Does Knowledge Retrieval Improve Work Efficiency?

An Investigation under Multiple Systems Use

Abstract: Organizations encourage active knowledge retrieval from knowledge management systems; however, this does not always lead to higher work efficiency. Anchoring on uses and gratifications theory and psychology of sunk cost, this study investigates knowledge workers' knowledge retrieval behavior and its subsequent impact on their work efficiency under three knowledge management systems, which differ in the creators of the systems and their related contents. Survey and interview data were collected from an IT call-center company. The results show knowledge workers who actively retrieved knowledge from the organization-created system that contains self-created content exhibited higher work efficiency. The results also show they obtained gratifications from actively retrieving knowledge from a self-made system; however, due to the workers' biased perceptions toward that system, knowledge retrieval from a self-made system did not induce higher work efficiency. The findings provide organizations suggestions for designing knowledge management systems and their related contents.

Keywords: knowledge management system, knowledge retrieval, uses and gratifications, sunk cost, work efficiency

1. INTRODUCTION

Even when an organization mandates the use of a specific IT application, individuals retain considerable discretion regarding use of the application in accomplishing their work activities (Hartwick & Barki, 1994). This behavior is called post-adoptive behavior, which is the myriad feature-use behaviors and feature extension behaviors of individual users after an IT application has been made accessible to them (Jasperson, Carter, & Zmud, 2005). Among the commonly researched IT applications for its post-adoptive behavior is the knowledge management system (KMS) (Alavi & Leidner, 1999). The extremely challenging proposition faced by knowledge workers in contributing their knowledge to the KMS has led many organizations to auto-populate the content of their KMS. Even so, organizations still face challenges in persuading knowledge workers to retrieve knowledge from the KMS. After so much effort populating knowledge to the KMS, if the knowledge stored is not being retrieved and used in daily work activities, it is of no value.

Previous studies provide suggestions to organizations on how to motivate knowledge retrieval from the KMS. For instance, motivation may come through the bottom-up social influence across hierarchical levels (Wang, Meister, & Gray, 2013), by establishing collaborative norms in the organization (Bock, Kankanhalli, & Sharma, 2006), and by ranking the knowledge stored in the KMS (Sutanto & Jiang, 2013). The commonality of these studies is that they examined knowledge retrieval behavior in the context of a specific KMS provided by the focal organizations. Knowledge workers also store knowledge, such as information about customers, marketing research and plans, and knowledge about company products and services, by creating folders and files in local storage (e.g., local drives, thumb drives, etc.), and these local storages are accessed when particular knowledge is needed. When researching about knowledge retrieval, researchers should investigate not only the organization-created KMS but also the employees' self-created KMS.

In fact, there are two main components of a KMS: the system and the content. Considering system creation and content creation, we can distinguish three types of KMS: 1) the organization-created system with auto-populated knowledge content and/or knowledge stored by employees other than the target knowledge seekers; 2) the knowledge seekers' self-created systems and content; and 3) the organization-created system that contains knowledge stored by the knowledge seekers themselves. Most studies have examined knowledge retrieval from the first or third type of KMSs, and the impact of such KMS usage on work efficiency has not always been found to be positive (Ko & Dennis, 2011). Having access to alternative KMS is important to identify those systems and holistically examine the impacts of knowledge retrieval activities on work efficiency from the different types of KMSs.

Building on uses and gratification theory (Rubin, 1985) and psychology of sunk cost (Arkes & Blumer, 1985), this study aims to holistically examine the extent of knowledge retrieval activities

from the different types of KMSs and their impacts on knowledge seekers' work efficiency. According to uses and gratification theory, individuals continue using a medium because they derive process and content gratifications from using it. One of the important process gratifications from retrieving knowledge from a KMS is the simplicity in doing so (Watson & Hewett, 2006). Content gratification, on the other hand, concerns the satisfaction with the knowledge retrieved from the KMS (He, Fang, & Wei, 2009a; Kankanhalli, Tan, & Wei, 2005). When the process of retrieving knowledge from a KMS is straightforward and the resultant knowledge search is satisfactory, knowledge workers should be motivated to continue seeking knowledge from that particular KMS. However, because the gratifications derived from a KMS are subjective, according to the psychology of sunk cost, there is a tendency to continue an endeavor once an investment in effort and time has been made (Arkes & Blumer, 1985). Therefore, although in reality, the process of retrieving knowledge from the self-created KMS may not be simple and the resultant knowledge search may not be satisfactory, the knowledge workers may perceive it as simple to use and as producing satisfactory results and thus continue retrieving knowledge from their self-created KMS in their daily work activities.

To achieve the study objective, which is to holistically examine the extent of knowledge retrieval activities from the different types of KMSs and their effects on the knowledge seekers' work efficiency, we collaborated with an IT call-center company. The company had implemented two KMSs, hereby referred to as KMSone and KMStwo. KMSone is embedded in the call-center's employees' daily work activities, such as the employee having to login into the system every day and insert customer complaints in the system's predefined fields. These inputs serve as knowledge contributions to KMSone. Hence, KMSone is an organization-created KMS that contains knowledge stored by the knowledge seekers themselves. In contrast, the knowledge stored in KMStwo is entered by the second-level support employees, who have received forwarded unsolved customer complaints from the call-center employees. The motivation behind the implementation of KMStwo is to provide the call-center employees access to more advanced knowledge to minimize the amount of call forwarding. Hence, KMStwo is an organization-created KMS that contains knowledge stored by employees other than the target knowledge seekers. In addition to these two types of organization-created KMSs, each call-center employee creates and maintains their own localized KMS in their local drives, hereby referred to as LocalKMS. These LocalKMSs, range from a Notepad file to sorted folders of Word-document files, are knowledge seekers' self-created KMSs and contents.

We surveyed 158 call-center employees and followed that with interviews and focus groups. The call-center company is a *unique setting* where the employees' work is time-critical, and their work efficiency is closely dependent on the sources they use to obtain the knowledge needed to answer customers' questions. Under that circumstance, the following questions were asked: Why do they retrieve knowledge from any of the KMSs available? Does knowledge retrieval from the respective

KMS actually improve their work efficiency? The answers to these questions can reveal whether there is a personal bias with respect to the self-created KMS and/or self-created knowledge content that leads to continuous knowledge retrieval, even though the choice may not actually improve the employees' work efficiency.

We found that both the perceived process and content gratifications of a KMS affected the extent of knowledge retrieval activities from the respective KMS. Moreover, we found that only the degree of knowledge retrieval from KMSone led to higher work efficiency. We discovered that most of the time, the knowledge workers were searching and retrieving knowledge from KMSone and LocalKMS. They very rarely retrieved knowledge from KMStwo. Altogether, the findings from the survey which were corroborated with follow-up interviews and focus groups imply two things. First, the content and process gratifications in using an organization-created KMS that contains knowledge stored by employees other than the target knowledge seekers (i.e., KMStwo) are the lowest. Second, although the gratifications in using LocalKMS are higher than KMStwo, searching knowledge from LocalKMS was not always associated with improved work efficiency. Hence, we found evidence of psychological sunk cost in the continued use of a self-created system and content.

This paper is structured as follow. In the next section, we will summarize the extant literature on knowledge retrieval from KMS, identify the research gaps, and highlight how our study contributes to the identified gaps. Subsequently, we will explain the theoretical foundations of our study, i.e., uses and gratifications theory and psychology of sunk cost. This is followed by a presentation of our research model and research methodology. In the following sections, we will describe and discuss our findings and conclude the paper by highlighting how our study contributes to research and what the implications of our findings to practitioners.

2. LITERATURE REVIEW

Knowledge retrieval is an important aspect of effective knowledge management (Alavi & Leidner, 2001). Prior studies have examined the determinants of retrieving knowledge from a KMS and provided suggestions to organizations on how to motivate knowledge retrieval from a KMS.

Knowledge seekers' perceptions toward the characteristics of KMS affect their retrieval behavior. Perceived ease of use (Lai J.-Y. , 2009; Phang, Kankanhalli, & Sabherwal, 2009; Su & Contractor, 2011) and perceived usefulness (Chen, Hsieh, Van de Vliert, & Huang, 2015; Choi & Durcikova, 2014; Lai J.-Y. , 2009; He, Fang, & Wei, 2009a) of KMS is positively related to the intention of knowledge use and retrieval. To be more specific, perceived searchability, actionability (Durcikova & Fadel, 2016), capability (Kankanhalli, Lee, & Lim, 2011), and usability (Phang, Kankanhalli, & Sabherwal, 2009) positively affect the knowledge retrieval behavior. The quality of the knowledge in a KMS is also essential: it has been found that perceived output quality (Kankanhalli, Tan, & Wei, 2005; Durcikova & Gray, 2009), resource availability (Kankanhalli, Lee, & Lim, 2011), expertise

recognition of contributors (Su & Contractor, 2011), visibility, and result demonstrability (Hester, 2011) are positively related to knowledge retrieval. Thus, implementing rating-based knowledge rankings to recognize high quality knowledge could also positively influence knowledge retrieval (Sutanto & Jiang, 2013). However, even when the quality of knowledge content in a KMS can be assured, knowledge seekers' perceived task-technology fit also affects their retrieval behavior (Lin & Huang, 2009). In order to encourage knowledge retrieval from a KMS, the value of a KMS should be demonstrated (Wang, Meister, & Gray, 2011; Watson & Hewett, 2006), and knowledge seekers' satisfaction should be guaranteed (Lai J.-Y. , 2009; He, Fang, & Wei, 2009a).

Knowledge seekers' characteristics also affect their retrieval behavior. Intrinsic motivation is positively related to knowledge retrieval (Kankanhalli, Lee, & Lim, 2011). Knowledge seekers with strong learning orientations or facing intellectual demands will engage in knowledge retrieval (Gray & Meister, 2004; Gray & Durcikova, 2005). Their self-efficacy of KMS (Lin & Huang, 2008; Lin & Huang, 2009; Bock, Kankanhalli, & Sharma, 2006) and personal outcome expectations (Lin & Huang, 2008) also positively affect their knowledge retrieval. However, risk-averse knowledge seekers (Gray & Durcikova, 2005) and knowledge seekers who perceive image loss when seeking knowledge from others (Wang, Meister, & Gray, 2011) will not actively engage in knowledge retrieval.

Social influence can also affect knowledge retrieval behavior (Su & Contractor, 2011). Knowledge-seeking intention is based on the subjective norm of knowledge seeking, which is influenced by community identification (Lai, Chen, & Chang, 2014). In addition to the social pressure from the community or the company, knowledge seeking by peers and subordinates can also motivate knowledge retrieval, which suggests the positive effect of bottom-up social influence across hierarchical levels (Wang, Meister, & Gray, 2013). Moreover, social relationships among KMS users are positively related to KMS usage (He, Qiao, & Wei, 2009b). Establishing collaborative norms in the organization is beneficial for motivating knowledge retrieval (Bock, Kankanhalli, & Sharma, 2006).

Management and organizational supports can facilitate knowledge retrieval by incentivizing or rewarding KMS use, in general, and knowledge retrieval, in particular (Kankanhalli, Tan, & Wei, 2005; Lai J.-Y. , 2009). Providing training and management support for users can also encourage knowledge retrieval from the KMS (Watson & Hewett, 2006; He & Wei, 2009; Bock, Kankanhalli, & Sharma, 2006). However, time and work pressures experienced by users have detrimental effects on their knowledge retrieval behavior (Gray & Durcikova, 2005).

Organizations encourage users to retrieve knowledge from KMSs because KMS use is positively related to work efficiency (Kankanhalli, Lee, & Lim, 2011; McCall, Arnold, & Sutton, 2008; Teo & Men, 2008; González, Giachetti, & Ramirez, 2005). For instance, deep structure use of a KMS positively affects job performance of the users (Zhang, 2017). But the efficiency benefit could be temporary and could only be gained by experienced users (Ko & Dennis, 2011). Moreover, this

relationship is contingent by several factors. For example, the benefit could be higher for nonroutine tasks, higher levels of absorptive capacity from the users, and higher levels of transformational leadership from organizations (Zhang, 2017). In addition, the benefit could be higher when task intensity is greater, and it could be lower when task environments demand rapidly changing information and knowledge (Kim, Mukhopadhyay, & Kraut, 2016).

Existing literature explored the determinants of knowledge retrieval and the effect of knowledge retrieval on users' performance separately, which prevents us from further observing the causes of different work performance obtained from using KMS. Moreover, prior studies have investigated users' knowledge retrieval behaviors from a particular KMS, but most of these studies focused on organization-created KMS. Users' knowledge retrieval behavior and related performance benefits could be affected when they can access alternative knowledge sources (Kim, Mukhopadhyay, & Kraut, 2016). In accessing knowledge content from an organization-created KMS, knowledge workers can also access the knowledge content from folders and files created in their local storages. This study distinguishes three types of KMSs based on who creates the system and populates the content: 1) an organization-created system with auto-populated knowledge content and/or knowledge stored by employees other than the target knowledge seekers; 2) a knowledge seekers' self-created system and content; and 3) an organization-created system that contains knowledge stored by the knowledge seekers themselves. Building on uses and gratifications theory and psychology of sunk cost, we holistically examine knowledge workers' perceptions of these systems and their respective content, their extent of knowledge retrieval behaviors from each system, and the effect on their work efficiency. In the following section, we explain the theoretical foundations of the study.

3. THEORETICAL FOUNDATIONS

3.1 Uses and Gratifications Theory

Uses and gratifications theory (UGT) originates from researches in traditional mass media communication contexts, such as radio and television (McGuire, 1974; Rubin, 1985). In these contexts, it is used to understand consumers' motivations and concerns in order to explain why they become involved in particular types of media and what gratifications they receive from that involvement (Ku, Chen, & Zhang, 2013; Ruggiero, 2000). In past decades, UGT has been used to examine the use of new forms of media and applications in the Internet context, such as online websites (Ebersole, 2000), social networking services (Cheung, Chiu, & Lee, 2011), mobile applications (Sutanto, Palme, Tan, & Phang, 2013), online games (Wu, Wang, & Tsai, 2010), and virtual communities (Sangwan, 2005).

UGT posits that users use a medium either for the experience of the process itself, which is categorized as process gratification (Cutler & Danowski, 1980), or for the content it conveys, which is categorized as content gratification (Stafford & Stafford, 1996). The distinctions between process

and content gratifications should be defined in context with operational definitions and resulting measures that are specific to the medium (Stafford, Stafford, & Schkade, 2004). For example, aimless surfing on websites is an Internet characterization of process gratification, whereas bookmarking a site might be more representative of motivations arising from content gratifications (Stafford & Stafford, 2001). Thus, process gratification has been measured by the frequency of logging into a system (Venkatesh, Speier, & Morris, 2003) or the frequency of launching the application (Sutanto, Palme, Tan, & Phang, 2013), and content gratification has been measured by the frequency of saving the application's contents (Sutanto, Palme, Tan, & Phang, 2013) or the frequency of bookmarking the sites (Stafford & Stafford, 2001).

Relating to our context of KMSs, knowledge workers may enjoy the process of knowledge retrieval from the KMS or the quality of retrieved knowledge. The gratifications derived could motivate them to continuously retrieve knowledge from the KMS. However, it is important to note that such gratifications are perception based and could be biased because of sunk cost.

3.2 Psychology of Sunk Cost

Sunk cost refers to a psychological commitment that may influence an individual's intention to continue a current action, even if it is contrary to rational cost benefit analysis (Samuelson & Zeckhauser, 1988). Since the individual desires to justify previous commitments to an action, the psychology of sunk cost motivates a status quo bias, which can explain user behavior of adoption and resistance toward the systems (Kim & Kankanhalli, 2009; Samuelson & Zeckhauser, 1988). Sunk cost affects an individual's acceptance of the new information systems because it is a part of switching costs, which reduce the value of a new information system (Kim & Kankanhalli, 2009). When individuals adopt new information systems, they may perceive higher levels of sunk costs compared with the incrementally improved versions of the current information systems (Lee & Joshi, 2016). The psychological commitment derived from sunk costs may prompt them to resist an information system (Polites & Karahanna, 2012).

Sunk cost has been measured as the amount of time and effort to learn to use the current information systems, which influences perceived ease of use and relative advantage. Thus, users' learning efforts, experience, and expertise in the current information systems would represent sunk costs of adopting new information systems (Polites & Karahanna, 2012). Although the role of sunk cost in studying user behavior toward the systems has been identified, only a few studies have empirically examined or even addressed sunk costs (Lee & Joshi, 2016). For instance, the perceived effort and time required affects the adoption of online social network services (Hu, Poston, & Kettinger, 2011), and even after the adoption of these services, usage intention can be lowered due to high switching-stress creators formed by sunk costs (Maier, Laumer, Weinert, & Weitzel, 2015). Another study also

found user's intention to switch from traditional IT services to cloud computing services was negatively influenced by the expected switching costs, whose antecedents are satisfaction with the traditional IT services, even when in reality, it was more beneficial to switch to cloud computing services (Park & Ryoo, 2013).

4. HYPOTHESES DEVELOPMENT

Our thesis is as follow:

The perceived search simplicity and content quality of a KMS affect knowledge workers' retrieval behavior, which leads to higher work efficiency when their perceptions toward a KMS is not biased by their previous time and effort investments.

According to UGT, knowledge workers may retrieve knowledge from a particular KMS for the experience of the process itself (Cutler & Danowski, 1980). These users could receive gratification mainly from the process of retrieving the knowledge (Cutler & Danowski, 1980), which indicates that a psychological need is gratified by the system usage process rather than from the knowledge stored in the KMS (Chen G. , 2011). Process gratification has been studied in the Internet context. For example, active Twitter users gratify the need to connect with others on Twitter (Chen G. , 2011) and use Twitter for fun (Liu, Cheung, & Lee, 2010), which lead to their satisfaction and use of Twitter (Liu, Cheung, & Lee, 2016). In another example, users are gratified by the personalization feature in a mobile application, which leads to active usage of the application (Sutanto, Palme, Tan, & Phang, 2013).

Since process gratification concerns the actual use of the medium itself (Cutler & Danowski, 1980), several dimensions related with process gratifications have been identified in the Internet context, such as searching and surfing (Stafford, Stafford, & Schkade, 2004). Among these dimensions, searching is the most important indicator for process gratification (Stafford, Stafford, & Schkade, 2004). In other studies, ease of use has been identified as one important dimension for browsing commercial websites (Eighmey, 1997). In the context of KMSs, knowledge searching is the core process for knowledge retrieval. When searching for the relevant knowledge in a KMS, knowledge workers may enjoy the simplicity of the searching process, and this process gratification may increase their active usage of KMS. Accordingly, we hypothesize:

H1: Perceived search simplicity increases the extent of knowledge retrieval from a KMS.

In KMS, perceived knowledge quality also affects knowledge retrieval behavior (Kankanhalli, Tan, & Wei, 2005; Durcikova & Gray, 2009). Based on UGT, content gratification is the purposeful use of a medium (Stafford, Stafford, & Schkade, 2004). Several dimensions related with content gratifications

have been identified in the Internet context, such as learning, knowledge, and information (Stafford, Stafford, & Schkade, 2004). Users may be gratified by the content carried by a medium and become involved in that medium. For example, content gratification of Twitter resides in the information content carried through Twitter, which affects users' satisfaction and continuous use of Twitter (Liu, Cheung, & Lee, 2016). In the context of KMSs, the gratification of the content quality in KMS may lead knowledge workers into actively retrieving knowledge from the KMS. Thus, we hypothesize:

H2: Perceived content quality increases the extent of knowledge retrieval from a KMS.

KMS knowledge retrieval has been found to positively affect knowledge workers' work efficiency (Kankanhalli, Lee, & Lim, 2011; McCall, Arnold, & Sutton, 2008; Teo & Men, 2008). However, the degree of knowledge retrieval from a KMS may not lead to better efficiency due to a knowledge worker's biased perceptions toward the KMS. According to the psychology of sunk cost, knowledge workers could be committed to their self-created system and content because of their previous efforts and time investment in it, which in turn bias their perceptions of the simplicity of retrieving knowledge from the self-created KMS and the satisfaction of the knowledge retrieved from their self-created content. Consequently, the extent of knowledge retrieval from a self-created KMS may be less impactful on their work efficiency compared to the extent of knowledge retrieval from an organization-created KMS. Therefore, we hypothesize:

H3: Compared with a self-created KMS, the extent of knowledge retrieval from an organization-created KMS has greater impacts on knowledge worker's efficiency.

5. RESEARCH METHODOLOGY

5.1 Research Site

To test the hypotheses, we collaborated with the customer service department of a large technology provider. The customer service department under study provides support for customers' technical problems. It is common for the customer service department to cover countless technology-related products and services, such as software, hardware, or network-related issues. Given that the complexity of IT infrastructures has significantly increased in the last years, customers may encounter a wider range of technical problems that require increasingly complex solutions. Consequently, customers may often need to wait considerably longer or even contact customer service specialists several times before their enquiries are adequately addressed. The customer service department under study faces two important challenges in responding to customers' enquiries. First, the customer service department is the customer's first contact point for support, and customers expect instant answers to their questions from its workers. Second, an important goal for the customer service department is to reduce call-handling duration via continuous tracking and efficiency assessment, and it is required to

develop mechanisms that enable customer service specialists to solve the overwhelming customer enquiries.

The organization created and implemented two KMSs, namely KMSone (see Figure 1) and KMStwo (see Figure 2). These KMSs are deeply embedded in the customer service department's daily work. When responding to customer enquiries, the customer service specialists will normally attempt to find the answers to the enquiries using KMSone. If, in terms of actionable knowledge, answers cannot to be found in KMSone, the customer service specialists can alternatively gain in-depth knowledge with the help of KMStwo. Although these two systems were designed to complement each other in the customer service practice, it appears that the customer service specialists have repeatedly encountered difficulties in applying relevant knowledge from these two systems when dealing with customer enquiries. In this sense, a significant proportion of customer specialists have been employing custom methods to help them compensate for the shortcomings of these KMSs. They have created and maintained their own localized KMS, such as a Notepad file or sorted folders of Word-document files, on their hard drives and use self-created Java-based search tools to search for the knowledge.

Figure 1: Screenshot of KMSone (blurred for anonymity)

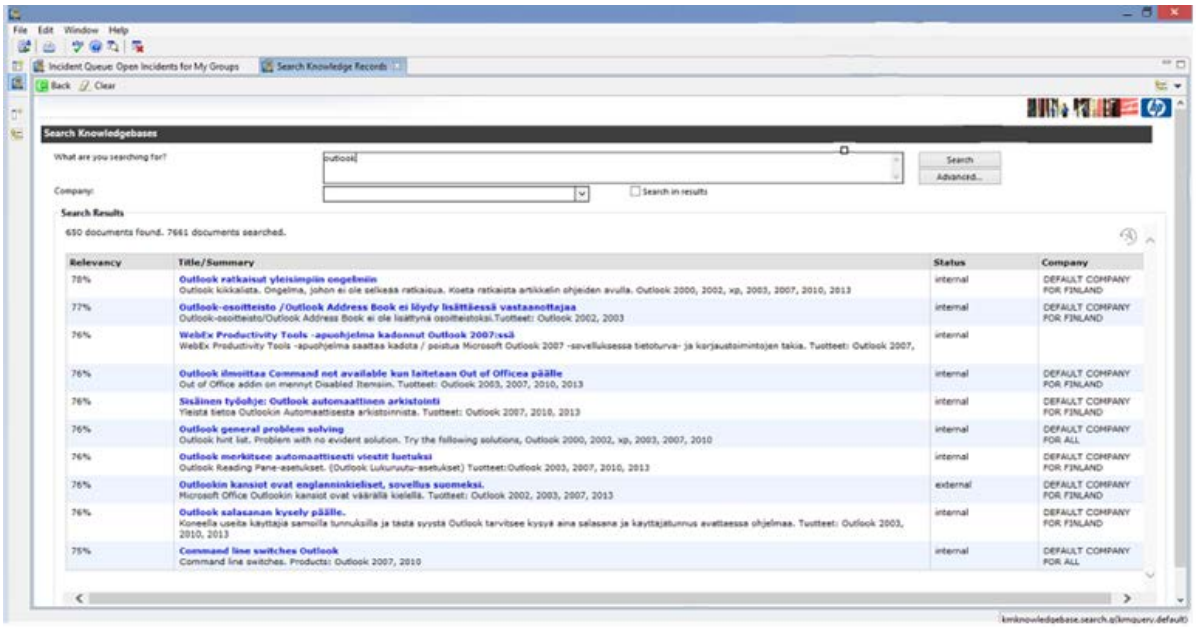

Figure 2: Screenshot of KMStwo (blurred for anonymity)

5.2 Data Collection

We collected two rounds of data (i.e., a survey and interviews/focus groups). Findings from the interviews/focus groups are also triangulated to add richness to the survey's findings.

The main variables for the survey are knowledge search simplicity, quality of the retrieved knowledge, extent of knowledge retrieval, and work efficiency. Regarding the control variables, we considered the factors that have been previously shown in the literature to affect knowledge retrieval and work efficiency. We included the demographic variables of survey respondents, such as gender, age, experience in the current position, and experience in the current area, as well as the variables characterizing the work environment, such as job stress level, training received, sourcing from colleagues, and task analyzability (Kim, Mukhopadhyay, & Kraut, 2016).

Two main variables, i.e., knowledge search simplicity and work efficiency, have a single measure. The weakness of single item measures is the inability to validate whether the variable is accurately captured; however in some situations, single item measure is the most appropriate (Straub et al. 2004). For example, in their MISQ paper, Siponen and Vance (2010) utilized some single item measures. The collaborating organization required us to minimize the number of survey questions. Before conducting the survey, we assessed the conceptual validity of the items by adopting Moore and Benbasat's procedure (Moore & Benbasat, 1991). The conceptual validation was carried out using structured sorting (with variable category labels). The goal was to gain a clear indication that the survey items are indeed measuring what they are supposed to measure. A set of five judges (researchers with substantial experience in the fields of information systems and knowledge management) were asked to sort the

items. Based on the sorting results, we revised the scales and conducted another round of sorting to confirm the construct validity. Following this positive result, we distributed the survey to the customer service specialists. The customer support specialists have clear time targets that need to be achieved, and they need to efficiently address questions from customers. On a daily basis, they receive up-to-date summaries of their efficiency of the previous day and the whole week. Thus, we cross-checked their responses with summaries of their work efficiency to ensured that the self-reported work efficiency reflected their actual work efficiency. Unfortunately, we could not use the objective efficiency data in our study because the company prevented us from "exporting" the data outside of the company premises. An overview of the survey items is presented in Table 1. Six-point Likert scales from strongly disagree to strongly agree (never to very frequently for the knowledge retrieval variable) was used. A total of 158 survey responses (102 male and 56 female) were returned. The descriptive characteristics of the respondents are also shown in Table 1.

Table 1: Survey Items

Construct	Reference	Items	Mean (S.D.)/ Frequency
Search Simplicity (SS_KMSone)	(Phang, Kankanhalli, & Sabherwal, 2009)	1: Searching for content in KMSone is simple.	4.487(1.173)
Search Simplicity (SS_KMStwo)		1: Searching for content in KMStwo is simple.	2.557(1.265)
Search Simplicity (SS_LocalKMS)		1: Searching for content in LocalKMS is simple.	4.158(1.280)
Knowledge Quality (KQ_KMSone)	(Durcikova & Gray, 2009)	1: The content in KMSone meets my needs; 2: I am satisfied with the content in KMSone; 3: The overall quality of content in KMSone is high.	4.114(1.136) 3.943(1.254) 3.892(1.215)
Knowledge Quality (KQ_KMStwo)		1: The content in KMStwo meets my needs; 2: I am satisfied with the content in KMStwo; 3: The overall quality of content in KMStwo is high.	3.025(1.248) 3.019(1.275) 3.070(1.317)
Knowledge Quality (KQ_LocalKM)		1: The content in LocalKMS meets my needs; 2: I am satisfied with the content in LocalKMS; 3: The overall quality of content in LocalKMS is high.	4.070(1.228) 3.880(1.208) 3.804(1.250)
Knowledge Retrieval (KR_KMSone)	(Phang, Kankanhalli, & Sabherwal, 2009)	1: To what extent do you use knowledge from KMSone when solving a customer case? 2: When working on a customer case, to what extent do you look in KMSone to find solutions to similar cases?	4.728(1.017) 4.709(1.039)
Knowledge Retrieval (KR_KMStwo)		1: To what extent do you use knowledge from KMStwo when solving a customer case? 2: When working on a customer case, to what extent do you look in KMStwo to find solutions to similar cases?	2.285(1.191) 2.329(1.290)
Knowledge Retrieval (KR_LocalKMS)		1: To what extent do you use knowledge from LocalKMS when solving a customer case? 2: When working on a customer case, to what extent do you look in LocalKMS to find solutions to similar cases?	4.127(1.330) 4.120(1.398)
Sourcing from Colleague (SC)	(Gray & Durcikova, 2005)	1: To what extent do you discuss problems with colleagues when you need to improve your knowledge on a topic or issue related to work?	4.943(0.936) 5.120(0.790)

		2: When you work on a challenging case, to what extent do you communicate with your colleagues who may have encountered similar issues?	
Task Analyzability (TA)	(Nidumolu, 1995)	1: To what extent is there a clearly known way to solve a customer case? 2: To what extent are there precise instructions that can be followed when solving customer cases? 3: To what extent are there common practices to work on customer cases?	4.519(0.832) 4.259(0.887) 4.342(0.891)
Job Stress (JS)	(Shigemi, Mino, Ohtsu, & Tsuda, 2000)	1: To what extent is there too much trouble at work? 2: To what extent is there too much work to handle? 3: To what extent is there pressure on subordinate employees?	3.930(1.038) 4.234(0.982) 4.342(0.953)
Training (TR)	(Chen & Huang, 2009)	1: To what extent are training activities available for new employees? 2: To what extent do training programs exist?	3.949(1.036) 3.766(0.922)
Efficiency (EF)	(Henderson & Lee, 1992)	1: To what extent are you able to operate efficiently when solving customer cases? (**Note**: we cross-checked the responses with summaries of their efficiency on the previous day and previous week; we found that their responses were consistent with their actual work efficiency.)	4.759(0.783)
Age		21 and under 22 to 34 35 to 44 45 to 54 55 to 64 65 and above	2 100 38 13 5 0
Gender		Female Male	56 102
Experience Current Position		How long have you been employed in the current position? < 4 months 4 months–1 year 1 to 2 years 2 to 5 years 5 to 10 years > 10 years	 15 32 27 44 32 8
Experience Current Area		How long have you been working in customer service? < 4 months 4 months-1 year 1 to 2 years 2 to 5 years 5 to 10 years > 10 years	 8 18 16 44 54 18

To gain a better understanding of knowledge workers' (perception-based) gratifications toward the organization-created KMS, interviews and focus groups with a total of 45 customer service specialists were conducted. During the interviews, we specifically asked about the functionalities and the usage behavior of the KMS. A comprehensive understanding of knowledge retrieval practices in the customer service department was obtained from the interviews, which adds richness to the findings.

6. FINDINGS

Based on the descriptive statistics of the survey items shown in Table 1, it seems that the respondents' perceived knowledge quality and search simplicity of KMStwo (organization-created system and

populated content) are much lower compared to KMSone (organization-created system, customer service specialists-created content) and LocalKMS (customer service specialists-created system and content). Moreover, it seems that they retrieved knowledge more frequently from KMSone and LocalKMS. Partial least squares (PLS) modeling technique and SmartPLS v.3 were used for our data analysis. The item loadings and the results of reliabilities and validities are shown in Table 2 (KMSone), Table 3 (KMStwo), and Table 4 (LocalKMS). The values of Cronbach's alpha and composite reliability, which are greater than 0.70, and the values of Average Variance Extracted (AVE), which are greater than 0.50, indicate the satisfactory reliability and convergent validity for all these constructs. The discriminant validity is also satisfactory, as the square roots of the AVE are greater than any of the inter-construct correlations. Given the satisfactory measurement model, our hypotheses could then be tested by examining the structural model.

As shown in Table 5, all values of Variance Inflation Factor (VIF) are smaller than 5; this reduces the concern of multi-collinearity among predictors. Tables 6 to 8 show the results of the analysis. Concerning KMSone (Table 6), we find that knowledge quality (coefficient = 0.341, $p < 0.001$) and search simplicity (coefficient = 0.212, $p < 0.001$) positively affect knowledge retrieval, which subsequently leads to higher work efficiency (coefficient = 0.303, $p < 0.001$). For the other two KMS, knowledge quality (coefficient = 0.317, $p < 0.001$; coefficient = 0.367, $p < 0.001$) and search simplicity (coefficient = 0.383, $p < 0.001$; coefficient = 0.394, $p < 0.001$) also positively affect knowledge retrieval. Thus, H1 and H2 are supported. However, knowledge retrieval in KMStwo (coefficient = 0.008, $p > 0.05$) or LocalKMS (coefficient = 0.094, $p > 0.05$) does not lead to higher efficiency. Thus, H3 is partially supported.

Regarding the control variables, task analyzability positively affects knowledge workers' efficiency (coefficient = 0.489, 0.541, and 0.462, respectively, $p < 0.001$), which is expected because less-complex customer enquiries should lead to better work efficiency. Moreover, task analyzability negatively affects knowledge retrieval only for LocalKMS (coefficient = -0.175, $p < 0.05$). Interpreting this finding together with the finding that knowledge retrieval from LocalKMS has no effect on work efficiency means that there is a serious issue of a positive bias toward the LocalKMS.

A combined structural equation modeling that contains the degree of knowledge retrievals from the three types of KMS is shown in Figure 3. The results are consistent: compared with a self-created KMS (LocalKMS), the extent of knowledge retrieval from organization-created KMS (KMSone) has a significantly greater impact on knowledge worker's efficiency; but, this is not the case for organization-created KMS whose content is not populated by the knowledge workers themselves (KMStwo).

Table 2 Loadings, Reliability, and Validity of Constructs for KMSone

Construct	Items	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted	KQ	KR	SC	TA	JS	TR	EF	SS
KQ	1	0.940	0.941	0.962	0.895	**0.946**							
	2	0.961											
	3	0.936											
KR	1	0.949	0.889	0.947	0.900	0.573	**0.949**						
	2	0.948											
SC	1	0.915	0.801	0.909	0.834	0.136	0.248	**0.913**					
	2	0.911											
TA	1	0.896	0.845	0.906	0.762	0.572	0.445	0.216	**0.873**				
	2	0.882											
	3	0.839											
JS	1	0.875	0.748	0.853	0.659	-0.210	-0.173	-0.115	-0.206	**0.812**			
	2	0.765											
	3	0.792											
TR	1	0.949	0.882	0.944	0.895	0.375	0.268	0.087	0.299	-0.323	**0.946**		
	2	0.942											
EF	1	1	1	1	1	0.428	0.516	0.132	0.566	-0.206	0.240	**1**	
SS	1	1	1	1	1	0.507	0.474	0.215	0.274	-0.175	0.266	0.424	**1**

Table 3 Loadings, Reliability, and Validity of Constructs for KMStwo

Construct	Items	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted	KQ	KR	SC	TA	JS	TR	EF	SS
KQ	1	0.976	0.973	0.982	0.949	**0.974**							
	2	0.982											
	3	0.964											
KR	1	0.950	0.901	0.953	0.910	0.475	**0.954**						
	2	0.958											
SC	1	0.929	0.801	0.909	0.833	0.028	-0.104	**0.913**					
	2	0.896											
TA	1	0.897	0.845	0.906	0.762	0.254	0.040	0.214	**0.873**				
	2	0.880											
	3	0.840											
JS	1	0.819	0.748	0.850	0.654	-0.176	-0.270	-0.092	-0.194	**0.809**			
	2	0.729											
	3	0.872											
TR	1	0.963	0.882	0.943	0.892	0.273	0.139	0.084	0.297	-0.339	**0.944**		
	2	0.926											
EF	1	1	1	1	1	0.128	0.035	0.130	0.567	-0.208	0.244	**1**	
SS	1	1	1	1	1	0.435	0.562	0.055	0.013	-0.214	0.089	0.027	**1**

Table 4 Loadings, Reliability, and Validity of Constructs for LocalKMS

Construct	Items	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted	KQ	KR	SC	TA	JS	TR	EF	SS
KQ	1	0.929	0.946	0.965	0.903	**0.950**							
	2	0.969											
	3	0.952											
KR	1	0.941	0.867	0.937	0.882	0.560	**0.939**						
	2	0.937											
SC	1	0.878	0.801	0.907	0.830	0.254	0.212	**0.911**					
	2	0.943											
TA	1	0.896	0.845	0.906	0.762	0.376	0.076	0.222	**0.873**				
	2	0.880											
	3	0.842											
JS	1	0.851	0.748	0.853	0.659	-0.098	-0.053	-0.110	-0.201	**0.812**			
	2	0.749											
	3	0.832											
TR	1	0.960	0.882	0.943	0.893	0.273	0.108	0.094	0.297	-0.332	**0.945**		
	2	0.929											
EF	1	1	1	1	1	0.381	0.216	0.135	0.566	-0.208	0.243	**1**	
SS	1	1	1	1	1	0.576	0.578	0.181	0.270	-0.182	0.169	0.316	**1**

Table 5 Collinearity Check

	KMSone		KMStwo		LocalKMS	
Construct	**Knowledge Retrieval**	**Efficiency**	**Knowledge Retrieval**	**Efficiency**	**Knowledge Retrieval**	**Efficiency**
Knowledge Quality_KMSone	1.995	2.197				
Knowledge Quality_KMStwo			1.453	1.636		
Knowledge Quality_LocalKMS					1.737	1.987
Search Simplicity_KMSone	1.452	1.530				
Search Simplicity_KMStwo			1.360	1.627		
Search Simplicity_LocalKMS					1.550	1.839
Knowledge Retrieval		1.733		1.817		1.855
Sourcing from Colleague	1.141	1.164	1.104	1.154	1.157	1.172
Job Stress	1.218	1.219	1.247	1.288	1.232	1.235
Task Analyzability	1.567	1.608	1.229	1.233	1.305	1.362
Training	1.293	1.294	1.257	1.257	1.235	1.235
Age	1.462	1.473	1.429	1.431	1.453	1.466
Gender	1.155	1.159	1.174	1.212	1.177	1,182

Experience_area	1.855	1.868	1.891	1.912	1.872	1.875
Experience_position	1.909	1.924	1.911	1.915	1.899	1.930

Table 6 Survey Results for KMSone

	Knowledge Retrieval	**Efficiency**		
	Path coefficients	*Path coefficients*	*Indirect effect*	*Total effect*
Knowledge Quality	**0.341*** **	-0.117	**0.103****	-0.014
Search Simplicity	**0.212****	**0.227****	**0.064***	**0.291*** **
Knowledge Retrieval		**0.303*****		
Control Variables				
Sourcing from Colleague	0.113	-0.051	0.034	-0.016
Job Stress	-0.018	-0.067	-0.006	-0.073
Task Analyzability	0.154	**0.443*** **	0.047	**0.489*** **
Training	0.024	-0.003	0.007	0.004
Age	0.080	-0.009	0.024	0.015
Gender	-0.044	**0.143***	-0.013	0.130
Experience_area	0.087	-0.118	0.026	-0.091
Experience_position	-0.094	0.156	-0.028	0.127
R square	0.423	0.478		

Note: Significant relationships are in bold. *p < 0.05; **p < 0.01; ***p < 0.001.

Table 7 Survey Results for KMStwo

	Knowledge Retrieval	**Efficiency**		
	Path coefficients	*Path coefficients*	*Indirect effect*	*Total effect*
Knowledge Quality	**0.317*** **	-0.061	0.003	-0.058
Search Simplicity	**0.383*** **	0.032	0.003	0.035
Knowledge Retrieval		0.008		
Control Variables				
Sourcing from Colleague	**-0.167***	0.032	-0.001	0.031
Job Stress	**-0.150***	-0.103	-0.001	-0.104

Task Analyzability	-0.044	**0.542*** **	0.000	**0.541*** **
Training	0.004	0.069	0.000	0.069
Age	0.034	0.061	0.000	0.062
Gender	-0.144	**0.135***	-0.001	**0.134***
Experience_area	-0.107	-0.086	-0.001	-0.087
Experience_position	0.046	0.146	0.000	0.146
R square	0.450	0.362		

Note: Significant relationships are in bold. *p < 0.05; **p < 0.01; ***p < 0.001.

Table 8 Survey Results for LocalKMS

	Knowledge Retrieval	**Efficiency**		
	Path coefficients	*Path coefficients*	*Indirect effect*	*Total effect*
Knowledge Quality	**0.367*** **	0.104	0.035	0.139
Search Simplicity	**0.394 *** **	0.059	0.037	0.096
Knowledge Retrieval		0.094		
Control Variables				
Sourcing from Colleague	0.091	-0.011	0.009	-0.003
Job Stress	0.041	-0.106	0.004	-0.102
Task Analyzability	**-0.175***	**0.479*** **	-0.017	**0.462*** **
Training	0.000	0.035	0.000	0.035
Age	0.083	0.024	0.008	0.032
Gender	0.050	0.099	0.005	0.104
Experience_area	0.039	-0.068	0.004	-0.064
Experience_position	-0.129	0.174	-0.012	0.161
R square	0.461	0.396		

Note: Significant relationships are in bold. *p < 0.05; **p < 0.01; ***p < 0.001.

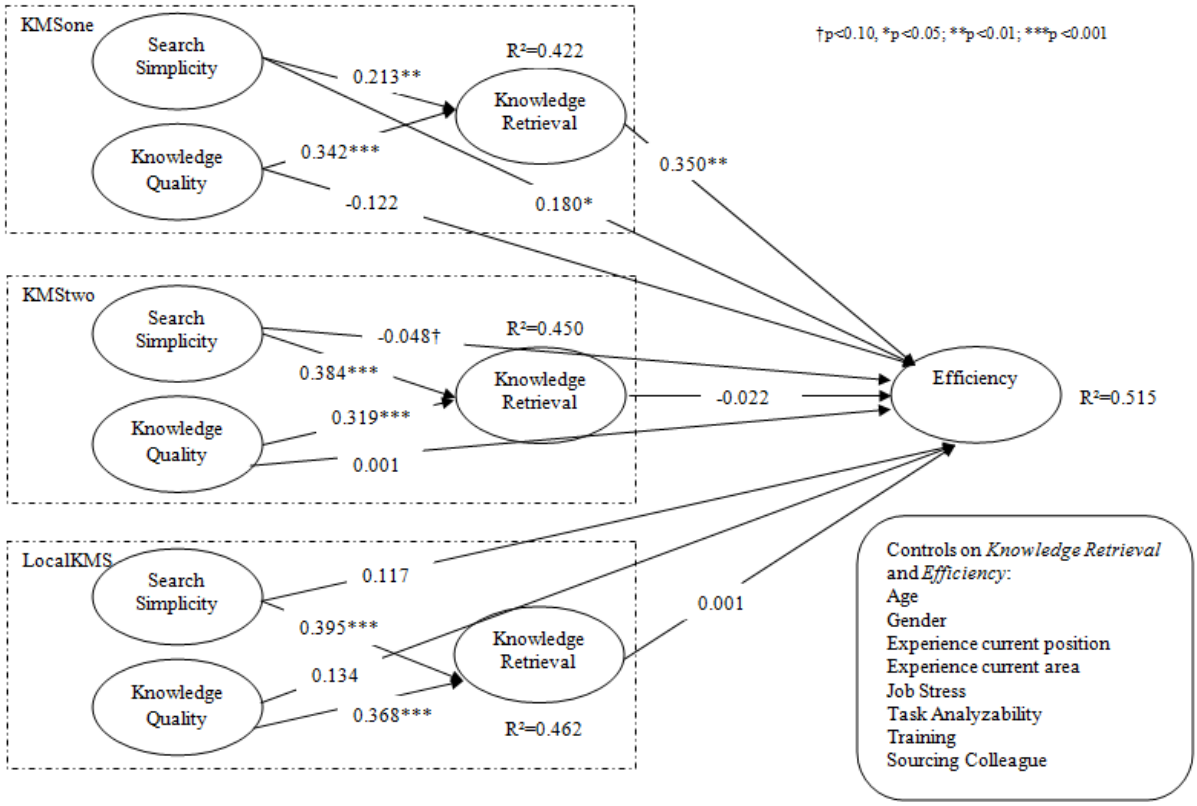

Figure 3: Combined Model

The interviews and focus groups indicated a vastly unexploited potential of search functionalities in both KMSone and KMStwo. On the one hand, a search in KMStwo appears to be difficult to use and is by far not exploited at its full potential: the customer service specialists are not fully aware of how to refine search results and thus prefer to avoid using KMStwo for solving customer cases. On the other hand, KMSone does not offer suitable support for refining the output of the search, but it does appear to contain more comprehensive applicable knowledge than KMStwo. The interviews further revealed that KMStwo contains too much content, which prevents the time-pressured customer service specialists from using it, and thus they look for knowledge from alternative resources. In addition to using KMSone, the customer service specialists prefer to use their own LocalKMS. A summary of all the issues identified following our interviews is presented in Table 9.

Table 9: Summary of interview insights

Aspects	Summary of findings	Interview quotations
Knowledge Retrieval from KMSone	The search engine in KMSone is very sensitive to the keywords that are typed in	"In KMSone if I use the wrong word I might get no answers [...] one word makes a difference. …"

	The search in KMSone is not fast enough	"I think [that the search in KMSone] could be faster. […] it would be easier if it would be like a Wiki, Wikipedia type of solutions or something like that and the searches would be fast"
Knowledge Retrieval from KMStwo	The search in KMStwo provides many irrelevant answers	"The organisation [in KMStwo] is so bad […]. In KMStwo I might have like a thousand answers. And then I start clicking. And at the same time I have a customer waiting for an answer …"; "It's like you [type in a query] and you search … and the KMStwo offers you … any possible kind of answer"
Knowledge Retrieval from LocalKMS	Development of customer-enquires' guides, as alternative to KMSone and KMStwo	"[…] we have also made for ourselves like a guide, where you can find all the [customer specific] information. And if the information is not there, and we find an answer to that question, we just add it in that guide." "Sometimes we use the guide that we have. We have the most [frequent problems described] there. [...]. And it takes about minute or two to find all the needed information from this guide. [...] the simplest way, and the fastest way is to use this guide, where we can find all the information." "We have created Excel files where there are certain problems or programs [described]. What to do in case of if the password is locked... So we can first look at the Excel file"

The insights from the interviews and focus groups provide us some possible explanations for the findings from the survey. Most of the customer service specialists are grateful for the opportunity to use the LocalKMS to a great extent. Two of them mentioned that:

We have the most [frequent problems described] there. [...]. And it's it takes about minute or two to find all the needed information from this guide. [...] the simplest way, and the fastest way is to use this guide, where we can find all the information.

We have also made for ourselves like a guide, where you can find all the [customer specific] information.

The perceived ease of use and relative advantage of the LocalKMS are probably induced by the amount of time and effort to create and use it. A customer service specialist mentioned:

We don't often use [KMSone] and we have our own network drive and all the instructions are there …we have about 90 customers and …have all the instructions there…most of them are word documents….

It appears from the interviews and focus groups that the sunk costs of creating LocalKMS increases the switching cost to use organization-created KMS (Polites & Karahanna, 2012) when handling customers' inquires. The customer service specialists also emphasized that search simplicity is the most prevalent system feature, which is probably because of their work time constraints. The customer support specialists have clear time targets that need to be achieved, and they need to efficiently address questions from customers. They are constantly under time pressures, and the daily summaries of their work efficiency make it worse as the summaries even rank their work efficiency compared to others.

6.1 Additional Findings

Based on the interviews and focus groups' insights, we did another test to check whether the extent of knowledge retrieval from LocalKMS negatively moderates the effect of knowledge retrieval from KMSone on work efficiency. We found that it does have a negative moderating effect on knowledge retrieval from KMSone (see Figure 4). Because only knowledge retrieval from KMSone positively improves work efficiency and there is a vastly unexploited potential of search functionalities in KMSone, this additional finding heightens the concern of a positive bias on self-created KMS.

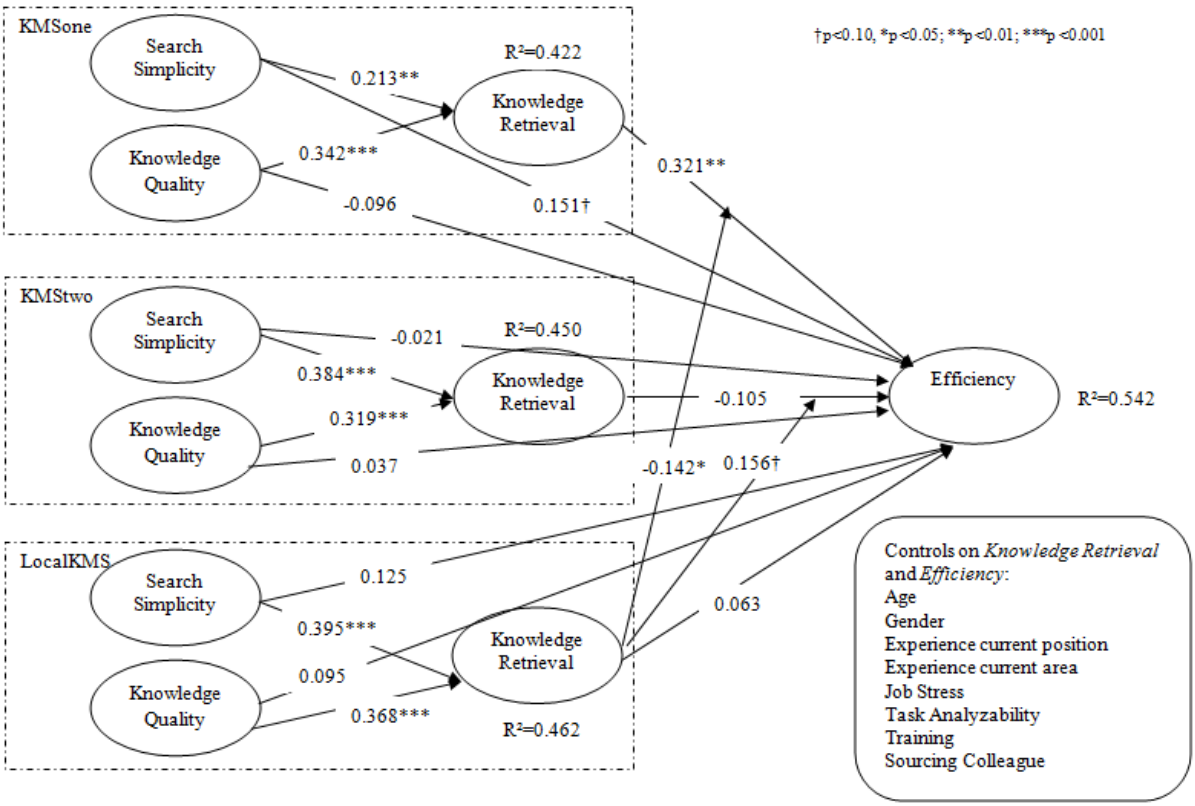

Figure 4 Moderating Effect of LocalKMS

7. DISCUSSIONS AND IMPLICATIONS

This study aims to examine knowledge worker's retrieval behavior in three types of KMSs: 1) an organization-created system and content, 2) an organization-created system whose content is inputted by the knowledge workers themselves, and 3) a self-created system and content. The study also aims to examine whether frequent knowledge retrieval from these different types of KMSs leads to higher work efficiency. The call-center company that we collaborated with for this research is a *unique setting* in which the employees' work is time critical and their work efficiency closely depends on the way they source the knowledge needed to answer customers' questions.

According to UGT, users' process and content gratifications lead to more frequent knowledge retrieval from a KMS, which subsequently leads to higher work efficiency (Kankanhalli, Lee, & Lim, 2011). However, according to the psychology of sunk cost, users may continue retrieving knowledge from self-created KMS because of positive bias in their perceived gratifications. Thus, knowledge retrieval from self-created KMS does not necessarily translate into work efficiency. We found that both perceived process gratification (reflected by search simplicity) and content gratification (reflected by content quality) with the KMS led to more frequent knowledge retrieval from the respective KMS. Moreover, although frequent knowledge retrieval from KMSone (an organization-created system whose content is inputted by the knowledge workers themselves) led to higher work efficiency, knowledge retrieval from KMStwo (an organization-created system and content) or LocalKMS (a self-created system and content) had negligible impact on knowledge workers' work efficiency. Concerning KMStwo, knowledge workers had relatively low content and process gratifications, which discouraged them from retrieving knowledge from KMStwo. For the LocalKMS, knowledge workers perceived high process and content gratifications, which encouraged them to retrieve knowledge from it frequently. However, their work efficiency was not highly improved along with the frequent knowledge retrieval from the LocalKMS. Evidently, their psychological commitments toward the LocalKMS, due to their previous investment in effort and time, induced them to continue using the LocalKMS (Kim & Kankanhalli, 2009; Samuelson & Zeckhauser, 1988), although, in reality, retrieving knowledge from the LocalKMS did not significantly improve their work efficiency. Moreover, we found that the frequent use of the LocalKMS due to the knowledge workers' positive bias negatively moderated the effect of their use of KMSone on their work efficiency.

Although surveys and interviews allowed us to obtain an in-depth understanding of the effects of multiple KMSs on customer service specialists' work efficiency, and we cross-checked their responses against objective reports when we were onsite, we could not export these objective data for analytic purpose due to confidentiality issues. Hence, findings of this study should be viewed in light of the limitation of the study. Nevertheless, this study offers several contributions to research and practice.

7.1 Contributions to Research

This study contributes to post-adoption literature of information ystems by examining organization-created KMS in conjunction with knowledge workers' self-made local KMS. Users' knowledge retrieval behavior from an organization-created KMS and related work efficiency are affected by alternative accessible knowledge sources users, such as colleagues, physical knowledge sources, or data warehouses (Kim, Mukhopadhyay, & Kraut, 2016). However, these alternative sources have significant differences compared with organization-created KMSs. For instance, knowledge in physical sources cannot be searched automatically via keywords, and data warehouses contain too much irrelevant content compared with specific KMSs. Through managing local folders, knowledge workers can maintain specific knowledge and accordingly customize the search function. Regardless of the strengths and weaknesses of the "other KMSs," these available alternatives, especially the self-developed alternatives, may discount the use of an organization-created KMS.

This study also contributes to the knowledge management literature in several ways. Knowledge retrieval from KMSs has been found to positively affect users' work efficiency (Kankanhalli, Lee, & Lim, 2011; McCall, Arnold, & Sutton, 2008). But the level of performance benefit depends on other factors, such as user experience (Ko & Dennis, 2011) and task characteristics (Kim, Mukhopadhyay, & Kraut, 2016). More importantly, the capability of a KMS is decisive on whether users' work efficiency could be improved through frequent knowledge retrieval (Kankanhalli, Lee, & Lim, 2011). However, the existing knowledge management literature has mainly focused on perceived output quality of KMSs (Kankanhalli, Tan, & Wei, 2005; Durcikova & Gray, 2009). We posit that the perceptions toward a particular KMS could be biased due to users' psychological commitments to other KMSs. Thus, frequent knowledge retrieval from a particular KMS that users perceive to contain high content quality may not necessarily lead to improved work efficiency. By examining knowledge workers' perceptions of three types of KMSs (an organization-created system and content, an organization-created system whose content is inputted by the knowledge workers themselves, and a self-created system and content) on their work efficiency, we confirm that knowledge workers' perceptions toward self-created KMS are biased. The knowledge workers have a positive bias on the search simplicity and content quality of their self-created KMSs, which leads them to frequently retrieve knowledge from their self-created KMSs, although, in reality, it does not significantly improve their work efficiency. This illusion of superiority of the self-created KMS may inhibit the knowledge workers from realizing the full potential of organization-created KMS that can actually improve their work efficiency.

7.2 Implications to Practice

Organizations should not go the extra miles of populating content into the organization-created KMS. The reasons for this suggestion are twofold. First, the knowledge workers may not have a sense of

ownership of the auto-populated content. Consequently, they may have a negative bias toward such a KMS. Second, the organization-created KMS should be integrated into the daily work activities of the knowledge workers in a way that, while doing their work, the knowledge workers are contributing knowledge to the KMS. For example, the call-center company embeds KMSone in the customer service employee's daily work. When responding to the customers' enquiries, the customer service specialists must type the enquiries and their responses into KMSone; hence, they routinely populate knowledge into KMSone.

Self-created KMS is unavoidable. It is not possible for organizations to prevent their knowledge workers from creating their own local knowledge repositories. Also, it is not possible for organizations to prevent knowledge workers from preferring their local knowledge repositories because of the positive bias of their self-created KMSs. What can be done is to integrate the knowledge workers' local knowledge repositories into the organization-created KMSs and maybe implement a ratings-based knowledge ranking as mentioned in Sutanto and Jiang's (2013) study. Therefore, the knowledge workers will access only one system when retrieving knowledge and the ranking system will help them access the best knowledge content that matches their needs. Over time, when the knowledge workers realize that the content of their local knowledge repository is inferior compared to the content of the organization-created KMS, they may no longer want to spend time creating local knowledge repositories.

8. CONCLUSION

Knowledge seekers are encouraged to actively retrieve knowledge from KMSs to obtain higher work efficiency. However, their knowledge retrieval activities from KMSs and subsequent effects on their work efficiency could vary depending on different types of KMSs. This study investigates knowledge seekers' knowledge retrieval activities and the work efficiency obtained from three types of KMSs: 1) an organization-created system that contains knowledge stored by the knowledge seekers themselves (KMSone); 2) an organization-created system with auto-populated knowledge content (KMStwo); and 3) a knowledge seeker's self-created system and content (LocalKMS). Knowledge seekers' content and process gratifications toward KMSone and the LocalKMS motivate them to actively retrieve knowledge from these KMSs. However, compared to KMSone, their positive perceptions of the LocalKMS are biased by their sunk costs of creating the LocalKMS, which, in turn, lead to frequent knowledge retrieval from the LocalKMS, although it does not necessarily translate into work efficiency. This study encourages future research to examine how to de-bias the perceptions of self-created systems. Moreover, the results of this study provide insights for organizations on KMS design so they will not overstretch their efforts in auto-populating content into organization-created KMSs.

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