

Knowledge Management and Consumerization of Information Technology: Opportunities and Challenges

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ABSTRACT

The conduct of knowledge management (KM) is changing fundamentally due to consumerization of Information Technology. The consumerization of Information Technology (CoIT) is transforming the way knowledge workers conduct work and share knowledge and information. Therefore, knowledge management activities in an organization are no longer only supported by traditional Information and Communications Technologies (ICTs) (such as DB, DSS, data warehouses, email), but are also enabled through new forms of ICTs commonly referred to as social software or Web 2.0 technologies. Although, the ubiquitous and pervasive nature of these new forms of ICTs are creating a flexible KM environment, these digitized workspaces are also creating challenges. This study examines the following research question, *what opportunities and challenges do knowledge-intensive organizations face during the conduct of KM in a multiple platform technology environment?* In this research in progress, the preliminary findings (emerging research themes and potential research questions) from our pilot test are presented. When the study is completed, the multiple and diverse perspectives from the practitioner and scholarly journals plus interviews with knowledge workers and providers will be compared and contrasted to posit a more complete research agenda and management implications.

Categories and Subject Descriptors

K.4.3 Organizational Impacts; K.6.4 System Management

General Terms

Management, Design, Human Factors

Keywords

Mobile technology; social media; consumerization of IT; multiple technology platforms; knowledge management; social software

1. INTRODUCTION

The conduct of knowledge management (KM) is changing fundamentally due to consumerization of Information Technology [11]. The consumerization of Information Technology (CoIT),

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which refers to a phenomenon where new technologies emerge first in the consumer market and then get diffused into organizations, is transforming the way knowledge workers conduct work and share knowledge and information [10]. Therefore, knowledge management activities in an organization are no longer only supported by traditional Information and Communications Technologies (ICTs) (such as DB, DSS, data warehouses, email), but are also enabled through new forms of ICTs commonly referred to as social software or Web 2.0 technologies. As a result, the workspace of today's knowledge worker is not constrained by a desktop or even a particular technological platform, but instead, involves multitudes of devices and applications. Although, the ubiquitous and pervasive nature of these new forms of ICTs are making knowledge workers' workspaces more flexible, these digitized workspaces are also creating challenges for the workers because they are expected to work, learn, and share knowledge effectively, no matter where they are or what device they are using. We use the term multiple platform technology environment (MPTE) to characterize the work environments where workers use multiple applications (such as social software) that can be accessed via multiple devices (such as PCs, server, smartphone, tablets) which are running on multiple operating systems. MPTE is not new, but the pervasiveness of smartphone and online services (such as social software and online storage) have made these environments very ubiquitous¹.

Toyota Australia rolled out a tablet mobility strategy to its travelling sales workforce who while visiting 200 Australian dealerships used to carry a laptop and 3G dongle which constrained both IT asset utilization and knowledge workers' productivity [3]. The new tablet mobile strategy allows each sales staff to use a mobile device enabled with social software. This has resulted in increase in workers' productivity, professionalism, presentation and morale [3]. According to the 2012 consumerization of IT survey by InformationWeek, the obvious trend is the increased use of mobile devices and applications (such as Instant Messaging, videoconferencing, and enterprise social networking) in work environment [7]. From the perspective of an information technology research company, Mark McDonald, a group vice president and head of research in Gartner Executive Programs, said that CoIT is changing the nature of work by creating highly networked and digitized working environments that allow for knowledge flows among people without constraints based on position in the organization².

¹www.webopedia.com/TERM/C/consumerization_of_it.html
retrieved February 20, 2014

²From Gartner Blog Network, a page of a Mark McDonald, a group vice president and head of research in Gartner Executive

Similarly, the public and non-profit sectors are also realizing the benefits of CoIT in the context of knowledge management. According to a recent report by the European Union Agency for Network and Information Security, CoIT enables increased access, mobility, and work flexibility allowing for communication and collaboration among knowledge workers. This in turn could increase peer influence and knowledge sharing through modern channels, such as social networking, blogging, and chatting [4]. In addition, inside the United Nations Development Programme (UNDP), social software, such as social media tools and social networking sites, is bringing people together so that they can learn from each other through informal knowledge exchanges [9].

The aforementioned examples provide anecdotal evidence of the potential KM benefits social software provisioned through CoIT could bestow within both private and public sectors. However, it is not clear whether these new social software are substituting and thus cannibalizing the traditional ICTs implemented in organizations to enable the conduct of KM. Or do they have complementary effects and thus can co-exist? Therefore, the emerging relationship between the traditional technologies (such as knowledge repositories, knowledge portals) and contemporary social software (such as Web 2.0 technologies) is not clear and needs to be systematically examined by KM researchers [11]. This relationship between traditional and contemporary technologies used for conducting KM within the organizational boundaries is complex, not only because it introduces disparate technological platforms, but also because it changes the power dynamics among the users of KM technologies (i.e., organizational knowledge workers) and providers of KM technologies (such as organizational IT units). In this work, we attempt to throw some light on this complex relationship by uncovering the challenges and opportunities organizations face while conducting KM in multiple platform technology environments resulting from the use of both the traditional technologies and emerging social software enabled by Web 2.0 technologies.

Next we summarize the limited academic research conducted to examine the effects of CoIT on the conduct of KM within the organizational boundaries. Andriole [2] conducted an empirical study to examine the business impacts of Web 2.0 technologies and found that formal KM tools are replacing more informal Web 2.0 tools, a substitution trend he expects will continue. Harris et al. [6] uncovered how businesses deal with the KM challenges due to CoIT by minimizing its risk and maximizing its benefits. Using the knowledge based view of the firm, Von Krogh [11] posit a KM research agenda developed around five fundamental issues arising from the complexities of using social software for KM activities within profit-making organizations. This research agenda is built on the premise that organizations can garner rent from its knowledge resources and thus they need to develop institutional capabilities that focus on protecting and maintaining the value of its knowledge resources, an assumption not valid for not-for-profit organizations. Ford and Mason [5] look at how organizations maximize the benefits of social media applications and traditional KM systems, and conclude that social media could be very useful in knowledge sharing at multiple levels, such as in organizations, between groups, and among individual if the

Programs and co-author of The Social Organization with Anthony Bradley. Retrieved October 29, 2013, from http://blogs.gartner.com/mark_mcdonald/2012/06/21/the-consumerization-of-management-part-1/

tension induced by multiple platform technology environment (MPTE) regarding the roles, ownership, control, and value of knowledge are appropriately addressed.

The limited extant literature on the conduct of KM in MPTE primarily focus on profit-making organizations. We premise that because of differential knowledge management objectives, organizations in different industries (financial, education, retail) and sectors (public, private) are likely to encounter different opportunities and challenges in managing knowledge in MPTE. A very thorough review of KM research issues was done by Alavi and Leidner [1], since the technological landscape has changed significantly, we argue there is a need to re-examine the conduct of KM in the age of CoIT. Therefore, in this study, we attempt to answer the following research question: *What opportunities and challenges do knowledge-intensive organizations face during the conduct of KM in a multiple platform technology environment?*

In this research in progress, the preliminary findings in form of emerging research themes and potential research questions) from our pilot test are presented. When the study is completed, the multiple and diverse perspectives from practitioner and scholarly journals plus interviews with knowledge workers and providers will be compared and contrasted to posit a more complete research agenda and management implications. The remainder of the paper is organized as follows. Section two explains our methodological approach. Section three summarizes the study's preliminary findings. And section four describes our next steps.

2. METHODOLOGY

2.1 Sampling

A pilot study was conducted to explore the phenomenon. For our pilot test, four research sites from both private and public sectors were included in our sample. The sample is comprised of knowledge-intensive organizations that offer products and services in form of knowledge representations (such as financial advice, innovation, and training) that heavily depend on organizational knowledge resources Holsapple and Joshi [8]. A total of nine participants who either performed the role of KM providers and/or KM users were interviewed. Table 1 summarizes our research sites and participants. Three sites are located in Thailand, those include (1) an internet-banking innovation unit within an IT department in a commercial bank (site A), (2) a research institute within a public university (site B), and (3) a nationwide project involving the government and a non-profit organization (site C). The fourth one is a research and development (R&D) unit in one of the US polymer company (site D).

Table 1: research sites and participants

Research site	Industry	Number of Participants	Participants' Roles
A – Private Sector	Banking	2	KM Users - 1 unit manager and 1 team lead
B – Public Sector	Public research institute	3	KM Users and Providers - 2 senior and 1 junior Scientists
C – Public Sector	Government and non-profits	3	KM Users and Providers - 2 project leaders

Research site	Industry	Number of Participants	Participants' Roles
			and 1 administrator
D – Private Sector	R&D intensive, startup company	1	KM User - Head of R&D

Moving forward, we plan on using a similar convenient sampling strategy to fully address the posited research question. Our research sample will include knowledge-intensive organizations included in the pilot. Organizational perspectives from two categories of knowledge workers, namely KM providers and KM users, will be captured. KM providers are knowledge workers responsible for provisioning IT enabled KM solutions in an organization, and could be people working in an IT department. For KM users, we will sample the participants who can provide an organizational level view of the opportunities and challenges in managing knowledge in MPTE. In addition, care will be taken to ensure that participants included in the study are aware of both the traditional and contemporary technologies used to support organizational KM activities.

2.2 Data Collection

The data was collected using unstructured interviews. We asked all nine participants opened-ended questions regarding (1) the benefits, positive impact, and/or opportunities of using social software supported by Web 2.0 technologies to conduct KM within a team/group, (2) the challenges or negative impact, or constraints imposed by these new technologies in the conduct of KM. Before the next round of interviews, the interview script will be revised and validated by two KM experts. For the pilot test, we decided to use note taking to make our participants feel comfortable. A combination of face-face and phone interviews were conducted to collect data. Each interview was typed up and sent back to the participants for verification, then it was translated from Thai to English. Each interview ranged from one to two hours.

2.3 Data Coding and Analysis

For the pilot test, one author coded all the interview transcripts to extract key challenges and opportunities. The second author reviewed all the coding and all the disagreements were resolved through discourse. After all the interviews were coded, the individually coded challenges and opportunities were iteratively analyzed to construct meaning. The first level of meaning was constructed by extracting all the coded instantiations and labeling them with brief descriptions that summarized the nature of challenge (or opportunity). These descriptions were then used to frame potential research questions which are listed in Table 2. In the second level of meaning making process, these descriptions were clustered into broader themes which are labelled as research themes.

3. PRELIMINARY FINDINGS

In this research in progress, we uncovered challenges and opportunities (framed as potential research questions) which fell into five research themes found in the extant literature. Even though the themes are not novel to the KM domain, the potential

research questions that emerge from our analysis of the interview data are unique to the conduct of KM in MPTE. More specifically, the research questions focus on the issues that knowledge workers face while using technologies to conduct their work in a multiple-platform technology environment

3.1 Knowledge Flows within MPTE

Multiple knowledge flows related issues emerged in our data. The interview data suggests that the flow of knowledge between employees' personal devices and organizational systems is not smooth. This may result in loss of knowledge that is valuable to an organization. As one knowledge worker from site A indicates, *"If we could have something like LINE and [also] be able to link with the company knowledge base, that would be even better;"* implying a disconnect between the social software (i.e., LINE) and organizational knowledge base. The use of social software could also mitigate barriers to information flow created by bureaucratic hierarchies. This is reflected in the sentiments shared by a knowledge worker in site C who suggests that *"Reduced barriers to reach management staff which creates team unity is also the obvious benefit of LINE."* The interview data also revealed that some knowledge workers resist the use of new forms of ICTs and thus are in danger of being "socially isolated" from their peers. This is reflected in the following quote from a knowledge worker in site B, *"We feel closer to our LINE friends, than our friends that are not on LINE, there are a few scientists here who don't use [LINE]. Some have been very quiet and they don't use the technology, and thus now they seem to [work] in silos."* The sociality is being enacted in or through social software, therefore employees who are not participating in the digital interactions lose the ability to garner social capital through informal interactions. Future research needs to examine the presence and effects of this social isolation on employee turnover, morale, and productivity.

3.2 Knowledge Security

Securing organizational knowledge assets emerged as a challenge only in the interviews conducted at for-profit organizations. These organizations felt the need for institutionalizing security policies and legal contractual agreements with their employees to protect knowledge. One company mitigated the security risks by providing appropriate employee training regarding organizational policies. Whereas the second company protected its knowledge secrets legally by contractually not allowing their employees to work for their competitors for 3-5 years if they left the company. In the R&D intensive company, the risks of using social media outweighed the benefits, therefore only the use of Twitter was allowed.

3.3 Changing Nature of IT Work

As users are becoming more dependent on social software, they are becoming less dependent on their organizational IT units. This is evident in the following two quotes provided by knowledge workers at two separate sites, *"With Google Apps/Docs, we no longer have to beg for help from our busy web developers. Non-technical person can create an ad hoc web database like in a matter of few minutes;"* and *"It is tedious to request one from the university. So, we just figure out on our own, it's quicker."* How does this shift in the dependencies on IT unit's resources and capabilities affect the roles and responsibilities of IT workforce within organizations? What strategic value do IT units provide to an organization in the era of CoIT? Does the phenomenon of CoIT which empowers knowledge workers, marginalize IT units?

3.4 Social Software Designs

Our data also reveals knowledge workers' social software preferences during the conduct of KM. The workers' preferences suggest that different social software are suitable for different kinds of KM activities. In addition, participants' responses also suggest that the selection of social software is contingent on the nature of the device being used during the conduct of KM. For instance, one knowledge worker shared the rationale for their team's preferences as follows, *"There are so many functions available on Facebook, it's good on PC, but it's not good for team privacy. LINE is much better for teamwork because it gives us much more privacy. Plus, we can share emotions and pictures which creates a relaxed environment that helps with discussion, allows us to show our respect to our seniors, and our care for other team members"*

3.5 IT and Innovation

Our participants perceived that the use of social software and personal devices can help accelerate an organization's innovative processes. The participants mentioned that the use of social software positively affect innovation because these technologies expedite knowledge sharing and search. For instance, a knowledge worker at a research intensive company indicated, *"Mobile technology is very beneficial because it speeds up knowledge search and sharing, and of course speeds up the innovation. Features of mobile devices (specifically iPad and iPhone) help a lot. [They are] Not just useful in the meetings."*

Table 2 summarizes research questions related to the themes discussed above. These are the areas in which we believe further research is warranted

Table 2: Research themes and potential research questions

Research Themes	Potential Research Questions Derived from Our Data
Knowledge Flows within MPTE	<ul style="list-style-type: none"> How can organizations transfer the knowledge assets and resources that are generated through the use of social software on knowledge workers' personal devices into organizational memory systems? Are the knowledge resources embedded in the newly created knowledge flows worth capturing? Are the new knowledge flows replacing (and possibly destroying) existing more formal knowledge flows institutionalized within the organizations or are they complementing them? Can the use of social software help mitigate the impediments to work flows due to constraining information flows created by bureaucratic hierarchies? Can informal knowledge flows supported by social software help attenuate information asymmetry often created within the organizations to maintain control and power?

Research Themes	Potential Research Questions Derived from Our Data
	<ul style="list-style-type: none"> What are the effects of digital social isolation on knowledge workers' job satisfaction, performance, and development?
Changing Nature of IT Work	<ul style="list-style-type: none"> How does this shift in the dependencies on IT unit's resources and capabilities affect the roles and responsibilities of IT workforce within organizations? What strategic value do IT units provide to an organization in the era of CoIT? Does the phenomenon of CoIT which empowers knowledge workers, marginalize IT units?
Knowledge Security	<ul style="list-style-type: none"> Are the traditional legal and procedural agreements institutionalized to protect knowledge assets sufficient in the era of CoIT? How can knowledge intensive organizations harness the benefits of online services (such as social media and storage) and mitigate the spill over risks of proprietary knowledge?
Social Software Design	<ul style="list-style-type: none"> What factors shape a knowledge worker's design preferences?
IT and Innovation	<ul style="list-style-type: none"> Can the adoption and use of social software accelerate firm innovation? What knowledge processes can social software enable that could facilitate firm innovation?

4. CONCLUSION

Our preliminary findings reveal that the conduct of KM within MPTE creates novel and unique opportunities and challenges that the knowledge management and IT communities need to investigate. The sample size used to uncover the findings in this research in progress study is small. In order for this work to offer a systematic and unified research agenda for the conduct of KM in the era of CoIT, we need to not only conduct more interviews (i.e., increase the sample size), but also triangulate our findings by reviewing practitioner literature. In addition, emerging scholarly literature will also be reviewed to find out which of the issues revealed in our work are being addressed by the academic community. We are in the process of revising the script based on our preliminary findings which we will use to collect additional data. We hope to present a more complete research agenda at the conference.

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