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The Relationship between Knowledge Management and Organizational Innovation (Case study: Ahwaz Industrial Estates Company)

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Abstract: *The present study is aimed to investigate the relations between knowledge management (KM) and organizational innovation. The statistical population was consisted of all manufacturing companies with their main sites located in industrial towns in vicinity of Ahwaz city of Iran. 488 companies were located and the required size of the sample (216 companies) was calculated using the Cochran's formula. Therefore, a number of questionnaires were distributed through a random sampling procedure and 219 questionnaires filled out by company managers were collected. The data were analyzed using SPSS and LISREL software packages. The findings suggest that knowledge management is positively and significantly related to organizational innovation. Also it is shown that positive and significant relations exist between the components of knowledge management, namely knowledge creation, knowledge sharing and knowledge application as well as with organizational innovation.*

Keywords: *knowledge management, organizational innovation, manufacturing companies, Ahwaz county*

INTRODUCTION

Every organization does rely on new and innovative ideas in order to survive in present times. New and innovative ideas flow like the spirit into the body of the organization and save it from destruction [1]. Since innovation plays a key role through creating and introducing new products and services [2], the companies with stronger capabilities for innovation can work more efficiently in response to variable environment and create new capabilities which in turn allow them to higher levels of practical innovation [3]. Organizations need to make sure their business strategies accommodate innovation as well in order to create and maintain the competitive advantages. However, innovation has turned into a complicated and sometimes problematic issue due to dynamic nature of customer demands, higher competitive pressures and rapid changes in technologies. Complications in the field of innovation have also grown along with knowledge growth within the organizations and largely depend on availability of the knowledge [4]. However, as much the importance of innovation, the studies show that many organizations not even are not innovative and creative, but lag behind in adaptation to contemporary evolutions, advancements and changes while mainly managed through inefficient traditional methods [5]. The role of knowledge and knowledge management (KM) is more prominent at this type of situations. An important role has been associated with the knowledge within the innovation literature, while the studies show that KM is related to organizational innovation. KM is a high profile concept which paves the way for realization of innovation. KM and innovation are considered as key processes within today's knowledge-based societies, which allow us to enhance productivity and help us to renew and apply knowledge flow in new

ways in order to create much demanded skills that lead to enhanced organizational performance [6]. KM covers a wide spectrum of activities for creation, enhancement and exchange of intellectual capitals at macro level. It consists of processes, tools, structures etc. designed cleverly with the intention to increase, rejuvenate, share or improve the applications represented by three components of intellectual capital: Structural, social and human capitals. The process of managing the knowledge helps the organizations identify, select, organize and share the important information and skills which are considered as parts of organizational memory and usually exist as a unorganized form. This gives the organizations the ability to solve learning and strategic planning problems and make dynamic decisions in an efficient way [7]. KM facilitates the required connections between knowledge and necessary exchanges within the innovation processes. Furthermore, it enhances the innovative performance through developing new capabilities. Therefore, the available capacity of KM plays a critical role for supporting and nurturing the innovation process. Organizational Knowledge can not be efficiently managed without being shared and the competitive advantage diminishes gradually in such a condition [8]. Nevertheless, few studies have been done to investigate the relation between KM and innovation [4]. All that said, the present study is aimed to investigate the relation of KM and organizational innovation. Thus, the question rises that whether KM is practically related to organization innovation?

Theoretical basis

Knowledge Management

KM has been considered as an important principle during recent decades. The importance of KM has been particularly recognized as a pillar of industrial economy along with natural resources and intellectual assets. The focus has been intensified further since 1995 [9]. KM has turned into an important issue within many business firms. The managers have realized that the value of their company depends on their ability to create and manage the knowledge. They are needed to play an effective role on gaining competitive advantage aligned with innovation and better organizational performance through KM methods. Local and global competition schemes are currently focused on the urgent need for smart KM within all internal and external aspects of the organization [10]. Various scholars have addressed the KM topic through different viewpoints. Some focus on the objectives of KM. They presume the KM as being an organizational issue. This school of thought focuses mainly on managing files, knowledge bases, data recording and data mining while emphasizing the establishment of an organizational KM based on information technology applications. In other words, those researchers view the KM as “information management” and believe KM to be the art of proper knowledge transmission to the right people at the right time and helping out the system through enhancing productivity of decision making processes. Yet, some others believe that organizational knowledge is just another strategic source of valuable and scarce assets and capabilities which are difficult to imitate and replace [11]. KM is a relatively new concept and despite a large number of studies done in this field, inconsistencies can be found amongst works of experts. However, it is generally accepted that KM is not a strait forward subject and no silver bullet solution exists for successful application of KM within an organization [12]. Dibosky (2006) defined KM as the process of identification, possession, customize and distribute intellectual assets which are critical to long term performance of any organization [13]. Also Brogen (2003) defines KM as a precisely optimized systematic strategy which connect the required business information together in order to improve performance amongst employees and competitive capabilities of the company to select, store, categorize, sort and correlate those data [14]. KM starts with the focus on importance of people, their behavior and professional culture within the framework of two social and technical dimensions. The essential point is that knowledge is created and shared through human interactions in work. Ideas can be conceptualized, but the most essential knowledge producing units within a company are teams and operational bodies [15].

Allen and Holmes (2006) suggest that the role of KM process in attaining the pest possible performance could be summarized as the following.

1- Creating, store and distribute new and useful knowledge in order to facilitate the business in the organization.

2- Assembling a specialized group to acquire the knowledge and capitalize on it regardless of cooperation and interactions amongst employees and having an efficient leader [16].

Organizational Innovation

Innovation is a systemic and complicated process which starches from creation of an idea to realization of a product and commercializing it. Those organizations and businesses are more successful today, which can develop their own new ideas with adequate speed and incurring costs. Despite the significance and applications of the word "innovation", no universal accord exists about its concept and definition yet. This word is often used in a generic meaning for any product or phenomena created by the human kind. However, there is a more precise definition within the field of KM that differs from other concept like creativity, invention and evolution [17]. Innovation in this sense can be defined as to produce, develop and implement a new thing within the organization and also extend the novel products, services, processes, technologies, systems or corporate structures [18]. Also Harkima (2003) has defined innovation as a scientific process aimed to create new knowledge in order to be used in developing enduring commercial solutions [19]. In general, it can be said that organizational innovation refers to creation and/or implementation of a new idea or behavior within an organization [20].

The general belief is that organizational innovation is the capability of creating value, products, services and ideas. Also innovation is a useful method to induce changes and developments at the outputs of the organization. Organizational innovation is delivered through the capabilities of creating techniques and ideas in order to take actions which help the business at particular conditions, inspire the employees while increasing capabilities and talents amongst them [16].

Innovation as a concept which includes creativity, is an important factor of success and competitive advantage for organizations and any strong economy. Today, almost all the organizations are facing a very dynamic business environment due to fast changes in technology, short life cycle of the products and globalization. Organizations, and particularly those which are based on technology, are increasingly in need for innovation and creativity in order to survive, compete and lead their business [22].

Innovation is a necessity for sustainable economic development in capitalism system which includes enhancements of living standards and creating new technologies. Innovation as a complicated and diverse phenomenon can be hardly organized itself. Wolf (1994) suggests that studies are following four main paths:

- That related to stages of innovation process;
- Innovation characteristics;
- Organizational aspects;
- and fundamental theoretical views [22]

Innovation even exists as a common process within the long established sectors and provides the organizations with essential opportunities to capture new markets and defeat economical stagnation and downturns which

pose threats to existing businesses. Innovation potentially leads to more rewards, more sales and higher market share. Innovation also could destroy the existing markets and create new dimensions [23].

Innovation is particularly important for companies and organizations, since it can provide sustainable competitive advantage for them. Many organizations are facing significant problems in competition within their environment due to rapid pace of changes, and particularly in technological evolutions. In this regard, managers and employees are required to use the power of creativity and innovation and work towards adaptation to fast changes of production lines, managerial methods, manufacturing processes, etc. [24].

In general, three approaches exist towards organizational innovation:

- Initially, innovation is considered as a determining factor of growth and higher commercial performance for the organization. The focus in this approach is on business strategy based on innovation and financial investments in order to grow the capabilities of the firm to innovate new products.
- The second approach is to view the innovation as a byproduct of dynamic organizational development and making decisions for priorities and work conditions strictly based on innovation management.
- The third approach considers innovation as an efficient factor while focusing on a critical trade-off between innovation and other effective factors in efficient business performance [25].

Research background

Safarzadeh et al. [23] studied the effects of strategic management on innovation and organizational performance within the healthcare and medical centers. Their findings suggest that customization of the knowledge can positively influence organizational innovation and performance while those variables influence the organizational performance through innovation; and there is a relation between innovation and organizational performance. Yousefi et al. [24] studied the influence of KM on technology firms located in Science and Technology Park of Urmia University. The findings of that study showed that a significant relation exists between KM and innovation (product, process, incremental, fundamental). Therefore, companies can increase innovation rate within their organization if they devote more attention to KM. Konjkav monfared et al. [26] studied the effect of various fundamental dimensions of KM on innovation. Their results suggest that significant relations can be found between underlying dimensions of KM and innovation in technique and implementation. Also the findings through structural equation modeling suggest that amongst various fundamental dimensions, technology aspect and the structure impose the strongest effects on innovation development. Yazhou and Jain [11] focused their study on relations between KM (with dimensions of organizational memory, knowledge sharing, knowledge acquisition and knowledge adoption), organizational innovation (with dimensions of corporate innovation and technology innovation) and organizational performance. According to their results, no significant relation could be found imposed by organizational memory on organizational performance or corporate innovation, while the other relations were statistically significant. Kor and Maden [18] studied the relation between KM processes and categories of innovation within organizations; they tried to show the effects of innovation brokers on the relation between KM and various types of innovation. The results suggest that KM processes positively influence innovation in organizations. Alrubaiee et al. [16] investigated the relations between KM, organizational innovation and performance in IT and communications industry. They found a positive and strong effect imposed by KM on organizational innovation and organizational performance, as well as a positive effect of innovation on performance within the organizations. Furthermore, the mediating role of organizational innovation on the relation between KM

processes and organizational performance was confirmed. Lopez and Merono [27] focused their study on the relation between KM strategies and business performance. Their findings showed that both types of strategies (formulated and personal) do influence innovation and performance within companies. Abdi and AmatSenin [4] investigated the effect of KM on innovation both as a direct relation and through the mediating effect of organizational learning. They showed that organizational learning imposes a comprehensive mediating effect on KM and organizational innovation. However, some ambiguities exist regarding the relation between KM and organizational learning.

Theoretical Framework

The theoretical structure of the present study is based on that provided by Abdi and AmatSinin [4] and states the effect of KM and its dimensions on organizational innovation:

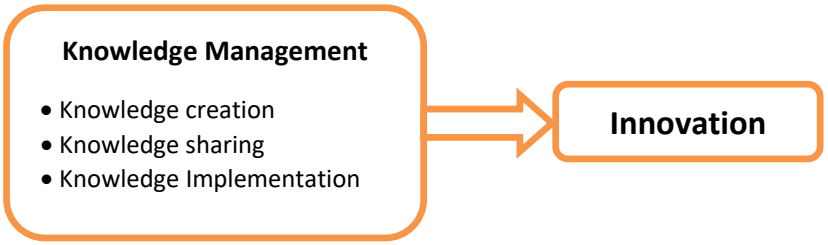

Figure 1. Conceptual model of the research [4]

Main hypothesis:

1. A positive and significant relation exists between knowledge management and organizational innovation.

peripheral hypotheses:

1. There is a positive and significant relation between knowledge creation and organizational innovation
2. There is a positive and significant relation between knowledge sharing and organizational innovation
3. There is a positive and significant relation between knowledge implementation and organizational innovation

Methodology

The present study aims to investigate the relation between implementation of knowledge management principles and organizational innovation in the manufacturing companies located within industrial towns all over the Ahwaz county in Iran. Thus it is an applied research in sense of objectives and a descriptive-correlation study in terms of data collection. The study is particularly based on structural equations. The statistical population was consisted of all manufacturing companies which had a facility located at various industrial towns in Ahwaz County (total 488 manufacturers). The adequate volume of the sample was estimated using the Cochran's formula in consideration of limited size of statistical population. The calculated adequate sample

size was 216 and therefore 219 completely questionnaires were collected which the company managers had filled out. The questionnaire consisted of 21 specifically designed questions. The outline of questionnaire structure is shown in the following table. We used the Cronbach's alpha test in order to assess the reliability of the questionnaire as the data collection instrument. Total reliability coefficient was 0.960 while the Alpha values for research variables are given in Table (1). It was inferred that the questionnaire was adequately reliable.

Table (1) Structure of the questionnaire

Variable		Cronbach's Alpha	No. of questions	source
KM	knowledge creation	.946	5	Khamda [28] and Norouzian [29]
	knowledge sharing	.959	5	
	knowledge implementation	.961	5	
Organizational innovation		.951	6	Khorasani-fard [30]
total questionnaire		.960	21	-

A Likert 5 point scale was used as the measurement system within the questionnaire. Validity of contents and form of the questionnaire was approved using the experts' judgments and the structural validity was confirmed using a Confirmatory Factor Analysis (CFA) method. Table (2) shows the results of CFA for the questionnaire. Those results suggest that all standard coefficients and the significance value (t-value) are at an acceptable level. The standard coefficient value for all the questions related to factors under investigation is higher than 0.60 in this case. Thus, indicating that all questions are acceptable. Also the t-values for all the questions are higher than 1.96 which indicates the significance of all relations between each factor and its pertinent factor. Furthermore, the indices of measurement model fitness related to all components show that measurement models are adequate for every factor. Table (3) shows the summary of results in terms of measurement model fitness indices pertaining to those components.

Table (2) standard coefficients and significance values for questions

Variable	Index	Question No.	Std. Coeff.	t-Value
KM	Creating Knowledge	Q 1	0.72	12.34
		Q 2	0.88	16.64
		Q 3	0.94	18.14
		Q 4	0.90	17.28
		Q 5	0.92	17.64
	Sharing Knowledge	Q 1	0.80	14.12
		Q 2	0.85	15.44
		Q 3	0.86	15.98
		Q 4	0.95	18.70

		Q 5	0.79	13.92
	Implementing Knowledge	Q 1	0.82	14.29
		Q 2	0.79	13.45
		Q 3	0.79	13.46
		Q 4	0.83	14.42
		Q 5	0.76	12.76
Organizational Innovation		Q 1	0.82	14.66
		Q 2	0.79	13.93
		Q 3	0.79	13.91
		Q 4	0.83	14.80
		Q 5	0.87	16.00
		Q 6	0.78	13.64

Table (3) Goodness of Fit indices in CFA mode

Fitness index	RMR	RMSEA	IFI	CFI	NFI	NNFI
Acceptable	near 0	<0.1	≥0.9	≥0.9	≥0.9	≥0.9
Calculated	0.020	0.051	0.98	0.98	0.95	0.97

Data Analysis

We used the structural equation modeling approach and the LISREL software package to analyze the conceptual model and evaluate the goodness of fit with the collected data. Figures (2) and (3) are respectively related to standard coefficients and significance values for the main hypothesis; while figures (4) and (5) show the same for the peripheral hypotheses. Values of standard coefficients indicate that a how much change would be seen for the value of dependent variable as the result of a one unit change in the predictor variable, and what would be the direction of the resulted change.

The standard coefficients in Figures (2) and (3) are considered significant when the significance value associated to them lies outside the range [-1,96, +1,96]. On this bases, as Figures (2) and (3) show, the strength of effect imposed by KM on the organization innovation is estimated to be 1.03 with a t-value of 14.79 which is pretty high. Thus the main hypothesis is deemed to be approved. Hence, the higher importance attached to the knowledge management efforts in the companies, the more innovations take place within the companies as well. Also considering Figures (4) and (5) regarding the peripheral hypotheses, it can be inferred that strength of effect for the "knowledge creation" on organizational innovation is estimated as 0.28 with the t-value of 4.07 which is high. Therefore, we infer that hypothesis 2 is approved. So, the organizational innovation is improved as the manufacturing companies pay more close attention to creation and building knowledge within their structure.

Furthermore, the strength of effect of knowledge sharing on the organizational innovation as the first peripheral hypothesis is estimated to be 0.42 with the t-value of 6.72 which is higher than the threshold. Hence the second peripheral hypothesis can be considered as approved. Also regarding the third peripheral hypothesis

the strength of the effect of knowledge implementation on organizational innovation is estimated to be 0.38 with the high t-value of 4.28 in this case. Therefore, this hypothesis was considered to be approved as well. This indicates that organizational innovation would be improved as a consequence of attaching higher importance to the practical applications of their acquired knowledge.

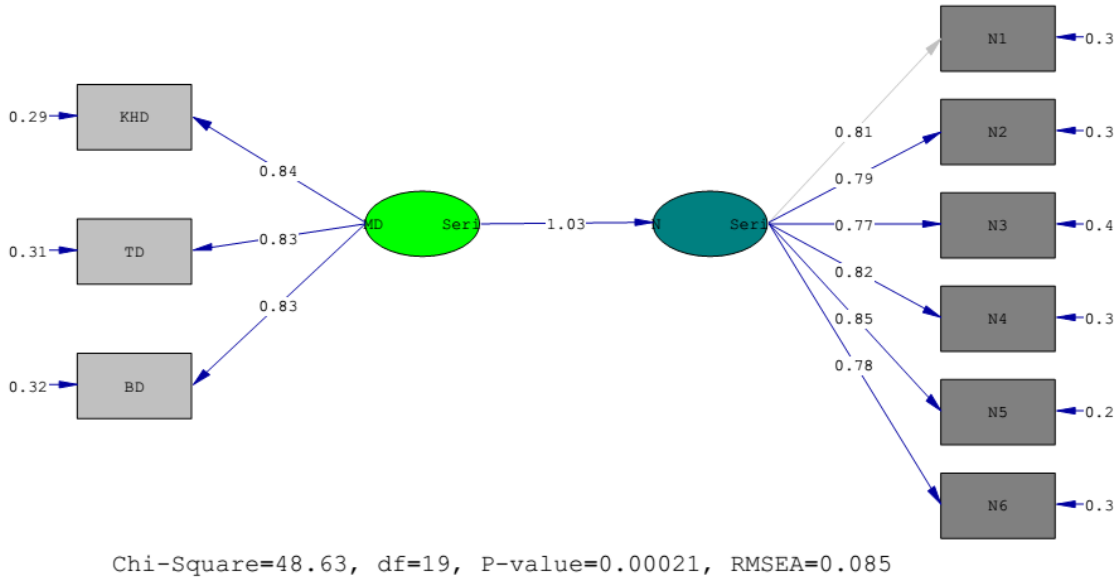

Figure (2) Significance levels of research model for the main hypothesis

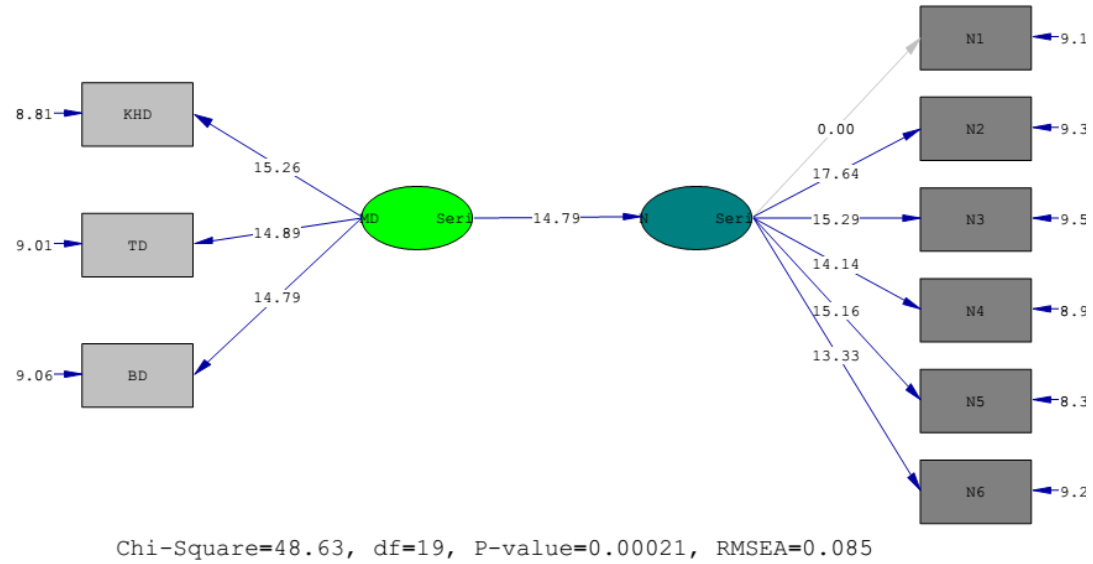

Figure (3) The coefficients of effect within the research model for the main hypothesis

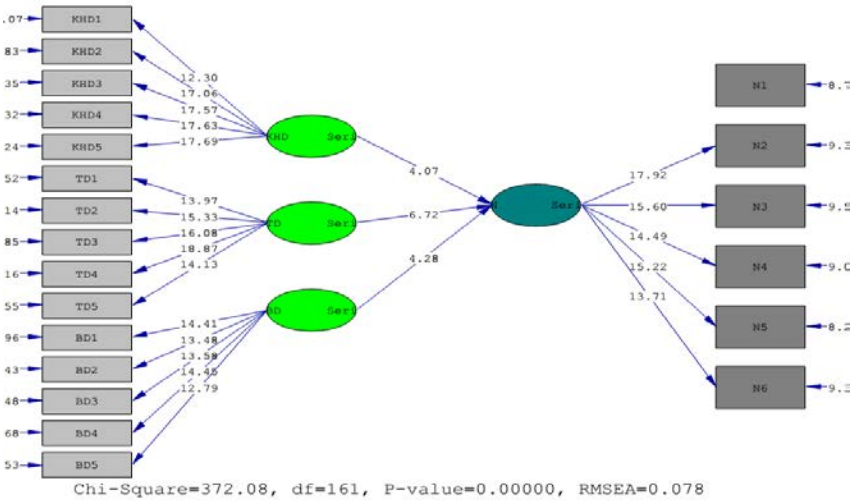

Figure (4) Significance coefficients of the research model for peripheral hypotheses

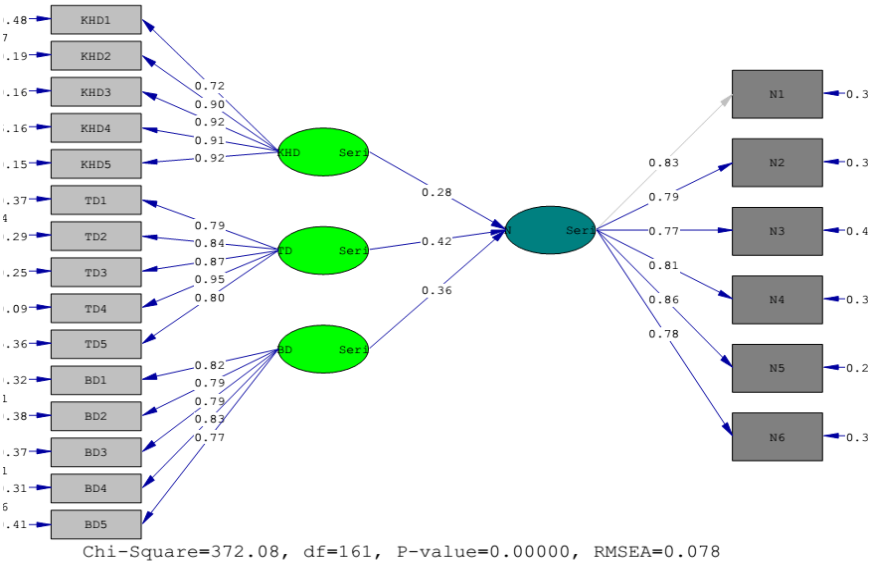

Figure (5) Coefficients of effect in research model for peripheral hypotheses

Table (4) shows the results regarding the goodness of fit for the whole model. Normalized Chi square number is 2.31 which is lower than 3, so it is within an acceptable range. There is a value of 0.078 obtained for the RMSEA index which is again within an acceptable range. The values for other indices are higher than the 0.90 critical threshold. Hence, the general Goodness of Fit index for the proposed conceptual model is considered to be adequate.

Table (4) Goodness of Fit for the research model

Fitness index	RMR	RMSEA	CFI	IFI	NFI	NNFI
calculated values	0.23	0.078	0.95	0.95	0.92	0.93

Conclusions and suggestions

The present study was an attempt to investigate the relation between knowledge management and organizational innovation within the manufacturing companies located in industrial towns over the Ahwaz county of Iran.

The results obtained throughout the examinations on the main research hypothesis suggest that a positive and significant relation exists between knowledge management and organizational innovation. This implies that as the companies devote more efforts to focus on practical management of their knowledge and implement KM within their structure, the level of innovation would be more improved. These findings are in concordance with those reported by konjkav monfared and Ardekani [26], Safarzadeh et al. [23], Kor and Maden [18] as well as Lopez and Merono [27]. Therefore we suggest that adequate environment of education and constant learning and ongoing hand-on training programs for the employees be provided in order to implement and enhance knowledge management processes within the companies. Also more focus and attention should be devoted to creativity, innovation and encouragement of creative initiatives by the employees through the commitments from managers and supporting measures provided for KM procedures in form of financial resources, structures and other types of resource and facilities.

Our first peripheral hypothesis showed that knowledge creation is significantly related to organizational innovation. This means that innovation and creativity are more likely to occur within an organization in which the knowledge creation processes are enhanced. The results obtained regarding the first peripheral hypothesis are in concordance with those reported by Nawab et al. [10] and Yazhou and Jian [11]. The following propositions are presented accordingly:

1. Explicitly presenting the value of creating new knowledge and ideas within the organization

2. Developing adequate atmosphere for implementing new theories and ideas

3. Using idea management systems such as propositions process, brain storm rooms, advisory groups, etc. within the organization

4. Providing certain mechanisms in order to transform tacit knowledge amongst employees into explicit knowledge

5. Providing the employees with clear perspectives and strategies towards the future

The second peripheral hypothesis showed that sharing the knowledge is positively related to innovation in organization. This implies that more innovations would materialize within the organization when knowledge and information are more widely shared within the ranks of a company. In other words, the more knowledge is shared amongst employees, the higher would be the possible level of innovations. These findings are in alignment with those of Nawab et al. [10] and Yazhou and Jian [11]. On this bases, we suggest that conferences and symposiums need to be held with the aim of improving and enhancing levels of knowledge sharing as well as exchanging experiences (success/failure stories) amongst colleagues. Furthermore, mechanisms should be created for encouraging people to transfer the knowledge they obtained through experiences and expertise to other peers within the organization.

Finally, the third peripheral hypothesis showed that a positive and significant relation exists between knowledge implementation and organizational innovation. This means that improvements in applications and

methods of practical use of knowledge would result in improvements of innovation and creativity levels within an organization. These findings are in concordance with those reported by Nawab et al. [10], Yazhou and Jian [11] and Taleghani et al. (2012).

The following practical suggestions can be stated on this bases:

1. Make right and reliable decisions based on the knowledge that already exists within the organization

2. Create feedback loops between behaviors and consequences

3. Identify the key employees whom their knowledge needs to be recorded and maintained within the organization

4. Use peoples' knowledge during decision making procedures

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