Developing a Rubric Matrix for Evaluating Knowledge Managment Capabilities

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ABSTRACT

For initiating one organization's knowledge management (KM) project, it is essential to evaluate knowledge management capabilities (KMC) of that organization. One of the most popular methods in the phase of evaluating KMC is Fuzzy method that seven attributes of KMC are evaluated by this method. In this paper a rubric matrix is presented to make easy evaluating the value level of each attributes. This rubric is applicable even for whom which are not familiar completely with KM and also is maintained by analyzing and surveying many different researches are done on these attributes.

Keywords
Knowledge, Knowledge management (KM), Knowledge management capabilities (KMC), Knowledge management infrastructure, Knowledge management processes, Rubric matrices

1.0 INTRODUCTION

1.1 Rubric Matrix

Rubric matrix is a clear set of criteria used for assessing a particular type of work or performance. A rubric also includes levels of potential achievement for each criterion. Using rubric has many advantages in this area such as: organizations can use rubric as a tool to improve their weaknesses; experts have explicit guidelines about how to judge about attributes; clarifying each attributes; easy and also exact evaluation and so on.

1.2 KMC

Because of importance of KM, many organizations spend pervasive effort on KM projects. But many researchers indicated that many KM projects have failed. Investigating on these projects is for acquiring many goals and expectations, thus reasons for project's failure are so controversial. Don't be familiar with the status of organization's knowledge and also preconditions (capabilities) that they are very essential for KM efforts are reasons for failure of KM projects.

The reason of KM projects failure could be the lacking of knowledge audit ("the The K-Audit is a discovery, verification and validation tool, providing fact-finding, analysis, interpretation, and reports. It includes a study of corporate information and knowledge policies and practices, of its information and knowledge structure and flow") for any KM plans and projects (Hylton A., 2002).

Knowledge management capability means the condition and ability which individuals have within the area of knowledge management domain in knowledge activity system (Subo Baimin et al., 2008).

1.3 KMC Infrastructure and Process

While many different meaning of KMC has been presented, there are some definitions that concentrate on KMC infrastructure. Organization's KMC infrastructure is defined as its ability to develop KM-based resources (KM and resource based here is defined as technical KM resource and social KM resource) by combination with other resources and capabilities (Shu-Hui Chuang, 2004).

On the other hand, focus of definitions is on KMC process. KMC consists of three processes: knowledge acquisition, knowledge dissemination and the last one use or responsiveness to knowledge (Darroch, 2003). KM is basically a human social process. It is a particular process, called knowledge processing, involving the production, evaluation, integration and control of how knowledge is created and used in organizations (Steven Cavaleri A., 2004).

In terms of some researchers' opinion, knowledge management should be defined as a combination of knowledge management process and knowledge management infrastructure. In this perspective KMC is expressed as KM infrastructure: technology, structure and culture and KM process: acquisition, conversion, application and protection (Golde et al. 2001).

Indeed, knowing the status of firm's KMC is very important to do KM projects successfully. So, before starting any plan for KM, capabilities should

be evaluated. There are many ways to evaluate KMC, such as scoring tool, fuzzy method, and Grey method and so on.

2.0 METHODOLOGY

In this paper, an influential evaluation tool -rubric- is developed both as assessment tools and as guides. Rubric also makes decisions easier and more consistent.

Preparing of rubric back to the research that have done by Zhi-Ping Fan et al. (2009) for evaluating knowledge management capability of organizations by fuzzy linguistic method. In this research it is needed to choose several experts to give their opinions about level of seven attributes technology, structure, culture (infrastructure capability) and acquisition, conversion, application, protection (process capability) .

Since all respondents in an organization are not expert of
KM and they are not knowledgeable about attributes, this rubric explains each of the attributes which can help them to answer about attributes'

level very precisely. Criteria for the rate of attributes are in terms of very high and very low. Very high and very low determine the best and worst status of attributes in the organization.

This rubric is produced by analyzing and surveying on general KMC problems, many different researches that have done on these attributes, studying about rubric matrixes and also by interviewing with experts in different fields of KM.

3.0 RESULTS

3.1 Infrastructure Capability

3.1.1 Technology

Technology for KM is only an enabler. By using technology truly, knowledge can be managed more effectively. Technology can provide a competitive advantage for an organization and become a necessary part of the services and products of that organization.

Table1: Rubric Matrix of Technology

	Very High	Very low
Technology	• Organization has technology which can deliver **relevant & timely knowledge**(e.g. email & hand phone)	• There is no technology to deliver knowledge at the right time
	• Organization look at technology as a source of **competitive advantage**(e.g. a company should pursue policies that create high-quality goods to sell at high prices in the market)	• Technology is not a source of competitive advantage for organization
	• Organization has **Collaboration technology** that allows a rich expression and discussion of ideas/proposals (e.g. Multimedia distribution service at universities)	• Because of lack of collaboration technology, sharing and collaborating knowledge and resources is become very difficult for members
	• Organization has technologies that allow its members to find **new knowledge** (e.g. Internet)	• Finding new knowledge doesn't happen by technology
	• Organization has technologies which allow members to effectively **track source of knowledge**, creating a catalog of internal organizational knowledge (e.g. The IntelliMerchant system from IntelliCatalog, Inc. provides the way to create and maintain online catalog)	• There is no technology to track source of knowledge
	• Organization has technologies which enable it to use its **existing knowledge** (e.g. online document sharing)	• There is no technology to use existing knowledge
	• Organization has technologies which allow the firm **to track knowledge** about its customers, partners, employees or suppliers	• There is no technology to track knowledge about its customers, partners, employees or suppliers
	• Organization has technology which enable it to have better **representation of knowledge** (e.g. Multimedia distribution service in the universities)	• There is no technology to have better representation of knowledge
	• Organization has technology that give value to an effective **learning culture** (e.g. as one benefit of e-portfolio, it increase students' ability to understand what they have learnt)	• There is no technology to have effective learning culture
	• Organization has technology which support the efficient **storage and retrieval of codified knowledge**	• There is no technology to support storage and retrieval of codified knowledge

Source: Gold et al. (2001), Emmanuel D. et al. (2006), Shu-Mei Tseng (2008), Peter J. Sher et al. (2004), Hitt Michael A., et al. (2000), Fan Wei et al. (2009), Joline Morrison (1992), Niess (2005), Kay Kimber et al. (2007)

3.1.2 Infrastructure Capability: Structure

Organizational structure is a set of policies and rules which an organization arranges to allocate duties, responsibilities and authorities. This structure depends completely on the organization's objectives and the strategy chosen to achieve them.

Table2: Rubric Matrix of Structure

	Very High	Very Low
Organizational structure	• Organizational structure is designed for flexibility so that it **encourage sharing & collaboration** across boundaries within the organization • An organization's structure can determine the **channels from which knowledge is accessed** and **how it flows** • System of organization should be structured so that **workers are motivated & rewarded** for taking the time **to generate new knowledge, share their knowledge**	• Organizational structure has the unintended consequence of inhibiting collaboration and sharing of knowledge across internal organizational boundaries • which knowledge is accessed and how it flows isn't determined by organization • There is no reward and motivation for knowledge workers of an organization to create new knowledge

Source: Gold et al. (2001), Annick Willem(2009), Zhi-Ping Fan (2009), Chung-Jen et al. (2007) and interview with lecturers of faculty of computer science and information system, UTM university

3.1.3 Infrastructure Capability: Structure

Concept of knowledge is completely different with data and information; it is rooted in human experience and social context. So managers must have very close attention to the people and their culture as well as structure and technology.

Table3: Rubric Matrix of Culture

	Very High	Very Low
Culture	• Culture is basically **the source of organization's passion** in addition to the value benchmark in judging and shaping organization's infrastructures and policies • Culture is **the most important view of organization toward its goal** as well as the management type and methods to achieve goal • A climate of **openness**, **trust and respectful amongst organization members** is the basic condition that allows tacit knowledge to be created, shared and used(e.g. members collaborate with each other in confident environment) • **Type of interaction and supporting collaboration in organization** enable individuals, knowledge workers, teams and communities to make better decision faster and to create new ideas • Organization has **sharing-oriented** culture (e.g. members share their knowledge easily) • Organization has **learning-oriented** culture • Organization has **innovation-oriented** culture • organization engender a sense of **involvement (responsibility) and contribution** among employees	• Organization doesn't look at culture as a source of organization passion • Culture doesn't have any role to achieve goals • Openness, trust and respectful of members of organization are not the best values • Individuals don't have willingness to collaborate and interact with each other **AND** • Managers don't stimulate their members to voluntarily collaborate and share their talent and ongoing experience into organizational assets • There is no emphasize on sharing of members' skills, experiences and knowledge Organizational culture is not in the base of learning • Organizational culture is not in the base of learning • Organizational culture is not in the base of innovation • There is no sense of involvement and contribution among employees

Source: Li Wei. (2008), Gold et al., (2001)

3.2 Process Capability

3.2.1 Acquisition and Conversion

The key to knowledge creation lies in the mobilization and conversion of two kind of knowledge: tacit and explicit knowledge. For conversion of knowledge there is a spiral that is explained on rubric, also see figure1 (Nonaka and Takeuchi, 2004).
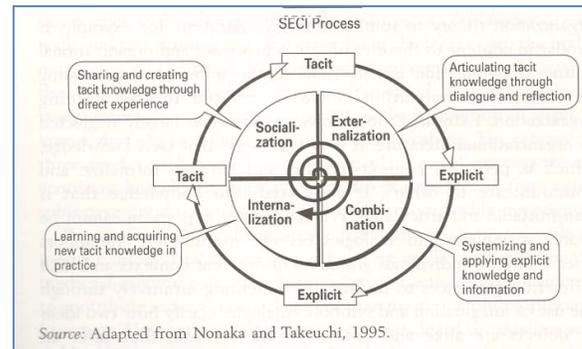
Figure1: Four model of conversion

Table4: Rubric Matrix of Acquisition and Conversion

	Very High	Very Low
Acquisition	• Members of organization make **full use of existing knowledge** in organization to acquire new knowledge • Organization **uses newest techniques** to acquire knowledge such as data mining (Data mining is the process of extracting patterns from data.) • Members in organization have **innovation** (as one aspect of acquisition), to create new knowledge from the application of existing knowledge • It is important for an organization to manage and identify **which kind of knowledge** whether the organization need(e.g. top managers look at outside environment and their need and identify what kind of knowledge organization need to produce for outside environment) • **Collaboration** take place at two levels within the organization: between individuals and between individuals and the organization's partners(it is a process of acquisition of knowledge) **Source:** Zhang, Wulamu, Gao, Shan (2008), Li Wei, (2008), Gold et al., (2001), Dezheng,Zhang et al., (2008)	• Knowledge workers and members will faced with problems from lack of knowledge distribution within organization • Members of organization don't use any techniques to acquire knowledge **OR** • maybe the techniques which are using are the oldest one • Innovation to generate new ideas is not supported by organization • Organization doesn't know even which kind of knowledge whether it needs • Collaboration doesn't happen within organization
Conversion	• Knowledge conversion must be **interaction between tacit and explicit knowledge AND** **Tacit knowledge and explicit knowledge** are not separate and also **complete each other**. They interchange to each other in the innovative activities of human beings • Two or more members in organization interact, and **tacit knowledge is expressed in a social way** and passed from human to human(tacit to tacit) • Members in organization **captures tacit knowledge by writing it** down or capturing it on computer (digitizing/codification) (tacit to explicit) • In organization, **Multiple sources of external knowledge are brought together** within a new context, like researching multiple sources, or when computers reference different data sources (explicit to explicit) • people **consumes explicit knowledge** by reading/ viewing/ hearing from the media it was externalized(explicit to tacit)	• Interaction between tacit and explicit very rarely happens within organization. Members don't follow order of spiral of knowledge conversion at all • Tacit to tacit doesn't happen because of not having extensive contact, trust and not sharing of knowledge • Organization has failure to exploit tacit knowledge **AND** • Tacit improperly explicate • Members of organization can't combine two resource of explicit knowledge in one • Members don't use any explicit knowledge **AND** • Members don't know after consuming explicit knowledge how to translate it to tacit

Source: Amrit Tiwana (1999), Nonaka (2004), Azyantie Noordin et al. (2006) and interview with lecturers of faculty of computer science and information system, UTM university

3.2.2 Application
Intangible assets derived from processes based on the application of knowledge (Application of knowledge means the actual use of knowledge) are the key determinants of valuation of organizations.

Table4: Rubric Matrix of Application

	Very High	Very High
Application	• For applying knowledge, organization must **integrate knowledge repositories** (e.g. codified and formulized content for storage in databases) (e.g. a recording of a manager's talk or lecturer's advices for writing papers in high-impact factor) • For applying knowledge, organization must be **interactive** (means to allow the integration and possible capture, analysis or even explication of tacit knowledge of the system's users) • Organization allow people to **learn** from **past decisions**, both good and bad, and **past knowledge** that can apply the lessons learned to complex choices and future decisions • Organization **chooses IT components** to apply knowledge (Search, retrieval, and storage tools to help organize and classify both formal and informal knowledge.)	• Organization misses all knowledge warehouses because don't try to integrate knowledge • Organization doesn't enable interaction among people and providing a basic channel for sharing tacit knowledge • Members don't know how to use past decisions, experience, successes, and failures which can help them to create and apply knowledge • IT components isn't used within the organization

Source: Amrit Tiwana (1999), Gold et al., (2001), Zhi-Ping Fan et al. (2009).

3.2.3 Protection

As mentioned several times in this paper, knowledge is the source of competitive advantages for organizations, so by securing knowledge decrease the risks of theft, misuse, and espionage and so on.

Table4: Rubric Matrix of Acquisition and Conversion

Protection	• Organization employs people who meet the highest standards in terms of **ethics, training, and knowledge** • Organizations **have training program** to teach an organizational members what is acceptable behavior in terms of using knowledge of organization • Organization **Develop teams** to monitor, check, and enforce security practices • Organization has procedures in place to **secure knowledge devices** and communication equipments. • Organization **secures and manages communication channels** effectively. • Organization **Monitors the movement of knowledge** within and especially around the organization • **Employees must be trained** and counseled on the dangers of sharing authentication schemes(password log in) with others and the risks to the organization • All members must be held **accountable for any breaches** to security that may result from their negligence in organization • **Organization upgrades and updates to security procedures** must occur in a proactive rather than a reactive manner	• There is no criteria in terms of ethic, training and knowledge for employing people • There is no strong training to secure knowledge for employees • There is no team to control security practices • procedures to secure knowledge appears so weak • Don't secure communication channels • Movement of knowledge through the organizations doesn't control and monitor • Members don't trained at all about dangers and risks that may happen for organization • Members are not accountable for their breaches • Upgrade and update of security don't happen on time at all

Source: Desouza and Vanapalli (2005), Gold et al., (2001), Thomas Finne (1996), Van Niekerk et al. (2009)

4.0 CONCLUSION

The proposed rubric makes evaluation of capabilities (seven attributes) more easy and precise. It is appropriate for all organizations especially for situations which don't have experts of in knowledge field.

The above rubric with the fuzzy method, used to evaluate the degree of KMC of organizations, is very useful in knowledge management initiatives and result will be more accurate. If the degree of KMC is too low according to the evaluation results, it has to be improved until acceptable status.

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