Chapter 7
A Simulation System for Evaluating Knowledge Management System (KMS) Implementation Strategies in Small to Mid-Size Enterprises (SME)

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ABSTRACT
Companies create and use information and knowledge every day. The problem all companies have is figuring out how to efficiently discover that knowledge, capture it, share it, and use it to gain competitive advantage in the marketplace. This chapter describes a simulation model designed to provide small to mid-sized enterprises (SME) with a means to understand the impact of barriers and value accelerators on the flow of organizational information. The simulation model reports the throughput of information (number of information packets received per day) and its timeliness (average duration until packet arrival) and provides for sensitivity analysis of the parameters describing a strategy. Comparisons among model instantiations allow an organization to determine the appropriate strategy for current and future KMS efforts.

INTRODUCTION
Corporations are faced with tradeoffs every day in the process of deciding where best to invest their capital. Information System (IS) departments serve a critical role in advising the company on the best means to use IS and Information Technology (IT) to achieve its strategies while limiting capital, time and risks. A Knowledge Management System (KMS) is one IS solution that may be considered important to a company’s strategy. Implementing a KMS is generally a large, complex, and costly undertaking, although it may be approached step-wise. This raises the question of just what is the
correct sequence of KM Infrastructure, methods, and processes to implement. There is little research that has looked into strategies related to the sequence of systems and processes for knowledge processing (Becerra-Fernandez, 2001; Chalmeta & Grangel, 2008; Choi, Poon, & Davis, 2008). However, it is clear a KM strategy is needed to minimize risks and uncertainties with budget and to encourage acceptance (M. Jennex & Olfman, 2003).

Key factors that influence the acceptance of a KMS in a SME have been identified in the literature: management leadership and support, culture, information technology, strategy and purpose, measurement, and organizational infrastructure (Wong & Aspinwall, 2005). Although no study appears to have looked at the differential ranking of critical success factors based on the number of company employees, it may be safe to assume that some factors are. In particular, any factors associated with the creation, input, and linking of knowledge in the KMS are likely to be influenced by the number of personnel available to create, input and link that new knowledge. (Becerra-Fernandez, González, & Sabherwal, 2004) indicate that organizational size has a direct influence on various KM processes. This company size factor provides a strong reason for researching Small to Midsize Enterprises (SME) organizations since they exist at the point where the knowledge flows and processes are likely to be in transition.

SMEs are a critical part of the U.S. economy, accounting for 96 percent of all companies in the U.S. (Moss, Ashford, & Shani, 2003) and approximately 75 percent of new employment (SBA, 2001). A SME, with less capitalization than large companies, may face considerable risk in taking on a large IS project such as the implementation of a KMS. This research will strive to provide information that may be valuable to those SMEs facing a decision on whether to move forward with implementing a KMS. Knowledge of key success factors, especially quantifiable ones, may greatly improve their ability to make informed decisions on whether to move forward with a KMS project. However, quantifiable factors alone do not provide enough information for sound decision making. Accounting for the interactions of those factors and how they operate in a specific entity can provide a much stronger foundation for effective decisions.

A SME’s organizational knowledge is limited relative to that of larger organizations. When an employee leaves, they potentially leave with a relatively larger share of the organizational knowledge. How large that share is, would be influenced by the number of employees, the degree of previous knowledge socialization and the cognitive capabilities of fellow employees. Given this potential large loss of knowledge, it should be an imminent concern of SMEs to find a means to capture and store that knowledge. Implementing appropriate KMS strategies will provide for such capability. There are other advantages that a SME can realize from an effective KMS: reduction of repetitive solutions to the same problem, reduction of redundancy in knowledge based activities, knowledge made available quickly and easily, and an increase employee satisfaction by enabling greater personal development and empowerment. The ultimate advantage, however, is to obtain a strategic advantage over competitors (Knapp, 1998). Knowledge-based resources may be essential to providing a sustainable competitive advantage because of the difficulty competitors have in duplicating it (McEvily & Chakravarthy, 2002).

There are two categories of knowledge that IT systems must support in some fashion. Explicit knowledge, is generally in a recorded form, and can be read, viewed, distributed, stored and manipulated in many ways for advantage (e.g., knowledge base, data warehouses, DSS, portals, etc). The second form of knowledge, tacit knowledge, encompasses perspectives, know-how, expertise and context-specific skills and is not easily put in writing (Nonaka & Takeuchi, 1995; Polanyi, 1962). Therefore, it requires entirely different systems to assist in its creation, stor-