
Knowledge and Technologies as Predictor of Better Decision in Telecommunication Sector of Pakistan

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Abstract

Knowledge is considered as value addition to business as it helps in better decision making. "The ability to create, preserve, and utilize knowledge about the future for efficient decision making is a key to competitiveness and survival for a business in this age of globalization, internet, commerce, and rapidly fluctuating economies" (Khan, Ganguly, & Gupta, 2005). Predicting and forecasting for the future is a critical and complex process. Optimal solutions are possible, while perfection is hard to achieve. However, minor improvements can lead to significant tactical and strategic decisions, and can improve the ability of an enterprise to react quickly to change. Based on the literature a study on knowledge usage, decision support system and better decision making is conducted in telecommunication sector of Pakistan. Established questionnaire for survey study is used to collect data, Logit analysis is performed, and results obtained validated theory suggested in literature. It is concluded the ability to utilize knowledge along with technological support leads to better decision making in telecommunication sector of Pakistan.

Key words: Knowledge; Technology; Telecommunication; Globalization

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1. Introduction

Businesses are required to be unique and competitive for survival in this era of globalization. That is why, organizations have been looking for resources that cannot be replicated or imitated. International expansion and liberation of markets shifted organizational focus on knowledge, as competitive asset for sustainable development (Akbar & Tzokas, 2012). Whereas, Davenport and Pursak (1998) defines knowledge as a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information into organizational practices. Therefore, organizational competitiveness could be determined through organizational, or individual's capability of creating knowledge (Akbar & Tzokas, 2012). Knowledge as organization's intangible significant resource, that must be accessed, created, managed, shared, and implemented (Alavi & Leidner, 2001). Because, knowledge sharing increases organizational learning and its proper implementation in competitive economic environment ensures organizational success (Kwan, & Balasubramaniam, 2003). As apprehended by the viewpoint of Grey and Meister (2006) "Knowledge is a mix of expertise, experience, process, conceptual information and insights that provides a framework for decision-making or problem-solving". Thus, the quality of knowledge implies the quality of decision made by the organization or the managers working within. The relevance of knowledge to effective business decision making in modern economy necessitates a thinking concern. It put forward questions about the type of knowledge, the medium of transformation, and the type of decision to be made. As, knowledge have different types and levels that could be implied for decision-making and problem solving. Likewise, some of the mediums of knowledge transformation were considered as efficient

sources, while others are highly controversial. Based on the situation, the researcher tries to identify the impact of knowledge implied through information communication technology on managerial decision making in the context of telecommunication sector of Pakistan. Telecommunication is one among the largest business sectors that has foreign direct investment, huge human capital employability and successful contribution to the economic activities of Pakistan (Hashim, Munir, & Khan, 2006).

2. Literature Review

Organizational performance usually depends upon routines and actions of individual working within an organization. Most of the actions are driven by the decisions, while these decisions to be effective require a certain set of knowledge (Bennet, & Bennet, 2008). This infers, organizational performance highly depends upon the kind of knowledge. The knowledge is embedded in organization or individuals and is mostly shaped by the context of both or the situation. This means knowledge have several shapes and kinds, based on the assumption literature exploration provided researcher with several distinction that ultimately help carrier in decision-making. Like Schwartz (2006) in his article throws light on Aristotle's classification of knowledge; the five levels of virtues (knowledge) that Aristotle presents are as following: "Epistme: factual or scientific knowledge, Techne: skill based action oriented knowledge, Phrnoesis: experiential self-knowledge or practical wisdom based on experience, Nous: intuition, Sophia: knowledge of universal truths". Through the critical evaluation of these classifications it can be assumed that Epistme and Sophia are similar to "explicit dimension of knowledge" and Techne, Phrnoesis and Nous are concepts parallel to "tacit dimension of knowledge". The concept of tacit and explicit dimension of knowledge are presented by Polyani, he alleged both tacit and explicit knowledge are not dichotomous but one generates the other (1958). Another classifications of knowledge is presented by Minsky (1975) named as declarative vs. procedural. "Declarative knowledge is defined as the factual information stored in memory and known to be static in nature" (Uluoglu, 2000). It is also called as propositional or descriptive knowledge: that is based on cause and effect (Schwartz 2006). While procedural knowledge is much more like tacit knowledge as it is subjected to "know how or operation of certain phenomenon" (Uluoglu 2000). Knowledge's existence as Individual or personal vs. collective

or organizational are claimed by Zander and Kogut (1995), according to them individual knowledge is embedded in the mind of knower or knowledge worker, whereas organizational knowledge comprises of norms, routines, processes and experiences particular to that organization. This may also be assumed as public (general knowledge) or private (proprietary) knowledge (Matusik & Hill 1998).

Byosiere and Luethge, (2008) cite four major distinct knowledge classes of (Byosiere and Ingham, 2002) named as basic, experiential, creative/emotional and innovative knowledge. The nature of these types is obvious from their respective names without getting into further detail. The aim behind presentation of these distinctions is to identify the origin and importance of particular set of knowledge. These classifications resulted from the stance of different authors. Some of them thought knowledge as object/entity (positivist school of thought) and consider its existence in concrete codified form that results from intellectual process. While other view knowledge from practice based perspective; tacit or explicit knowledge, embodied in repositories, constructed through social interactions, contestable and context specific (Hislop 2005; Argote McEvily & Regans 2003). In the current research knowledge is considered from practice based perspective because this viewpoint entails knowledge development with changing world for effective decision making (Nardi, 2006). Beside these distinctions, Bennet and Bennet (2007) categorize knowledge based on their application to perform different activities as Knowledge Taxonomy. Knowledge taxonomy involves "Meta knowledge (MK): it is the capacity to understand, create, or assimilate different types of knowledge". Such type of knowledge (MK) is very useful in complex situations especially for sense making (Wilson, 1998).

The other kinds of knowledge included in Knowledge Taxonomy is Research Knowledge (RK) based on empirical or theoretical data. Praxis also known as pragmatic knowledge (PK) based on the understanding of change process. Action Knowledge (AK) describes the ability of individual to take actions in accordance with given situation. Descriptive knowledge (DK) is the information about W-family that is what, who, when and where of a situation. Strategic Knowledge (SK) is about alignment of current actions with future vision of the organization. Learning Knowledge (LK) is the learning of individuals, group, and organization (Bennet, & Bennet, 2008). The above stated taxonomies of knowledge are just like the seven colors in rainbow: as the colors are merged and diffusion of a color into another color completes the spectrum. Every color is equally important and

essential for the beauty of rainbow. Likewise, each set of knowledge has certain level of overlapping with others and all of the types complement each other in order to make wise (efficient and effective) decision. However, due to limited abilities of human being members of organization may have their expertise in one, some, or none of the types instead of expertise in all (Alavi, & Leidner, 2001). That is why group decision-making or team approach is preferred when complex situation and huge amount of data is involved because of versatility of group knowledge. Researchers are working on decision-making, as it is being an important area of management and behavioral science. Managers working in high technology industry to low technology industry have to take decisions about the future of their organization (Khan, et al., 2005). These decisions must be prompt and according to the market situation, as change cannot be left to the chance, instead a knowledge base is required for organizational development (O'Dell, and Grayson, 1998). As elaborated by Khan and colleagues (2005) "Phenomenal growth and spectacular failures are associated with organizations depending on their ability to understand market directions". This means attention to the details of any situation might enable an organization's strategic vision and it might lead the organization on the road to success. The advent of modern technology and increased pace of change, reverted managers decision-making methods.

Managers or entrepreneurs feel comfortable while making decision through expert systems instead of conventional methods like cognitive mapping, AI approach, or decision tree (Yim, Kim, Kim, & Kwahk, 2004). The managerial problem solving or decision-making process requires an integration of information from different sources and perspectives (Leong, 1998). Many of the general decision-making theories and methods emerged in the last few decades in different application areas (White, 2009). Among all, computer based information systems are thought as best systems to support decision-making in complex environments. Since, reported by Ganguly, Gupta, & Khan (2005) "Many organizations have invested in automated analysis techniques to unearth meaningful patterns and structures from millions of records with hundreds of attributes".

Such automated systems are referred to as Management Information Systems (MIS), whereas decision support system and experts systems are categorized as sub-types of MIS (Nowduri, 2011). "Decision Support System (DSS) is a type of information system that ensures participation and support for decision-making (Power, 2002). DSS provides a machine and human interface

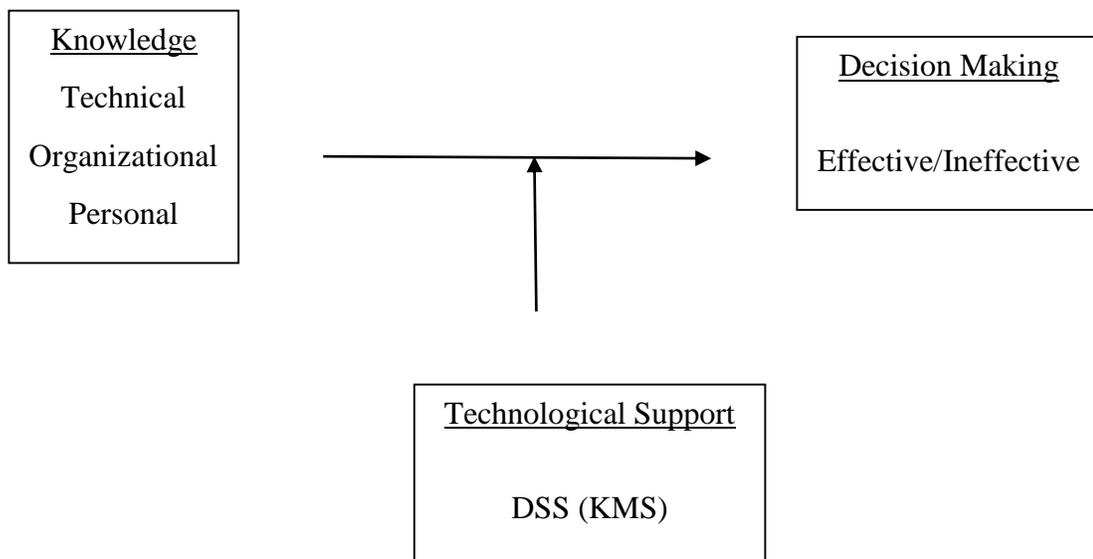
that includes a variety of programs, where decision maker preferences, assumptions and limitations are provided for critical evaluation, analysis and decision-making. According to Zhou et al. (2008) "DSS is an interactive computer information system that can help decision-makers make use of data and models and solve the problem of non-structures".

2.1 Knowledge Management and Information System

In this globalized technology centered world, it is hard to imagine any approach or system contrary to technology. In defining the relationship between KM and IS it would be worth quoting Alavi and Leidner (2001); "KMS refer to a class of information system (IS) applied to managing organizational knowledge." Precisely IS are thought to be helpful only in exchange or management of explicit knowledge but now with advancement in the field of IS we can augment or design system that can help in externalization of pure and transparent form of knowledge i.e. tacit knowledge (Sveiby 1997). As argued by (Holsapple, 2005), "now a day computer based technologies are inseparable from modern KM". This means Information System not only deals with acquisition of knowledge (tacit or explicit) but also with application of knowledge, as it provides space for human interaction. This has been identified from literature; the tacit knowledge embedded in repositories can be exchanged through social relationship (Devenport, & Prusak, 1998; He, Qiao, & Wei, 2009). An organization may have strong social relationship (an enabler for knowledge transformation); if there is tie strength, shared norms, and trust. For the reason, technology intensive networking can be used (Kaiser & Fordinal 2010). The phenomenon underlines another important aspect that is adoption of ICT for exchange of knowledge and information. The motivational factor for this adoption may be quality, ease, usability (friendliness) and security of IS. Among these another important factor that may affect individual usage of IS may be recognition and authentication (that may enable user to find out who is an expert or layperson) shared what (knowledge or information) and when (under what circumstances) (Alavi, & Leidner, 2007; He, et. al., 2009).

Researchers claim data warehouse technology through Artificial Intelligence system and conventional categories are system approaches that may act as powerful source of knowledge management (Edward, Shaw, & Collier, 2005). Three types of IT applications used in organization's KM through System are coding, sharing, and creation (ibid.). Information system provides people with discussion forum where they can exchange, confirm, and interpret beliefs and

ideas (Alavi and Leidner, 2001). For example, social websites, blog posts, bulletin boards, emails, etc. may act as a major source of exchange of tacit knowledge (Li & Lu 2007). In modern organizations use of intranets and groupware can be observed, these are considered as collaborative technologies that help organization in managing their knowledge and innovative ideas (Civi, 2000). Mostly managers from top (strategic), middle (tactical) and operational levels use such kind of system to support their working in the organization. This working also includes decision-making that ranges from simple operational decision to visionary planning for strategic growth (Al-Zhrani, 2010). Moreover, systems in one organization may differ from systems in the other organization "depending on the nature of organizational operations, size of the businesses and organizational priorities among many other salient factors" (Nowduri, 2011).



2.2. Hypotheses:

Based on the literature explored it is hypothesized that;

H₁: There is a positive relationship between Knowledge gained and effective decision-making in telecommunication sector of Pakistan.

H₂: Decision support system positively mediates the relationship between knowledge gained and effective decision-making in telecommunication sector of Pakistan.

3. Methodology

In order to test the suggested relationship between knowledge gained and effective decision making, quantitative research strategy is applied. Aliaga and Gunderson (2002), describes quantitative research methods as a method in which a phenomena is explained by collecting numerical data that is then analyzed by using mathematically based methods (in particular statistics). For this reason, a questionnaire designed by Ong and Lai (2005) measuring user satisfaction and perceived adoption of knowledge management system for organization work is adopted. The questionnaire uses total 26 items, but only 16 items are adopted to be used in this research. The Cronbach's α calculated is 0.95 for adopted questions and 0.83 for the other 10 items related to decision making that assures the reliability of the tool.

The questionnaire is distributed to 400 managers in the telecommunication sector of Pakistan via respective HR-departments. Respondents are recruited from Mobilink, Telenor, Warid, and Zong. Total 180 useful responses are received, that accumulate for 0.45% response rate. Among these 180 responses, 24 are females, while rest of the managers are males working in different areas of organization. While in term of organization; 58 responses are from Mobilink, 42 are from Warid Telecom, 44 are from Telenor Pakistan, and 36 are from Zong Tel. These responses are qualified based on information system usage for decision-making. Data regarding knowledge and information system and decision-making is collected in terms of agreement and disagreement that is LIKERT-scale. Where, 5 points are assigned for highly agree and 1 for highly disagree. While for decision-making, effective decision-making is coded as 1 and ineffective decision making is coded as 0. Linear regression Logit-model is applied in order to perceived difference in decision making because of knowledge and decision support system.

4. Discussion

Basically, in Logit model the dependent variable is a qualitative variable that may assume the value "zero" or "one", on the other side the independent variable was a quantitative variable (Vashisht). Based on the statistical assumptions, Logit model allows the transformation of dichotomous variable as continuous variable that ranges from $+\infty$ to $-\infty$ other conditions for application of Logit model requires larger value of N (ibid.). Based on provided information Logit model is applied to the data and results are generated for interpretation. Two models are tested, the first model involves testing of the relationship between Knowledge (Independent Variable), Decision-Making (Dependent Variable). For the second model, Knowledge is multiplied with DSS (decision support system). The results obtained from these analysis were presented in Table 1 and Table 2.

Table 1. ML - Binary Logit (Quadratic hill climbing) for Knowledge and decision-Making

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.913884	0.692959	1.318814	0.1872
KNOWLEDGE	0.383052	0.236043	1.622810	0.1046
McFadden R-squared	0.020008	Mean dependent var		0.8833
S.D. dependent var	0.321918	S.E. of regression		0.3204
Akaike info criterion	0.728269	Sum squared resid		18.281
Schwarz criterion	0.763746	Log likelihood		-63.54
Hannan-Quinn criter.	0.742653	Deviance		127.08
Restr. deviance	129.6830	Restr. log likelihood		-64.84
LR statistic	2.594635	Avg. log likelihood		-0.353
Prob(LR statistic)	0.107226			
Obs with Dep=0	21	Total obs		180
Obs with Dep=1	159			

Table 2. Binary Logit (Quadratic hill climbing) for mediating role of DSS between Knowledge and decision-Making

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.804075	0.247746	3.245557	0.0012
KNOWLEDGE*DSS	0.042035	0.024225	1.735194	0.0827
Dependent Variable: DM				
Method: ML - Binary Probit (Quadratic hill climbing)				
McFadden R-squared	0.023447	Mean dependent var		0.883333
S.D. dependent var	0.321918	S.E. of regression		0.320147
Akaike info criterion	0.725791	Sum squared resid		18.24394
Schwarz criterion	0.761268	Log likelihood		-63.32117
Hannan-Quinn criter.	0.740175	Deviance		126.6423
Restr. deviance	129.6830	Restr. log likelihood		-64.84149
LR statistic	3.040643	Avg. log likelihood		-0.351784
Prob(LR statistic)	0.081204			
Obs with Dep=0	21	Total obs		180
Obs with Dep=1	159			

Based on the results obtained, it can be comprehended that, there exists a probability of significant relationship between knowledge and effective decision-making. Increase in knowledge that may be factual, technical or experiential would likely increase the chances of effective decision-making. A larger Number of Board of director would likely produce better returns that ultimately improve firm performance. In order to measure the fitness of model applied, stated tests in Table 1 are conducted. The LR statistics 2.594 provided the base for the acceptance of relationship predicted for the test. Therefore, it can be argued presences of knowledge can increase the chances of efficient decision making. Therefore, Hypotheses 1, is accepted. Based on the results another model is tested in which knowledge is combined with decision support system. The results produced are given in Table 2. The LR statistics were improved from 2.594 to 3.05, hence predicting a better relationship among the variables regressed. The improvement is minor in term of number but a careful consideration could help organization out perform in decision-making.

5. Conclusion

Based on the study, it is contributed to the body of knowledge, that a grip of mangers working in telecommunication sector of Pakistan on different type of

knowledge could enable them to take better decisions. These decisions intern can improve organizational performance and might lead to the success of organizations in this competitive world. Elsewhere, in this fast-changing world use of technology or knowledge base decision support system could give individuals an edge. Organizational investment in these area and training related to these areas could be thought of as an investment for secure future in this highly competitive world. The data is collected in the premise of Pakistan application to other societies may be not possible. The sample is not very large and only managerial level are consulted in telecommunication industry. Expansion to other areas could provide better information. These limitations could be overcome in future research in the area. Whereas, the research is a sort of unique study based in Pakistan's in the area of management and decision-making.

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