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Using Knowledge Management Processes in order to Prioritize Organizations by Fuzzy TOPSIS method; with a Case Study

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ABSTRACT

Nowadays, knowledge management has become a key element of knowledge-based organizations activities. These companies attempt to effectively and efficiently use of their intellectual investments and knowledge resources in order to achieve strategic objectives executing various knowledge management projects. This research is done to Prioritize organizations based on knowledge management processes. Therefore, in first step, the general model of knowledge comprised 4 processes of knowledge creation, knowledge storage, knowledge sharing and application of knowledge, are selected and they were weighted by the experts regards. The statistical population of this research was the chief and middle managers of the companies and a questionnaire was used to collect information. Then Fuzzy TOPSIS, one of multi criteria decision making algorithms was applied to Prioritize automotive part manufacturing companies. The results of prioritizing the organizations through Fuzzy TOPSIS model revealed that PeymanSanat company has the first rank in the field of knowledge management processes with the similarity indicator of 0.5975, and sensitivity analysis revealed the knowledge preservation and knowledge creation are the most effective factors.

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1. Introduction

Knowledge as new wealth of organizations is considered that using it competitive advantages and excellent business functions are achievable (Al Alawi et al., 2007). The importance of knowledge as a brilliant capital have caused to create new topic entitled "knowledge management".Knowledge management is a structured process of creating, maintaining and fostering organizational knowledge to obtain the best implication of personal and group knowledge. Knowledge management is a systematic and integrated approach to identifying, managing and disseminating the knowledge assets of an organization such as databases, documentation, procedures, and processes (coates, 2001).

In this paper, knowledge management is studied in process-based viewpoint. In this viewpoint, knowledge management contains four processes comprised of create, save, transfer and implement of knowledge (Newman & Conrad, 1999).

The reason for this choice is that in most of knowledge management models have emphasize in these four processes and it can be inferred that these processes are the basic elements of knowledge management. On the other hand, according to the researchers and consultants idea, executing knowledge management in an organization is consist of these stages which enhance the performance of the organizations and create a competitive advantage (Zack, 1998; Davenprt, 1998; Malhotra, 2004).

Therefore multi – criteria decision making procedure can be effective in evaluation and ranking of the organizations based on the knowledge management processes. Decision - making is the procedure to find the best solution among a set of feasible alternatives. Sometimes, decision-making problems considering several criteria are called multi-criteria decision - making (MCDM) problems (Chen, 2000). TOPSIS is one of the best and useful decision making procedures with multi – indicators that is based on a simple logic by Hwang in1981. This logic is in a way that it makes one ideal and one anti – ideal option and then chooses the select options based on the least distance from the ideal option and the most distance from the anti – ideal option (Yoon and Hwang, 1995).

The aim of this study is to rank Isfahan automotive part companies based on the knowledge management processes through Fuzzy TOPSIS. To do this, the processes of knowledge management in desired organizations are determined theoretical foundations and then the level of the importance of each factor is specified by the experts. After that, the values of each factor in each organization are calculated by the questionnaire. Next, the organizations are ranked based on the knowledge management processes by Fuzzy TOPSIS and level of the effect of each factor will be specified.

2. Literature review

Noting was found in organizations ranking based on the knowledge management processes but some researches have been done in knowledge management and its combination with the techniques of the multi – criteria decision – making. Some of them are mentioned in Table 1.

Table 1. Literature review

Researchers	Methodology	Researches
Perçin (2010)	analytic network process (ANP)	Selecting knowledge management strategies
Kazemi & Allahyari (2010)	group analysis hierarchy process (GAHP)	Defining a knowledge management conceptual model
Abzari (2011)	T-test & Friedman	Check the gap between existing and desired state of knowledge management in Iran's car industry
Shakeri (2011)	TOPSIS	Evaluate Process of Applicable & Especial Knowledge in Loop of Research,Extension and Farmers
Monavarian et al. (2011)	ANP & TOPSIS	Selecting knowledge management strategies
Tseng (2011)	ANP & DEMATEL	Evaluate firm environmental knowledge management in uncertainty
Saeedi et al. (2012)	Fuzzy TOPSIS	Ranking the effective factors in knowledge management implementation
Shabani et al. (2012)	TOPSIS	Identification and Ranking of Factors Affecting the Implementation of Knowledge Management
Sadeghi et al. (2013)	analytic hierarchy process (AHP)	Identifying and prioritizing of effective constructs in readiness of knowledge management implementation
Ansari & Norouznezhad (2013)	Fuzzy TOPSIS	Identifying and ranking knowledge management factors in security and exchange organization
Asgari (2013)	TOPSIS	Identification and ranking of factors affecting the implementation of knowledge management
Ahani (2013)	Fuzzy TOPSIS	Identifies and ranks the dimensions of knowledge management based on the building blocks of the knowledge management model
Li (2013)	Fuzzy TOPSIS	Developing a model for the selection of knowledge management system
Mohaghar et al. (2014)	Fuzzy AHP & TOPSIS	Identifying the best method for using knowledge management in supply chain
Patil & Kant (2014)	AHP & TOPSIS	Ranking the solutions of knowledge management adoption in supply chain to overcome its barriers

3. Knowledge management

Analyzing the characteristics of knowledge and its importance within the organization it can be understood that having update information and knowledge have become an undeniable necessity for

continued existence of the organization. Specifically, if the knowledge transformations trend in community be carefully evaluated, this can be concluded that today's post-industrial society is a society in which the power-increase technologies have gradually given way to knowledge-increase technologies. Important role of knowledge as a brilliant investment in organizations has led researchers in recent years to enormously research in this field and most of the organizations try to transform the staffs' saved knowledge as an organizational assess. Due to the fact that knowledge as a strategic source and a competency key to organizations is especially important, nowadays to use correct of this high value source knowledge management issue has put at the first level of organization's must-be improvement list (Beccera – Fernandez&Sabherwal, 2001).

General model of knowledge in organizations:

The model was presented in 1999 by Newman and Conrad. General model of knowledge includes the following four activities (Newman and Conrad, 1999):

A) Knowledge creation: this phase includes activities that are associated with enter of knowledge to the system which includes development, discovery and capture of knowledge.

B) Knowledge storage: it means the organization's ability to maintain the knowledge that leads to the survival of knowledge in the organization.

C) Knowledge sharing: it refers to activities that are associated with the flow of knowledge from one sector or one person to another sector or person and it is including communications, translation, conversion, purification interpretation of knowledge.

D) Knowledge application: it is including activities that are associated with the implementation of organizational processes.

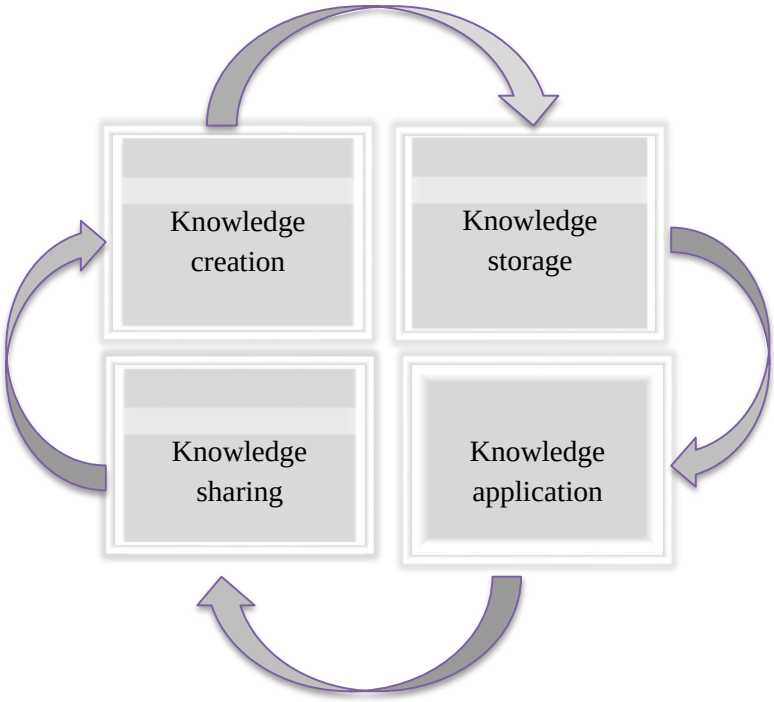

Figure 1. General model of knowledge (Newman and Conrad, 1999)

4. Fuzzy TOPSIS

In fuzzy TOPSIS, the technique of ideal and anti - ideal solution is used to find the best alternative, considering that the chosen alternative should simultaneously have the shortest distance from the ideal solution and the longest distance from the anti - ideal solution. The fuzzy TOPSIS technique steps for a MCDM problem with n criteria and m solution are as followings (Chen and Hwang, 1992).

Step 1: *Decision matrix generation*

Based on n criteria and m solution and evaluating all the solution for all different criteria, decision matrix is generated as:

$$\widetilde{D} = \begin{bmatrix} \tilde{x}_{11} & \tilde{x}_{12} & \dots\dots & \tilde{x}_{1n} \\ \tilde{x}_{21} & \tilde{x}_{22} & \dots\dots & \tilde{x}_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ \tilde{x}_{m1} & \tilde{x}_{m2} & \dots\dots & \tilde{x}_{mn} \end{bmatrix}$$

If triangular fuzzy numbers are used in the problem, then Xij= (aij, bij, cij). If the solution assessments based on the criteria is done through surveying a group of K members, and the Kthdecision maker fuzzy assessment is Xijk= (aijk, bijk, cijk), then based on combinatory fuzzy ranking criteria, the solution can be considered as the following relations:

$a_{ij} = \mathrm{Min}(a_{ijk})$

$$b_{ij} = \frac{\sum_{k=1}^{k} b_{ijk}}{k} \qquad i = 1,2,\dots\dots\dots\dots,m \qquad (1)$$

$c_{ij} = \mathrm{Max}(c_{ijk}) \qquad j = 1,2,\dots\dots\dots\dots,n$

Step 2: *Criteria weight matrix determination*

Here the significance coefficient of various criteria is:

$$W_J = [w_1, w_2, \dots\dots\ w_n] \qquad (2)$$

If triangular fuzzy numbers are used, each elements of Wiare defined as Wij= (Wj1, Wj2, Wj3). When the criteria weights are given by the expert group, then for getting the mean of the group' s idea, the following relations are used:

$aij = \mathrm{Min}(W_{jk1})$

$$bij = \frac{\sum_{k=1}^{k} W_{jk2}}{k} \qquad (3)$$

$cij = \mathrm{Max}(W_{jk3})$

Step 3: *Fuzzy decision matrix normalization*

Here in order to normalize fuzzy decision matrix values, linear normalize is used totransform different criteria to comparable scales. In this case, as Xijsare fuzzy, so rijsare.If the fuzzy numbers are triangular, decision matrix entry for positive and negativecriteria are measured from the followings, respectively:

$$r_{ij}=\left(\frac{a_{ij}}{c_j^*},\frac{b_{ij}}{c_j^*},\frac{c_{ij}}{c_j^*}\right)$$

$$c_j^*=\max c_{ij} \quad (4)$$

$$r_{ij}=\left(\frac{a_j^-}{c_{ij}},\frac{a_j^-}{b_{ij}},\frac{a_j^-}{a_{ij}}\right)$$

$$a_j^-=\min a_{ij}$$

Step 4: *weighted fuzzy decision matrix determination*

Based on the weights of different criteria, weighted fuzzy decision matrix is given by multiplying the related significance coefficient of each criterion in fuzzy normalized matrix, as the following:

$$v_{ij}=r_{ij}\times w_j \quad (5)$$

Then weighted fuzzy decision matrix is as the following:

$$v=\begin{array}{c} \\ A_1 \\ \vdots \\ A_i \\ \dots \\ A_m \end{array}\begin{array}{c} \begin{array}{ccccc} X_1 & \dots & X_j & \dots & X_n \end{array} \\ \begin{bmatrix} v_{11} & \dots & v_{1j} & \dots & v_{1n} \\ \vdots & & \vdots & & \\ v_{i1} & \dots & v_{ij} & \dots & v_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ v_{m1} & \dots & v_{mj} & \dots & v_{mn} \end{bmatrix} \end{array}$$

If fuzzy numbers are triangular, then for those criteria with positive and negative aspects, we respectively have:

$$v_{ij}=r_{ij}\times w_j=\left(\frac{a_{ij}}{c_j^*},\frac{b_{ij}}{c_j^*},\frac{c_{ij}}{c_j^*}\right)\times\left(w_{j1},w_{j2},w_{j3}\right)=\left(\frac{a_{ij}}{c_j^*}\times w_{j1},\frac{b_{ij}}{c_j^*}\times w_{j2},\frac{c_{ij}}{c_j^*}\times w_{j3}\right) \quad (6)$$

$$v_{ij}=r_{ij}\times w_j=\left(\frac{a_j^-}{c_{ij}},\frac{a_j^-}{b_{ij}},\frac{a_j^-}{a_{ij}}\right)\times\left(w_{j1},w_{j2},w_{j3}\right)=\left(\frac{a_j^-}{c_{ij}}\times w_{j1},\frac{a_j^-}{b_{ij}}\times w_{j2},\frac{a_j^-}{a_{ij}}\times w_{j3}\right)$$

Step 5: *Finding fuzzy ideal and anti-ideal options:*

$$A^+=(v_1^*,v_2^*,\dots\dots\dots,v_n^*) \quad (7)$$

$$A^-=(v_1^-,v_2^-,\dots\dots\dots,v_n^-)$$

In this research and based on Chen's model, the following constant values are used to measure fuzzy ideal and anti-ideal solutions:

$$A^+=(1,1,1) \quad (8)$$

$$A^-=(0,0,0)$$

Step 6: *Calsulating the distances from fuzzy ideal and anti-ideal solutions*

In this step, the distance from each fuzzy ideal and anti-ideal solution is given:

$$S_i^+ = \sum_{j=1}^{n} d(v_{ij}, v_j^*) \qquad i = 1,2,\dots\dots\dots\dots,m \qquad (9)$$

$$S_i^- = \sum_{j=1}^{n} d(v_{ij}, v_j^-) j = 1,2,\dots\dots\dots\dots,n$$

If fuzzy numbers are triangular, the distance of two triangular numbers of (a1, b1, c1) and (a2, b2, c2) is:

$$d(M_1, M_2) = \sqrt{\left(\frac{1}{3}\right)[(a_1 - a_2)^2 + (b_1 - b_2)^2 + (c_1 - c_2)^2]} \qquad (10)$$

Step 7: *Measurement of closeness coefficient*

Closeness coefficient is calculated by:

$$CC_i = \frac{S_i^-}{S_i^+ + S_i^-} \qquad i = 1,2,\dots\dots\dots\dots,m \qquad (11)$$

Step 8: *Ranking of solution*

At this step the solutions are ranked based on closeness coefficient value. It is in such a way that indices with more closeness get a higher rank.

5. Research method

This study deals with ranking automotive parts companies based on theKnowledge Management Processes. To do so, fuzzy TOPSIS technique is used. The main tool for gathering information is the questionnaire. In the first phase, theknowledge management processes are determined. In the second phase, the level of the knowledge management in each company is specified through questionnaire. In the third phase, the value of eachprocesses of knowledge management is specified in a Fuzzy way after defining Fuzzy values. In the fourth phase, organizations are ranked by the Fuzzy TOPSIS and higher organizations in knowledge management are determined. In the last phase, sensitivity analysis will be carried out based on criteria and the most effective criterion in ranking is determined by Fuzzy TOPSIS.

The first step: first the questionnaire of knowledge management processes was prepared and its validity was approved by some expert in this case. Cronbach′ sα was used to assess the stability capabilities of the questionnaire. Its amount for the whole questionnaire was 0.886. Considering that this amount is higher than 0.7, then the questionnaire have acceptable stability. The statistical population in this study was chief and middle managers of automotive parts companies. After distributing 110 questionnaires in 30 companies, 81 questionnaires were returned. This questionnaire has 25 questions and the four processes are evaluated. There are 5 choices (completely agree / disagree) for each question. In the next phase, the level of each knowledge management processes in each company was specified.

The second step: Fuzzy amount of each verbal variable was determined in Table 2.

Table 2. Fuzzy values of linguistic variable (Tavakoli et al, 2013)

Very high	5	(0.8, 1, 1)
High	4	(0.6, 0.7, 0.8)
Average	3	(0.3, 0.45, 0.6)
Low	2	(0.1, 0.2, 0.3)
Very low	1	(0, 0, 0.1)

The third step: organizations are ranked by Fuzzy TOPSIS. To determine the weight of the criteria, they were weighted based on the experts' ideas and the weights are in table 3.

Table 3. Criteria weights

Criteria	**Criteria weights**
Knowledge creation	(0.6 , 0.88 , 1)
Knowledge storage	(0.3 , 0.55 , 0.8)
Knowledge sharing	(0.3 , 0.6 , 0.8)
Knowledge application	(0.6 , 0.82 , 1)

In the next phase, decision making matrix in Table 4 was created by the use of the information obtained from the knowledge management questionnaire.

Table 4. Decision making matrix

Criteria / Organization	**Knowledge creation**	**Knowledge storage**	**Knowledge sharing**	**Knowledge application**
HaghighatKhodro	(0.1 , 0.632 ,1)	(0.1 , 0.64 , 0.8)	(0.1 , 0.617 , 0.8)	(0.3 , 0.692 , 1)
Borna Battery	(0.1 , 0.614 , 1)	(0 , 0.654 , 1)	(0 , 0.576 , 1)	(0.3 , 0.693 , 1)
Ikad	(0 , 0.649 ,1)	(0.1 , 0.607 , 1)	(0.1 , 0.512 , 1)	(0.1 , 0.667 , 0.8)
Dorsa Khodro	(0 , 0.469 , 0.8)	(0.1 , 0.425 , 1)	(0.3 , 0.655 , 1)	(0.3 , 0.625 , 1)
Sanatgar	(0.1 , 0.55 , 1)	(0.3 , 0.589 , 0.8)	(0 , 0.62 , 1)	(0.1 , 0.467 , 1)
Delvar Machine	(0.1 , 0.572 , 1)	(0.1 , 0.586 , 1)	(0.1 , 0.535 , 0.8)	(0.1 , 0.513 , 0.8)
Farman Khodro	(0.1 , 0.513 , 0.8)	(0.1 , 0.561 , 0.8)	(0.3 , 0.6 , 0.8)	(0.3 , 0.575 , 0.8)
Isfahan Dor	(0 , 0.566 , 1)	(0 , 0.353 , 0.8)	(0 , 0.508 , 1)	(0.1 , 0.517 , 0.8)
SarvSanat	(0 , 0.576 , 1)	(0.1 , 0.537 , 1)	(0.1 , 0.612 , 1)	(0.1 , 0.637 , 1)
Goharbafan	(0 , 0.678 , 1)	(0.1 , 0.656 , 1)	(0.1 , 0.63 , 1)	(0.3 , 0.693 , 1)
AyandehShimi	(0.1 , 0.581 , 1)	(0.1 , 0.422 , 0.8)	(0 , 0.41, 0.8)	(0 , 0.467 , 0.8)
Atlas pomp	(0 , 0.592 , 1)	(0 , 0.548 , 1)	(0 , 0.577 , 1)	(0.1 , 0.683 ,1)
Asia Shisheh	(0 , 0.519 , 1)	(0 , 0.581 , 1)	(0 , 0.665 , 1)	(0.1 , 0.533 , 0.8)
GhetesaziSepahan	(0.1 , 0.569 , 1)	(0.1 , 0.583 , 1)	(0 , 0.543 , 1)	(0 , 0.3 , 0.8)
PeymanSanat	(0.3 , 0.65 , 1)	(0.3 , 0.678 , 1)	(0.3 , 0.77 , 1)	(0.6 , 0.8 , 1)
Sepahan Battery	(0.1 , 0.588 , 1)	(0.1 , 0.534 , 0.8)	(0.1 , 0.45 , 0.8)	(0.3 , 0.672 , 0.8)

Table 4. Decision making matrix

Criteria / Organization	Knowledge creation	Knowledge storage	Knowledge sharing	Knowledge application
SetarehPalayeh	(0.1 , 0.544 , 0.8)	(0 , 0.511 , 0.8)	(0 , 0.56 , 0.8)	(0.3 , 0.617 , 0.8)
EmdadSanaye	(0 , 0.613 , 0.8)	(0 , 0.511 , 0.8)	(0.3 , 0.65 , 0.8)	(0.3 , 0.717 , 1)
SepahanPich	(0 , 0.488 , 0.8)	(0 , 0.483 , 0.8)	(0 , 0.46 , 0.8)	(0.3 , 0.617 , 0.8)
ParszobEspadana	(0.3 , 0.691 , 1)	(0.3 , 0.619 , 1)	(0.1 ,0.68 , 1)	(0.3 , 0.708 , 1)
PayazobKave	(0 , 0.557 , 1)	(0.1 , 0.614 , 1)	(0 , 0.61 , 1)	(0.1 , 0.644 , 0.8)
Ghetekaran	(0.3 , 0.675 , 1)	(0.3 , 0.617 , 0.8)	(0.3 , 0.65 , 0.8)	(0.3 , 0.617 , 0.8)
SanyeAzarin	(0 , 0.555 , 1)	(0 , 0.567 , 1)	(0.1 , 0.525 , 1)	(0.1 , 0.642 , 1)
Poulad trash	(0 , 0.594 , 1)	(0.1 , 0.6 , 1)	(0.1 , 0.61 , 1)	(0 , 0.567 , 1)
Estilzob	(0 , 0.556 , 1)	(0 , 0.444 , 1)	(0.1 , 0.35 , 0.8)	(0 , 0.383 , 0.8)
Ghaemieh	(0.1 , 0.613 , 1)	(0 , 0.539 , 0.8)	(0.1 , 0.6 , 0.8)	(0.3 , 0.717 , 1)
Roueensanat	(0.1 , 0.544 , 0.8)	(0.1 , 0.589 , 0.8)	(0.1 , 0.56 , 1)	(0.3 , 0.617 , 0.8)
Isfahan Egzoz	(0.1 , 0.434 , 0.8)	(0 , 0.453 , 0.8)	(0 , 0.43 , 0.8)	(0.1 , 0.45 , 0.8)
Iran Godakht	(0 , 0.631 , 1)	(0 , 0.568 , 1)	(0.1 , 0.603 , 1)	(0.3 , 0.658 , 0.8)
SahandGirbox	(0.1 , 0.644 , 1)	(0.3 , 0.575 , 1)	(0.3 , 0.735 , 1)	(0.3 , 0.617 , 0.8)

After gaining decision making matrix, organizations were ranked through Fuzzy TOPSIS and similarity indicator was obtained (Table 5) and organizations were ranked according to that.

Table 5. Closeness coefficient and ranking

Organizations	Closeness coefficient	Ranking	Organizations	Closeness coefficient	Ranking
PeymanSanat	0.5975	1	RoueenSanat	0.4975	16
ParszobEspadana	0.5725	2	SanayeAzarin	0.496	17
Goharbafan	0.5584	3	Sepahan Battery	0.4944	18
GhetesaziSepahan	0.5522	4	SetarehPalayeh	0.4884	19
Ghtekaran	0.5487	5	Farman Khodro	0.4864	20
SahandGirbox	0.5467	6	Asia Shisheh	0.4841	21
EmdadSanaye	0.5359	7	Delvar Machine	0.4771	22
Borna Battery	0.5358	8	Sanatgar	0.4714	23
Iran Godakht	0.5302	9	Dorsa Khodro	0.4695	24
Ghaemieh	0.5298	10	SepahanPich	0.4548	25
Ikad	0.5286	11	Isfahan Dor	0.4363	26
PayazobKaveh	0.5178	12	HaghighatKhodro	0.4322	27
Atlas Pomp	0.516	13	AyandehShimi	0.4246	28
SarvSanat	0.5089	14	Isfahan Egzoz	0.3949	29

Poulad Trash	0.5013	15	Estilzob	0.3943	30

The result of organizations ranking showed that PeymanSanat, ParszobEspadana and Goharbafan companies have the least distance from the ideal option and the most distance from the counter – ideal option according to their similarity indicator. They were ranked the first to the third by Fuzzy TOPSIS.

The fourth step: the criteria were analyzed by their sensitivity in the last phase. To do this, the issue was solved another 4 times but in each phase, one of the criteria was omitted and similarity indicator was derived for each organization. Each time the sum difference similarity indicator obtained in case of criteria removed has been calculated along with similarity indicator; consequently the criterion whose removal result in a higher difference in the indicator takes higher significance. The results obtained by sensitivity analysis are in Table 6.

Table 6. Sensitivity analysis

Criteria	Closeness coefficient difference	Significant rank
Knowledge storage	0.5678	1
Knowledge creation	0.5552	2
Knowledge application	0.498	3
Knowledge sharing	0.452	4

The results of the sensitivity analysis of the criteria showed that the Knowledge storage and knowledge creation are the most effective of critical success factors in ranking the automotive part companies by Fuzzy TOPSIS.

6. Conclusion

Today, knowledge management is one of the newest and most key management issues. Knowledge management can be defined as a conscious strategy to achieve appropriate knowledge and a kind of help for people in sharing and implementing informationon the way to improve organizational performance. Correct and complete implementation of knowledge management needs to develop processes comprised of identifying, creating, storing, sharing and applying knowledge. These processes form the foundation of the basic concepts of knowledge management and provide the

possibility to share experiences, knowledge and expertise that led to the creation of new strengths, improve performance, encouraging innovation and value creation for customers.

Knowledge management and related activities has numerous functions in the organization. One of the main and most important is increasing competitiveness in the competitive environment and creates a sustainable competitive advantage for the organization. This issue is particularly touchable in the industry. The automotive industry has been one of the most important branches of industry during his life and is a source of many industrial developments in other areas. Automotive industry is identified as one of the most competitive areas in the world and they should implement of knowledge as the most important competitive factor due to maintain their position in the market and compete with other companies. The proper application of knowledge can help to create a sustainable competitive advantage in these companies.

In this study, firstly the knowledge management processes were chosen and they were weighted based on experts ideas. Then the values of these processes in each organization were evaluated by the questionnaire. The statistical population of this study was chief and middle managers of automotive parts companies. After that, the organizations were ranked according to the knowledge management processes through Fuzzy TOPSIS. PeymanSanat, ParszobEspadana and Goharbafan companies were ranked respectively the first to third by Fuzzy TOPSIS.The results of the sensitivity analysis revealed the knowledge preservation and knowledge creation are the most effective factors.

7. References

Abzari, M., Sha'emi, A., Talebi, H., Abdolmanafi, S., (2011), "Check the gap between existing and desired state of knowledge management in Iran's car industry", *Public Management Journal*, Vol. 3, No. 6, pp. 19-34.

Al-Alawi, A.I.,Al-Marzoogi, N.Y. and Mohammad, Y.F. (2007), Organizational Culture & Knowledge Sharing: Critical Success Factors. Journal of Knowledge Management, Vol.2, PP.22-42.

Ahani, M., (2013), "Identifies and ranks the dimensions of knowledge management based on the building blocks of the knowledge management model using the Fuzzy TOPSIS technique", *Behavioral sciences in Asia*, Vol. 1, No. 4, pp. 31-44.

Ansari, M., Norouznezhad, A., (2013), "Identifying and Ranking Knowledge Management Factors Using Fuzzy TOPSIS: A Case in Security and Exchange Organization", *Journal of Basic and Applied Scientific Research*, Vol. 3, No. 3, pp. 426-433.

Asgari, M.H., (2013), "Identification and Ranking of Factors affecting the implementation of Knowledge Management based on TOPSISTechnique", *Applied and Basic Sciences*, Vol. 4, No. 10, pp. 3076-3084.

Becerra-Fernandez, I., (2001), "Organizational knowledge management: A contingency perspective", *Journal of Management Information Systems*, Vol. 18, No. 1, pp. 23–55.

Chen, CH.T., (2000), "Extension of the TOPSIS for Group Decision Making Under Fuzzy Environment", *Fuzzy Sets and Systems*, Vol. 114, No. 1, pp. 1-9.

Chen S. J., Hwang C.L., (1992), *Fuzzy Multiple Attribute Decision Making Methods and Applications*, Springer-Verlag, Berlin, New York

Coates, J. (2001), ''The HR implications of emerging business models'', Employment Relations Today, Winter, pp. 1-7

Davenport, T. H, &Prusak, L., (1998), *Working knowledge: How Organizations Manage What They Know*, Harvard Business School Press.

Kazemi, M., Zafar Allahyari, M., (2010), "Defining a knowledge management conceptual model by using MADM" *knowledge management*, Vol. 14, No. 6, pp. 872-890.

Li, M., (2013), "A multi-criteria group decision making model for knowledge management system selection based on TOPSIS with multiple distances in fuzzy environment", Kybernetes, Vol. 42, No. 8, pp. 1218-1234.

Malhotra, Y., (2004), "Knowledge management and new organization form: a framework for business model innovation", *Information Resources Management Journal*, Vol. 13, No. 1, pp. 5-14.

Mohaghar, A., Rajabani, N., KarimiZarchi, M., Fathi, M.R., (2014), "Identifying the Best Method for Using Knowledge Management in Supply Chain Using Fuzzy Logic", *International Journal of Business Management and Economics*, Vol. 1, No. 1, pp. 33-39

Monavvarian A., Fathi M.R., Zarchi M.K., Faghih A., (2011), "Combining ANP with TOPSIS in Selecting Knowledge Management Strategies (Case Study: Pars Tire Company) ", *European Journal of Scientific Research*, Vol. 54, No. 4, pp. 538-46.

Newman, B., Conrad, K.W., (1999). *A Framework for Characterizing Knowledge Management Methods, Practices, and Technologies*. The Knowledge Management Forum, 4600 Mallard Court, West Richland

Patil, S.K., Kant, R., (2014), "A fuzzy AHP-TOPSIS framework for ranking the solutions of Knowledge Management adoption in Supply Chain to overcome its barriers",*Expert Systems with Applications*, Vol. 41, No. 2, pp. 679-693.

Perçin, S., (2010), "Use of analytic network process in selecting knowledge management strategies", *Management Research Review*, Vol. 33, No. 5, pp. 452-471

Sadeghi, M.R., Moghimi, M., Ramezan, M., (2013), "Identifying and prioritizing of effective constructs in readiness of knowledge management implementation by using fuzzy analytic hierarchy process (AHP)", *Knowledge-based Innovation in China*, Vol. 5, No. 1, pp. 16-31.

Saeedi, N., Mehrmanesh, H., Askari, S., Mahdavi, H., (2012),"Ranking the Effective Factors in Knowledge Management Implementation Using Fuzzy Topsis Technique", *World Applied Sciences Journal*, Vol. 19 No.9, pp. 1335-1341.

Sandhawalia. B, Dalcher. D,(2011), "Developing knowledge management capabilities: a structural approach", *Journal of knowledge management*, Vol. 15, No .2, pp. 313-328.

Sarawanawong, J., Tuamsuk, K., Vongprasert, C., Khiewyoo, J., (2009), "Development of a Strategic Knowledge Management Model for Thai Universities", *Asia-Pacific Conference on Library & Information Education & Practice*

Shabani A., MohammadiOstani M., Forugozar H., (2012) "Identification and Ranking of Factors Affecting the Implementation of Knowledge Management Based on TOPSIS Approach: A Case Study". *Health InformationManagement* ,Vol. 9, No. 3, pp. 318-326.

Shakeri, F., Mirghafoori SH., Shakeri M., (2011), "Process of Applicable & Especial Knowledge in Loop of Research,Extension and Farmers", *Journal of Economics and Agricultural Development*, Vol. 24, No. 4, pp. 479-490.

Tseng, M.L., "Using a hybrid MCDM model to evaluate firm environmental knowledge management in uncertainty", *Applied soft computing*, Vol. 11, No. 1, pp. 1340-1352.

Yoon, K. P. and Hwang, C. L. (1995)."*Multiple Attribute Decision Making: An Introduction*", Sage University Paper series on Quantitative Applications in the Social Sciences. Sage Publications, Thousand Oaks, CA.

Zack, M., (1999), "Managing Codified Knowledge", *Sloan Management Review*, Vol. 40, No.4, pp. 45-58.