Journal of Public Value and Administrative Insight
Journal Homepage: http://readersinsight.net/JPVAI

Research Article

Challenges of knowledge sharing within oil & gas sector

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Submission: 18 September 2021 Revised: 28 September 2021 Accepted: 30 September 2021

ABSTRACT

This paper intends to examine the challenges towards knowledge sharing within four sub sectors of Pakistan's Oil & Gas industry, i.e. E&P Upstream, Field service providers, Midstream and Downstream. It is accomplished by conducting a focused quantitative research & subsequent statistical analysis on the perceptions of O&G professionals towards various challenges of knowledge sharing at organizational level. The research employed a questionnaire based quantitative study comprising of 27 closed ended questions for collecting insights of O&G professionals towards challenges of Knowledge sharing. Based upon 286 responses collected from all four subsectors of Pakistan's O&G industry, correlation and regression analysis were applied to assess the various challenges towards the process of knowledge sharing. Good level of interpersonal trust among employees, Adequate communication, Knowledge as a power, Low organizational hierarchy, Efficacious rewards & recognition mechanisms and Existence of IT tools have a positive impact on the process of knowledge sharing. Research was focused on the O&G sector of Pakistan, and thus it can't be generalized to any other sector or country. This study fulfills the insufficiency of research regarding challenges of KS within all sub sectors of Pakistan's O&G sector. It lists down the key challenges of KS & thus provides an insight for enhancing the culture of KS at organizational level.

Keywords: Knowledge Sharing, Oil & Gas, Trust, Communication, Power, Hierarchy, Rewards & Recognition Mechanisms, Information & Communication Tools

1. INTRODUCTION

Global proliferation, increasing competitiveness, enterprising & constantly transfiguring market requires organizations to preserve & utilize their existing knowledge databases for creating & adding value to achieve sustainable performance (Johansson & Johansson, 2011). Knowing is a peculiar humanly ambition & knowledge is its outcome which marks it as a human's ancient avidity (Bolisani & Bratianu, 2018). Knowledge has become one of the critical driving forces for business success (Kumar, Singh, & Haleem, 2014). Knowledge management is a process of discerning, seizing, grasping communal organizational knowledge to help organization excel (Ikujiro Nonaka, von Krogh, & Voelpel, 2006). As one of the elemental category of knowledge management, knowledge sharing is an action of dispensing task related ideas, information, improvements & recommendations with each other (Eze, Goh, Goh, & Tan, 2013). Employees adjourn, switch to better jobs or recline from work & what goes with them is knowledge. In today's emulous market, companies pilfer each other's workmanship by offering competitive advantages. Upon leaving, a knowledge worker takes tacit knowledge & human information networks with him. It creates a huge skill gap which can't be readily replenished by succeeding generations. These blows of losing employees can be palliated to some extent if the knowledge of the employees is

https://doi.org/10.31580/jpvai.v4i2.2084

preserved. As far as an aging workforce is concerned, United Nations Population Division's report, i.e. "*World Population Prospects: The Revision 2017*" states that there are around 1.25 billion baby boomers in the world (Nations, 2017). Industries are soon going to face an unintentional & unprecedented loss of valuable organizational knowledge & most of them are unaware of that, i.e. retirement of knowledge workers which will cause reduced quality, inefficiency & deteriorated performance (Burmeister & Rooney, 2015). While this challenge of knowledge management persists globally, some industrial sectors, particularly the oil & gas sector, is suffering the most. Oil & Gas is a large-scale industry ranging from upstream processing plants, mid-stream transportation companies & downstream refineries to product distribution & numerous field services corporations. Multinational companies spread over different parts of the world with massive multi-cultural & heterogeneous workforce who makes it more difficult to practice knowledge sharing activities in disparate sectors & locations. Furthermore, oil price remained a major determinant of knowledge management workflows (Sumbal, Tsui, See-to, & Barendrecht, 2017). As during a recent downturn (2015 – 2017) of oil prices, around 44, 1371 oil & gas layoffs have been observed around the globe (Jones, 2017). These instantaneous layoffs had resulted in an enormous & immeasurable privation of worker's knowledge which could have been preserved if there were effective knowledge sharing strategies in place. In addition to the job insecurity, O&G field jobs are quite uncouth & astringent. People don't prefer field jobs due to its dissonance nature. This perspective makes this sector more vulnerable to the shortage of skilled workforce & loss of their valuable knowledge in coming years.

2. KNOWLEDGE MANAGEMENT IN PAKISTAN'S O&G INDUSTRY

Pakistan is short at indigenous oil & gas reserves. Currently, it imports 65% of its energy needs with a shortfall of around 2 billion cubic feet per day (Nisar, 2018). It is an emerging market for Oil & Gas industry with an on-going mega-scale Qatar LNG project and numerous conferrals of E&P licenses to national & foreign investors. During a recent global oil slump, various national & foreign companies lay off their workforce & others winded up their operations, i.e. Baker Hughes, OMV etc. Pakistan's industrial sectors will face a shortage of an experienced & skilled workforce due to their anticipated retirements & subsequent knowledge privation (PBS, 2015). As depicted in Fig. 1, proportion of aged people in national Labor force is on the increasing trend.

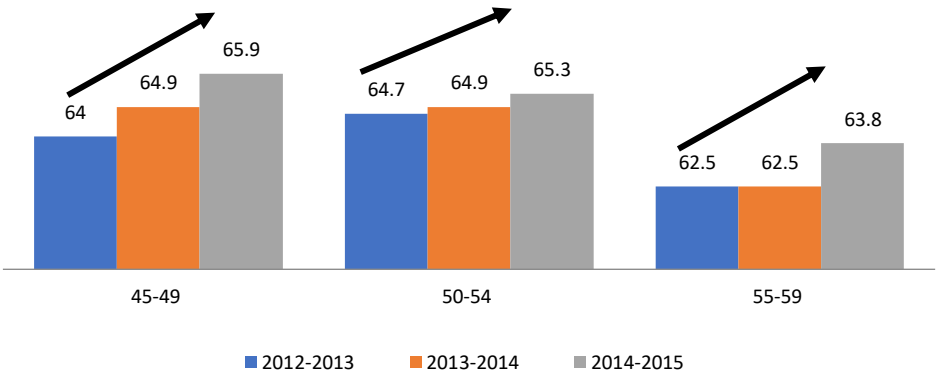

Fig. 1. Age Specific Labor Participation Rates

Using the literature, this study pursues the following core objective.

- Identification of the key challenges towards knowledge sharing

Due to diminutive nature of oil & gas business, an urge for firm knowledge sharing culture becomes an over-riding demand as every slump in oil price, rig count reductions & field abandonments came up with massive jobs cuts & subsequent loss of valuable organizational knowledge. Therefore, it is indispensable to assess the challenges towards knowledge sharing within Pakistan's oil & gas companies. Existing body of literature doesn't render comprehensive information about this context of knowledge sharing. Hence, this study reinforces the growing body of knowledge by exploring the potential drivers and deterrents of knowledge sharing within Pakistan's Oil & Gas sector.

3. CHALLENGES TOWARDS KNOWLEDGE SHARING

Knowledge management is a motif of extreme contemporary concern in organizational sectors. Knowledge, innovativeness & ingenuity are the key business competitive success tools. Knowledge sharing describes an exertion of disseminating task related ideas, information, improvements & recommendations with each other. Chong & Besharati studied three major factors hampering knowledge sharing within petrochemical industries, i.e. Individual, organizational & technological deterrents. Based upon convenience sampling & descriptive statistics, they drew a conclusion that "Interpersonal trust, Individual's power, Communication, Organizational hierarchy and IT systems" has a positive impact on knowledge sharing. While reward & recognition mechanisms have an insignificant impact on knowledge sharing within petrochemical companies (Chong & Besharati, 2014). Johanasson & Johanasson (2011) researched on the knowledge sharing within a product build out project in aerospace sector. They concluded that primitive trust & apprehension of losing competitive edge are the main deterrents in knowledge sharing. Furthermore, information & communication technologies (ICT) came out to be the vital enablers of Knowledge sharing. Eze & co-authors studied the effect of various factors which can hamper or strengthen the process of knowledge sharing in SME's of Malaysia. Their research deduces that motivation, knowledge technology, efficacious reward mechanisms, trust & empowering leadership are the salient drivers of knowledge sharing in SMEs (Eze et al., 2013). Ardichvili & co-authors researched on the inducement & deterrents for employees to participate in virtual knowledge sharing processes at CATERPILLAR Co. They found out that employees don't share knowledge because of fear of criticism or misleading the peers. To eliminate that, it's important to create an atmosphere of trust within an organization (Ardichvili, Page, & Wentling, 2003).

Organizations lose precious knowledge resource whenever a knowledge worker retires. In the past, NASA was unable to return to moon due to the lack of expertise & knowledge due to the retirements & deaths of senior employees. Knowledge loss mainly occurs due to the retirements, jobs layoffs, turnovers & duty rotations of employees. Retirement of baby boomers is also instigating the phenomenon of knowledge loss. Recently O&G sector has observed high job layoffs around the globe during the downturn of oil prices (2015-2017). *For companies to be successful, they need to best utilize capabilities, learning & experiences of their employees (Mattox & Jinkerson, 2005). Knowledge workers produce more value than other workers in knowledge organizations & they constitute bigger chunk of company's staff (Currie & Kerrin, 2003).* Kumar & co-authors have presented a framework of "*Critical success factors (CSFs)*" retrieved from KM promoters & deterrents. They identified 55 vital KM enablers & deterrents from existing literature & conducted a questionnaire-based study in Indian Manufacturing Industry. Results of statistical analysis revealed that, i.e. "*Team building & knowledge variety, Employee knowledge & Knowledge integration*" are the major knowledge promoters while "*pressure for conformity, issues of language required to integrate complex knowledge & employee turnover* "are the

extremely crucial deterrents to knowledge management implementation within Indian Manufacturing Industries (Kumar et al., 2014).

Knowledge sharing has greatly helped universities in sustaining their competitive advantage. It nurtures trust among staff members & promotes R&D initiatives. Van Ta & Zyngier researched on knowledge sharing deterrents in Vietnamese Higher Education Institutions (HEIs). They tried to determine substandard research publication caliber & inefficiency of academic staff by researching three less explored knowledge sharing deterrents in HEIs, i.e. "Bureaucratic *Management, Knowledge Management Systems & Individual Adsorptive Capacity*". Bureaucratic management is envisaged as negatively impacting people's capacity of generating innovative ideas. Bottom up reporting & top down directives impede the process of knowledge sharing. Knowledge Management Systems (KMS) provide means for knowledge storage, retrieval & distribution. Library approach & technology readiness are the two vital KMS which can foster effective knowledge sharing within HEIs. Capability to conceive new knowledge & its application in daily work routine was found to be hampered by heavy workloads & English language proficiency. Knowledge sharing has been elaborated in the light of aforementioned barriers (Van Ta & Zyngier, 2018). Knowledge sharing has been widely accepted as a key to organizations strive for establishing & driving its knowledge resources for success & improvement. Knowledge sharing mechanism includes knowledge aspiration, knowledge offering & knowledge captivation (Bryden, McKnight, & Houston, 2018). Various studies have been conducted for assessing deterrents of knowledge sharing in the communities of practice (Ardichvili et al., 2003), organizations (B. M. Han & Anantatmula, 2007), universities (Seonghee & Boryung, 2008) & across the boundaries (Carlile, 2002). This research focuses on following challenges of knowledge sharing at an organizational level.

3.1. Trust:

McAllister (1995) described trust as "*The extent to which a person is confident in, and willing to act on the basis of the words, actions & decisions o the other*". Nonaka (2015) has considered trust as an indispensable basis for the development of mutually shared knowledge among people in an order to facilitate process of knowledge sharing. *Riege (2005) declaimed that individuals won't disseminate their insights except if they had a belief that their insight won't be abused. The keenness to share knowledge greatly relies on the degree of trust among knowledge beneficiaries & benefactors (Adler, 1999; De Long & Fahey, 2000; McAllister, 1995).*

3.2. Power:

There exists a general perception that one will lose a competitive edge upon sharing his knowledge with others (Szulanski, 1996). Employees who think so will render a primitive tendency for sharing their knowledge with fellow colleagues. Workers share their knowledge more willingly when they feel secured & assured that their knowledge will not be misused. Anticipated usage of shared knowledge by a recipient is a major motivation for knowledge contributor (Lichtenstein & Hunter, 2008). Presentiment of job's insecurity still prevails among employees & this perception hampers the process of knowledge sharing (Riege, 2005).

3.3. Communication:

"*Communication is a meaningful exchange of information between two people*" (Fayard & Metiu, 2014). It regulates the process of trading knowledge & help contributors to develop

new viewpoints on work related issues (Hooff, Ridder, van den Hooff, & de Ridder, 2004) . Riege (2005) declaimed that the frankness of workers contributes greatly in knowledge sharing process. Communication implies sharing or trading data by the utilization of non-verbal communication. It was contended that in the work environment if communications among workers are high it might contribute positively about disseminating the information & knowledge among them (Al-Alawi, Al-Marzooqi, & Mohammed, 2007).

3.4. Organizational Hierarchy:

It is a general fact that if an organization has an worker friendly culture, knowledge sharing occurs frequently among workers (Huotari & Iivonen, 2005). Hierarchical patterns and authoritative powers are the two major knowledge disseminating obstructions in high hierarchical organizational cultures (Suppiah & Sandhu, 2011). Henceforth, supervisors ought to give a bureaucratic space in which the knowledge can stream effortlessly (Al-Alawi et al., 2007). Von Krogh (1998) declaims that attentiveness of higher authorities will dictate the capital assigned & the time allotted to the workers for communicating & sharing their knowledge. Directive leadership style is detrimental towards knowledge management practices while delegating leadership style supplements the knowledge management (Singh, 2008).

3.5. Reward & Recognition Systems:

McDermott and O'Dell (2001) specified that award & acknowledgment systems are certainly not considered as the first most strategy in rousing and creating a limpid image for the employees to disseminate information but it can be utilized to portray & upgrade the significance of information dissemination. Fathi, Eze, and Goh (2011) contended that awards enhance knowledge dissemination between workers in light of the fact that workers are spurred to disseminate their insight upon foreseeing rewards. Many researchers declaims the existence of positive relationship between existences of rewards & process of knowledge sharing (Chiu, Hsu, & Wang, 2006; Dang, Le-Hoai, & Kim, 2018; Phang, Kankanhali, & Sabherwal, 2009; Wang & Noe, 2010).

3.6. Information & Communication Tools:

Technology is regarded as one of the knowledge administration framework alongside individuals and procedures (Panahi, Watson, & Partridge, 2013). Han, Zhou, and Yang (2011) iterated that this is important for discovering specialized modes with a specific end goal to discover, disperse and using the information. They demonstrate that strong information & communication tools are the major imperative elements which ought to be regarded in actualizing knowledge administration framework.

4. RESEARCH DESIGN

Fig. 2 illustrates the analysis framework adopted for this research. Following the research approaches of Razmerita, Kirchner, & Nielsen (2016) and Chong & Besharati (2014), the research framework comprises of six independent variables which are listed below:

1. Trust
2. Power
3. Communication
4. Hierarchy
5. Rewards & Recognition Systems

6. Information & Communication Systems.

The seventh variable, i.e. "Knowledge Sharing" is the dependent variable which depends upon the six independent variables. Conceptual framework is illustrated below:

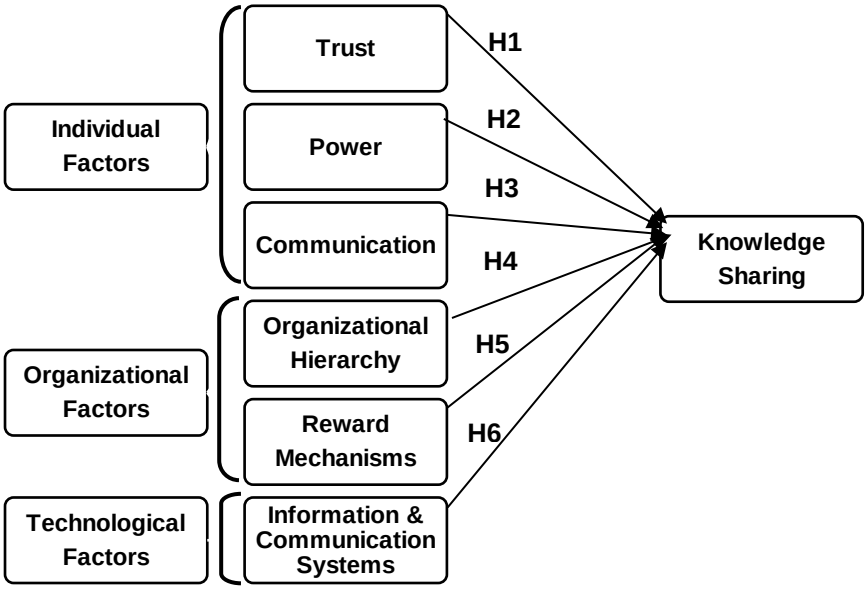

Fig. 2. Research Framework

Based upon this research framework, following six hypotheses are devised.

H1: There exists a positive relationship between trust & knowledge sharing.

H2: There exists a positive relationship between not losing power & knowledge sharing.

H3: There exists a positive relationship between communication & knowledge sharing

H4: There exists a positive relationship between low organizational structure and knowledge

H5: There exists a positive relationship between rewarding and knowledge sharing.

H6: There exists a positive relationship between the existence of IT mechanisms and knowledge sharing

5. SAMPLE & DATA COLLECTION

This study is based upon primary data collected through web questionnaires administered via "Google Forms". Forms are disseminated among O&G professionals through various social media platforms, i.e. Whatsapp, Linkedin, Facebook & Emails. This research focuses solely on the Oil & Gas sector of Pakistan which comprises of following four sub sectors:

1. Exploration & Production (Upstream)
2. Field Service Providers (Upstream)
3. Transportation & Distribution (Midstream)
4. Refining & Retail (Downstream)

All the white & blue-collar employees who are involved in knowledge sharing process in their daily job routines are considered as research subjects. A systematized research questionnaire has been adopted from literature for data collection from the respondents. Questionnaire was based upon five level bipolar scales as "1" representing 'Totally Disagree"

to 5 representing "Totally Agree". This nomenclature helps in subsequent statistical data analysis. Questionnaire comprises of two segments. First segment comprises of 9 questions seeking demographic information about the respondent. Second segment comprises of 27 questions pertaining to one dependent variable & six independent variables. In an order to reduce response biasness, seven questions were reverse coded.

Table 1 shows the profiles of respondents which mainly includes 93.3% male with majority of them holding a four-year bachelor's degree or an equivalent education, 52% are employed in E&P (Upstream), 58% serves in Multinational companies, 38% belongs to 26-30 age group & 26% have an experience 6-10 year.

Table 1. Respondents' Profile

	Frequency	Percentage (%)
Gender		
Male	267	93.3
Female	19	6.7
Qualification		
High School	94	1
Diploma	3	33
Bachelors	139	49
Masters	50	17
Oil & Gas Sector		
Exploration & Production (Upstream)	148	52
Field Service Providers (Upstream)	60	21
Distribution & Transportation (Midstream)	41	14
Refining & Retail (Downstream)	36	13
Organization		
Public sector/Semi-Public sector	59	21
Multinational	166	58
Private	61	21
Age		
20 – 25	18	6
26 – 30	109	38
31 – 35	69	24
36 – 40	38	13
41 – 45	22	8
46 – 50	19	7
51 – 55	10	3
56 – 60	1	0.3
Work Experience		
1 – 5	86	30
6 – 10	73	26
11 – 15	62	22
16 – 20	28	10
21 – 25	20	7
26 – 30	13	5
31 - 35	4	1

6. *STATISTICS USED*

Research employs following statistical tests for data analysis:

- Arithmetic Mean & Standard Deviation
- Pearson Correlations
- Simple Linear Regression

7. RESULTS & DISCUSSION

The research was conducted to assess the relationship between knowledge sharing & various key challenges identified from literature. To investigate the research objective, data was collected from O&G professionals of Pakistan industry. Research results will be listed as well as described in below section.

Table 2 shows the descriptive statistics including Mean, Range & Standard deviation for all research variables. Trust is the main driver of Knowledge sharing as it has the highest mean value (3.8147), followed by Power (3.5629), Communication (3.5303), Information & Communication Tools (3.5026), Hierarchy (3.3823) & Rewards (3.2657).

Table 2. Mean, Range & Standard Deviation

Variables	N	Range	Mean	Std. Deviation
Trust	286	3.000	3.814	0.536
Power	286	4.000	3.562	0.797
Communication	286	3.330	3.530	0.624
Hierarchy	286	4.000	3.382	0.826
Rewards	286	4.000	3.265	0.753
ICT	286	4.000	3.502	0.751
Knowledge Sharing	286	2.400	3.825	0.507

Table 3 enlists the Pearson correlation coefficients for all independent variables & Knowledge Sharing. Pearson correlation coefficient explains the strength & direction of association between two variables with "0" representing absolute independency & ±1 representing absolute strong relationship. Obtained values entail the existence of positive uphill relationships between knowledge sharing & all six independent variables. As per below results, "Hierarchy" came out as the strongest predictor variable for knowledge sharing with a Person Coefficient value of "0.581". Values for all predictor variables are greater than 0.4 which entails that all predictor variables have positive moderate association with knowledge sharing (Ratner, n.d.).

Table 3. Pearson Correlations

	KS	Trust	Power	Communication	Hierarchy	Rewards	ICT
Knowledge Sharing	1	0.440**	0.480**	0.545**	0.581**	0.501**	0.524**

Table 4 enlists the values for adjusted R square, i.e. 0.533 which declaims that 54.3% variability in knowledge sharing is explained by the all six independent variables. Significance value of "0.000" confirms the accuracy of the regression model.

Table 4. Anova Table

Model	R	R Square	Adjusted R Square	Anova	
				Significance	F
1	.737[a]	.543	.533	.000[b]	55.311

In Table 5, p-values for all variables are less than 0.05 which marks the rejection of null hypothesis & all research (alternate) hypotheses are being accepted. It proves that all the listed independent variables are the noteworthy prognosticators of a knowledge sharing. Furthermore, since VIF values are less than 5, hence no issue of multi-co linearity exists among the predictor variables. The outcomes of quantitative tests show that all the six independent variables have significant positive relationship with the knowledge sharing. Hence, all our research (alternate) hypotheses are accepted.

Table 5. Coefficients Table

Model		Unstandardized Coefficients		Sig.	Collinearity Statistics	
		B	Std. Error		Tolerance	VIF
1	(Constant)	1.154	0.169	0		
	Trust	0.150	0.044	0.001	0.768	1.302
	Power	0.088	0.032	0.006	0.663	1.508
	Communication	0.173	0.041	0.000	0.633	1.580
	Hierarchy	0.143	0.032	0.000	0.600	1.667
	Rewards	0.129	0.034	0.000	0.638	1.567
	ICT	0.078	0.036	0.034	0.562	1.781

a. Dependent Variable: Knowledge_Sharing

The results show that incredible level of trust exists among the workers employed in O&G sector of Pakistan. Respondents share their perceptions, knowledge, experiences & feelings with their fellow colleagues & good level of trust is observed among all knowledge practitioners. The outcome of this proposition is aligned with the research work conducted by Al-Alawi (2007), Riege (2005) ,Goh (2002) and Levin (2005). Trust among the employees enhances the practice of knowledge sharing. Fear of getting maltreated, penalizing by disclosing your mistakes & exploitation inhibit the intention of sharing your knowledge with fellow colleagues (Chong & Besharati, 2014). All these dimensions represent an air of mistrust. However, when there is an encouraging culture of trust, people share their mistakes for the future betterment so that someone else may not commit the same mistake. Overall, there is a proficient level of trust among O&G professionals in Pakistan which complements the process of knowledge sharing.

Second proposition is also accepted which proclaims the existence of a positive correlation of knowledge sharing & not losing power within an O&G sector of Pakistan. Normally, it is observed that when you share knowledge; people can harm you or even misuse your knowledge to excel or to gain a competitive edge (Riege, 2005; Szulanski, 1996). But as per research outcomes, people discarded the prevailing stupefaction of losing power upon sharing your knowledge.

Third proposition which declaims about communication among the knowledge workers & its impact on knowledge sharing has also found to be valid. Results signify that as communication between the workers enhances the knowledge sharing will also enhance. It emphasizes that companies should strengthen the communication & engagement among employees for nurturing the culture of knowledge sharing (Al-Alawi et al., 2007; Lindsey, 2003; Riege, 2005).

Fourth hypothesis relating the positive association of low organizational hierarchy & knowledge sharing has found valid. Majority of the O&G professionals of Pakistan see eye to eye with our proposition that if a company has a galvanizing culture & magnanimous hierarchy then knowledge sharing happens more recurrently (Huotari & Iivonen, 2005). Findings supplements the fact that mangers can play a pivotal role in establishing a culture of knowledge management (Al-Alawi et al., 2007)

Research outcomes prove the positive association of rewards & recognition systems with the process of knowledge sharing. Certain companies make knowledge sharing an essential attribute of an employee for promotions & rewards (Mcdermott & O'Dell, 2001). Results underscore the existence of rewards & recognition systems for encouraging employees to share their knowledge.

Sixth proposition which orates the positive relationship of information & communication tools with knowledge sharing has also been found valid. In today's technological world, it is

of utmost importance to distribute knowledge for enhancing organizational performance (X. Han et al., 2011). Majority of the Pakistan's O&G professionals believe that existence of IT tools make is easy for them to share & codify their knowledge.

8. CONCLUSION

To conclude, all the six independent variables, i.e. Trust, Communication, Power, Organizational Hierarchy, Rewards & Recognition systems & Information & Communication Tools have a positive impact on Knowledge sharing. These factors should be promoted if mangers want to establish knowledge sharing culture within their organizations.

There is a positive correlation of good interpersonal trust & knowledge sharing. Employees share their knowledge regardless of the perception of losing competitive edge over their peers. Managers are found to play a pivotal role in establishing a culture of knowledge management. Low organizational hierarchy is found to be a driving factor for sharing & retaining knowledge. Rewards & recognition mechanisms play an effective role in motivating employees to share their knowledge. In today's technological world, it is of utmost importance to distribute knowledge for enhancing organizational performance and user-friendly information & communication tool s augment the process of knowledge sharing.

9. IMPLICATIONS OF THE STUDY

This study is carried out on O&G professionals of Pakistan. Hence, findings of this study are culture & industry specific and can't be generalized beyond Pakistan's O&G sector.

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QUESTIONNAIRE

1) Gender?

a) Male b) Female

2) Age?

a) 21-25 b) 26-30 c) 31-35 d) 36-40 e) 41-45 f) 45-50 g) 50-53 h) More than 53

3) Work Experience?

a) 1-5 years b) 5-10 years c) 10-15 years d) 16-20 years e) 20-25 years f) More than 20 years

4) Qualification?

a) High School b) Diploma c) Bachelors d) Masters e) Phd

5) Which sector of Oil & Gas value chain do you work in?

a) O&G Exploration & Production (Upstream) b) Field Service Providers (Upstream)
c) O&G Distribution/Transportation (Midstream) d) Refinery (Downstream)

6) Organization?

a) Government Org b) Semi Government c) Multinational d) Private Org e) Others

7) Designation/Position?

a) Operational Staff b) Junior Level Managers c) Mid Level Managers
d) Executive Managers e) Others

8) Department?

a) Maintenance b) Process c) Administration d) Drilling/Geologists/Geophysicist/Reservoir
e) Finance/HR/IT f) Others

SN	Question Statement	SD	D	N	A	SA
		1	2	3	4	5
1	Most of my colleagues are trustworthy. (Al-Alawi et al., 2007)					
2	A considerable level of trust exists between co-workers in the organization. (Al-Alawi et al., 2007)					
3	I have never been harmed as a result of sharing my knowledge with my co-workers (Al-Alawi et al., 2007.					
4	I hesitate to share my feelings and knowledge with my fellow colleagues (Al-Alawi et al., 2007) **(Reverse Coded)**					
5	I share my knowledge with new employees. (Suppiah & Sandhu, 2011)					
6	Knowledge is a source of power & superiority in my company. (Joia & Lemos, 2010)					
7	Sharing knowledge with others decreases my influence within the company. (Bennett & Gabriel, 1999) **(Reverse Coded)**					
8	I believe if I share my knowledge & experience with others they will misuse it for their personal benefits. **(Reverse Coded)**					
9	Native language is a communication barrier while interacting with staff members. **(Reverse Coded)**					
10	There is a high level of face-to-face interaction among colleagues in my company. (Al-Alawi et al., 2007)					
11	Teamwork discussion and collaboration enhance communication between colleagues in my company. (Al-Alawi et al., 2007)					
12	I share my experience with my colleagues so that they may not repeat the mistakes that I have made. (Suppiah & Sandhu, 2011)					
13	My co-workers don't share their knowledge with me while working.(Suppiah & Sandhu, 2011) **(Reverse Coded)**					
14	Employees actively participate in the process of knowledge sharing. (Al-Alawi et al., 2007)					
15	Information flow easily throughout the organization regardless of employee roles or other boundaries. (Al-Alawi et al., 2007)					
16	Employees seek knowledge from their seniors without any fear. (Jain, Sandhu, & Sidhu, 2007)					
17	Employees have access to the people who possess knowledge, irrespective of their hierarchical levels. (Joia & Lemos, 2010)					
18	Employees can freely express their ideas in organizational meetings. (Suppiah & Sandhu, 2011)					
19	Employees are not rewarded for sharing their knowledge and experience with fellow colleagues. (Al-Alawi et al., 2007) **(Reverse Coded)**					
20	Knowledge sharing rewards are effective in motivating me to share my knowledge. (Al-Alawi et al., 2007)					
21	Knowledge sharing behaviour is considered as a postivie indicator during performance evalutions. (Fong & Choi, 2009)					
22	The reward systems of my company encourage employees to interact & share knowledge among themselves. (Bennett & Gabriel,1999)					
23	In my organization, employees are more likely rewarded on teamwork rather than on individual performance. (Al-Alawi et al., 2007)					
24	My organization had provided various tools and technologies to facilitate knowledge sharing and exchange (e.g. email, lesson learnt portals, Newsflashes etc)?. (Al-Alawi et al., 2007)					
25	The technological tools available at my organization for knowledge sharing aren't fruitful. (Al-Alawi et al., 2007) **(Reverse Coded)**					
26	I feel comfortable at using the available knowledge sharing technologies in my company.					
27	Employees use IT technology to share their knowledge innside the company. (Smith, 2006)					