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The role of social and intellectual capital in achieving competitive advantage through enterprise resource planning (ERP) systems

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Abstract

Enterprise resource planning (ERP) software merges a firm's data, information flows and business processes into a single package. Vendors argue that ERP provides an extremely useful strategic resource to enhance competitiveness and make it possible for a firm to leverage its other resources more effectively and efficiently. In addition, they allege that ERP encourages a system-wide perspective that is a basis for collaboration and a systems orientation. However, an examination of ERP systems using criteria established in research on resource-based views of the firm and chaos/complexity theory indicates that these claims are overstated. Observation suggests that even if ERP is necessary to coordinate complicated, multifaceted operations, it is far from sufficient to promote a strong competitive position over the long term. Moreover, ERP systems fit best within mechanistic, clockwork organizations dominated by routine, highly programmed technologies and operations, yet it is the non-routine learning and change processes found in complex, self-organizing systems that enable firms to create distinctive competitive advantages from ERP outputs. ERP makes possible deep changes in relationships, culture, and behaviors that can be crucial sources of advantage in the knowledge economy, but the structures and cultures most able to achieve this level of change are a poor fit with ERP requirements. To reconcile this paradox, we propose a dual-core, loosely coupled

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organization that views ERP as an enabling technology to build and augment social and intellectual capital, rather than as an information technology (IT) solution for organizational inefficiencies. Propositions for using ERP as a foundation for social and intellectual capital formation are introduced. Implications for research and practice are discussed.

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1. Introduction

Recent chronicles of ERP implementation efforts across a variety of industries suggest that few firms have assessed the long-term strategic and organizational consequences of resolving operational concerns by installing ERP systems (Bingi et al., 1999; Davenport, 1998, 2000; Martin, 1998; Schneider, 1999). ERP generally requires a firm to modify its business practices to conform to software mandates. This, in turn, changes patterns of interaction and often the culture of a firm. If, as some have argued (e.g., Kogut and Zander, 1992, 1996; Conner and Prahalad, 1996), a firm's information system shapes its processes, culture and social system, then ERP implementation has significant implications that go far beyond operational efficiency. Moreover, since competitive advantage requires asymmetric distinctiveness across firms (Porter, 1996), if ERP achieves operating effectiveness by using a common IT solution across an industry, long-term competitiveness may be jeopardized by conventional ERP implementation.

The path that led to this situation is not difficult to diagnose. Manufacturing firms face mounting pressures to reduce costs and simultaneously improve market agility and increase product variety (Ghoshal, 1987). Service firms are expected to provide personalized responsiveness and seamless integration across all aspects of the delivery system (Schneider and Bowen, 1995). Chemical plants, paper mills and utility companies must reduce costs and tie their production directly to the fluctuating needs of major customers. Public enterprises such as city governments are expected to provide high-value, cost-effective solutions to contradictory needs among diverse constituencies (Davenport, 2000). Everywhere constant improvements in operational effectiveness are necessary to achieve superior performance (Porter, 1996).

A growing number of firms try to resolve these challenges by implementing enterprise resource planning (ERP). This technology reshapes a firm's information processing, workflow, design and interpersonal interactions in fundamental ways. ERP applications affect everything a firm does. These integrated software packages provide real-time links across all of a firm's activities from order capture to accounting to procurement to material resource planning to production scheduling to human resource management to after-sales service. The functionality is so broad that a company typically replaces all of its legacy systems (autonomous software designed for specific functional areas) with a consolidated, integrated software system.

A crucial question, then, is what can be done to ensure that ERP (or any widespread IT solution) enhances a firm's long-term competitive position, rather than improves operations at the expense of long-term strategic distinctiveness. This paper examines the strategic and organizational implications of using ERP technology to improve operating

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