

INNOVATION AND KNOWLEDGE MANAGEMENT: A LITERATURE REVIEW AND RESEARCH FRAMEWORK

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ABSTRACT

This paper discusses the relationship of knowledge creation process (KCP) and innovation also the role of organizational culture (OC) in this relationship. The controversial arguments in the literature regarding this relationship provoked this discussion. The paper covers the theoretical discussion on innovation and knowledge creation modes and formulates a research framework based on previous literature. The research argues that all four modes of knowledge creation (socialization, externalization, internalization and combination) are positively associated with product and process innovation. Furthermore, flexibility-oriented organizational culture moderates the relationship of KCP and innovation.

Keywords: *Knowledge creation process (KCP); Innovation; Organizational culture*

1) INTRODUCTION

It has been realized that to sustain competitive advantage in continuous changing market dynamics, organizations must strive hard to improve quality (Feng et al. 2006). Total quality management (TQM) has long been a major management philosophy to gain performance improvements in organizations; however, knowledge management (KM) initiatives have received considerable popularity as an emerging concept. In addition, innovation has also gained substantial attention in the marketplace as a critical resource to sustain competitive advantage (Hung et al. 2010). All the aforementioned concepts have become the center of attention for recent literature. In today's competitive world, where quality control, quality assurance and quality management have become commonly implemented concepts, the next step is to be innovative.

It is now fully acknowledged that innovation is capable of playing a crucial role in maintaining a sustainable competitive advantage. Based on intense

competition and tight market conditions, it is expected that the focus of customers will shift from quality to innovation. Earlier, quality conscious customers preferred to choose good-quality products from poor-quality but now the preference criteria are innovation. They are to choose more innovative products with newer functions among different quality products (Prajogo and Sohal 2004).

In line with this trend, it has been explored that as life-cycles of different products are shortening day by day and technologies are becoming ever more imitable, the basis of sustainable competitive advantage is now organizational knowledge which is basically tacit in nature and hard to imitate by competitors (Alazmi and Zairi, 2003). The role of knowledge in achieving competitive advantage is explained in different ways in literature. Internalization and effective utilization of knowledge through knowledge management (KM) initiative can lead organizations to achieve improved innovation and overall performance. It is argued that if knowledge management (KM) concepts are effectively integrated into the organizational processes, they can trigger the effectiveness of quality management process which will result in quality improvement and increased productivity (Zhao and Bryar 2001).

Authors are trying to investigate the relationships among above stated concepts to gain maximum advantages in today's competitive era. Some authors tried to investigate the relationship between TQM and innovation (Akgün et al., 2014; Sadikoglu and Zehir, 2010; Perdomo-Ortiz et al., 2006; Singh and Smith, 2004; Prajogo and Sohal, 2001; 2004). Another stream of literature explored the interrelationship of KM and TQM (Asif et al., 2013; Sanz-Valle et al., 2011; Hung et al., 2010; Hsu and Shen 2005; Linderman et al., 2004). Recent research is being conducted on the interrelationships of KM and innovation. It is interesting to see whether proper management of knowledge creates innovation in the organization or innovation helps to create and manage organizational knowledge (Hung et al. 2010).

This paper discusses the relationship of knowledge management and innovation. Discussion is important for the following reasons: Firstly, as discussed earlier that basis of market competition is now shifting from quality to innovation so it is of interest to get insight into this emerging dimension (Hung et al., 2010). Secondly, the growing need of organizational knowledge due to its tacit and inimitable nature and its crucial role in achieving organizational innovation (Gloet and Terziovski,

2004; Carneiro, 2000). Thirdly, emerging literature is digging out these dimensions (Seidler-deAlwis and Hartmann, 2008; Du Plessis, 2007) but empirical studies on the relationship of innovation and knowledge management (KM) are still scant (Donate and Guadamillas, 2011; Darroch, 2005). Furthermore, to my knowledge, no previous study has tried to investigate this relationship in the presence of moderating effect of organizational culture. This discussion would be of great value for managers and practitioners as it will guide them to focus right knowledge creation mode to trigger right innovation strategy in the presence of supportive culture. This paper therefore seeks to further dig out this relationship from a theoretical perspective. It will lead to the development of a theoretical research framework examining the relationship of innovation and knowledge management.

This paper is structured into following sections: Section two provides a brief literature review on innovation, knowledge management and their relationship. Section three discusses the role of organizational culture with respect to innovation and knowledge management. Finally, section four provides summary of the paper and presents the theoretical framework with derived hypotheses to be examined.

2) LITERATURE REVIEW

This section provides a brief literature review on innovation, knowledge management and their relationship.

2.1) Innovation

Innovation means new things, objects, practices and ideas. It is “the act of introducing something new” (American Heritage Dictionary of the English Language, 2000). Creativity triggers novel and valuable ideas and innovation implements these ideas to produce new products and processes (Sarooghi et al., 2015).

The innovation process includes the creation, internalization, implementation, and integration of new ideas and practices (Palm et al. 2014). In organizational management, innovation refers to the process of being creative and introducing new processes and methods. These unique methods lead an organization towards innovation and improved results (Prajogo and Sohal, 2001). Innovation can involve the new product,

process, technology, diversification into the new market and use of new material or combination. It could be an adoption of an idea or concept that is new to an organization. To bring novelty into products or services, organizations should have a knowledge base from where individuals can acquire, interpret and integrate knowledge whenever and wherever it is needed (Du Plessis, 2007).

2.1.1) Innovation types

Different types of innovation are explored in literature including Incremental product, radical product, incremental process, radical process and administrative innovation (Kim et al. 2012). The two most cited types of organizational innovation are the focus of this study: product innovation and process innovation. Product innovation is defined as the changes or newness introduced in the end product or service, while process innovation refers to the novelty introduced in the method or process of producing products or services (Kim et al., 2012). **Product innovations** are defined as new products or services that are introduced into the market to meet customer's needs and expectations, and **process innovations** are defined as any change in the production or service operations of an organization to produce a product or deliver a service. Product innovations are generally market-oriented and customer-focused while process innovations have internal focus and are introduced for efficiency gains (Sarooghi et al. 2015). Product innovation improves a firm's external product mix whereas process innovation improves its internal operations mix (Sidin and Sham 2015).

There are two choices for management to introduce innovation in the organization: first by copying others' innovations or by developing their own. The first approach can be useful for short term benefits where companies enjoy competitive advantages. However, the second approach is better to obtain sustainable competitive advantage (Martínez et al. 1999).

2.2) Knowledge management

Knowledge has been emerged as a significant organizational intellectual resource in the past few years. To deal with this intellectual resource, Knowledge Management (KM) term has been introduced in the organizations. To avail all the associated benefits, it is essential to differentiate knowledge from data and information. Data can be defined as

raw alphabets, numbers, objects, ideas, and sounds obtained through some observation or experiment. Whereas, when data is arranged in some meaningful form it becomes information. In line with this trend, when information is combined with some beliefs, experiences, commitments, contexts, perspectives, and interpretations it becomes knowledge (Nonaka, 1994). The real strength of organizations lies in its distinctive resources and the effective utilization of these resources. Any organization can hold two types of resources: Physical and Intellectual. Physical resources can include organization facilities, equipment, building, materials and office furniture etc. whereas intellectual resources include all informational resources including human capital (Carneiro, 2000).

Knowledge Management (KM) is defined as a term or approach for the creation, storage/retrieval, sharing and application of knowledge (Gloet and Terziovski, 2004). All these functions are interdependent and interlinked under the umbrella of Knowledge Management (KM). The objective of Knowledge Management (KM) is to make the best effective use of existing resources and capabilities of an organization (Donate and Guadamillas, 2011). Knowledge management provides the required tools, techniques, processes and platforms to ensure the timely availability and accessibility of knowledge (Du Plessis, 2007) in order to improve organizational performance (Donate and Guadamillas 2011).

To sustain a competitive advantage, it is of crucial importance to make sure the timely availability of knowledge to the right people and at the right time. Due to intense competitive conditions, it is important for a company to know “what it knows”. Means it should be well aware of its all data sources to extract required information at right time (Brand, 1998). It is further supported that application of KM gives the benefits of high quality, low cost, efficiency, improved delivery time, high flexibility and innovation (Singh et al. 2006). Operational definitions of used variables and their related literature are summarized in **Table 1**.

Table 1: Operational definitions of Variables and related Literature

Variables	Type	Definition	Indicators	Measurement
Innovation	Dependent variable	It is “the act of introducing something new” (American Heritage Dictionary of the English Language, 2000). The innovation process involves the generation, adoption and implementation, and incorporation of new ideas and practices (Palm et al., 2014).	<ul style="list-style-type: none"> • Process Innovation • Product Innovation 	Prajogo and Sohal (2011; 2001)
Knowledge Management	Independent variable	KM can be defined as an umbrella term for a wide variety of interdependent and interlocking functions consisting of: knowledge creation, storing, sharing and improving (Gloet and Terziovski, 2004).	Knowledge Creation SECI cycle	Linderman et al (2004) Nonakaand Takeuchi, (1995)
Organizational Culture	Moderator	Organizational culture is built on shared ideas and beliefs (Hofstede, 1990) affecting the way an organization operates and these norms are propagated to new employees (Schein, 1985).	Flexible-oriented Culture	Competing Values Framework (CVF) developed by Quinn and Spreitzer (1991) and Denison and Spreitzer (1991)

2.2.1) Process of knowledge management

Knowledge management (KM) is an emerging discipline in the recent literature. Michael Polanyi's (1967) first distinguished the two types of knowledge: tacit and explicit knowledge. Later on, Ikujiro Nonaka (1994), used these terms and as a result, most recent Knowledge management (KM) literature seems to be influenced by this distinction. It is of great value to distinguish tacit knowledge from the explicit one. Tacit knowledge is intuitive in nature, it is hard to communicate in stated form whereas explicit knowledge is codified in nature and is relatively easy to communicate and codify (Nonaka and Peltokosrpi, 2006). Explicit knowledge can be collected through written manuals, instructions and standard operating procedures, so it can be easily transferred to others. It can take the form of tangible organizational knowledge in the form of company's vision, mission and policy in black and white (Lim et al. 1999).

Knowledge management is an approach which can be divided into several processes such as knowledge generation, storage and retrieval, transfer, and application and improvement of knowledge (Alavi and Leidner, 2001). During the process of knowledge creation new knowledge is generated or existing knowledge is replaced with new one. The source to generate knowledge can include social interaction between individuals or individuals' own intellectual thinking process. The essence of knowledge creation is to create, amplify, improve and adjust newly generated knowledge in organizational settings (Nonaka, 1994). The second step of knowledge management is knowledge storage and retrieval. It deals with the proper organization of knowledge whether newly generated or acquired by internal and external sources (Linderman et al., 2004; Donate and Pablo 2015). It involves storage of data in the form of written documents, electronic databases, expert systems and makes sure the efficient retrieval of stored data (Nonaka, 1994). The third step is to transfer that generated and stored knowledge. There are different levels of knowledge transfer in the organization: transfer of knowledge can occur between individuals, between group of individuals, across different groups, and from the group to the overall organization. The crucial element of this step is to make sure the transfer of knowledge to the right place and at the right time for effective utilization (Linderman et al., 2004; Donate and Pablo 2015). The last step of knowledge management (KM) process involves the application of this stored knowledge to get the everlasting benefits of knowledge management. Knowledge can be applied in many

real time situations for timely decision making, preventive and corrective actions or for some critical problem solving (Donate and Pablo 2015; Alavi and Leidner, 2001).

The knowledge transfer process has been the subject of many researches whereas knowledge creation or utilization processes have been relatively neglected areas. Specifically, it is argued that knowledge creation can play very crucial role to improve the organizational innovation performance (Lee and Choi, 2003). So, the focus of the study is limited to knowledge creation process that is most critically associated with Innovation.

Nonaka (1994) put forward that knowledge creation in any organization occurs through a spiral interaction between tacit and explicit knowledge (Fig 1). The interaction of these two dimensions results in four patterns that how new knowledge is created and internalized in the organizational processes.

	Tacit	Explicit
Tacit	Socialization (Sympathized Knowledge)	Externalization (Conceptual Knowledge)
Explicit	Internalization (Operational Knowledge)	Combination (Systematic Knowledge)

Figure 1: Modes of knowledge conversion

Socialization is the process of tacit-tacit conversion (Tseng, 2010). In this mode of conversion, individuals interact with each other to create knowledge but this interaction is not in tangible form (Linderman et al., 2004). It is usually an informal sort of conversation in which people share their personal experience and learned skills with others (Lee and Choi, 2003). Some popular ways of socialization are coaching, observation, following others and mentoring. Through socialization process, people are more inclined to share their feelings and ideas with others and likewise understand theirs. Nonaka named the output of this process as sympathized knowledge (Nonaka, 1994). Externalization is the process of tacit-explicit conversion (Tseng, 2010). In this mode of conversion, tacit knowledge is converted into explicit concepts. The purpose of externalization is to make tacit knowledge understandable to others. Since tacit knowledge is difficult to store, organizations usually transform it into explicit knowledge (Asif et al. 2013). Explicit

concepts are in more stated and codified form (Lee and Choi, 2003) like metaphors, hypotheses, drawings, stated concepts and models (Nonaka, 1994). The output of this process is described as conceptual knowledge. Internalization is the process of explicit-tacit conversion (Tseng, 2010). This mode of conversion helps individuals to enrich their tacit knowledge on the bases of explicit knowledge (Linderman et al., 2004). Written manuals and standard operating procedures (SOPs) help individuals to learn the required skill. That skill is further apprehended with personal experience and improves individual's tacit knowledge (Lee and Choi, 2003). Internalization often refers to "learning-by-doing" (Asif et al. 2013). The output of this process is described as operational knowledge. Combination is the process of explicit-explicit conversion (Tseng, 2010). This mode of conversion helps organizations to arrange explicit knowledge for better and efficient utilization. Different bodies of explicit knowledge are reconfigured and systematized to extract new knowledge (Nonaka, 1994). In this process, existing explicit knowledge is categorized, sorted, re-contextualized and manipulated to make new knowledge (Lee and Choi, 2003). The output of this process is described as systematic knowledge.

2.3) Knowledge Management and Innovation

Changing customer needs, intense market dynamics and rapidly changing technology and growing amount of knowledge are some critical enablers of innovation (Du Plessis, 2007). Knowledge can play a crucial role in improving the creative abilities of any organization. Knowledge management helps organizations to arrange and manipulate existing data to create new creative ideas that lead organizations to innovation. To face rapid changes in the competitive market place, organizations must be able to improve the knowledge skills of their human capital (Carneiro, 2000). Authors are of the opinion that all knowledge management processes play important role in innovation but the process of knowledge creation is specifically associated with organizational creativity (Lee and Choi, 2003).

The summary of studies on the relationship of innovation and knowledge management is presented in Table 2.

Table 2: Summaries of Studies on the relationship of Innovation and Knowledge Management (KM)

Sr. No.	Author	Nature of Organization	Research Methodology	Main Findings
1.	Gloet and Samson (2017)	Service firms	Case study/Content Analysis	Results showed that excellence framework shapes KM practices that in turn, encourage incremental innovation.
2.	Tieng et al., (2016)	Manufacturing firms	Questionnaire/ Regression Analysis	Knowledge management has a positive influence on product and process innovation. Also, This influence is stronger in organizations having formal R and D units.
3.	Obeidat et al., (2016)	Jordanian consultancy firms.	Questionnaire/ Regression Analysis	Showed a significant and positive impact of knowledge management processes on innovation.
4.	Donate and Pablo (2015)	Technology firms	Questionnaire/SEM	The effect of knowledge-oriented leadership on innovation is positively mediated by KM. KM practices improve product innovation performance.
5.	Barraies et al., (2014)	Information technology and communication (ICT) sector.	Questionnaire/SEM	Socialization and externalization (more tacit based activities) are strongly associated with Innovation.
6.	Berraies and Chaher (2014)	Information technology and communication (ICT) sector.	Questionnaire/SEM	Organizational learning plays a role of partial mediator between knowledge creation process and innovation performance. Socialization and externalization (more tacit based activities) are more positively associated with innovation performance.
7.	Easa, N. (2011)	Banking sector	Questionnaire/ In-depth Interviews/Content Analysis	Results suggested that the socialization and externalization have weak influence on innovation whereas combination and internalization are more strongly associated with innovation.
8.	Hung et al. (2010)	High-tech companies	Questionnaire/SEM	KM has significant positive association with both TQM and innovation performance. TQM positively mediates the relationship of KM and innovation performance.
9.	Taminiau et al (2009)	Consultancy	In-depth Interviews/ Content Analysis	Informal knowledge sharing plays a major role to enhance innovation performance of consultancy firms.
10.	Schulze and Hoegle (2008)	Miscellaneous industries	Questionnaire/ Regression Analyses.	Socialization and internalization are positively associated with the generation of new product ideas whereas externalization and combination are negatively associated with innovative ideas.
11.	Alwis and Hartmann, (2008)		Literature based	Tacit and explicit both types of knowledge are important but tacit knowledge is more related to innovation than explicit.
12.	Du Plessis, (2007)		Literature based	Stresses the use and conversion of tacit and explicit knowledge to achieve innovation performance. Supports the argument that innovation depends on timely and accurate availability of knowledge.
13.	Darroch, (2005)	New Zealand firms	Questionnaire/SEM	Provide support that all three KM processes (acquisition, knowledge dissemination and responsiveness to knowledge) are significantly related to innovation.
14.	Lee and Choi (2003)	Manufacturing, service, and financial business	Questionnaire/ Interviews/ Regression Analysis	Results showed that each mode of knowledge creation process (socialization, externalization, combination and internalization) is positively associated with innovation and plays a significant role to enhance organizational creativity.
15.	Refaey (2002)	Pharmaceutical	Field Study	Study results suggest that only two modes of knowledge creation process (externalization and combination) are linked with innovation.

3) RESEARCH FRAMEWORK

It is argued by many authors that firms that are able to generate, store, retrieve and use knowledge effectively are more early and successful innovators than the others which are not. Innovation is based on exploration of existing information to extract something unique so innovative ideas are particularly dependent on timely availability of knowledge (Du Plessis, 2007). Knowledge is the direct output of organizational learning and they both play a major role in improving innovation performance of organization. Efficient knowledge management enables an organization to better understand the changes in the customers' needs and market trends thus are in a better position to respond these changes faster than competitors (Sanz-Valle et al., 2011).

The true spirit of innovation lies in the timely conversion of one form of knowledge into another so that it can be more useful for innovative decisions (Carneiro, 2000). It can be concluded that knowledge management system of an organization can significantly contribute to achieve sustainable competitive advantage by backing up its innovation strategies (Du Plessis, 2007). Gloet and Terziovski (2004) conducted a study to investigate the relationship between knowledge management practices and innovation performance. Their findings concluded a positive relationship between the two. They further suggest that organizations should use an integrated approach of knowledge management and innovation by taking into account the role of organizational culture to achieve sustainable competitive advantage.

Firms that effectively manage their knowledge management approach are likely to be more innovative and in turn perform better (Darroch, 2005). Knowledge management enables organization to make better use of their resources by organizing and controlling different data sources and innovative ideas are basically based on this timely available and accessible data (Donate and Guadamillas, 2011). After knowledge creation, it is also of great importance to disseminate this knowledge within organization. Individuals interact with others and exposed to new knowledge thus directly contributing in innovation. And lastly, effective application of this knowledge for real time decision making and problem solving is the essence of innovation. Hence it can be concluded that all stages of knowledge management are associated with innovation performance of an organization (Darroch, 2005).

Based on the above discussion, following hypothesis can be derived:

H1: Knowledge Management is positively associated with Innovation.

Although a number of studies are being conducted on the relationship between KM and Innovation, empirical studies still lack in this potential area. Also, emerging studies talk merely about the effect of overall KM approach on innovation but the debate on the association of each knowledge creation mode with innovation is still neglected. Darroch (2005) explored this relationship in detail and concluded that all three KM components (Knowledge creation, dissemination and responsiveness) are significantly related to innovation. Likewise, Linderman et al., (2004) tried to investigate that how quality management practices are related to knowledge creation processes. Results concluded that specific quality management practices are linked to each knowledge creation mode that leads to performance improvement.

The deeper link of each knowledge creation mode with innovation is investigated by very few studies: Refaey (2002) conducted a study on Egyptian pharmaceutical sector to investigate the influence of SECI processes on innovation. His findings concluded that two processes of SECI cycle (combination and externalization) positively influence the innovation process. Lee and Choi (2003) research was carried on Korean organizations and results suggested that each dimension of SECI model plays a significant role to enhance organizational creativity. In contrast, According to Schulze and Hoegle (2008), socialization and internalization have a positive influence whereas externalization and combination have a negative effect on the generation of new product ideas. Moreover, Popadiuk and Choo (2006) concluded that combination and internalization processes of knowledge creation are more associated with exploitative innovation whereas, socialization and externalization play major role in exploration innovation.

In the same vein, another study was conducted by Easa, N. (2011) to investigate the effect of different knowledge creation modes on innovation. Results suggested that the internalization process had the most positive influence on innovation, followed by the combination, externalization and socialization processes respectively. Another study was conducted in Tunisian context by Berraies in (2012) and its findings concluded that three knowledge creation modes, socialization, externalization and

internalization have a positive impact on innovation performance. Berraies and Chaher (2014) results also confirmed the findings of Berraies (2012). In line with the above studies, Berraies et al., (2014) tried to investigate the importance of knowledge creation process for innovation performance. Their findings concluded that KCP plays a crucial role in the innovation of a firm. Results also suggested that tacit knowledge and tacit knowledge based activities (socialization, internalization and externalization) are more influencing dimensions for innovation in ICT Tunisian sector.

Above referenced studies were some exceptions that tried to investigate the effect of each knowledge creation process (socialization, externalization, combination, and internalization) on different kinds of innovation performance but with mix results. Also, these studies were conducted on different sectors and in different national contexts and, it is illogical to generalize these results. So this particular study is planned to fill that gap by exploring how different knowledge creation modes (socialization, externalization, internalization and combination) are associated with product and process innovation particularly in Pakistani manufacturing context.

Literature argued that tacit knowledge has to be converted into codified form and shared with others to trigger innovative ideas. Tacit knowledge plays more dominant role in innovation process than explicit knowledge due to its intangible nature (Lee and Choe, 2003; Berraies and Chaher, 2014). So following hypotheses can be derived:

H2a: Socialization is positively associated with product innovation.

H2b: Socialization is positively associated with process innovation.

H3a: Externalization is positively associated with product innovation.

H3b: Externalization is positively associated with process innovation.

It is also worth noting that innovation is a process of recombining existing knowledge in new ways and ideas. So manipulation and recombination of explicit knowledge is also crucial for innovative ideas (Plessis, 2007). As the inter-conversion of tacit and explicit knowledge back up innovation efforts of organizations, so the role of explicit knowledge and explicit knowledge based activities (internalization and combination) to trigger innovation is also very critical (Easa, N. ,2011). This discussion formulates the following hypotheses:

H4a: Internalization is positively associated with product innovation.

H4b: Internalization is positively associated with process innovation.

H5a: Combination is positively associated with product innovation.

H5b: Combination is positively associated with process innovation

3.1) Moderating role of organizational culture

Although technology plays a vital role in knowledge management but it is argued that cultural and human factors are more associated with it than a technological one (Donate and Guadamillas, 2011). Even though, knowledge management can directly trigger innovation, this relationship can still be moderated in the presence of some critical factors. Authors argued that organizational culture, leadership and human resource (HR) practices of a firm can moderate the effect of KM practices on the innovation results (Donate and Guadamillas, 2011). Organizational culture and organizational structure can be some major barriers to the successful tacit knowledge transfer in enhancing innovation. The absence of trust factor in organizational culture can create reluctance in sharing ideas and the effective creation and transfer of knowledge (Alwis and Hartmann, 2008). Above mentioned studies discuss the role of organizational culture in forming a relationship between innovation and knowledge management and they also suggest that a conducive and supportive culture can play a vital role in the implementation of KM and innovation strategies. But no study has explored the characteristics of that supportive culture based on any cultural framework. So, this study is based upon the competing value framework (CVF) to assess organizational culture developed by Quinn and Spreitzer (1991).

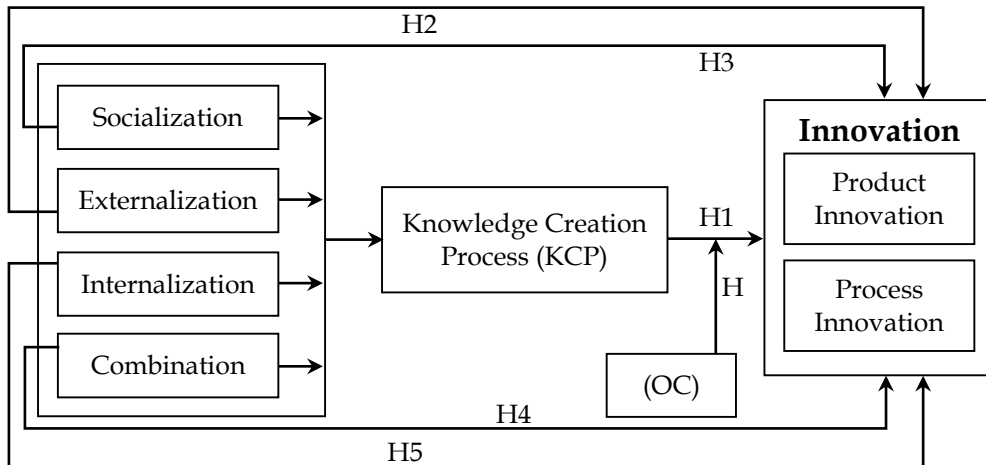
Prajogo and McDermott (2011) concluded that group and developmental cultures (oriented towards flexibility) are more associated with innovation than quality and rational/hierarchical cultures (oriented towards control/stability) are more associated with quality than innovation. Literature supports that the basic requirement is to develop and maintain the required culture that is supportive for innovation and KM. It is suggested that conducive culture is the one which is innovative and supportive rather than controlling and directive (Brand, 1998).

Based on the above arguments, following hypothesis can be derived:

H6: Flexible-oriented Organizational Culture can positively moderate the relationship of knowledge management and innovation.

4) THEORETICAL FRAMEWORK

The theoretical framework of the study concepts, based on the existing literature, is presented in figure 2.



Currently, the author is designing a questionnaire that will be used to collect data from Pakistani manufacturing industry listed with Lahore Stock Exchange (LSE) and Karachi Stock Exchange (KSE). The data will be used to test the above derived hypotheses shown in Fig. 2. The results will be reported in future articles.

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