

# A Model of Organization Knowledge Management Maturity

Kittipong Tissayakorn, Fumio Akagi, and Yu Song

**Abstract**—Knowledge management entails formally managing knowledge resources in order to facilitate access and reuse of knowledge, typically by using advanced information technology. In this paper analyzes the organizational knowledge management and discusses knowledge management maturity aim and process. Then organizational knowledge management maturity model is established based on the research of some typical international project management maturity models. The study is intended to guide organizations to improve and optimize their knowledge management capability.

**Index Terms**—Knowledge management, maturity model, key elements, construction organizations.

## I. INTRODUCTION

In recent years, knowledge management has attracted considerable interest worldwide. A growing number of organizations have included knowledge management into their strategies. However, in the 20th century, the most valuable asset in the organization is the production equipment's; while in the 21st century, the most valuable assets will be knowledge workers within the organization and their productivity [1]. The need for managing diverse knowledge from multiple sources across organizational boundaries is real world problems which have great strategic significance for any organization [2]. This is because knowledge is widely considered as a strategic differentiator between firms and essential for creating and sustaining competitive advantage [3]-[5]. Knowledge management refers to identifying and leveraging the collective knowledge in an organization to help the organization compete [6], which is purported to increase innovativeness and responsiveness. It has become the fundamental framework of a successful business [7] and a critical source of competitive advantage [8]. Knowledge management impacts firm performance through its efficiency in developing the intellectual assets that are a source of competitive advantage [9]. Many organizations are now increasingly focusing on knowledge management, and specifically concentrating on the establishment of an appropriate environment of workplace for facilitating knowledge sharing.

Nevertheless, in many organizations, knowledge management is submerged in the absence of discipline and standardization. The reason is that the organizations are

incapable of managing knowledge management processes effectively, achieving real-time evaluation and improving it in a timely manner. Consequently, it is essentially necessary to measure the capability and level of knowledge management process, which is conducive to find methods to accelerate and promote the capability of knowledge management. Maturity model is the tool and methodology used by organizations to evaluate and improve the level of management. It contributes to the organization wanting to identify current management weakness and situation in the organization and define key practices that is indispensable for achieving the next maturity level and then developing and improving their management capability effectively.

Many scholars have analyzed and studied maturity model from different perspectives. However, how to apply the theory of maturity model in the knowledge management and construct knowledge management maturity model remain less. It is therefore valuable from both theoretical and practical perspectives to provide a clear definition for the knowledge management maturity model at both the conceptual and operational levels.

The remainder of this paper is organized as follows: in the next section, we briefly introduction knowledge management in organization. In Section III describes target management object and knowledge management maturity model and key element (Section IV). Finally, Section V concludes the paper with remarks on the future.

## II. KNOWLEDGE MANAGEMENT IN ORGANIZATION

### A. *Intended Knowledge Management in Organization*

It is crucial for the organization to have definite objects and aims through implementing knowledge management. Most knowledge management projects have one of six aims: 1) to make knowledge visible and show the role of knowledge in an organization, mainly through maps, yellow pages, and hyper-text tools; 2) to develop a knowledge-intensive culture by encouraging and aggregating behaviors such as knowledge sharing (as opposed to hoarding) and proactively seeking and offering knowledge [10]; 3) to make the enterprise act as intelligently as possible to secure its viability and overall success; 4) to otherwise realize the best value of its knowledge assets [11]; 5) to formulate a organization culture based on learning knowledge and using knowledge. 6) to make the organization adapt to the dynamic marketing environment.

### B. *Processed Knowledge Management in Organization*

Knowledge management is a growing field of interest in business today [12] which are largely regarded as a process

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involving various activities. All activities within an organization can be described in terms of processes [13]. From the point of practical sense, knowledge management is a set of distinct and well-defined approaches and processes [14]. Our organizational knowledge management process is grounded in the framework and the definition of knowledge and knowledge management [15]-[18]. As a result, the organizational knowledge management processes are as follows: 1) acquisition; 2) storage/retrieval; 3) transfer; 4) creation; 5) application, show in Fig. 1. However, these processes do not represent an integration set of activities, but an interconnected and inter-twined set of activities.

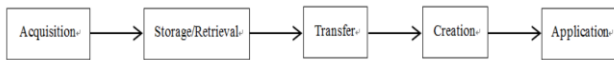


Fig. 1. Processed organization knowledge management in organization.

### 1) Acquisition

Knowledge is acquired from both outside organization and internal learning. There are numerous alternatives for this task that mainly fall into three categories [19]: 1) permanent or temporary engagement of experts; 2) gain access to documented knowledge; 3) participation in knowledge related events and processes. Knowledge acquisition is perceived as a fundamental and essential process of individual and organizational learning. A firm's knowledge acquisition capabilities give them a basis to develop competitive advantage [20]. A firm's long term dynamics are driven in large part by knowledge acquisition efforts [21]. Therefore, the organization must continually thrive to acquire new knowledge and integrate it into its existing knowledge base through different kinds of ways.

### 2) Storage/retrieval

It is essentially important to deepen the understanding of knowledge storage through explaining organizational memory which refers to a system of knowledge and skills that preserves and stores perceptions and experiences beyond the moment when they occur, so that they can be retrieved at a later time [22]. Organizational memory includes various forms of knowledge, such as written documents, important data and information stored in the organizational databases, tacit knowledge and valuable experience understood and acquired by individuals from practices.

### 3) Transfer

Knowledge transfer refers to systematic approaches to obtain, organize, restructure, warehouse or memorize, repackage for deployment, and distribute knowledge to points of action where it will be used to perform work. In the organization, knowledge transfer occurs at various levels: knowledge transfer between individuals; from individuals to groups, between groups, across groups. In the area of knowledge management, the prime aim of transferring knowledge is that knowledge recipients or groups are capable of absorbing knowledge.

### 4) Creation

Knowledge creation emphasizes organizational learning, basic and applied research and development, and motivation of employees to innovate and capture lessons learned to

obtain new and better knowledge that will lead to improved competitiveness. The essential question of knowledge creation is to establish an organization's ba defined as a common place or space for creating knowledge [23]. Therefore, it is crucial for the organization to form a harmonious atmosphere and environment in which the organization members can represent their potential and stimulate creativity.

### 5) Application

Knowledge application involves the use of data and information ordered by the end user, produced by the user's agency and most often applied with a view to improve management capability of the organization's internal operations and processes [24]. Knowledge that is acquired, storied or retrieved, transferred and then created should be reused wherever it is useful for organizations. The ultimate aims of the process are to realize the value of knowledge.

## III. TARGET MANAGEMENT OBJECT IN KNOWLEDGE MANAGEMENT

As candidates of something to be managed, various components in the knowledge management, the most commonly mentioned components are knowledge itself, the knowledge management process, knowledge workers, trust-based human relationship, information technologies, knowledge oriented Culture, flexible organizational structure, performance measures and rewards, strategy, leadership.

However, considering all of them as target management objects will be difficult since some of them are not only too board or vague but also too complex to manage. Therefore, we propose that strategy, the knowledge management processes, information technologies, human resource and organizational culture should be emphasized and managed as the determinants of knowledge management implementation effectiveness.

### A. Strategy

To be successful, a knowledge management strategy must do more than just outline high level goals such as become a knowledge enabled organization. We focus strongly on the needs analysis activities with staff, to drive a primarily bottom-up strategy, as follows:

- 1) Identify the key staff groups within the organization. These groups deliver the greatest business value, or are involved in the most important business activities.
- 2) Conduct comprehensive and holistic needs analysis activities with selected staff groups, to identify key needs and issues.
- 3) Supplement this research with input from senior management and organizational strategy documents, to determine an overall strategic focus.
- 4) Based on these findings, develop recommendations for addressing the issues and needs identified.
- 5) Implement a series of strategic and tactical initiatives, based on the recommendations. These will select suitable knowledge management techniques and approaches.

The main steps of strategy are Knowledge management strategy, knowledge management vision, knowledge

management goals

### B. Knowledge Management Process

Knowledge management processes can be thought of as a structured coordination for managing knowledge effectively. Knowledge management processes are broad processes that help in discovering, capturing, sharing, and applying knowledge. Knowledge discovery may be defined as the development of new tacit or explicit knowledge from data and information or from the synthesis of prior knowledge. Knowledge capture is the process of retrieving either explicit or tacit knowledge that resides within people, artifacts, or organizational entities. Knowledge sharing is the process through which explicit or tacit knowledge is communicated to other individuals. Knowledge application is the process through which some individuals utilize knowledge possessed by other individuals without actually acquiring, or learning, that knowledge.

### C. Information Technology

The IT infrastructure includes data processing, storage, communication technologies and systems, and management information. The effectiveness and efficiency of the IT infrastructure supporting the knowledge management implementation is an essential condition at the initial stage and across the knowledge management maturity stages. One possible way of systematically viewing the IT infrastructure is to consider the capabilities it provides in four aspects: reach, depth, richness, and aggregation. As organizations work to develop and improve their knowledge management system, it will also change from a closed system, such as a GroupWare, or workflow system, to an enterprise-wide knowledge sharing system with more intelligent technologies and, finally, to a global sharing system. Gottschalk suggests four stages of growth for knowledge management technology. Stage I is labeled “end-user-tool systems” or “person-to-technology,” as IT provides people with tools that improve personal efficiency. Examples are word processing, spreadsheets, and presentation software. Stage II is labeled “who-knows-what systems” or “person-to-person,” as people use IT to find other knowledge workers. Examples are yellow-page systems, and intranets. Stage III is labeled “what-they-know systems” or “person-to-information,” as IT provides people with access to information that is typically stored in documents. Examples include data mining, and search engines. Stage IV is labeled “how they think systems” or “person to system,” in which the system is intended to help solve a knowledge problem. Examples are expert systems, artificial intelligence, and business intelligence.

Hence, the IT trigger for knowledge management, the focus when applying IT, the dominating strategy for knowledge management technology, and the attitude towards IT change according to the knowledge management stages.

### D. Human Resource

Knowledge management and human resources management initiatives are focused on harnessing the available knowledge assets and to prevent knowledge from walking out of the door. Hence, there is a need for the integration between the knowledge management initiatives

and the human resource policies of the organization. Regard and motivation systems, training of personnel, cooperation of personnel, and protection of personnel, strengthening of personnel are the indicator of human resources.

### E. Organizational Culture

Culture incorporates a set of shared values, norms and beliefs, mainly implicit, that the members of an organization possess. Some people find a positive relationship between organizational culture (defined by collaboration, trust, and learning) and knowledge creation processes and conclude that shaping an organization’s cultural factors is key to the ability of the firm to manage knowledge effectively. Therefore, organizations should seek to promote and build the types of cultural values that support their specific knowledge management objectives.

The certain types of organizational values will lead to different types of knowledge management behavior and that these behaviors will lead to varying outcomes. Thus, “good” cultural values such as sharing, openness, and trust will lead to positive knowledge management behaviors, which will lead to innovation and efficiency, whereas “bad” values will lead to dysfunctional knowledge management behaviors and, hence, undesirable outcomes such as inefficiency.

Therefore, an organization’s culture should provide support and incentives as well as encourage knowledge-related activities by creating environments for knowledge exchange and accessibility.

## IV. KNOWLEDGE MANAGEMENT MATURITY MODEL AND KEY ELEMENT

### A. Organizational Knowledge Management Maturity Model

In this section, we develop and define the knowledge management maturity model that will be used to further measure and evaluate the capability of knowledge management in organizations. Our knowledge management maturity model is grounded in the research of capability maturity model [25] and project management maturity model [26]. The organizational knowledge management maturity model level is represented in a development model, which describes an organization’s degree of maturity regarding knowledge management, show in Fig. 2. Accordingly, after evaluation and analysis, an organization is ranked to one of the levels of maturity that we develop. The five levels of maturity are as follows;

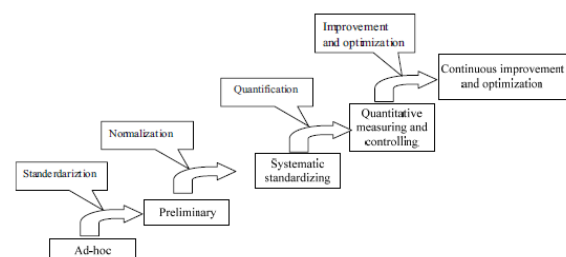


Fig. 2. Organizational knowledge management maturity model.

#### 1) Acquisition

At this stage, organization knowledge management is

essentially in a state of chaos. On one hand, the basic points and concepts of knowledge management has not been recognized and understood by all members of the organization; on the other hand, related trainings of knowledge management has not been conducted. The implementation of knowledge management process is in disorder and non-standard, which is always changing with business operations. There are not any unified and standard landmark documents methods reference cases that may guide and guarantee the organizational knowledge management.

2) Preliminary level

There is a basic understanding of knowledge management methods, concepts and specific knowledge management process for organizations in this level. Full implementation of knowledge management is generally recognized and accepted by all members inside the organization. Organization implementing knowledge management activities can achieve definite tasks, guaranteed measures and responsibility implementation. The organizations make full use of knowledge management and knowledge management process in their daily operation and business. As a result, the organization gradually formulates the ideas of documenting the experience perceived and acquired in knowledge management, which may be used for repeated applications.

3) Systematic standardizing level

At this level, organization has gradually formed knowledge management standards including standardization for knowledge management process, documentation and members who are involved in the process of knowledge management. Organizations that practice knowledge management in establishing strategy, new product development and innovation and creating a unique organization culture are more effective and mature. All members of the organization fully understand and support the enforcement of knowledge management and spontaneously form a work environment and organization atmosphere in knowledge management, which means that knowledge management, has played a crucial part in modeling organization culture and indicates that knowledge management of the organization has basically matured.

4) Quantitative measuring and controlling level

Knowledge management of this level of organization has become a strong guarantee. The organizations are capable of shaping and constructing a systematic evolution index for quantitatively measuring knowledge management performance through practice and experience gained in the process of implementing knowledge management. The organizations implement lean management with measuring by standards, controlling by measures and executing by guarantees. Moreover, a corresponding knowledge management database is established to analyze the possible problems that may occur and adopt preventive measures correspondingly. Knowledge management team can share different types of data analysis in order to work together as a unit.

5) Continuous improvement and optimization level

Continuous improvement refers to organizations can

improve the next execution process based on feedback information of the implementation, which identify that the organizations are optimizing execution steps of knowledge management. It is the highest level of knowledge management in the organization. The fundamental idea of knowledge management is treated as a code of conduct in any activity or business of the organization. Furthermore, the organization can dynamically improve and optimize all the process of knowledge management and periodically evaluate and examine knowledge management performance. As a result, the level of organizational knowledge management is increasingly mature or achieves excellence. Knowledge management has been the key practices in forming core competence of organizations, formulating strategy and shaping organization culture. The level of knowledge management of organization has been a positive cycle of continuously improving and optimizing.

B. Key Elements of Knowledge Management

According to general principle of maturity model, the knowledge management maturity model includes following elements. We establish the internal structure of knowledge management maturity model, show in Fig. 3

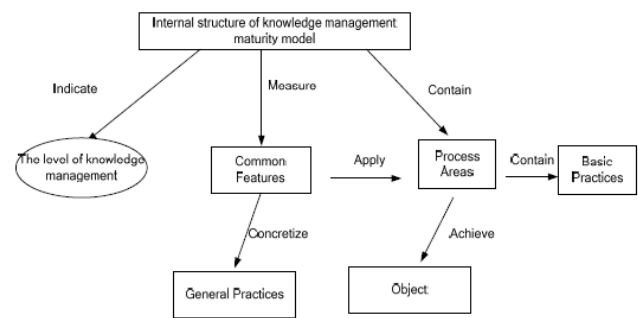


Fig. 3. Internal structure of knowledge management maturity model.

1) Process areas

Process areas refer to a group of definite processes of knowledge management. When the group interacts mutually, the organization is capable of realizing their specific targets. The process areas are consisted of several base practices which is the most basic process required for completing the specific objects. Each maturity level is characterized in terms of KPA (Key Process Areas) which is described by a set of characteristics. These characteristics specify the key practices that when collectively employed can help organizations accomplish the goals of the particular maturity level.

2) Capability levels

Capability levels are several steps identifying levels of knowledge management during the process of organizational knowledge management capability becoming mature. Generally, capability levels are defined by common features which indicate basic requirements of each level. Generic practices are usually summarized and refined from a number of concrete practices derived from the process of implementing knowledge management in the organizations. It is regarded as activities that should be completed in

knowledge management maturity model.

## V. CONCLUSION

In this paper, we mainly concentrate on applying the pro-found concept of maturity to construct organizational knowledge management maturity model which is positive to advance the degree of effectiveness and efficiency of organizational knowledge management process and give rise to continuous improvement of knowledge management capability.

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