Examining the Influences of Social Capital and Knowledge on Innovation

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Abstract: This survey explores the influence of inter organizational relationship on the radical innovations. In this survey, three main issues named social capital; knowledge-oriented viewpoint and innovation are mentioned and described. Also, the influence of knowledge tacit ness and knowledge complexity on innovation, the way by which the social capital affects on these factors and the radical innovation are examined. This survey, done by Fars Gassing Management, indicates that social capital and knowledge complexity affect positively on radical innovation and knowledge tacit ness affects on it via social capital.

Key words: Innovation · Social capital · Knowledge complexity · Knowledge tacit ness

INTRODUCTION

With the appearance of informational technology, informational society and the rapid development of major technology from the beginning of 1990, the pattern of global economy has changed. These changes along with the global and technological competitions have made some difficulties for the companies. This is because of their proximate competition. In this regard, the comparative advantages of those companies collaborated suitably by the external ones remain in security. Also, they achieve more capabilities in order to make progress. The social capital network prepares this characteristic.

The social capital plays a main role in the progress of our society when we face an implied and complex knowledge. Here, a big question is: "How can the organizations mix their social capital and internal knowledge together in order to increase the radical innovations?"

This survey examines the effect of external social capital on the radical innovations and also the effect of knowledge tacit ness on the radical innovations. It also seeks the relationship between social capital, implied knowledge and basic innovations. At first, three variables, social capital, radical innovation and knowledge-based view point, are introduced and then these variables will be related to each other by testing a theoretical model. Also in this article, the radical innovations are mentioned instead of total innovations because the first prepares more advantages and opportunities in order to distinguish them from their competitors. Radical innovation affects positively on the performance of the company.

Background

Social Capital: This term was used in an article conducted by Hany Fan from United States, Virginia.[1]

Puntam believes that social capital refers to the relationship between persons, social networks, customs and confidences by which the co operations are facilitated [2]. Vain Baker believes that social capitals are resources oriented from the business and personal networks. These resources include information, thoughts, guidance, work opportunities, financial capitals, power, affective support, confidence and cooperation [3].

Cohen and Prusak state that social capital emphasizes on the relationship between people. It joins confidence, mutual recognition, joint values and the behaviors of human networks to each other and makes the cooperation possible. [4]

In their article titled "The social capital and the staffs' role" in 1999, Lean and Van Buren describe the methods affecting on the relationships, customs and roles relative to the organizational social capital, profits and the expenses of social capital. [5]

In their survey titled "professional groups and organizational performance", Lesser and Stork consider the professional groups as an engine by which the social capital is developed. [6]

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Field believes that the main idea of the social capital is: "The importance of the relationships". Using some interrelated network and sharing some values, people are interested in the other members of this network, so that they could be regarded as the main capitals [7].

Cohen and Prusak believe that social capital emphasizes on the relationship between the people.

Some factors such as confidence, joint values and behaviors by which the human network and social network are joined to each other, make the cooperation possible. Social capital exists differently in every organization. Organizations can not perform their duties without social capital. There are several methods by which social capital can be profitable for the organization. These methods include: Sharing knowledge better, decreasing the expenses of transfer, decreasing the degree of exchange and increasing the integrity of the performance because of the joint perception of the organization [4].

Coleman believes that social capital includes: obligations and expectations, information's capacity, customs and executive guarantees, firm relationships, adaptable social organization and deliberate organization [8].

Woolcock Divides Social Capital into Three Categories:

- Inter-group social capital: it refers to the correlation between family members or group members.
- Between-group social capital: it could be known based on the weak relationship by which the between- group joints such as commercial and governmental cooperation are existed.
- Connective social capital: It refers to the vertical relationships by which persons could achieve formal resources in order to develop their society and economy. [1].

Nahapiet and Ghoshal Classify Various Aspects of Social Capital as Follows: Structural element of social capital refers to the total pattern of the relations between the people. i.e. whom you contact to and how you contact.

Recognition element of social capital refers to the sources by which interpretations, explanations and joint systems are made among the groups.

Relational element of social capital describes a kind of personal relationship existed among the persons because of their interactive experience [9].

Berger-Schmitt Believes That Social Capital Includes:

- The existence of social relationships
- Social and political activities and partnerships
- The quality of social relationships
- The quality of social natures [10].

This article explains the positive effect of inter-organizational cooperation on the radical innovations. Strengthening the social capitals causes not only the progress, but also the creation of radical innovations. By use of their know ledges, companies can mix special characteristics and develop modern technologies and goods. These relations create radical innovations.

From its relational perspective, social capital creates reliable and repetitive relationships [11]. Shu *et al* concluded that the internal relationship of some companies improves their learning ability and creates attractive capacities in order to increase the radical innovations and penetrate into modern markets [12].

Radical Innovation: Radical innovation could not be easily known. It increases rewards, sales, profits and shares of the market [13]. It also destroys current markets and creates new aspects [14]. Radical innovation is a current process in established departments.

It makes opportunities for the organizations in order to create modern markets and destroy stagnation and available businesses [15].

Radical innovation includes systematic innovations by which modern industries, products and markets are created [16]. There are different kinds of innovation: official innovation, technical innovation, production innovation, technological and architectural innovation, increasing and radical innovation. There is no explicit deferent between increasing innovation and radical innovation [17]. Authors believe that there are many differences between radical innovation and increasing innovation of an organization. They also believe that radical innovation is a main factor for a company to be succeeding [18].

Gopalakrishnan *et al* examined the effect of knowledge and its characteristics on the innovation. They concluded that knowledge affects positively on the innovation's probabilities [19].

Knowledge tacit ness and knowledge complexity knowledge is considered as the key resource and the main value of an organization. From the knowledge-based perspective, knowledge is a main strategic resource.

By knowledge we mean a base for reaching the comparative advantages, because it can make some progresses and help the organization to develop modern productive successes [20].

Explicit knowledge refers to the one which could be presented by symbols and also could be transferred to other persons.

Implicit knowledge refers to one by which we could not easily establish relations with others. Generally, it is more difficult to transfer the implicit knowledge and firstly, we should collect it [21].

Regarding the relationship between knowledge and radical innovation, the main characteristic is their tacit ness. Implicit knowledge is related to the radical innovation, because it prepares new ideas. Due to the joint innovations we need informal and face to face relations [22].

Bringle defines the knowledge complexity as the needed parameters in order to describe a system [23]. A complex system refers to one in which there are many reciprocal elements affecting on the degree of value. It is difficult to transfer the knowledge- based innovation out of the organization, unless there is a meaningful relationship between them. On the other hand, simple knowledge could be achieved by use of external resources which have no obligation to the innovation process [24].

Research Model
Based on the above Mentioned, There Are Some Hypotheses:

Hypothesis 1: Social capital affects positively on the radical innovation.

Hypothesis 2: Knowledge tacit ness affects positively on the radical innovation.

Hypothesis 3: Social capital affects positively on the knowledge tacit ness.

Hypothesis 4: Knowledge tacit ness affects positively on the radical innovation.

Hypothesis 5: Social capital affects positively on the knowledge tacit ness.

Luno *et al's* model (2011) was used to examine the effect of social capital and knowledge on the radical innovation.

Research Methodology: This survey is an application and descriptive one. The population is the Fars Gassing Management. Gas National Company is composed of three subsets: refineries, gas pipe-lines and gassing management. Gassing management changes the natural gas into the refined one in order to present it to the industrial and home partners. The staffs of this part include: technical workers, technician and expertise. They attempt to preserve the economic growth of the regions. By use of partnership system, the company act toward the satisfaction of the staffs and the clients. Because the population are 420 employees from the company and based on the Kerjsi and Morgan's table they should be 201 persons, about 220 questionnaires were distributed among the population from which 214 were gathered.

A questionnaire designed by Lono *et al.* (2011) was used in order to examine the hypotheses of the survey in which four below variables were measured: innovation (5 items), knowledge tacit ness (5 items), knowledge complexity (4 items) and social capital (4 items).

Coronbach's alpha was used in order to examine the reliability of the questionnaire. It was separately and then totally calculated for each criterion. The results are illustrated in Table 1.

Table 1: Pretest coronbach's alpha for each variable

Cronbach's alpha	Number of items	Scale
701.	5	radical innovation.
727.	5	Knowledge tacit ness
79.	4	Knowledge complexity
71.	4	Social capital

Table 2: Numbers of variables criterions in structural model

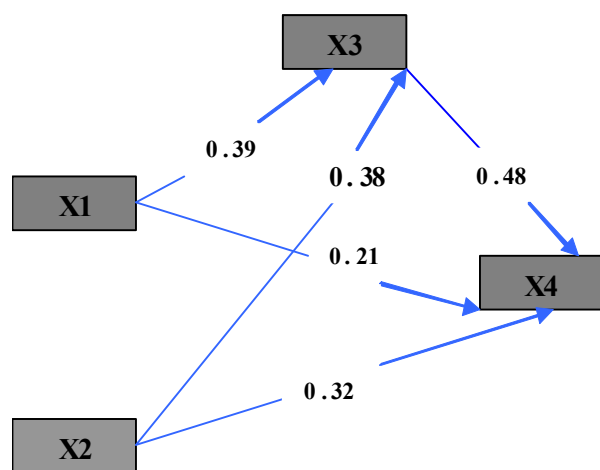| Sig.	t value	Standard error	Standardized	Estimate	Variables direct relationships	
P<./01	75/4	082/.	41/.	39/.	Social capital (X3)	(X1) Knowledge tacit ness
P<./01	38/3	062/0	51/.	21/.	(X4) radical innovation	
P<./01	4/9	051/0	32/.	48/0	(X4) radical innovation	(X3) Social capital
P<./01	7/4	068/0	31/0	32/0	radical innovation ((X4	(X2) Knowledge complexity
P<./01	3/7	052/0	38/0	38/.	(X3) Social capital	

Fig. 1: The final model of the relationship between variables such as knowledge tacit ness, knowledge complexity, social capital and radical innovation.

Lizrel's soft ware and emphasizing_ factor analyze were used in order to examine the reliability of each variable and structural equation test was used in order to analyze the findings.

Findings: As illustrated in the figure below, the relationship between variables was directly examined in order to explore the effect of knowledge tacit ness and knowledge complexity on the radical innovation and then to explore the effect of social capital on the innovation.

Based on the T_numbers (99% reliability) there is a direct relationship between X3(social capital) (01/0< p ¡ 75/4= t), X4 (radical innovation)( ) (01/0< p ¡ 38/3= t) and knowledge tacit ness.

Also it shows that there is a direct relationship between X4(radical innovation) and X3(social capital). There is a meaningful relationship between X4(radical innovation), X3(Social capital) and X2 (knowledge tacit ness) (table 2).

Finally, the indexes related to the suitability of path analyses were illustrated in Figure 2.

Acceptable range	Value	Measure
2Df</χ2	976/0	Df / χ2
05/0P >	43108/0	p-value
09/0RMSEA<	000/0	RMSEA
9/0GFI>	00/1	GFI
85/0AGFI>	96/0	AGFI
90/0NFI>	99/0	NFI
90/0CFI>	99/0	CFI

Hypotheses' Test: Based on the results, there is a direct relationship between knowledge tacit ness, radical innovation and social capital. Also there is a meaningful relationship between knowledge complexity, radical innovation and social capital. Finally, social capital affects positively on the radical innovation.

CONCLUSION

This survey examines the effects of inter organizational relationships on the radical innovation performed in the complex networks. Variables of this survey include: social capital, knowledge-based view point and innovation. This view point helps us to perceive the way by which social capital, knowledge tacit ness and knowledge complexity are mixed and also the effects of these factors on the improvement of innovation. Due to the results, social capital affects positively on the radical innovation. Also, knowledge tacit ness and knowledge complexity create radical innovations. Therefore, organizations could not perform their duties without social capital. Radical innovations are also achieved by improving social capitals. Also, relational aspects of social capital affect on the knowledge tacit ness and knowledge complexity. It coordinates the key parts of the company and creates radical innovations by obligating the staffs to do their duties better. By this way, it could prepare some comparative advantages for the organization and cause the organization to make progress.

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