Chapter 22
Enterprise Information Systems:
Two Case Studies

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ABSTRACT

Enterprise Information Systems (EIS) provide a platform that enables small organizations and distant collections of organizations to better integrate and coordinate their operations. We provide a theory of organizations and review two case studies beginning to use EIS-type architectures that form common information infrastructures to be more responsive, flexible and agile first for a system of medical organizations and second for a small college. The system of organizations is a distributed collection of military medical department research centers (MDRC) whose mission is to train physicians how to conduct and publish research; and the small college is providing a liberal arts education (Future College). Both MDRC and Future College (pseudonyms) are reorganizing their operations. We review theory for our approach, the two case studies, field evidence, computational models, and future prospects.

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INTRODUCTION

Enterprise Information Systems (EIS) attempt to reduce the fragmentation and uncertainty in the information gathered from an organization on its internal and external interactions among agents, where agents are individuals, machines, or other organizations. Many social psychological forces oppose standardization. At a fundamental level, whether for individual agents, groups or organizations, bistable perceptions require uncertainty in the interaction. As one agent or collective acts while its partner(s) observe, uncertainty exists for both action and observation behaviors. An interaction occurs when these two behaviors are interdependent during an interaction, entangling the two agents or collections of agents together. Entanglement produces two effects: the conservation of information (COI) and mutual or bistable changes.

Interactions between action and observation under uncertainty introduce illusions into connections between worldviews and reality (Kuhn, 1970), making management and research both struggle to understand the information derived from the interactions in an enterprise. We attribute these struggles to managers and scientists embedded in the social fabric (Axsom & Lawless, 1992), the lack of a measurement theory of interdependence, and the difficulty of testing interdependence in the laboratory. In addition to our two case studies, we include field research with observations of citizen organizations advising the Department of Energy (DOE) on its environmental cleanup; laboratory simulations of DOE field results; stock market data; and computational modeling (coupled differential equations, control theory, AI, Gaussian distributions, uncertainty models, Fourier transform pairs, continuous and discrete wavelets). Results from our laboratory experiments and stock market data agree with our theory (e.g., Lawless et al., 2008a), but many questions remain. Our objective is to incorporate computational interdependent uncertainty into providing information that can be used autonomously and online with EIS metrics to better manage organizations entangled internally with their personnel and externally with other organizations.

Four Objectives for the Two Case Studies

In general, in the following four objectives for the EIS system used in the two Case Studies, we address document and content management, website management and maintenance, customer relationship management, financial costs, internal and external communication processes, and training. However, both of our case studies are just beginning to implement their EIS systems; thus, objectives 2-4 are more for future rather than immediate objectives.

- As our primary focus, we introduce and discuss the challenges and problems associated with the differing social, organizational and technological perspectives. This includes the implications for the organization and its members for the new technologies. We discuss the social aspects by focusing on the resistance to change and the levels of trust and confidence in the new system.
- We discuss the importance of an EIS to small and medium enterprises and the technology functionality used to integrate information and administer the enterprises by generating more reliable and relevant operational information. This first objective entails the design, execution and impact of a new system in both case studies, with a particular focus on the impact of the EIS system on the functional areas of the organization (new units that are included; changes in employment numbers, employee reassignments, etc.).
- We present the practical solutions used in the two case studies to produce tailor-made