

## Perceptions of Universiti Kebangsaan Malaysia (UKM) Academicians on the Impacts of Technological Factors on Knowledge Sharing

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**Abstract:** Academicians in higher learning institutions should practice knowledge sharing. In the process of sharing knowledge, there are three main factors involved; namely organizational, individual and technological factor. Technological factor is vital in ensuring knowledge sharing among academicians to be successfully implemented. Much have been mentioned on knowledge sharing, but less has been discussed on knowledge sharing between university faculty academicians, especially among pure sciences and social sciences groups. Therefore, this study is aimed to identify the impacts of technological factors on knowledge sharing in university. This study is conducted through a set of survey instrument among academicians in Universiti Kebangsaan Malaysia (UKM). The findings of this study showed that in term of technological factor from system infrastructure part, majority of the academicians agree that the infrastructure provided are important to make knowledge sharing a reality. While from the system quality part of the technological factor, it is found that academicians are slightly agree on the knowledge provided by the the system. This findings could provide us with a conclusion that the practice of knowledge sharing in UKM are inline with the support of system infrastructure.

**Key words:** Knowledge sharing, technological factors, system infrastructure, system quality, academicians

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### INTRODUCTION

Knowledge, defined in this study as a mix of experience, values, contextual information and expert insight (Davenport and Prusak, 1998) has been highlighted by many academicians and practitioners as the most important and competitive resource for organizational success (Quinn, 1996; Albert and Bradley, 1997). Organizations might not survive in knowledge Era without proper strategy to managing and leveraging value of their intellectual assets (Abell and Oxbrow, 2001). As a result, more organizations, both large and small, turn to knowledge management strategies to manage and leverage their organizational knowledge in full (Davenport *et al.*, 1998).

However, there are several challenges in knowledge management attempt like maintaining, locating and applying knowledge in organization. The major challenge in knowledge management is to enhance knowledge creation and sharing (Grant, 1996; Wasako and Faraj, 2000) since the success or failure of knowledge management always depends on this. Many believe that one way to make knowledge become more powerful for organizations is through knowledge sharing practices, so that individual knowledge can be transferred into organizational knowledge through the interaction and

communication of individual co-workers, in project teams or between projects and these knowledge sharing processes could assist in knowledge creation at higher levels (Nonaka, 1994). In other words, through knowledge sharing, an organization can transform the knowledge of individuals into organizational knowledge.

Previously, the study of knowledge sharing is dominated by business organizations where their ultimate goal for knowledge sharing is profit-motivated. However, the issue of knowledge sharing is equally important for a knowledge-based institution such as a Higher Learning Institutions (HLI) where knowledge production, distribution and application are the main activity in the institution (Petrides and Nodine, 2003). With the increased number of HLI in Malaysia, there are a need for them to upgrade their institution knowlegde in order to differentiate among themselves to serve as a as reservoir of knowledge and are no longer just providing knowledge to students. However, comprehensive research in the area of knowledge sharing between university faculty academicians especially in pure sciences and social sciences groups has been rather limited.

### Objective of study

**This study is aimed:** To identify the impacts of system infrastructure in tecnological factors on knowledge

sharing in Higher Learning Institution (HLI-UKM). To identify the impacts of system quality in technological factors on knowledge sharing in Higher Learning Institution (HLI-UKM).

**Literature review:** The recognition of knowledge as the key resource in organizations affirms the need for processes that facilitate the creation, sharing and leveraging of individual and collective knowledge. Currently, it is popular belief that one way to make knowledge become more powerful for organizations is through knowledge sharing practices (Quinn, 1996; Bock and Kim, 2002) so that individual knowledge can become organizational knowledge. Organizational knowledge is developed through the interaction and communication of individual co-workers, in project teams or between projects and this knowledge sharing process could assist in knowledge creation at a higher level (Nonaka, 1994).

For that reason, many turn to a knowledge management initiative to manage their knowledge. The effective management of knowledge in an organization depends on how well knowledge sharing occurs within it. Meaning, knowledge sharing is a crucial activity for knowledge management success (Cabrera and Cabrera, 2002, 2005; McDermott and O'Dell, 2001). That said, it is considered a very challenging process requiring the organization to implement certain knowledge strategies effectively to manage the process (Chiu *et al.*, 2006).

Sabherwal and Sabherwal view knowledge sharing as involving the transfer or dissemination of knowledge among individuals or groups as a basis for knowledge utilization to create competitive advantage for the firm. Lee and Al-Hawamdeh (2001) has defined knowledge sharing as “activities of transferring or disseminating knowledge from one person, group or organization to another” and Park *et al.* (2004) have further elaborated on this view, adding that knowledge sharing is a process where individuals mutually exchange their knowledge and jointly create new knowledge.

Organizational knowledge consists of tacit and explicit knowledge. Both tacit and explicit knowledge are important and complementary to each other and essential for knowledge creation. Unfortunately, few organizations handle explicit and tacit knowledge effectively (Brown and Duguid, 2000). Explicit knowledge without tacit insight quickly loses its value since it can be easily imitated by others so it needs to be shared with others so that new insights and learning will empower the knowledge. Tacit knowledge that cannot be codified and shared throughout the organization also has the potential to be lost when the person who holds it leaves the organization. Here, new

knowledge or knowledge innovation is created through interactions between tacit and explicit knowledge and not from either tacit or explicit knowledge alone (Nonaka, 1994). So, it is crucial to manage and share both kinds of knowledge accordingly since different knowledge brings different benefit to organizations. This view brings a new perspective on the importance of different types of knowledge to different individuals, groups or units in organizations, making knowledge sharing activities critical to ensure that knowledge reaches those who need it.

However, knowledge sharing is not an easy process due to the fact that knowledge in organizations is often held by individuals, units or groups (collective forms) distributed all over the organization and sometimes across territorial borders. Furthermore, knowledge is recognised as being socially-complex since it is held by people and a personal relationship is needed in order to acquire it. It is regarded as sticky and causally-ambiguous because it is embedded in a complex network of formal and informal relationships, thus making it difficult for organizations to share it effectively.

There are a number of factors leading towards the success of knowledge sharing and so far researchers have underlined that its motivation as a function of reciprocity issues, relationships with recipients and rewards apart from attitudes to share knowledge, working culture, motivation to share and opportunities to share (Ipe, 2003; Hislop, 2003). On another account, Kim and Lee (2005) found out that organizational culture, structure and information technology give impact to the knowledge sharing capabilities among employees. This supported findings from Gupta and Govindarajan (2000) that show group-based incentives strongly encourage knowledge sharing while other researchers argue on tangible (monetary) rewards as well as intangible (non-monetary) rewards play identical important factors to motivate knowledge sharing (McDermott and O'Dell, 2001; Gagne, 2009).

System infrastructure is an important organizational factor that could lead towards better sharing of knowledge. According to Orlikowski (1992), the concept of technology comprises of two main elements, that is scope and function. In terms of scope, there are two types of research (Ismail and Yusof, 2010). One, the research that considers technology as ‘hardware and two, the research that views technology as ‘social technology’. In terms of function, early research predicts technology as an objective while other research focuses on technology as a product which include people action on technology. The latest research refers technology as soft determinant in which technology is considered as external factor that has impact but controlled by human and organization

(Ismail and Yusof, 2010). Technology has always been the main variable in organizational theory (Orlikowski, 1992).

While system quality is highly expanded to serve different ways including knowledge sharing (Ho and Kuo, 2013), The purposes of information systems vary from entertainment such as online games and social communities, to instrumental purposes such as e learning, e-Commerce and knowledge management systems (Petter *et al.*, 2008). Until recently, many have adopted virtual communities to share data, collaborate in research and exchange messages that provide impacts on knowledge sharing (Ho and Kuo, 2013).

**MATERIALS AND METHODS**

This study is in the form of a descriptive study, on the perceptions of academicians in UKM regarding impacts of organizational factors on knowledge sharing in HLIs. According to Wiersma (1995) this method is appropriate to measure or evaluate the attitude, perception and achievement of a program. The descriptive form is also used at par with the requirement of the study to understand in its real phenomenon (Konting, 1990). Thus, a survey instrument is developed for this study based on the literatures selected. According to Tuckman (1999), a questionnaire is an effective way to gain information from the respondents. All questions are in positive form and the respondents were required to state their perceptions according to the Likert scale.

This study is conducted through a set of survey instrument among academicians in Universiti Kebangsaan Malaysia (UKM). The academicians are selected from 5 faculties, 2 faculties representing pure sciences group and another 3 faculties representing social sciences group in UKM. Thus, to determine the number of respondents, the Sample Size Determination Table by Krejcie and Morgan (1970) is adopted. The sample size for this study is 38 based on Krejcie and Morgan (1970)'s sample size determination.

In this study, the validity of the questionnaire is determined by an expert. Reliability refers to the stability and consistency in the instrument in measuring a particular concept. A popular test in measuring the consistency of a concept is the Cronbach Alpha. The reliability value of the Cronbach alpha is between 0.0 and 1.0. According to Konting (1990), the Cronbach alpha value >0.60 is often applied as the reliability index in a particular research. Thus, in this study, researcher has determined the Cronbach alpha value that is 0.60 as the reliability value for every section of

**Table 1: Respondent background**

| n = 38                                     | Numbers | Percentages |
|--|---------|-------------|
| <b>Name of institution</b>                 |         |             |
| Faculty Science and Technology             | 2       | 5.3         |
| Faculty Technology and Information Science | 12      | 31.6        |
| Faculty Economics and Management           | 5       | 13.2        |
| Faculty Social Science and Humanities      | 14      | 36.8        |
| Faculty Islamic Studies                    | 5       | 13.2        |
| <b>Position in this institution</b>        |         |             |
| Professor                                  | 3       | 7.9         |
| Associate professor                        | 9       | 23.7        |
| Senior lecturer                            | 17      | 44.7        |
| Lecturer                                   | 9       | 23.7        |
| <b>Years of working experience</b>         |         |             |
| 1-5  | 8       | 21.1        |
| 6-10                                       | 5       | 13.2        |
| 11-20                                      | 18      | 47.4        |
| 21 and above                               | 7       | 18.4        |
| <b>Highest educational qualification</b>   |         |             |
| Doctoral degree                            | 28      | 73.7        |
| Master's degree                            | 7       | 18.4        |
| Bachelor degree                            | 3       | 7.9         |
| <b>Years in conducting research work</b>   |         |             |
| 1 year and below                           | 2       | 5.3         |
| 2-5 years                                  | 7       | 18.4        |
| 6-10 years                                 | 13      | 34.2        |
| 11-15 years                                | 8       | 21.1        |
| 16-20 years                                | 4       | 10.5        |
| 21-25 years                                | 2       | 5.3         |
| 26 years and above                         | 2       | 5.3         |

the questionnaire being tested. Next, to decide on the reliability value for the questionnaire given, researcher had carried out a pilot study.

The pilot study was done to identify the weaknesses and the strength in the questionnaire provided. Thus, before the questionnaire was given, 10 academicians were selected to answer the questionnaire first. The outcome obtained shows that all 10 academicians understand the questions clearly. Then, by using the Statistical Package for the Social Science (SPSS) Program Version 21, it is confirmed that the Cronbach alpha value for all the items of the questions obtained >0.6. Thus, the questionnaire constructed to carry out this study is deemed appropriate to be used.

**Findings and discussions on respondent background:**

Table 1 describe the background of respondents. The number of academicians from pure sciences comprises of 36.9% and social sciences academicians give a number of 63.1%. The respondents are majority from Senior Leturers (44.7%) with 65% of all the respondents have been serving UKM for >11 year. The 73.7% of the respondents are PhD holders who possess expertise and knowledge in their respective fields with 34.2% of them experiencing conducting research between 6-10 years.

From the demographic data obtained, the field of expertise among UKM academicians are generally divided into two; pure sciences and social sciences. For the position related to their post, they are categorized under

**Table 2: System infrastructure**

| Items  | Tidak setuju | Kurang setuju | Setuju    |
|--|--------------|---------------|-----------|
| My institution uses system that allows academics in my faculty/school to collaborate with each other   | 9 (23.7)     | 6 (15.8)      | 23 (60.5) |
| My institution uses system that allows academics in my faculty/school to communicate with others   | 3 (7.9)      | 6 (15.8)      | 29 (76.3) |
| My institution uses system that allows academics in my faculty/school to search necessary knowledge  | 4 (10.5)     | 6 (15.8)      | 28 (73.7) |
| My institution uses system that allows academics in my faculty/school to access necessary knowledge  | 4 (10.5)     | 6 (15.8)      | 28 (73.7) |
| My institution uses system that allows academics in my faculty/school to store specific types of knowledge that includes explicit knowledge (e.g. documents) and tacit knowledge (e.g., personal/experience-based knowledge) | 4 (10.5)     | 8 (21.1)      | 26 (68.4) |

**Table 3: System quality**

| Items  | Tidak setuju | Kurang setuju | Setuju    |
|--|--------------|---------------|-----------|
| The knowledge provided by the system in my institution is relevant to my research work | 2 (5.3)      | 10 (26.3)     | 26 (68.4) |
| The knowledge provided by the system in my institution is accurate                     | 2 (5.3)      | 13 (34.2)     | 23 (60.5) |
| The knowledge provided by the system in my institution is always up-to-date            | 3 (7.9)      | 10 (26.3)     | 25 (65.8) |
| The operation of the system in my institution is dependable                            | 3 (7.9)      | 17 (44.7)     | 18 (47.4) |
| The system in my institution makes knowledge easy to access                            | 5 (13.2)     | 12 (31.6)     | 21 (55.3) |

the post of professor associate professor, senior lecturer and lecturer. From the data, senior lecturers and associate professors make the majority with experience of work between 12-20 years of service with 6-10 years experiences in research. All the above indicators show to us that these academicians are in the process of climbing up their career development which make truly important for them to share knowledge and create networking in their expertise to increase their research, publication and teaching.

**Findings and discussions on system infrastructure:**

Table 2 describe the system infrastructure of knowledge sharing. The 76.3% of academicians agreed that the system infrastructure provided could make up better communication among academicians, followed by 73.7% academicians agreed that the infrastructure could provide as an important tool to search as well as access necessary knowledge required. Academicians also agreed that (68.4%) the systems infrastructure allows them to store specific type of knowledge with another 60.5% of them recognized that the system shall help them to collaborate knowledge sharing activities.

The findings show to us that in term of technological factor of system infrastructure in UKM for knowledge sharing is slightly high where there are supportive systems around. There are online application systems such as “staff affairs”, “finance affairs”, “students affairs”, “research affairs”, “logistics affairs”, “document management system”, “traffic system” and “campus card system”. For example, in the “students affairs” section, there are eleven online systems running simultaneously and interactive with each other. One if it is i-Folio (local UKM Learning Management System-LMS), an open

online system that help to engage learning and teaching among academicians. The data also shows us that the system infrastructure developed is very much supportive to knowledge sharing in UKM. This is in line with Orlikowski (1992) and Lee and al-Hawamdeh (2002) that mention technology has always been the important variable and fundamental requirement of knowledge sharing in organizational theory. It facilitates and accelerates the process of knowledge sharing, both within intra and inter-organizations apart from playing an important transformational role in changing corporate culture to knowledge sharing (Gurteen, 1999).

**RESULTS AND DISCUSSION**

Table 3 also describe the system quality of Knowledge Sharing in UKM. The academicians generally agree on knowledge provided by the system are relevant to their research work (68.4%) followed by knowledge provided by the system are always up-to-date (65.8%). Then, the knowledge provided by the system is perceived as accurate (60.5%) while perception on knowledge as easy to access (55.3%). on the contrary, the operation of the system is deemed as not quite dependable (47.4%).

The findings show that the systems quality in term of its relevancy, accurateness and up to date are relatively high. However, in term of dependable and easy to access, the result shows slightly low due. These two aspects could become barrier in knowledge sharing as mentioned by Riege (2005) who listed that there are 7 technological barriers that hinder people from sharing knowledge which are; lack of information technology process and system integration which limit employees to work. Lack of internal and external technology support, unrealistic expectation

what technology can do and cannot do, mismatch between technological needs, systems integration and information technology processes, reluctant to use information technology because of not familiar to, lack of training to get use to new information technology systems and processes, lack of communication and usage of new system advantages compared to current system.

### CONCLUSION

From the data elaborated, this study shows that knowledge sharing is very much linked with both system infrastructures and system quality. From the system infrastructure part, the applications developed are significant in making knowledge sharing process a success. At the same time, UKM need to ensure that the systems developed are more dependable and easy to access to all academicians. This could be achieved by using simple technology and well-equipped ICT infrastructure that could foster better knowledge sharing.

### REFERENCES

- Abell, A. and N. Oxbrow, 2001. *Competing With Knowledge: The Information Professional in the Knowledge Management Age*. Library Association Publishing, London, England, UK.
- Albert, S. and K. Bradley, 1997. *Managing Knowledge: Experts, Agencies and Organisations*. Cambridge University Press, Cambridge, England, ISBN:0-521-59887-7, Pages: 217.
- Bock, G.W. and Y.G. Kim, 2002. Breaking the myths of rewards: An exploratory study of attitudes about knowledge sharing. *Inform. Resour. Manage. J.*, 15: 14-21.
- Brown, J.S. and P. Duguid, 2000. *The Social life of Information*. Harvard Business Press, Boston, Massachusetts, ISBN:0-87584-762-5, Pages: 323.
- Cabrera, A. and E.F. Cabrera, 2002. Knowledge-sharing dilemmas. *Organiz. Stud.*, 23: 687-710.
- Cabrera, E.F. and A. Cabrera, 2005. Fostering knowledge sharing through people management practices. *Int. J. Human Resour. Manag.*, 16: 720-735.
- Chiu, C.M., M.H. Hsu and E.T. Wang, 2006. Understanding knowledge sharing in virtual communities: An integration of social capital and social cognitive theories. *Decis. Support Syst.*, 42: 1872-1888.
- Davenport, T.H. and L. Prusak, 1998. *Working Knowledge: How Organizations Manage What They Know*. Harvard Business Press, Boston, MA., USA., ISBN-13: 9780875846552, Pages: 199.
- Davenport, T.H., D.W. de Long and M.C. Beers, 1998. Successful knowledge management projects. *Sloan Manage. Rev.*, 39: 43-57.
- Gagne, M., 2009. A model of knowledge-sharing motivation. *Hum. Resource Manage.*, 48: 571-589.
- Grant, R.M., 1996. Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organiz. Sci.*, 7: 375-387.
- Gupta, A.K. and V. Govindarajan, 2000. Knowledge management's social dimension: Lessons from Nucor steel. *Sloan Manage. Rev.*, 42: 71-80.
- Gurteen, D., 1999. Creating a knowledge sharing culture. *Knowl. Manage. Mag. Vol.*, 2.
- Hislop, D., 2003. Linking human resource management and knowledge management via commitment: A review and research agenda. *Employee Relat.*, 25: 182-202.
- Ho, L.A. and T.H. Kuo, 2013. How system quality and incentive affect knowledge sharing. *Ind. Manage. Data Syst.*, 113: 1048-1063.
- Ipe, M., 2003. Knowledge sharing in organizations: A conceptual framework. *Hum. Resour. Dev. Rev.*, 2: 337-359.
- Ismail, M.B. and Z.M. Yusof, 2010. *The Contribution of Technological Factors on Knowledge Sharing Quality Among Government Officers in Malaysia*. Intech Open Access Publisher, Malaysia.
- Kim, S. and H. Lee, 2005. Employee Knowledge sharing capabilities in public and private organizations: Does organizational context matter?. *Proceedings of the 38th Annual Hawaii International Conference on System Sciences*, January 6-6, 2005, IEEE, Syracuse, New York, ISBN:0-7695-2268-8, pp: 249a-249a.
- Konting, M.M., 1990. *Kaedah Penyelidikan Pendidikan*. Dewan Bahasa Dan Pustaka, Kuala Lumpur, Malaysia.
- Krejcie, R.V. and D.W. Morgan, 1970. Determining sample size for research activities. *Edu. Psychol. Meas.*, 30: 607-610.
- Lee, C.K. and S. Al-Hawamdeh, 2002. Factors impacting knowledge sharing. *J. Inform. Knowledge Manage.*, 1: 49-56.
- McDermott, R. and C. O'Dell, 2001. Overcoming cultural barriers to sharing knowledge. *J. Knowledge Manage.*, 5: 76-85.
- Nonaka, I., 1994. A dynamic theory of organizational knowledge creation. *Organiz. Sci.*, 5: 14-37.
- Orlikowski, W.J., 1992. The duality of technology: Rethinking the concept of technology in organizations. *Org. Sci.*, 3: 398-427.
- Park, H., V. Ribiere and W. Schulte, 2004. Critical attributes of organizational culture that promote knowledge management technology implementation success. *J. Knowledge Manage.*, 8: 106-117.
- Petrides, L.A. and T.R. Nodine, 2003. *Knowledge Management in Education: Defining the Landscape*. Half Moon Bay, California.

- Petter, S., W. DeLone and E. McLean, 2008. Measuring information systems success: Models, dimensions, measures and interrelationships. *Eur. J. Inform. Syst.*, 17: 236-263.
- Quinn, J.B., 1996. Managing professional intellect making the most of the best. *Harvard Bus.Rev.*, 74: 71-80.
- Riege, A., 2005. Three-dozen knowledge-sharing barriers managers must consider. *J. Knowledge Manage.*, 9: 18-35.
- Tuckman, B.W., 1999. *Conducting Educational Research.* Harcourt Brace College Publishers, Fort Worth.
- Wasko, M.M. and S. Faraj, 2000. It is what one does': Why people participate and help others in electronic communities of practice. *J. Strategic Inform. Syst.*, 9: 155-173.
- Wiersma, W., 1995. *Research Methods in Education: An Introduction.* Allyn and Bacon, Boston, MA., USA.