THE RELATIONSHIP BETWEEN KNOWLEDGE MANAGEMENT PRACTICES, INNOVATIVENESS AND ORGANIZATIONAL PERFORMANCE (A CASE FROM SOFTWARE INDUSTRY)

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ABSTRACT: *The dynamic environment of organizations spurs the practitioners and business gurus to act according the sway of effective knowledge management practices. This paper will not only bring the importance of knowledge management practices into light, but also unleashes that how KM Practices lead to contribute in overall organization performance and innovativeness. The study sample encompassed of 102 employees from 20 software houses of Pakistan. The results demonstrate that the knowledge management practices have been witnessed in software houses. Innovativeness was additionally found at an acceptable level while respondents were uncertain about the organization performance. A solid positive relationship has realized between knowledge acquisition and dissemination, knowledge dissemination and responsiveness to knowledge, knowledge acquisition and responsiveness to knowledge, knowledge dissemination and innovativeness, responsiveness to knowledge and innovativeness However, a feeble positive relationship has found between innovativeness and knowledge acquisition, knowledge acquisition and organizational performance.*

Key words: Knowledge Management Practices, Innovation, Human Resource Behavior, knowledge acquisition, Pakistan

INTRODUCTION:

The world has moved from industrial economy to the knowledge economy. Traditionally, physical and financial resources were considered to be an organization's prime assets. After human relations movement, another component 'Human Resources' was added and were also considered an important asset of the organization. Although it has always been difficult for the proponents of scientific management to declare humans as an important resource. Even today, practice of showing human resources as an 'expense' in the income statement with account title 'Salaries' prevails. However, the world today has taken a turn towards a new dimension; it is 'knowledge' dimension of human resources. Considering Barney ,those human resources are considered vital for organizations that have distinct, non-imitable, rare and valued knowledge; this knowledge, then becomes an organization's capability that can earn long lasting competitive advantage[1].

These ideas spurred the practitioners and social scientist to embark from traditional approaches to knowledge approaches. Not only this school of thought has enabled the organization to become more capable and effective, but it also opened a new horizon of discussion regarding the managing knowledge. The words of Baquero & Schulte are witness that managing the knowledge requires efforts to make it long lasting and competitive for the organization. Therefore the way organization acquires, disseminate and response to knowledge becomes vital for an organization to be competitive. Similarly, the definition of (Darroch & McNaughton encompasses the core of our study 'Knowledge Management (KM) is a management function that creates or locates knowledge, manages the flow of knowledge and ensures that knowledge is used effectively and efficiently for the long-term benefit of the organization[2].Despite the immense importance of knowledge management for organization has been acknowledged by the practitioners, however the discussion of what knowledge management embraces is still an ongoing phenomenon.

Knowledge Based View (KBV) is one of the outcomes of academic scholars who studied the impact of knowledge on an organizational performance. According to Prusak, those organizations which manage their knowledge resources to manifold economic, intellectual, cultural and social factors are based on Knowledge Based View (KBV)[3]. These organizations manage their knowledge resources in such a way that it's not only enable their selves to exploit their existing knowledge resource but also empower themselves to yield new one. For the purpose of our study, we have chosen software development organizations which are considered to be the high knowledge intensive organizations [4].Software development organizations are entangled in a dynamic business environment where there is consistent technology advancement, vogue client requirements and fickleness in nature of the problem [5,6]. Therefore, no one best method can anticipate the need of such organizations. In this way the survival of the organization is to the best utilization of their existing knowledge but also creating new one. Many factors can be associated with practice of knowledge management, but innovation, which is dependent on KM practices has its own significance[7]. Modern theories emphasize that innovativeness does require knowledge resources as a necessary condition[8]. Well managed knowledge affects an organization in a productive way; knowledge becomes a resource for the organization which fosters innovativeness in organization and enhances performance. This study has targeted software houses for analyzing KM practices, innovation and performance. Software development industry is a knowledge intensive industry where tacit and explicit knowledge is utilized at its best.

Research Question:

"What is the level of KM practice/activities in software developers and how these knowledge management practices/activities effect innovation and organizational performance in software industry?"

Objectives of the Study:

To measure the KM practices, innovativeness and perceived organizational performance in the software industry and to perceive the relationship between KM practices, innovativeness and organizational performance.

Literature Review:

Webster's Dictionary defines knowledge as "the fact or condition of knowing something with familiarity gained through experience or association". Knowledge is a structure that integrates information and elaborates relationships between the pieces of information [9,10]. As described by Zack, 'Knowledge means that information which we understand, believe and ponder based on the meaningfully organized accretion of information through experience and communication[11]. Knowledge has also been defined as a kind of instruction or technique that define how a good or service can be developed [12]. Knowledge exists in two forms: Explicit and Tacit. Explicit knowledge lends itself to be communicated and used by others while tacit knowledge resides in the brains of those with the knowledge, here knowledge structure may not be well comprehended even by the knower [13]. Nonaka & Takeuchi, elaborated three types of knowledge: tacit knowledge (intangible knowledge), implicit knowledge (intangible form, but could be made explicit) and explicit knowledge (tangible knowledge) [14].

Moving from knowledge to organizational knowledge, a working definition of organizational knowledge is 'processed information embedded in routines and processes which enable action"[15]. Knowledge has certain characteristics, namely non rivalry, not excludability, cumulative nature, doubt and lags [16]. Effective knowledge creation, dissemination and application require activities that can make knowledge a productive resource for an organization and can earn lasting competitive advantage. These activities are called knowledge management (KM). The term knowledge management (KM) was developed approximately two decades back in 1990. It is generally accepted that there is a need to manage knowledge, however similar to enormous definitions of 'knowledge', there are many definitions of KM as well in literature, [17] however still it is considered an elusive and multi-facet concept. However, to engage in the deliberation why consensus is not there about definitions of KM is beyond the scope of this article. For the purpose, a few definitions are cited in the article. Davenport defined knowledge management as 'the process of capturing, distributing, and effectively using knowledge[18]. Scarbrough & Sawan explained that the knowledge management is a procedure or exercise of developing, acquiring, catching, articulating and diffusion of knowledge, wherever it exists, to enhance learning and performance in the organizations[19].

According to Beijerse;*"knowledge management is achieving organizational goals through the strategy driven motivation and facilitation of knowledge-workers to develop, enhance and use their capabilities to interpret data and information (by using available sources of information, experience, skills, culture, character, personality, feelings, etc.) through a process of giving meaning to these data and information"* [9]. Another important definition on which the whole substance of this article centered is provided by [2]. According to them, 'Knowledge Management is a management role that develop or traces knowledge, manages the stream of knowledge and ensures that organization is enjoying long term advantages by using that knowledge effectively and efficiently. Last two decades of twentieth century were labeled as information age business entities faced new facet of competition due to the contraction of profit, organizations were forced to redesign business strategy for boost operational efficiencies[20]. To redesign business strategy it became imperative for the organizations to remain flexible and challenge acknowledged business practices [21]. To remain competitive organizations had to build competency in KM[2].

Knowledge has an important relationship with innovation, knowledge management practices of a firm to accumulate knowledge by creation, absorption and its application in the desired area are the drivers of innovation in a firm.[22]. According to Kör & Maden, the process of knowledge management is positively related to innovativeness and as a result innovation in an organization is increased.[23]. Damanpour *et al*., argued that knowledge management helps gain competitive advantage for firms by acquisition, sharing and application of related knowledge [24]. Damanpour, explained that innovation has an important impact on the survivability and competitiveness of organization[25]. According to Kör and Maden, knowledge management processes significantly affect innovation[22]. Darroch, in her study found that firms that were better in managing organizational knowledge showed efficient resource utilization, more innovation and better performance [23]. Mehta, elaborated that organizations that establish effective knowledge management systems gain three capabilities of articulating the KM Strategic Intent, facilitating the knowledge flows to enable innovation, and assessing KM Value[6].

Knowledge Management Practices:

KM has progressed as a vast interdisciplinary field and there is a persistent debate about what constitutes Knowledge Management. In the last two decades diverse perspectives about KM have appeared in literature. For example, one perspective of KM focuses on the types of knowledge like tacit and explicit [14], as a taxonomies and processes [26,27], as a strategy-codification or personalization. KM work is also classified into different schools which are generally characterized as technocratic, economic and behavioral school [28,29,5]. The rise of diverse perspectives endorsed the fact that the field of KM has grown and at present is accepted as a recognized academic discipline. Researchers and practitioners are proposing varied practices for leveraging knowledge in an organization for its benefit and to support organizations to convert different resources into capabilities to survive in a long run and to get a sustainable competitive advantage. KM is now becoming essential for organizations fronting dynamic environment like mounting global competition, advent of ICT, and rapid development of product/process innovations etc[30]. As KM promises to help organizations to become more efficient and responsive.

Many KM practices have been presented in literature but most effective KM practices have components like knowledge acquisition, knowledge dissemination and responsiveness to knowledge as these components would

have the most impact on the creation of a sustainable competitive advantage, enhanced financial outcomes [23,02]. KM practices are conceptualized as organizational routines and organizations would have distinctive capability in KM if these organizations have superior established KM routines [31,32]. Each component of these is dependent on the other components. An organization which has great access to accumulated knowledge, its knowledge dissemination and responsiveness to knowledge behaviors will be better developed. Likewise, if in an organization knowledge is well established, then knowledge dissemination behaviors will be more responsive to knowledge.

Knowledge acquisition is related to the location, creation or discovery of knowledge. Researchers have observed that organizations develop policies, structures and processes to expedite learning and knowledge acquisition[33]. The sources from where knowledge can be acquired are of great diversity and each source might be related to a broad range of issues a firm can face. Knowledge can be acquired from outside the organization like from inter-organizational relationships, social networks, alliances, customers or competitors [33,34,28,35] or from inside the organization like individuals as well as from team through individuals' skills and experiences. [21,2,36]. The gained knowledge might be in the shape of data and/or information about the financial status of the organization, its competitors, the fluctuating trends of the industry, technological advancement and similar.

Knowledge dissemination is transmitting and disseminating the acquired knowledge to all concerned sections of the organization.[2,35]. The successful knowledge dissemination demands substantial knowledge drifts to make sure that the knowledge reaches its requested terminals. SECI model of Nonaka & Takeuchi, provides a well-thought-out typology for knowledge dissemination [14].

Responsiveness to knowledge means how an organization responds or reacts to acquired knowledge from different sources.[36,35]. Responsiveness mirrors the promptness and coordination with which the organizations' responses are realized and from time to time appraised. The quality and appropriateness of organization's response is also representing organization's agility. For an instance, an organization's swift response to customer knowledge may lead to improvement in customers' overall satisfaction and confidence in its products and offering [32].

KM Practices and Software Development Organizations:

Many theoretical frameworks have been devised in the recent past by many academic scholars to study competitive impacts of knowledge on an organization's overall survival and growth, and Knowledge-based view (KBV) is one of those efforts [6]. KBV describes organizations as assorted and knowledge-bearing entities where organizations manage their knowledge resources to generate value of multiple factors like economic, intellectual, cultural and social.[3]. Organizations combine their capabilities to exploit their dominant knowledge resources and develop new resources.

Software development organizations categorized as knowledge intensive organizations are engaged in more complex and dynamic business in which people work in teams to complete a project[4,37]. The business is dynamic because of constant change in technology, diversity of problems and demands of clients[5,6]. Each project and output of each project is diverse in terms of goals and contexts and therefore, for software development single methodology cannot be anticipated as best fit for all projects or products [63]. When software developers are exposed to this diversity of projects, they intrinsically turn out to be experimental and gain know-how for future projects to evade inaccuracies and leverage successes. Moreover, when software developers utilize their experience and knowledge, learning takes place, which, consequently, expands the stock of knowledge accessible to the organization[37]. Organizations that effectively enable organizational and individual support usually improve employee's participation in better utilization of their existing knowledge resources and concurrently create new knowledge. Software organizations possess assorted knowledge resources like know-how, skills, and abilities, however, the employees who keep the knowledge and know-how are considered as core assets instead of plants, concrete structures, and machines.

Organizations' strength to survive and contest in cutthroat competitive environment is being embedded predominantly in the skills and knowledge of the employees of the organization[28]. Employees are continuously engaged in the software development process and therefore both explicit and implicit knowledge is required. Software development teams work on different projects simultaneously and better results may be realized more easily if previous practices are stored in organization's repository [5]. KM is an effective tool used to disseminate these practices within the organization to development teams.[6]. The role of KM practices in software organizations has also been examined. Scholars are constantly discussing how to manage knowledge or foster learning in software organizations. Software organizations are investing millions of dollars in their KM practices to face the challenges of technology development. KM practices support software developers to create, preserve and apply knowledge exist within the repositories of organizations.

KM Practices, Innovativeness and Innovation:

The New Oxford Dictionary of English defined innovation as 'Making changes to something established by introducing something new [38]. Sullivan, described the word innovation as a process in which changes are made at large and small level, radical and incremental, to products, processes, and services which results in the introduction of something novel for the organization that adds value to customers and contributes to the knowledge store of the organization[39]. In application domain, there are three different forms of innovation like, product innovation, service innovation and process innovation. Innovation can also be categorized according to its degree of novelty because some innovations are achieved on a high degree of novelty and some are just cosmetic innovations. On the basis of degree of novelty, innovation can be divided into four types: radical innovation, incremental innovation, modular innovation, and architectural innovation[40].

Effective KM practices spawn the way to innovation. Knowledge acquisition, dissemination, and responsiveness foster innovation in the firm [2]. Innovation is an outcome of a process called innovativeness, which is dependent on KM

practices. Literature appraises that innovativeness is something different from innovation. Innovativeness is basically an initiating phase to innovation. It is not innovation, but the innovativeness that speaks of an organization's ability to innovate[7]. Speaking alternatively, "different from innovation, innovativeness is not an end, but rather a means to an end, and it is this idiosyncratic aspect that captures the significant difference between innovativeness and innovation"[41]. This describes that organizational innovativeness may be seen as a strategically innovative capability of an organization and innovation as a source of competitive advantage. Such provocation gives a clear picture of innovativeness as being input and innovation as an output[42]. In the words of Galunic & Rodan "Innovativeness can be visualized as the capacity of an organization to produce innovations continuously"[43]. Comprehending the innovativeness orientation of an organization is thus critical to an organizational well being.

The earliest attempt to define innovativeness was made by Hurt *et. al*., who expressed it as 'willingness to change'[44]. This idea was further explored by many researchers. Their views about innovativeness are summarized in the following table-1.

Table -I: Views about Innovativeness

Views About Innovativeness
Open mindedness, willingness to change, ability to innovate [45].
A form of innate personality trait[46].
Innovativeness is composed of a technological and behavioral dimension denoting both a 'technological capacity' and a behavioral willingness and commitment of the organization to innovate [47].
A firm's tendency to engage in and support new ideas, to experiment and to be creative[48].
It conveys some behavioral change [49].
Innovativeness is aligned to the concept of 'organizational creativity' [50].
It is an organization's 'cultural readiness' to innovate or to adopt new ways of doing things [51].
Something to be creative [52].
Behavioral change in response to a stimulus[53].
Innovativeness is the organization's 'intention to be innovative' [54].
Organization's capacity to introduce new processes, products, or ideas within itself [7].
A firm's proclivity, receptivity, and inclination to adopt ideas that departs from the usual way of approaching business [41].
Innovativeness gives the notion of risk [55].

Based on the foregoing, following conceptualization of organizational innovativeness is propose

"*Organizational Innovativeness is a behavioral willingness to change and the stimulating receptivity of an organization to undertake deviating ways in order to carve out way to achieve a sustained competitive advantage with the intentional use of organizational resources and technical ability by assuming risk but with a strategic propensity to become successful organization".*

Innovativeness and KM Practices:

Theories of modern organizational management entail that innovativeness does require knowledge resources as a necessary condition. This knowledge resource possession is a prerequisite for the maintenance and improvement of business processes and for prompt reaction to vibrant environmental changes. Knowledge has become the source of competitiveness and the key dimension of the profitability of a business. Those organizations which have developed a knowledge culture within and care about managing those knowledge management practices, have increased rate of innovations, have become successful in enhancing the size of organization's market segment, and have improved service quality and operational effectiveness resulting in large profits [8]. Liao and Chuang argued that organizational innovativeness helps in capturing new market segments in short time, building organizational position in the market and earn large amount of profits [56].

There has been ample work done on knowledge models of innovative process [57,58,59,60,61]. These models try to explain the impact of knowledge on the knowledge creation process on one hand and to distinguish between knowledge creation and innovation on the other. Though these models speak about processes of knowledge creation and their role in the creation of new knowledge, yet these have the infirmity within that such establishment is still under question as to whether the knowledge so created is an innovation or not. Woodman et al., regard creativity as a subset of innovation, and innovation a subset of innovativeness [62]. Machlup model represents innovation as ideas flowing through four stages, namely, research, invention, development, and application; the last one being the only element in the innovation process[57]. These two varying thoughts of Woodman and Machlup give an idea about the scope of innovation process available in knowledge literature.

Further, in the knowledge literature, the existing knowledge is considered a foundation for any innovativeness to happen. In the words of Cohen and Levinthal "the prior possession of relevant knowledge and skill is what gives rise to creativity, permitting the sorts of associations and linkages that may have never been considered before"[63]. This reliance on existing knowledge makes path-dependence a crucial issue which avers that a little amount of knowledge can obstruct the way of innovativeness as the same may not lead to the required 'path-dependent knowledge'. However, despite the consideration of existing knowledge as being a prerequisite to the innovativeness, the researchers do not take it as the starting point of the innovation process. Combined input of 'existing knowledge' and 'the scientific problems and hunches' is the starting point of the process[57]. For Nonaka and Takeuchi innovative process initiates with 'creating and defining problems'[58]. Tsai and Ghoshal find that innovativeness starts when the problems get consistency with the tacit knowledge[59]. This thought is in line with the Schumpeterian view that invention belongs to the realms of ideas (tastiness) and an innovation is a practical implementation of these ideas.

The climate of the business world has changed drastically and has been changing continuously. This has now been becoming unpredictable. Business environment conditions are getting turbulent. These shifts in the environment have compelled the organizations to seek that competitive source/ability which may win them survival and success. It seems that organizations' survival for a longer period of time in the market is vested in innovativeness. Keeping in sight the 'Resource-Based View' and the 'Dynamic Capabilities View' a small software firm may endeavor to seek its dynamic capability in order to be competitive, strategically resorting to innovativeness, even with very limited resources may lead the organization to the path of success, profitability and capacity maximization[1,64].

The survival, rather long-term survival of a software organization is dependent, not utterly on the actual innovations, but more on the organizational innovativeness which is subjected to produce dynamic capabilities. These dynamic capabilities add to the innovational development [and competitiveness increase as a result[65,66] Therefore, "the long term survival of an organization does not depend on specific, discrete innovations, though it appears to be so, but rather, on an ever-changing, organization wide innovation capability structure, termed as 'organizational innovativeness [67].

KM Practices, Innovation and Organizational Performance:

Innovativeness leads to innovation and innovation ultimately results in higher performance[23,7]. Performance is to do something up to a standard to succeed or excel. Generally, the meaning of word 'performance' is the execution of an action, something accomplished, the fulfillment of a promise or request and the action of representing character in a play[68]. Robbins & Coulter elaborated performance as the end result of any activity[69]. 'Performance is the achievement of goals and fulfillment of obligations against preset known standards of accuracy, completeness, cost and speed'[70]. For continuous better performance of employees, organizations use different performance management tools[71].Pfeffer argued that collective performance of all the resources of an organization becomes organizational performance[72].

Performance is an activity and organizational performance means accumulated end result of the organization's overall work processes and activities[69]. Traditionally, organizations measure their performance in terms of economic indicators like efficient budgeting, more assets, effective operations, quality products and effective human resources[73]. The financial strength of an organization depends upon the organizational success or failure. However, the concept of performance has a wider scope. Organizational performance shows the ability of an organization to achieve its mission through comprehensive management, resilient governance and a persistent re-dedication[74]. The concept of organizational performance as a comparison of output of the organization against given goals or objectives of the organization[75].

Carter discussed organizational performance as a process which includes the recurring activities and to establish organizational goals, monitor progress towards the goals, and make adjustment to achieve those goals more effectively and efficiently[76]. Organizational performance is based on seven key dimensions which are also called "domains of excellence"[77]. These include strategic focus, customer value, leadership and team performance, culture value and ethics, process excellence, talent management and knowledge management.

For measuring the organizational performance some key performance indicators are used which must be quantifiable. A framework based on three key indicators that show the organizational performance: accounting return, growth, and stock market performance [78]. These performance indicators can vary according to the nature of work and business. Every business organization has key performance indicators for assessing the performance, like the income related, customer service department performance indicator. Social service organizations use key performance indicators like number of clients assisted during a particular time period. Whenever organizations change their goals their performance indicators are also changed.

Knowledge enhances the capability of the management and it plays important role in organizational performance[79]. Knowledge management Practices (KMPs) provide the way to fulfill the knowledge based needs of an organization to succeed through knowledge creation, storing and articulating [80,81].

Primus explored six best knowledge management practices; firstly, develop knowledge management a ordinary segment of the workflow; secondly, offer access to the most pertinent knowledge available: thirdly, obtain the support of key managers from the top to bottom; fourth one is target the cultural change that knowledge management suggests; fifthly, recognize and incentive the efforts of knowledge contributors; and sixth one, view performance & analyze results for unremitting improvement[82]. According to Bhatti et.al. Without

employing knowledge management organizational performance cannot be improved[83]. For continuous improvement in organizational performance and innovation KMPs are important which are supported by Resource Based View (RBV) and knowledge Based View (KBV)[81].

Innovation is the key indicator for organizational performance[77]. KMPs play a great role in all forms of innovation i.e. product, service and process innovations [84]. There is overwhelming evidence that effective knowledge management practices lead to positive impact on organization performance[85]. With effective knowledge management in the organization efficient and effective performance can be achieved.[84] Effective knowledge management practices help achieve organizational goals more efficiently and effectively[84].

Darroch & McNaughton found mixed evidence of the relationship between KMPs and innovation [2]. Knowledge management practices show that additional knowledge does not enhance performance of the organization rather relevant knowledge may have a positive impact on organizational performance[86]. Interestingly, knowledge acquisition does not positively affect organizational performance[23].

In literature, generally a positive relationship has been found between knowledge management and innovation; a contradictory finding is also there, stating that knowledge management can negatively affect organizational performance[87]. Knowledge management process has three main stages. First one is accumulation, and second, knowledge storing and third is knowledge diffusion. Knowledge accumulation activities in the organizations gain new understanding and notions. Knowledge storing activities in the organizations always maintain the exclusive nature of an organization's knowledge and knowledge diffusion activities in the organizations use exciting knowledge for commercial ends.

These three stages are important, but some issues can be raised in the process of these stages. For example, aggressive efforts of knowledge diffusion can block knowledge accumulation. Knowledge accumulation does not offer financial returns in short period as the diffusion of knowledge often does. On the other hand, organization need to reset the existing behavior patterns, values, and tacit mindsets for supporting the effective knowledge accumulation. Furthermore, effective storage of knowledge typically demands segregating or embedding knowledge within the organization. On the other side, diffusion demands integration and appearance of knowledge. It means that if a proper balance among KM process is not maintained then knowledge management can negatively impact organizational performance [88].

Theoretical Model:

Fingure-1, theoretical model explains the positive relationship between knowledge acquisition, knowledge dissemination and responsiveness to knowledge to organizational innovativeness and organizational performance. The figure-1 also indicates the relationship between organizational performance and organizational innovativeness.

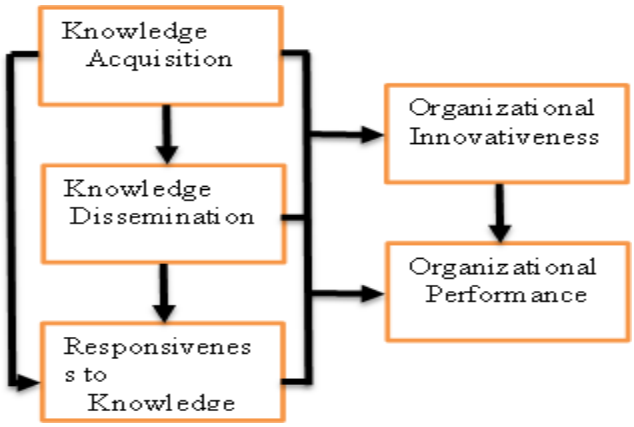

Figure-1 Theoretical Model

(Adopted from Darroch, 2005, p.110) [23].

Hypotheses:

On the bases of above mentioned model, this study is based on following hypotheses.

H_1. There is a positive relationship between knowledge acquisition and knowledge dissemination.

H_2.There is a positive relationship between knowledge dissemination and responsiveness to knowledge.

H_3.There is a positive relationship between knowledge acquisition and responsiveness to knowledge

H_4.There is a positive relationship between knowledge acquisition and innovativeness.

H_5.There is a positive relationship between knowledge dissemination and innovativeness.

H_6.There is a positive relationship between Responsiveness to knowledge and innovativeness.

H_7.There is a positive relationship between knowledge acquisition and performance.

H_8.There is a positive relationship between knowledge dissemination and performance.

H_9.There is a positive relationship between responsiveness to knowledge and performance.

H_{10}.There is a positive relationship between innovativeness and performance.

RESEARCH METHODOLOGY:

Sample and Data Collection:

Data were collected from software houses operating in the Lahore, capital of Punjab province, Pakistan. A list of all software houses operating in Lahore is available online at Pakistan Software Houses Association for IT & ITES. This list has been used as sampling frame in this study. Purposive sampling was used in this study as only those software houses were shortlisted that had 30 or more employees. Keeping in view research objectives, data were collected from those individuals who were in leadership positions like team leader. These individuals possess information about KM practices, innovation and organization's performance because of their role in product development and contacts with clients.

More than 215 questionnaires were forwarded to the individuals of more than twenty (20) software houses. A total of 121 responses were received yielding response rate of 56%, which looks quite good, and out of these 121, nineteen (19) questionnaires were rejected due to

incomplete information. The literature also supports and provides the evidence about response rate, which seems to be relatively low. The average response rate is 36% when respondents are from top management of an organization and mode of data collection is either online, email or postal mail[89].

Data Collection Instrument:

Structured Questionnaire has been used for data collection, questionnaire consisted of four parts: first part was designed to get demographic information of respondents. The rest of three parts were about KM practices, organizational innovation and organizational performance. For all items five point likert scale (1 – strongly disagree, 5 strongly agree) was used so that respondents could indicate their level of agreement/disagreement to a particular statement.

Knowledge Management Practices:

As discussed earlier that many KM practices are stated in the literature, however well operationalized and verified definition is provided by Darroch and McNaughton[2]. Both authors not only conceptualized KM practices, but also developed an instrument which is used in this study. The instrument consists of 59 items. These 59 items measure three main constructs: 1) knowledge acquisition – 21 items; 2) knowledge dissemination – 18 items; and 3) responsiveness to knowledge – 20 items. Each principle construct is further fragmented into sub-constructs. Knowledge acquisition has six sub constructs whereas both knowledge dissemination and responsiveness to knowledge have five sub-constructs each.

Organizational Innovation:

Organizational innovativeness is measured through a validated 20-item instrument developed[90]. total five types of innovations are defined by authors and four items for each type of innovation. Five types of innovations are: (i) product innovativeness, (ii) market innovativeness, (iii) process innovativeness, (iv) behavioral innovativeness, and (v) strategic innovativeness.

Organizational Performance:

Organizational performance measurement is not a trivial task, with diverse methods having both advantages and disadvantages. Diverse methods for organizational performance include profits, revenues, return on capital or similar financial/accounting measures. Objective performance information was tough to acquire because respondents of this survey were either team leaders or a software developer, they did not have financial information. To measure organizational performance a self-reporting 17-item instrument developed[91]. The instrument provides a snapshot of organizational performance at a certain time based on perceptions of respondents rather on hard financial data. The instrument uses proxy measures for actual performance. Because the measure is perception based, only senior management is comfortable to answer the questions[91]. This is also a reason to target senior management of software housed for this survey. The results of this research survey are as follows.

RESULTS:

Table II – Summary of Demographics

		Frequency	Percentage
Gender	Male	78	76.5
	Female	24	23.5
Education	Graduate	50	49.0
	Master	39	38.2
	M.Phil.	13	12.7
Marital Status	Single	38	37.3
	Married	61	59.8
	Divorced	03	2.90
Age	Less Than 25 Years	03	2.90
	25-30 Years	55	53.9
	31-40 Years	44	43.1
Tenure	Less than One Year	07	6.90
	1-3 Years	31	30.4
	3-5 Years	50	49.0
	5-10 Years	07	6.90
	More than 10 Years	07	6.90
Clients	Local Only	02	02.0
	Majority Local	11	10.8
	50-50	55	53.9
	Majority Foreign	13	12.7
	Foreign Only	21	20.6

Total 102 valid responses were received (affective response rate is 47%). Table – 2 shows the demographic data of the respondents. Approximately 77% males and 33% females participated in the study. The participation of females in the survey and in software development industry is reasonable and encouraging. From qualification perspective, results are also promising i.e. 49% of the respondents are graduates; in Pakistan BSCS or BS-IT are most frequent degrees for software developers; 39% respondents are having master degree while 13% have done MS/M.Phil. A higher qualification of respondents is appreciable for the study as it questionnaire comprised of complex question which otherwise would have been difficult for the respondents to comprehend. Almost 54% respondents were between the ages of 25-30 years. Majority of respondents are dealing with foreign clients whereas 55 respondents were dealing with local and overseas clients alike. Software development seems to be the profession of young people as all the respondents were less than or equal to 40 years f age.

Table III – Reliability and Descriptive Statistics

	N	Cronbach Alpha (α)	N0.of Items	Mean	SD
Knowledge Acquisition	**102**	**0.875**	**21**	**3.46**	**0.56**
KAF1: Organization values employees' attitudes and opinions	102	0.775	7	3.59	0.63
KAF2: Organization has well developed financial reporting systems	102	0.896	4	3.48	0.92
KAF3: Organization is sensitive to information about changes in the market place	102	0.750	4	3.57	0.55
KAF4: Science and technology human capital profile	102	0.785	2	3.57	0.91
KAF5: Organization works in partnership with international customers	102	0.716	2	3.40	0.85
KAF6: Organization gets in formation from market surveys	102	0.850	2	3.13	0.94
Knowledge Dissemination	**102**	**0.874**	**18**	**3.54**	**0.49**
KDF1: Market in formation is freely disseminated	102	0.827	6	3.52	0.61
KDF2: Knowledge is disseminated on-the-job	102	0.632	3	3.83	0.59
KDF3: Use of specific techniques to disseminate knowledge	102	0.741	3	3.32	0.67
KDF4: Organization uses technology to disseminate knowledge.	102	0.750	3	3.74	0.81
KDF5: Organization prefers written communication	102	0.611	3	3.29	0.70
Responsiveness to Knowledge	**102**	**0.877**	20	3.61	0.48
KRF1: Responds to customers	102	0.868	4	4.24	0.63
KRF2: Well-developed marketing function	102	0.659	4	3.33	0.59
KRF3: Responds to technology	102	0.912	4	3.60	0.95
KRF4: Responds to competitors	102	0.720	4	3.48	0.50
KRF5: Organization is flexible and opportunistic	102	0.774	4	3.38	0.77
Knowledge Management Practices	**102**	**0.938**	**59**	**3.50**	**0.56**
Organizational Innovativeness	**102**	**0.764**	**20**	**3.30**	**0.39**
Behavior Innovation	102	0.763	4	3.43	0.77
Product Innovation	102	0.705	4	3.28	0.66
Process Innovation	102	0.641	4	3.37	0.62
Market Innovation	102	0.717	4	3.25	0.66
Strategic Innovation	102	0.708	4	3.16	0.63
Organizational Performance	**101**	**0.892**	**17**	**3.09**	**0.58**

Reliability:

Table III shows reliability and descriptive statistics. Questionnaire comprised of three scales, practices, organizational innovativeness and organizational performance. KM practices scale has three subscales namely: knowledge acquisition, knowledge dissemination and responsiveness to knowledge. Overall reliability of the KM practices scale has been very good, a Cronbach Alpha (α) equal to .938 has been achieved. The value of Cronbach alpha of a scale should be above .7, in this scale it is well above .70 which shows that items in the scale are consistent with each other[92]. Cronbach Alpha (α) for subscales is also quite good, for knowledge acquisition it is .875, for knowledge dissemination .874 and for responsiveness to knowledge .877, these values of KM practices subscales are well above acceptable ranges. Organizational innovativeness yielded a reliability coefficient of 0.764 and organizational performance showed a reliability coefficient 0.89. It can be safely said that the reliability of the instrument used is well established. Since all the items have been taken from original scales, the validity of the instrument is also well established.

Descriptive Statistics:

Mean scores of KM practice scales are appreciable. An overall mean score for the scale is 3.5 with standard deviation 0.56 which shows that respondents showed a favorable attitude towards KM practices. On a 5-points Likert scale Mean Score is 3.5 means respondents generally confirmed the prevalence of KM practices in the surveyed organizations. Sub-scales of KM practices showed higher mean scores. Knowledge acquisition showed 3.45, knowledge dissemination 3.54 and responsiveness to knowledge yielded highest mean score of 3.61. Organizational Innovativeness scale showed overall mean score 3.30 with standard deviation 0.39. Sub-scales of innovativeness showed mean scores as, Behavior Innovation 3.43, Product Innovation 3.28, Process Innovation 3.37, Market Innovation 3.25 and Strategic Innovation achieved a mean score of 3.16. On a 05 point Likert scale these mean scores also exhibited the presence of innovativeness in the organizations. Organizational performance had no sub-scales and it showed a mean score of 3.09 which was lowest among all the scales. Organizational performance was measured on a10 point scale; these categories were then collapsed in 05 categories to make this scale compatible with other two scales.

Correlation Matrix:

Table IV shows correlation matrix. The correlation between dimensions of KM practices and innovativeness (and its dimensions) and organizational performance has been obtained. To evaluate the strength of relationships among

variables following criteria suggested by Cohen [93]. Small r = 0.10 to 0.29, Medium r = 0.30 to 0.49, Large r = 0.50 to 1.0 It is found that behavior, innovation has statistically significant correlation with knowledge dissemination and responsiveness to knowledge (p<.01) with small values of r=.254. Product innovation has statistically significant correlation with knowledge dissemination (p<.01) with small values of r=.235. Market innovation yielded statistically significant correlation with knowledge acquisition and dissemination (p<.05) with small values of r. Strategic innovation has statistically significant correlation with responsiveness to knowledge (p<.05) with small value of r. Overall 0rganizational innovativeness was found to have statistically significant correlations with knowledge dissemination (p<.000) and responsiveness to knowledge (p<.05). Statistically significant correlation has been found between organizational performance and strategic innovation. Organizational performance yielded statistically significant correlation with behavioral innovation (p<.01) and strategic innovation (p<.000) with large value of r=.564 showing strong positive relationship.

Table IV – Correlation Matrix

		1	2	3	4	5	6	7	8	9	10
1	**Knowledge Acquisition**	1									
2	**Knowledge Dissemination**	0.669***	1								
3	**Responsiveness to Knowledge**	0.467***	0.641***	1							
4	*Behavior Innovation*	0.136	0.254**	0.202**	1						
5	*Product Innovation*	0.137	0.235*	0.130	0.120	1					
6	*Process Innovation*	0.089	0.088	-0.058	0.148	0.536***	1				
7	*Market Innovation*	0.197**	0.204**	0.092	0.155	0.582***	0.296***	1			
8	*Strategic Innovation*	-0.103	-0.041	0.208**	0.109	-0.006	0.113	-0.270***	1		
9	**Organizational Innovativeness**	0.161	0.263***	0.203**	0.571***	0.748***	0.693***	0.602***	0.308***	1	
10	**Organizational Performance**	0.007	-0.005	0.193	0.239*	-0.137	0.044	-0.259**	0.564***	0.156	1

***** p < .000** **** p < .05** *** p < .01**

DISCUSSION:

The first aim of this research study was to measure the KM practices in software houses of Lahore, Pakistan. KM practices were measured by using scale developed by Darroch[23]. Mean scores have been used to measure firm KM practices. Results show that Knowledge Management Practices do prevail in surveyed software houses. High mean scores have been reported for overall KM practices scale and its subscales. The mean score of 3.50 on 5 point Likert scale has been measured and an ample evidence has been collected regarding KM practices.

Second objective of the study was to measure innovation in selected firms; Mean scores have been used to measure firm innovation. Innovativeness was also found at a satisfactory level with mean score 3.30, this shows that respondents perceive that their organizations are innovative at a satisfactory level. Behavior, product, process, market and strategic innovation all yielded good mean scores with behavior innovation showing highest mean score of 3.43. It can be inferred in software houses, managerial support for doing new things is available, employees get encouragement for doing things differently and novel approach encouraged.

The third objective of the study was to measure organizational performance; Mean scores have been used to measure firm performance. Organizational performance yielded a lowest mean score of 3.09 which shows that respondents were not very much clear about the performance of the organization. Since hard financial data were neither obtained nor shown to respondents they might not have been able to comment on the self-reporting perception based organizational performances. Most of the software houses were well established and had overseas clients as well and it can be inferred that their financial performance would not have been bad if not exceptional. Fourth objective was to explore the relationship between KM practices, Innovation and Organizational performance. The relationship among these variables was observed by Pearson Correlation Coefficient.

Table IV shows correlation matrix. A strong positive correlation (r = 0.669) was found between Knowledge acquisition and Knowledge dissemination with (p < .000) validating H1. Strong positive correlation (r = 0.641) between knowledge dissemination and responsiveness to knowledge was observed with statistically significant p-value (p < .000) confirming H2. A positive correlation (r = 0.467) relationship between Knowledge acquisition and responsiveness to knowledge was obtained thus confirming H3. A weak positive correlation (r = 0.161) was found

between innovativeness and knowledge acquisition, relationship was not statistically significant, H4 not confirmed. A positive correlation (r = 0.263) between Knowledge dissemination and innovativeness was found and was also statistically significant as well (p < .000), H5 validated. A statistically significant correlation (p < .05) was found between responsiveness to knowledge and innovativeness (r = 0.203) confirming H6. A very weak and insignificant correlation (r = 0.007) was found between knowledge acquisition and performance, thus, H7 rejected. Similarly H8 and H9 were also rejected. H10 was partially validated as organizational performance was positively correlated with strategic innovation (r = 0.564), relationship was also statistically significant (p < .000).

CONCLUSION:

The purpose of the study was to measure knowledge management practices, innovativeness, and perceived organization performance and to ascertain the relationship between knowledge management practices, innovativeness and firm performance. The statistical findings of this study unveil the profound picture of KM practices going on in software houses of Lahore, Pakistan. The results show that the knowledge management practices has been observed in software houses as discussed by Makani & Marche that the software development organizations are considered as knowledge intensive organizations[4]. However Lindvall & Rus studied that these orgnizations are engaged in most complex and dynamic business in which people work in teams to complete a project[37]. Innovativeness was also found at a satisfactory level while respondents were blurred about the organizational performance. A strong positive relationship has found between knowledge acquisition and dissemination, knowledge dissemination and responsiveness to knowledge, knowledge acquisition and responsiveness to knowledge, knowledge dissemination and innovativeness, responsiveness to knowledge and innovativeness whereas, a weak positive relationship has found between innovativeness and knowledge acquisition and knowledge acquisition and performance, the results are in line with Darroch & McNaughton as he found the effective KM practices spawn the way to innovation[2]. Knowledge acquistion, dissemination and responsiveness foster innovation in the firm also found that innovation ultimately results in higher performance [23,84]. In the same way the study of Natalija & Vveinhardt also concluded that those organizations which have developed a knowledge culture within and care about managing those knowledge management practices, have increased rate of innovations, have become successful in enhancing the size of organization's market segment, and have improved service quality and operational effectiveness resulting in large profits[8].

LIMITATIONS AND RECOMMENDATIONS:

This study conducted in software sector of Lahore, Pakistan. Therefore the very first recommendation for future research is to conduct this study among different knowledge intensive organizations within a country or in same sector among distinct national cultures and countries. The approach used to conduct this study was purely quantitative. Consequently, for future research it is better to conduct this study by using mixed methodology. This study was based on cross sectional approach because of limited time frame. So it would be given more in-depth analysis if longitudinal study would be undertaken.

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