A THEORETICAL STUDY OF THE SAND CONE MODEL AND KNOWLEDGE MANAGEMENT FROM MALAYSIAN UNIVERSITY LIBRARIES PERSPECTIVE

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Abstract: This paper outlines the previous research on the theoretical study for Knowledge Management. The current study of this paper seeks to explore whether knowledge creation, knowledge acquisition, knowledge capture and knowledge sharing possibly have a significant impact and gaps in knowledge management practice at Malaysian university libraries. Therefore, this paper adopts the "Sand Cone Model" approach to gauge its feasibility to be incorporated into this research. The knowledge contribution of this research will be employed to elaborate and integrate using Structural Equation Model (SEM) for some of the confirmatory factors that can influence the knowledge management practices. The expected outcome and gaps of knowledge in theoretical model could also provide some direction for future research.

Keywords: Knowledge management, Knowledge creation, Knowledge acquisition, Knowledge capture, Knowledge sharing, Structural Equation Model (SEM), Sand Cone Model

INTRODUCTION

This article considers some of the principles and practices commonly associated with "knowledge management" (KM) in so far as they seem to be of potential importance or relevance to library and information professionals. The multidisciplinary nature of knowledge management has resulted in input from people in different fields including economists, human resource professionals, IT professionals and library and information professionals. In this case, individual and competencies has included in familiarity with information and knowledge, and with users and related technologies. Sabri (2005) in his study stated that data are simple, facts and raw material that, in and of themselves, represent observations, or facts out of context, and therefore not directly meaningful and may be of little use. However, information is data that have been linked with other data and converted into useful context for specific use. But, it is

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different with the knowledge because it goes a step further. It is that which individual or people come to believe and value based on the meaningful organized information from the human mind through experience and communication with guidance for action and is a much more implicit entity. Knowledge, as opposed to data and information always has a human factor. The fundamental of knowledge components can be depicted in Figure 1.
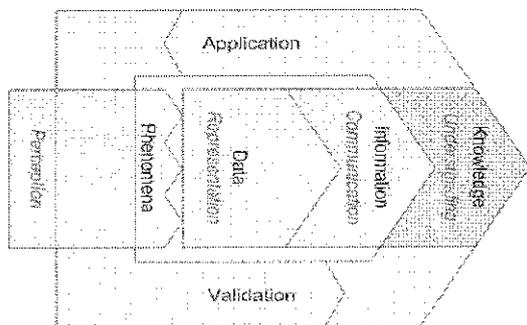

Figure 1. Knowledge components

More generally, a perceived overlap between the activities in the library and knowledge management has been cited, with some commentators maintaining that KM is a new name for what librarians have been doing for years (Gorman, 2004). It was observed by Davenport and Prusak in 1998 that the awareness and application of knowledge have always been at the centre of librarians' work. Similarly, Koenig (1997) stated knowledge management has been described as librarianship in new clothes. Nowadays, much Knowledge Management (KM) definition in the library has been stressed by previous researchers through observation and practice. Yaacob, *et al.*, (2010) stressed that the need for a systematic knowledge management system to help the library staff know what they should know, store, organize and exploit effectively. Malhotra (1997) defines KM in the following terms, which is, Knowledge Management caters to the critical issues of organizational adaption, survival and competence in face of increasingly discontinuous environmental change. Weerasinghe (2006) stated that there are contributions on creating knowledge, resources and capabilities, communication and sharing knowledge, knowledge innovation and human resources. KM is observed collectively in communities of

practices through interaction of specialized groups that produce specialized knowledge, skills and expertise.

Sivan (2005) points out that knowledge management is the art of performing *knowledge actions (KA)* such as organizing, blocking, filtering, storing gathering, sharing, disseminating and using *knowledge objects (KO)* such as data, information, experiences, evaluations, insights, wisdom and initiatives. In general terms, it is the performance of knowledge actions on knowledge objects (Sivan, 2001) as shown in the Figure 2.

KM = Knowledge Actions × Knowledge Objects		
The art of performing knowledge actions on knowledge objects ...	*Organizing, storing, gathering, sharing, disseminating, using ....*	*Data, information, experience, evaluations, insights, wisdom, ...*

Figure 2. Knowledge Actions (KA) and Knowledge Objects (KO)

Within this view, Knowledge Actions (KA) and Knowledge Objects (KO) are used in this KM environment for achieving the alignment of the organizational actors with pre-defined 'best-practices'. Librarians live in a competitive environment, and they are advised to stay focused and relevant while applying KM principles together with Information Technology and Communication tools in the libraries to facilitate the rapidly changing environment. Organizations, especially Malaysian university libraries have to change in the ways they manage, using a number of strategies, including knowledge management. It is imperative that KM has to be applied because of the emergence of the knowledge age, globalization, dynamic labor market, rapid technological development and knowledge as the only corporate non-diminishing asset. "The effective way to manage change successfully is to create it (Drucker, 2004).

This study examines the linkage between Knowledge Creation, Capturing, Acquisition, Sharing (CCAS) and knowledge management practice in the library context. Specifically, it aims to explore and demonstrate the knowledge

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gap between these factors to enhance knowledge management in university libraries.

RELATED WORKS

In developing country like Malaysia has reported that the interest of KM practices is still growing especially among Malaysian universities (Tasmin *et al.*, 2010). Knowledge management initiative in Malaysia set its root which is traceable to this early new millennium. Dr. Mahathir (then the Prime Minister) laid Malaysia's foundation in the knowledge-based economy by launching the National K-economy Masterplan in 2000 (Mohamad, Ng, and Abdulai, 2002). Also, Ever (2001) points that Malaysia, or at least its government, has made the move towards a knowledge-based society and economy its primary target. Stoffle (1996) suggested that institutions of higher education need to gear up for a massive increase in the demand for educational services. Hawkins (2000) highlighted that collaboration requires the actual commitment and investment of resources, based on a shared vision. As a result, universities may be required to pool their resources in terms of human expertise, skills and competencies to achieve their goals. As such, these challenges which occur as a result of change and transformation demands that university comes to grips with the notion that collaboration is one of the means of competitive survival. Knowledge management is also creeping into the government agenda, affecting both the government's vision for the country as a whole and the way ministerial departments operates on a day-to-day basis (Hamid and Nayan, 2005; Hansen *et al.*, 1999).

Nowadays, universities are faced with a challenge to create and disseminate knowledge to society. To face with this scenario, people in universities today must learn new things and discard some of their old habits and perspectives. They must completely retool. They must expend their vision and re-strategize if they are to cope with the emerging trends and threats that confront them in all facets of life (Anoa, 2003). Traditionally, universities have been the sites of knowledge production, storage, dissemination and authorization (Reid, 2000). Universities and other higher education institutions face similar challenges that many non-profit and for-profit organizations face. The challenges are financial, increasing public demand, accountability, rapidly

evolving technologies, changing role of staff, diverse student demographics, competing values and a rapidly changing world (Naidoo, 2002; Olu Adeyoyin, 2006). Universities need to share information and knowledge among the academic community within and outside the institution. A knowledge management practice has become a key issue in the universities due to changes in knowledge culture. Universities are not isolated entities but exist as a part of society. They engage in teaching, research and community services.

Therefore, knowledge management practice created in university through research and teaching should be relevant to the society, and promoting knowledge as a major factor of business of the university and higher education institutions. These demands require the development of partnerships universities and curricula customized to meet users' satisfaction and needs.

A REVIEW OF KM FRAMEWORKS

The acceptance of knowledge management importance was brought out into numerous framework models for its successful implementation. Generally, the initiatives towards knowledge practice require specific planning and alignment of organizational objectives. Yaacob, *et al.*, (2010) stressed that Peter Drucker (1998), Paul Strassman (1999), Ikujiro Nonaka (1991) and Peter Senge (2003) were some of the expert management theorists who have contributed to the evolution of KM. They emphasized on the significance of information and knowledge as organizational resources. With good knowledge management practice and service, an organization can bring its entire organizational memory and knowledge to bear on any problem anywhere in the world and spending on knowledge management services reported with expected grow from $1.8 billion to more than $8 billion by 2003 (Hussain *et al.*, 2004; KM news archive, 2000).

Wen (2005) points out that KM has been tooted and hyped since late 1990s. KM started in the business sector then in higher education and now in library management. The thrust for embracing Knowledge Management in academic libraries is mainly from a combination of library budget shortfall and higher user expectations. Rather than adopting an often trumpeted high-

tech approach, it is more practical to utilize the existing staffing, technology and management structure for academic libraries. Figure 3 depicted the conceptual framework of KM process, from the identification of knowledge needs stage of the organization to the utilization that knowledge to be practice. The framework impetus customers to support KM practice in the library. Without staffing, technology and management structure, this framework will not succeed to be practiced. The conceptual framework of KM process was depicted in Figure 3.
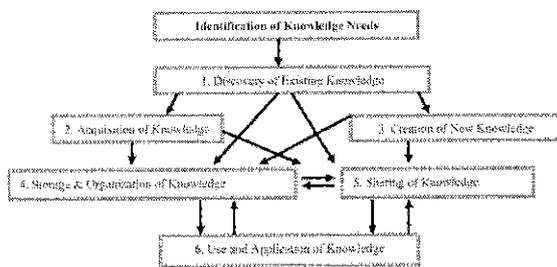

Figure 3. The Conceptual Framework of Knowledge Management Process

However, this framework needs to combine into the structural model to indicate significant differences among these factors toward customer satisfaction. Jennex and Olfman (2004) stated that KM practice flows from understanding of the organization, its knowledge users, and how they use knowledge. But, this framework only organizes the process until customer use and applied the knowledge. In depth, this framework should focus and trigger on customer satisfaction in order to perceive KM practice among the customers. Wen (2005) agreed that experience gained and benefit reaped shall encourage the academic library administration to implement Knowledge Management practice in the whole library. Figure 4 shows a model illustrates by Gold, *et al.* (2001).

This model highlighted several factors or variables involve in organizational effectiveness. The researcher believes that common representation schemes to capture of knowledge should exist across the organization. Therefore, this model ought to be adopted and has structural linkage among variables. But, this model needs to remodel and suits with knowledge management practice in university libraries.
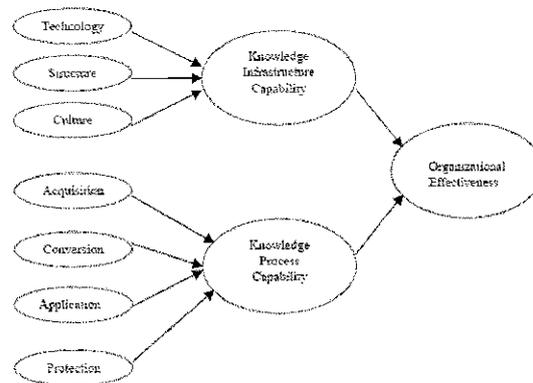

Figure 4. Organizational Capabilities Perspectives

Jantz (2001) has stressed that knowledge management can help transform library into more efficient, knowledge sharing organization. To adapt, KM within libraries could involve organizing and providing access to intangible resources that help librarians carry out their tasks more effectively and efficiently.

In all, much researcher agreed in the development of knowledge management practice (KmP) in academic libraries is to create, acquiring, capturing, sharing, and using knowledge, wherever it resides, to enhance learning and performance in organizations (Skryme, 1997; White, 2004; Townley, 2001; Zack, 1998; Wiig, 1993). For the purpose of this paper, KM is defined as "a purposeful management process to create, capture, store, exploit, share and apply both implicit and explicit knowledge for the benefit of the employees, the organization and its customers. It is strategic and action oriented. In the context of this paper academic libraries refer to only university libraries. It is evident from literature that knowledge is an intrinsically ambiguous term, and therefore, defining it precisely is difficult.

Maponya (2004) also agreed that whatever affects universities also affects academic libraries. This can be achieved through creating an organizational culture of KM practices and expertise within the library. Academic libraries as constituents of the parent university should rethink and explore ways to improve their services and become learning organizations, in which to discover how to capture and share tacit and explicit knowledge within the library.

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According to Shin *et al.* (2001) stated, there is debate as to whether knowledge itself is a cognitive state, a process, an object, the description of KM as a process, based on understanding organization as a knowledge system dominates. This view, therefore, examines the nature of individual knowledge and collective knowledge and their interactions (Grant, 1996). While authors differ in the terminology used in describing the KM process, the aggregate of their works can be described as a simple KM value chain as depicted in Figure 5.

Figure 6. Research model

Therefore, the model selected (Gold, et al., 2001; Lee and Lee, 2007) have to mixed up using structural equation models (SEM) based on preceding models and systematic review in Knowledge Management Practice (KmP) as depicted in Figure 7.
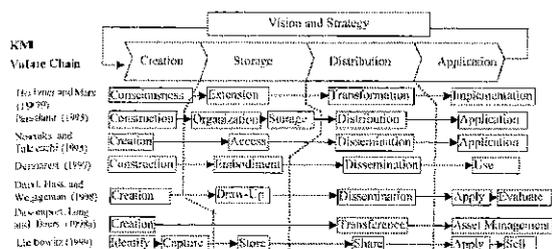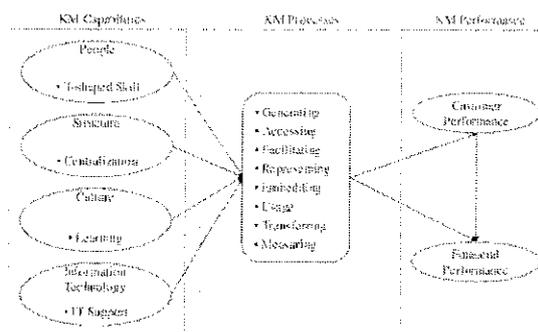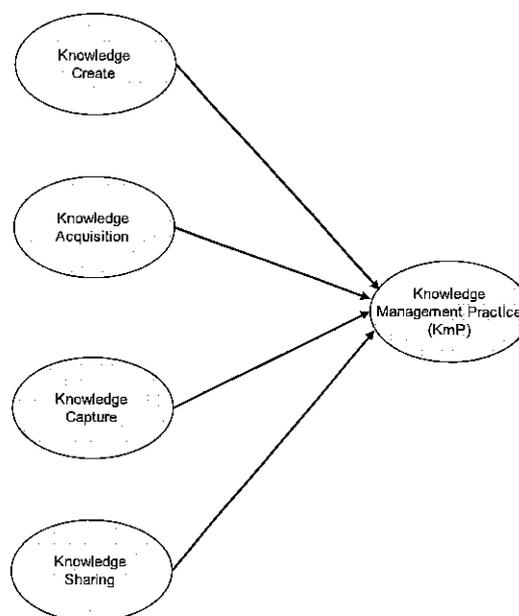

Figure 5. KM value chain

Via this way, individual knowledge was built up by social practices engaged and the value chain can be used to explain to some degree social knowledge and its interactions with individual knowledge. It is essential that the KM value chain should be strategically driven in order to realize the objectives of an organization and resulting in a continuously cycling process.

Lee and Lee (2007) shows a research model consists of knowledge management capabilities, knowledge management processes, and knowledge management performance. The authors considered organization member's T-shaped skills, centralization of organizational structure, learning organization culture, and IT support level of capabilities in knowledge management, and considered knowledge management process of generating, accessing, facilitating, representing, embedding, usage, transferring, and measuring for knowledge management processes as depicted in Figure 6.

This model can be suggested to adopt in the purpose causality of component structural equation model (SEM) based on KM practice in libraries. It is clearly indicates the factor/variable associated with KM process and KM performance.

Figure 7. Proposed structural model of KM Practice

THE SAND CONE MODEL

Being a flexible in operations is becoming a competitive necessity for a company (Grobler and Grubner, 2006). The originality of the Sand Cone model was developed by Ferdows and De Meyer in 1990s. This model shows the achievement of a multiple set of manufacturing capabilities as a best vehicle for putting the fundamental principles in expanding and enriching the set of

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production process. The originality of the Sand Cone model can be depicted in Figure 8.
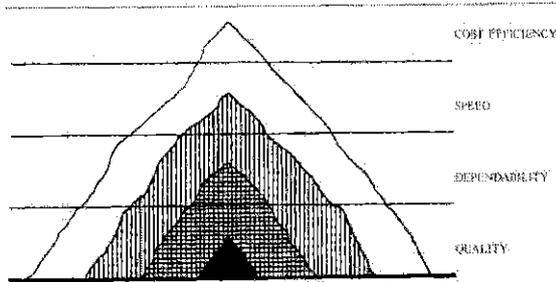

Figure 8. The Sand Cone Model by Ferdows and De Meyer (1990)

In Knowledge management practice, the purpose Sand Cone model could be depicted in different layers in Figure 9. It assumes that the sand, in this case is a stand-in for knowledge management effort and resources. To obtain a sand cone, it has to create, first a stable foundation of knowledge creation. To build a taller sand cone, an increasing amount of sand needs to be poured, thereby it should improve the knowledge acquisition layers, building the foundation for improving knowledge capturing could lead users to become more knowledgeable. Thus, by pouring still more sand, and enhancing the foundation layers of knowledge creation, knowledge acquisition, and knowledge capture still further, one can start building stable and well-founded for knowledge sharing improvement programs (Ferdows and De Meyer, 1990; Takala *et al.*, 2006).
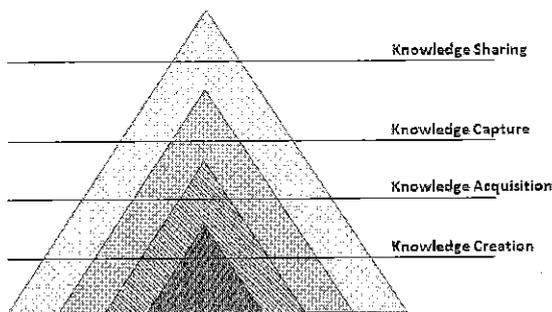

Figure 9. The propose of Sand Cone model in Knowledge Management Practice

Ferdows and De Meyer (1990) stressed that this analogy helps this research to explain an important characteristics of the model, which that moving up each step in the path towards development of knowledge management

practices. All of this could provide a unique opportunity to understand the library resources and identify the categories of knowledge to be managed and to support a library's organization-wide strategies and also spot library challenges towards KM. Therefore, this model shows the way for an organization to go after and it shows the best vehicle for putting the fundamental principles of good knowledge practices in place and continually expanding and enriching that set of principles. The question which people may ask and argues, is this Sand Cone Model can indicate significant difference and impact in this research?

In addition, as a user/customer, they became more sophisticated and academic libraries need to develop innovative ways to respond and to add value to their services, which refers to Sand Cone model. Librarians need to be aware in capturing the knowledge which exists within them to satisfy their customer needs to fulfill knowledge gaps. Therefore, Narasimhan *et al.* (2005) cited that Schonberger's (1986, 1990, 1996), suggested that best practices should be continually measured against customers' needs.

PROPOSITION OF THE RESEARCH

Knowledge management, in the sense of used here relates to the organizations (i.e. University's library) and encompasses both process and outcomes. It can be described as the way organizations build, supplement and organize knowledge and routine around the activities and within their culture, and develop organizational efficiency by improving the use of employee skills (Pan and Scarbrough, 1999). It seems likely that the emerging knowledge-based practices of the organizations may permit greater understanding of emerging organizational structures (Nonaka and Teece, 2001). In order to investigate how knowledge management practices and library users' satisfaction may be fostered and to provide prescription that knowledge practices, this research have to identify the factors that facilitate library users' satisfaction at Malaysia universities. Grant (2001) focused on knowledge as the critical resource in the production of all goods and services helps clarify the central issues of coordination. The challenge of coordination is to devise mechanisms by means of which the knowledge resources of many different individuals can be deployed in the production of a particular product. Webster (2007) pointed out

that the greatest challenge facing librarians moving to KM is moving from the traditional role of housing information to analyzing and using the information. Information can be viewed as the explicit form of knowledge and LM as management of the tacit knowledge inside people's heads to make it accessible to others as possible.

CONCLUSIONS

It can be clearly seen that the knowledge management environment in which academic libraries operate is changing. It is both faced with challenges and opportunities. Academic libraries need to respond to these challenges in order to serve better the needs of the entire academic community. One way of doing that is engaging in knowledge management practices, that is, creating, capturing, sharing and utilizing the knowledge to achieve the library goals. Knowledge management is a viable means in which academic libraries could improve their services and become more responsive to the needs of users in the university. People gain knowledge from their experiences and their peers' expertise. Academic libraries need to recognize the knowledge of its staff and create an environment in which their knowledge can be valued and shared. The proposed structural model of Knowledge Management Practices of this research will be employed to elaborate and integrate using a structural equation model for some of the factors that can influence the knowledge management practices and library users' satisfaction. Also, the proposed of the Sand Cone model will be employed to illustrate the significant balanced and well founded of the Knowledge Management. The expected outcome of this theoretical model could provide some direction for future additional research on KM practices and library users' satisfaction in Malaysian universities.

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