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RESEARCH KNOWLEDGE MANAGEMENT SYSTEM IN UNIVERSITY: FACULTY INTENTION AND POTENTIAL BARRIERS

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Abstract: *Knowledge creation is an essential pre-requisite to ensure sustainable competitive advantage of universities in a highly net-worked and integrated globalised setting. Universities, worldwide, strive hard to achieve excellence in research through increased research productivity and its outcome. Literature shows that knowledge management systems contribute significantly to improve research productivity in higher education institutions. This paper investigates the antecedents to faculty members' intention to contribute to research knowledge management system in a private deemed university. The study has explored faculty perception towards the research knowledge management system, faculty intention to contribute and barriers of research knowledge sharing. Customised survey instrument was used to elicit information from the subjects of the study, using mail survey method. Results indicate that discipline is the most prominent predictor of faculty's intention to contribute to Research Knowledge Management System. Cultural and Institutional Support barriers to knowledge sharing have been identified and possible areas of KM application in research have been proposed.*

Key words: *Knowledge management, Research knowledge management system, Academic excellence, Faculty research, Academic entrepreneurship*

INTRODUCTION

Roles of higher education institutions (HEIs) have undergone sweeping changes owing to manifold aspirations and requirements of their diverse stakeholder strata. Engagement of HEIs as mere disseminators of knowledge draw a low key attention in a stakeholder-centric operational design. Continuous knowledge creation is a source of sustainable competitive advantage (Davenport & Prusak, 1998; von Krogh *et al*., 2000). The mandates of such institutions/universities as creators of knowledge through cutting-edge research need no emphasize. When universities are on the race to be enlisted in the elite club of 'world-class' universities through global ranking, research will become an institutional priority. Moreover, as a reciprocal commitment to the support and patronage that universities receive from community, the former create new understanding, new technologies and provide

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store-house of knowledge and capabilities that the society can draw upon (GoE, 2013). Research-intensive universities promote excellence in research and education by emphasizing the mutual dependence of these activities (*ibid*). Constantly changing global atmosphere and its complexities (Cheng, 2015) necessitate universities/ HEIs to be knowledge factories by developing and sharing knowledge.

Speaking from the national perspective, developing countries have ample potential due to the availability of a vast unutilized or underutilized talent pool. India has the largest higher education system, in terms of number of institutions in both public and private sector (Ernst & Young, 2012). Steady rise in gross enrollment ratio signals the emerging opportunities in higher education on an enormous scale. This calls for the capability and preparedness of the system to leverage the current as well as emerging opportunities. Research, as an indicator of the capability of faculty expertise and institutional policy on knowledge creation, can offer ample visibility to its creators among their peers and stakeholders. Quality of Research is considered to be one of the important aspects to achieve excellence in higher education and to be a globally recognized institute. GOI (2016) has identified research as one of the thrust areas to improve quality in higher education. A serious concern in this regard is the inability of the system to build synergy between teaching and research to promote excellence in the process of knowledge development (*ibid*). British Council (2014) has noted several challenges of Indian institutions to be research-intensive. Lack of quality researchers, little opportunities for interdisciplinary research, and lack of early stage research experience to name a few (*ibid*). An analysis of research output in Scopus indexed database (Prathap, 2016) reveals that India's research base is skewed towards engineering and physical sciences and there is no significant contribution from areas of social sciences, business, management and accounting.

BACKGROUND OF THE STUDY

Knowledge management (KM) process involves creation, dissemination, upgrade and application of pertinent knowledge towards organisational survival (Awad & Ghaziri, 2007). Research is the enabler of knowledge creation. As one of the most enduring institutions in history, universities are the immense reservoir of knowledge and expertise, primarily embedded in the resources of faculty (Bird & Allen, 1989). KM research has predominantly been focussed on knowledge-intensive organisations in IT and consulting firms. But application of the concept is more relevant in the context of educational institutions, as they operate within the framework of knowledge dissemination. However, KM research in HEIs have received attention recently. Several researchers have studied benefits of RKMS implementation in HEIs (Kidwell *et. al.,* 2000; Wang *et al.,* 2006; Cranfield, 2011; Chumjit, 2012; Tan & Noor, 2013; Hosain *et. al,* 2015). In Indian HEIs context, few

researchers have developed frameworks to implement KM in HEIs (Rajan & Khalil, 2007; Bhusry & Rajan, 2011) and identified challenges to implement KM in HEIs (Ashish & Arun, 2006; Vashish *et al.,* 2011). Institutional repositories developed and maintained by universities facilitate aggregation of their faculty members' scholarly works in public domain. These repositories facilitate dissemination of research works such as publications, PhD theses and students' projects. Nation-wide repository of PhD theses, *Shodhganga* by UGC, mandates universities to deposit their PhD theses with an objective of augmenting quality of research, avoid duplication and provide open access to research outputs. Such institutional repositories may be a stepping stone to build a store-house of aggregation. But it is not adequate to inculcate a research culture, interdisciplinary collaboration and improve quality of research. The inputs for draft national education policy 2016 (GoI, 2016) underline the need to develop an enabling climate for research and innovations for facilitating the emergence of a new knowledge society. Intensive research activities and their proper management are key to realize the vision of the new education policy. Research-intensive academic environment has been identified as academically entrepreneurial (Bird & Allen, 1989).

Availability of research embedded faculty members, who have altruistic benevolence to share knowledge, in a university/ HEI is analogous to perennial tributaries that continuously enrich the reservoir. Sufficient institutional support, in terms of an adequate and suitable architecture, is to be built up to sustain and scale-up the knowledge creation process. The presence of Research Knowledge Management System (RKMS) is a befitting environment for organisational excellence. It can encourage intensive culture in intra-institutional level with supportive spill-over by harnessing collaborative capabilities across disciplines. Mutually reinforcing collaboration will result in organisational synergy through unwavering and passionate team learning. Senge (1990) identifies team learning is an essential pre-requisite to create a learning organisation, which stays ahead of the curve timelessly. He defines team learning as constant augmentation of collective capabilities and improving team effectiveness (*ibid*.).

This paper investigates the antecedents to faculty members' intention to contribute to RKMS at university level, focusing on a private deemed university in India. It explores what features of the RKMS, faculty members consider useful for their research work, and identifies barriers to knowledge sharing within the university. The paper proposes possible areas in which RKMS may be developed in higher education institutions, focusing on the following major research questions.

- What do faculty members of a private university perceive about RKMS?
- What demographic attributes of faculty members' explain their intention to contribute to RKMS?

- What are the barriers to research knowledge sharing among faculty members?

LITERATURE REVIEW

Literature on RKMS is sporadic and scanty owing to the dearth of studies and relatively new embarkation of KM on academic realm. Schubert *et al.* (1998) define Knowledge as "understanding gained through experience or study". Knowledge management primarily involves four critical processes of knowledge creation, knowledge storage and retrieval, knowledge transfer, and knowledge application (Alavi & Leidner, 2000). Groff and Jones (2003) define knowledge Management systems as "tools, techniques and strategies to retain, analyse, organise, improve and share business expertise". Kidwell *et al.* (2000) outlined KM applications in research and identified that RKMS should include repository of research interests of faculty members, research results and funding organisations. Research Knowledge Management System is a comprehensive set of strategies and processes to create, capture and disseminate research knowledge assets to enhance a university's research performance and competitiveness. It guides young researchers to understand best practices and facilitates experience sharing. Research Knowledge management systems provide several benefits to higher education institutions. Several researchers have acknowledged the benefits of RKMS as described in Table I. RKMS is a one stop portal guiding researchers on policies on grant proposal and management, funding opportunities, templates on technical and financial reports, exemplars on budgets and proposals, information on internal services and resources Kidwell *et al.* (2000).

While several higher education institutions have initiated institutional repositories, it is observed that deposit rates are very low (Cullen & Chawner, 2011). Implementation of a comprehensive research knowledge management system in higher education is also lacking. In spite of the benefits, higher education institutes are yet to reap the full potential of knowledge management system (Agarwal *et al.*, 2014). The KM implementation failure is attributed to reasons such as lack of support from leadership (Disterer, 2001), lack of sharing culture (Bhusry & Rajan, 2011), users do not perceive value or afraid of consequences of their contribution (Disterer, 2001). Vashist et al. (2010) identified that lack of time, work load, poor access to resources and infrastructure, lack of motivation, fear of losing their knowledge were some of the barriers to KMS in Indian higher education systems.

Studies (Covey, 2009; Cullen & Chawner, 2011; Oguz & Assefa, 2014) on institutional repositories found that there was significant difference in perception towards institutional repositories from faculty members of different disciplines. In order to test this in the context of RKMS, we proposed that:

Table I
Literature Evidence of advantages of RKMS in Higher Education Institutions

Benefit	*Author(s)*
Facilitate organizational learning and knowledge retention through shared knowledge	Cranfield, 2011
Improved research productivity	Wang *et al.,* 2006; Cranfield, 2011; Chumjit, 2012; Tan & Noor, 2013; Hosain *et al.,* 2015
Facilitation for inter disciplinary research	Kidwell *et al.,* 2000; Bhusry & Rajan, 2011
Motivation for research	Bhusry & Rajan 2011
Increased competitiveness and responsiveness to opportunities	Kidwell *et al.,* 2000 Alavi & Leidner, 2001
Easy access and effective utilisation of institutional resources and facilities	Kidwell *et al.,* 2000 McCarthy, 2006
Reduced research administrative costs	Kidwell *et al.,* 2000

H1: There is significant difference in faculty intention to contribute to RKMS across disciplines

Literature review shows contradictory findings on influence of faculty rank and seniority on KM initiatives. In research focused institutions, Kim (2010) found that faculty rank had no influence faculty's self-archiving behaviour. However, Oguz and Assefa (2014) found that junior faculty members had more positive perception towards institutional repositories. Cullen and Chawner (2011) found that among senior faculty members, the rate of deposit was higher. Therefore, we propose the following two hypothesis.

H2: There is difference in faculty intention to contribute to RKMS with respect to Rank of the faculty

H3: There is difference in faculty intention to contribute to RKMS with respect to Age of the faculty

In addition to the above, we would also observe the differences in the faculty intention to contribute to KMS based on gender and the number of years of experience (Tenure) in the university.

H4: There is difference in faculty intention to contribute to RKMS with respect to Gender of the faculty

H5: There is difference in faculty intention to contribute to RKMS with respect to Tenure of the faculty

METHODOLOGY

This study followed an analytical approach to identify the major determinants of faculty members' intention to contribute to RKMS in a research-intensive private university in India. The university offers under-graduate, post-graduate and

doctoral programs. Database for the study was obtained through mailed survey. Instrument for the survey was prepared after proper consultation with literature, the research team considered all full-time faculty members in Engineering, Social Science and Management as sampling frame. Survey schedule was designed using Google forms and the hyperlink was mailed to all 680 faculty members in the relevant discipline areas. Every field in the survey form was made mandatory to ensure the meaningful completion of survey, before being it submitted online. The survey link was uploaded during July 2016 and was kept open to the prospective respondent for four weeks, with two reminders. We could retrieve 114 completed responses, registering 17 per cent response rate.

Eight manifest variables were identified to capture the response of faculty members regarding what they perceived as useful to build and perpetuate a research-intensive culture in the university. These items were provided on a five-point scale with proxy measures ranging from highly desirable (5) to highly undesirable (1). The respondents were also asked to express their willingness to contribute to the enrichment of research knowledge repository of the university voluntarily on a dichotomous scale. Certain demographic variables such as discipline, professional rank, age, gender, and tenure were identified to examine their influence on intention to contribute. The data was analysed using SPSS version 23. Logistic regression (Hair *et al.,* 2011) on the binary dependent variable regarding the willingness to contribute to the knowledge repository voluntarily was used. The aforementioned demographic variables were used as predictors to infer what would be the probability of a particular variable to predict faculty's intention to contribute to RKMS. The coefficients for the independent variable were estimated using the model as follows (ibid.)

$$Log\left(\frac{p}{1-p}\right) = b_o + b_1X_1 + \ldots\ldots b_nX_n$$

The probability of the intention to contribute to RKMS was predicted using the following model

$$p = 1/(1 + e^{-(b_0 + b_1x_1 + \ldots\cdots + b_nx_n)})$$

Faculty members' perceptions on potential barriers to research knowledge sharing culture in the university were sought in open ended manner. The responses were synthesized and classified based on their implied semantics and incorporated under common themes.

ANALYSIS OF RESULTS

Out of the 114 responses received by the survey, 31 percent of the faculty belonged to humanities and management and 69 percent from engineering disciplines. About

68 percent of the responded had positive response towards willingness to contribute towards RKMS and 32 percent of the respondents showed reluctance towards intention to contribute. The sample profile of the respondents is summarised in Table II. Majority of the respondents (72 percent) in the survey belonged to the rank of assistant professor which also formed the major group of the faculty in the university. The sample included responses from both newly joined faculty to experienced senior faculty members. The minimum tenure of the faculty member in the sample was one year, maximum being 27 years. Majority of the faculty members (70 percent) were below the age of 40 years, the average being 36.6 years with a standard deviation of 8 years. Among the respondents, majority of the respondents (76 percent) were male.

The analysis of faculty perception towards importance of RKMS features revealed that majority (at least 86 per cent) of the faculty members felt that all the eight features of RKMS is important for their research work. Table III shows the faculty members and their responses towards the RKMS features.

Table II
Sample Profile

	Measure of variable	*Percent (N=114)*
Discipline	Nominal	
1: Humanities and Management		31
2: Engineering		69
Rank	Ordinal	
1:Assistant Professor		72
2:Associate Professor		15
3:Professor		13
Gender	Nominal	
1: Male		76
2: Female		24
Age	Scale	36.6 (8)*
Tenure	Scale	7.5 (6.2)*
Intention to Contribute to RKMS	Binary	
0: No		32
1: Yes		68

*Mean & (Standard Deviation)

The analysis showed that faculty members have an overall positive perception towards the Research Knowledge Management Systems features such as research expertise database, research related training modules, repository of published

Table III
Faculty Perception towards Importance of RKMS Features

	Frequency (N=114)		
	Desirable	*Neutral*	*Undesirable*
Search experts in specific area within University	104	9	1
Access research profiles of experts of University	101	11	2
Search experts for collaboration from institutions outside University in specific area	104	8	2
Obtain information on how to write research proposals	104	7	3
Accessing training modules/Guides on research	100	13	1
Identify sources of funding in your area (News, announcements, deadlines of research events and proposal submissions)	106	7	1
Have your research publications and other data at one place for review and view research metrics such as h-index.	98	14	2
Access to repository of successful grant proposals	100	13	1

(publications) and unpublished research documents (such as grant proposals). This indicates that faculty perceive that RKMS is useful in their research work.

Binary Logistic Regression was performed with five independent variables (Discipline, Rank, Gender, Age, and Tenure) to identify empirical evidence of the antecedents to intention to contribute to RKMS. Hosmer and Lemeshow (2000) test for goodness-of-fit revealed that the test statistic is not statistically significant (Chi-Square = 9.020, p = 0.341) which implied that model fit the data at an acceptable level. The model was able to predict overall 71 per cent of the cases correctly. The results of the logistic regression is shown in the Table IV. The logistic regression coefficients and significance of individual independent variables revealed that Discipline ($p=0.01$), Age ($p<0.05$) and Gender ($p<0.05$) were statistically significant predictors of faculty's intention to contribute to knowledge management system.

Table IV
Logistic Regression Results

Factor	*B*	*S.E.*	*Wald*	*df*	*Sig.*	*Exp(B)*	*Decision on Hypotheses*
Age	-.098	.043	5.117	1	.024	.907	**Supported**
Gender(1)	1.052	.534	3.881	1	.049	2.863	**Supported**
Rank	.637	.402	2.512	1	.113	1.891	**Not Supported**
Discipline(1)	1.420	.553	6.579	1	.010	4.136	**Supported**
Tenure	.068	.051	1.783	1	.182	1.071	**Not Supported**
Constant	1.762	1.139	2.394	1	.122	5.826	-

Discipline was found to be the prominent predictor of faculty intention to contribute to knowledge management system as is evident by the largest value

under Wald Statistics (6.579), which statistically significant, followed by gender and age respectively. Among the faculty members who had positive intention towards RKMS, 36 percent were from Humanities and Management and 64 percent were from Engineering. Among the faculty members who had negative perception towards RKMS, 19 percent were from Humanities and Management and 81 percent were from Engineering. From the logistic regression analysis, it was found that Humanities and Management discipline faculty were more likely to have positive intention to contribute to RKMS than the engineering discipline.

Age of the faculty member was found to have negative influence on faculty intention to contribute to RKMS. Senior faculty members were found to have negative intention towards contribution to RKMS. This result is consistent with the study conducted by Oguz and Assefa (2014). Gender was also found to influence faculty members' intention to contribute to RKMS. The study revealed that male faculty members were more likely to contribute than their female counterparts. Rank and tenure of the faculty members had no significant influence on faculty intention to contribute to RKMS. The estimated model of probability of faculty intention to contribute to RKMS is as follows:

$$p = 1/(1 + e^{-(1.762-0.098(\text{Age}) + 1.052(\text{Gender}) + 0.637(\text{Rank}) + 1.420(\text{Discipline}) + 0.068(\text{Tenure}))})$$

The responses on barriers to research knowledge sharing were coded and analysed. Barriers were grouped into two major sources: Cultural Barriers and Institutional support Barriers as presented in Table V.

Table V
Barriers to Research Knowledge Sharing

Cultural Barriers
Data collected is sensitive
Lack of interest in young faculty
Absence of effective peer review
Absence of Knowledge sharing Culture
Lack of collaboration in research
Institutional Support Barriers
Lack of time to share knowledge due to academic work
Lack of effective support system
Lack of communication and a central portal for free access of internal resources

Cultural barriers refers to the barriers due to research culture and existing practices in the university. Institutional Support Barriers refers to the barriers due lack of proper support services at the HEI for participation in knowledge sharing activities.

DISCUSSION AND MANAGERIAL IMPLICATIONS

The study has several managerial implications. Though the perception on RKMS usefulness for research is positive, intention to contribute to RKMS has mixed reactions from the faculty members. As success of KMS systems relies on the contribution from all the faculty members across gender and disciplines, higher education institutions have to develop policies, incentive systems to motivate faculty members to contribute to the KMS. While hard influences in the form of policies and procedures may be useful in capturing explicit and published knowledge assets such as faculty publications, soft influences would be necessary in order to motivate faculty members to share tacit knowledge assets and unpublished research outputs. von Krogh et al. (2000) are sceptical about potential of top-down , dead-line driven, target-focused knowledge creation, especially in a hyper competitive context, where individual will try to hold it rather than share it on a voluntary basis. Results of the current study also evidence volunteerism in knowledge creation, supporting the observation of Davenport and Prusak (1998).

The findings of the study is useful in identifying the champions of the KMS initiatives in the university. Junior faculty members with research experience and from humanities and management disciplines may be targeted to be champions for such initiatives. These faculty members may drive the KM initiatives of the university. As knowledge is emotional predisposition and so intimately tied to people (von Krogh *et al.,* 2000), it appears as a stock of personal expertise, not a flow of information (Starbuck, 2001) and tacit in dimension due to its indwelling (Polanyi, 1966:2001; von Krogh *et al.,* 2000). Hence, the real challenge faced by universities in realising RKMS is to identify and institutionalise suitable knowledge enabling culture across all disciplines and verticals.

The study identified that there are several cultural barriers for research knowledge sharing. Knowledge sharing culture may be induced by creating smaller Research groups or communities of practice. Knowledge creation is a social as well as individual process (von Krogh *et al.,* 2000). Research knowledge sharing culture through research activities workshops, seminars, and informal discussions among peers with common interests must be encouraged and rewarded. Senge (1990) observes that teachers can suspend individual assumptions about the work and think collaboratively in collective learning process through productive interactions and exchange of knowledge. von Krogh *et al.* (2000) stress the importance of micro-communities of knowledge, a minority within an organisation who are enablers of knowledge creation and sharing for common goal.

Institutional support systems is essential for formalising the knowledge management activities within the university. Knowledge Portal would encourage junior faculty members to find exemplars of research work, find internal expertise for collaboration and establish a formal process for all research activities of the

university. Knowledge Management Systems (KMS) have broader scope than institutional repositories and includes explicit and tacit knowledge assets, procedures, training modules and technical know-hows, expert networks with an objective to improve institute's performance. It is very useful for higher education institutions and universities with multiple campus to connect faculty members, facilitate knowledge exchange, learning and knowledge retention. The Table VI describes the proposed areas of applications of RKMS in higher education institutions.

Table VI
Application areas of RKMS in higher education

Directory of experts and their expertise with easy search
Repository of Published Research Outputs (Publications, PhD thesis)
Repository of Unpublished Research Outputs (Projects, Research Proposals, Budget samples, Progress Reports, Grant Proposals, Patent documentation)
Templates of Proposals, financial and technical reports
Guidelines on Research policy, incentives, grant and patenting policies and patent filing procedures
Training modules on Research process, Research ethics, Assessing quality of journals, research metrics, best practices in research
Research resources repository (Labs, software, databases, equipments)
Internal support services for improving productivity
Updates on Research events, new opportunities in funding, emerging areas
Area specific Discussion Forums

The proposed mandate of Government of India (GoI, 2016) to promote generation of new knowledge and its applications to consolidate and strengthen India's position as a soft power offers much silver lining.

CONCLUSION

Individual faculty member contribute his research outcome as an extension of their research interests. The knowledge so created can be leveraged to attain competitive advantage through integrated management systems, which comprises of information technology architecture, mutually reinforcing social and professional collaborations. The study identifies the demographic variables of the faculty who have positive intention to contribute to RKMS. The study reveals cultural and institution support barriers to knowledge sharing. The application areas of RKMS in University has been proposed. However, the study is not free from limitations. The researchers do not claim the generalisability of findings of the study on a nation-wide level due to its focus on micro level. Another limitation of the study is its poor reach, due to non-response by all relevant subjects of the study. Future researchers can broaden the study by including more predictor variables from institutional dimensions as well. When faculty members possess unwavering

passion for creation of knowledge and it is fused into the university's research embedded culture, a conducive research knowledge management system will be well in the orbit. This will only be possible when universities become catalysts by being active agents of change through promoting cutting-edge research and its dissemination of outcome, which, in turn, will be instrumental in propelling progress of the nation and prosperity of the people.

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