

MEASUREMENT AND ANALYSIS OF STRATEGIC AGILITY OF INSURANCE COMPANIES THROUGH FUZZY DECISION MAKING TECHNIQUE BASED ON SIMILARITY MEASURES

Seddigheh Khorshid¹, Mohammad Reza Mehregan²

¹Department of Management, Faculty of Economics, Management and Administrative Science, Semnan university, Semnan, Iran,

² Department of Industrial Management, Faculty of Management, University of Tehran, Tehran, Iran

Email: .Khorshidseddigheh@gmail.com, Seddighehkhoshid@semnan.ac.ir

ABSTRACT: *The aim of this study was to measure and analyze the strategic agility of insurance companies through the development of a model based on fuzzy multiple criteria of similarity measures. Six insurance companies were considered in order to assess the options and features of the strategic agility level indicators. This research has been a descriptive survey and the data was collected using a questionnaire. 180 managers and staff of the insurance companies were selected according to the available sampling method participated in this study to answer the research questionnaire. The results showed that: A) In terms of management and insurance companies staff who were studied, feature of joint responsibility scored the highest and lowest scores were devoted to the feature of clarity of vision . B) According to the method of fuzzy SAW, Iran and Moalem insurance companies are in the first place with regard to the strategic agility, and Dana, Alborz Parsian and Karafarin insurance companies won the second place. C) In accordance with the fuzzy multiple criteria of similarity measures, Iran and Moalem won the first and second place respectively, which leaves the third place to Dana and Parsian. Also, Alborz and Karafarin insurance companies ranked fourth and fifth. According to this method, the values of the strategic agility in the studied insurance companies studied in a larger multi-criteria decision method of sawing fuzzy similarity measures based on the phase of the SAW technique the degree of similarity between the current levels of strategic agility with the ideal level of strategic agility.*

Keywords: Strategic Agility, Fuzzy Set Theory, Similarity Measure, Fuzzy Entropy Method, the Larger Multi-Criteria Decision of the Phase Saw

INTRODUCTION

Today's business environment is described with increasing uncertainty and extreme changes due to the attack and the explosion of new technologies, the emergence of new business models and global competitiveness [1] In addition, the competitive advantage in this unstable environment is temporary and unstable. These systematic changes described by the complex path, feedback loops and delay effects need something beyond analytical strategies and adapt quickly to new nurses today. Understanding these changes and the resulting competitive advantage is the challenge that the organizations need for innovation in order to reclaim and restore their continuous renovation [2] In fact, efficient and effective management of organizations under the complex, uncertain and rapidly changing situations needs a mental model of strategic insight and understanding of the prospective strategic visionary in order to be able to predict the trends of the important changes in the environment better in the competition and to create a strategic commitment and therefore risky decisions dealing with different levels of uncertainty, and high speed direct resources towards strategic opportunities [3] The strategic mental model is described as strategic agility in the literature.

Strategic Agility is a survival tool in described markets characterized by growing interdependence between systematic and rapid changes [3] and a market leader in the industry. This is recognized as the key to success in a business environment which is full of rapid change, and is of utmost importance to the organizations that have a changing environment, and the change is of complex nature [3] It is of interest to large enterprises who on the one hand

are more apt toward their own interests and on the other hand are to revive and revitalize their needs. Strategic Agility requires the ability to create or prepare for change, and being "active" to "react" in the short term. This needs the ability to respond to a sense of understanding and continuous Dynamics within and outside the industry in the short and long term. It requires the adoption of an innovation process outsourcing industry which is excited by the opportunities for new business in addition to predict emerging trends or irregularities which may be impaired and the market before competitors may benefit. The ability of a company is the one which would distinguish it from its competitors.

Measurement and analysis of strategic agility and awareness of the organization's strategic agility is very important for managers and operators. The reason is that organizations sometimes have gained strength by being agile, lose. Because of the clear, high efficiency and strong leadership, organizations are on the path to growth and success in this direction, which means the doing the same things better, and the organizations would be able to succeed in their fundamental axial works in long run. But with suddenly growing and rapidly changing environment, a lot of pressure on businesses are to be entered, which, in turn, would be stimulated if there is a change in the fundamentals of the business together. The same sources of growth can become barriers to change and rejuvenation. In fact, stimulating and motivating the growth of an organization would reduce its strategic agility. The present report considers the level of strategic agility insurance companies using fuzzy logic and fuzzy multi-criteria

analysis techniques to evaluate, and thus making them strategically agile.

A LITERATURE REVIEW OF RESEARCH

The concept of strategic agility

The concept of strategic agility is somewhat different from the classic strategy but it is not in direct contrast with it. In its traditional sense, a strategy bears the meaning the extensive planning is devising a strategy to develop a strategy for a company that leads the way in a few years doggedly followed. The strategic agility means having a strategy, but instead refers to the emphasis on strategic thinking and a clear vision. It does not mean strategic planning. In addition, it would suggest the joint concept development and implementation of strategic, rather than separating the two [4]

Different definitions have been used by researchers in this field. Hamel and Välikangas Gus [5] define it as the ability to reform and revitalize the strategic agility and dynamic organization and its strategy to adapt to business changes. The ability is achieved by the ability to predict by the continuous addition of modified trends and customer needs and give up no matter what the company's vision. This means that an organization learns to change its direction quickly, and is able to move without losing momentum, and has transformed its reconstruction and rehabilitation [3 and 5] Santala [6] in his study on strategic agility of small knowledge-based business Services Company reported that strategic agility means that large companies act as small companies with order to avoid a large company on their efforts. Therefore, strategic agility will be a balance between strategic and agile bound. Agile characteristic of small companies and entrepreneurs are guided by an entrepreneur, strategic characteristic of large institutions and structured hierarchical manner. The optimal location depends on the axis of the company. Some companies are naturally feisty and need to be more strategic in nature, while others are of a strategic nature and need to be more nimble. For example, firms with strategic agility from different sides collide. This approach can be seen in Figure 1:

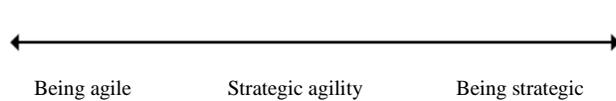


Figure 1: Strategic Agility [1]

Roth [7] defined strategic agility as the strategic ability to rotate in a timely manner, providing the right product at an affordable price by using leverage and vast resource of knowledge value chain to generate economies. Knowledge economy, the company's ability to use his intelligence and business acumen combined with skilled and experienced advanced technology to continuously create new knowledge in an organization implies that the competitors have the effective way to effectively identify, recruit and operate [7] Strategic Agility requires that the boundaries of the production company develop operations exceeds fluid (Roth, 1996). In fact, strategic agility needs a company that moves beyond simplistic "machine work" to a "knowledge factory".

It reinforces learning organization that produces knowledge as a major product [7] According to this definition, knowledge and knowledge production, the most important asset of an organization to achieve strategic agility is to be reconciled with the company's knowledge-based approach, which considers the most important and most strategic resource of a company, its knowledge base [8]

Conceptual models for strategic agility

Dos and Kosonson [3] have proposed a three-dimensional model for the realization of strategic agility, which consists of three ultra-sensitive strategic capabilities, commitment to collective / union leadership and fluid sources. The model of strategic agility is the product of the geometrical interpretation of all abilities. Without one ability, the other ability can no longer be useful. In addition, a potential imbalance may have harmful side effects on other features. Therefore, they must be grown as a whole in harmony with each other (Figure 2). Strategic sensitivity points to changes in their environment and the ability to identify and understand their company. It is composed of a futurist and visionary insight and understanding, curiosity and simple search with more emphasis on understanding and insight [3] Strategic sensitivity means openness to information, intelligence and innovation by establishing and maintaining relationships with a variety of individuals and organizations. It is the collective commitment, motivating and driving force for the success of the organization. It must be started from the actions and the actions of individual members. Therefore, it is necessary that the actions are coherent with each other, which helps build a cohesive organization. This integration can be achieved through administrative steps which in turn improves their cohesiveness. The collective commitment and trust are associated with communications. Therefore, it is needed to develop long-term relationships with stakeholders inside and outside the organization through management actions. With no fluid source, and coherence, strategic sensitivity remains unused [3] Fluid supply sources, and flexible ability to transfer from one place to another are needed [3] Hamel and Välikangas, [5,9]

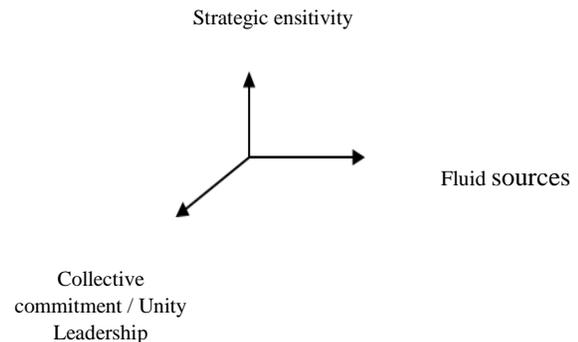


Figure 2: The Strategic Agility of [3]

Sambamurthy and colleagues [10] based on agility strategic foundation of knowledge provided by Roth [7] presented a three-dimensional model of agility strategic (Fig.5): a) Agility customer, b) Agility Partnership, c) Agility operational. Customer agility means the selection and

admission of clients in the exploration and exploitation of opportunities for innovation and competitive dynamics of action. Agility is the ability to leverage partnerships and increased use of assets, knowledge and competencies, suppliers, distributors and contract manufacturers and logistics providers through alliances, partnerships and business

Work implies joint venture [11] Agility operational is the business processes, the ability to achieve accuracy, speed and cost savings opportunities for innovation and action. Long [4], has provided a scale strategic agility that covers the three dimensions of strategic agility by Sambamurthy and colleagues [10] This scale consists of six dimensions: a) the clarity of vision, b) knowledge of the client, c) learn basic functionality, d) selection of strategic goals and objectives, k) joint responsibility, f) knowledge of competitors , g) of the act. Ojha [12] believes that both the client's knowledge and competence reflects a sharp sense of market competition [2](#) that can be applied to achieve strategic agility [13] and are not considered of strategic agility. Five dimensions of clarity of vision, understanding the fundamental capabilities, targets and strategic objectives, shared responsibility, and acting, structures reflect the strategic agility. Clarity of vision and understanding of the fundamental capabilities for an organization, "speed and stability" are needed to provide strategic agility. If a company fundamentally lacks understanding of the capabilities, it will pursue opportunities that it cannot take advantage of them [4] Clarity of vision, as well as the speed of the necessary performed provides all value chain partners which are fully aligned and motivated to exploit the opportunities that emerge when these opportunities are considered. The ability of a company to amend the targets and strategic objectives, and the ability of its appropriate helps existing and emerging opportunities. Another important aspect is that a company's strategic agility in relation to its value chain partners the value of the business. The common responsibility to assess the extent to which extent it implies that, relationship with clients is to help create value (Long, 2000). Finally, measure reflects the degree to which companies can take action as the opportunity to appear that are way different, this dimension reflects the company's "response rate".



Figure 3: Sambamurthy Model for Strategic Agility and Colleagues 2003

Mavengere [14] has used the seven characteristics to evaluate strategic agility: the ability to detect changes rapidly, the ability of partners to make collective decisions quickly, the ability to respond quickly to changes in the use of information technology for data sharing, process integration and coordination network, collaborative product development partners, whose strong network of partners is thriving. In this study, the dimensions of strategic agility by Ojha [12] are used Due to its universality and function in previous studies [7 ,10, 12]

FUZZY EVALUATION MODEL AND THE ANALYSIS OF THE STRATEGIC AGILITY

Measurement and analysis of strategic agility in a company requires human judgment. Impregnated human judgment is somewhat ambiguous and imprecise. Inaccurate occur for several reasons: A) bit of useless information. B) Incomplete information. C) Unachievable Information. D) Biased ignorance. Traditional multi-criteria decision methods can be effective in manner, including issues of vague and inaccurate information [15] To fix this Problem, the theory of Fuzzy sets is used. This theory is related mainly to the uncertainty in the minds of human perception and how the effectiveness of the approach is quantitatively imprecise and uncertain [16] Fuzzy logic modeling human reasoning describes the method, provides a means by which judgments can, without selecting a synthetic process for the preparation of these judgments, be accurate [17]The aim of this study was to establish a foundation and basis for the theory of fuzzy sets that can be applicable for expression inexact fuzzy logic inherent in the way of human thinking, and the adoption Agility level strategic decisions about the insurance companies which were studied. In the following sections, the model of fuzzy measure and analyze strategic agility will be explained:

Fuzzy judgment matrix evaluators for each company, executives and experts from insurance companies, were judged on their company's strategic agility degree perspective on the characteristics of clarity, to understand the capabilities of the fundamental strategic, and the selection of goals- shared responsibility, and action is obtained through a questionnaire. Gathered answers are presented on Likert (I do agree and I disagree), in the form of words. Calculations are very difficult based on qualitative terms. Hence, fuzzy words can be used that express a judgment about the insurance company executives and experts in the study, the application of fuzzy set theory is a generalization [18] In this research report, we quantify the qualitative responses managers and experts from the triangular fuzzy numbers (Table 1). After quantifying the qualitative responses, fuzzy judgment matrix evaluated is formed separately for each insurance company. The matrix of the form (6) is shown. In this matrix, $j (j = 1,2,\dots,n)$ represents the characteristics of strategic agility and $k (k = 1,2,\dots,L)$ represents the appraiser and $i (i = 1,2,\dots,m)$ represents insurance companies.

(B) Calculate the weights for all corporate strategic agility characterized by fuzzy entropy techniques. To calculate the weights for the company's strategic agility characterized by techniques of fuzzy entropy measure is as follows.

Table 1: Scale Linguistic Terms and Corresponding Fuzzy Triangular Numbers

Words	The triangular fuzzy numbers
Very high	(100, 100, 80)
A lot	(100, 80, 60)
Average	(70, 50, 30)
Low	(40, 20, 0)
Small allotment	(20, 0, 0)

$$FJM(A_i) = \begin{matrix} & X_1 & \dots & X_j & \dots & X_n \\ E_1 & \tilde{V}_{1i1} & \dots & \tilde{V}_{1ij} & \dots & \tilde{V}_{1in} \\ E_2 & \tilde{V}_{2i1} & \dots & \tilde{V}_{2ij} & \dots & \tilde{V}_{2in} \\ \vdots & \vdots & \dots & \vdots & \dots & \vdots \\ E_k & \tilde{V}_{ki1} & \dots & \tilde{V}_{kij} & \dots & \tilde{V}_{kin} \\ \vdots & \vdots & \dots & \vdots & \dots & \vdots \\ E_L & \tilde{V}_{Li1} & \dots & \tilde{V}_{Lij} & \dots & \tilde{V}_{Lin} \end{matrix}$$

Figure 4: Matrix A Definite Judgment on the Strategic Agility for Studied Insurance Companies

3. The application of the technique to calculate the entropy weights, agility characteristics for the insurance companies: Entropy is an important concept in Physics and Sociology, and bears several useful meanings in knowledge theory which measure the contents of the expected information of a message. When a wide distribution shows uncertainty more than a head distribution, Entropy is used as a measure for the description of the amount of uncertainty which is used as Pj. Entropy is an important concept in the physical sciences and social sciences and has many useful meanings in information theory, the content of the life expectancy of a clear message Top of Form

Therefore, the two terms, entropy and uncertainty, are used interchangeably. Shannon and Weaver [21] used the concept of entropy for evaluation and measurement of the uncertainty associated with a random phenomenon. The Shan measure of uncertainty has been shown in equation 3 (Hwang and Yoon, 1980).

$$S(p_1, p_2, \dots, p_j, \dots, p_n) = -k \sum_{j=1}^n p_j \ln p_j \tag{3}$$

so that k is a positive constant. When k indicates positive Entropy, it is called the entropy of the probability distribution. When all on a specific j are Equal; the value will be maximized. This concept has been used successfully for several domains [23]. Hwang and Yoon [22] have used the concept for determining the index weights in multi-criteria decision making problems [22] Assuming that decision matrix as shown. Entropy algorithm techniques are described for calculating weights of strategic agility characteristics:

Step 1: The outcome of the characteristic (indicator) is defined as a discrete probability distribution, which is displayed as a matrix. The matrix content of the subject (s) of the equation (4) can be calculated (Hwang and Yoon, 1980).

$$p_{ij^o} = \left(d_{ij^o} / \sum_{j^o=1}^n d_{ij^o} \right), \forall i, j^o \tag{4}$$

step 2: entropy, characteristic (indicator) from the equation (5) can be calculated (hwang and yoon, 1980).

$$E_{j^o} = -k \sum_{f=1}^F p_{ff^o} \ln p_{ff^o}, \forall j^o \in J \tag{5}$$

k is a fixed number that is calculated from a value between zero and one, and ensures that the equation must be established. Here m represents the number of decision options.

Step 3: uncertainty or degree of deviation (dj) of information produced for criterion j can be calculated from equation (6) (hwang and yoon, 1980).

$$d_{j^o} = 1 - E_{j^o}, \forall j^o \tag{6}$$

Step 4: Variation of entropy, the equation (7) is normalized. J normalized entropy measure or weight variation characteristic (indicator) (Hwang and Yoon, 1980), (Chen and He, 1997).

$$w_{j^o} = d_{j^o} / \sum_{j^o=1}^n d_{j^o}, \forall j^o \in J \tag{7}$$

C. Score Calculation of the strategic agility with a multi-criteria decision technique based on fuzzy similarity measures: The following would explain measures of similarity-based fuzzy multi-criteria decision technique to calculate the final score of each company's strategic agility:

1. Social fuzzy judgment matrix for insurance companies: First the fuzzy judgment matrix for each company executives and experts will be formed (matrix described in Figure 1). Using phased out in two stages; groups of fuzzy judgment matrix for insurance companies were formed. In the first step, fuzzy judgment of the appraiser on the corresponding items of strategic agility is characterized by equation (8) for each company integrating. Secondly, all evaluators' fuzzy judgment on any strategic agility characterized by equation (9) can be integrated to any company. The matrix is shown in (8).

$$\tilde{A}_m^j = (a_{m1}^j, a_{m2}^j, a_{m3}^j) = \left(1/n \sum_{j_h=1}^H a_1^{j_h}, 1/n \sum_{j_h=1}^H a_1^{j_h}, 1/n \sum_{j_h=1}^H a_1^{j_h} \right) \tag{8}$$

$j_j : h$: Represents items that weigh a peculiar characteristic of strategic agility. ($h = 1, 2, \dots, H$) Represents the number of each item that measures each strategic agility.

$$\tilde{A}_m^{jg} = (a_{m1}^{jg}, a_{m2}^{jg}, a_{m3}^{jg}) = \left(1/n \sum_{k=1}^L a_1^{jk}, 1/n \sum_{k=1}^L a_1^{jk}, 1/n \sum_{k=1}^L a_1^{jk} \right) \tag{9}$$

L represents the number of evaluators in each company and j represents a strategic agility.

2. Normalizing the mass matrix and fuzzy judgment matrix: fuzzy logic mass is normalized using equation (9) in compliance with Act fuzzy division (equation 10)

$$(9) \quad r_{fj}^g = x_{fj}^g / \sum_{f=1}^F x_{fj}^g$$

f Represents insurance companies in the study, F shows the number of insurance companies.

$$FJM(In) = \begin{matrix} & \begin{matrix} X_1 & \dots & X_j & \dots & X_n \end{matrix} \\ \begin{matrix} In_1 \\ In_2 \\ \vdots \\ In_f \\ \vdots \\ In_F \end{matrix} & \begin{bmatrix} \tilde{X}_{11}^g & \dots & \tilde{X}_{1j}^g & \dots & X_{1n}^g \\ \tilde{X}_{21}^g & \dots & \tilde{X}_{2j}^g & \dots & \tilde{X}_{2n}^g \\ \vdots & \dots & \vdots & \dots & \vdots \\ \tilde{X}_{f1}^g & \dots & \tilde{X}_{fj}^g & \dots & \tilde{X}_{fn}^g \\ \vdots & \dots & \vdots & \dots & \vdots \\ \tilde{X}_{F1}^g & \dots & \tilde{X}_{Fj}^g & \dots & \tilde{X}_{Fn}^g \end{bmatrix} \end{matrix}$$

Figure 5: Collective Fuzzy Judgment Matrix for the Studied Insurance Companies

Assuming that $A = (a^l, a^m, a^u), B = (b^l, b^m, b^u)$ are two triangular fuzzy numbers. Dividing the triangular fuzzy number is calculated by the following formula.

$$(10) \quad \tilde{A}/\tilde{B} = (a^l/b^u, a^m/b^m, a^u/b^l)$$

The measure of similarity between the current and the ideal level of strategic agility strategic agility: To assess the degree of similarity between the current and the ideal strategic agility strategic (by linguistic terms as very high and the normalized 0.599, 0.4, 0.25 triangular fuzzy numbers 100, 100, 80), the similarity scale is used. Therefore, to measure the similarity between the current and the ideal strategic agility, the strategic agility fitness function based on the similarity measures was proposed by Chen (1988) and Chen et al (1995). Suppose, there are two triangular fuzzy numbers

$$A = (a^l, a^m, a^u), B = (b^l, b^m, b^u),$$

the similarities between the two triangular fuzzy numbers based on this function using are measured equation (11).

$$(11) \quad S(\tilde{A}, \tilde{B}) = a^l b^l + a^m b^m + a^u b^u / \text{Max}(((a^l)^2 + (a^m)^2 + (a^u)^2), ((b^l)^2 + (b^m)^2 + (b^u)^2))$$

Based on the fitness function, the membership function measures the similarity between the current and the ideal strategic agility of industry and are defined as follows.

$$(12) \quad S(\tilde{A}, \tilde{B}) = \begin{cases} 1 & \tilde{A} = \tilde{B} \\ 0 & \tilde{A} \neq \tilde{B} \end{cases}$$

After calculating the similarity measure between the current and ideal levels of strategic agility, measures the similarity matrix (S_{fj}^g) industry is studied (Figure 6).

$$S(In) = \begin{matrix} & \begin{matrix} X_1 & \dots & X_j & \dots & X_n \end{matrix} \\ \begin{matrix} In_1 \\ In_2 \\ \vdots \\ In_f \\ \vdots \\ In_F \end{matrix} & \begin{bmatrix} s_{11}^g & \dots & s_{1j}^g & \dots & s_{1n}^g \\ s_{21}^g & \dots & s_{2j}^g & \dots & s_{2n}^g \\ \vdots & \dots & \vdots & \dots & \vdots \\ s_{f1}^g & \dots & s_{fj}^g & \dots & s_{fn}^g \\ \vdots & \dots & \vdots & \dots & \vdots \\ s_{F1}^g & \dots & s_{Fj}^g & \dots & s_{Fn}^g \end{bmatrix} \end{matrix}$$

Figure 6: Matrix Measure the Similarity between Current and Ideal Levels of Strategic Agility in the Studied Insurance Companies

3. Calculating the normalized balance matrix of mass judgment for the studied insurance companies:

$$(13) \quad S_{fj} = w_j * s_{fj}$$

4. final Strategic Agility score of the companies in the study and their ranking is estimated. The final score for each insurance company's strategic agility is calculated by using equation (14)

$$(14) \quad f = 1, 2, \dots, F; j = 1, 2, \dots, n$$

METHODOLOGY

The aim of this study was to determine the weights of strategic agility in Tehran, insurance companies, and these companies are ranked according to their level of strategic agility. This study was done in descriptive style. That is a description of each industry in terms of how water is a strategic assessment and analysis. Data from the questionnaire developed by Ojha [12] is used. The questionnaire consists of 15 questions that measures five strategic agility dimensions, ie acting, shared responsibility, understanding the fundamental capabilities, targets and strategic objectives, and clarity of vision, and strategic agility in the structural. Questionnaire has been graded using Likert scale of five options much agree (5) to very strongly disagree (1). The survey population consists of managers and experts from six participating insurance companies Dana Tehran, Alborz Insurance, Insurance Corp, Iran Insurance, Moalem, and Karafarin. Through available sampling, a sample consisting of 180 experts and managers of the insurance companies for the study was obtained. Data are analyzed using fuzzy multi-criteria decision technique based on similarity measures and Fuzzy SAW technique. Valid and reliable measure of the size of its constituent structures and strategic agility are evaluated first and second order through Cronbach's alpha test, correlation analysis and confirmatory factor analysis.

5. DATA ANALYSIS AND FINDINGS

Measurement model and measurement tools to measure and assess the reliability and validity of the research structures

Using item analysis based on the correlation between the items and their corresponding structures (correlation between items and sub-scales) and strategic agility structure (scale), and the correlation between strategic agility and size (correlation between sub-scales and scales total), validity of the study is assessed. According to the literature [27] when

the correlation coefficients are positive and significant between items and their corresponding structures, construct validity was confirmed. Strategic objectives and targets (0.88), clarity of strategic goals (0.96). Level $0.01 = \alpha$ is significant. The first and second order confirmatory factor analyses, the validity of the study were evaluated. Between $0.01 = \alpha$. In total, fitness of the first order ($0.96 = \text{NFI}$, $0.65 = \text{NNFI}$, $0.97 = \text{CFI}$, $0.97 = \text{IFI}$, $96 = \text{GFI}$, $108 = \text{X}^2$, $58 = \text{df}$, $0.05 = \text{RMSEA}$) indicates a good fit of the model to the data collected.

The second index fitness ($0.92 = \text{NFI}$, $0.94 = \text{NNFI}$, $0.96 = \text{CFI}$, $0.96 = \text{IFI}$, $0.92 = \text{GFI}$, $106 = \text{X}^2$, $60 = \text{df}$, $0.045 =$ indicate multi-dimensional structure of strategic agility. According to the literature, the amount equal to or greater than 0.90 to index CFI, RFI, NFI and IFI demonstrates a good fit to the related data model [28] Using Cronbach's alpha, construct validity and internal consistency of strategic agility and its constituent dimensions were studied. [31]. Likewise, the Cronbach's alpha values of forming strategic agility are more than 0.70, which is sufficient according to the research literature [30] Convergence Divergence validity of forming strategic agility were calculated by following the procedures According to practice, when the average variance extracted (AVE) for each construct is equivalent to 0.50 or more of the total variance, discriminate validity is established. As the results show (Table 2), the average variance extracted for structures of this study are as follows: action (0.88), structural joint responsibility (0.87), understanding the fundamental capabilities (0.83), setting strategic goals (0.88), and clarity of strategic goals (0.83). In general, convergent validity was confirmed for all the research structures. Also according Fornell and Larcker [32] the validity of divergence is established if the average variance extracted is greater than the square of the correlation coefficient between pairs of structures. Validity and reliability of a composite (CR) was calculated for this structure (Table 2) as follows: action (0.93), the structures responsible.

Case study: determining weights and dimensions of strategic agility ranking of insurance companies in Tehran based on strategic agility

Measurement and analysis of fuzzy model is now being followed to calculate the weights of strategic agility strategic agility characteristics of insurance companies in Tehran and final score of this industry are used for strategic agility.

A) Strategic agility dimensions, weights calculated using the algorithm developed in (subparagraphs 1 and 2) Part III, the insurance companies were strategic agility performance matrix was formed. Results are shown in Table 3. Then, in accordance with paragraph (b) (Bndfry 3) Part III (entropy technique), the content of the information matrix is subject to the judgment of a group of strategic agility (P_{ij}) by equation (4) was calculated (Table 4). Finally, values and the use of equations (5), (6) and (7) respectively the results in Table 5 are shown. The results show, shared responsibility with the highest score of 0.32) First, a basic understanding of the capabilities of the score (0.19) ranked second, with action points (0.18) ranks third with a score of strategic

targets (0.17), ranked fourth, with a score of clarity of perspective (0.14) is dedicated to the fifth grade.

(B) Calculating the final score of each insurance company's strategic agility to calculate the final score of each insurance company's strategic agility, the current level fuzzy performance matrix was formed strategic agility. Strategic agility levels were calculated for each insurance company with the ideal strategic agility. The results are shown in Tables (6), (7), (8) and (9). Then, using equation (14), the final score of strategic agility insurance companies studied were calculated. The entrepreneur and Alborz Insurance companies ranked fourth and fifth respectively.

In order to measure the validity of the multi criteria fuzzy decision making technique based on the similarity measure in comparison to the SAW technique, the data of the research were analyzed using SAW. The results are shown in table 10 and 11. According to these results, Moalem and Iran insurance companies rank first with regard to strategic agility and Dana, Alborz, Parsian and Karafarin would win the second place.

Finally, the ultimate score of strategic agility and the rankings gained for the studied insurance companies through Saw fuzzy technique are shown in table 12. As the results indicate, the fuzzy decision making technique based on the similarity measure has been more successful in discriminating the companies with regard to their strategic agility level in comparison to the SAW technique.

CONCLUSION AND SUGGESTIONS

Strategic Agility is the ability of reforming the path without losing the long term view for a company which plays a key role in modern economy. As Hamel (2007) states, in order to succeed in today's chaotic world, companies need to be strategically agile. Moreover, they have to be practical. Strategic agility is a current process and a developing concept for a company which requires be predicting actively and using to win the significant competitions. Therefore, it necessitates continuous behavioral methods which would benefit the company in short term. In contrast to production agility which is a local potential in a factory, this strategy is derived from inner politics and procedures of the company and is more with the inner side of the company. Although the source of the first one is flexibility 7, although the primary source of production agility is flexibility [7] it can be done through technical interventions such as the use of flexible machines, the training, and the delay. The source of strategic agility is the organization's knowledge base through strategic interventions, such as the development of market knowledge, which could be combined in order to obtain a better fit with the new capabilities [12] In today's dynamic and competitive world, companies more than ever need to be strategically agile. The companies that is strategically agile with strategies to meet our customers' needs and have the flexibility to use them. If your system does not care to be agile and nimble, you will experience the tragic fate. Results showed the characteristic of strategic agility "shared responsibility" among strategic agility and characteristics of landscape management of the insurance companies studied have been of the utmost importance. While the three

Table 2: The Results of the Evaluation and Measurement and Item Analysis to Determine the Validity and Measurement

			confirmatory factor analysis of the items Structures (evaluation and measurement)			Item analysis		Item	Scale
Cronbach's alpha	AVE	CR	R ²	t	Standardized scale	Total scale	sub-scales		
0.88	0.88	0.95	0.90	9.41	0.95				
			0.59	8.67	0.77	0.78**	0.92**	Action1	Action
			0.42	7.40	0.65	0.72**	0.89**	Action2	
			0.40	6.10	0.63	0.67**	0.83**	Action3	
0.75	0.87	0.95	0.72	5.30	0.85				
			0.44	6.44	0.66	0.60**	0.78**	Responsibility1	Shared responsibility
			0.81	9.24	0.90	0.75**	0.84**	Responsibility2	
			0.45	7.58	0.67	0.73**	0.93**	Responsibility3	
0.80	0.88	0.97	0.81	6.89	0.90				
			0.50	7.77	0.71	0.61**	0.85**	Goal1	Targets and strategic objectives
			0.42	7.95	0.68	0.65**	0.83**	Goal2	
			0.46	4.40	0.40	0.59**	0.75**	Goal3	
0.85	0.83	0.85	0.85	5.34	0.92				
			0.29	5.17	0.50	0.54**	0.80**	Capacity1	Understanding the fundamental capabilities
			0.81	10.62	0.90	0.70**	0.88**	Capacity2	
			0.50	8.19	0.71	0.63**	0.89**	Capacity3	
0.83	0.83	0.90	0.27	5.19	0.52				
			0.94	11.73	0.97	0.69**	0.96**	Vision1	Clear vision
			0.62	9.30	0.79	0.65**	0.89**	Vision2	
			0.48	7.85	0.69	0.62**	0.88**	Vision3	
0.95									Strategic Agility
RMSEA-0.05 ,df-58 ,X ² -108 ,GFI-96 ,IFI-0.97 ,CFI-0.97 ,NNFI-0.95 ,NFI-0.96								First fitness indicators	
RMSEA-0.045 ,df-60 ,X ² -106 ,GFI-0.92 ,IFI-0.96 ,CFI-0.96 ,NNFI-0.94 ,NFI-0.								Second fitness indicators	

Table 3: Integration of Matrix Management and Insurance Companies Were Judged on the Level of Strategic Agility Based on A – Cut

Insurance companies studied						Dimensions of strategic agility
Karafarin Insurance	Moalem Insurance	Iran Insurance	Parsian Insurance	Alborz Insurance	Dana Insurance	
67.645	52.835	69.125	72.06	66.765	48.42	Acting
57.24	48.435	65.805	63.425	57.365	42.25	joint responsibility
62.86	48.045	65.715	65.355	61.785	45.55	Understanding the fundamental capabilities
68.965	45.85	67.71	63.54	65.005	51.275	Strategic Targets
66.68	50.96	68.665	67.235	64.445	50.405	Clarity prospects
64.678(3)	49.225(5)	67.404(1)	66.232(2)	63.073(4)	47.58(6)	Sum

Table 4: The Content of the Information Contained in the Matrix of Group Judgments about Aspects of Strategic Agility

Insurance companies studied						Dimensions of strategic agility
Karafarin Insurance	Moalem Insurance	Iran Insurance	Parsian Insurance	Alborz Insurance	Dana Insurance	
0.194	0.1965	0.2045	0.1895	0.1935	0.201	Acting
0.198	0.198	0.2185	0.211	0.18	0.185	joint responsibility
0.19	0.2095	0.192	0.1915	0.1975	0.208	Understanding the fundamental capabilities
0.1925	0.2055	0.2015	0.1975	0.191	0.2005	Strategic Targets
0.2035	0.1945	0.203	0.1985	0.199	0.1995	Clarity prospects

Table 5: Values , Strategic Agility Dimensions and Weights (Wj) Based on Fuzzy Entropy Method

Sum of the weights	Clarity prospects	Strategic targets	Understanding the fundamental capabilities	Joint responsibility	Acting	Strategic dimension (j)
	0.998	0.998	0.997	0.994	0.997	Ej
	0.002	0.003	0.003	0.005	0.003	Dj
1	0.14	0.17	0.19	0.32	0.18	Weights (wj)

Table 6: Strategic Agility Fuzzy Performance Matrix in the Case of Insurance Companies

Insurance companies studied						Dimensions of strategic agility
Karafarin Insurance	Moalem Insurance	Iran Insurance	Parsian Insurance	Alborz Insurance	Dana Insurance	
(37.635,57.475,77.865)	(37.175,58.185,75.84)	(40.875,61.495,71.195)	(35.85,56.47,72.96)	(36.545,55.765,77.765)	(38.96,50.19,745.80)	Acting
(42.32,61.825,87.555)	(27.405,47.785,56.895)	(47.79,68.43,84.85)	(45.57,66.21,78.555)	(36.75,55.615,70.17)	(24.155,43.4,56.895)	joint responsibility
(42.475,62.345,80.75)	(48.235,70.855,76.635)	(42.92,62.93,80.415)	(42.52,62.56,77.18)	(44.715,64.605,80.43)	(48.19,70.64,80.205)	Understanding the fundamental capabilities
(64.365,65.475,84.75)	(40.45,70.335,87.81)	(49.03,68.635,86.815)	(47.6,67.205,85.06)	(45.905,65.41,83.98)	(39.215,68.605,87.5)	Strategic Targets
(50.47,69.85,85.635)	(45.795,65.77,68.37)	(49.35,69.11,85.74)	(47.575,67.705,83.65)	(48.605,67.855,84.845)	(48.69,67.915,70.355)	Clarity prospects

Table 7: Normalized Fuzzy Performance Matrix Strategic Agility Insurance Companies Studied

Insurance companies studied						Weights of dimensions	Dimensions of strategic agility
Karafarin Insurance	Moalem Insurance	Iran Insurance	Parsian Insurance	Alborz Insurance	Dana Insurance		
(0.0975,0.1955,0.3875)	(0.0965,0.1945,0.39)	(0.106,0.209,0.4025)	(0.093,0.192,0.3755)	(0.0945,0.1895,0.387)	(0.101,0.198,0.405)	0.18	Acting
(0.107,0.199,0.3685)	(0.104,0.1965,0.3725)	(0.121,0.2205,0.397)	(0.115,0.213,0.385)	(0.092,0.179,0.3455)	(0.096,1825,0.356)	0.32	joint responsibility
(0.102,0.1905,0.3555)	(0.1155,0.209,0.3795)	(0.103,0.192,0.354)	(0.102,0.191,0.353)	(0.107,0.1975,0.3675)	(0.1155,0.2085,0.385)	0.19	Understanding the fundamental capabilities
(0.107,0.192,0.3485)	(0.1169,0.206,0.362)	(0.113,0.201,0.357)	(0.11,0.197,0.35)	(0.106,0.192,0.355)	(0.113,0.201,0.3605)	0.17	Strategic Targets
(0.1185,0.2055,0.354)	(0.1075,0.1935,0.344)	(0.1169,0.2035,0.3545)	(0.1115,0.199,0.346)	(0.114,0.1995,0.351)	(0.1145,0.2,0.352)	0.14	Clarity prospects

Table 8: Similarity Matrix of Strategic Agility Insurance Companies Studied with the Ideal Strategy

Insurance companies studied						Weights of dimensions	Dimensions of strategic agility
Karafarin Insurance	Moalem Insurance	Iran Insurance	Parsian Insurance	Alborz Insurance	Dana Insurance		
0.66	0.585	0.685	0.64	0.58	0.605	0.18	Acting
0.575	0.575	0.625	0.605	0.53	0.545	0.32	joint responsibility
0.55	0.595	0.55	0.55	0.57	0.595	0.19	Understanding the fundamental capabilities
0.54	0.575	0.56	0.55	0.54	0.565	0.17	Strategic Targets
0.565	0.54	0.565	0.55	0.555	0.555	0.14	Clarity prospects

characteristics of strategic agility "to understand the basic capabilities", "strategic targets", and "acting out" are relatively close to each other regarding the importance degrees, the "clarity of vision" has the lowest degree of importance from the perspective of managers and experts of the insurance companies which have been studied. Rapid changing of the needs of customers is essential, but it does not seem enough. Technically, insight and strategic knowledge are to identify and conceptualize the use of complex strategic positioning and intelligent actions are to mobilize and organize.

The results showed that regarding the "acting out", Parsian Insurance Company (72.06) and Dana Insurance Company (48.42) have the highest and lowest points. With regard to the Strategic agility characteristic of "shared responsibility", Iran Insurance Company (65.805) and Dana Insurance Company (42.25) have won the highest rating. For Strategic agility characteristic of "understanding the basic

capabilities", Iran Insurance Company (65.715) and Dana Insurance Company (45.55) to have the highest and lowest points. Characteristic of strategic agility "strategic targets", the insurance company Karafarin (68.965) and the Moalem (45.85) have the highest and lowest points. Finally, regarding the characteristics of strategic agility "clarity of vision", Iran Insurance Company (68.665) and Dana Insurance Company (50.405) have the highest and lowest points allocated. Overall results showed (Table 2), that although the rating level of strategic agility in insurance companies were all fairly close together, but the insurance company's (67.404) and Parsian Insurance Company (66.323), as compared to other insurance companies the study had the highest level of strategic agility, and two insurance companies of Dana (47.58) and Moalem insurance Company (49.225) are the lowest level of strategic agility. Today, we encounter the competitive environment within the national borders with a sensitive and specific dynamics and

international competitive environments. This may be the result of strategic agility and the need to have strategic terms. Final suggestions are as follows:

A) Develop and clarify the strategic landscape through a process of dialogue with high quality internal stakeholders

(employees, shareholders) and external stakeholders (customers, Suppliers). B) Encourage and develop teamwork, and

Table 9: Rhythmic Similarity Matrix of Strategic Agility Insurance Companies in the Study of the Ideal Strategic Agility

Insurance companies studied						Dimensions of strategic agility
Karafarin Insurance	Moalem Insurance	Iran Insurance	Parsian Insurance	Alborz Insurance	Dana Insurance	
0.105	0.105	0.11	0.1015	0.1035	0.1085	Acting
0.1835	0.185	0.1985	0.1935	0.17	0.175	joint responsibility
0.104	0.113	0.104	0.104	0.108	0.113	Understanding the fundamental capabilities
0.092	0.0955	0.0955	0.0935	0.0915	0.096	Strategic Targets
0.079	0.0785	0.0785	0.77	0.078	0.078	Clarity prospects
0.56	0.58	0.59	0.57	0.55	0.57	The final score
4	2	1	3	5	3	Rank

Table 10: Shows the Normalized Weighted Fuzzy Performance Matrix Strategic Agility Insurance Companies Studied (SAW Technique Fuzzy)

Insurance companies studied						Dimensions of strategic agility
Karafarin Insurance	Moalem Insurance	Iran Insurance	Parsian Insurance	Alborz Insurance	Dana Insurance	
(0.07,0.0355, 0.0175)	(0.017,0.035, 0.07)	(0.019,0.038, 0.0725)	(0.0165,0.03 5,0.0675)	(0.017,0.0345, 0.0695)	(0.018,0.035 5,0.0725)	Acting
(0.0345,0.06 4,0.118)	(0.0335,0.06 3,0.1195)	(0.039,0.070 5,0.1275)	(0.037,0.098 5,0.1235)	(0.0295,0.0575 0,0.1105)	(0.031,0.058 5,0.114)	joint responsibility
(0.019,0.036, 0.067)	(0.072,0.04,0 .027)	(0.0195,0.03 65,0.064)	(0.019,0.036 5,0.0665)	(0.02,0.0375,0. 0695)	(0.027,0.039 5,0.0725)	Understanding the fundamental capabilities
(0.0185,0.03 250,0.059)	(0.0195,0.03 5,0.0615)	(0.0195,0.03 4,0.0605)	(0.0185,0.03 3,0.0595)	(0.018,0.0325, 0.0585)	(0.0195,0.03 45,0.061)	Strategic Targets
(0.0165,0.02 9,0.0495)	(0.015,0.027, 0.045)	(0.016,0.028 5,0.0495)	(0.0155,0.02 8,0.0485)	(0.016,0.028,0. 049)	(0.016,0.028, 0.049)	Clarity prospects

Table 11: Shows the Normalized Weighted Fuzzy Performance Matrix Strategic Agility Insurance Companies Studied (SAW Technique Fuzzy) Final Score and Ranking

Insurance companies studied						Dimensions of strategic agility
Karafarin Insurance	Moalem Insurance	Iran Insurance	Parsian Insurance	Alborz Insurance	Dana Insurance	
0.041	0.041	0.0403	0.0395	0.0405	0.0425	Acting
0.072	0.072	0.0785	0.076	0.066	0.068	joint responsibility
0.041	0.0445	0.041	0.0405	0.0425	0.045	Understanding the fundamental capabilities
0.0365	0.0385	0.038	0.037	0.0365	0.038	Strategic Targets
0.0315	0.03	0.0315	0.0305	0.031	0.031	Clarity prospects
0.202	0.23	0.23	0.22	0.22	0.22	The final score
2	1	1	2	2	2	Rank

Table 12: Summary and Final Values, Respectively, By Preference Attribute Decision Making Techniques

SAW Technique Fuzzy Based on the Degree of Similarity	SAW Technique Fuzzy	Industry
0.57(3)	0.22(2)	Dana Insurance
0.55(5)	0.22(2)	Alborz Insurance
0.57(3)	0.22(2)	Parsian Insurance
0.59(1)	0.23(1)	Iran Insurance
0.58(2)	0.23(1)	Moalem Insurance
0.56(4)	0.22(2)	Karafarin Insurance

continuous and permanent recovery capabilities senior management team to develop a spirit of shared responsibility and create solidarity among team members to achieve strategic objectives. C) Develop a shared responsibility and therefore the creation of a collective commitment among team members, senior management through the development of communication and trust. D) Development of fundamental capabilities through emphasis on the individual, team, organization, communication with customers and suppliers and knowledge management, customers and suppliers. K) Optimization of targets and strategic objectives through the development and wide application of information technology decision systems (including decision support system) by the administrator.

ACKNOWLEDGEMEN

The author appreciates all personal and manager of insurance companies to assist the author to find the needed information and data.

REFERENCE

- Wiggins, R.R. and Ruefli, T.W. "Schumpeter's Ghost: Is hypercompetition making the best of times shorter?", *Strategic Management Journal*, 26(10), pp.887-911. 2005
- Swafford, P.M, Ghosh, S. and Murthy, N "The antecedents of supply chain agility of a firm: Scale development and model testing", *Journal of Operations Management*, 24, pp.170-188. 2006
- Doz, Y. L. and Kosonen, M. "Fast Strategy: How strategic agility will help you stay ahead of the game". *Wharton School Publishing, Harlow*. 2008
- Long, C. "You Don't Have a Strategic Plan? - Good!", *Consulting to Management*, 11(1), pp.35-42. 2000.
- Hamel, G. and Välikangas, L. "The Quest for Resilience", *Harvard Business Review*, 81(9), pp.52-63. 2003.
- Santala, M. "Strategic Agility in a Small Knowledge Intensive Business Services Company: Case Swot Consulting", *Organizatio and Management Master's thesis, Department of Marketing and Management, Helsingin Kauppakorkeakoulu, Helsinki Chool Of Economics*. 2009.
- Roth, A. V. "Achieving Strategic Agility through Economies of Knowledge, Strategy and Leadership Strategy and Leadership", *Formerly Planning Review Planning Review*, 24(2), pp.30-37. 1996.
- Grant, R. M. "Toward a knowledge-based theory of the firm", *Strategic Management Journal* 17, pp.109-122. 1996.
- Sull, D. "How to Thrive in Turbulent Markets", *Harvard Business Review*, 87(2), pp.78-88. 2009.
- Sambamurthy, V., Bharadwaj, A. and Grover, V., "Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firm", *MIS Quarterly*, 27(2), pp.237-263. 2003.
- Venkatraman, N. and Henderson, J., "Real Strategies for Virtual Organizing", *MIT Sloan Management Review*, 40(1), pp.33-48. 1998.
- Ojha, D., "IMPACT of strategic agility on capabilities and financial performance, Presented to the Graduate School of Clemson University", *Dissertation Presented to the Graduate School of Clemson University*. 2008.
- Hoek, Remko I. van, Harrison, A. and Christopher, M., "Measuring agile capabilities in the supply chain", *International Journal of Operations & Production Management*, 21(1/2), pp.126-147. 2001.
- Mavengere, N. B. "Strategic agility of supply chains, Master's Thesis in International management of Information Technology", *Turan Kauppakorkeakoulu, Turku School of Economics, Tilburg University*. 2009.
- Chang, C-W, Wu, C-R. and Chen, H-C. "Using expert technology to select unstable slicing machine to control wafer slicing quality via fuzzy AHP", *Experts Systems with Applications*, 34, pp.2210-2220. 2008.
- Beskese, A., Kahraman, C. and Irani, Z. "Quantification of flexibility in advance manufacturing systems using fuzzy concept", *International Journal of Production Economics*, 89, pp. 45-56. 2004.
- Golec, A. and Taskin, h. "Novel methodologies and a competitive study for manufacturing systems performance evaluations", *Information Sciences*, 177, pp.5253-5274. 2007.
- Zadeh, L. A., "The concept of linguistic variable and its application to approximate reasoning", *Information Science*, 8/9, pp.199-249. 1975
- Hsu, T. H. and Yang, T. H "Application of fuzzy analytic hierarchal process in the selection of advancing media", *Journal of Management and Systems, Taiwan*, 7(1), pp.19-39. 2000.
- Chen, y., Fung, R. y. k. and Tang, J "Rating technical attributes in fuzzy QFD by integrating fuzzy weighted average method and fuzzy expected value operator", *European Journal of Operational Research*, 174, pp.1553-1566. 2006.
- Shanon, C.E., and Weaver, W. "The mathematical theory of communication", *University of Illinois Press, Urbana*, II. 1947
- Hwang, C. L., and Yoon, K., "Multiple attributes decision making methods and Applications". *Springer-Verlag*. 1980
- Martin, N.F.G., and England, J. W. "Mathematical theory of Entropy", *Addison-Wesley, Readings, MA*. 1981
- Chen, J. J-G., and He, Z. "Using analytic hierarchy process and fuzzy set theory to rate and rank the disability", *Fuzzy Sets and Systems*, 88, pp.1-22. 1997.
- Chen, S. M. "A new approach to handling fuzzy decision making problems", *IEEE Transactions on Systems, Man, and Cybernetics*, 18, pp.1012-1016. 1998
- Chen, S. M. and Hsiao, P. H. "A comparison of similarity measures of fuzzy values", *Fuzzy Sets and Systems*, 72, pp. 79-89. 1995
- Seo, D-C, Torabi, M. R., Blair, E. H. and Ellis, N. T "A cross-validation of safety climate scale using conformity factor analytic approach," *Journal of Safety Research*, 35, p.427-445. 2004.
- Hair, Jr. Jf, Black, W.C., Babin, B.J., Anderson, R. and Tachum, R "Multivariate data analysis", 6th ed., *prentice-Hall, Upper Saddle River*. 2006
- Churchill, G.A., "Marketing research: methodological foundation", (5th Ed), 1991, *The Dryden Press, New York, Ny*. 1991
- Nunnally, J.C "Psychometric theory", (2th Ed.), *McGraw-Hill, New York, NY*. 1978
- Sekaran, U, "Research Methods for Business", (2nd Edition), New York: John Wiley and Sons. 1992
- Fornell, C., and Larcker, F. D., "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, 18(1), pp.39-50. 1981
- Hamel, G., "The Future of Management", *Harvard Business School Press, Boston*. 2007
- Stratovation Consulting Inc, "The importance of corporate agility" <http://www.stratovation.com/images/StrategicAgility.pdf>. 2006