An Investigation of the Relationship between Knowledge Sharing, Innovation and Social Capital Based on Path Analysis (Case Study: PERGAS International Consortium)

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Abstract
Research confirms that knowledge sharing and social capital are elements within the organization that affect innovation in organizations and improve innovation; The purpose of this study; Explain the relationship between knowledge sharing, social capital and innovation (Case study: PERGAS International Consortium); The method of the present research is descriptive, which has been done by the survey method and is considered as part of applied research in terms of purpose; The instrument of the present study is a questionnaire whose validity has been confirmed by the professors and experts of the PERGAS International Consortium and its reliability has been more than 0.7 for each variable; The statistical population of the present study; The directors and senior experts are the PERGAS International Consortium, which numbers about 635; Taking into account the error rate of 0.5, the probability of success of 0.5 and the target population of 635 people, the number of samples required for this study was determined to be about 240 tons. That the same amount has been analyzed; The sampling method in the present study was simple random; The data analysis method was structural equation modeling using LISREL 8.80 software; The results showed a positive and significant effect of social capital on knowledge sharing and knowledge sharing on innovation, while the effect of social capital on innovation has not been confirmed and based on the path analysis technique, the role of knowledge sharing is fully mediated. have been.
Keywords: Knowledge sharing; Innovation; Social capital; PERGAS International Consortium.

1. Preface
Social capital, which has sociological roots, is also a successful and well-liked lever. Social capital has many dimensions and components that are appropriate to the culture of society, such as trust; Participation in civic institutions, proper communication with others, commitment and responsibility, cooperation and teamwork spirit, and a sense of collective identity are considered in this field. The most important component of social capital is trust and reliability, which has its own pillars [1].
In today's societies, in addition to physical, human and economic capital, another type of capital is discussed, which is called social capital. The extent and manner of interactions of social actors, which are referred to today as social capital, is one of the most important issues studied by sociologists [3].
Social capital is considered as a suitable platform for the productivity of human and physical capital and a way to achieve success and improve the performance of the organization. Managers and those who can create social capital in the organization, pave the way for their professional and organizational success. The use of social capital at the organizational level has advantages and dimensions and components that are appropriate to the culture of society. Now it can be said that social capital is the result of accumulation of potential and actual resources in a network of more or less lasting relationships. Institutionalized among individuals that is created by membership in a group and is embodied in the relationships between individuals [4 and 5].
Social capital is mainly based on cultural and social factors and its identification as a kind of capital, both at the level of macro-management of countries and at the level of management of organizations and enterprises can be a serious knowledge of systems. Create socio-economic and help managers to better manage systems [17]; Organizational improvement is a professional field in social activities and research in practice. Organizational improvement encompasses a wide range of activities with endless changes. Creating a team with senior

management membership, structural changes and job enrichment are examples of improving organizational performance [6].

In today's world, it is basically impossible to manage something intangible and mental, such as knowledge; What is managed is the sources of knowledge and related technologies, processes and techniques, and most importantly, the human elements that are the source of all knowledge. Knowledge resources must be expanded after creation; an organization that has not created the motivation for its employees to share or share knowledge will lose a significant amount of knowledge; The main point behind knowledge management is that creating the success factors of an organization such as organizational creativity, quality of products and services depends on the availability and efficient use of superior and better knowledge. Certainly, in the next few years, the category of knowledge will become an integral part of all organizational collections, and organizations in this field will be successful in providing the necessary infrastructure for its implementation and designing the appropriate framework.

The 21st century is a century of changing patterns in traditional markets [10]; With the products of the 21st century, organizations have felt the beginning of change. Challenges such as reducing product life cycle, minimum production cost and responding to the diverse needs of customers, has caused organizations to pay attention to these changes to survive in order to have the minimum cost and maximum benefit from these changes [1]; All of this will require the acquisition and sharing of appropriate knowledge.

According to the definition of knowledge management, knowledge sharing is one of the key areas in the knowledge management process. Our culture offers different definitions and messages from the concept of "sharing"; In some organizations, knowledge sharing is natural, but in others, the old view that knowledge is power still prevails; Many new organizations have started strategies to change these outdated attitudes. They have used a variety of motivational factors to show that they are determined and serious about sharing knowledge in their organization. For example, some of them, for people who share their knowledge with others, have planned appreciation and reward programs that range from appreciation in the company (among other partners), insert in the newsletter to the payment of rewards. Includes substantial material [14]; Some other companies evaluate their employees based on how much they have participated in knowledge sharing activities and consider promotions or extraordinary vacations for them [22].

Capable employees in knowledge-based organizations usually to improve the organizational performance of these companies; While using social capital, they should share knowledge; The PERGAS International Consortium is no exception; The PERGAS International Consortium is active in providing services to organizations or individuals in various scientific fields, including oil, gas, and petrochemicals. Due to the special environmental conditions of these companies, they seek to continuously improve the situation, improve performance and, consequently, gain competitive advantages for survival and development. In order to improve performance and gain a competitive advantage, these companies must improve the level of innovation in their organization, which in this way requires the support of their employees. One of the best ways for these companies to ensure that they are effective in promoting innovation is to expand and use in-house knowledge. Knowledge that leads to understanding the internal conditions of the organization, recognizing the environment around the organization and identifying competitors and helps employees to improve the level of innovation in the organization. This can be achieved through knowledge sharing.

The main issue of the present study is to improve the innovation of the PERGAS International Consortium. Social capital and another is knowledge sharing that the present study uses these two factors to improve innovation, in this regard, the following question arises:

What is the relationship between knowledge sharing, social capital and innovation in the PERGAS International Consortium?

2. Research Precedent and Theoretical Foundations

- A summary of the research conducted in this field is shown in the table below

Table 1: Summary of internal and external studies

Researcher / Researchers-Year	Research Title / Research Purpose	Statistical Society	Conclusion
Ardakani et al. (2010) [1]	Investigating the relationship between knowledge management and competitive advantage of	-----------	Knowledge management and competitive advantage of organizations are conceptually related

	organizations		
Wang and Wang (2012) [24]	Investigating the effect of knowledge sharing on organizational and financial performance	89 companies with advanced technologies have been located in Jiangsu Province, China	Knowledge sharing affects organizational and financial performance by mediating the role of innovation
Terry Kim et al. (2013) [21]	Social capital, knowledge sharing and organizational performance in the hotel industry	South Korea Hotel Industry	The results show a two-to-two relationship between the three factors
Vahid et al. (2013) [23]	Relationship between 4 variables: knowledge sharing, organizational performance, innovation and competitive advantage	Their statistics were technology companies (based on science and technology)	The results of their research show that knowledge sharing has a positive and significant effect on organizational performance, and they also list competitive advantage and innovation as a subset of organizational performance.
Augusto Felicio et al. (2014) [13]	Human capital, social capital and organizational performance	199 small and medium enterprises	The results show the effect of human and social capital on organizational performance in these companies with a history of 3 to 15 years.
Kim and Shim (2018) [19]	Investigating the relationship between knowledge sharing, social capital and innovation in small and medium enterprises in the field of tourism	199 examples of tourists and tourism companies in South Korea	The results confirm a positive and significant relationship between the elements

➢ Based on the review of the research literature, the research hypotheses are presented as follows:

1. Social capital has a positive and significant effect on the knowledge sharing of the PERGAS International Consortium
2. Knowledge sharing has a positive and significant effect on the innovation of the PERGAS International Consortium
3. Social capital has a positive and significant effect on the innovation of the PERGAS International Consortium

✓ The independent variable in this research is knowledge sharing and the dependent variable of the research is innovation and the intermediate variable includes knowledge sharing, based on which the conceptual model of the research is drawn as follows:
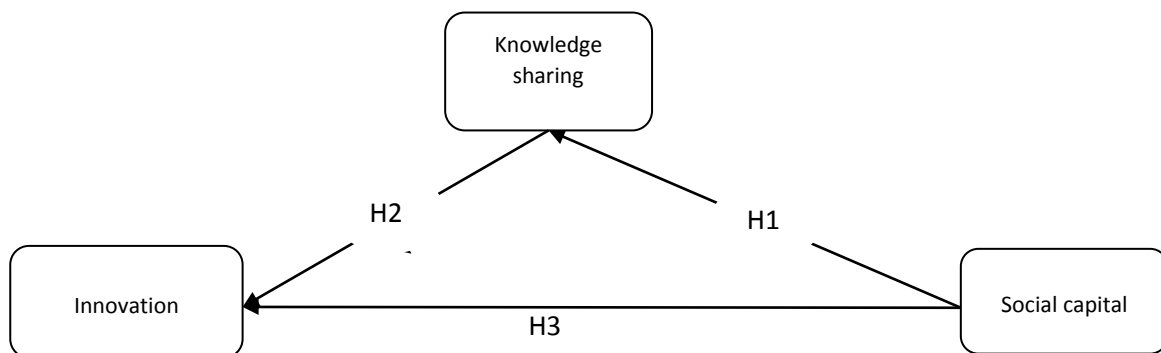

Figure 1. Conceptual model of research (taken from [24, 19])

3. Research Methodology

The present research is applied in terms of purpose and descriptive (non-experimental) research in terms of data collection and is a branch of field studies. In terms of the relationship between research variables is causal. The research method is survey. The most important advantage of survey research is the ability to generalize their results, the stratified random sampling method has been proportional; Because the samples were not homogeneous.

The tool for measuring research variables was a questionnaire that used Likert scale to quantify it, to measure knowledge sharing, two dimensions of tacit and explicit knowledge sharing, and to measure innovation, two dimensions of innovation speed and quality were used. The standard scale (Wang and Wang, 2012) has been used, also the Nahapit and Goshal (1998) model has been used to measure social capital based on three elements of structural, cognitive and human capital; To evaluate the validity of the measurement tool, the opinions of professors and experts of the PERGAS International Consortium have been used. For reliability, Cronbach's alpha has been used, which has been greater than 0.7 for all variables [20, 24].

Population and statistical sample: The statistical population of this study is the managers and staff of PERGAS International Consortium, which is about 635 people, considering the error rate of 0.5, the probability of success of 0.5 and the target population of 635 people, the number of samples required for this study is about 240 tons were determined. To compensate for the lack of answers, more questionnaires were distributed, which in the end the number of healthy questionnaires was 258 people, which has been analyzed.
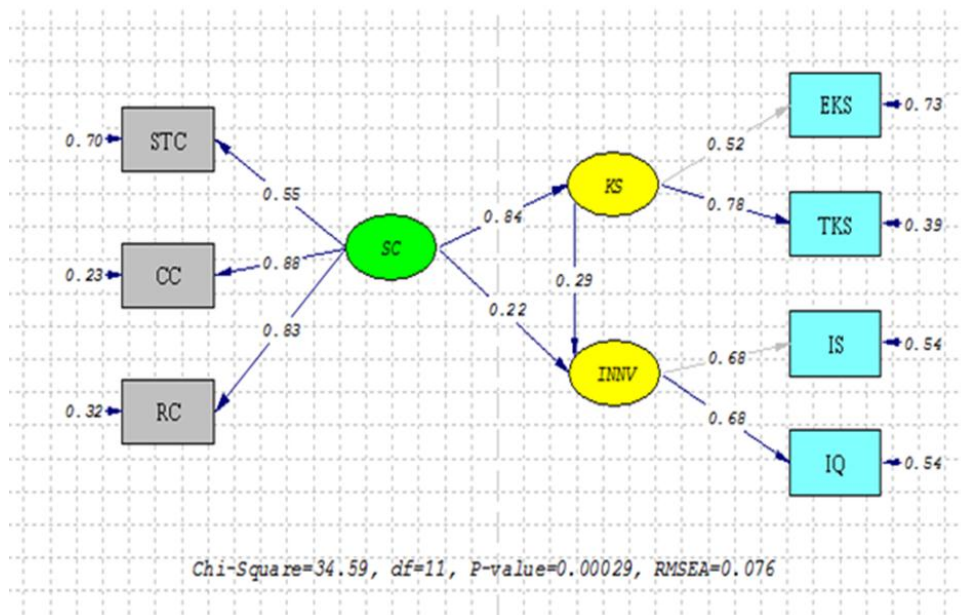
4. Results

In this research, path analysis and structural equation modeling have been used to review and analyze information; The fit indices of the structural equation models are described below

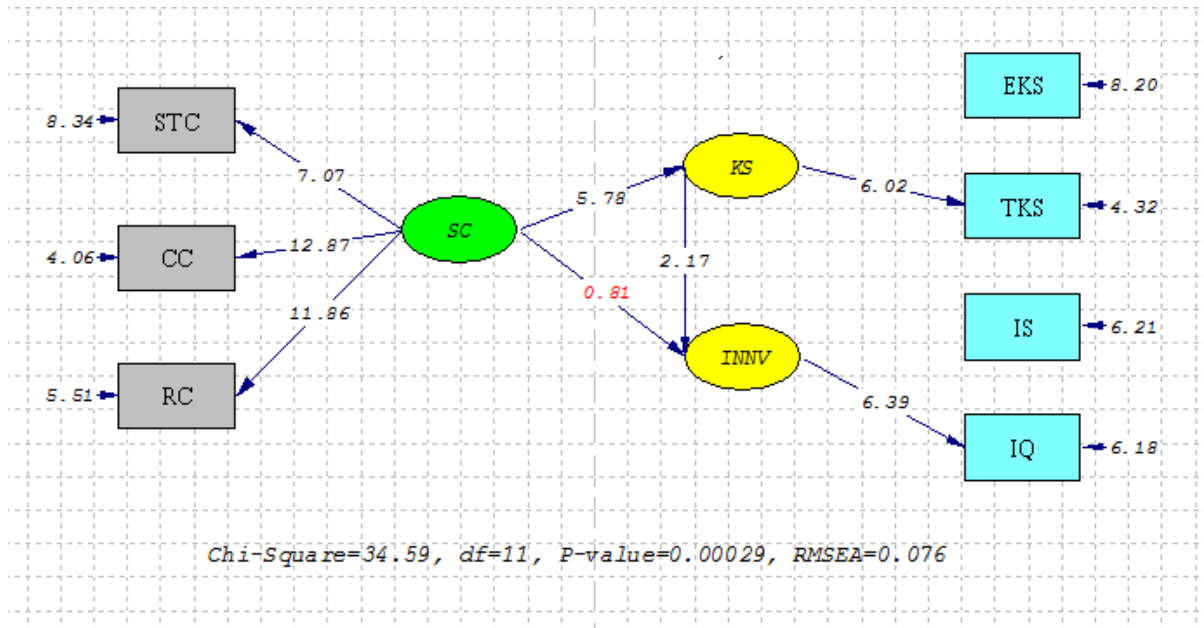|	Index name	Abbreviation	It is graceful if
Significant indicators	The root mean square of the estimation error	RMSEA	Be less than 1/0
	Kai Scorpio degree of freedom	$\dfrac{\chi^2}{d_f}$	Is equal to and less than 5
Fit indicators	Fit goodness index	GFI	Is greater than 0.8
	Abnormal fit index	NNFI	Is greater than 0.8
	Normalized fit index	NFI	Is greater than 0.8
	Adaptive Fit Index	CFI	Is greater than 0.8
	Incremental fit index	IFI	Is greater than 0.8

✓ Examination of the results of the conceptual model fit test showed that the research model is in a good condition. Also, the results of analysis of the measured equations related to the research structures and the obtained indices (RMSEA = 0.076, P-value = 0.00029, CFI = 0.96, NFI = 0.94 and GFI = 0.94) show a fit. The measurement model is desirable. In other words, all dimensions, components and indicators that have been drawn for the structures have had the desired validity and fit.

Figure 1- Standard estimation (main research model)

Chi-Square=34.59, df=11, P-value=0.00029, RMSEA=0.076

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✓ In this study, according to the application of structural equations, the relationship between latent variables is estimated. In fact, by doing this, all the multiple regression coefficients are calculated simultaneously, then using the T-statistic, the significance of the effect coefficients is obtained and the structural equations between the variables are obtained. If the T-statistic between the two variables is greater than 1.96, the null hypothesis that there is no relationship between the two latent variables is rejected and the alternative hypothesis that the relationship is significant in the latent variable is accepted. According to LISREL output, the absolute value of t calculated in all variables is greater than 1.96, so all estimates are statistically significant, although this does not apply to the impact of social capital on innovation.

Figure 2- Significance coefficients of the model

Chi-Square=34.59, df=11, P-value=0.00029, RMSEA=0.076

❖ Social capital has a positive and significant effect on the knowledge sharing of the PERGAS International Consortium

The results of the analysis of this hypothesis have shown that social capital has a positive effect of 0.84 and a significant effect of 5.78 on knowledge sharing; According to the significance coefficient, the present hypothesis has been confirmed and the effect of the independent variable on the dependent is 0.84 and the direction of the effect has been positive.

❖ Knowledge sharing has a positive and significant effect on the innovation of PERGAS International Consortium

The results of the analysis of this hypothesis have shown that the influence of knowledge sharing has a positive effect of 0.29 and a significant effect of 2.17 on innovation; According to the significance coefficient of the present hypothesis has been confirmed and the effect of the independent variable on the dependent 0.29 and the effect Has also been positive.

❖ Social capital has a positive and significant effect on the innovation of the PERGAS International Consortium

Based on the analysis of the path, the results showed that social capital did not affect innovation in the PERGAS International Consortium, because the obtained T-statistic was 0.81 in the critical area of 1.9 and -1.96, which confirms the rejection of this hypothesis.

❖ Knowledge sharing has a complete mediating role in this research because the effect of social capital on innovation has not been confirmed, so the effect of social capital on innovation is established only through knowledge sharing.

5. Conclusions and Suggestions:

The research hypotheses have examined the impact of social capital on knowledge sharing and innovation and the positive and significant impact of social capital on innovation through knowledge sharing has also been confirmed; This research is in line with the research [13, 18, 19 and 21], this research shows a positive and significant relationship between human resource actions, performance, innovation and social capital, attention to social capital in the organization is important In this regard, paying attention to them and using their functions can become a positive element to improve innovation, and this depends on the organization being able to attract talented people and somehow succeed in attracting its talents, and Then it can improve innovation by sharing knowledge between forces. In terms of the first and second hypotheses, the present study is in line with the research and in terms of the third hypothesis is inconsistent.

➢ The first hypothesis of the research showed that social capital had an effect on the sharing of knowledge of the PERGAS International Consortium; The magnitude of this effect was 0.84, so with a change of 1 unit or 100% in social capital, knowledge sharing is improved by 0.84 units or 84% with 95% confidence; In line with the results obtained in the present research, the following proposal is presented:

✓ Since the obtained path coefficient is the highest among other hypotheses, the effect of social capital on knowledge sharing in the PERGAS International Consortium will have the highest effect on improving social capital.

✓ Creating a service compensation system to support knowledge sharing leads to more creativity and innovation in knowledge sharing behavior; In this case, the desire to share knowledge by employees is improved and ultimately improved by the social capital of the organization.

➢ The second hypothesis of the research showed that knowledge sharing has influenced the innovation of PERGAS International Consortium; The magnitude of this effect was 0.29, so by changing 1 point or 100% in knowledge sharing, innovation improved by 0.29 points or 29% with 95% confidence; In line with the results obtained in the present research, the following proposal is presented:

✓ Changing job responsibilities in order to develop examples related to knowledge sharing, thus improving organizational innovation; If job tasks are defined in a direction where knowledge sharing is a priority, the resulting performance is based on knowledge sharing, so it can improve knowledge sharing and better innovation.

✓ Attention of senior managers to knowledge sharing and comprehensive support to facilitate the organization's innovative processes.

➢ The third hypothesis of the study showed that social capital did not affect the innovation of the PERGAS International Consortium; Based on the analysis of the path, the results confirmed that social capital did not affect innovation in the PERGAS International Consortium, because the obtained T-statistic was 0.81 in the critical area of 1.96 and -1.96, which confirms the rejection of this hypothesis. Hypothesis It is suggested to interview the experts of the PERGAS International Consortium to identify the reasons for rejecting this hypothesis.

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