A Preliminary Study On Designing A Framework Of Virtual Workplace For Conducting Research Activities

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ABSTRACT

Sharing of knowledge is critical in supporting research activities among researchers. Thus Research centers should take more significant initiatives to build information and knowledge sharing platform in their workplace. In this study, we examine the knowledge sharing needs of the research team members in performing their task in University Tun Hussein Onn Malaysia. This paper proposes elements for designing a virtual workplace for conducting research activities that enable sharing of information and knowledge on intranet.

Keywords

Knowledge Management, Virtual Team, Virtual Workplace, Knowledge Sharing, Digital Community.

1. INTRODUCTION

Knowledge has become the most important and valuable asset in organization nowadays. Knowledge is defined by Awad and Ghaziri [3] as 'understanding gained through experience or study' and also indicated by Senn [13] as 'part of components of Information Technology that create opportunities for organizations to be productive, effective and successful through "know-how". As knowledge is become the most valuable commodity in an organization, it is important to find way to generate, capture, use, store, reuse, share and search knowledge as efficiently and effectively as possible for organization competitive advantage. Knowledge sharing among co-workers in an organization can be realized by the creation of virtual workplace.

Knowledge is derived and applied in the minds of individuals. In organizations, knowledge is embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms [7]. A proper knowledge sharing process and practice are required to enable knowledge to be communicated and transferred to the other individuals in the organization. With the support of information technology in data communication and networking, the internet and intranet have become potential solution to facilitate information and knowledge acquisition, dissemination and sharing.

This paper is concerned with proposing a suitable Virtual Workplace framework to conducting research activities for the University Tun Hussein Onn Malaysia.

2. LITERATURE REVIEW

2.1 Virtual Community and Knowledge Sharing

Virtual community or online community is a group of people that primarily or initially communicate or interact via the Internet, rather than face to face. Online communities have also become a supplemental form of communication between people who know each other in real life. Different virtual communities have different levels of interaction and participation among their members. In recent times, online community has become a main tool to support activities and to facilitate knowledge sharing among community members.

The concept of knowledge sharing however is closely interrelated with the role of community of practice. Community of practice aims to find a solution to problems by the exchange of experiences, the diffusion of new instruments for new work processes. From a technological point of view, databanks and applications are designed and used in order to make co-operation and identification of best solutions easier. An important point in this kind of community is that learning is not an individual process or a simple knowledge transferring. It is strictly linked to the texture of relations where the "practice" of the community itself is based upon, generating new opportunities for innovation [12]. Knowledge sharing among community of practice has brought forth a new model of knowledge where information is not only regards knowledge but also as a systemic property of people in communities [14]. Through knowledge sharing within the community of practice can lead to the enhancement of collective knowledge for that particular community. Thus fostering knowledge sharing within CoPs might be a main purpose for many people especially for research teams trying to foster creation and dissemination of knowledge.

2.2 The Role of Technology

Technology played an important role in supporting knowledge sharing within CoPs [14]. The adoption of World-Wide Web has created important social phenomenon such as e-business, e-learning and e-government. In term of supporting individual needs the WWW technology is used to support online communities or virtual communities. Virtual community exist for variety of purposes ranging from computer programming support

group to online dating but most significant purpose is that online communities can provide a platform in form of forum where knowledge can be exchanged.

The WWW technology also has made virtual workplace a reality. The concept of virtual workplace simply means works are done by people who are separated in time and space significantly changes the pattern of work behavior, attitudes about work and towards employer, and profoundly affects beliefs about quality of work life [15]. Sole and Applegate [16] broadly categorize the technology used by virtual teams into two types: technology that allows for "same time, different place" communication and information sharing (e.g audio conferencing, video conferencing, application sharing, electronic whiteboarding etc.) and "different time, different place" technology (e.g thread discussions, shared document repositories, workflow organizations, etc.). The former set of technology is also labelled as shared workspace defined as electronic workspaces in which team's members can work together on document or objects see the actions of other teams and draw or write their own comments during common session [17].

The approach 'virtual workplace' in the context of conducting research activities in faculty of information technology and multimedia, UTHM was initialized to explicitly recognize the importance of the formal knowledge sharing that occurs between researchers, and within small research groups or research communities. An intranet is identified to play a valuable role in supporting the establishment and ongoing activities within research communities, including:

- Building a 'home page' for the research communities, in which can be used as the basis for establishing the identity of the group, provide a platform to manage project activities and promoting its existence throughout the institutions.

- Providing a collaborative environment that can be used by research community members, especially those located in other offices.

- Offering a mechanism by which the output of the research group can be disseminated to the rest of the institution.

As a conclusion, designing a virtual workplace for research communities must be supported by an effective environment and infrastructure. The intranet has an important role to play as an enabler for the nurturing of knowledge sharing among group of researchers. An intranet is recognized in supporting these knowledge sharing activities as it makes better access to the knowledge and experience of researchers around the clock. An intranet is also a creative and empowering tool for an organization or institution in developing knowledge-based interactive environment to collaborate knowledge transfer and knowledge sharing [3].

2.3 Facilitating Research Process

Virtual workplace can be used to facilitate the research activities that are carried out. A study done by Jaime et al [8] identified six main functions that must be implemented in a system for facilitating the research process.

1. The location and analysis of interesting information in the external information sources. The system has top facilitate the activities of information research and of analysis of the information found

2. The selection and analysis of interesting information available in the internal information sources.

3. The provision of relevant information to a project in progress.

4. The enrichment of the information available in the internal information sources.

5. The sharing of the bibliographical information collected and produced.

6. The support of the writing of publications.

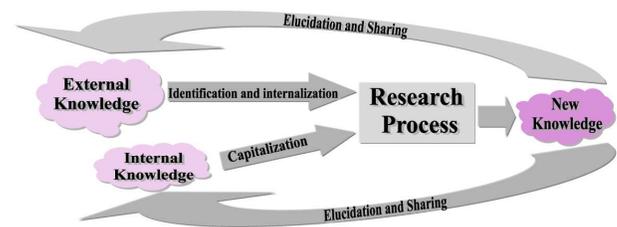Below is the graphical representation of facilitating the research process.

Figure 1: Research Process.

3. PROBLEM STATEMENT

In an organization especially university environment, research activities among academic staff is an obligation. The research groups need a common platform that can facilitate them in performing their tasks. Their tasks involve knowledge sharing among research groups and group members, researching and expanding the body of knowledge, promoting new ideas through group discussion, monitoring and reporting project progress, project management activities, supervising group tasks, group writing and document editing, team-development Furthermore, the platform should be able to provide them reliable and timely information and related knowledge within their research interest.

As a new university, UTHM research groups encountered several issues that need to be resolved in order to survive the challenging environment. These issues are discussed as the followings:

- Team members located in a dispersed location. Thus, making it difficult to conduct a group discussion where the entire team member must be present. Furthermore, each team member has to compete for attention to deliver their ideas within that short period of time.
- There is no immediate and specific venue to discuss and collectively solve problem related to the research projects. The team members could not share knowledge or information timely and objectively.
- Knowledge shared and created within a research team is not documented properly. Therefore, making it difficult to be accessed by other research teams.

- Difficulty to obtain past research documents because there is no online repository of previous research project.
- Group writing and editing is difficult to monitor and parallel editing always made the paperwork problematic to be merged. There is no version tracking tools to handle the paperwork edited by the team members. Sometime one team members consume too much time in editing the paperwork hence dragging the project schedule to be delayed.
- As for the team leader, monitoring and reporting of project progress becomes a liability because research activities is not documented systematically. Supervising each member tasks becomes difficult when there is no platform that documents the project activities.
- There is no centralized platform to share project management documents such as project schedule, meeting reports budget and resources plan. Most of the documents are kept by the team leaders accumulating the team leaders' burden to constantly remind their team members.
- Since there is no centralized platform, it is difficult to post announcement, retrieve research information and attach forms related to research project such as grant application form.

By employing virtual workplace as the centralized platform, these issues could be resolved instantaneously. The research activities not only can be monitored systematically as member's contribution for a particular task is documented. Acquisition and dissemination of present and past knowledge is also possible through the use of knowledge repository residing in the virtual workplace. In order to develop this virtual workplace initially a set of elements must be identified as a guideline. It is the aim of this study to propose the elements in designing a virtual workplace for conducting research activities within an intranet environment and enable sharing of information and knowledge among research teams at UTHM.

4. RESEARCH METHOD

Research method that is carried out in this study is base on the Action Research method. Qualitative data sources involved in this study include observation and participant observation (fieldwork), interviews and questionnaires, documents and texts, and the researcher's impressions and reactions. There are numerous definitions of action research, however one of the most widely cited is that of Rapoport's [11], who defines action research as 'action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework'. Base on this method, data is collected through interviews and action experiments that entail discussion with subjects during action taking [2]. The action research has been divided into 5 steps which are problem diagnosis, action planning, action taking, evaluating and specify the lesson learns [4].

Base on the proposed approached by Baskerville [4], the research problem is diagnosed based on the experience and previous literature. This method is carried out through background reading

and previous publication which is parts of the techniques that useful when it comes to follow a line of investigation on the system and domain problem. This technique uses computer journals, reference books, and the Internet (including user groups and bulletin boards) to find information on how others have solved similar problems, plus whether or not software packages exist to solve, or even partially solve, the problem. Other than that, examining documentation is done to gain some insight as to how the need for the system arises. This technique is used to identify the part of the organization that associated with the problem and also to understand the current system if available.

Action planning is then carried out based on the problem identification. This activity specifies organizational actions that should relieve or improve these primary problems. The discovery of the planned actions is guided by the organization structure and policy. Action taking phase is done through prototype implementation based on the data collected. In this research methodology the data is collected by implementing interviews techniques. Through interviews, research communities will be asked to determine what forms of knowledge that is value to their activities. The last phase of action research method is evaluating and specifying lesson learns. This is done through distribution of questionnaires to the targeted despondences to evaluate how the prototype would meet the user requirements.

- Phase 1: Problem diagnosis based on the experience and previous literature
- Phase 2: Investigate current practice of knowledge capture, knowledge dissemination and knowledge sharing of the domain through open-ended interview with the research communities in UTHM.
- Phase 3: Investigate on the system and domain problem through background reading and previous publication. This technique uses computer journals, reference books, and the Internet (including user groups and bulletin boards) to find information on how others have solved similar problems, plus whether or not software packages exist to solve, or even partially solve, the problem.
- Phase 4: In depth interviews with the research community members' to get detailed data. Information collected will be used to design a framework of virtual workplace for research communities in UTHM.
- Phase 5: Evaluation of the prototype. In order to evaluate the prototype a set of questionnaire is developed with consideration on the demography of respondents. The data collected then will be used to measure how the prototype would meet the user requirement and the deliverable of the prototype.
- Phase 6: System maintenance & improvement. Information and suggestion from respondents during the prototype evaluation phase is collected and noted to improve the prototype.

5. PROPOSED ELEMENTS FOR DESIGNING A VIRTUAL WORKPLACE

The virtual workplace is a powerful emerging trend in future IT. It provide benefit in personal productivity, time and cost saving. This benefits have been identified and evaluated and are causing radical shifts in workplace cultures [5].

In this section we proposed elements for designing a virtual workplace to facilitate the knowledge sharing needs for research communities in UTHM. These elements, as illustrated in figure 2 is proposed based on the members knowledge needs and facilities available in the intranet.
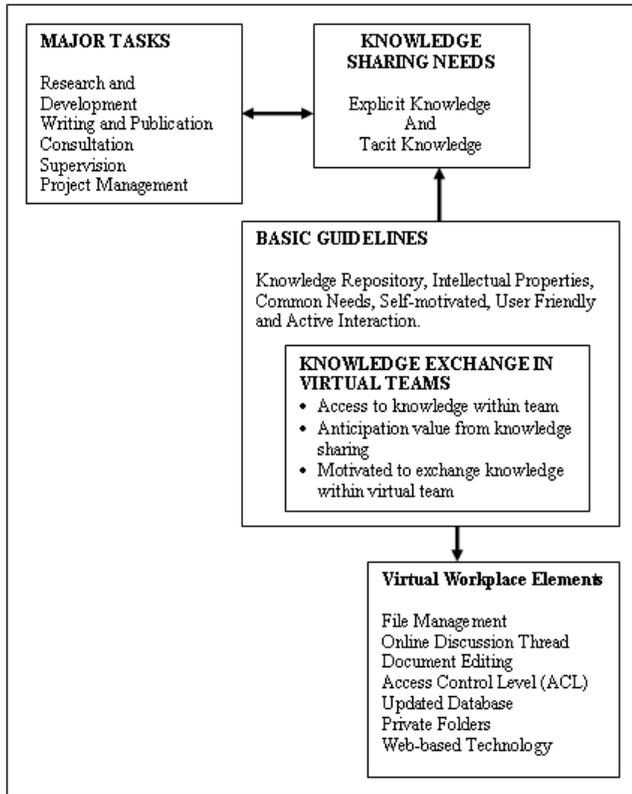

Figure 2: Proposed element for designing a virtual workplace.

The major task performed by research community members mainly consist of research and development, Writing and Publication, Consultation, Supervision, Project Management and Team-Development. In this study we found that virtual workplace on intranet is able to facilitate the knowledge sharing needs among research community members through a set of basic requirements or basic guidelines identified in the study. The key elements that are needed as basic guidelines for knowledge sharing among members in the virtual workplace are:

- A common knowledge repository of documents, information, papers and knowledge embodied.
- The virtual workplace should abide by underlying principle of intellectual property rights.
- The relationships between research community members within virtual workplace are based on their common needs to perform their tasks.
- Research community members are self-motivated and voluntarily ready to participate.
- The functions and features of virtual workplace should be user-friendly to enable active participations.
- Sharing of knowledge within virtual workplace through active interactions among community members.

Within the basic guidelines for sharing knowledge, we specified list of best practices of knowledge exchange in virtual teams based on Malholtra and Majchrzak [10]. The best practices to be followed by research community in FTMM are in the areas of access to knowledge within team, making the value of knowledge haring explicit, motivating members to share knowledge and ensuring that team members have the ability to synthesize knowledge that is shared [10].

Table 1: Fostering Knowledge Exchange in virtual workplace of research community in UTHM (adopted from Malholtra and Majchrzak, 2004)

Issues	Best practices
Access to knowledge within team	• Ensure each member knows others roles, responsibility and expertise • Ensure that each individual's progress is visibly displayed
Anticipation value from knowledge sharing	• Ensure that each member have clear understanding of value of team to organization, value of obtaining knowledge from outside the team when needed and sharing the knowledge within team.
Motivated to exchange knowledge within virtual team	• Ensure that information-hoarding is not practiced • Establish open information sharing • Resolve intellectual property issues upfront
Ability to synthesize knowledge	• Ensure members are aware of and respect each others' expertise • Encourage sharing knowledge about decision rationale, decision process and options not just individual outputs.

The design of virtual workplace for research community of UTHM should be congruent with the task performed in the faculty environment. Relevant document such as research proposal and research report should be made available for quick references. In fact, template for a number of tasks should be available to simplify preparation of documentation and work processes. Thus we proposed file management element should be included in the designing the virtual workplace for UTHM. Spaces for intellectual discussion and interactions should be provided to encourage communication using discussion threads. The rationale of using discussion thread is to avoid one-to-one email communication within team and to provide knowledge repository of communication so that team members are aware and alert with the latest intellectual discussion in the virtual workplace.

The document editing element is proposed in the virtual workplace to provide capabilities of the repository so that each team members could see what everyone else's comment were on all draft documents and ensuring the document history is maintain in the repository. The research community members should be ready to participate and motivate to share and contribute information, knowledge and experience within the community. However, each research community should respect and acknowledge other community's privacy and ownership. Thus, all information should be protected base on access control level.

6. CONCLUSION

This paper suggests that virtual workplace can become a platform for information and knowledge sharing within research community by given a proper set of guidelines and elements. However, these guidelines and elements identified in the study are not exhaustive, but are suggestive and meant to be explored further. The proposed elements identified from this study would become the basis for designing a virtual workplace for research community in UTHM. We hope that the virtual workplace shall later be used to facilitate research community in doing research activities in UTHM.

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