

## Ranking the Intellectual Capital Components Using Fuzzy TOPSIS Technique (Case Study: An Iranian Company)

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### ABSTRACT

In a scientific economical system, products and organizations' lives are dependent on knowledge and the most successful organizations are which use this intangible property in a better manner and higher speed. Today and from a strategic point of view, intellectual capital is utilized to create and improve organizational worthiness and organizational success depends on how this vital capital is used and managed in the system.

The purpose of writing this paper is to rank the intellectual capital components by fuzzy topsis technique in Sapco company. The results show that "Staff's knowledge, skills and expertise", "Identity acquisition from organizational values" and "associative staff's capability in decision" were chosen as the most important sub-criteria.

In the other side, "strategic management leadership", "staff's characteristics", "organization's operational performance" were selected as the least ones.

Finally, some suggestions were presented to achieve better intellectual capital and intangible assets management.

**KEYWORDS:** Intellectual capital, human capital, organizational capital, relational capital, fuzzy topsis technique

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### 1. INTRODUCTION

The components of knowledge economy are knowledge production, knowledge innovation, and the source of innovation is intellectual capital which also defined as intellect capital and knowledge capital (Bontis, 2004). So, more and more theorists and practitioners have moved their attention from physical capital to intellectual capital; enterprisers also have enhanced their focus on knowledge economy management (Fu, 2003). Along with the expansion of economic globalization, increasing compatibility is the vital key to future market share (Saeedi, 2009). The effective management of intellectual capital will not only bring businesses value appreciation, but also improve their compatibility.

Drucker, the famous management thinker says: We are entering a new knowledge-based society, in which the main economic resource will be 'knowledge', rather than natural resources, land, money and work force. The 21<sup>st</sup> century is the time for knowledge and information based economy, while the 20<sup>th</sup> century was the industrial economy. In an industrial economy, the physical properties such as land, work force and money were profitable main factors, and wealth was made from the combination of all these factors. Knowledge - as a source of making money - was playing a small role in such an economy. Whereas in knowledge-based economy, knowledge or intellectual capital are more superior compare to other physical, tangible properties. In contrast to industrial economy, intellectual and human capital is the most important properties of a knowledge-based economy, and organizations success is rooted in their intellectual capabilities. Based on this, the management techniques of intellectual capital play a crucial role in organizations' efficiency and goal advancement (Mehrmanesh et al, 2011).

### 2. LITERATURE REVIEW

#### 2.1. Intellectual Capital: Definitions and concepts

Intellectual capital has been defined as: mental acts, but not mere knowledge or pure intelligence; the discrepancy between company's market value and book value is explained as intellectual capital. Stewart (1997) offers the opinion that "intellectual capital stands for knowledge, information, intellectual property and experience that can be adopted to create wealth". Also intellectual capital is described as "the experience, organizational technology, customer relationship management and professional skills which increases a company's compatibility in the market". Intellectual capital refers to the organizational or individual knowledge which contributes to sustainable competitive advantage. It includes in his definition all employees' and organizations' ability to create value under a market assessment (Zou and Huan, 2011).

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To define intellectual capital in a simple way, it includes of the difference between its market price and its clerical properties price of an organization (Seetharaman et al, 2002). Jelcic, 2007 has been defined the intellectual capital in this way: Intangible mercantile properties and measurements of an organization which impact operations and other success factors effectively, while actually are not reflected on balance sheets.

Intellectual capital is viewed as an organization’s competencies and acts as the moving factor for business success. Intellectual capital is also defined as the strategic assets of an organization and is applied to differentiate one organization from the others through the products or services offered (Daud and Wan Yusoff, 2011).

Initially, there had been debates amongst interest parties on intellectual capital in respect to what had to be recognized as intellectual capital. In other hand, intellectual capital contains intellectual material – knowledge, information, intellectual property and experience – which can be put to apply to create wealth = collective brain power”. Intellectual capital is knowledge which can be converted into profit” (Kaufmann and Schneider, 2004). This kind of capital is not one thing, it is a fragile construct, that has to be continuously supported and held together by a whole array of interrelated elements”, and intellectual capital is meant as specific and valuable knowledge which belongs to the organization (Riahi-Belkaoui, 2003).

**2.1.1. Human Capital**

Human capital -or sometimes mentioned as human enterprise capital– is considered as the backbone for intellectual capital and is a very crucial factor for value creation in organizations (Royal & O’Donnell, 2008). Human capital is one of the most important variables in the study of intellectual capital. It is the dimension of intellectual capital that deals with the human knowledge and its experience, that is based on other elements and that will affect on a firm’s value by influencing the other elements. Employee knowledge and capabilities are the important sources of innovation (Wang and Chang, 2005; Van Buren, 1998).

It is appropriate to deduce that human capital closely affects on innovation capital. Employees are needed to carry out the internal process of an organization. Employees are also required to perform all customer services. By providing quality of service while implementing internal processes, the capability of employees would influence process efficiency and customer satisfaction. Stewart (1997) emphasized on the relationship between customers and employee capabilities. He pointed out that employees should possess suitable knowledge or skills to serve customer needs (Stewart, 1997). According to Wang and Chang (2005), human capital affects business performance through innovation capital, process capital and customer capital. Figure 3 shows the links between the intellectual capital components and business performance (Ahmad and Mushraf, 2011).

**Table 1: Human capital components (Chen et al, 2004)**

Employees’ Competency	associative staff’s capability in decision making and management, staff’s characteristics, staff’s learning ability, staff’s learning performance, Strategic management leadership, technical staff and managers’ learning
Employees’ Attitudes	Identity acquisition from organizational values, satisfaction rate, job quitting (desertion) rate, beneficent working lives’ average
Employees’ Creativity	Staff’s creative abilities, creative thinking income, employees knowledge, skill and expertise, entrepreneurship, competency

**2.1.2. Organizational Capital**

This group of capital consists of non-intellectual capital (Roos et al, 1997) which includes such factors as information databases, customers’ information, trademarks and organizational structure (Skandia, 1994; Nazari Hashemi et al, 2010).

Bontis (2002) described organizational capital as the knowledge entrenched within the schedules of an organization which includes technological modules and architectural competencies. Generally speaking the knowledge infrastructure in Gold et al. (2001) explained the variables such as organization structure, culture and technology (Gold et al, 2001).

**Table 2: organizational capital components (Chen et al, 2004)**

<b>Organizational culture</b>	<b>Organizational culture creation, staff’s identity acquisition in organization’s viewpoint</b>
Organizational structure	Provided clear relationship (Clear relationship’s choice), responsibility and profits, organizational system control’s credit
Organizational learning	Internal information network creation and application, organizational information repositories creation and application
Operational process	Business period process, products’ quality rate, organization’s operational performance
Informational system	Support and cooperation between staff, accessibility of organizational information, knowledge sharing, staff’s supporting of together, spiritual property, management philosophy

**2.1.3. Relational capital**

The most important factor in creating added value for the organization is the relational capital (Kamath, 2007). The distribution channels, customers’ satisfaction and loyalty are the factor which effect on additional value creation

(Bannany, 2008).

Sometimes customer capital and relational capital are defined similarly (Roos et al, 1997). In the knowledge based world, intellectual capital plays an important role in the establishment of intangible and knowledge towards value creation (Marr, 2004).

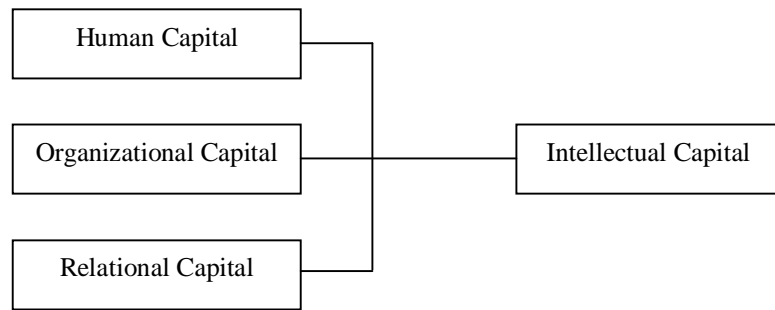
Particularly, the past literature explains human, organizational and customer capital as different entities and suggests that they are interconnected causally so that human capital creates knowledge which then can become constant in organizational capital to promote customer relations (Ahmad and Mushraf, 2011).

**Table 3: Relational capital components (Chen et al, 2004)**

Fundamental capability	marketing	Customer's information database creation and application, customer services capability, The ability to recognize customers' needs
Market intensity		Market contribution, market potential capability, customer's sales, brand's reputation, sales channel's creation, fair suppliers rules, timely obligations' accomplishment toward supplier, Honesty in responding to investor from informed sources
Customer loyalty		Customer's satisfaction, customer's complaint, customer's desertion, Investment on customers' relations

**2.4. Conceptual model of the research and research question**

Attention to research literature, the conceptual model below can be selected for the purpose of the current study. This model measures the intellectual capital dimension. It should be mentioned that human, organizational and relational capital have 15, 16 and 15 sub criteria in direct order which because of high volume of calculation, we present just the main criteria of intellectual capital.



Conceptual framework

**3. RESEARCH METHODOLOGY**

Society for this research is 153 employees who work in Sapco Company (car material supplier). Whereas this number seems to be adequate, no sampling strategy was applied.

Current study can be considered as a descriptive survey if to view from data collection aspect and as a used research if to investigate the goals of the study. To collect the data library method (to refer to books, articles, libraries, etc...) and fieldworks (questionnaire) was being used. The questionnaire was designed in 3 parts; 46 questions in intellectual capital (human capital with 15, organizational capital with 16 and relational capital with 15 questions) and then distributed within the samples (participants).

To analyze the data Excel software and fuzzy topsis technique were utilized.

The management experts were being asked to evaluate the validity of questionnaire. For this mean, the questionnaire was given to some professors and experts in management and familiar to knowledge management, intellectual capital and generally intangible assets fields, and after their modifications was being utilized and they confirmed it, the questionnaire was given to the participants.

To determine the questionnaires' reliability, the 'Cronbach Alfa technique' was used. For this purpose, 35 people were selected by random from the statistical society and the questionnaire was given to them. The 'Cronbach Alfa' values for all variables were calculated as table 1:

**Table 4: the results of reliability**

Variables	Cronbach Alfa
Intellectual capital	0.82
Human capital	0.78
Organizational capital	0.79
Relational capital	0.86

These values support the reliability of questionnaires, because the calculated results for cronbach’s alpha are more than 0.7 (Nunnally & Bernstein, 1994).

**3.1. Decision making process by fuzzy TOPSIS technique**

Technique for order performance by similarity to ideal solution (TOPSIS), one of known classical MCDM method, was first developed by Hwang and Yoon (1981) for solving MCDM problems. TOPSIS is known as one of the most classical MCDM methods, which is based on the idea, that the selected alternative should have the shortest distance from the positive ideal solution and on the other side the farthest distance of the negative ideal solution (Chen and Hwang, 1982). The TOPSIS-method will be applied to a case study, which is described in detail. In classical MCDM methods, the ratings and the weights of the criteria are known precisely (Jahanshahlou et al, 2006),

Decision making process steps by fuzzy TOPSIS technique are shown below:

Step 1: calculating weights vector  $w_j$

Step 2: normalizing the calculated matrix:

$$\tilde{R} = \left[ \tilde{r}_{ij} \right]_{m \times n} \tag{1}$$

$B \subseteq \{1, \dots, n\}$  is related to benefit-based indices and  $C \subseteq \{1, \dots, n\}$  is related to cost-based indices.

$$\tilde{r}_{ij} = \left( \frac{a_{ij}}{d_j^*}, \frac{b_{ij}}{d_j^*}, \frac{c_{ij}}{d_j^*}, \frac{d_{ij}}{d_j^*} \right), \quad j \in B$$

$$\tilde{r}_{ij} = \left( \frac{a_j^-}{d_{ij}^-}, \frac{a_j^-}{c_{ij}^-}, \frac{a_j^-}{b_{ij}^-}, \frac{a_j^-}{a_{ij}^-} \right), \quad j \in C$$

Step 3: so normalized weighted matrix is calculated as formula 4:

$$V^{\sim} = \left[ v_{ij}^{\sim} \right]_{m \times n}, \quad i = 1, 2, \dots, m, \quad j = 1, 2, \dots, n \tag{4} \quad \tilde{r}_{ij} \otimes w_j$$

Step 4: determining the fuzzy positive ideal solution  $\tilde{v}_j^*$  (FPIS) and fuzzy negative ideal solution  $\tilde{v}_j^-$  (FNIS) (formulas 5, 6):

$$\tilde{v}_j^- = \begin{cases} \min_{i=1, \dots, m} \tilde{v}_{ij} & ; j \in B \\ \max_{i=1, \dots, m} \tilde{v}_{ij} & ; j \in C \end{cases} \quad \tilde{v}_j^* = \begin{cases} \max_{i=1, \dots, m} \tilde{v}_{ij} & ; j \in B \\ \min_{i=1, \dots, m} \tilde{v}_{ij} & ; j \in C \end{cases}$$

$$FNIS = \{ \tilde{v}_j^- \mid j = 1, \dots, n \}$$

$$FPIS = \{ \tilde{v}_j^* \mid j = 1, \dots, n \}$$

Step 5: calculating the alternatives from positive and negative ideal by applying formulas 7 and 8:

$$d_i^* = \sum_{j=1}^n d(\tilde{v}_{ij}, \tilde{v}_j^*), \quad i = 1, \dots, m$$

$$d_i^- = \sum_{j=1}^n d(\tilde{v}_{ij}, \tilde{v}_j^-), \quad i = 1, \dots, m$$

Step 6: Calculating the relative closeness to the ideal solution:

$$Cc_i = \frac{d_i^-}{d_i^- + d_i^+}$$

In real-world situation, because of incomplete or non-obtainable information, the data (attributes) are often not so deterministic, there for they usually are fuzzy /imprecise. So, we try to extend TOPSIS for fuzzy data to categorize the driving factors affecting on intellectual capital. Linguistic variables for the important weight of each criteria are shown in table 5:

**Table 5: Linguistic variables for the importance weight (Chen, 2000)**

<b>Very Low</b>	<b>VL</b>	<b>(0, 0, 1, 2)</b>
Low	L	(1, 2, 2, 3)
Medium Low	ML	(2, 3, 4, 5)
Medium	M	(4, 5, 5, 6)
Medium High	MH	(5, 6, 7, 8)
High	H	(7, 8, 8, 9)
Very High	VH	(8, 9, 10, 10)

**4. DATA ANALYSIS**

After distributing questionnaire among statistical society people and gathering data, decision making matrix with fuzzy weights were calculated as table 6:

**Table 6: decision making matrix and fuzzy weights**

Decision making matrix and fuzzy weights	8	9	10	10	2	3	4	5	7	8	8	9
	Human capital				Organizational capital				Relational capital			
associative staff's capability in decision making and management	8	9	10	10	8	9	10	10	4	5	5	6
staff's characteristics	0	0	1	2	2	3	4	5	2	3	4	5
staff's learning ability	4	5	5	6	5	6	7	8	2	3	4	5
staff's learning performance	2	3	4	5	4	5	5	6	0	0	1	2
Strategic management leadership	0	0	1	2	1	2	2	3	4	5	5	6
technical staff and managers' learning	7	8	8	9	7	8	8	9	7	8	8	9
Identity acquisition from organizational values	8	9	10	10	7	8	8	9	8	9	10	10
satisfaction rate	2	3	4	5	7	8	8	9	4	5	5	6
job quitting (desertion) rate	5	6	7	8	8	9	10	10	4	5	5	6
beneficent working lives' average	2	3	4	5	4	5	5	6	8	9	10	10
Staff's creative abilities	0	0	1	2	2	3	4	5	7	8	8	9
creative thinking income	2	3	4	5	7	8	8	9	8	9	10	10
Staff's knowledge, skills and expertise	8	9	10	10	7	8	8	9	7	8	8	9
Entrepreneurship	5	6	7	8	8	9	10	10	8	9	10	10
Competency	0	0	1	2	4	5	5	6	5	6	7	8
Organizational culture creation	2	3	4	5	2	3	4	5	0	0	1	2
staff's identity acquisition in organization's viewpoint	7	8	8	9	5	6	7	8	5	6	7	8
Provided clear relationship (Clear relationship's choice)	2	3	4	5	2	3	4	5	4	5	5	6
responsibility and profits	7	8	8	9	4	5	5	6	2	3	4	5
organizational system control's credit	7	8	8	9	0	0	1	2	8	9	10	10
Internal information network creation and application	8	9	10	10	8	9	10	10	0	0	1	2
organizational information repositories creation and application	0	0	1	2	8	9	10	10	2	3	4	5
Business period process	5	6	7	8	5	6	7	8	2	3	4	5
products' quality rate	2	3	4	5	4	5	5	6	2	3	4	5
organization's operational performance	0	0	1	2	1	2	2	3	7	8	8	9
Support and cooperation between staff	7	8	8	9	7	8	8	9	8	9	10	10
accessibility of organizational information	8	9	10	10	7	8	8	9	5	6	7	8
knowledge sharing	2	3	4	5	7	8	8	9	0	0	1	2
Staff's supporting of together	5	6	7	8	8	9	10	10	0	0	1	2
Spiritual property	2	3	4	5	4	5	5	6	7	8	8	9
Management philosophy	0	0	1	2	2	3	4	5	8	9	10	10
Customer's information database creation and application	2	3	4	5	7	8	8	9	7	8	8	9
customer services capability	4	5	5	6	7	8	8	9	7	8	8	9
The ability to recognize customers' needs	4	5	5	6	8	9	10	10	8	9	10	10
Market contribution	0	0	1	2	4	5	5	6	8	9	10	10
market potential capability	2	3	4	5	2	3	4	5	8	9	10	10
customer's sales	4	5	5	6	5	6	7	8	0	0	1	2
brand's reputation	2	3	4	5	4	5	5	6	4	5	5	6
sales channel's creation	7	8	8	9	4	5	5	6	7	8	8	9
fair suppliers rules	5	6	7	8	8	9	10	10	2	3	4	5
timely obligations' accomplishment toward supplier	7	8	8	9	2	3	4	5	4	5	5	6
Honesty in responding to investor from informed sources	5	6	7	8	4	5	5	6	5	6	7	8
Customer's satisfaction	0	0	1	2	7	8	8	9	7	8	8	9
customer's complaint	4	5	5	6	2	3	4	5	8	9	10	10
customer's desertion	7	8	8	9	2	3	4	5	8	9	10	10
Investment on customers' relations	7	8	8	9	0	0	1	2	2	3	4	5

By utilizing formula 4, fuzzy weighted normalized matrix is shown in table 7. It is necessary to mention because of extra volume of calculation, presenting fuzzy normalized matrix was ignored.

**Table 7: fuzzy weighted normalized matrix**

associative staff's capability in decision making and management	0.6	1	1	1	0.16	0.27	0.4	0.5	0.3	0.4	0.4	0.54
staff's characteristics	0	0	0.1	0	0.04	0.09	0.16	0.3	0.1	0.2	0.3	0.45
staff's learning ability	0.3	0	0.5	1	0.1	0.18	0.28	0.4	0.1	0.2	0.3	0.45
Staff's learning performance	0.2	0	0.4	1	0.08	0.15	0.2	0.3	0	0	0.1	0.18
Strategic management leadership	0	0	0.1	0	0.02	0.06	0.08	0.2	0.3	0.4	0.4	0.54
technical staff and managers' learning	0.6	1	0.8	1	0.14	0.24	0.32	0.5	0.5	0.6	0.6	0.81
Identity acquisition from organizational values	0.6	1	1	1	0.14	0.24	0.32	0.5	0.6	0.7	0.8	0.9
satisfaction rate	0.2	0	0.4	1	0.14	0.24	0.32	0.5	0.3	0.4	0.4	0.54
job quitting (desertion) rate	0.4	1	0.7	1	0.16	0.27	0.4	0.5	0.3	0.4	0.4	0.54
beneficent working lives' average	0.2	0	0.4	1	0.08	0.15	0.2	0.3	0.6	0.7	0.8	0.9
Staff's creative abilities	0	0	0.1	0	0.04	0.09	0.16	0.3	0.5	0.6	0.6	0.81
creative thinking income	0.2	0	0.4	1	0.14	0.24	0.32	0.5	0.6	0.7	0.8	0.9
Staff's knowledge, skills and expertise	0.6	1	1	1	0.14	0.24	0.32	0.5	0.5	0.6	0.6	0.81
Entrepreneurship	0.4	1	0.7	1	0.16	0.27	0.4	0.5	0.6	0.7	0.8	0.9
Competency	0	0	0.1	0	0.08	0.15	0.2	0.3	0.4	0.5	0.6	0.72
Organizational culture creation	0.2	0	0.4	1	0.04	0.09	0.16	0.3	0	0	0.1	0.18
staff's identity acquisition in organization's viewpoint	0.6	1	0.8	1	0.1	0.18	0.28	0.4	0.4	0.5	0.6	0.72
Provided clear relationship (Clear relationship's choice)	0.2	0	0.4	1	0.04	0.09	0.16	0.3	0.3	0.4	0.4	0.54
responsibility and profits	0.6	1	0.8	1	0.08	0.15	0.2	0.3	0.1	0.2	0.3	0.45
organizational system control's credit	0.6	1	0.8	1	0	0	0.04	0.1	0.6	0.7	0.8	0.9
Internal information network creation and application	0.6	1	1	1	0.16	0.27	0.4	0.5	0	0	0.1	0.18
organizational information repositories creation and application	0	0	0.1	0	0.16	0.27	0.4	0.5	0.1	0.2	0.3	0.45
Business period process	0.4	1	0.7	1	0.1	0.18	0.28	0.4	0.1	0.2	0.3	0.45
products' quality rate	0.2	0	0.4	1	0.08	0.15	0.2	0.3	0.1	0.2	0.3	0.45
organization's operational performance	0	0	0.1	0	0.02	0.06	0.08	0.2	0.5	0.6	0.6	0.81
Support and cooperation between staff	0.6	1	0.8	1	0.14	0.24	0.32	0.5	0.6	0.7	0.8	0.9
accessibility of organizational information	0.6	1	1	1	0.14	0.24	0.32	0.5	0.4	0.5	0.6	0.72
knowledge sharing	0.2	0	0.4	1	0.14	0.24	0.32	0.5	0	0	0.1	0.18
Staff's supporting of together	0.4	1	0.7	1	0.16	0.27	0.4	0.5	0	0	0.1	0.18
Spiritual property	0.2	0	0.4	1	0.08	0.15	0.2	0.3	0.5	0.6	0.6	0.81
Management philosophy	0	0	0.1	0	0.04	0.09	0.16	0.3	0.6	0.7	0.8	0.9
Customer's information database creation and application	0.2	0	0.4	1	0.14	0.24	0.32	0.5	0.5	0.6	0.6	0.81
customer services capability	0.3	0	0.5	1	0.14	0.24	0.32	0.5	0.5	0.6	0.6	0.81
The ability to recognize customers' needs	0.3	0	0.5	1	0.16	0.27	0.4	0.5	0.6	0.7	0.8	0.9
Market contribution	0	0	0.1	0	0.08	0.15	0.2	0.3	0.6	0.7	0.8	0.9
market potential capability	0.2	0	0.4	1	0.04	0.09	0.16	0.3	0.6	0.7	0.8	0.9
customer's sales	0.3	0	0.5	1	0.1	0.18	0.28	0.4	0	0	0.1	0.18
brand's reputation	0.2	0	0.4	1	0.08	0.15	0.2	0.3	0.3	0.4	0.4	0.54
sales channel's creation	0.6	1	0.8	1	0.08	0.15	0.2	0.3	0.5	0.6	0.6	0.81
fair suppliers rules	0.4	1	0.7	1	0.16	0.27	0.4	0.5	0.1	0.2	0.3	0.45
timely obligations' accomplishment toward supplier	0.6	1	0.8	1	0.04	0.09	0.16	0.3	0.3	0.4	0.4	0.54
Honesty in responding to investor from informed sources	0.4	1	0.7	1	0.08	0.15	0.2	0.3	0.4	0.5	0.6	0.72
Customer's satisfaction	0	0	0.1	0	0.14	0.24	0.32	0.5	0.5	0.6	0.6	0.81
customer's complaint	0.3	0	0.5	1	0.04	0.09	0.16	0.3	0.6	0.7	0.8	0.9
customer's desertion	0.6	1	0.8	1	0.04	0.09	0.16	0.3	0.6	0.7	0.8	0.9
Investment on customers' relations	0.6	1	0.8	1	0	0	0.04	0.1	0.1	0.2	0.3	0.45

And finally by applying formulas 7, 8 and 9, fuzzy positive ideal solution, negative ideal solution and the relative closeness to the ideal solution were calculated which are shown in table 8:

**Table 8: final indices ranks**

Dimensions	$d_i^+$	$d_i^-$	$Cc_i$	Ranks
associative staff's capability in decision making and staff's characteristics	1.143893502	1.895441133	0.623636868	2
staff's learning ability	2.471599426	0.620185902	0.200591515	45
staff's learning performance	1.854527098	1.2218289	0.397167591	28
Strategic management leadership	2.240639716	0.836877123	0.271932589	41
technical staff and managers' learning	2.515077245	0.556055854	0.181058859	46
Identity acquisition from organizational values	1.258430766	1.825512096	0.591940959	7
satisfaction rate	1.118121163	2.008575448	0.642395377	1
job quitting (desertion) rate	1.800788466	1.276081934	0.414733729	25
beneficent working lives' average	1.450897935	1.648792506	0.531921667	10
Staff's creative abilities	1.823841514	1.250129148	0.406682199	27
creative thinking income	2.252262695	0.836205781	0.270750952	42
Staff's knowledge, skills and expertise	1.594387603	1.489664354	0.483021809	16
Entrepreneurship	1.178236871	1.945654615	0.62283041	3
Competency	1.244497072	1.862374927	0.599437289	6
Organizational culture creation	2.20586258	0.874589625	0.283915986	40
staff's identity acquisition in organization's viewpoint	2.360034172	0.730617119	0.236395844	43
Provided clear relationship (Clear relationship's choice)	1.449945907	1.647035097	0.531819567	11
responsibility and profits	2.149636834	0.930286724	0.302048641	38
organizational system control's credit	1.707221408	1.369957011	0.445199083	21
Internal information network creation and application	1.763612478	1.332055108	0.430296558	24
organizational information repositories creation and Business period process	1.446018766	1.695771528	0.539746886	9
products' quality rate	2.03385046	1.066429217	0.343978392	34
organization's operational performance	1.731370909	1.372385271	0.442169163	22
Support and cooperation between staff	2.103293953	0.971188437	0.315886811	37
accessibility of organizational information	2.36879209	0.706717442	0.229788734	44
knowledge sharing	1.198315058	1.888432928	0.611787207	4
Staff's supporting of together	1.251231212	1.877778455	0.600119097	5
Spiritual property	2.011185805	1.076412328	0.348624491	33
Management philosophy	1.661295274	1.449122901	0.465893272	17
Customer's information database creation and application	1.883957222	1.187208316	0.386566045	29
customer services capability	2.192146987	0.899126614	0.290859603	39
The ability to recognize customers' needs	1.654503311	1.426743521	0.46304097	18
Market contribution	1.516669568	1.548449617	0.505184146	14
market potential capability	1.367653261	1.711818555	0.555880572	8
customer's sales	2.072752531	1.005386618	0.326621562	36
brand's reputation	1.94323597	1.143869145	0.370531324	31
sales channel's creation	1.991872861	1.087517586	0.353160018	32
fair suppliers rules	2.030242377	1.036546728	0.337990873	35
timely obligations' accomplishment toward supplier	1.487884677	1.58597689	0.515955861	12
Honesty in responding to investor from informed sources	1.523949511	1.583434215	0.509571509	13
Customer's satisfaction	1.753564289	1.329055299	0.431144765	23
customer's complaint	1.695961631	1.391594623	0.450710694	20
customer's desertion	1.903414328	1.182000991	0.383092994	30
Investment on customers' relations	1.805402227	1.26557524	0.412108279	26
	1.547163425	1.542637719	0.499267638	15
	1.221648457	1.053114396	0.462955686	19

As it can be viewed the most important sub criteria of intellectual capital in direct order are: “staff’s knowledge, skills and expertise”, “identity acquisition from organizational values” and “associative staff’s capability in decision”. Table 9 shows the ranking of intellectual capital’s main criteria:

**Table 9: main criteria ranking**

Criteria	Weight	Rank
Human capital	6.054664	2
Organizational capital	5.984302	3
Relational capital	6.367325	1

## 5. Conclusion and further suggestions

Current study is done in a community which includes of 153 employees in ‘Sapco company’. In this sampled society, 75.81 percent was men and 24.19 women. 9.80 percent were carried a diploma, 63.39 percent a bachelor degree and 2.61 percent master. Meanwhile 25.49 percent of participants had work experience less than 10 years, 54.90 percent between 11 to 20 years and 19.6 percent more than 21 years of experience.

The results of applying fuzzy topsis technique show that “staff’s knowledge, skills and expertise”, “Identity acquisition from organizational values” and “associative staff’s capability in decision” were chosen as the most important sub-criteria.

As results indicate, staff’s knowledge, skills and expertise are absolutely high and it is enough to associate in decision making process. It means by matching these two factors, the mentioned company will achieve more competitive advantage and will be able to increase its productivity.

The other point is related to second choice: “identity acquisition from organizational values”. It is the full definition of affective commitment. The organization can utilize the employees’ commitment to achieve their goals and objectives.

Also among the main criteria of intellectual capital, relational capital was placed in first place (6.367325) and human capital (6.054664) and organizational capital (5.984302) were the second and last ones.

The relational capital had the highest number of points. So we can suggest that the best strategies to increase relational capital are: to plan and program improvement for external relations with the customers, suppliers, and investors, to measure customers, suppliers, and investors' satisfaction and loyalty, to inform the staff about the market goals and customers' kinds, and also to publicize the customers, suppliers, and investors' feedbacks and finally to manage the relation knowledge (such as customer's knowledge, investors knowledge, supplier knowledge).

Finally the company manager’s is advised to by making some educational course, symposiums and conferences improve their human capital.

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