



KNOWLEDGE SHARING PORTAL BUILDING BLOCKS: ACADEMIC'S PERSPECTIVE

**MOHD FARHAN MD FUDZEE
ZURINAH SURADI
NORLIDA HASSAN
MOHAMAD AIZA SELAMAT
HAIRULNIZA MAHDIN**

Knowledge Sharing Portal Building Blocks: Academic's Perspective

Mohd Farhan Md Fudzee¹, Zurinah Suradi, Norlida Hassan, Mohamad Aizi Salamat, Hairulnizam Mahdin

+60 7 4538053

+60 7 4538002

+60 7 4538055

+60 7 4538054

+60 7 4538044

farhan²

zurinah

norlida

aizi

hairuln

ABSTRACT

Knowledge sharing among knowledgeable staff in an organization gives a great impact towards productivity, especially in academic environment; where most of the knowledge resides in one's brain. Some researchers have discussed the important of knowledge sharing and suggested more researches and development should focus on academic environment. However, without a proper framework, the activities of knowledge sharing may become invisible. On top of that, in order to achieve greater impacts, knowledge transfer modes must be identified. The purpose of the study is to construct a knowledge sharing portal building blocks. This study describes the building blocks of a knowledge sharing portal for a particular academic organization. Data collection for feasibility was collected through focus group interview. Through triangulation technique, the building blocks described were derived from: enriched database, access mechanism and control, single user interface. Significantly, the proposed framework model can be adopted by other organizations as a guideline to develop their knowledge sharing portal.

Keywords

Knowledge management, knowledge sharing, transfer modes, portal.

1. INTRODUCTION

In current globalization era, knowledge is becoming more vital in our daily life. Knowledge in the sense is commonly resides in the brains of people. It is self-evident that within any group of persons the combined knowledge of this group is much larger than the knowledge of any individual. Since human beings have no direct brain-to-brain connection, group knowledge is fragmented between the individuals, persons often not knowing or understanding what is clear for others (Maurer H., 1999). Many researches have been done and still currently being carried, focusing on what is called knowledge management.

Alain J. (1999), states that "Knowledge management (KM) is concerned with the exploitation and development of the knowledge assets of an organization with a view to furthering the organization's objectives. The knowledge to be managed includes both explicit; documented knowledge, and tacit; subjective knowledge."

Knowledge sharing among members in a particular community is really crucial, especially to maintain the disseminating of the knowledge within it. It shows that knowledge sharing is very crucial either in private or public sector. In order to support knowledge sharing, a various considerations need to be in the first place such as cost, user's experience, and suitable platforms.

In academic sector, where most of the knowledge on the academicians' brain, the knowledge should give benefit to others. Usually, some of the precious knowledge will remains in the individual's brain as there is no medium to bring the tacit knowledge into the surface and be visible to others. Some researchers (Sharatt & Usoro, 2003; Oliver, 2003) discussed the understanding of knowledge sharing in online communities and put more focus on the KM practices in academic environment.

2. RELATED WORKS

2.1 Knowledge Transfer Modes

Modes of knowledge transfer can be divided into 4 categories, based on Nonaka (1995) and later being reviewed in Marwick (2001). The categories are:

2.1.1 Socialization (tacit to tacit):

Socialization includes the shared formation and communication of tacit knowledge between people, e.g., in meetings. Knowledge sharing is often done without ever producing explicit knowledge and, to be most effective, should take place between people who have a common culture and can work together effectively (Davenport, 1998). Thus tacit knowledge sharing is connected to ideas of communities and collaboration. A typical activity in which tacit knowledge sharing can take place is during a team meeting which experiences are described and discussed.

2.1.2 Externalization (tacit to explicit):

¹ All authors from Faculty of Information Technology & Multimedia, Universiti Tun Hussein Onn Malaysia.

² All email are followed by @uthm.edu.my

By its nature, tacit knowledge is difficult to convert into explicit knowledge. Through conceptualization, elicitation, and articulation, typically in collaboration with others, some proportion of a person's tacit knowledge may be captured in explicit form. Typical activities in which the conversion takes place are in dialog among team members, in responding to questions, or through the elicitation of stories.

2.1.3 Combination: (explicit to explicit):

Explicit knowledge can be shared in meetings, through documents, e-mails, etc. The use of technology is to manage and search collections of explicit knowledge. However, there is a further opportunity to foster knowledge creation, namely to enrich the collected information in some way, such as by reconfiguring it, so that it is more usable. An example is to use text classification to assign documents automatically to a subject schema. A typical activity here might be to put a document into a shared database.

2.1.4 Internalization (explicit to tacit):

In order to act on information, individuals have to understand and internalize it, which involves creating their own tacit knowledge. By reading documents, they can to some extent re-experience what others previously learned. By reading documents from many sources, they have the opportunity to create new knowledge by combining their existing tacit knowledge with the knowledge of others. However, this process is becoming more challenging because individuals have to deal with ever-larger amounts of information.

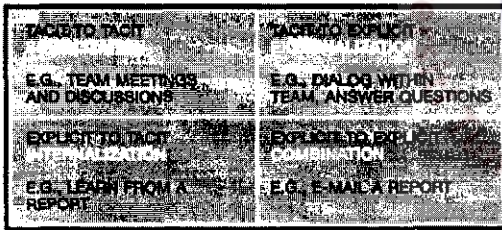


Figure 1: Knowledge transfer modes (Nonaka & Takeuchi, 1995).

2.2 Knowledge Sharing Elements

In the process of having knowledge sharing in an organization, there are three main elements that have to be considered. These elements are human, place and information. All these elements must exist in order to have an effective knowledge sharing process.

2.2.1 Human

Knowledge exists because of human existence. Knowledge presenter must know what is to be delivered to the other knowledge users. Knowledge presenter can also be referred to as knowledge user, because the presenter himself is using the knowledge that has been shared by other users to solve a problem (dual roles). Contributor or knowledge presenter can be

categorized as colleagues, experts, friends and also customer to the organization.

2.2.2 Place

Place here means that the location where the knowledge could be shared. By having this place, the shared knowledge can be discussed by knowledge users to share their ideas for a certain activity or problem. Apart from that, it can help in forming many communities which have expertise in their own fields and working together in running a certain project. For a knowledge user from a lower ranking group, he could learn many new things that can be used to upgrade his quality of work. In addition to that, the knowledge sharing helps in providing answers to existing problems.

2.2.3 Knowledge

Information or knowledge gained from the knowledge sharing process is either structured or unstructured. These two types of knowledge enable users to create new knowledge. The shared knowledge can be classified and accessed by the knowledge users. The shared knowledge must be useful to other users.

2.3 KM Building Blocks

As referred to previous studied by Georg (2003), the building blocks/system architecture for KM system can be separated into 3 components (see figure 2):

2.3.1 Virtual pool

The virtual information pool is a knowledge base that incorporates all relevant information. It is not necessarily storing all the information. Forming a virtual pool of information, and allows all relevant data available to the organization to be found and accessed is desirable.

2.3.2 Providing ubiquitous access.

Another issue of similar importance is the provision of access to the system. It must in full functionality for a variety of communication devices.

2.3.3 Automatic update/enriching knowledge base.

Utilizing the integrated knowledge base provided by the virtual information pool, automation is the key to go beyond from a "mere" Information Management System (IMS) to knowledge base system. Situated between the knowledge base (thus being able to work on all available information) and the user interface, it provides functions and features that separate it from simpler and smaller solutions.

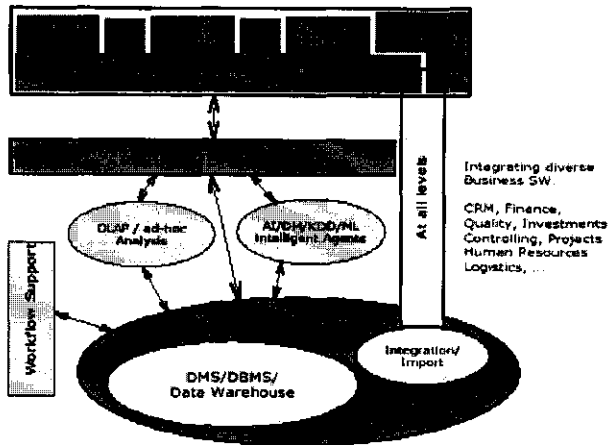


Figure 2: KM system architecture (Georg, 2003).

As knowledge sharing is one of the processes in KM, the building blocks in knowledge sharing platform should inherit the idea of KM building blocks.

Besides, W.Pohs et al (2001) has developed what is called knowledge station portal; and seems to work well. This portal should have:

- Automatically find, organize, and map disparate content
- Build a network to locate subject matter experts
- Add value to content by maintaining its context and by incorporating the opinions and judgments of individuals.

3. RESEARCH DESIGN

In this case study, the focus group interview was used to collect data for feasibility study. Five academicians were selected randomly. Then, parallel interviews were conducted in order to identify the content, functions, appearance and value of an academic portal. This is one of the ways to elicit important views on the feasibility of the portal concept from Faculty of Information Technology and Multimedia, University of Tun Hussein Onn Malaysia.

3.1 Identification of the academics' information needs

The personal knowledge management model includes these aspects: collection and retrieval of information, organizing and processing of information, the creation of knowledge products and the communication and distribution of knowledge. The following questions were asked to the interviewees:

- What is the impact of the Internet on the knowledge cycle?
- To what extent the concept and functionality of Web portals support your personal management of knowledge and information of academics?

- What information sources, services and tools must be part of such a knowledge portal?
- Explain how acceptable the idea of such a Web portal for academics is.
- What problems do you anticipate with regard to the implementation of the portal?
- Do the needs of academics who are research achievers, differ from the needs of those regarded as education achievers?
- Can an academic portal be developed and implemented successfully? Elaborate.
- Processing of information and the creation of knowledge products
 - What technological tools do you use for processing of information and creating of knowledge products (for example lectures, papers and articles)?
- Communication and distribution of knowledge
 - How do you communicate your knowledge products?
 - How do you communicate with your invisible college of scientific colleagues?
- Personal knowledge management
 - Do you experience any problems with regard to your personal management of information and knowledge?
- Collection and retrieval of information
 - What information sources do you use? What are the frequency of use and availability on the Web of these information sources?
 - What information services do you use and frequency of use?

3.2 Results from the Focus Group

Some general results from the interviews:

- Research is the main activity of this senior group, although teaching is also seen as an important activity.
- They are mostly using e-mail and Web search engines.
- There are no significant differences between the research achievers and the education innovators in terms of portal requirements.
- These academics are very positive about the portal concept to support their personal management of academic information and knowledge.

3.3 Personal management of academic information and knowledge

In order to support academics' personal knowledge management in an integrated manner the academic portal must have the following characteristics:

- High levels of functionality and integration are needed – a seamless interface. This must include advanced personalization and customization capabilities.
- The portal must support both the teaching and research roles of academics.

The result gained from the case study will be used in developing the knowledge sharing building blocks.

4. CONSTRUCTION OF KNOWLEDGE SHARING BUILDING BLOCKS

Knowledge sharing building blocks will be constructed by combining all the components (from 4.1 to 4.5).

4.1 Interaction between knowledge user and the knowledge sharing system.

The first step is to have interaction between knowledge user and the knowledge sharing system. As referring to knowledge sharing element research model, the framework should consists of the knowledge user, place to share the knowledge and the knowledge itself. And the knowledge should be captured in a specified database or repository. We can illustrate the situation as the figure 3 below:

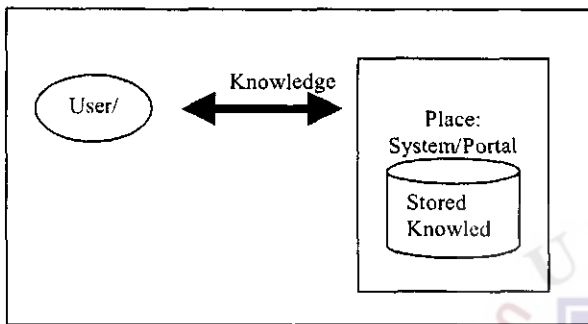


Figure 3: Sharing elements derivation.

Users will interact with the system/portal to give or to get knowledge. The knowledge will be stored in the database.

4.2 Knowledge transfer modes

As discussed earlier, in order to ensure the movement of knowledge is visible, we must define the possible knowledge transfer modes. Referring to knowledge transfer modes research model, we discussed that there are 4 types of knowledge transfer modes. Each mode contains several media to transfer knowledge. And based on the focus group session, we discussed each available transfer modes. On top of that, we also suggested other possible ways to transfer knowledge. We can illustrate the knowledge transfer modes as the figure 4 below:

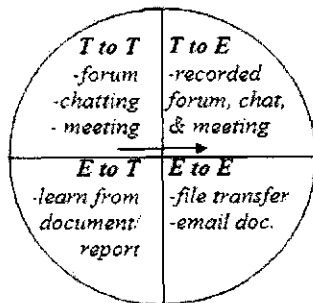


Figure 4: Knowledge transfer modes derivation.

Based on figure 4, the media of each transfer mode are:

- a. T to T
 - Online forum
 - Online chatting
 - Online meeting
- b. T to E (T to T mode is recorded)
 - Recorded physical/online meeting
 - Recorded online forum
 - Recorded chatting
- c. E to T
 - Learn from stored document/report
- d. E to E
 - File transfer
 - E-mail

4.5.3 General sharing blocks

To construct a general sharing blocks, we would inherit the components in KM building blocks research model. The blocks should contain:

- a. Knowledge acquisition

The process of user giving/storing the knowledge to the database through the system

- b. Knowledge dissemination

The process of user seeking and getting the required knowledge from the database through the system

- c. Access control

The system should be able to ensure only the authorized user is using the system. It will also handle the management and accountability issues

- d. Search mechanism

User must be able to find the desired knowledge with the aid of searching tool

- e. Knowledge database

A place where the knowledge is stored

- f. Enriching/Updating tools

In this study, this component will be used to enrich the knowledge with additional knowledge attributes. Knowledge attributes have been discussed earlier

- g. User interface/output facilities

To handle interaction with the user and to cater with user need

On top of that, enriching/updating tool can be used as a useful component; as it can add values to the stored knowledge. Besides, it can be used as the knowledge attributes mechanism.

The components for sharing blocks can be illustrated as figure 5 below:

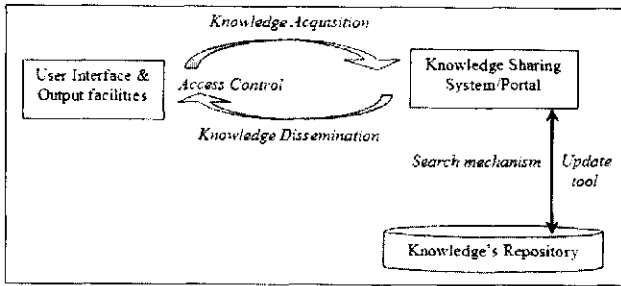


Figure 5: General sharing blocks.

In figure 5, the process of knowledge acquisition and dissemination occur between user and knowledge sharing system/portal through the user interface and output facilities. Logically, we put access control between user interface and the system. The search mechanism and the update tool are illustrated logically between the system and database/repository.

4.4 The big picture

The construction of the framework is based on the derivation of every single component. It is done by mapping all components into a big picture as illustrates in figure 6:

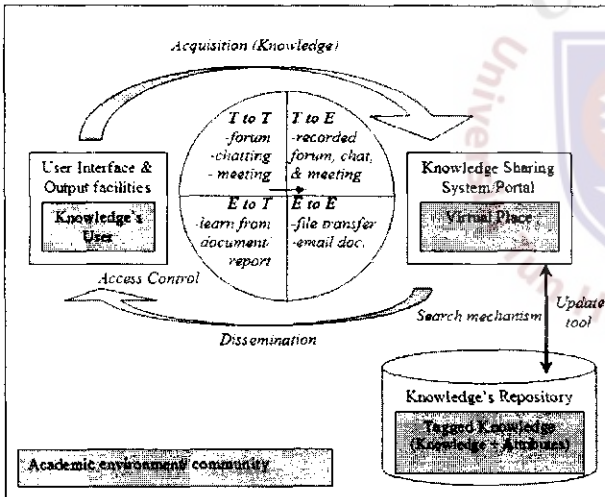


Figure 6: Proposed framework model.

The proposed framework model consists of:

a. User interface and output facilities.

It acts as the display to knowledge's user. The knowledge user belongs to a particular virtual community and can be divided based on department, special interest group (SIG) or personalize group. User interface is mapped with knowledge user as the interface is use by the user.

b. Knowledge Acquisition and Dissemination.

The captured knowledge should be tagged with knowledge attribute/s. Knowledge attribute can be the knowledge expert's rating, knowledge's expertise and the knowledge's domain. It shows the activities and interaction between user and the portal.

c. Knowledge transfer modes.

Transfer modes is divided into four modes, and for each mode contains possible media of knowledge transfer and based on the current knowledge sharing practice in i-learn or any academic environment. The transfer modes are illustrated between the process of knowledge dissemination and acquisition as it can be the guidelines on how knowledge can be transfer between users.

d. Knowledge sharing system/portal.

It is the virtual place where the sharing processes happen. Knowledge user can meet virtually anytime and anywhere, as long as the Internet is available. The system/portal should be the connector between user and knowledge repository; and the connection must be transparency.

e. Knowledge repository.

All the tagged knowledge/information will be put into a well defined database thus supporting manipulation of the knowledge. The repository will always be available to the user; through the portal.

f. Access control

As the user need different level of access, the access control is really crucial, so that the receiver will receive the right knowledge.

g. Search mechanism

The search mechanism will be a good alternative to locate a particular knowledge thus increase portal efficiency. Thus, search mechanism is mapped between the repository and the system as the services will interact with both components.

f. Updating tool

As mentioned earlier, the updating/enriching tool can be used to add attributes to the stored knowledge and thus adding values to the knowledge

All the components of the framework model will be synchronize with the need and sharing activities at a particular environment. That is why we put a border to the framework model; to narrow down the environment into academic environment.

5. CONCLUSION AND FUTURE WORK

This study only covered knowledge sharing within organization (academic). We can broader the scope to cater the inter organization or inter university for example. Thus, it will increase universities efficiency and academic credibility; as the 'brain' (academic staffs) are tabulated across the country throughout many universities. But before that, a proper study of business opportunity must be in place to ensure the full use of it. As mentioned earlier, the acceptance of knowledge sharing in academic environment is quite good. Even if the good attitude is there, we still need a proper mechanism to nurture life long learning; thus ensuring the success of the knowledge sharing portal.

To expand the study, we can put more focus on knowledge filtering issue. There are structured and unstructured knowledge. Besides, some information/knowledge cannot be the organization's asset, so it must be eliminated to avoid overload and unused of knowledge. Furthermore, an agent can be used to take that responsibility and has been discussed in D.Pole et.al. (1998).

As open source CMS has some of the important features to support the development of the knowledge sharing system (discussed in K.Mahesh and J.K.Suresh, 2004), it is considered as a good tool. As an addition, we can map the features of work flow engine with acquisition and dissemination processes. The editorial tools in CMS can be used as system admin section, thus controlling the administrative work. Meanwhile, add on features and some modifications are needed to support more knowledge transfer modes using CMS.

6. ACKNOWLEDGMENTS

Our thanks to the staff involved in our focus group sessions.

7. REFERENCES

- [1] Alain J.G. Working Knowledge: How Organizations Manage What They Know. *Journal of Systematic Knowledge Management* (1999)
- [2] Davenport, T., Prusak, L. *Working Knowledge: How Organizations Manage What They Know*. Harvard Business School Press, Boston, 1998.
- [3] Georg H. Knowledge Management System Building Blocks. *E-Journal of Knowledge Management*, 1, 2 (2003), 65-76.
- [4] Mahesh K. & Suresh J.K. What is the K in KM Technology. *E-Journal of Knowledge Management*, 2, 2 (2004), 11-22.
- [5] Marwick A.D. Knowledge Management Technology *IBM System Journal*, 40, 4 (2001), 814-830.
- [6] Matteo B., Paolo B. & Roberto C. Knowledge Nodes: the Building Blocks of a Distributed Approach to Knowledge Management. *Journal of Universal Computer Science*, 8, 6 (2002), 652-661
- [7] Maurer H. The Heart of the Problem: *Knowledge Management and Knowledge*. University of Technology, Austria., 1999.
- [8] Nonaka I. & Takeuchi H. *The Knowledge Creating Company: How Japanese Companies Create The Dynamics of Innovation*. Oxford University Press, UK, 1995.
- [9] Oliver G.R. Towards Understanding KM Practices in the Academic Environment: The Shoemaker's Paradox *Electronic Journal on Knowledge Management*, 1, 2 (2003), 139 -146.
- [10] Pittinsky M. *Blackboard Building Blocks*. Overview White Paper, Blackboard Inc, 2003.
- [11] Pohn W., Pinder G., Dougherty C. & White M. The Lotus Knowledge Discovery System: Tools and Experiences. *IBM System Journal*, 40, 4 (2001), 956-966.
- [12] Pole D., Mackworth A. & Goebel R. *Computational Intelligent: A Logical Approach*. Oxford University Press, New York, 1998.
- [13] Sharatt M. & Usoro A. Understanding Knowledge-Sharing in Online Communities. *Electronic Journal on Knowledge Management*, 1, 2 (2003), 187-196.
- [14] Zuhair I. Developing an Instrument for Knowledge Management Project Evaluation. *Electronic Journal on Knowledge Management*, 1, 1 (2003), 55-62.