Chapter 2.13
Integrating Knowledge Management with the Systems Analysis Process

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INTRODUCTION

Information systems research has clearly recognized that knowledge management systems (KMSs) have different characteristics and requirements than those of a classic management information system (MIS). Beginning with the relationship drawn between data, information, and knowledge (Alavi & Leidner, 1999, 2001; Bhatt, 2001; Ulrich, 2001; Spiegler, 2000, 2003; Tuomi, 2000), through to the essential nature of unstructured and semi-structured information vs. structured information (Wu, Ling, Lee, & Dobbie, 2001; Lai, Carlsen, Christiansson, & Svidt, 2003; Fensel et al., 2002; Chou & Chow, 2000), there are many elements and areas in which the two diverge.

However although the definition, description, and implementation of a KMS has been recognized as sufficiently distinct from an MIS (Alavi & Leidner, 2001; Hahn & Subramani, 2000; Plass & Salisbury, 2002; Malhotra, 2002), there is no single clear approach to develop a systems analysis and development process that is tailored specifically for a KMS (Alavi & Leidner, 2001; Hahn & Subramani, 2000; Plass & Salisbury, 2002). While the first generation of KMS has been developed as add-on or parallel systems living alongside pre-existing structured management information systems, the next generation of systems development needs to deal with fusion systems. A fusion system (Gray et al., 1997) is a system that integrates structured and unstructured knowledge in real time, allowing for full situational assessment based on both information and knowledge resources.

MIS has a long and illustrious history of research and development focusing on creating and refining the systems analysis process. KMS has no such legacy other than what it has inherited directly from MIS. The purpose of this article is to articulate the unique systems analy-

sis and development issues presented by KMS in organizations, explain why tight integration between MIS and KMS development processes is desirable, and illustrate how such integration can be achieved through a modified Knowledge Integrated Systems Analysis (KISA) process for knowledge management.

The KISA process evolved from a series of action research cycles conducted over an information system development project within the Information Systems Development Department and the Chief Information Office of the Israeli Navy. Beginning with a classic IS development approach, each development cycle added new modifications to the process, until a fully integrated process was reached and then applied, without modification, to new integrated KMS-MIS development. The result is a process that is tailored to the needs of fusion systems. The result is an integrated (knowledge and process) system to support the Navy mission lifecycle.

BACKGROUND

According to Demarco (1978):

Analysis is the study of a problem, prior to taking some action. In the specific domain of computer systems development, analysis refers to the study of some business area or application, usually leading to the specification of a new system. (p. 4)

Whitten, Bentley, and Dittman (2001) state that the systems analyst will study "the problems and needs of an organization to determine how people, data, processes, communications, and information technology can best accomplish improvement for the business" (p. 14). No matter what methodology of system analysis is chosen—structured, information modeling or object-oriented methodology—this statement by Demarco made over 25 years ago is still correct. Although methodology changes, still the systems analyst as specified by

Yourdon (1989) is the key member of any systems development project and, in fact, this role has not changed. Sircar, Nerur, and Mahapatra (2001) showed that a controversy exists in the literature about the magnitude and nature of the differences between object-oriented (OO) and structured systems development methods. Some authors, as cited by these researchers, believe that the OO approach is merely an evolution from the structured systems development approaches. Others cited by these researchers claim that OO requires an entirely new approach and mindset; still the researchers' emphasize that the primary task of system analysis within the systems development process is to capture the essence of a real-world system through models. This fundamental task has been incorporated into both the structured and the OO development approaches.

Knowledge in an organization can be characterized as unstructured or semi-structured, whereas information and data are fully structured and can be managed by common information management methods. Estimates show that unstructured and semi-structured information account for about 80% of the information volume within organizations (Corp, 2001; Lindvall, Rus, & Sinha, 2003; Ferrucci & Lally, 2004). Therefore, a structured MIS that aids organizational processes will only be addressing 20% of the information management needs. KM flourishes in this gap. Within this gap, most KM projects place an emphasis on knowledge "stock," which tends to dominate an organization's thinking about knowledge (Fahey & Prusak, 1998). According to Schwartz and Te'eni (2000) and Fisher (1999), the problem is "getting the right knowledge to the right person at the right time," or in other words, "delivery of the knowledge to the point of action where it can be applied to the issue at hand" (Schwartz, Divitini, & Brasethvic, 2000).

However, the "right knowledge" is not necessarily the sole property of the knowledge management domain, nor is it to be wholly found in the management information systems domain. The

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