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Yuh Law
National University of Singapore

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Exploring The Strategic Roles of Enterprise Modelling 
In Knowledge Management Functions

David Yuh Foong Law, National University of Singapore, fbalawyf@leonis.nus.edu.sg

Introduction

With the dawn of the knowledge era, industries and organisations recognise the value of corporate know-how and the strategic purpose of harnessing intellectual resources for business competitive advantage. As the world moves rapidly into a global knowledge-based economy, these organisations are transforming themselves through various means (such as knowledge management, business and process reengineering, quality management practices, etc) in order to better equipped themselves for knowledge-intensive business capabilities. The knowledge management (KM) paradigm has evolved which promises to empower organisations with the necessary tools and mechanisms to handle knowledge effectively. KM is poised to serve as a key driver and strategic management infrastructure for knowledge-based organisations to tap human and intellectual resources effectively, as well as to develop and sustain knowledge-intensive activities. However despite the evolution and emergence of a myriad of tools, techniques and management strategies, there appears to have no deeper insights on how these technologies can facilitate the management and utilisation of knowledge in organisations and a clearer view of the relationships and roles among several KM components. Thus one of the main purpose of this research is to identify missing links, fresh research and application perspectives which, hopefully, provides common working ground and unites KM researchers and practitioners.

Related Concepts and Background

Knowledge. The concept of knowledge can be explored along various dimensions and perspectives. According to Awad (1996), knowledge can be classified in various ways according to its nature and form, its source, the way it is used, and its purpose and relevance. Knowledge is understanding gained through experience or study. It is “know-how” or a familiarity with the way to do something that enables a person to perform a task. Knowledge may also be an accumulation of facts, procedural rules, or heuristics. From a knowledge engineering perspective, knowledge can be classified in several ways: shallow and deep knowledge; knowledge as know-how; common sense as knowledge; procedural, declarative, semantic, or episodic. Foray and Lundvall (1996) proposes four different types of knowledge based on their contexts and usage: know-what; know-why; know-how; and know-who.

Knowledge Management. The field of KM is a fast emerging interdisciplinary area of research and practice. KM is the formalisation of and access to experience, knowledge, and expertise that create new capabilities, enable superior performance, encourage innovation, and enhance customer value (Beckman 1997). The key objectives of KM can be summarised: firstly to make the enterprise act as intelligently as possible to secure its viability and overall success, and secondly, to otherwise realise the best value of its knowledge assets (Wiig 1997a). In essence, KM involves the creation of the environment and opportunities to enhance the potential for co-ordination and synergism between networks and pools of knowledge. Beckman (1997) proposes an eight-stage process for KM: Identify, Capture, Select, Store, Share, Apply, Create and Sell. Alongside these KM processes which guide and drive the construction of corporate memory repositories, a whole spectrum of advanced information technologies and techniques may be used for supporting the activities in a KM cycle (Wiig et al. 1997). KM can be examined at different levels and explored along a wide range of dimensions. This reveals the diversity and complexity of KM in research and practice, with converging contributions from various disciplines and perspectives such as organisation and management (Harvard 1998), economy and policy-making (OECD 1996), and advanced information technologies (AAAI 1997; Borghoff and Pareschi eds. 1998; Shariq 1998; Wiig 1997b).

Enterprise Modelling. In general, an enterprise can be considered to imply the functioning of the whole or part of a business, government, military, or educational organisation. An enterprise model is a multi-level logical and holistic representation of the enterprise which can be flexible and distributed throughout the organisation, serving as a standard point of reference for communication within the enterprise (Heng et al 1998). The goal of an enterprise modelling (EM) approach is not to model the entire enterprise in all of its details, although this might be theoretically possible at various levels of abstraction. Rather, it seeks to model a part of an organisation which needs to be represented, whose size and scope is defined by the business users. Such a model represents a perception of an enterprise which may comprise of several sub-models including (but not limited to) process models, data models, resource models and organisation models (Vernadat 1996). An enterprise model is used as a semantic unification mechanism, or knowledge-sharing mechanism, built by applying
principles and tools of a given EM method. Semantic concept definitions in the model can be expressed in the form of ontologies, i.e., using a neutral knowledge representation format (Neches et al. 1991). A range of EM research perspectives and approaches, currently pursued, especially in the use of ontologies for knowledge sharing, has been surveyed (Fox and Gruninger 1998; O’Leary 1998).

Research Context and Objectives

Current situation. KM research and practice are still in their infancy stages, let alone the transfer and application of research results to industry. There are current difficulties and challenges in KM. To begin with, there seem to be a general lack of initiatives and specifications to guide the institutionalisation of KM in businesses and industries. Practitioners may not be clear in the definition and understanding of the roles and applications of KM in industry, especially in the contexts of existing business practices and technologies; the dynamic nature of contemporary business, technologies and competition; and how KM relates to or synergise with existing organisational practices, and new technology development and diffusion in organisations and industries. In implementing KM, there is no clear or standard guidelines to address the general lack of understanding of how we manage knowledge, and manage related processes and activities that act on this resource. Common but unanswered queries include: what is regarded “knowledge”; what constitutes useful knowledge; whether there is a need for KM (perhaps for particular industries or business environments which are relatively more knowledge-intensive in nature); how do we capture it, measure it; when do we capture it; how do we match and apply appropriate types of KM activities to business needs; and how do we vary the degrees of intensity of these activities depending on the requirements and situation. (eg. when to adopt formal, semi-formal or informal knowledge representation structures; or to determine the appropriate level of sophistication of technologies to apply etc; or which KM application framework to adopt.

Objectives. This research aims to explore the roles of EM in organisations. Both organisational and technological issues will be examined in the context of the basic KM problems mentioned earlier. The objectives can be summarised as follows:

- To define clearly the concept of knowledge and what entities it comprises.
- To expand the definition and scope of EM for modelling knowledge entities, and to develop frameworks illustrating the roles and uses of EM in the context of KM-related functions and processes.
- To investigate the roles of EM as a knowledge infrastructure and platform for:
  - reconciling various KM methodologies, practices and systems models together
  - facilitating the expression, contribution and conversion of tacit knowledge to explicit forms for the creation, sharing and utilisation of corporate knowledge.
- To explore implementation issues, approaches and strategies; how KM can build upon and be incorporated with current existing practice and approaches in organisations through an EM platform.

EM will be investigated in the context of existing KM frameworks as illustrated in figures 1 to 3, developed by Nonaka and Takeuchi (1995), Beckman (1997), and Borghoff and Pareschi (1998) respectively. New EM-centred frameworks will be constructed which would hopefully address the difficult questions in KM and illustrate the strategic roles played by enterprise models.

![Diagram of Knowledge Conversion, Creation and Sharing](image1)

**Figure 1.** Knowledge conversion, creation and sharing (adapted from Nonaka and Takeuchi 1995)

![Diagram of Eight-Stage Process for KM](image2)

**Figure 2.** An eight-stage process for KM (adapted from Beckman 1997)
The resultant EM-centred frameworks and models to be derived in this research, drawing results from the three frameworks above, will guide organisations who wish to incorporate KM concepts into their strategic visions and planning, and embed KM in their business operations. The results will hopefully assist organisations in gaining better insights into the nature of knowledge work, the needs and requirements associated with its creation, sharing, and utilisation; about managing knowledge and the processes that act on it; and enhancing the capability to map technologies and methodologies to support KM functions.

Validation criteria. The results from this research may be validated in terms of the usefulness of a more explicit form of knowledge representation; the effectiveness of enterprise models in alleviating the basic problems in KM; the effectiveness of the models in enhancing KM functions and activities; and the value of such models as corporate knowledge infrastructures in establishing semantic relationships and connectivity.

Research Methodology

Due to the complexity of the field of KM and the infancy stage of its research and practice, a combination of research approaches and data collection techniques is proposed for this study. The research can be broadly categorised into four phases. In phase one, a broad-based qualitative survey approach is adopted to explore the state of KM awareness, practice and the perceptions of KM-related issues in industry. This will be carried out using the focus group study methodology (Morgan 1988). Phase two will involve the theoretical development of new frameworks and models focussing on the inter-play between EM and KM related functions. Extensive literature review from an inter-disciplinary perspective will be the initial approach for theory development. Results from phase one will be used for verifying the new frameworks and possibly for the grounding (Strauss and Corbin 1998) and refining of these frameworks. In phase three, some case studies (Yin 1994) on selected organisations will be carried out to explore new insights on the relationships between EM and KM. Phase four will involve the further grounding of new frameworks and theories based on the rich qualitative data collected from the case studies in phase three. Data collected from the focus group and case studies will be constantly used to validate the frameworks based on the set of criteria listed in the earlier section.

Preliminary Results and Conclusion

Phase one has been carried out through a series of focus group studies on CIOs and senior IS executives from a total of 18 large organisations based in Singapore. The results reveal a healthy state of KM awareness and initial efforts undertaken by most of these organisations, in the areas of KM concepts understanding, KM facilitators and inhibitors, mechanisms, technologies, roles and responsibilities. The study also reveals the lack and the need for a more explicit form of knowledge structures; the difficulties faced in encouraging and enhancing the knowledge sharing and creation processes in organisations; and the conversion of knowledge from tacit to explicit forms. This thesis hopes to identify missing links among related concepts and practices, and highlight the strategic roles of EM in KM, in order to overcome current limitations and problems in KM research, adoption and institutionalisation in organisations.

References are available from the author and at http://www.fba.nus.edu.sg/cmit/people/amcis99DC.html