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Chapter V

An Intelligent Knowledge-Based Multi-Agent Architecture for Collaboration (IKMAC) in B2B e-Marketplaces

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ABSTRACT

This chapter presents an Intelligent Knowledge-Based Multi-Agent Architecture for Collaboration (IKMAC) in B2B e-Marketplaces. IKMAC is built upon existing bodies of knowledge in intelligent agents, knowledge management, e-business, XML, and web service standards. This chapter focuses on the translation of data, information, and knowledge into XML documents by software agents, thereby creating the foundation for knowledge representation and exchange by intelligent agents that support

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collaborative work between business partners. The realization of the proposed architecture is explained through an infomediary-based e-Marketplace prototype in which agents facilitate collaboration by exchanging their knowledge using XML and related sets of standards. Use of such systems will provide collaborating partners with intelligent knowledge management (KM) capabilities for seamless and transparent exchange of dynamic supply and demand information.

INTRODUCTION

This chapter presents an Intelligent Knowledge-Based Multi-Agent Architecture for Collaboration (IKMAC) in B2B e-Marketplaces. IKMAC is built upon existing bodies of knowledge in intelligent agents, knowledge management (KM), e-business, eXtensible Markup Language (XML) and web services standards. IKMAC incorporates a consolidated knowledge repository to store and retrieve knowledge captured in XML documents, to be used and shared by software agents within the multi-agent architecture. The realization of the proposed architecture is explicated through an infomediary-based e-Marketplace example in which agents facilitate collaboration by exchanging their knowledge using XML and related set of standards. This chapter focuses on the translation of data, information, and knowledge into XML documents by software agents, thereby creating the foundation for knowledge representation and exchange by intelligent agents that support collaborative work between business partners.

CONTEXT

Rapid growth in Internet technologies has tremendous impact on business processes in the Digital Economy. As the reliance on electronic information sources grows — fuelled by the growth in the Internet and the global Digital Economy, the relevance and pertinence of information become critical for effective use of scarce resources and time. As businesses discover new ways of using the information-sharing and process-enabling features of the Digital Economy, greater demands are placed on goal-oriented problem-solving activities. The growing complexity in information sources and business processes requires an alliance of human analysis, intuition, and judgment aided by intelligent agent support for the range of information processing tasks. Companies, in the current Digital Economy, are forced by intense competition to

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