

## Chapter 2.42

# Intelligent Agents for Knowledge Management in E-Commerce: Opportunities and Challenges

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### ABSTRACT

*E-commerce has become a key aspect of the global business environment, causing fundamental changes in markets and organisational structures. This chapter considers how knowledge management, the latest management approach aimed at improving business performance, can create new business opportunities in the new business environment that is defined by electronic commerce. Knowledge management deals with the systematic generation, codification and transfer of knowledge and can be supported by a number of technologies, known as knowledge management tools. It has been argued that intelligent systems can offer additional capabilities and advantages in comparison with more traditional informa-*

*tion technologies. This chapter investigates the potential of intelligent agent-based software for more effective knowledge management in the context of e-commerce, adopting the perspective of an SME involved in development of intelligent agents-based knowledge management software. The chapter concludes with a research agenda for knowledge management research in e-commerce.*

### INTRODUCTION

The importance of knowledge management (KM) as a competitive differentiator is increasingly recognised by both ‘traditional’ and ‘virtual’ organisations. A recent OECD report claims

that industrial countries are spending as much on intangible knowledge-based investments as on physical equipment (OECD, 1999). There is an expectation that the technical exploitation of knowledge data will improve substantially with the use of intelligent tools that have several additional capabilities in comparison to traditional knowledge management tools, as discussed in this chapter. With improvements in IT-based systems for handling knowledge, knowledge management is becoming an essential theme of research into business success. Yet, it has been argued (e.g., Hlupic et al., 2001; Myers, 1996; Snowden, 1998) that the effective management of knowledge involves more than simply exploiting the data held on information systems. It also requires attention to the 'softer' parts of the corporate knowledge base, as found in the human and cultural aspects of businesses, particularly the experiences and tacit knowledge of employees. There is a growing emphasis on innovation through 'knowledge work' and 'knowledge workers' and on leveraging 'knowledge assets' (Swan et al., 1999).

While some research also makes reference to the organisational context within which the technology will be used (e.g., Delesie and Croes, 2000; Edwards and Gibson, 2000), there is little evidence of whether or how the organisational and technical dimensions have been integrated. The challenges, both technical and contextual, presented in this chapter indicate that electronic commerce creates a new context for knowledge management, not just in terms of the cultural and business environment created, but also in terms of the actual knowledge that is captured, exchanged and exploited. To deal successfully with the latter, it has been suggested that artificial intelligence, and intelligent agents in particular, have a key role to play (Smith and Farquhar, 2000). This chapter will consider how this new technology can be applied in practice. Typically, research in knowledge management would consider the view of the 'client', i.e., how a particular organisation improves its knowledge management practices.

Our chapter focuses instead on the ways in which the new context of electronic commerce creates business opportunities for the provider of intelligent technology to support knowledge management. This party, the 'supplier', needs to have a broader view of the new technological and cultural landscape. We access this perspective by researching the case of an internationally oriented SME involved in multi-agent software development used for knowledge management in electronic commerce.

The chapter is structured as follows. The next section presents some of the key organisational and technical challenges for knowledge management, with emphasis on the role intelligent multi-agents and the challenges that electronic commerce presents for knowledge management. Section three introduces the case of an SME involved in development of intelligent agents-based KM software. A research agenda for KM research in e-commerce is then proposed, and conclusions are drawn.

## **KEY CHALLENGES IN KNOWLEDGE MANAGEMENT**

The literature has been unable to agree on a definition for the term 'knowledge management' (Brooking, 1999; Hlupic et al., 2002; Malhotra, 1997; Trauth, 1999). One reason is that discussions of, and approaches to, the subject are rooted in different academic disciplines and areas of professional expertise. From the information systems perspective, for example, KM is often looked upon as synonymous with new forms of 'data mining' and 'warehousing' — the 'hard' tools that allow for sophisticated pattern searches of raw data (Trauth, 1999). From the innovation management perspective, a 'cognitive' approach is adopted, which looks at the transfer of explicit and tacit knowledge through product development and organisational change procedures (Kuhn and Abecker, 1997; Leonard-Barton, 1995; Nonaka

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