

October 2012

Information Technology as a Medium of Inter-organizational Knowledge Sharing

Fatemeh Nooshinfard

Islamic Azad University, nooshinfar2000@yahoo.com

Leila Nemati-Anarak

Islamic Azad University, lnemati@yahoo.com

Follow this and additional works at: <http://digitalcommons.unl.edu/libphilprac>

 Part of the [Library and Information Science Commons](#)

Nooshinfard, Fatemeh and Nemati-Anarak, Leila, "Information Technology as a Medium of Inter-organizational Knowledge Sharing" (2012). *Library Philosophy and Practice (e-journal)*. 819.
<http://digitalcommons.unl.edu/libphilprac/819>

Information Technology as a Medium of Inter-organizational Knowledge Sharing

Fatemeh Nooshinfard, PhD
Department of Library and Information Science
Science and Research Branch
Islamic Azad University
Tehran, Iran
nooshinfard@sbiau.ac.ir

Leila Nemati-Anaraki
PhD Student
Department of Library and Information Science
Science and Research Branch
Islamic Azad University
Tehran, Iran
lnemati@yahoo.com

Abstract

Nowadays knowledge is one of the most important strategic resources in organizations. Knowledge sharing is a mechanism for people to capture, disseminate, transfer and apply useful knowledge. In this regard knowledge sharing has become a strategic issue: as a source of funding for university research and as a policy tool for economic development. So collaboration between universities (centers of science) and research organizations (centers for practice) can play an important role in the field of knowledge sharing, as such, understanding the perceptions of how knowledge is shared between organizations is very important in their implementation of KM. Therefore this paper begins with the description of the term knowledge. It then discusses knowledge sharing and scientific collaboration between universities & research centers. Finally different ways of this process like communicational channels, especially ICTs are discussed.

Keywords- Information Technology, Knowledge Management, Knowledge Sharing, Inter-organization, Scientific Collaboration

Introduction

In modern knowledge economies, science is becoming increasingly more important in realizing economic growth (Coriat & Weinstein, 2001; OECD, 2002). Structural economic growth can only exist if the knowledge-based society and production of knowledge increase. Universities are places for science. However, for playing an important role in the economy, it is inevitable that the new knowledge is not only created at universities, but also transferred from universities to society, or more precisely to research centers. Universities traditionally provide teaching and research services but an increased focus on undertaking research is leading to a requirement to improve the process of research management. This requirement includes a need to increase the likelihood and research proposals that are submitted to research organizations are successful and result in the award of a contract (Philbin, 2008; Tucker, 2007). In this regard communication and knowledge sharing play an important role in the scientific endeavor. Scientific/scholarly communication means the study of how scholars in any field use and disseminate information through formal and informal channels (Khosrowjerdi, 2011). As expected, university-research centers interaction is found to be more important in science-based technologies (Schartinger, Rammera, Fischer, & Frhlich, 2002). Thus, our study begins with defining the word «knowledge» then after discussing about the importance of organizational knowledge sharing, scientific collaboration and communicational channels between university and research centers, the important role of different channels and ICTs in knowledge sharing are briefly mentioned.

What is Knowledge?

It is usually agreed that no standard definition of knowledge exists. One of the most referenced definitions in the literature is provided by Davenport & Prusak (1998): “Knowledge is a fluid mix of framed experience, values, contextual information, expert insight and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of individuals. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms”(Bechina , Michon, & Nakata, 2005; Davenport & Prusak, 1998). Historically, the concept of knowledge has been defined in many ways. Recently, prominent authors have defined it as a meaningful resource that makes a new society unique (Drucker, 1993). Drucker argued that knowledge has been the basis of capitalist society, which is highly specialized. “Toffler saw knowledge as the essence of power in information age. This is the source of the highest-quality power and the key to the power shift that lies ahead. According to Rogers (2003), knowledge is something that ‘occurs’, which might, for example, be the result of a knowledge creation or knowledge transfer process. Knowledge generation, which includes knowledge creation as a main component, and knowledge application, which includes knowledge transfer as a main component, are represented as the two dimensions of KM (Despres & Chauvel, 2000). For sharing and transferring knowledge between organizations it is essential to realize what knowledge sharing and scientific collaboration are”(Toffler, 1990).

Knowledge Sharing

Knowledge sharing is the process of being aware of knowledge needs and making knowledge available to others by constructing and providing technical and systematic infrastructure. Numerous studies have addressed issues related to knowledge sharing at various levels within organizations and between types of organizations (Kim & Ju, 2008). The effectiveness of knowledge sharing in organizations can be a significant factor to successful organizational management. “Dixon viewed knowledge sharing as the flow of knowledge from someone who has it to someone who wants it”(Dixon, 2000). In other words knowledge sharing is the process of exchanging and communicating knowledge between employees in an organization. Effectively sharing knowledge increases the accumulation of organizational knowledge and develops the capability of its employees for better performing their jobs. Such a process of sharing organizational knowledge, facilitates the exchange of working experiences, technical know-how and individual insights between and among individuals (Xiong & Deng, 2008).

Scientific Collaboration between Organizations (Collaboration Network)

There are some Benefits of collaboration:

- Sharing of valuable knowledge,
- Avoid re-inventing the wheel,
- Reducing redundant work,
- Reduce the cost for inventions,
- Creation of knowledge with the help of experts and experienced persons and so on(Parekh, 2009).

For policy makers, it is very much essential to invent new ways to establish a proper knowledge sharing networks. Collaboration between universities, research centers and industrial organizations can play an important role in the field of knowledge sharing (Parekh, 2009). By collaborations, the research centers will inform universities and universities will frame the research work as per the needs to fulfill the aim and any kind of the problem raised will be solved at the primary level which will save the time, money and man power (Parekh, 2009). It is very much essential to apply knowledge on practical ground. For that, collaboration of universities and research centers is a must (van Zyl, Amadi-Echendu, & Bothma, 2007). By collaborating with universities, research centers may reduce uncertainty inherent from the innovation process, as well as expand their markets, access to new or complementary resources and skills, keep up with evolution of scientific knowledge, and create new technological learning options on future technologies (Hagedoorn, 2001).

In Figure 1, a collaboration network is shown to consist of a group of organizations with the knowledge sharing as the focal point. The other organizations in the network are local and national departments, universities, industry and other related research organizations. Knowledge can be shared in each direction between each participating organization. This emphasizes the important role of interdependence in the network. Issues influencing knowledge sharing between organizations, such as management, trust, organizational culture, strategic goals, the ability and willingness to communicate and learn also appear to be important in this context.

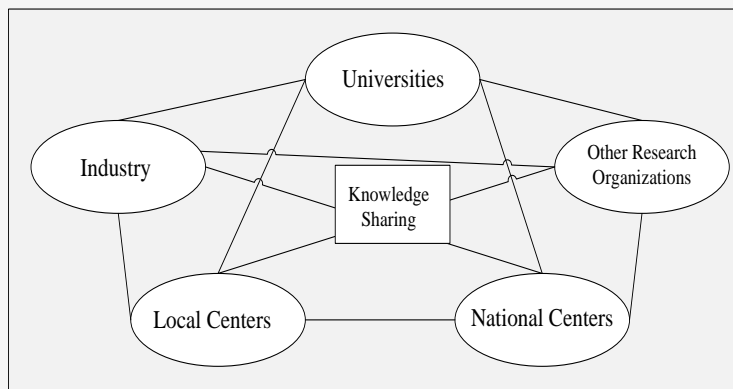


Figure 1. Collaboration Networks

University, as the stock of knowledge, has been paid growing attention by academics and management parishioners (Lambooy, 2004; Lazzarotti & Tavoletti, 2005). The development of knowledge-based economy and increasing demand for innovation has brought about new challenges for universities to move beyond their traditional role as educational institution and develop more outreach activities in partnerships with research centers and industries (Etzkowitz & De Mello, 2003). One of an important means for university to engage with research organizations is through technology transfer and ICT tools. However, developing effective knowledge sharing between university and research organizations requires collective learning based on close interactions between knowledge generation and knowledge application. Significant attention also needs to be paid on the challenges emerging from the dynamic

process and complex interactions due to “knowledge stickiness” (Wang & Lu, 2007) during the process of knowledge sharing between university and research centers. So the authors focus on the role and differences of communicational channels.

Communicational Channels

Research centers seem to make use of diverse types of technological and market knowledge; they also seem to attribute different levels of importance to interact and access knowledge developed by the universities (Bekkers, Maria, & Freitas, 2008). Given the diversity of knowledge and the way it interacts with economic processes, it is not surprising that there is also a variety of potential channels through which knowledge is transferred. Perhaps one of the most archetypical ways of knowledge transfer is publication of research. By writing down and publicizing research, knowledge becomes public and accessible for many people. However, due to the nature of publications, only explicit knowledge can be transferred. Along with publicizing, academic researchers are often encouraged to visit conferences and workshops. It offers the researchers the advantage to be able to communicate directly with many (international) specialists. When speaking at a conference, scholars receive direct feedback from those specialists, enhancing the quality of their work. Moreover, conferences and workshops can also be very important in creating social networks of people within a certain field of science especially at research centers with other scientific institutes, like Universities. Many contacts between research organizations and universities seem to be informal (OECD, 2002). A well-known form of knowledge sharing on an informal basis is the flow of information via social networks (blogs, wikis, web 2.0 etc.) (Bongers, den Hertog, & Vandeberg, 2003). Informal communication networks are characterized by more linkages than formal ones (Kratzer, Gemünden, & Lettl, 2008). Cooperation in R&D is typified by the common formulation of the targets of the research and the long-term cooperation is established. Some mutual benefits have to occur to establish a long-term relationship. Research centers and universities can share knowledge by cooperating in education. Since education is one of the core-businesses of the academy, it can also be used to educate employees of the research centers (Brennenraedts, Bekkers, & Verspagen, 2006). As we mentioned, there are various scientific communicational channels between universities and research centers, there are many other communicational channels with the aim for improving these scientific collaborations. Open-door university day for industries and research centers for visiting laboratories and new equipments and their applications, preparing research missions for motivated human resources at research organizations, and even researchers changes with some scientific institutes like universities for transmitting new scientific research results and ideas through organizing workshops, conferences, disseminating pamphlets, job training courses with getting support from scientific centers and government in funding, planning, policy making and etc. are some practical ways.

Nowadays, modern information and communication technologies (ICTs) are powerful medium which facilitating and accelerating these scientific collaborations (Munkvold, 2003). In this regard we concentrate on the role of ICT and their implications in knowledge sharing.

Role of IT and ICT in Knowledge Sharing

Information technology is used in broad level in order to heighten the level of cooperation between people and groups. Information technology has the potential of acquisition, storage, processing, retrieving and transferring the knowledge (Reychav & Weisberg, 2010) and enables scientists, geographically close or far from each other, to share their knowledge simultaneously or separately. There are different tools for knowledge sharing which let the scientists to increase their mutual cooperation and scientific productions. These tools give speed to experts ‘communications in scientific knowledge sharing. One of the most powerful forms of informal networks is the new ICTs (discussion forums, e-scholarly societies, social networks and etc.). ICTs employment in the universities and research centers allow the communication between all the persons and also inter or intra relationship between organizations. These technologies have the potential to eliminate significant barriers to the communication. The influence of the ICT in knowledge sharing has been investigated very much lately by many researchers. The technological hardware is applicable for supporters of the knowledge sharing, because the efficacy of the transference of the knowledge can be improved to increase the transfer and diminish the costs due to the time and at

the distance (Albino, Garavelli, & Gorgogline, 2004). So ICTs have been accelerated the scientific communication between universities and research centers. Today, Cyber scientific communication has been utilized from this modern technology. E-learning courses, e-publication of recent research results, and other e-services are some of ICTs services which are now available.

Figure 2 shows several ICT and non-ICT mechanisms sorted by two dimensions relating to knowledge sharing. The ability to codify knowledge is considered on the horizontal axis, whereas the dissemination breadth, which shows how many or how few people can be reached by different means of knowledge sharing, is considered on the vertical axis. Overall, eighteen different methods and tools ranging from personnel transfer and training/seminars to email and data exchange are illustrated. The ability to codify is differentiated by a low ability, which refers to codifying of know-how and contextual knowledge, and by a high ability, which takes explicit knowledge and information into account. In Despres and Chauvel's (2000) model, ICT examples to support knowledge transfer are shared databases, email, groupware and videoconferencing. Whereas shared databases and email may also be part of groupware, videoconferencing appears to provide another suitable alternative (Maier, 2001).

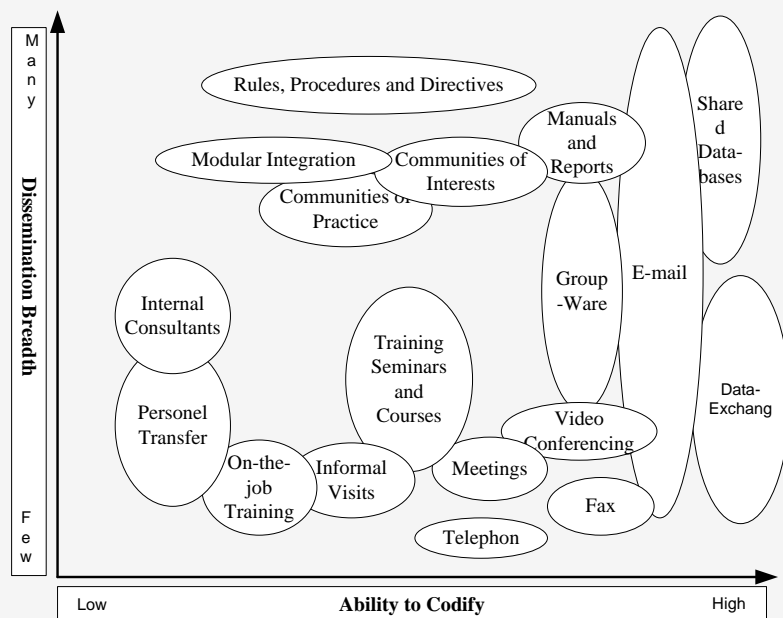


Figure 2. Different ICT and non-ICT tools for KS (Despres & Chauvel, 2000, p. 49)

According to Rasmus (2003), currently more or less any technology that can be used to support knowledge creation, transfer or codification defines itself as knowledge management technology, which has led to confusion over the technology market for knowledge management (Nassuora, 2011). Multiple technologies can be used to support knowledge management, but technology is rarely unique for the purpose of knowledge management only (Gartner, 2006; Logan, 2006; Rasmus, 2003; Riege, 2005). It is important for the organization to integrate an infrastructure that supports various types of knowledge transfer (Riege, 2005).

Conclusion

Knowledge sharing appears to work best when it is seen not so much as a relay race, but as a team sport. It is 'a game during which the ball moves continuously between the players and in which all players have to collaborate and share resources to win'. One significant point of this paper is that there is a distinct need to explore the knowledge lying in university research resources. By involving the research organizations and universities, a knowledge life cycle can be moved on and on. By involving enthusiastic, fresh and intelligent youth in research works, universities and enterprises can contribute in economic,

scientific, technical and social development of the country. Government will have to do more to support university-research center collaboration. Research centers will have to learn how to exploit the innovative ideas that are being developed in the university sector. In general, collaboration with universities influences the decision making procedures in research organizations.

ICTs would accelerate diffusion of knowledge. Different ICTs could facilitate and accelerate knowledge sharing from universities to research centers and vice versa, and even between all organizations not only at national but also at international scale. In addition, government supporting from this important project, funding, policy making, planning, monitoring and implementation strategies could play critical role in betterment of knowledge sharing in all kinds of organizations, especially between universities and research centers. The outcome of this study will enable further understanding of inter-organizational knowledge sharing and will therefore contribute towards successful implementation of knowledge sharing as part of organizational knowledge management (KM) initiatives in construction organizations.

References

- Albino, V., Garavelli, A. C. and Gorgogline, M. (2004) 'Organization and technology in knowledge transfer', *Benchmarking an International Journal*, 11(6).
- Bechina, A., Michon, N. and Nakata, K. (2005) 'Pathway to Innovation through Knowledge Management', in *ICICKM, the International Conference on Intellectual Capital, Knowledge Management and Organisational Learning*, Dubai, United Arab Emirates,
- Bekkers, R., Maria, I. and Freitas, B. (2008) 'Analysing knowledge transfer channels between universities and industry: To what degree do sectors also matter?', *Research Policy*, 37, 1837–1853.
- Bongers, F., den Hertog, P. and Vandeberg, R. (2003) *Naar een meetlat voor wisselwerking. Verkenning van de mogelijkheden voor meting van kennisuitwisseling tussen publieke kennisinstellingen en bedrijven/maatschappelijke organisaties*, Den Haag: AWT.
- Brennenraeds, R., Bekkers, R. and Verspagen, B. (2006) 'The different channels of university industry knowledge transfer: empirical evidence from biomedical engineering', *Ecis*.
- Coriat, B. and Weinstein, O. (2001) *The organisation of R&D and the dynamics of innovation. a "sectoral" view. sectoral systems of innovation. concept, issues and analyses of six major sectors in Europe*, Cambridge: Cambridge University Press.
- Davenport, T. and Prusak, L. (1998) *Working knowledge: how organizations manage what they know*, Harvard Business school press.
- Despres, C. and Chauvel, D. (2000) *Knowledge horizons*, Oxford: Butterworth-Heinemann.
- Dixon, N. (2000) *Common knowledge: how companies thrive by sharing what they know*, Boston: Harvard Business School Press.
- Drucker, P. (1993) *Post-capitalist society*, Oxford, UK: Butterworth Heinemann.
- Etzkowitz, H. and De Mello, J. M. C. (2003) 'The rise of a triple helix culture', *International Journal of Technology Management & Sustainable Development*, 2(3), 159-171.
- Gartner (2006) 'Hype Cycle for High-Performance Workplace'.
- Hagedoorn, L. (2001) 'University-industry collaboration and the development of high-technology sectors in Brazil', in *Prime-Latin America Conference*, Mexico City, September 24-26,
- Khosrowjerdi, M. (2011) 'Designing a viable scientific communication model: VSM approach', *Library Hi*

Tech, 29(2), 359-372.

- Kim, S. and Ju, B. (2008) 'An analysis of faculty perceptions: attitudes toward knowledge sharing and collaboration in an academic institution', *Library & Information Science Research*, 30, 282–290.
- Kratzer, J., Gemünden, H. G. and Lettl, C. (2008) 'Balancing creativity and time efficiency in multi-team R&D projects', *The Alignment of Formal and Informal Networks R&D Management*, 38(5), 538-549.
- Lambooy, J. G. (2004) 'The transmission of knowledge, emerging networks, and the role of universities: an evolutionary approach', *European Planning Studies*, 12(5), 643-657.
- Lazzeretti, L. and Tavoletti, E. (2005) 'Higher education excellence and local economic development: the case of the entrepreneurial university of twenty', *European Planning Studies*, 13(3), 475-493.
- Logan, D. (2006) 'Knowledge Management is Critical to Organizing and Accessing a Company's Intellectual Assets'.
- Maier, R. (2001) *Knowledge management systems* 1 ed. ed., Berlin, Heidelberg: Springer.
- Munkvold, B. E. (2003) *Implementing collaboration technologies in industry*, Springer.
- Nassuora, A. B. (2011) 'Knowledge Sharing in Institutions of Higher Learning', *International Journal of Economics and Management Sciences*, 1(3), 29-36.
- OECD (2002) *Benchmarking industry-science relationships*, Paris.
- Parekh, R. A. (2009) 'Knowledge sharing: collaboration between universities and industrial organisations', in *International Conference on Academic Libraries (ICAL-2009)*, Delhi, INDIA, 5th to 8th October, Delhi University Library System, University of Delhi (North Campus), 146-151.
- Philbin, S. (2008) 'Process Model for University-Industry Research Collaboration', *European Journal of Innovation Management*, 11(4), 488 - 521.
- Rasmus, D. W. (2003) 'Don't Bother Looking for a Knowledge Management Market'.
- Reychav, I. and Weisberg, J. (2010) 'Bridging intention and behavior of knowledge sharing', *Journal of Knowledge Management*, 14(2), 285-300.
- Riege, A. (2005) 'Three-dozen Knowledge-Sharing Barriers Managers Must Consider', *Journal of Knowledge Management*, 9(3), 18-35.
- Rogers, E. (2003) *Diffusion of innovations*, 5th ed. ed., New York: The Free Press.
- Schartinger, D., Rammera, C., Fischer, M. M. and Frhlich, J. (2002) 'Knowledge interactions between universities and industry in Austria: sectoral patterns and determinants', *Research Policy*, 31, 303–328.
- Toffler, A. (1990) *Powershift: Knowledge, wealth and violence at the edge of the 21st century*, New York: Bantam Books.
- Tucker, R. C. (2007) 'Industry sponsored university research: an underutilized resource', *Advanced Materials and Processes*, 165(5), 78-81.
- van Zyl, A., Amadi-Echendu, J. and Bothma, T. J. D. (2007) 'Nine drivers of knowledge transfer between universities and industry R&D partners in South Africa', *South African Journal of Information*

Management, 9(1).

- Wang, Y. and Lu, L. (2007) 'Knowledge transfer through effective university-industry interactions: Empirical experiences from China', *Journal of Technology Management in China*, 2(2), 119-133.
- Xiong, S. and Deng, H. (2008) 'Critical success factors for effective knowledge sharing in Chinese Joint Ventures', in *19th Australasian Conference on Information Systems Knowledge Sharing in Chinese*, Christchurch, 3-5 Dec 2008.