INFLUENCE OF INFORMATION TECHNOLOGY ON FINANCIAL & NON-FINANCIAL PERFORMANCE OF AN ORGANIZATION: AN EMPIRICAL STUDY

Dr. Girish. K. Nair*

Abstract

This research investigates the influence of IT (process and support) on organizational performance with KM (capture and learning based) as the moderator. A survey has been undertaken in a knowledge intensive public sector with a sample size of 238 based on simple random sampling. Meta-analysis of literature was the basis for developing the metric that included the variables constituting the hypothetical research model. The tool used for data analysis was structural equation modelling with partial least square technique. Results differ from the general understanding of the role of KM on organizational performance. Among the variables considered, only IT process for KM positively influenced learning based KM and capture based KM, both of which in turn positively influenced organizational performance. Organizational performance as a whole was measured in terms of financial and non financial performance. Surprisingly, capture based KM influenced learning based KM. The study also revealed that knowledge process capability had positive influence on capture based KM and IT process for KM had direct influence on organizational performance. The generalization of results may not be possible to the full extent, as the outcome is organization specific. Strengthening of IT process for KM is the key managerial implication to enhance organizational performance. Promoting knowledge process capability could be the next imperative. This research provides empirical support to the strengthening of IT process for KM for enhancing organizational performance, which was hitherto mostly a theoretical concept.

Key words – Knowledge management, Information technology, Organizational performance, Capture based KM, Learning based KM.

* Team Leader, Programme Leader, International Hospitality Management Faculty, Stenden University, Qatar

Introduction

Owing to the importance KM has gained in the business world, quite a good number of researchers have focussed on distinct research areas of KM such as: performance improvement (Becerra-Fernandez and Sabherwal, 2001), KMS capabilities (Bloodgood & Salisbury, 2001 and Choi & Lee, 2002), intangible characteristics of knowledge assets (Ahn & Chang, 2002), KM and business processes (Dalmaris et al., 2007), KM process improvement (Mertins et al., 2003; Kalpic & Bernus, 2006 and Siha & Saad, 2008), KM effectiveness (Anantatmula, 2007), knowledge management systems (KMS) metric (Turban and Aronson, 2001 and Jennex & Olfman, 2004), information technologies (IT) (Hsu et al., 2007), people, process and technology (Fink & Ploder, 2009; Coakes et al., 2010; and Aujirapongpan et al., 2010), and benefits management (Pina et al., 2013). The spectrum of KM is ever growing and newer concepts and theories are being added as more and more organizations are embarking into it on realizing the success stories.

Despite the fact that IT revolution has brought KM such a popularity round the globe, not much of empirical work has been done to link IT, KM and organizational performance. Establishing this link is very important as IT is mainly an enabler and KM is a process, and unless these two are aligned towards the organizational objectives, the huge amount of investment on these two may not be justified, as it may not yield the required level of organizational performance. So, it is in this context, the research of this nature becomes important, as it can bring into light certain observations that have the potential to cut cost and improve performance, which may otherwise remain dormant under the normal circumstances.

Purpose of the study

Zaim et al., (2007) state that despite the lack of confirming empirical evidence, it has been widely accepted that KM processes and infrastructure have significant influences on the performance of KM applications. One of the purposes of this study is to seek empirical evidence to this relationship.

As stated before IT is the enabler, KM a process, and organizational performance the desired result. Theoretically speaking, the processes need to be supported with the technologies to yield the desired results, but the research literature lacks empirical evidence to show that the enabler significantly contributes to the processes and the processes give the desired output in the form of the organizational performance. Measurement of the KM processes is important, as it gives a better understanding of the system and helps in developing and implementing it (Jennex and Olfman, 2004). There can also be other reasons such as justifying investment, identifying what is important and providing a basis for valuation (Turban and Aronson, 2001). Also, past measures can be good indicators for future comparisons (Kankanhalli and Tan, 2004). Ahn and Chang (2002) have proposed that as it is difficult to measure knowledge and its outcomes due to its intangible nature, an indirect approach of measuring its contribution to business performance can be a means to justify the effectiveness of KM.

This research draws upon the above concepts and investigates whether IT processes for KM and IT support for KM significantly influence the two major components of KM viz., capture based KM and learning based KM, when knowledge process capability also concurrently influences KM. Further, it makes an attempt to study the influence of capture based KM and learning based KM on organizational performance. So, the main purpose of the research was to investigate whether IT as an enabler and KM as the moderator contribute to the organizational performance.

Objectives of the study

The main objective of this research is to determine the significance of influence of IT as an enabler and KM as the process to the organizational performance. More specifically, following are the sub-objectives:

- Identify the variables of IT process for KM, IT support for KM, Capture based KM, learning based KM, knowledge process capability, and organizational performance.
- Develop a hypothetical research model to seek relationships between the variables of interest.
- Develop a metric to measure the above dimensions of study, validate it and test the metric for its suitability to collect the research data.
- Collect the data using the metric and analyse the same for testing relationships as defined in the hypotheses.
- Evaluate the results and itemize the key IT enablers and KM processes, which contribute to the organizational performance and draw implications so as to enhance the organizational performance.

Literature Review

Several researchers have found that KM could create value or competitive advantage in business (Davenport, 1997; Powell & Dent-Micallef, 1996; Zack, 1999; Goh, 2005; Halawi et at., 2006; and Edvardsson & Oskarsson, 2011) and that good KM practices could enhance organizational performance (Wiig, 1994; Bassi, 1997; Teece, 1997; Bontis, Gupta et al., 2000; Crossan, & Hulland, 2002; Malhotra, 2004; Zack et al., 2009). IT capabilities exist to facilitate the creation of external knowledge via externalization (Junnarkar and Brown. 1997). The collection, storing, aggregation and transmission of quantitative data are especially done well by IT technologies and the transfer of explicit knowledge based on structured data is an organizational competency. IT is used to support the creation and continuance of knowledge communities with members in multiple geographic locations, as well as to provide tools for decision support to more organizational members (Junnarkar and Brown, 1997). In general, IT supports collaboration, communication, search and access, decision making, and systematic storage of information (Gold et al., 2001; Lee & Choi, 2003; and Lee et al., 2012). All these IT capabilities are just support facilities for KM. KM integrates people, process and technology in an organization to provide the competitive advantage. Junnarkar & Brown (1997) have stated that KM requires an understanding of knowledge creation at the individual level, and IT tools are necessary, but not sufficient, for enabling sense-making, decision making, and promoting innovation. While KM is considered to improve performance the measurement issues are still in evolutionary stages. Ahn and Chang (2002) have suggested that because knowledge and its outcomes are difficult to measure, a suggested approach would be to measure their contribution to organizational performance. So, it is necessary to establish a link between IT as an enabler, KM as a moderator and organizational performance as the outcome. Following are the key components of these three streams of research, which lead to the research hypotheses.

IT-centred KM

IT-centred KM was operationalized using items developed from theoretical exposition on KM practices (Davenport et al., 1997; Ruggles, 1998 and Gray, 2002). Many researchers have emphasized upon the use of the appropriate KM processes and infrastructure to achieve meaningful outcomes (Tanriverdi, 2005; Choo et al., 2007; Cha et al., 2008; Lee and Steen, 2010; and Lee et al., 2012). Together, these items captured the extent to which a firm has invested in technological infrastructure as a KM tool. Further, the measure also captured whether a firm had identified one or more individuals as responsible for implementing KM initiatives. There are two distinct components of IT centred KM viz., IT processes for KM and IT support for KM. The IT processes for KM consists of the indicators such as: the IT infrastructure supports information generation, transfer, codification, storage (Lopez et al., 2009) and validation. The IT support consisted of indicators such as: environment which enable cooperative working, fast and easy exchange of opinion, fast and easy access to information, use of software tools for decision making, and systematic storage of necessary information (Lee and Choi, 2003). The IT support could be in the form of Internet, Intranet, Groupware, Instant messaging and other IT tools. It is believed that the IT centred KM with its two distinct components supports the capture based and learning based KM and hence, the following four hypotheses have been proposed.

H_1: IT processes for KM significantly influence capture based KM.

H_2: IT processes for KM significantly influence learning based KM.

H_3: IT support for KM significantly influences capture based KM.

H_4: IT support for KM significantly influences learning based KM.

Capture-based KM

Capture-based KM was operationalized using items developed based on the theoretical exposition of similar notions in the literature (Kettinger et al., 1994; Davenport et al, 1997; and Zack, 1999). Together, these items captured the extent to which a firm has invested in capturing knowledge, classifying it, storing it and making it accessible to everyone in the organization. Further, this measure captures the investments made to protect a firm's intellectual property. This construct included five items viz., emphasize codification, emphasize capture, store customer complaints, retaining knowledge, and storage of knowledge on intranet. Capture based KM is considered to influence learning based KM as it provides the necessary support to learning process as well as influence organizational performance. Hence, the following two hypotheses have been proposed.

H_5: Capture based KM significantly influences learning based KM.

H_6: Capture based KM significantly influences organizational performance.

Learning-based KM

Learning-based KM was operationalized using items adapted from Bontis et al., (2002). Together, these items capture the extent to which employees and groups in the organization freely interact among and between themselves and learn from each other. This construct consisted of five items viz., emphasize learning, solutions adopted, movement of idea from individual to organization, employees input to critical decisions, and employees share knowledge. Learning based KM is considered to influence organizational performance, and hence, we propose the following hypothesis.

H_7: Learning based KM significantly influences organizational performance.

Knowledge Process Capability

Knowledge process capability is a very significant determinant of organizational performance often ignored by many researchers, as they have focussed only on knowledge creation process (Lee et al., 2012). Alavi & Leidner (2001) and Gold et al., (2001) consider knowledge acquisition, knowledge validation, knowledge conversion, knowledge application, and knowledge protection as the key measures of knowledge capability, and hence, these were considered to be the indicators of the knowledge process capability. Further, as emphasized by Lee et al., (2012), knowledge process capability is an important component of the entire knowledge management system and its determinants need to be analysed carefully to study the influence it can actually produce. So, the following hypotheses were postulated to test the influence of knowledge process capability on learning based KM and capture based KM.

H_8: Knowledge process capability significantly influences learning based KM. .

H_9: Knowledge process capability significantly influences capture based KM.

Organizational Performance

Organizational performance has been operationalized with items that capture both organizational processes and adaptation capabilities (Kanter & Brinkerhoff, 1981). Some of the items were borrowed from prior research (Bontis et al., 2002), while others were developed based on the theoretical exposition of organizational performance (Kanter & Brinkerhoff, 1981 and Kaplan & Norton, 2001). There are two distinct measures of organizational performance viz., financial measures and non-financial measures. Financial measure of performance is directly in terms of financial returns to the organization. It basically gives the financial health of the organization. Organizational performance is measured by financial measures: Revenue growth, Net profits, Profit to revenue ratio, and Return on assets (Salaheldin, 2009). These measures are not directly in terms of financial figures, but are still results of KM implementation. They will add value to the knowledge intensive organization and ensure growth and success of the industry. Non-financial measures are: investments in R&D, capacity to develop a competitive profile, new products development, market development and market orientation (Salaheldin, 2009). So, organizational performance may have different meaning in different context but in this research the focus was on financial and nonfinancial measures and the indicators chosen were: revenue growth, net profit, and investment in R & D, capacity to develop competitive profile, and new product development.

In addition, there could be direct influence of the enablers on the outcome. To test these influences the following hypotheses have been postulated.

H_{10}: IT process for KM significantly influences organizational performance.

H_{11}: IT support for KM significantly influences organizational performance.

H_{12}: Knowledge process capability significantly influences organizational performance.

The hypothetical research model is shown in figure 1.

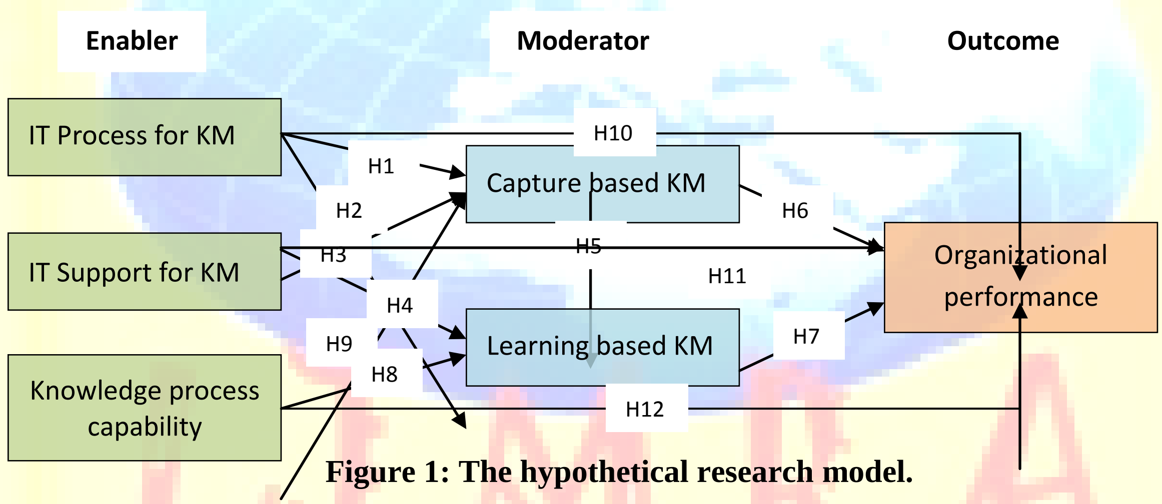

Figure 1: The hypothetical research model.

Research Methodology

The metric

In order to empirically test the proposed research hypotheses, survey method was adopted and the metric in the form of a questionnaire with six dimensions of study was developed. All variables of this research were perceptual measures, which were rated on a five-point Likert scale from one to five as ‘‘Strongly disagree’’ to ‘‘Strongly agree’’. The Individual constructs were validated in other research, but they were grouped together in a different form in this research and some questions were modified to suit to the specific context of study, and hence, the metric was validated by the standard procedure of content, construct and item validation (Pattanayak et al., 2002).

This study employed a self-administered and structured questionnaire, with most of the questions developed through meta-analysis of the literature and this formed the primary source of data. Meta-analysis is basically a research procedure where all the literature relevant to the study is scanned and most of the variables of interest are separated and scanned for the association with other variables so that a relation can be established between these variables of study. This would be of particular use while developing a metric for measurement. One expert (KM officer) evaluated the questionnaire, which then was pre-tested with five respondents who were IT professionals involved in KM. The five respondents were chosen because of their expertise and knowledge related to the content of study. On the basis of the comments and evaluations from both the expert and the five respondents, some questions have been re-worked on for the sake of improving the clarity, readability and simplicity of questionnaire. The questionnaire had two parts. Part I consisted of questions seeking information about executive's characteristics which included demographics (such as gender, age, educational qualifications, experience, department, designations and income). The Part II included questions that aim at obtaining data for hypothesis testing.

Sample characteristics

The study has been undertaken in a public sector in India, which is basically a Heavy Electrical Manufacturing Company having 10,470 employees. The company has evinced interest in supplying turbines for the six super critical thermal power stations of 660 MW, each proposed to be established in India with the claim of having enhanced its capacity to manufacture heavy-duty power generation equipment. The company has developed a capacity to manufacture turbines to cater to power plants of 800 MW. So, it is a highly knowledge intensive manufacturing sector.

The approach of sample size calculation involved specifying of the precision of estimation desired first, and then determining the sample size necessary to ensure it (Kothari, 2004), according to which, the minimum sample size necessary was 185 (eqn. 1).

$$N = (z^2 . p. \ q. N_U) / (e^2 (N_U - 1) + z^2 . p . q) \text{ -----------------------------} \quad (1)$$

where,

p = Proportion of defectives in the universe (based on the pilot study, a 2% defect is assumed).

$q = (1 - p)$.

$z = 1.96$ (as per table of scores in a normal distribution within a selected range of z for a confidence level of 95%).

e = Acceptable Error (an error of 2% of the true value is assumed).

N_U = Size of Universe = 10,470

The questionnaires were distributed to all 824 executives and the researcher received 252 questionnaires (31% return rate) out of which the incomplete questionnaires were excluded and finally, 238 completed questionnaires were used for this study as samples. The optimum size of the sample in management/social research is based on the nature of the empirical study, time and resources available, and various other considerations such as size of questionnaire, size of universe, nature of classes proposed etc. In practice, the complexity of the competing factors of resources and accuracy means that the decision regarding a sample size tends to be based on experience and good judgment, rather than relying on a strict mathematical formula (Hoinville et. al. 1978). Also the surveys need not necessarily have to involve samples of 1000 or 2000 people or events, instead, research involving a number between 30 and 250 cases is adequate (Denscombe, 1999) provided they well represent the cross section of the population and are completely randomised and unbiased. So, the sample size of 238 taken in research stands justified to a considerable extent and is a reasonably good estimate of the perception of the knowledge workers.

The sample consisted of 146 responses from junior executives, 68 responses from mid-level executives, and 24 responses from senior executives with 72 percent male and 28 percent female employees. Majority of the respondents were engineers (54 percent), a sizable number was management executives (26 percent), and the rest were IT professionals. Experience wise about 20 percent had more than 15 years of experience, 40 percent had 10 to 15 years of experience, 15 percent had 5 to 10 years of experience and the rest had less than 5 years of experience. So by and large, most of the respondents were quite competent to respond to the questionnaire.

Procedure

The respondents were contacted through the HR manager during their free timings and the purpose as well as the importance of the research was explained, and also, the anonymity of respondents was guaranteed to ensure that there would be no bias in their response. Before administering the questionnaire, some general questions were asked in a very informal manner to check whether they had serious involvement with KM. Most of the respondents were regular users of the KM system in the organization and had undergone extensive training on KM initiatives. Several visits were made to the company until the desired sample size was reached.

Method

The analysis of data employed the partial least square (PLS) approach to structural equation modelling (SEM). The reason for this choice is the simple fact that partial least square path modelling (PLSPM) is an analytic technique that runs principal component analysis (PCA) and regression analysis simultaneously. Thus, PLSPM is considered to be a more efficient analytic technique than the conventional method, in which, PCA and regression analysis are performed separately. Further, PLSPM successfully avoids multi-collinearity and measurement errors, while addressing the cause-effect relationships among the research constructs. There are two approaches, namely, covariance and PLS based approach. The covariance – based approach for SEM needs a larger sample (the definition of large size varies from one author to another viz. some define it as sample having more than 100 subjects and some others define it as a sample having more than 200 subjects, at least three indicators and typically requires reflective mode). PLS path modelling (PLS-PM) is generally meant as a component based approach to SEM that privileges a prediction oriented discovery process to the statistical testing of causal hypotheses. Further, PLS does not make assumptions about the population or scale of measurement and there are no distributional requirements (Fornell and Bookstein, 1982). Another benefit of PLS over other SEM techniques such as AMOS, LISREL is that it allows both formularize and reflective indicators to be used in the model (Fornell and bookstein, 1982). Therefore, this study used PLS technique using SmartPLS® software. The PLS analysis pursued here is a two-stage approach by first assessing the measurement model (validity and reliability), and then assessing the structural model by an estimate of the paths between the latent variables in the model and its predictive power.

Measurement Model

This study investigated the internal consistency of the metric and used three validity assessments viz., content validity, convergent validity, and discriminant validity, and also, the construct reliability and goodness of fit through R-square. Considering the exploratory nature of this study, the reliability of the study in terms of internal consistency is acceptable in terms of Cronbach's Alpha (0.7 and above) (Table 1) (Nunnally, 1978). Composite reliability values were all above the suggested value of 0.7 (Dillon-Goldstein's rho), indicating acceptable internal consistency. Content validity is mainly judgemental based on the meta-analysis of literature and discussion with the experts. In this research, for each construct the relevant literature has been analysed for its suitability and during the pilot run the content has been validated by the experts in the area of KM. Convergent validity is by calculating the item-to-total correlations; that is, the correlation of each item to the sum of the remaining items within a variable. Convergent validity measures the extent to which the items truly represent the intended latent construct. Convergent validity is assessed by factor loading and composite reliability measures (Hair et al, 1998). Only factor loading above 0.6 have been considered in this research (Table 2), which are adequately high (suggested cut-off value 0.4). The composite reliability measures the extent to which items in the construct measures the latent concept. A commonly acceptable threshold value for composite reliability is 0.7 or more, although values slightly below 0.7 have been considered acceptable (Haire et al, 1998). The composite reliability in this research is above 0.7, which indicates reasonably high construct reliability. The average variance extracted (AVE) values (Table 1), in the present research are all above the suggested values of 0.5 and the metric has relatively high discriminant validity (Fornell & Larcker, 1981). Another method used for testing the discriminant validity is, the square root of the AVE of each construct needs to be much larger, although there are no guidelines about how much larger, than any correlation between this construct and any other construct (Gefen & Straub, 2005). In this research this holds good for most of the constructs as the values are adequately large (Table 3). Further, the highest correlation is between the IT process for KM and organizational performance, which is later proved by the hypothesis testing. The least correlation between IT process for KM and IT support for KM also goes with the general understanding as both the constructs are independent of each other. Finally, R-square is basically one minus the square of unexplained variance. The larger the R-square value better is the fitness of the model. In the present research, R-square values for all the endogenous variables are above 0.7, which indicate that there is more than 70% of influence of exogenous variables on the endogenous variables of study.

Table 1: Reliability and internal consistency of the variables

	AVE	Composite Reliability	R-Square	Cronbach's Alpha	Communality	Redundancy

CBK	0.5296	0.8155	0.7473	0.7260	0.5296	0.3278
ITP	0.9974	0.9991	---	0.9987	0.9974	---
ITS	0.5437	0.8233	---	0.7642	0.5437	---
KPC	0.7888	0.8819	---	0.7326	0.7888	---
LBK	0.4892	0.7890	0.7678	0.6859	0.4892	0.2926
ORP	0.6261	0.8637	0.8595	0.7856	0.6261	0.3652

CBK = Capture based knowledge; ITP = IT processes for KM; ITS = IT support for KM

KPC = Knowledge process capability; LBK = Learning based KM;

ORP = Organizational performance.

Table 2: Factor Loadings (values below 0.6 excluded)

	CBK	ITP	ITS	KPC	LBK	ORP
CBK2	0.7501					
CBK3	0.6267					
CBK4	0.6502					
CBK5	0.8655					
ITK2		0.9984				
ITK4		0.9994				
ITK5		0.9984				
ITS1			0.9097			
ITS3			0.6234			
ITS4			0.6641			
ITS5			0.7189			
KPC2				0.5410		
KPC3				0.8995		
KPC4				0.8750		
LBK2					0.8659	
LBK3					0.6535	
LBK4					0.5893	
LBK5					0.6639	
ORP1						0.5881
ORP2						0.9529
ORP3						0.5855
ORP5						0.9529

Table 3: Correlations between the variables

	CBK	ITP	ITS	KPC	LBK	ORP
CBK	1					
ITP	0.8681	1				
ITS	0.0577	0.0272	1			
KPC	0.1770	0.1336	0.1807	1		
LBK	0.8215	0.8701	0.0587	0.1084	1	
ORP	0.8800	0.9512	0.0529	0.1291	0.8943	1

Alpha level = 0.05

Structural Model

Results from the structural model, as hypothesized, showed that IT process for KM was positively related to the capture based KM, with a path coefficient of 0.854, which supports the first hypothesis. This means, if IT support for KM is increased by say 1 unit, the capture based KM will improve by 0.854 units. As the very purpose of IT process of KM is to facilitate the capture based KM, this sounds pragmatic. Further, as expected, IT process for KM was also positively associated with the learning based KM, with a path coefficient of 0.634, a finding that supports the second hypothesis. As anticipated through theoretical study, the capture based KM was positively correlated with the Learning based KM with a path coefficient of 0.271 and organizational performance with a path coefficient of 0.445, thus supporting the fifth and sixth hypothesis. Learning based KM was positively associated with organizational performance, with a path coefficient of 0.528 supporting the seventh hypothesis. R-square measures the capacity of the manifest variables to describe the related latent variables and it is expected to be higher than 0.60 for each manifest variable (Zaim et al., 2007). Incidentally, the three latent variables in the first stage of the model(IT process for KM, IT support for KM, and Knowledge process capability) explained nearly 75 percent of the variance of the capture based KM, and about 77 percent of Learning based KM. In the second stage of the model the two latent variables (capture based KM and Learning based KM) accounted for about 86 percent of variance of organizational performance (Figure 2). Hence, the model adequately explains the interrelationships between the variables of study.

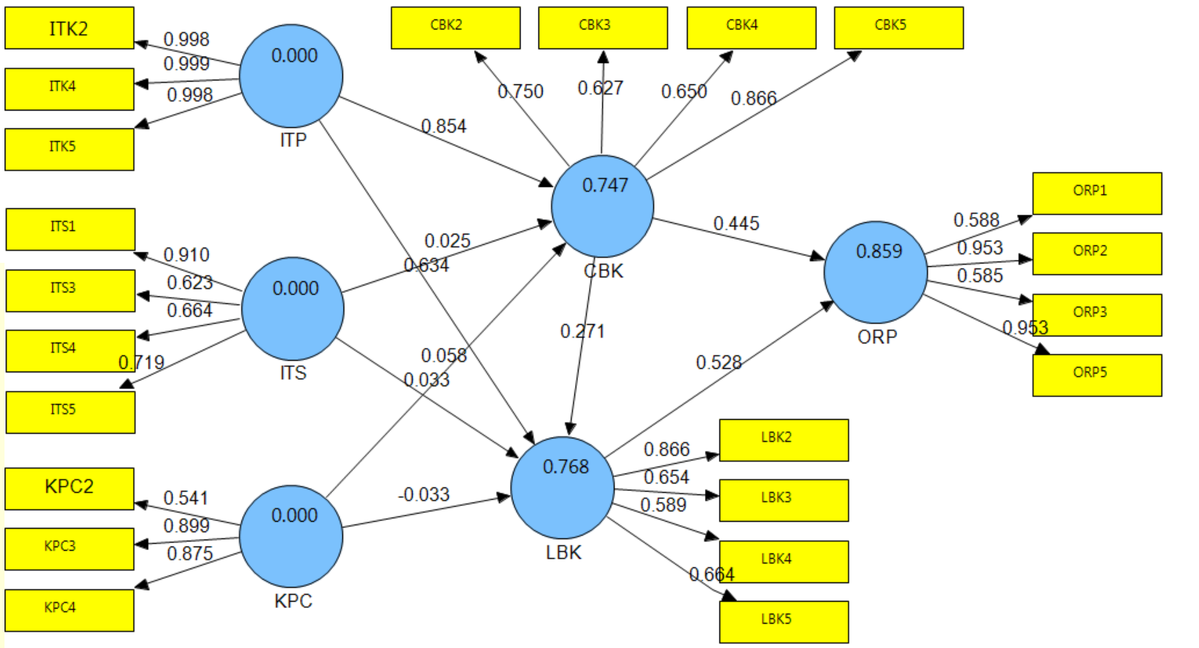

Figure 2: Factor loadings after reduction and path coefficients.

The path coefficients basically show the strength of association between the latent variables of study, but hypothesis testing basically performed based on the t-statistic. The t-values and the structural model with the t-values are given in table 4 and figure 3. Hence, it is clear that the following hypotheses stand supported.

H_1: IT processes for KM significantly influence capture based KM.

H_2: IT processes for KM significantly influence learning based KM.

H_5: Capture based KM significantly influences learning based KM.

H_6: Capture based KM significantly influences organizational performance.

H_7: Learning based KM significantly influences organizational performance

H_9: Knowledge process capability significantly influences capture based KM.

H_{10}: IT process for KM significantly influences organizational performance.

Table 4: t-statistic of the variables

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	T Statistics (|O/STERR|)	Hypothesis
1. ITP -> CBK	0.8514	0.8548	0.0094	0.0094	90.5830	**Supported**
2. ITP -> LBK	0.1308	0.8668	0.0096	0.0096	13.6320	**Supported**
3. ITS -> CBK	0.0248	0.0238	0.0343	0.0343	0.7245	Unsupported
4. ITS -> LBK	0.0396	0.0309	0.0376	0.0376	1.0050	Unsupported
5. CBK -> LBK	0.2711	0.2687	0.0494	0.0494	5.4902	**Supported**
6. CBK -> ORP	0.5884	0.5883	0.0304	0.0304	17.5414	**Supported**
7. LBK -> ORP	0.5278	0.5268	0.0256	0.0256	20.648	**Supported**
8. KPC -> LBK	-0.0173	-0.0123	0.0226	0.0226	1.5500	Unsupported
9. KPC -> CBK	0.0578	0.0567	0.0238	0.0238	2.4287	**Supported**
10. ITP -> ORP	0.8371	0.8387	0.0107	0.0107	78.0245	**Supported**
11. ITS -> ORP	0.0320	0.0268	0.0315	0.0315	1.0149	Unsupported
12. KPC -> ORP	0.0166	0.0188	0.0182	0.0182	0.9128	Unsupported

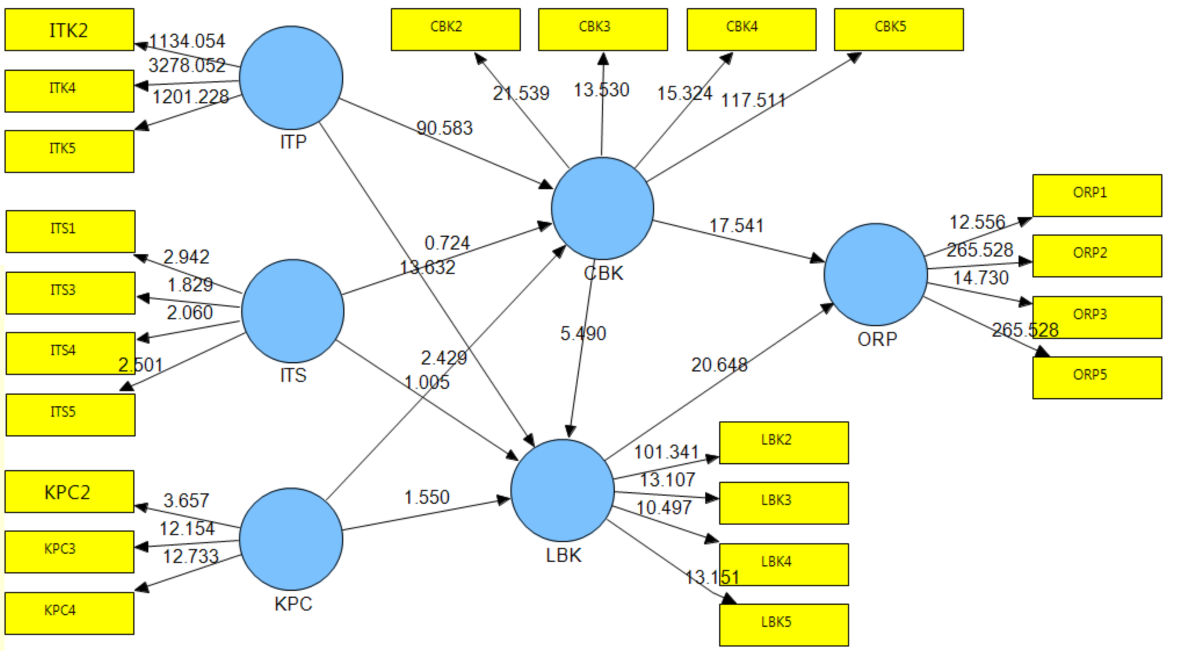

Figure 3: Structural Research Model with correlation and t-statistics

Discussions and implications for knowledge managers

This research identifies a clear path from IT process for KM to organizational performance. Hypotheses H_1, H_2, H_5, H_6, and H_7 which stand supported indicate that well designed IT processes positively influence the capture based KM, as well as learning based KM. Capture based KM further influences learning based KM, and both capture based KM as well as learning based KM positively influence the organizational performance. One direct implication to the managers is that it is the IT processes which significantly influence the organizational performance in any knowledge intensive sector and they need to design and monitor efficient and effective IT processes, which have the ability to promote capture based as well as learning based KM. Gold et al., (2001) have emphasized that an organization should be able to assess its preconditions for successful KM and their impacts on KM performance. This research clearly reveals that it is the IT processes in the organization which form the crucial preconditions for KM performance as well as the organizational performance. The study also had some unexpected revelation that IT support to KM took the back seat in comparison to the processes in influencing the organizational performance. Even though it doesn't imply that IT support is not important, it is the well-designed processes which can result in better organizational performance. There are studies to support the fact that IT processes have improved organizational performance (Bergeron et al., 2004 and Cragg et al., 2002). IT processes can increase revenues, decrease costs (Johnston et al., 2007), and drive innovation (Dibrell et al., 2008) and this research aligns itself with these studies which are undertaken in different contexts. Having realized that IT processes have important bearing on performance, the question that naturally arises is, which one of those processes would be more important in a particular context? Tallon (2007) opines that firms may want tight alignment in some processes only and that alignment was easier to achieve in some business processes than in others. So, it is the manager's prerogative to narrow down to those IT processes which are most relevant to the business context. IT processes in complex situations such as supply chain management, customer relationship management, enterprise resource planning etc., may be more challenging, as it may require system integration. However, irrespective of the context or situation, for KM to produce results, interaction between all the four types of processes (socialization, externalization, internalization and combination) defined by Nonaka and Takeuchi (1995) for the interaction between tacit to explicit knowledge, which would result in innovation and organizational performance will be important. So, the IT processes well designed to consider all the four cases of knowledge conversion has the true potential to enhance organizational performance.

This research has revealed that knowledge process capability (KPC) has significant positive influence on capture based KM (H_9). Lee et al., (2012) had obtained the empirical evidence for KPC and organizational performance through the mediating effect of creative organizational learning. But this research significantly differs from the work undertaken by Lee at al., in the sense that KPC has a positive influence on capture based KM, but not on learning based KM. Further, this research also reveals the fact that both capture based KM and learning based KM have significant influence on organizational performance. So, it is clear that KPC can influence organizational performance through capture based KM. This was completely ignored by previous studies and most of the researchers were focusing only on the study of the influence of IT processes for KM (Pérez-López, Joaquin Alegre, 2012) or IT support for KM (Lee and Choi, 2003; Kulkarni et al., 2007) on KM performance or organizational performance. While these studies have contributed to a great deal on the individual influences, the current study attempts to give an empirical evidence for the combined influence in the context of organizational performance. So, one more managerial implication of the study is to develop a metric for knowledge process capability measurement in the organization so that it can be constantly measured and improved and enhance the capture based KM continuously. While developing a metric for knowledge process capability, the antecedents: collaboration, trust, learning culture, decentralization, IT supports (Lee and Choi, 2003); top management support (Carpenter and Fredrickson, 2001); and promotion (Kankanhalli et al., 2005) may be considered. Finally, IT process on KM also has a direct significant influence on organizational performance (H_{10}), which merely underscores the importance of IT processes for KM in a knowledge intensive organization, which has been already discussed.

Conclusions

Zaim et al., (2007) had observed that the research literature lacks empirical evidence to prove that KM processes and infrastructure contribute to the performance of KM applications. Their study has successfully established relationship between these enablers and KM performance, but they have not addressed the issue of organizational performance. The ultimate purpose of the existence of KM is to provide the organization with the competitive advantage which in turn is a function of cost leadership, product differentiation and overall performance of the business. So, the study of this nature will be complete if the KM processes and infrastructure are empirically related to either competitive advantage or one of its components. With this as the premise, the research has successfully provided the empirical relationship between the IT process for KM, IT support for KM, knowledge process capability and the organizational performance with the moderating effects of capture based KM and learning based KM. This research has identified that IT processes for KM have greater impact than any single dimension on the overall organizational performance. So, the managerial imperative is to have a very well established set of IT processes for KM which will drive both the capture based KM and learning based KM and have the ability to enhance organizational performance.

The issue of adequate sample size is not a major consideration in structural equation modeling, as the bootstrapping technique can address this issue to a considerable extent. So, the results of this research can be generalized to a considerable extent, as it is based on a knowledge intensive organization. The future scope of this research lies in extending the study for the other dimensions of competitive advantage, because the ultimate aim of KM is to make the organization more innovative so as to ensure sustainability. So, the challenge to the KM community is to come out with innovative IT processes, which can meet the changing global needs of information processing.

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