

ROLE OF INFORMATION TECHNOLOGY IN KNOWLEDGE MANAGEMENT

***AUWAL MAGAJI ABUBAKAR; **HAUWA MAMMAN SALEH; & **SAHANATU MUAZU**

*Department of library and Information Science, Kaduna Polytechnic, Kaduna. **Department of library and Information Services, Nigerian Institute of leather and Science Technology, Samaru Zaria.

ABSTRACT

Effective knowledge management is becoming crucial for the survival of business organizations due to their increasing reliance on knowledge work. Information technology (IT) plays a key role in enabling knowledge management. The objective of this research is to understand the role of IT in managing organizational knowledge. The results of the study will enhance our understanding of the organizational knowledge management process and provide guidelines for designing IT infrastructure for effective knowledge management.

that the IT support in enhancing activities such as socialization (S), externalization (E), combination (C), and internalization (I).

socialization

IT has enhanced socialization among people thus enhancing sharing of knowledge among peers. Socialization requires interaction between two or more persons with similar and overlapping interests. Communication, coordination, and group process support functions offered by IT are useful in facilitating the socialization process (Mahapatra, R. K., & Sarkar, S., 2000). IT enhances the sharing of tacit knowledge among people directly through face to face interaction through discussion, observation, imitation

Introduction:

Knowledge is considered to be an important resource to maintain the competitiveness of an organization. Drucker (1993) contends that knowledge is a key resource, more important than land, capital and labor, in the post-capitalist society. Effective knowledge management (KM) requires appropriate use of organizational strategies as well as information technology (IT). The KM strategy must be congruent with the competitive strategy of the organization (Hansen et al., 1999), and the organization must have the appropriate IT infrastructure for implementing the KM strategy (Alavi and Leidner, 1999).

Role of IT on Knowledge Management

Role of IT on knowledge creation

IT plays an essential role in accomplishing knowledge creation which is a key and crucial feature for success and continuous enhancement of KM and its activities. Similarly, (Scharmer, 2000; Heeseok Lee and Byounggu Choi, 2003) state

and practice using the following Information Technology tools like video conferencing, Internet and Knowledge directories.

Externalization.

Externalization converts tacit knowledge into explicit knowledge. Knowledge acquisition techniques and tools can facilitate this process to some extent. To leverage knowledge to the whole organization, tacit knowledge has to be converted to explicit knowledge; this is called externalization (Mahapatra, R. K., & Sarkar, S., 2000). Externalization enable the “know-how” knowledge that is gained through socialization to be documented. Tacit knowledge is converted to explicit knowledge and explicated, codified and stored in knowledge repository for easy access by others so that the knowledge can be reused. To have effective knowledge transfer, and to avoid loss of knowledge during tacit to tacit knowledge transfer, for example, a lecture, if it is possible can record knowledge. Lectures can be recorded, stored and uploaded in Youtube that is made accessible only for those students that are taking the course. For faculties, knowledge repository can store rules, policies, solutions, work flows, and processes that can be accessed anywhere anytime they are needed. Administrative rules, courses for undergraduates and postgraduates, and program requirements can be stored in knowledge repository. Every new semester, the knowledge repository can be accessed to retrieve program requirements for students’ enrollment. Any addition or modification of the program can be updated in knowledge repository. Other internal knowledge such as research reports, and the result of discussion by academicians in workshops can be stored in knowledge repositories. Knowledge repository can act as a knowledge-base for keeping keynote speech, the universities conference publications, and any publications that were published in conferences and journals by academic staff as well as students’ thesis and final year projects (Ali, N., Sulaiman, H., & Cob, Z. C., 2014).

Managing explicit knowledge requires significant investment in IT (Hansen et al., 1999). Knowledge extracted from experts, organizational policies and procedures, problem solving episodes, etc. are captured in the organizational knowledge base. Browsing, presentation, location, and filtering functions are deployed to provide knowledge workers access to this knowledge. An expert system may also be used as a vehicle for knowledge reuse (Liebowitz and Beckman, 1998). IT, thus, plays a key role in facilitating knowledge creation and management

Combination (explicit to explicit).

Combination process creates explicit knowledge through transformation, analysis, and integration of available explicit knowledge. All IT functions with the exceptions of communication, coordination, and group process support are useful in facilitating combination. At this stage, individuals exchange and combine knowledge through exchange mechanisms such as discussions on the existing explicit knowledge. As a result of discussions, the existing knowledge is modified, updated, improved and combines with other knowledge to create new knowledge. Blogs, electronic document management systems, and portals are examples of repository where knowledge can be stored. New knowledge keeps on growing that can lead to more innovations. The readily available knowledge of lecturers in repository such as ebook, or youtube, will be updated based on feedback from students. A lecturer can create his or her portal to transform all his or her teaching documents that include notes, syllabi, assignments, grades, case studies, and references specifically for the courses. Any lecture notes can be transformed

into eBooks. Blogs can be used by lecturers to share their experiences about students' common problems, and how they solve them. Sharing knowledge via blogs in a form of storytelling may attract students and other lecturers to read and provide comments. Electronic document systems are useful for storing syllabus of all courses, thus the easy access of syllabus could improve speed of curriculum revision and updating. Students' performance analysis and historical records on students' performance can be stored electronically and reused for analysis to further improve their performance. Solutions for problems faced by students and lessons learned can be documented so that any same problems occur can refer to the solutions, hence reducing efforts in reinventing new solutions. For researchers, having electronic document management systems may help them store and keep track their publications. When their expertise is made available online, it is easy for external collaborators, post graduate students and industries to contact them, which open doors for them to be recognized globally (Ali, N., Sulaiman, H., & Cob, Z. C., 2014).

Internalization (explicit to tacit)

The internalization of newly created knowledge is the conversion of explicit knowledge into tacit knowledge. Internalization converts explicit knowledge into tacit knowledge. Knowledge location, browsing, filtering and retrieval functions are useful in finding appropriate knowledge, while analysis and presentation functions are useful in assimilating knowledge from its explicit form into tacit form. During this process, knowledge required from sources such as books, and publications is internalized and transformed into actions or practices in the organizations. The process of conversion from explicit to tacit is the opposite of conversion of knowledge from tacit to explicit but the technologies used are the same. Conversion of explicit knowledge to tacit knowledge in higher education is when lecturers incorporate lessons learned and students' evaluation and form into action such as more exchange of knowledge via electronic discussion forums. For researchers, the accumulation of knowledge acquired in publications help more new knowledge be created and new ideas produced. The sharing of tacit knowledge can be conducted in a form of presentation in virtual conferences, blogs, social media and electronic discussion forums (Ali, N., Sulaiman, H., & Cob, Z. C., 2014).

Role of IT on Knowledge Transferring

The key determination to share or transfer knowledge has been done with several purposes in organizations; make the knowledge visible, show the role of knowledge, solve the problems through innovative solutions and inspire employees to foster behaviors of sharing and build the knowledge infrastructure (Storck & Hill, 2000; Al-Busaidi and Olfman 2005; Jones & Linderman, 2014; Merlo, 2016). In this regard, IT are effective tools for transfer and sharing the knowledge with collaboration tools that allow people and teams who are geographically dispersed to communicate regardless geographical limitations (Sun and Scott, 2005; Nasimi et. al. 2013). IT are effective tools for improving outside communications, the excellence of services for established and new customers, faster response time and information access (Southwood, 2004; Rosemary and Craig, 2004; Edvardsson & Oskarsson, 2011; Ha et al., 2015). Furthermore, knowledge acquired as results of information possesses in the people's minds or people's experience and understanding (Marwick, 2001; Alavi et al., 2005) and the role of technology is not making organization share and transfer knowledge, but to facilitate the range and opportunity of such exchanges, only if people want to share and transfer it (Sun and Scott, 2005).

Therefore, IT has played an essential role in knowledge transfer by facilitating the whole process of knowledge transfer from one point to another throughout the world and it's also a catalyst in promoting organizations to adapt, apply and integrate their business processes and operations.

Role of IT on Knowledge Reusing

In order to provide value and effective reuse of knowledge to the organization once it is created, it is essential for knowledge to be shared with colleagues, teammates and co-workers. (Hislop, 2013; Dul et al., 2011). It plays an important role in facilitating the processes by providing an improved external communication and quality of services (Rosemary and Craig, 2004) through the use of Internet-based technologies like : computers, Internet, websites, mobile phones, other wireless communications devices and computer networks which allow the reuse of knowledge all over the world and within organization (Wickramasinghe, 2003; Manuelli et al., 2007). Additionally, in the study conducted by (UN 2007; Modimongale, 2009; Apulu, 2012), state that IT credit organizations and all organizations worldwide should have the ability to reuse the knowledge in order to become efficient, innovative and competitive. Moreover, IT enables electronically stored, rapid search, access, delivered and retrieval of information, and support collaboration and communication between organizational members for the use of knowledge (Alavi and Leidner, 2001; Brunn et al., 2002; Lee and Hong, 2002; Schware, 2003) and information gathering and processing (Beckinsale and Ram 2006). In summary, IT is a very important tool and has played a very critical role in the reuse of knowledge by supporting organizations to reuse the knowledge indoor and outdoor of the organization and shortening the process of distribution and forwarding

Role of IT on Knowledge Capturing or Storage

IT has played an important role in facilitating the process of knowledge capturing. With access to information, IT certainly plays a variety of roles by providing the way in which information can be acquired through the use of networks and databases (Takanashi, 2002; Nasimi et. al. 2013) to support an organization's KM process (Alavi and Leidner, 2001; Lee and Hong, 2002). Moreover, (Brunn et al., 2002; Schware, 2003; Beckinsale and Ram 2006; Chang & Lin, 2015) stated that IT has empowered information to be electronically captured and stored, accessed, delivered and retrieved for use of organizational decision making. Mutula and Brakel (2006) declared that IT has increased the e-readiness position to acquire, disseminate and apply information for knowledgeable decision making. Furthermore, Turban, Leidner, Mclean and Wetherbe (2004), claimed that IT in an organization can benefit in building the organizational memory and knowledge that can provide the organization to tolerate with any challenges in the business environment at any given time. In summary, IT plays a critical role in knowledge capturing because it is an essential tool for both the effectiveness of usage and reuse of knowledge in facilitating the processes of identification, storing, classification and selection of required knowledge

Conclusion

Information Technology play a very crucial role in knowledge management since knowledge can be extracted from experts, organizational policies and procedures and problem-solving episodes are captured in the organizational knowledge databases which are easily accessed universally thanks to IT.

References:

- Alavi, M. (1999). and Leidner, D.E. "Knowledge Management Systems," Communications of the AIS (1:7), February 1999.
- Alavi, M. and Leidner, D.E. (2001), "Review: knowledge management and knowledge management systems: conceptual foundations and research issues", MIS Quarterly, Vol. 25 No. 1.
- Alavi, M., Kayworth, T. & Leidner, D. (2005). An Empirical Examination of the Influence of Organizational Culture on Knowledge Management Practices. *Journal of Management Information Systems*, 22(3).
- Al-Busaidi, K.A. & Olfman, L, (2005), An Investigation of the Determinants of Knowledge Management Systems Success in Omani Organizations. *Journal of Global Information Technology Management*. 8(3).
- Ali, N., Sulaiman, H., & Cob, Z. C. (2014). The role of information technology for knowledge management paradigm in higher education. *Journal of Information Systems Research and Innovation*, 6, 59-67.
- Apulu, I (2012). Developing a Framework for Successful Adoption and Effective Utilization of ICT by SMEs in Developing Countries: A Case Study of Nigeria, Unpublished Ph.D. Thesis. University of Wolverhampton, February.
- Beckinsale, M, and Ram, M (2006). Delivering ICT to ethnic minority businesses: an action-research approach, *Environment and Planning C: Government and Policy*, Vol.24, No. 6.
- Brunn, P., Jensen, M. and Skovgaard, J.E.-M. (2002), "Market places crafting a winning strategy", *Journal of European Management*, Vol. 20 No. 3.
- Drucker, P.F., *Post-Capitalist Society*, HarperCollins Publishers, New York, NY, 1993
- Dul, J., Ceylan, C. and Jaspers, F. (2011). Knowledge workers' creativity and the role of the physical work environment. *Human Resource Management*, 50(6).
- Edvardsson, I. R. & Oskarsson, G. K. (2011). Knowledge Management and Value Creation in Service Firms. *Measuring Business Excellence*, 15(4).
- Ha, S.-T., Lo, M.-C. & Wang, Y.-C. (2015). The relationship between Knowledge Management and Organizational Performance: A Test on SMEs in Malaysia. Kuching, Sarawak, Elsevier.
- Hansen, M.T., Nohria, N., and Tierney, T. "What's Your Strategy for Managing Knowledge," *Harvard Business Review*, March-April 1999, 106-116.
- Heeseok Lee and Byounggu Choi (2003). Knowledge Management Enablers, Processes, and Organizational Performance: An Integrative View and Empirical Examination. *Journal of Management Information Systems / Summer*, Vol. 20, No. 1.
- Hislop, D. (2013). *Knowledge management in organizations: A critical introduction*. 3rd Ed. UK: Oxford University Press.
- Jones, J. S. & Linderman, K. (2014). *Process Management, Innovation and Efficiency Performance*. *Business Process Management*, 20(2).
- Lee, S.M. and Hong, S. (2002), "An enterprise-wide knowledge management system infrastructure", *Industrial Management & Data Systems*, Vol. 102 No. 1.
- Liebowitz, J., and Beckman, T. *Knowledge Organizations: What Every Manager Should Know*, St. Lucie Press, New York, NY, 1998
- Mahapatra, R. K., & Sarkar, S. (2000). The role of information technology in knowledge management. *AMCIS 2000 Proceedings*, 421.
- Manueli, K., Latu, S., and Koh, D. (2007) ICT Adoption Models, Pro. 20th Annual Conference of the National Advisory Committee on Computing Qualifications (NACCQ), Nelson, New Zealand, pp.175-181. Available at: www.naccq.ac.nz.
- Marwick, A. D. (2001). Knowledge Management Technology. *IBM Systems Journal*, 40(4).
- Merlo, T. R. (2016). Factors Influencing Knowledge Management Use in Technology Enterprises in the Southern United States. Vienna, Austria, Elsevier.
- Mutula, S.M. and Brakel, P.V. (2006), "E-readiness of SMEs in the ICT sector in Botswana, with respect to information access", *The Electronic Library*, Vol. 24 No. 3.
- Rosemary, S. and Craig, S. (2004), "Benefits and barriers of electronic marketplace participation: an SME perspective", *Journal of Enterprise Information Management*, Vol. 17 No. 4.
- Scharmer, C.O. (2000) Organizing around not-yet-embodied knowledge. In G. Krogh, I. Nonaka, and T. Nishiguchi (eds.), *Knowledge Creation: A Source of Value*. New York: St. Martin's Press.
- Schware, R. (2003), "Information and communications technology (ICT) agencies", *Journal of Information Systems*, Vol. 5 No. 3.
- Southwood, R. (2004), "The impact of ICT on SMEs - a motor for future economic growth in hard-pressed times", *Balancing Act News Update*, available at www.balancingact-africa.com/news/current.html (accessed 21 Jan 2018).
- Storck, J. & Hill, P. (2000). Knowledge Diffusion Through Strategic Communities. *Sloan Management Review*, 41(2).
- Sun, P. Y.-T, and Scott, J. L. (2005). An investigation of barriers to knowledge transfer. *Journal of Knowledge Management*,

- Takanashi, T. (2002). Introduction to knowledge Management – A Tool for Knowledge Creation/ed. APO knowledge Management A key for corporate Competitiveness /Asian productivity organization/Tokyo.
- Turban, E., Leidner, D., Mclean, E., & Wetherbe, J. (2004). Information Technology for Management: Transforming Organizations in the Digital Economy (5 ed.). California: John Wiley & Sons Inc.
- United Nations Development Programme (2007). The role of governments in promoting ICT access and use by SMEs: considerations for public policy, APDIP e-note. Available at: www.apdip.net/apdipenote/12.pdf.
- Wickramasinghe, N. (2003). "Do We Practice What We Preach? Are Knowledge Management Systems in Practice Truly Reflective of Knowledge Management Systems in Theory?" Business Process Management, Vol. 9, No. 3.