The Implementation Of Knowledge Management System In Taiwan's Higher Education

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ABSTRACT

Success in an increasingly competitive marketplace depends on the quality of knowledge that organizations apply to their key business processes. The concept of knowledge management (KM) is widely discussed in commercial applications. There are limited discussions as to how it applies to not-for-profit organizations and its relevant measurement issues. This paper examines the application of knowledge management systems (KMS) in a private college in Taiwan, who is facing administrative challenges and cutting-edge competition. The multi-perspective modeling approach is adopted. The college first defines vision in a SWOT analysis through faculty brainstorming sessions. Leadership is formed to ensure a culture of sharing. A knowledge road map then documents inventories of IC and core competence. After defining knowledge management strategies in academic and organizational perspective, the KM model describes steps and procedures for implementation. Finally, implications for other universities and colleges are discussed.

INTRODUCTION

𝓑usiness enterprises typically are valued at the net tangible assets recorded on their books. When the market value of a firm succeeds its book value, conventional stock market theory regards the premium as the market's assessment of intangible assets or intellectual capital of the firm. Svieby (2000) classified intellectual capital into three categories: employee competence, internal structure and external structure.

The managing and measuring of intellectual capital are widely discussed in commercial applications. Skandia, a Swedish insurance group, first reported their measurement of intellectual capital on one subsidiary- AFS in 1991 annual report, which attracted international attention. The implementation of key factors in intangible assets using indicators in day-to-day operations highlights the company's value in creating processes. Many other firms apply similar frameworks in managing their intellectual capital, for example: Exxon Chemical's, "Learning Forums"; World Bank's, "Communities of Practice"; Amgen Pharmaceutical's, "Divergent vs. Convergent"; Toyota's, "Alignment Rooms"; Ryder Trucks', "Knowledge Center"; Allied Signal's, "Mental Model Learn"; and Scott Paper's "Real Bottom-Line Customer Service". Researchers have paid little attention to higher education institutions, and non-profit, government, and community organizations (Coukos-Semmel, 2003).

The purpose of this paper is to explore how a not-for-profit organization can adopt the concept of knowledge management and subsequently measure the intellectual capital - specifically in a private college in Asia. The first two sections review literature in KM theory and its conceptual model in higher education. This paper details the needs and objectives of adapting KM in the higher education industry in Taiwan. Section IV identifies the implementation framework in applying KM with relevant measurable indicators. Last section presents summary and implications.

KM LITERATURE REVIEW

Knowledge refers to the ideas or understandings that an entity creates and/or possesses that are used to take effective action to achieve the entity's goals. Nonaka and Takeuchi (1995) first proposed the concept of explicit and tacit knowledge. Explicit knowledge is the knowledge that can be written down, processed by information systems,

codified or recorded, and archived and protected by the organization. Tacit knowledge represents knowledge that cannot be written down, exists in people's heads and is extremely difficult to transfer. Both explicit knowledge and tacit knowledge are the intangible assets any organization holds to provide excellent service to their customers. Knowledge has become the driving force in our economy today. It powers the ability of professionals to be their best, and to deliver value service to customers.

Knowledge management is the practice of harnessing and exploiting intellectual capital in order to gain competitive advantage and customer commitment through efficiency, innovation and effective decision-making. Both the ideas of knowledge worker (Drucker, 1993) and expert labor (Hull, Coombs, & Peltu, 2000) think that knowledge management is important to any entity.

The knowledge management system is the framework of an integration of organizational elements in organizational culture, organizational information technology infrastructure and the organization's store of individual and collective experiences, learning, insights, values, etc. (Allee, 1997). Members can effectively accomplish organizational goals through knowledge management processes and procedures (Von Krogh, Ichijo, & Nonaka, 2001). A firm that effectively manages knowledge is likely to be considered a learning organization (Mellander, 2001). Knowledge dissemination and responsiveness to knowledge are cited repeatedly as the most effective way to a competitive advantage (Oxbrow, 2000; McEvily, Das & McCabe, 2000). While the need for effective managing of knowledge is accepted, much of the literature continues to explore measurement and its effect on outcomes. Only Sveiby (2000) and Becerra-Fernandez and Sabherwal (2001) have developed inventories and clear procedures or methods to measure the effectiveness of such activities
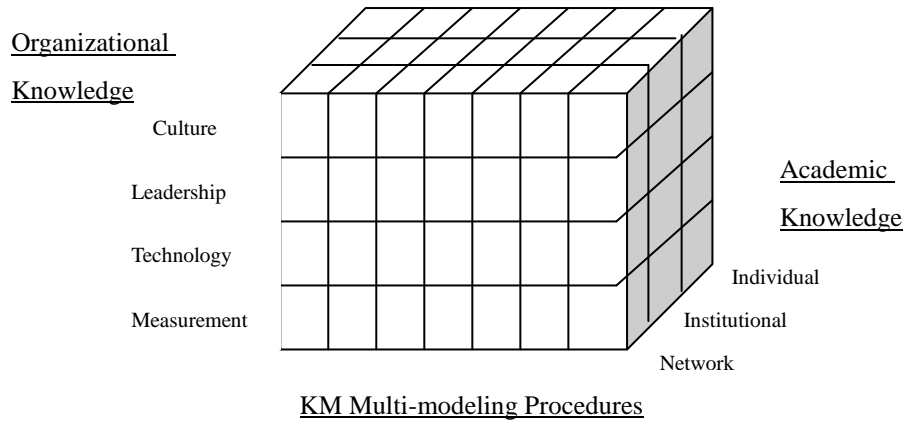
KMS CONCEPTUAL MODEL IN HIGHER EDUCATION

Universities are the main instruments of society for the constant pursuit of knowledge. Knowledge management in educational settings should provide a set of designs for linking people, processes, and technologies and discuss how organizations can promote policies and practices that help people share and manage knowledge (Petrides & Nodine, 2003). There are two types of knowledge involved in higher education settings: academic knowledge and organizational knowledge. Academic knowledge is the primary purpose of universities and colleges. Organizational knowledge refers to knowledge of the overall business of an institution: its strength and weaknesses, the markets it serves, and the factors critical to organizational success (Coukos-Semmel, 2003). This paper suggests strategies for the formation of KM ecology in an academic knowledge framework and organizational knowledge framework (Figure 1). Each dimension is depicted further in the following sections. It is believed that knowledge management can be used to support educational administration, which in turn supports teaching and learning (Petrides & Guiney, 2002).

Academic Knowledge Framework

Huang (1998) suggested four major processes to form a culture of knowledge sharing and collaboration. They are: (1) making knowledge visible, (2) increasing knowledge intensity, (3) building knowledge infrastructure, and (4) developing a knowledge culture. From an academic knowledge perspective, the learning community should start at the individual level, create departmental knowledge, create domains of knowledge across departments that share academic interests or disciplines, create institutional knowledge networks and networks with other institutions and corporations (Galbreath, 2000, p. 28). This research presents three strategies to establish knowledge ecologies within the academic framework: individual strategy, institutional strategy and network strategy.

The capitalization of collective knowledge begins with sharing in knowledge communities: from individual, through teams and groups, to organizations. Individual strategy mainly deals with the teacher's individual professional growth. KM helps teachers develop their teaching ability, skill and experience through e-learning, teaching portfolio, and action research. Once individual knowledge is captured, institutions and processes must be established to compel its dissemination throughout the organization. Knowledge management is then escalated to the organizational level. Institutional strategy emphasizes knowledge sharing through school-based teacher education, organizational learning, sharing culture, and teacher community. Knowledge sharing is not limited to the organization. Network strategy calls for establishment of knowledge map for teaching, knowledge database and instructional resource center.

Figure 1: KM Ecology

Organizational Knowledge

Culture

Leadership

Technology

Measurement

Academic Knowledge

Individual

Institutional

Network

KM Multi-modeling Procedures

Organizational Knowledge Framework

The most generally recognized four organizational knowledge management strategies are culture, leadership, technology, and measurement (The American Productivity and Quality Center and Arthur Andersen Consulting, 1997). As suggested by Coukos-Semmel (2003), examples of culture strategies in universities include staff development and training, communities of practice, and promotion of learning organizations. KM leadership strategies in universities include KM strategic planning in alignment with mission/vision, hiring knowledgeable employees, and evaluating employees for knowledgeable contribution. The university is responsible for providing infrastructure of tools, systems (intranets, web pages, electronic repositories, and data base, etc.), platforms, and automated solutions that centralized the development, application, and distribution of organizational knowledge. Measurement strategies may include benchmarking against other universities, allocating resources toward efforts that measurably increase the knowledge base, and linking and accessing impact of KM to the strategic plan.

Many KM application experts recommend the multi-perspective modeling approach. Models have been used previously from business management, such as SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis, balanced scorecards (Kaplan & Norton, 1996), and benchmarking as good sources of techniques.

CASE BACKGROUND

In Taiwan, there are two educational tracks: the liberal arts track, where students enter high school and then college/university, and the vocational track, where students proceed from junior high school to vocational high school and then an institute of technology. The higher education industry in Taiwan is segmented due to the dual education system. Total college enrollment in 2001 is about 1,083,000 for both liberal art track and vocational track colleges, including public and private institutions (Education Statistics, Ministry of Taiwan, 2002). Long-standing traditions of centralized state control still apply to the higher education industry in Taiwan. The Ministry of Education routinely determines enrollment levels, tuition rates, authorized curricula, and appointed institutional leadership (Dee, Henkin, & Chen, 2000). Institution autonomy is desired but is implemented slowly.

From 1991 to 2002, the number of colleges increased from 50 to more than 160 (Education Statistics, Ministry of Education in Taiwan). The birth rate declined 26%, from 16% in 1997 to 11% in 2002 (Labor Statistics, Ministry of Statistics). The decrease in birth rate eventually influences the number of college freshman enrollment.

The percentage of eligible students taking vocational track decreased from 50% five years ago to 40% now and is expected to be 30%. Student recruitment is the key to the survival, especially for private institutions in the vocational track. This sector is known as a cluster of competitors who applies similar management strategies and marketing tools in competing with each other. The need to stay strategically focused is essential for survival. Considering the competition and diminishing supply of students, colleges can only survive by creating core

competencies. By adapting KMS can help to assimilate knowledge at a faster rate.

Established in 1967, YTIT is a private vocational institution located in the southern part of Taiwan with 8,300 students and about 300 administrative staff and faculty members. YTIT provides comprehensive programs including day school, night school for recurrent education and supplementary school on weekends in fourteen departments enrolling students in a 5-year program (equivalent to high school plus community college), 2-year program (equivalent to community college), and 4-year college program. The school is a community-centered institution providing quality vocational education emphasizing both in theory and practice. In the past twenty years, YTIT grew five times in student enrollment and was upgraded from a junior college (equivalent to the combination of vocational high school and community college in the USA) to institute status in 1999. YTIT is financially sound, with income in excess of expenses at 27% (US $6.8M) and debt to equity ratio at 9% for 2002 fiscal year (2002/8/1-2003/7/31).

The school is facing new challenges and vigorous competition externally. In 2004, student enrollment dropped 27%. YTIT was rated in the last rank of all private institutions nationally in 2003 periodic peer review conducted by the Ministry of Education. The administration of YTIT realized the urge for an organizational change to gain competitive edge in order to survive in the industry.

KNOWLEDGE MANAGEMENT APPLICATION FRAMEWORK IN YTIT

Leaders of YTIT recognized the need for organizational change to reposition strategically in the competitive higher education industry. With the support from high-level management and the board of directors, YTIT begins her journey for implementation. At this point of time, knowledge management is a new idea to most members of the college. Knowledge is a valuable resource and it is natural for members to hoard knowledge from others. Sharing is not a phenomenon on campus.

Organization culture can inhibit or enhance organizational change efforts in knowledge management initiatives. Proper procedures are taken to ensure the concept of KM is correctly understood and thus creates a culture of sharing using organization-wide vocabulary. An outside KM specialty team is brought in as mediator for KM implementation. To ensure successful implementation of KMS, the Institute selects 50 representatives from faculty and staff of various departments to attend 14 brainstorming sessions. Figure 2 is the implementation model.
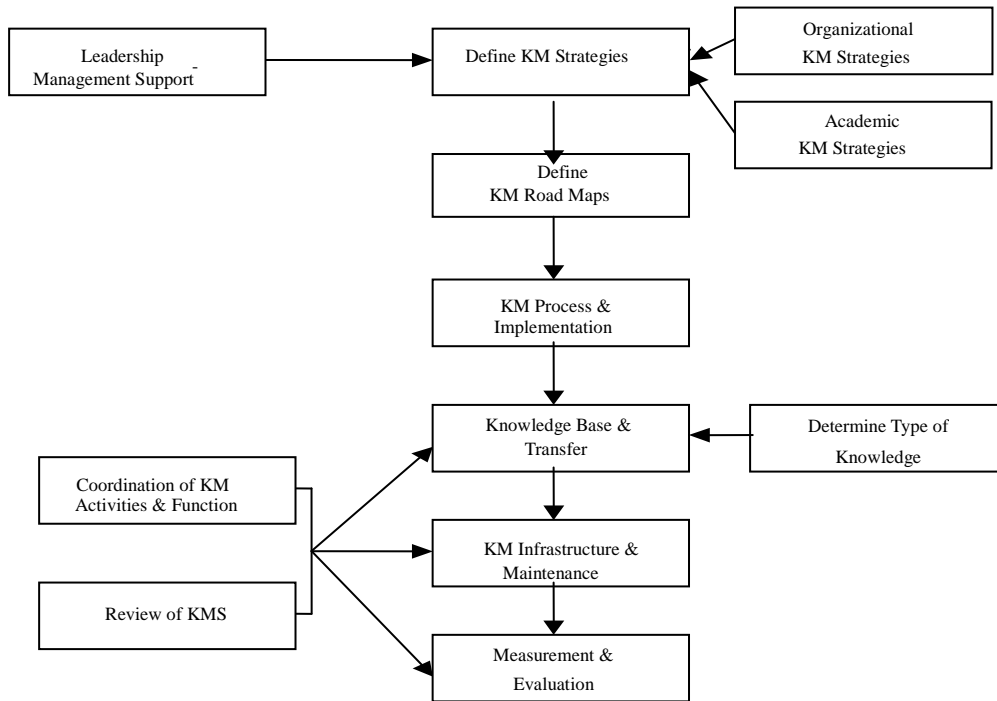
Specific implementation procedures are described in Table 1 corresponding to specific strategies in the KM ecology.

In the first few brainstorming sessions, faculties, administrators and student representatives defined the mission of YTIT as becoming a technology university in 2010, insisting on the spirit of humanism, emphasizing both liberal arts and high tech education, pursuing the future with truthfulness, goodness, and beauty. The Vice President in Administration of YTIT is designated as the Knowledge Management Officer

Academia is a pool of individual knowledge. The Institution has to create a sharing culture to transfer individual knowledge into an organizational knowledge base. The KM project involves executives and many employees in the school. KM related seminars on topics, such as KM basics, sharing culture, learning organization, creativity and innovation, technology platform, etc. YTIT promotes teachers' professional growth as well as school-based teacher education. Thus, the full utilization of an entity's knowledge base, coupled with the potential of individual skills, competencies, thoughts, innovations and ideas will enable an entity to compete more effectively in the future.

The design of an implementation process should focus on the user-how KM can improve a worker's daily work. At the strategic level the organization analyzes and plans its business in terms of the knowledge it currently has and the knowledge it needs for future business processes. Road Map serves as a living document regularly updated and a framework for the monitoring of the knowledge management program. This document reflects the current state of the interrelationship between work in progress and proposed for the future and the overall milestones and aims of the program (Macintosh, Filby, Kingston, & Tate, 1998). YTIT documents on-hand knowledge assets and visualizes critical IC needed in 5-10 years. Inventories of intellectual capital (IC) are generated after the SWOT analysis session.

Figure 2: KM Implementation Model in YTIT

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┌─────────────────────┐      ┌──────────────────┐      ┌──────────────────┐
│     Leadership      │─────▶│ Define KM        │◀─────│  Organizational  │
│ Management Support  │      │ Strategies       │      │  KM Strategies   │
└─────────────────────┘      └──────────────────┘◀──┐  └──────────────────┘
                                      │              │  ┌──────────────────┐
                                      ▼              └──│    Academic      │
                             ┌──────────────────┐       │  KM Strategies   │
                             │    Define        │       └──────────────────┘
                             │ KM Road Maps     │
                             └──────────────────┘
                                      │
                                      ▼
                             ┌──────────────────┐
                             │  KM Process &    │
                             │ Implementation   │
                             └──────────────────┘
                                      │
                                      ▼
┌─────────────────────┐      ┌──────────────────┐      ┌──────────────────┐
│ Coordination of KM  │────▶ │ Knowledge Base & │◀─────│ Determine Type of│
│ Activities & Function│     │   Transfer       │      │   Knowledge      │
└─────────────────────┘      └──────────────────┘      └──────────────────┘
                                      │
                                      ▼
┌─────────────────────┐      ┌──────────────────┐
│   Review of KMS     │────▶ │ KM Infrastructure│
│                     │      │  & Maintenance   │
└─────────────────────┘      └──────────────────┘
                                      │
                                      ▼
                             ┌──────────────────┐
                             │  Measurement &   │
                             │  Evaluation      │
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Core Team is formed as center for KMS for each community, including Router for initial evaluation of knowledge proposal, Reviewer for verification, Structures for categorizing, Editor for formalizing, Category Owner for maintenance and Communicator for knowledge transfer and sharing. For each community, specific KM activities are designed for acquiring and sharing knowledge. Major categories in each community are clearly defined.

A complete technical and organizational infrastructure is built by outsourcing tailor-made Gweb e-KM Solution software on Lotus Domino System. Standardized, flexible and friendly knowledge structure is ideal. Self-service intranet portals and networks and community of practice-knowledge sharing learning communities are also established.

The success of KM implementation should be linked to economic performance or industry value. The performance of a college ties to rating, recruiting and financial stability. Table 2 presents measurement indices that the core team builds for each community.

SUMMARY

Higher education institutions have come to face pressures similar to the private sector. Private colleges are experiencing huge challenges due to the structural change in the higher education industry in Taiwan. In order to deal with the cutting edge competition, management has to adopt new models in search for excellence. It seems reasonable to propose management techniques such as KM and related strategies to enhance quality and performance. Knowledge Management (KM) helps an entity making the collective information and experience available to individual workers.

Table 1: KM Procedures Corresponding to KM Ecology Strategies

KM Ecology	Organizational KM Strategies				Academic KM Strateagies		
KM Strategies	Leadership	Culture	Technology	Measure	Individual	Institutional	Network
Top Management Support and the Announcement of KM Implementation, Appointment of KMO	✓						
Selection of 50 KM representatives		✓			✓		
Brainstorming session on defining vision/mission						✓	
Brainstorming session on SWOT analysis		✓				✓	
Define KM Strategies		✓				✓	
Describe knowledge road map		✓				✓	
Selection of core team							✓
Planning of KM related seminars-research methodology, e-learning skills, etc.		✓	✓		✓		
Define knowledge asset categories-knowledge Community (KC)				✓		✓	
Knowledge base and transfer-define specifics for each KC		✓				✓	
Selection of key man: 1. Router for initial evaluation of knowledge proposal 2. Reviewer for verification 3. Structures for categorizing 4. Editor for formalizing 5. Category owner for maintenance	✓					✓	
KM infrastructure-Outsourcing tailor maid Gweb e-KM Solution software on Lotus Domino System			✓				
Establishment of intranet portals and networks and community of practice				✓			✓
Establishment of measurement indices				✓			

Table 2: Guideline of Intellectual Capital Indices

Measurement for Excellent Research Community	Measurement for Teaching Enjoyment Community	Measurement for Recruitment Community
Number of publications in each school year	Number of sharing of experience from best student evaluated teachers	Establishment of public relation department in charge of press conference and media communication
Number of conference paper	Number of academic workshop or conference held by each Department each term	Establishment of student bulletin board by each Department
Number of funded or non-funded research project	Number of workshop for new teaching method and experience	Recruitment preparation by each Department
Number of international cooperation project	Increase in student evaluation result	Establishment of Recruitment Team
		Analyzing new student background every year
		Collecting alumni information and establish alumni web site

(KMO). Top-level management declares the implementation of KM as a priority project.

The exploration and integration of know-how involve knowledge condensation and internal transformation and then cultured and integrated to improve the core competence and innovation performance. The case under study takes an aggressive move to initiate organizational change through KMS implementation. Organization culture is an important element enhancing successful efforts. Good planning and proper procedures are taken to form KM ecology with academic and organizational strategies. With high-level management support, YTIT begins her journey of organizational change. The implementation process is still in progress and the result should be an interesting issue to other institutions in the industry and for future study.

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