness of pair comparison (16).

To overcome these deficiencies, FAHP is developed to resolve the expanded hierarchical issues. Decision makers found out that distances judgment is more persuasive than rigid judgment. That's because the individual often cannot explicitly express his preferences regarding the fuzzy nature of comparison process (15).

Since the relative importance specified by AHP decision makers is oral, it is vague and imprecise. Decision makers often prefer to employ oral presentation rather than numerical value. Because due to the nature of pairwise comparisons, they cannot explicitly express their opinions about priorities. In such condition the best solution is to make decisions on the basis of multiple conditions and goals to achieve a relatively desirable level of achievement. These issues have caused the nature of decision making to be full of complexities and ambiguities in the most minor or most major cases. Consequently, most decision is made a fuzzy environment.

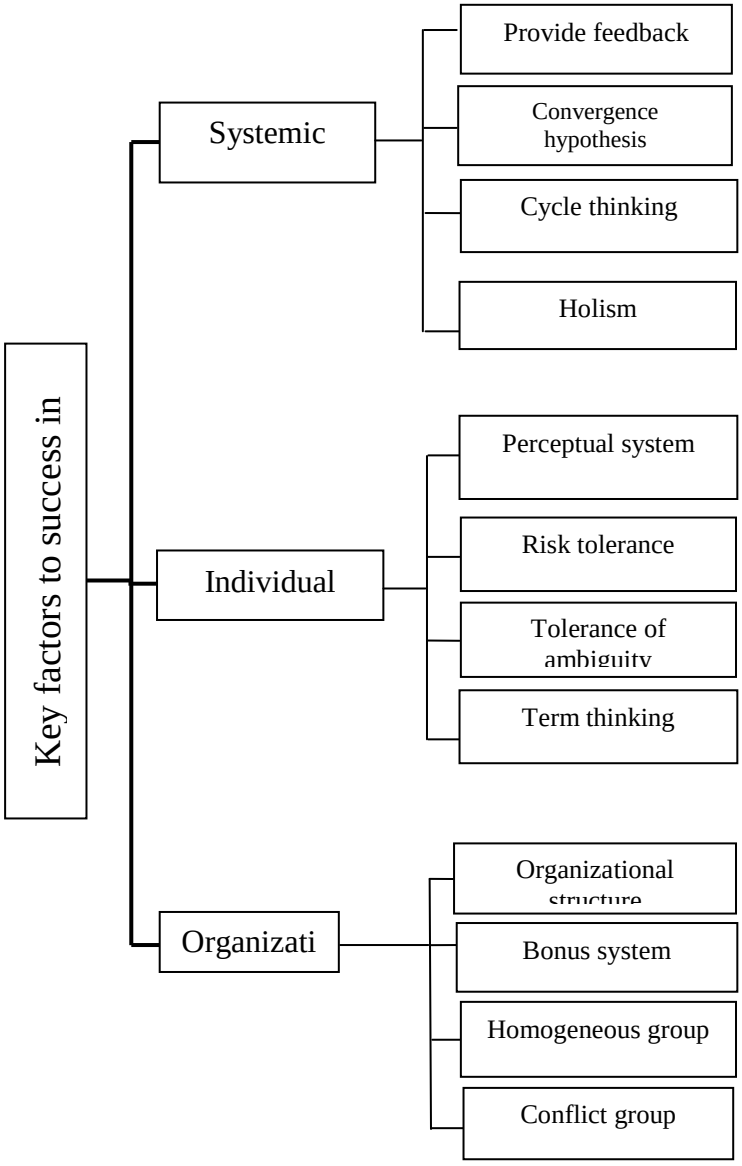
Therefore, considering that the fuzzy logic method is proposed for decision making in uncertain and ambiguous situation, using this method can reduce an ambiguities and increase the effectiveness of decisions made. The analytical hierarchy tree of decision making in this study present below.

2.2. Experimental results.

In this stage, after completing the questionnaires which had the common FAHP questionnaire format and was designed based on hierarchy, by consensus decision makers express their preferences in fuzzy way by paired comparison of each levels elements to higher level elements, which the consensus opinion is given in pairwise comparison matrices.

Table2. Matrix of main criteria Pairwise comparisons

Criteria Priority (I)	**I1**	**I2**	**I3**	**W_j**
I1	(1,1,1)	$(\frac{1}{2},\frac{2}{3},1)$	$(\frac{2}{5},\frac{1}{2},\frac{2}{3})$	0.1427
I2	$(1,\frac{3}{2},2)$	(1,1,1)	$(\frac{1}{2},\frac{2}{3},1)$	0.2984
I3	$(\frac{3}{2},2,\frac{5}{2})$	$(1,\frac{3}{2},2)$	(1,1,1)	0.3866



$$\sum_{j=1}^{3} M_{g_1}^{j} = (1,1,1) \oplus (\frac{1}{2},1,\frac{3}{2}) \oplus (\frac{1}{2},\frac{2}{3},1) \oplus (1,\frac{3}{2},2) \oplus (\frac{2}{5},\frac{1}{2},\frac{2}{3}) =$$

$$= (3.4000,4.6667,6.1667)$$

$$\sum_{j=1}^{3} M_{g_3}^{j} = (1,\frac{3}{2},2) \oplus (2,\frac{5}{2},3) \oplus (1,1,1) \oplus (1,\frac{3}{2},2) \oplus (\frac{1}{2},\frac{2}{3},1) =$$

$$= (5.5000,7.1667,9.0000)$$

$$\sum_{j=1}^{3} M_{g_5}^{j} = (\frac{3}{2},2,\frac{5}{2}) \oplus (\frac{3}{2},2,\frac{5}{2}) \oplus (1,\frac{3}{2},2) \oplus (2,\frac{5}{2},3) \oplus (1,1,1) =$$

$$= (7.0000,9.0000,11.0000)$$

$$\sum_{j=1}^{3}\sum_{j=1}^{3} M_{g_i}^{j} = (3.400,4.667,6.167) \oplus (5.500,7.167,9.000) \oplus (7.000,9.000,11.000) =$$

$$= (22.1333,28.6333,36.8333)$$

$$\left(\sum_{i=1}^{n}\sum_{j=1}^{m} M_{gi}^{j}\right)^{-1} = (\frac{1}{36.8333},\frac{1}{28.6333},\frac{1}{22.1333}) =$$

$$= (0.0271,0.0349,0.0452)$$

$$S_1 = (3.4000,4.6667,6.1667) \otimes (0.0271,0.0349,0.0452) =$$

$$= (0.0923,0.1630,0.2786)$$

$$S_2 = (5.5000,7.1667,9.0600) \otimes (0.0271,0.0349,0.0452) =$$

$$= (0.1493,0.2503,0.4066)$$

$$S_3 = (7.0000,9.0000,11.0000) \otimes (0.0271,0.0349,0.0452) =$$

$$= (0.1900,0.3143,0.4970)$$

$$V(S_1 \geq S_2) = 1.000 \quad , V(S_1 \geq S_3) = 0.597 \quad , V(S_1 \geq S_4) =$$

$$= 1.000 \quad , V(S_1 \geq S_5) = 0.369$$

$$V(S_3 \geq S_1) = 1.000 \quad , V(S_3 \geq S_2) = 1.000 \quad , V(S_3 \geq S_4) =$$

$$= 1.000 \quad , V(S_3 \geq S_5) = 0.772$$

$$V(S_5 \geq S_1) = 1.000 \quad , V(S_5 \geq S_2) = 1.000 \quad , V(S_5 \geq S_3) =$$

$$= 1.000 \quad , V(S_5 \geq S_4) = 1.000$$

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

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

$$= 0.369$$

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

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

$$= 0.772$$

$$V(S_5 \geq S_1, S_2, S_3, S_4) = \min(V(S_5 \geq S_1), V(S_5 \geq S_2), V(S_5 \geq S_3), V(S_5 \geq S_4)) = 1.000$$

$$W = (w_1, w_2, w_3)^T = (0.369,0.772,1.000)^T$$

$W = (w_1, w_2, w_3) = (0.143, 0.298, 0.387)$

Table3. Matrix of Systemic sub-criteria Pairwise comparisons

I1. Open culture of organization	**I1-1**	**I1-2**	**I1-3**	**I1-4**	**w_j**
I1-1	(1,1,1)	$(\frac{1}{2},\frac{2}{3},1)$	$(\frac{3}{2},2,\frac{5}{2})$	$(1,\frac{3}{2},2)$	0.3427
I1-2	$(1,\frac{3}{2},2)$	(1,1,1)	$(\frac{3}{2},2,\frac{5}{2})$	$(\frac{3}{2},2,\frac{5}{2})$	0.4505
I1-3	$(\frac{2}{5},\frac{1}{2},\frac{2}{3})$	$(\frac{2}{5},\frac{1}{2},\frac{2}{3})$	(1,1,1)	$(\frac{1}{2},\frac{2}{3},1)$	0.0250
I1-4	$(\frac{1}{2},\frac{2}{3},1)$	$(\frac{2}{5},\frac{1}{2},\frac{2}{3})$	$(1,\frac{3}{2},2)$	(1,1,1)	0.1817

Table4. Matrix of Individual sub-criteria Pairwise comparisons

I2. Employee involvement	**I2-1**	**I2-2**	**I2-3**	**I2-4**	**w_j**
I2-1	(1,1,1)	$(\frac{1}{3},\frac{2}{5},\frac{1}{2})$	$(1,\frac{3}{2},2)$	$(\frac{2}{5},\frac{1}{2},\frac{2}{3})$	0.1237
I2-2	$(2,\frac{5}{2},3)$	(1,1,1)	$(1,\frac{3}{2},2)$	$(1,\frac{3}{2},2)$	0.4407
I2-3	$(\frac{1}{2},\frac{2}{3},1)$	$(\frac{1}{2},\frac{2}{3},1)$	(1,1,1)	$(\frac{2}{5},\frac{1}{2},\frac{2}{3})$	0.0603
I2-4	$(\frac{3}{2},2,\frac{5}{2})$	$(\frac{1}{2},\frac{2}{3},1)$	$(\frac{3}{2},2,\frac{5}{2})$	(1,1,1)	0.3752

Table5. Matrix of Organizational sub-criteria Pairwise comparisons

I3. Systems thinking	**I3-1**	**I3-2**	**I3-3**	**I3-4**	**I3-5**	**w_j**
I3-1	(1,1,1)	$(\frac{1}{2},1,\frac{3}{2})$	$(\frac{1}{2},\frac{2}{3},1)$	$(\frac{3}{2},2,\frac{5}{2})$	$(\frac{3}{2},2,\frac{5}{2})$	0.2465
I3-2	$(\frac{2}{3},1,2)$	(1,1,1)	$(\frac{1}{2},\frac{2}{3},1)$	$(\frac{3}{2},2,\frac{5}{2})$	$(\frac{3}{2},2,\frac{5}{2})$	0.2489
I3-3	$(1,\frac{3}{2},2)$	$(1,\frac{3}{2},2)$	(1,1,1)	$(2,\frac{5}{2},3)$	$(\frac{1}{2},1,\frac{3}{2})$	0.2768
I3-4	$(\frac{2}{5},\frac{1}{2},\frac{2}{3})$	$(\frac{2}{5},\frac{1}{2},\frac{2}{3})$	$(\frac{1}{3},\frac{2}{5},\frac{1}{2})$	(1,1,1)	$(\frac{3}{2},2,\frac{5}{2})$	0.1283
I3-5	$(\frac{2}{5},\frac{1}{2},\frac{2}{3})$	$(\frac{2}{5},\frac{1}{2},\frac{2}{3})$	$(\frac{2}{3},1,2)$	$(\frac{2}{5},\frac{1}{2},\frac{2}{3})$	(1,1,1)	0.0996

Table 6. Rank on basis of FAHP

Criteria	Weight of Criteria	Sub-criteria	Weight of Sub-criteria	Final Weight	Rank
I1. Factors of Systemic	0.1427	I1-1	0.3427	0.0489	8
		I1-2	0.4505	0.0642	6
		I1-3	0.0250	0.0035	12
		I1-4	0.1817	0.0259	14
I2. Factors of Individual	0.2984	I2-1	0.1237	0.0369	10
		I2-2	0.4407	0.1315	1
		I2-3	0.0603	0.0179	11
		I2-4	0.3752	0.1119	2
I3. Factors of Organizational	0.3866	I3-1	0.2465	0.0952	5
		I3-2	0.2489	0.0962	4
		I3-3	0.2768	0.1070	3
		I3-4	0.1283	0.0496	7
		I3-5	0.0996	0.0385	9

3. Conclusion.

Strategy has never been more challenging, or more important, than in today's environment of global competition, in which, corporate strategies must transcend the borders of nations and markets. Too many organizations try to be everything to everyone, wasting resources in markets that may never provide a worthwhile return on investment. The role of managers in the process of strategic planning and decision making depends on how they are thinking. Strategic planning frameworks only provide questions to be answered; the answers depend on executives' methodologies for decision making. Strategic thinking plays a critical role in today's business survival. The aim of this paper was key factors to success in Strategic Thinking and Management by using Fuzzy Analytical Hierarchy Process (FAHP) method has been ranked in terms of importance as one of the multi criteria decision making approaches.

Effective measures includes 12 criteria which were prioritized in three main groups based on the importance of weight and they were as factors of organizational (0.3866), factors of individual (0.2984), factors of systemic (0.1427) and other minor factors (according to the profile (7)) so that the necessary measures be provided by officers and managers.

It should be noted that in primary and secondary factors prioritization, that part of objective view has first priority which is not evident in the ranking. However, we note that FAHP method is development of priorities based on consensus of experts and professionals and its result is the outcome of experts' different opinions in a ranked and specified domain. Because of ambiguity and uncertainty of human judgment in multi criteria decision making definite data expression is not proper. Fuzzy situation is a kind of decision making environment in which the collected data are vague or closed. Anyway, this study can be developed in different directions.

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