

Full Length Research Paper

A novel sensemaking model of effective knowledge management within SMEs

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Many organizations that are adept in leveraging and capitalizing their knowledge resources have been convinced to obtain performance improvement and business success. But despite dedicated attempts to follow the prescribed knowledge management guides and success path, SMEs are still encountering uncertainties and face the threat of potential failure or unmet expected results, which are little known and seldom attended. So this paper, in consideration of the crucial role of SMEs in economic growth and industrial development of a country especially under today's increasingly turbulent global environment, attempts to propose a sense making based model for more effective decision making in the implementation of knowledge management within SMEs, which is supposed to demonstrate the proper ways in which SMEs can manage knowledge more strategically and can better design knowledge management building.

Key words: Knowledge management, sense making, decision making, knowledge creation, tacit knowledge.

INTRODUCTION

The world has been experiencing an era termed as the "knowledge age" or the "knowledge economy", in which knowledge flows are recognized as the most important elements in the economy. Then how to effectively manage knowledge to enhance competitive advantage has become one of the critical issues for all kinds of organizations. Although dedicated attempts to follow the prescribed knowledge management (KM) guides and success path, SMEs are still encountering uncertainties and face the threat of potential failure or unmet expected results, which are little known and seldom attended (Wong et al., 2005).

Nowadays, most KM research, addressing such perspectives as KM strategy, KM implementation, or performance based on KM etc., unconsciously assumes that the existing environment is ideal, which is much more suitable for the reality of large organizations (McCampbell et al., 1999; Apostolou and Mentzas, 2003; Kim et al., 2003; Handzic and Agahari, 2004). But SME, due to its specific characteristics "not a little big business" (Lim and Klobas, 2000; Wong and Aspinwall, 2004), needs to explore

its unique way to implement KM. But little is known about how SMEs fair in knowledge management (Bryson, 1997; Dalley and Hamilton, 2000; Shelton, 2001; Collinson and Quinn, 2002; Saarenketo et al., 2004).

Also from the practical perspectives, according to Ivy and Chee-Kwong (2008), most SMEs possess an awareness of KM for business competitiveness. But some of their management is in lack of adequately formulated plans to direct employees to apply knowledge to improve efficiency. Some suffer from financial constraints, thus leading to underinvestment in KM-related technology. Some confront the challenge of pushing approach, by just simply shifting the KM responsibility to the information technology and claiming department/colleagues to follow up, who often emphasize their technical specialization causing loss of management consideration to end users. Some encounter knowledge loss due to no strong intention to undertake close supervision and monitoring of how knowledge is being used or stored within the organizations. Normally, they think of change but hardly change.

Amongst staff, there exists strong fear with regard to job security, saying if they adopt more technology in their work process, management may consider substituting manpower with technology. They present minimum interest

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in KM, preferring management or seniors to provide guidance on the knowledge to be explored, the resources or contact persons needed, and new product or service ideas to be discussed. The so-called “experts” usually strongly believe in their experience and become less open to new perspectives or knowledge. They prefer the new employees or their apprentices to take on their ideas and instructions in a rigid manner. Also employees express their unwillingness to share knowledge as they do not feel or sense the benefits of doing so or if no adequate rewards are provided. For technology, many small firms do not trust new technology or they are lacking proper utilization of KM tools.

Shortly, SMEs’ ineffective decision making in terms of management support, culture, technology, infrastructure, measure, KM process control, results in poor KM implementation performance. Thus, in consideration of SMEs’ limited resources and conditions available, making sense in decision making appears more precious, especially under today’s increasingly turbulent global environment. Thus, this paper was aimed to propose a sense making based model for more effective decision making in the implementation of knowledge management within SMEs, which is supposed to demonstrate the proper ways in which SMEs can manage knowledge more strategically and can better design knowledge management building.

In the following sections, the study will firstly introduce a sense making process module to demonstrate how organizational members give meaning to the external information flows and evaluate the internal events and actions of the organization. Secondly, a four-level sense making module (intra-subjective, inter-subjective, inter-objective and extra-subjective) will be constructed integrating with the process of knowledge creation. Thirdly, in decision making module, a rational KM model is focused to bridge the gap between organizational objectives and individual’s constrained rationalities. And finally, by holistically managing the three areas, a dynamic sense making-based model for more effective implementation of knowledge management will be presented.

LITERATURE REVIEW

Theory of sensemaking

Sensemaking is the ability or attempt to make sense of an ambiguous situation. More exactly, it is the process of creating situational awareness and understanding in situations of high complexity or uncertainty in order to make decisions.

When referring to sensemaking, no discussion could be completed without consideration of Brenda Dervin’s sense-making methodology (Dervin, 1983). It assumed that there exist gaps between people, things, spaces, and times and people are making sense of their world all the time. It conceptualizes information as “that sense created

at a specific moment in time-space by one or more humans”. For more than 20 years, Dervin’s approach was developed focusing on better understanding the ways people make sense out of information under changing conditions by mandating methods of question framing, data collection, and analysis that can be used in conducting research. Although, rooted in the communication field has been highly influential in the field of information science, especially as it relates to the ways people seek, use and benefit from information.

Sensemaking was first induced into organization studies, to cognitively frame experienced situations as meaningful by creating shared awareness and understanding from different individuals’ perspectives and varied interests. Weick (1988, 1993, 1995, 2005) in particular has dealt with sensemaking at the organizational level, providing insight into factors that surface as organizations address either uncertain or ambiguous situations. Then, the application of sensemaking theory in organizations has been largely increased with understandings of organization evolved from rational systems to open systems, which recognizes organization’s openness to and communication with the environment and views organization as a looser rather than tighter system with emphasis on process rather than structure (Scott, 1987).

A sensemaking view of organizations considers sensemaking as a central activity in the construction and maintenance of organizations and their environments. According to Wiley (1988, 1994), organizations are operated with continuous interplay amongst interacting subjects, their inter-subjectivity or collective “we”, and generic subjectivity within the constraints of organizational culture. More precisely, organizations are described under four, mutually-interrelated levels of sensemaking framework: 1) The level of an individual who has thoughts, beliefs, feelings, desires, intentions, etc., that is called an intra-subjective level; 2) the level of social interaction at which actors create inter-subjective understandings; 3) the level of social structure where social reality characterized by generic subjectivity is formed and maintained; and 4) the level of organization culture or an extra-subjective level (Wiley, 1988). The four levels of sense-making are supposed to be understood in a dynamic way that one interrelates with another, whatever the kind or size of an organization and the situation it finds itself in, though not necessarily in the same way and with same importance or intensity.

Knowledge and knowledge management

Knowledge has been realized as assets including human skills, experience, know-how, best practices and databases, which could provide opportunities to lower cost, save design time and reduce the time to market. Knowledge management is a system or a managerial approach to collecting, processing, and organizing enterprise-specific knowledge assets for business functions and decisions.

The first era of KM exploration starting from the 1980s, was focused around knowledge. Sveiby (1992) introduced the elements of knowledge as an important asset for a company. Davenport and Prusak (1998) further elaborated the knowledge as a fluid mix of framed experience, values, contextual information and expert insight. Turban, McLean and Wetherbe (1999) also stated that knowledge consists of a data or information that has been organized and processed to convey understanding, experience, accumulated learning, and expertise as they apply to a current problem or activity.

In the second era of KM exploration, between the 1990s and 2000, researchers started to explore the KM components, elements, cycle, framework and processes of KM. Ruggles (1998) proposed eight main activities of KM cycle which includes generating new knowledge, accessing valuable knowledge from outside sources, using accessible knowledge in decision making, embedding knowledge in processes, products, and/or services, representing knowledge in documents, databases, and software, facilitating knowledge growth through culture and incentives, transferring existing knowledge into other parts of the organization, and measuring the values of knowledge assets and/or impact of KM. Hsinchun (2001) integrated another comprehensive KM framework which consists of four main perspectives: Consulting, content/information, technology foundation, and knowledge management system.

Finally, in the third era from the year 2000 onwards, researchers were more focused on the implementation strategy, methodology, challenges, status and effectiveness of KM implementation in an organization. Generically, they framed knowledge strategy in terms of knowledge exploration/creation versus exploitation/codification (Hansen et al., 1999) and the configuration of organizational and technological resources to support those orientations.

Since sensemaking is performed at each level by different entity, like by self at the intra-subjective level of an individual, by "we" at the inter-subjective level and by different upward reductions of self (Wiley, 1988) at other levels, the nature of knowledge is significantly different at each level. Also since knowledge at different levels represents different types of social reality that make up an organization, different nature of knowledge management are required to process accordingly. It is obvious that these four distinct levels of sensemaking theory of organizations dissected the nature of knowledge in organizations and deepened the understanding of the key processes of knowledge creation and transmission. But knowledge, knowledge creation and transmission only consist of a small part of the whole knowledge management systems let it alone the organizational theory. So the following part will integrate sensemaking theory into knowledge management implementation from three strategically complementary areas -environment, knowledge creation and decision making.

A SENSEMAKING BASED MODEL OF KM IMPLEMENTATION

The theory of management and organization proposes three distinct but complementary areas in which the use of information plays a strategic role in promoting an organization's capability to maintain and renew its creativity and competitiveness (Choo, 1996). Firstly, organizations thrive in a dynamic and uncertain world, so it needs to make sense of changes and developments in its external environment with the immediate goal of reaching a common understanding of what the organization is and what it is doing amongst the organization's members. Secondly, as the right role of management is to ensure the application and performance of knowledge (Drucker, 1993), organizations need to create, organize and process information in order to generate new knowledge which could then be applied to design new products and services, enhance existing offerings, and improve organizational processes. Thirdly, organizations search for and evaluate information in order to make important decisions. Although organizational decision making is a complex, messy process, there is no doubt that it is a vital part of organizational life.

Making sense of external changes (Module I)

To make sense of knowledge management, the organizational members should first make sense of what is currently happening in their organizational environments in order to share a meaningful interpretation that serves as a context for organizational activities. But when processing the information around them, they may probably lay on their own previous experience which would cause subjectively irrational basis for subsequent understanding and action. That is, the organizational members create their own subjective reality instead of unveiling some existing reality. So here, the study assumes the sensible information or event as the one that resembles something that has happened before so that the human subjectivity could to some extent be removed. Making sense of external changes passes through four sets of steps: Ecological change, enactment, selection and retention.

As shown in Figure 1, sensemaking begins when there is some change or difference in the organizational environment, resulting in disturbances or variations in the flows of experience affecting the organization's members. This ecological change requires the members to attempt to understand those differences and to determine the significance of these changes, which is called enactment. The result of this enactment is to generate equivocal raw data about environmental changes. In creating the enacted environment, they attend to isolate some portion of the changes, selectively bracket actions and texts, label them with nouns, and discover relationships. This

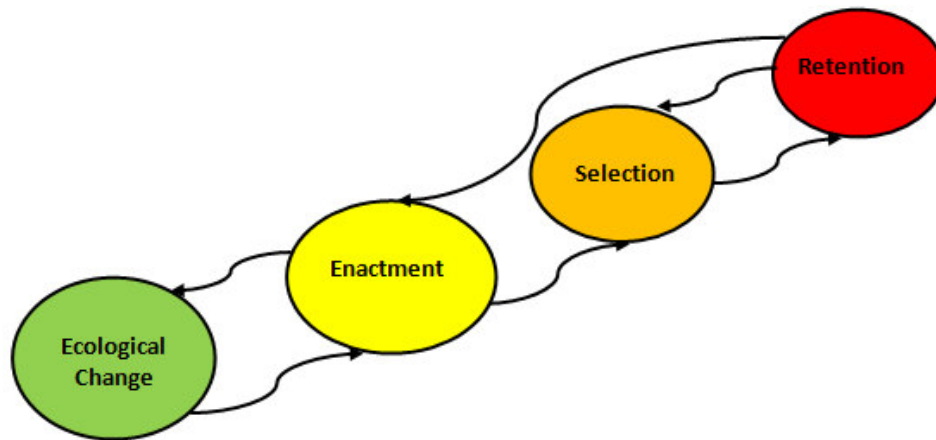


Figure 1. Sensemaking process of external changes.

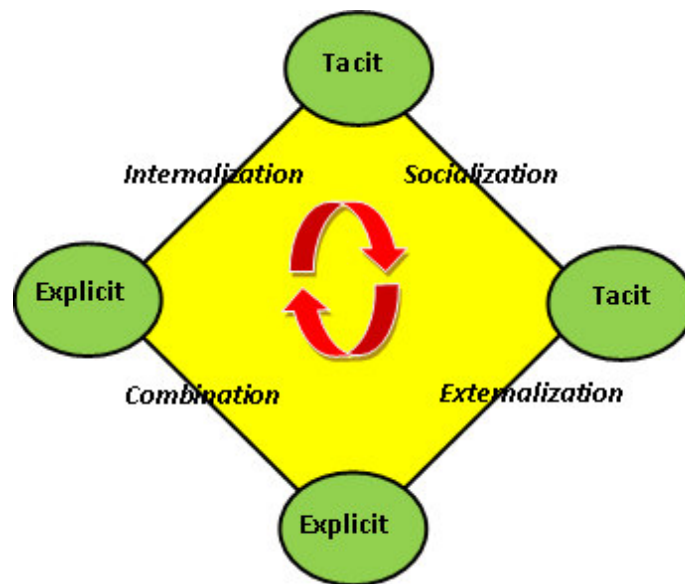


Figure 2. The dynamic process of knowledge creation.

selection involves the overlaying of various plausible relationship structures on the enacted raw data in an attempt to reach into the past to extract history and select a reasonable scheme of interpretation. Finally, this product of successful sensemaking should be retained for future use. Although the entire process operates to reduce equivocality, some equivocal features do and must remain if the organization is to have the flexibility to survive into a new and different future.

Making sense with knowledge creation (Module II)

As it is well-known, Nonaka and Takeuchi (1995) defined the tacit and explicit knowledge and modes of knowledge creation which was categorized as socialization (face-to-

face), internalization (explicit to tacit), externalization (tacit to explicit) and combination (explicit to explicit), as shown in Figure 2.

Actually, the four modes of knowledge conversion interact with each other in a continuous pattern. First, knowledge creation normally starts from individuals through improving their comprehension or skills in better doing their tasks. Then, this tacit know-how may be shared with others through socialization. But as long as the knowledge stays tacit, the organization is unable to exploit it further. Thus, externalization of tacit knowledge into explicit concepts is crucial, which often involves the creative use of a metaphor or analogy. Then, different types of explicit knowledge produced by different groups or units of an organization may be combined and reconfigured into new forms of explicit knowledge. Subsequently,

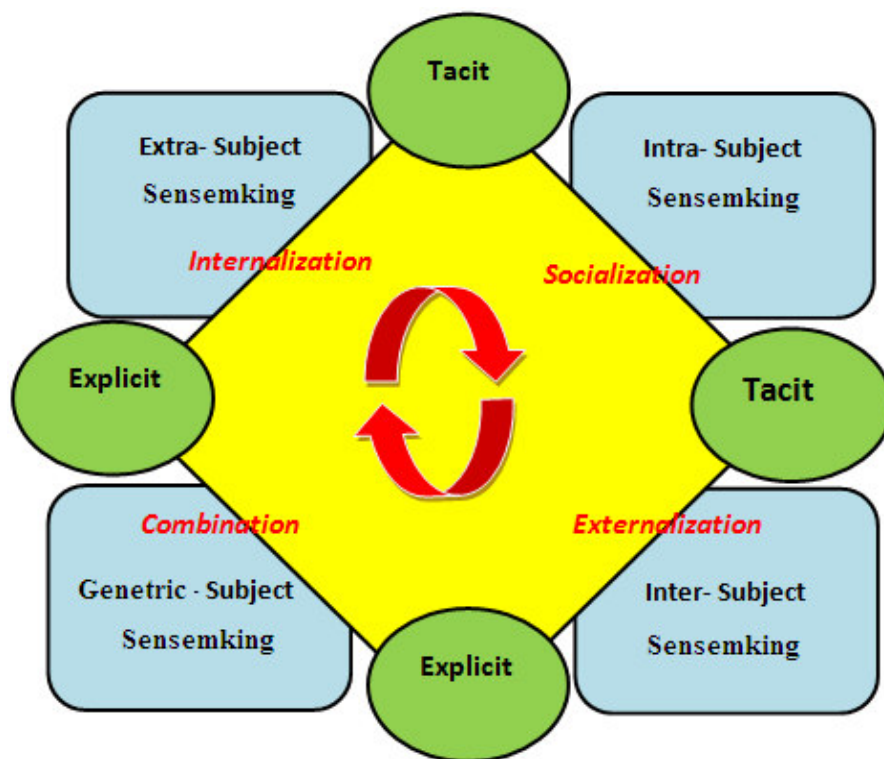


Figure 3. The dynamic sensemaking process in knowledge creation.

Subsequently, the new created explicit knowledge would have to be re-experienced and re-internalized as new individual tacit knowledge.

To put it from the integrated perspective of knowledge and sensemaking, this pattern indicates four levels of knowledge as well as four corresponding types of sensemaking. The dynamic sensemaking model with knowledge creation is shown in Figure 3 with detailed descriptions followed.

1. Tacit knowledge socialization can also be interpreted as an intra-subjective sensemaking process. Being involved in particular organizational practices, an individual uses his/her own values, beliefs, experiences and skills, interacting with others, to make sense of the events and situations, his/her own actions and actions by others, thus updating his/her personal knowledge, which is totally within self (Wiley, 1994). To note, his/her intra-subjective sensemaking is not an isolated, solitary process but one that draws from and is embedded in other sensemaking levels.

2. Externalization from tacit to explicit can also be called inter-subjective or collective sense making process, at which level 'the meaning is not within but between and among selves' (Wiley, 1994). Namely, individuals (actors) engage in social interaction, share their experiences and interpretations and thereby co-create shared, collective, inter-subjective meanings of events and situations, based on which they may take joint or coordinated actions. In

any social setting, this process is ongoing, having no beginning or ending, but may be more or less intensive and focused on specific issues.

3. Combination of explicit and explicit can also be regarded as generic-subjective sensemaking process which involves creation and maintenance of generic meanings shared by members of an organization. Typically such knowledge includes notions of organizational structure, resources, roles, policies, norms, rules and control mechanisms, patterns of activities or actions, and scripts or standard plots (Barley, 1986). The generic-subjective sensemaking emerges at the level of social structure resulting from a shift of 'inter-subjectivity to generic subjectivity' (Weick, 1995).

4. Internalization from explicit to tacit can also be viewed as extra-subjective sensemaking process referring to culture knowledge, that is, a stock of explicit, taken-for-granted convictions, beliefs, assumptions, values and experiences expressed in language, symbols, metaphors, and stories. As culture provides a reservoir of background knowledge, members of an organization can draw upon in order to make sense of a situation and create meanings at all other levels.

The application of sensemaking approach to knowledge creation helps to understand the nature of knowledge in organizations. Actually, knowledge is created and recreated by continuous and simultaneous interplay between all types of sensemaking: Intra-subjectivity of its members

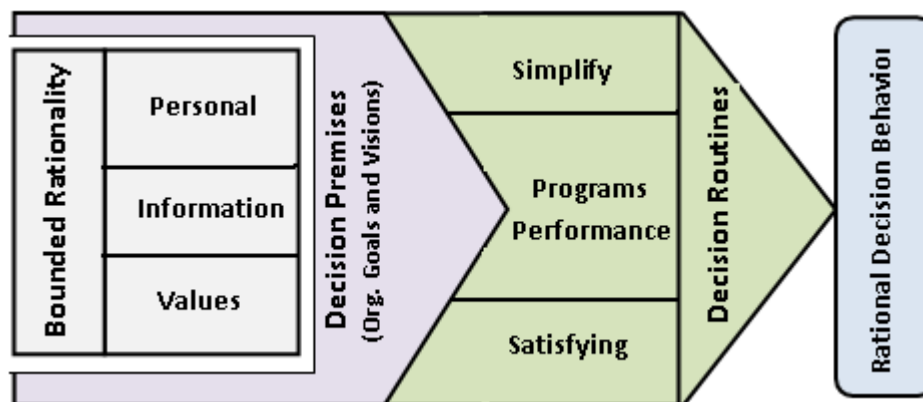


Figure 4. Sensemaking in (KM) decision making process.

and their inter-subjective sensemaking, that are continually emerging, mutually influencing and co-constituting each other; generic subjective sensemaking that tends to persist and resist changes; and extra-subjective (cultural) sensemaking that underpins and enables all other sensemaking processes. In particular the ongoing and dynamic recreation of intra- and inter-subjective meanings, on one hand and the maintenance of social order and generic meanings, on the other, constitute the key tensions in an organization. Thus, while it is important to distinct types of knowledge at specific sensemaking levels, it is equally even more important to investigate the impacts of one level on the other and tensions between them.

Making sense in KM decision making (Module III)

In terms of decision-making in organization, Simon (1957) suggested that it is constrained by the principle of bounded rationality. And for what constitute the bounds that limit rational decision making, Simon (1957) identified three categories: The individual is limited by his mental skills, habits, and reflexes; by the extent of knowledge and information possessed; and by values or conceptions of purpose which may diverge from organizational goals. To solve the first type of the bounds, Simon (1957) proposed that the organization influence its members' behaviors by creating or changing the organizational environment, or in other words by controlling the decision premises in which the individual's decision making takes place. And to solve the second and the third types of the bounds, Simon (1957) suggested decision routines.

Step1: Search for a satisfying alternative instead of optimal solution, which is motivated by the occurrence of a problem and concentrated near the symptoms or an old solution and reflects the training, experience and goals of the participants.

Step 2: Simplify the decision process in order to avoid uncertainty and reduce complexity. Take action repertoires for example. It uses performance programs to deal with recurrent situations. The key features are shown in Figure 4.

So specifically to make rational decision of knowledge management, the module can be enriched as illustrated. For decision premises, the knowledge management strategy should be closely aligned to the overall business strategy. A business strategy refers to a high-level, flexible plan, while a KM strategy is defined as a supply of a high-level plan of the organization with the knowledge resources that it needs to carry out its vision and goals. To ensure the success of the business objectives, any subsequent business development within the organization should be aimed at furthering the goals of the organization. That is to say, a knowledge management implementation strategy shall be a function of the business strategy, or else the KM initiative will fail to accomplish goals that are tangible to the organization.

And for decision routines, knowledge management systems can be applied to meet both the satisfactory and simplicity requirements to support decision making. In formal words, knowledge management systems refer to the use of modern information technologies (for example the Internet, intranets, extranets, LotusNotes, software filters, agents, data warehouses) to systematize, enhance and expedite knowledge management (Alavi and Leidner, 2001). It is intended to help an organization cope with turnover, rapid change, and downsizing by making the expertise of the organization's human capital widely accessible. Take artificial intelligence (AI) methods and tools for example.

Generally, it assists in identifying expertise, eliciting knowledge automatically and semi-automatically, interfacing through natural language processing, and intelligent search through intelligent agents. Specifically, AI methods, notably expert systems, neural networks, fuzzy

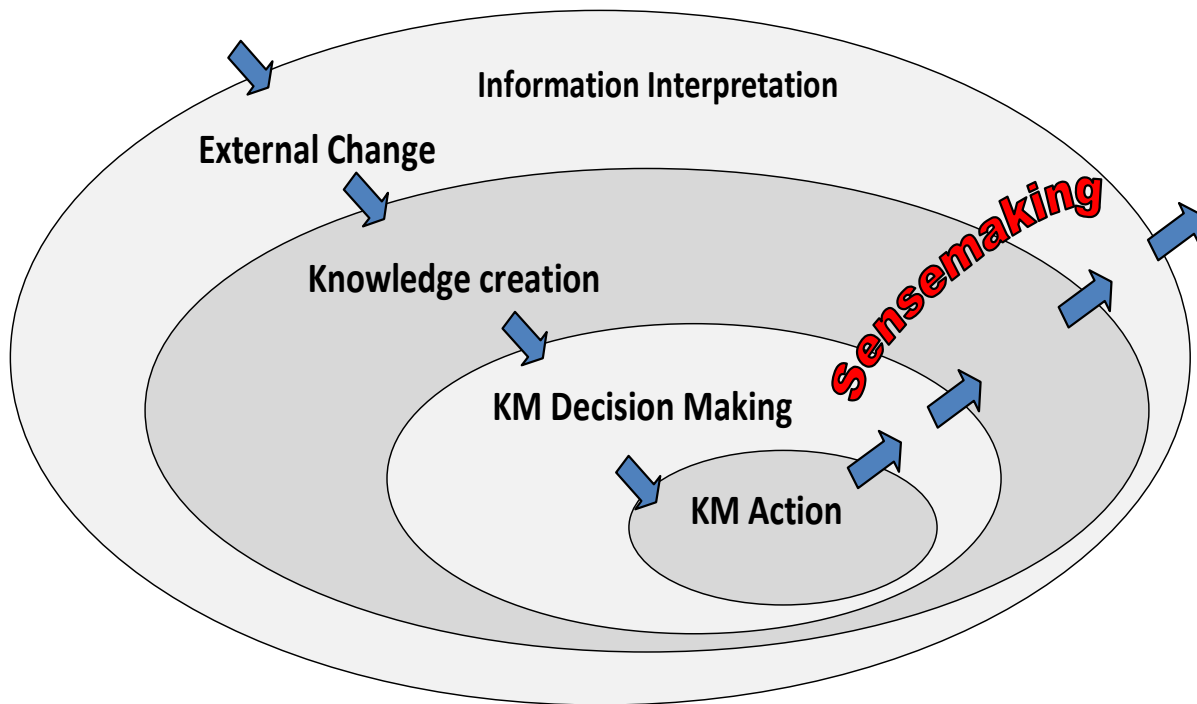


Figure 5. A dynamic sensemaking-based knowledge management model.

logic, and intelligent agents, are used in knowledge management systems to do the following:

1. Assist in and enhance searching knowledge (for example intelligent agents in Web searches).
2. Help establish knowledge profiles of individuals and groups.
3. Help determine the relative importance of knowledge when it is contributed to and accessed from the knowledge repository.
4. Scan e-mail, documents, and databases to perform knowledge discovery, determine meaningful relationships, glean knowledge, or induce rules for expert systems.
5. Identify patterns in data (usually through neural networks).
6. Forecast future results using existing knowledge.
7. Provide advice directly from knowledge by using neural networks or expert systems.
8. Provide a natural language or voice command-driven user interface for a knowledge management system.

Normally, All methods are based on optimal principle, that is, to produce optimal options according to its own program design and accessible resources to help you make satisfactory choice. And all the functions they can offer are originated to felicitate the process of your decision making. In this way, the KM decision-making model remains a rational one. First, KM strategies are set aligned to the overall organizational goals and objectives. Then in pursuit of these objectives, KM systems are

employed, followed by evaluation of the outcomes according to the objectives and preferences.

A DYNAMIC SENSEMAKING-BASED KNOWLEDGE MANAGEMENT MODEL

Within the framework of knowledge management, the three modules —making sense of external changes, making sense with knowledge creation and making sense in KM decision making—are actually interact with each other by supplying different state of information. Figure 5 visualizes the three modules by representing three ellipses of organizational information behaviors, with each inner layer building upon the information outputs of the outer layer. And information flows from the external environment and is progressively absorbed and utilized to enable organizational action.

First, the changing information about the organization's environment is recognized and its meaning is socially constructed. During sensemaking, organizational members choose what information is significant and should be paid attention to; they form possible explanations from past experience, exchange and discuss their opinions in order to reach a common interpretation which will guide the next information conversion or knowledge creation. During knowledge creation, members share their personal knowledge through meeting and training as well as other formal or informal channels. When there is sufficient understanding and knowledge, the organization is supposed to select or design, and evaluate a proper

knowledge management strategy that is closely aligned to the overall organizational visions and goals. And during this KM decision making process, some suitable knowledge management systems could be employed so as to preserve the rational information processing way. The resulting organizational KM action produces new streams of experience for the organization to adapt to and also changes the environment, thus beginning another cycle. All three sensemaking based modules are dynamic information flow processes, subject to interruptions and iterations.

CONCLUSIONS AND FURTHER RESEARCH

How to refresh innovation, retain competitiveness and keep pace with endless changes is an important question for any SMEs. While, knowledge management is considered particularly interesting and critical as its potential to advance processes, improve utilization of other resources and increase performance. SMEs are therefore, vitally motivated to seek for more productivity of their knowledge resources and more effective knowledge management to sustain competitive advantage. Hence, this paper proposed the dynamic sensemaking model of knowledge management to assist both researchers and practitioners to deepen their understanding of knowledge and knowledge management in organizations.

The dynamic sensemaking-based knowledge management model deconstructs complex KM phenomena by focusing on different sensemaking processes in the three strategically complementary areas of an organization: Environment, knowledge creation and decision making. Through sensemaking, organizational members give meaning to the external information flows and evaluate the internal events and actions of the organization.

During knowledge creation, corresponding to levels of sensemaking (intra-subjective, inter-subjective, inter-objective and extra-subjective), distinct types of knowledge (individual, interpersonal, organizational and cultural) in organizations are identified and described. Finally, in KM decision making, a rational model is focused to bridge the gap between organizational objectives and individual's constrained rationalities through the utilization of KMS.

Further application of the sensemaking theory into knowledge management can be in several directions. For instance, more empirical studies are needed to apply, expand and refine the model and to learn from its application. Also the sensemaking model of knowledge management can also be applied to examine the effectiveness of KMS to assist organizations to increase their capacity to manage and productively deploy knowledge resources.

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