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Defining Knowledge Management (KM) Activities from Information Communication Technologies (ICTs) Perspective

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Abstract

KM practitioners or managers may sometimes face difficultities when they come to adop definitions to plan for effective KM and information infrastructure in their respective situations to achieve organisational competitive advanatge (CA). This paper is to review and examine the variations and similarities from the various definitions of KM activities since 1990s from the perspective of Information Communication Technologies (ICTs) with the aim of finding out which is the most suitable one to adopt. A keyword index search of 'knowledge management' was conducted on 01 December 2009 in the ProQuest Central online database. 25932 articles were found. After topic filtering, there were only 254 articles related to the keyword and 55 of them were connected to the 'knowledge management activities'. Based on the scope of the 55 articles, this paper identified that there are four KM activities: creating, storing, sharing and utilising knowledge.

Keywords: Information Communication Technologies (ICTs), Knowledge management (KM) and KM Activities.

Introduction

Knowledge management (KM) activities are one of the basic requirements to know for any individual who wishes to implement KM in his/her organisations. The activities are enabled better by information communication technologies (ICTs). However, since the inception of KM, there are a myriad of definitions given for KM activities by different KM workers for both academic and practical applications. As a result of this, a clear understanding of KM activities is hence essential for effective development and implementation of KM.

Therefore, this paper is to review and examine various definitions of KM activities since 1990s from the perspective of ICTs with the aim of showing their variations. A keyword index search of 'knowledge management' was conducted on 01 December 2009 in the ProQuest Central online database. 25932 articles were found. After topic filtering, there were only 254 articles related to the keyword and 55 of them were connected to the 'knowledge management activities'. Based on the scope of the 55 articles, this paper identified that there are four KM activities: creating, storing, sharing and utilising knowledge. KM practitioners and managers can adopt this KM activities for implementing KM to effectively implement KM to achieve organisational CA.

The following sections of this paper will first present the research background of KM, KM activities, KM system (KMS) and ICTs, and subsequently evaluation of KM activities. Thereafter, a summary of exisitng KM framework issues surrounding the KM activities is discussed. Section 6 finally concludes this paper.

Research Background

There are different views of knowledge. These different views thus lead to different perceptions of KM. From the ICTs view,

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knowledge consists of data and information that has been organised and processed to give understanding, experience, and expertise in a specific context (Benbya et al., 2004, Zack, 1999b).

If knowledge is viewed as an object, or is equated with information access, then KM should focus on building and managing knowledge stocks. If knowledge is an activity, then the implied KM focus is on knowledge activity. The view of knowledge as a capability suggests a KM perspective centred on building core competencies, understanding the strategic advantage of know-how, and creating intellectual capital. The major implication of these various conceptions of knowledge is that each perspective suggests a different strategy for managing the knowledge and a different perspective of the role of systems in support of KM (Alavi and Leidner, 2001).

In the context of this paper, knowledge is viewed as an object and processed-based since this paper is from the view of ICTs to KM activities (Alavi and Leidner, 2001, Benbya et al., 2004, Davenport and Prusak, 2000, Zack, 1999b). KM is seen as a broad, multi-dimensional and covers most aspects of business activities (Alavi and Leidner, 2001, Wiig, 1997). The business activities were perceived as KM life cycle (Benbya et al., 2004). KM life cycle is an iterative sequence of KM activities (Benbya et al., 2004, West and Hess, 2002).

Methods of Study

This study was carried out by searching publications of works since 1990s which were connected to knowledge management activities. An online database system subscribed by Multimedia University called ProQuest Central Online database system was basically used to carry out the search by means of keyword index such as knowledge management, knowledge management and technology, knowledge management activities, etc.

All the related topics were then reviewed, analysed and summarised on their frameworks defined for KM activities in terms of number of phases and definitions of phases.

Results

A total of 55 articles from 1994 to 2008 were found connected to 'knowledge management activities' in the literature search carried out. Table 1 below shows the summary of the KM activities identified in different frameworks. This table shows that the KM activities consist of three, four or five phases.

Table 1: List of KM Activities from Different Frameworks

	Author(s)	Year	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Source
1	Nonaka	1994	Socialise	Externalise	Combine	Internationalise		(Nonaka, 1994)
2	Bassie	1997	Create	Capture	Use			(Bassie, 1997)
3	Wiig	1997	Create	Develop	Organise	Leverage		(Wiig, 1997)
4	Gertjan, Rob and Eelco	1997	Develop	Consolidate	Distribute	Combine		(Gertjan et al., 1997)
5	Mayo	1998	Create	Capture	Storage	Availability	Utilisation	(Mayo, 1998)
6	Martinez	1998	Capture	Organise	Share			(Martinez, 1998)
7	Blake	1998	Capture/ Collect	Distribute				(Blake, 1998)
8	Davenport and Prusak	2000	Generate	Flow/Share	Establish/ Maintain	Codify	Transfer	(Davenport and Prusak, 2000)
9	Zack	1999	Create	Manage	Utilise			(Zack, 1999a)
10	Zack	1999	Create	Explicate	Share	Apply	Improve	(Zack, 1999b)
11	Tiwana	2000	Acquire	Share	Utilise			(Tiwana, 2000)
12	Hahn and Subramani	2000	Acquire	Organise	Communic ate			(Hahn and Subramani, 2000)
13	Meso and Smith	2000	Use	Search	Create	Package		(Meso and Smith, 2000)

Table 1: List of KM Activities from Different Frameworks (continued)

	Author(s)	Year	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Source
14	Alavi and Leidner	2001	Create	Storage/ Retrieval	Transfer	Apply		(Alavi and Leidner, 2001)
15	Kim	2001	Create	Organise	Locate	Distribute	Share	(Kim, 2001)
16	Bloodgood and Salisbury	2001	Create	Transfer	Protect			(Bloodgood and Salisbury, 2001)
17	King et al.	2002	Capture	Store	Disseminate			(King et al., 2002)
18	Holsapple and Joshi	2002	Acquire	Select	Internalise	Use		(Holsapple and Joshi, 2002)
19	Bose	2003	Collect	Analyse	Exchange	Utilise		(Bose, 2003)
20	Benbya et al.	2004	Generate	Store	Distribute	Apply		(Benbya et al., 2004)
21	Sher and Lee	2004	Collect	Codify	Combine			(Sher and Lee, 2004)
22	Ngai and Chan	2005	Create	Acquire/ Capture	Store	Maintain	Disseminate	(Ngai and Chan, 2005)
23	Rajiv and Sanjiv	2005	Create	Share	Utilise			(Rajiv and Sanjiv, 2005)
24	Wang, Klein and Jiang	2007	Create	Share	Store	Use		(Wang et al., 2007)
25	Nevo, Furneaux, and Wand	2008	Create	Codify	Transfer	Apply	Feedback	(Nevo et al., 2008)

While there are different KM frameworks that used different number of KM activity phases, Table 2 lists that the KM activity phases used by different frameworks are mostly three and four. There are 9 articles that used three and four KM activity phases respectively as highlighted in Table 2.

Table 2: Number of KM Activity Phases Used by Different Frameworks

Number of Phases	2	3	4	5
Number of Framework(s)	1	9	9	6

Table 3 shows that there are 34 KM activity terminologies used. The five most frequent used terminologies are create, store, share, distribute and utilise as highlighted in Table 3.

Table 3: Number of KM Activity Terminologies Used by Different Frameworks

	Phase Terminology	**Frequency**
1	Socialise	1
2	Externalise	1
3	Combine	3
4	Internationalise	1
5	Create/Generate	14
6	Capture	6
7	Utilise	9
8	Develop	2
9	Organise	4
10	Leverage	1
11	Consolidate	1
12	Distribute / Disseminate	6
13	Store	6
14	Availability	1
15	Share	7
16	Maintain	2
17	Codify	3
18	Transfer	4
19	Apply	4
20	Manage	1
21	Explicate	1
22	Acquire	4
23	Communicate	1
24	Search	1
25	Package	1
26	Locate	1
27	Protect	1
28	Select	1
29	Internalise	1
30	Exchange	1
31	Analyse	1
32	Collect	2
33	Feedback	1
34	Improve	1

Interpreting Knowledge Management (KM) Activities

Knowledge is having more descriptive value based on recent frameworks proposed as in KM activities. KM activities are supported by information infrastructures (Alavi and Leidner, 2001, Benbya et al., 2004, Bloodgood and Salisbury, 2001, Gertjan et al., 1997, Hahn and Subramani, 2000, Holsapple and Joshi, 2002, Kim, 2001, Nonaka, 1994, Rajiv and Sanjiv, 2005, Sher and Lee, 2004, Tanriverdi, 2001, Zack, 1999a, Wang et al., 2007). KM capabilities are supported by information infrastructures (Alavi and Leidner, 2001, Benbya et al., 2004, Bloodgood and Salisbury, 2001, Gertjan et al., 1997, Hahn and Subramani, 2000, Holsapple and Joshi, 2002, Kim, 2001, Nonaka, 1994, Rajiv and Sanjiv, 2005, Sher and Lee, 2004, Tanriverdi, 2001, Zack, 1999a). In 1994, Sher and Lee proved that information infrastructure facility often resulted in greater information infrastructure capabilities (IICs). Competitive advantage (CA) resulting from the view of ICT was investigated among researchers within the information system (IS) field (Wade and Hulland, 2004). The primary finding was organisation that possesses imitable or-non-substitutable resources often enjoys sustainable CA.

Creating Knowledge

Creating knowledge refers to the development of new knowledge from data, information, or prior knowledge (Rajiv & Sanjiv, 2005). Creating new knowledge was treated as continued organisational learning which was formed by teams of employees and synergies emanating from these teams (Nonaka, 1994; Quinn, Anderson, & Finkelstein, 1996). Nonaka (1994) proposed a framework for managing the dynamic aspects of organisational knowledge creating process. This framework viewed processing information and creating knowledge as KM activities which can process information and then create knowledge to the organisation efficiently in a changing environment. This framework proposed "hypertext management" for implementing more effective knowledge creation. The term "hypertext" is borrowed from computer software which allows users to search large quantities of text, data and graphics with a user-friendly interface. The core feature of the hypertext is having the KM capability of switching between dynamic aspects of organisational knowledge creation. Within the KM activities of knowledge creation, the KM capability is able to distinguish between various KM activities such as acquisition, generation, exploitation and accumulation of knowledge. Such KM activities are managed effectively by appropriate capabilities and tools. ICT infrastructure such as modern computer systems enables reconfiguring of existing information through the sorting, adding, re-categorising and re-textual of knowledge creation effectively and efficiently. It is proven that while lots of new KM tool is developed by individuals, organisations play a critical role in articulating and amplifying that knowledge (Nonaka, 1994). In Sher and Lee's (2004) framework, knowledge creation incorporates organisational and managerial routines. It is closely related to innovation (Nonaka, 1994). For example, KM is regarded as central to product and process innovation and improvement, the execution of decision-making, organisational adaptation and renewal. In Rajiv and Sanjiv's (2005) framework, knowledge creation is mostly from combining prior knowledge, socialisation and hiring new employees or by forming external alliances. Knowledge can be created through collecting knowledge from new knowledge, codifying knowledge and combining new and old knowledge (Gertjan et al., 1997; Nonaka, 1994; Sher & Lee, 2004). It is impossible to manage the requirements for these knowledge flows unless information infrastructure is supportive (Sher & Lee, 2004).

Storing Knowledge

While organisations create knowledge, they also forget (Alavi & Leidner, 2001). Knowledge can be viewed as an item to be stored for future usage (Zack, 1999a). Gertjan, Rob and Eelco (1997) presented a framework for organising corporate

memories. The goal of the research was to investigate how IICs and knowledge KM tools can be used to realise corporate memories. Any piece of knowledge or information that contributed to the performance of an organisation could (and perhaps should) be stored in the corporate memory. This included knowledge about products, production processes, customers, marketing strategies, financial results, strategic plans and goals etc. Sher and Lee (2004) suggested that more attention should be paid to the storage and retrieval of knowledge. This is because the storage of organisational knowledge constitutes an important aspect of organisational CA and high ICTs utilisation that lead to a reduction of ICTs application costs.

Sharing Knowledge

Sharing Knowledge is the stage between knowledge acquisition and knowledge utilising of the three basic activities of knowledge management elaborated by Tiwana (2002). Each stage may take place simultaneously to support each other. Becerra-Fernandez, Gonzalez, & Sabherwal (2004) demonstrated knowledge sharing as the process through which explicit or tacit knowledge is communicated to other individuals. Three important clarifications are in order. First, knowledge sharing means effective transfer, so that the recipient of knowledge can understand it well enough to act on it. Second, what is shared is knowledge instead of recommendations based on the knowledge. Third, knowledge sharing may take place across individuals as well as across groups, departments, or organisations. Sharing knowledge allows dissemination of skills, experience, and knowledge across individuals, groups, departments or organisations. The shared knowledge enhances learning and enables employees to be more responsive to environmental change with lesser cost (Gertjan et al., 1997; Rajiv & Sanjiv, 2005). An expert system that helps a novice technical support person answers technical support calls at the help desk of Microsoft is a good example of knowledge that is being shared with that person (Tiwana, 2002).

Utilising Knowledge

Utilising knowledge is the actual use of the knowledge, which can be used to adjust strategic direction, solve new problems, and improve efficiency (Wang et al., 2007). Tiwana (2002) indicated that learning is integrated into the organisation by utilising knowledge. Whatever is broadly available throughout the organisation can be generalised and applied, at least in part, to new situations. The expert system example that helps a novice technical support person who answers technical support calls at the help desk of Microsoft is a good example of sharing and utilisation taking place simultaneously.

Today, the organisational CA relies less on traditional factors (capital, land, and labour) that was true in the past. Knowledge can be viewed as:

"A resource and now appears to be one of these traditional factors"(Sher & Lee, 2004).

"A process of simultaneously knowing and acting - that is utilising knowledge" (Zack, 1999a).

Emerging KM literature suggested that ICTs have the potential to add value to firms by enabling utilisation of valuable knowledge resources across the firm (Benbya et al., 2004; Hahn & Subramani, 2000; Holsapple & Joshi, 2002a; Kim, 2001; Nath, 2000; Ngai & Chan, 2005; Sher & Lee, 2004; Tanriverdi, 2001; Wang et al., 2007). As such, a knowledge driven organisation must effectively and efficiently utilise knowledge to respond to environment variations to sustain a competitive advantage**.** Organisations thus benefit from improved dynamic capabilities and competitiveness. Furthermore, since high ICTs utilisation leads to a reduction of ICTs application costs, it tends to be a source of CA. Hence knowledge, like any other resource, demands good utilisation.

Implications, Discussions and Suggestions

Implications

Based on the research findings and contributions, there are several

implications for the theory about KM activity in view of ICT for organisational CA. This paper provides new insights into KM activity in two ways. *First,* this research findings appear to provide the review and investigation from a myriad of definitions given for KM activities by different KM workers for both academic and practical applications. This is due to the progress of globalisation and adoption of KM activities which are viewed crtitical for knowledge-driven organisations (Chong, Chong, 2005, Chong and Choi, 2005). *Second,* the suitable definitions of KM activity, which are needed to invest ICT infrastructures that are supported by KM activities to effectively implement KM and eventually lead to organisational CA, can be identified.

Discussions

In general, the different frameworks proposed in Table 3 share considerable similarities, the only difference is the activity definition. In order to examine the KM activities from a comprehensive point of view, four most frequently used KM activities are identified, namely creating, storing, sharing and utilising knowledge. These activities are adopted in this paper as representing a myriad of KM activities.

Consequently, in the context of this paper, the knowledge development cycle is defined as the systemic activity of creating, storing, sharing and utilising an organisational knowledge. From the perspective of KM, the definition can be extended to:

"The management of creating, storing, sharing and utilising organisation's knowledge that gives understanding, experience, and expertise efficiently and effectively in a specific context for achieving specific organisational goals"

Suggestions

In this paper, the definition of KM activiy is not complete because other methodologies, such as statistical method, were not included in the study.

The qualitative and quantitative methods are different in both methodology and problem domain. Integration of qualitative and quantitative methods may be an important direction for future work on KM activities.

Conclusion

In this paper, the author has presented an evaluation of KM activities based on review, interpretation, and synthesis of a broad range of relevant literature. KM activities are defined as create, store, share, and utilise in the perspective of ICT. It is hoped that this information will be able to help KM practitioners and managers to identify which definition of KM activities is most suitable to adopt when implementing KM in their respective situation particularly orgnaisational competitive advanatage (CA).

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