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Effect of Incentives on Knowledge Sharing and Learning – Evidence from the Indian IT Sector

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***Abstract*—**The organizations in the knowledge economy era have recognized the importance of building knowledge assets for sustainable growth and development. In comparison to other industries, Information Technology (IT) enterprises, holds an edge in developing an effective Knowledge Management (KM) programme-thanks to their in-house technological abilities. This paper tries to study the various knowledge based incentive programmes and its effect on Knowledge Sharing and Learning in the context of the Indian IT sector. A conceptual model is developed linking KM Incentives, Knowledge Sharing and Learning. A questionnaire study is conducted to collect primary data from the knowledge workers of the IT organizations located in India. The data was analysed using Structural Equation Modeling using Partial Least Square method. The results show a strong influence of knowledge management incentives on knowledge sharing and an indirect influence on learning.

***Keywords*—**Knowledge Management, Knowledge Management Incentives, Knowledge Sharing, Learning.

I. Introduction

KNOWLEDGE Management (KM) deals with how to manage knowledge assets effectively so that it enables the organization to improve its performance. The active and dynamic implementation & management of knowledge are critical to enabling organizational performance enhancements, problem solving, decision making, and teaching [1]. Understanding the need of implementing a Knowledge Management System (KMS) is profoundly important for new organizations as well as existing organizations. Over the last decade or so, KM has found its space as a major discipline in an organization's formal functional structure.

Knowledge management is the answer to some of the critical issues such as organizational adaptation, survival and competence in this era of knowledge economy and it is the only tool that helps an organization to gain insight and understanding from its own experience [2]. Some of the most successful and influential companies compete primarily on the knowledge-based strategy whereby knowledge and knowledge-based products drive their global strategy. In fact, the core competency of these companies is to commercialize knowledge faster and more efficiently than their competitors. They achieve their strategic goals through organizational structure, processes and culture that are integrated to support knowledge workers and knowledge driven strategy [3]. The IT sector was one of the early adopters of the KM initiatives, because they seemed to have realized much earlier the potential of a KMS in a dynamic and changing business environment like IT. This movement helped such organizations to come out of a people-centric approach to more of a knowledge-centric one, which gave them the much needed freedom and flexibility to innovate and compete in the global economy. IT organizations, with their in-house technology capabilities, were also in a much better position compared to other sectors, to begin their own KM initiative.

As in the case of any other functional area, knowledge management also has certain factors which have been identified crucial to its success, which is often referred to as the critical success factors (CSFs) of KM. One of the critical success factors of knowledge management as proposed by various researchers is Knowledge Management Incentives (KMI). For the successful implementation and sustenance of KM programmes within an organization, the employees should be motivated for knowledge sharing and learning. Hence KMIs are crucial for developing a long term KM initiative that generates new knowledge which could ultimately lead to innovation. This paper tries to understand the relationship between knowledge management incentives, knowledge sharing and learning.

II. Literature Review

According to Redman, that which does not get measured does not get managed [4]. Measurement of the KM activities of employees and providing appropriate incentives is extremely important for improving the process [5]-[11]. The growth of the organization's knowledge assets needs to be evaluated and the individual contribution of the employees needs to be measured consistently. Employees are not mere users of a knowledge management system, but they also generate and contribute knowledge to the KMS: The voluntary sharing of knowledge by individuals is a crucial element in the implementation and success of any knowledge-management initiative; KM community has theorized, examined, and implemented various incentive structures to promote knowledge sharing and systemic approach in organizations [12].

Recognition, in the form of incentives, for their efforts in knowledge contribution, employees can be further motivated to contribute to the various processes of KM. According to Hendriks and Sousa [13] the main themes of knowledge work motivation are:

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A. For Knowledge Work

Tampoe identified three key motivators for knowledge workers viz. personal growth, operational autonomy, and task achievement. The knowledge workers should be sufficiently motivated for their overall knowledge work in the organization [14].

B. For Knowledge Creation

Creativity of the employees should also be motivated, this can lead to generation of more innovative ideas and hence more knowledge creation. Elements of the work environment such as supervisory encouragement, workgroup supports, adequate availability of resources, absence of undue workload pressure, and other work contextual variables have been shown to have a positive impact on creativity [15].

C. For Knowledge Sharing

Knowledge sharing and associated motivation is related to a variety of subjects, such as knowledge intensive collaboration, the formation of knowledge teams, and so forth. According to Osterloh and Frey intrinsic motivation is particularly important for the transfer of tacit knowledge [16].

D. For the Adoption of KM

McKenzie et al reported that making the end users understand the value of a KM initiative is the best guarantee that the employees will be motivated to adopt the initiative [17]. They also suggest that a close connection between intrinsic motivation and a KM program is essential. Malhotra and Galletta suggest that, in addition to intrinsic motivators, extrinsic motivators also make the knowledge worker to decide whether or not to participate in a KM initiative [10].

Hence the ultimate aim of providing incentives is to increase knowledge sharing and promote learning so that the KM programme gets benefited. The current study aims to empirically analyse the role of incentives with respect to knowledge sharing and learning. The following are the objectives of this research:

1. To assess the influence of knowledge management incentives on knowledge sharing and learning.
2. To analyse the relationship between knowledge sharing and learning.

III. Hypotheses Development

Recognition, in the form of incentives, for their efforts in knowledge contribution, employees can be further motivated to contribute to the various processes of KM. According to Hendriks and Sousa, without work motivation, individual knowledge workers may direct their efforts to their individual needs at the expense of organization goals or decide to leave the firm [13]. Various other KM researchers [5], [6], [9]-[11], [18]-[21] have also supported the view that incentives can improve knowledge sharing in an organization. In order to get the knowledgeable workers to share their knowledge with their colleagues, incentive and reward systems are required [5], but it should be chosen carefully so that it helps in achieving the purpose for why it is given. Malhotra and Galletta were of the opinion that although KM incentives are important, it does not guarantee knowledge sharing [10]. Nanelicited that for knowledge with high level of intangibility (like in the case of an IT organization) it is difficult to encourage employees to share knowledge [20]. Hence it needs to be empirically tested whether incentives provided are resulting in the desired knowledge sharing behavior. These reviews form the basis of the first hypothesis which states:

H1. There is a significant relationship between knowledge management incentives and knowledge sharing.

Apart from sharing of knowledge, the incentives should also be directed towards learning and usage of knowledge, which is a critical success factor for KMS success. Incentives to motivate users to learn from experience, and to adopt KMS is crucial for developing and improving the organizational knowledge [8]. Learning and creativity of the employees should also be motivated, as this can lead to generation of more innovative ideas and hence more knowledge creation [15]. Therefore there is a need to analyze if the current incentive structures are promoting learning in an IT sector scenario. This forms the basis of the second hypothesis which is stated as below:

H2. There is a significant relationship between knowledge management incentives and learning.

Almahamid and Mcadams opined that knowledge sharing practices can improve employees' commitment towards learning [22]. Also when employees start sharing knowledge it could develop peer pressure and force knowledge workers to practice continuous learning [19]. When knowledge is readily available through sharing, the employees are ready to use them effectively for their personal benefit and as well as for carrying out their routine activities. Adequate availability of resources can lead to improved learning and enhanced creative ability of work force [15]. Kamasak and Bulutlar suggested that knowledge sharing can lead to learning which can ultimately result in improving a firms' innovative capacity [23]. Hence the third research hypothesis for this research is developed as follows:

H3. There is a significant relationship between knowledge sharing and learning.

IV. Research Methodology

A. Samples

The objective of this study is to analyze the interrelationship between KM incentives, Knowledge sharing and Learning in the Indian IT sector, in companies who have already implemented KM and were successful in doing so. The IT sector was chosen for the reason for it being one of the early adopters of the KM initiative. The Indian Most Admired Knowledge Enterprises (MAKE) study in 2010, reported that out of a total of 14 Indian organizations that were selected as 2010 Indian MAKE Finalists, 50% were IT companies. Since the MAKE study analyzed an organization's intellectual capabilities in-depth, the MAKE report 2010 was used as a guideline, to shortlist the IT companies for the present study.

Six IT companies were randomly selected from the MAKE finalist list of 14 companies, for this study.

The target group for the survey was the knowledge workers in these organizations which includes Project Managers, Team Leads and Team Members. Participants with a work experience of less than one year in their respective organizations were excluded from the study. Also support staff who are not directly involved in the IT operations, were not included in the study. Since the target population was diversified and scattered, data collection method which was most suitable was a self-administered online survey. An online survey was created using the online survey tool, SurveyGizmo™ (Version: 3.19.1) which is a user friendly application to create surveys.

The data for this research was collected in two stages. In the first stage, pilot test was conducted to validate the survey instrument by collecting 24 responses. After the questionnaire validation, primary data was collected for the final analysis. The potential participants of the survey were first contacted through phone, requesting them to participate and also an overview of the purpose of the survey was provided. Later, the survey links were e-mailed to the respondents, describing in brief about the study, along with a covering letter. Repeated reminders were given through phone and e-mails to persuade the respondents to participate in the study. A period of four months was given for the data collection. Finally, after several requests, 185 responses were received and out of which 43 responses were discarded due to insufficient or inaccurate data. Thus 142 complete and sufficient responses were used for the final data analysis.

B. Research Instrument

Based on the objectives of the research a questionnaire was developed to collect the data. The questions were selected on the basis of literature review and with the consultation of the experts. Since the target group were the knowledge workers of the IT sector, the questions were developed to suit their understanding. Content validity and pilot study was also carried out to validate the questionnaire. For recording the responses, the Likert scale rating method was used. It was suggested by Finstad that for an electronic radio-button style survey tool, since it is an unsupervised usability questionnaire, the 7-point Likert items provided a more accurate measure of a participant's true evaluation compared to the 5-point Likert scale [24]. Since this research was also meant to be distributed in a similar fashion, 7-point Likert scale ranging from "Strongly Agree" (7) to "Strongly Disagree" (1) was adopted for each indicator of the constructs.

C. Content Validity

Content validity refers to checking whether the research instrument has a true and adequate coverage of the concept for which it is developed. The content validity of the measure will be considered good and accurate, if it represents the universe of the subject matter of interest adequately. Generally, it is judgmental processes in which various experts judge the content of measure [25]. Therefore, the content validity of the questionnaire was checked through a two stepprocess. Firstly, the questionnaire was presented to two academicians who reviewed the content of the questionnaire. The suggestions in terms of concept, wording, construction etc were incorporated and the questionnaire was modified accordingly. As a second step, the survey instrument was sent to two knowledge management experts working in the IT industry for their review. Based on the two stage review process, a final draft of the questionnaire was developed which consisted of 5 items to measure KMI, 5 items to measure Knowledge sharing and 2 items to measure Learning – the major constructs of study.

V. Results and Discussion

A. Demographic Analysis

The first part of the questionnaire captured demographic information of the respondents. Some of the demographic characteristics are portrayed in Figs. 1 and 2. The average years of experience of the respondents in their current organization was 3.2 years and the average of total years of overall experience of the respondents was 4.7 years. The company-wise response rate of the employees of the six companies, who were selected for the study, is shown in Fig. 1. The names of the companies are not mentioned due to ethical considerations. The participation was fairly proportionate to the size of the organization, although a few variations were observed.

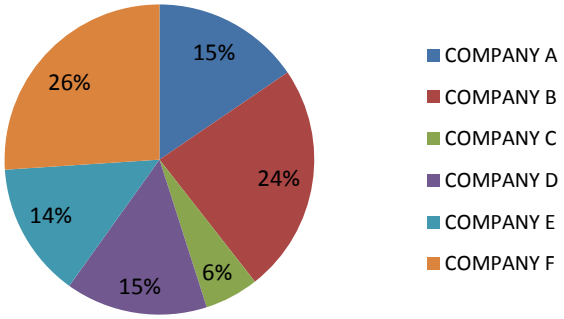

Fig. 1 Company-wise response rate

Fig. 2 depicts the role-wise participation in the survey. 60% of the respondents belonged to the category of software engineers, 35% to the category of Team Leads, 4 % belonged to the Project Manager level and around 1% did not reveal their designation.

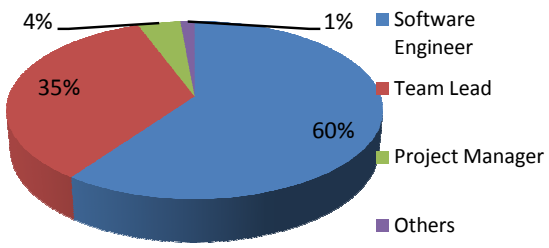

Fig. 2 Role-wise response rate

B. Statistical Analysis

Partial least square-structural equation modeling (PLS-SEM) approach was used to analyze the model and Smart-PLS 2.0 software was used for conducting the analysis. PLS is a modeling approach to SEM which does not make any assumptions about the data distribution [26]. Also, it can be used in cases where sample size is small and predictive accuracy is paramount [27]. Before assessing the structural model, to determine the validity and reliability of the research instrument, the measurement model was analyzed [28].

TABLE I
MEASUREMENT MODEL EVALUATION – VALIDITY TEST RESULTS

Constructs	Items	Loadings	Cronbach's Alpha	CR	AVE	SQRT of AVE
SHR	SHR1	0.684	0.728	0.831	0.553	0.743
	SHR2	0.752				
	SHR3	0.817				
	SHR4	0.714				
LRN	LRN1	0.881	0.697	0.868	0.768	0.876
	LRN2	0.871				
KMI	KMI1	0.763	0.746	0.839	0.567	0.753
	KMI2	0.762				
	KMI3	0.827				
	KMI4	0.635				

Note:
(1) Items SHR5 and KMI5 were deleted due to low loadings
(2) CR = Composite Reliability; AVE = Average Variance Extracted
(3) SHR = Sharing; LRN = Learning; KMI = Knowledge Management Incentives

C. Testing of the Measurement Model

The convergent and discriminant validity of the scales were analyzed in to confirm if the measurement model was adequate enough to assess the respective dimensions. Convergent validity can be defined as "the degree to which two or more items measuring the same variable agree" [29]. Convergent validity of the measurement model can be assessed in two ways. If the values for average variance extracted (AVE) for each dimension is greater than 0.50 and the composite reliability (CR) is greater than 0.80 [30] it can be concluded that the items of each construct have convergent validity. The results show that (Table I) the loadings for all items were greater than 0.60 [32] and the CR of each factor was: Knowledge Management Incentives (KMI) = 0.839, Knowledge Sharing (SHR) = 0.831 and Learning (LRN) = 0.868, which were above the proposed value of 0.80 (Fornell & Larcker, 1981). Also the value of AVE of each construct was: KMI = 0.567, SHR = 0.768 and LRN = 0.553, was above the cut off level of 0.50 [30]. Hence the convergent validity of all the three constructs of the measurement model was established (Table I).

Discriminant validity can be defined as the "degree to which items differentiate between variables" [31]. This can be determined using latent variable correlation analysis and also by checking the square root of AVEs to its inter-construct correlations. Table II shows that the square root of AVE exceeds the correlation coefficients of the inter-constructs. In addition to this, to confirm the discriminant validity, the correlation estimates of the constructs should outline a set of indicators to measure that different constructs are not very high (>0.90) or very low (<0.10) [32]. Table II shows that the highest correlation between the exogenous constructs was 0.683 (i.e. between SHR and LRN). Therefore, it can be concluded that the measurement model exhibited appropriate levels of discriminant validity.

TABLE II
MEASUREMENT MODEL EVALUATION – LATENT VARIABLE CORRELATION AND DISCRIMINANT VALIDITY

	KMI	LRN	SHR
KMI	**0.753**		
LRN	0.360	**0.876**	
SHR	0.632	0.683	**0.743**

Notes:
(1) N=142, square root of AVE is shown on the major diagonal (bold);
(2) SHR = Sharing; LRN = Learning; KMI = Knowledge Management Incentives

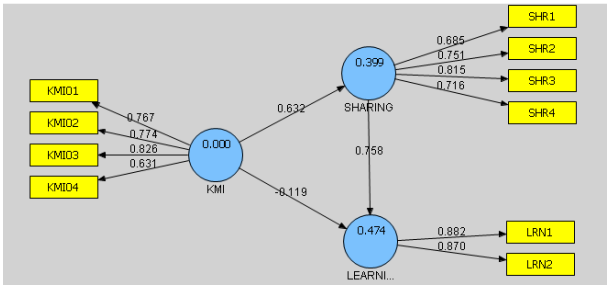

Fig. 3 Structural Model with Path Coefficients and Outer Loadings

D. Structural Model

After establishing the validity and reliability of the measurement model, the structural model was subject to evaluation. The PLS-SEM result revealed that 39.9% of the variance of SHR was explained by KMI and 47.4% of the variance of LRN was explained by KMI & SHR together (Fig. 3).

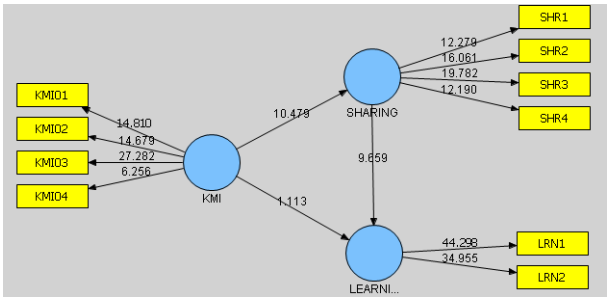

Fig. 4 Structural model with t-values

As illustrated in Table III, KMI (β = 0.632, t = 10.370, p < 0.001) has a strong positive significant influence on SHR. Also it was revealed that SHR (β = 0.758, t = 9.463, p < 0.001) has a very significant influence on LRN. But, KMI (β = -0.119, t = 9.463, p > 0.05) was found to have no influence on LRN. The path coefficients can be observed in Fig. 3 and the inner t-values and outer t-values are also shown in Fig. 4.

Therefore the hypotheses H1 and H3 were supported whereas the hypothesis H2 was not supported.

TABLE III
PARTIAL LEAST SQUARE RESULTS OF HYPOTHESIS TESTING

Independent Variable →Dependent Variable	Path coefficients	t-value	p-value	Remarks
KMI → SHR	0.632	10.370	<0.001*	*Supported*
KMI → LRN	-0.119	1.104	0.269	*Not Supported*
SHR → LRN	0.758	9.463	<0.001*	*Supported*

Note:
(1) N = 142.
(2) * Significant at 0.1% level.

E. Discussions

The findings of this study proved that Knowledge Management Incentives (KMI) has a strong positive impact on Knowledge Sharing (SHR), but at the same time it was failed to prove that KMI had any direct significant impact on Learning (LRN). The findings were in line with the previous studies which claimed that incentives had an impact on sharing [5], [9], [10]. This clearly indicates that the top management of IT firms is keen in providing incentives for knowledge sharing and they are achieving fruitful results in doing so. However, it seems that there incentives are directed more towards the sharing aspect of knowledge and not towards learning. It can also be inferred that the incentives given by the management is encouraging employees to share their knowledge. But it is no way influencing their learning behavior directly.

Also it was revealed that that there exists a strong positive relationship between Knowledge Sharing (SHR) and Learning (LRN) as it has been hypothesized. These results were consistent with previous research findings [15], [19], [23] which claimed that sharing and learning are closely related. It is concluded that knowledge sharing practices within the organization is helping individuals and teams to improve learning. It has to be noted that although KMI is not having a direct impact on Learning, the KMI is influencing sharing in a strong way which in turn is influencing learning of individuals.

VI. IMPLICATIONS, LIMITATIONS & FUTURE SCOPE

A) Implications

The results clearly highlight the impact of incentives on knowledge management initiative of IT organizations. It underscores the fact that KMI is indeed a critical success factor for the success of a KM in any organization. Top management should give consistent focus on the incentives provided for knowledge sharing. Policies could be devised were knowledge sharing can be linked with annual appraisal of employees. This could motivate the individuals to find time for sharing knowledge along with their routine work. Identifying experts in an organization and trying to give specific incentives to them for knowledge sharing can significantly influence the quality of the knowledge being shared.

Although from the results it is not evident that incentives are not directly influencing learning, it can be inferred that it is indirectly influencing through sharing, because sharing is found to have a strong influence on learning. Hence if management along with focusing on incentives for sharing, if they can also devise policies to link incentives to the learning aspect of individuals, then the impact could be double fold. This could lead to a knowledge spiral and create an environment in the organization were knowledge is constantly shared and acquired and shared again, which ultimately makes the organization innovative.

B) Limitations and Future Scope

One of the limitations of this study is that the data collected was purely based on self-reported survey data. This could result in response bias, hence in future research it is suggested to couple the survey along with qualitative collection of data through field observation and interviews with knowledge workers. Secondly, only incentives have been considered as one factor which is influencing sharing and learning, whereas there could be few other factors which may also be relevant to the model. Hence it is recommended for future researches to explore and extend the model with other parameters, based on literature review, so that the dependent variable behavior can be explained with greater confidence.

VII. CONCLUSION

The success stories of several leading organizations further strengthens this point that incentives in the forms of Employee stock options (ESOP), Knowledge currency units (KCUs), etc. are very effective in promoting higher level of KMS performance. The KM incentives turn out to be such a key factor with great leverage which improves the KMS success to a greater extent by improving the knowledge sharing. The focus on this factor is extremely important and critical for the success of KMS. This factor, almost certainly, contributes hugely to the motivation factor of the employees to endorse the KM programme. When the benefits in the form of incentives seem to be visible, the employees go for it, which results knowledge sharing and ultimately the success of KM. The results of this study clearly suggest that, retaining the existing incentives on sharing and introducing new incentives for learning, could have a multi fold impact on the success of a knowledge management initiative.

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