Chapter IX

Semantic E-Business

Rahul Singh, The University of North Carolina at Greensboro, USA

Lakshmi Iyer, The University of North Carolina at Greensboro, USA

A. F. Salam, The University of North Carolina at Greensboro, USA

Abstract

We define semantic e-business as “an approach to managing knowledge for coordination of e-business processes through the systematic application of Semantic Web technologies.” Advances in Semantic Web-based technologies offer the means to integrate heterogeneous systems across organizations in a meaningful way by incorporating ontology — a common, standard, and shareable vocabulary used to represent the meaning of system entities; knowledge representation, with structured collections of information and sets of inference rules that can be used to conduct automated reasoning; and intelligent agents that collect content from diverse sources and exchange semantically enriched information. These primary components of the Semantic Web vision form the foundation technology for semantic e-business. The challenge for research in information systems and e-business is to provide insight into the design of business models and technical architecture that demonstrate the potential of technical advancements in the computer and engineering sciences.
to be beneficial to business and consumers. Semantic e-business seeks to apply fundamental work done in Semantic Web technologies to support the transparent flow of semantically enriched information and knowledge — including content and know-how — to enable, enhance, and coordinate collaborative e-business processes within and across organizational boundaries. Semantic e-business processes are characterized by the seamless and transparent flow of semantically enriched information and knowledge. We present a holistic view of semantic e-business that integrates emergent and well-grounded Semantic Web technologies to improve the current state of the art in the transparency of e-business processes.

Introduction

The Semantic Web vision (Berners-Lee, Hendler, & Lassila, 2001) provides the foundation for semantic architecture to support the transparent exchange of information and knowledge among collaborating e-business organizations. Recent advances in Semantic Web-based technologies offer means for organizations to exchange knowledge in a meaningful way. This requires ontologies, to provide a standardized and shareable vocabulary to represent the meaning of system entities; knowledge representation, with structured collections of information and sets of inference rules that can be used to conduct automated reasoning; and intelligent agents that can exchange semantically enriched information and knowledge, and interpret the knowledge on behalf of the user (Hendler, 2001). It is increasingly clear that semantic technologies have the potential to enhance e-business processes. The challenge for research in information systems and e-business is to provide insight into the design of business models and technical architecture that demonstrate the potential of technical advancements in the computer and engineering sciences to be beneficial to business and consumers.

E-business is “an approach to achieving business goals in which technology for information exchange enables or facilitates execution of activities in and across value chains, as well as supporting decision making that underlies those activities” (Holsapple & Singh, 2000). Inter-organizational collaborations are effective means for organizations to improve the efficacy of their e-business processes and enhance their value propositions. Inter-organizational collaborative business processes require transparent information and knowledge exchange across partner firms. Businesses increasingly operate in a dynamic, knowledge-driven economy and function as knowledge-based organizations. Knowledge is defined as the highest order in the continuum of data and information, as having utility and specificity in its context domain. Functionally and in systems, the lines between useful information and knowledge are blurred (Grover & Davenport, 2001). For this research, we define knowledge as “information, in the context of a specific problem domain, upon
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