Chapter XV

A Cooperative Communicative Intelligent Agent Model for E-Commerce

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ABSTRACT

The complexities of business continue to expand. First technology, then the World Wide Web, ubiquitous commerce, mobile commerce, and who knows. Business information systems need to be able to adjust to these increased complexities, while not creating more problems. Here, we put forth a conceptual model for cooperative communicative intelligent agents that can extend itself to the logical constructs needed by modern business operations today and tomorrow.

INTRODUCTION

For more than ten years, the changes to the way business is being conduced has been accelerating. The acceleration is based on a range of developments in information technology and the World Wide Web infrastructure. The developments in information technology and the infrastructure presented by the World Wide Web (WWW) are well documented and discussed every day. With these changes, a more

complex business environment, in particular, a global electronic business environment, now exists and continues to expand. Electronic business (e-business), with its essential partner, electronic commerce (e-commerce), continues to increase in number of users and data transactions. Computerworld estimated that, by the end of 2001, there were to be 450 million users of the Internet (Computerworld, 2001). Forrester Research projected that world-wide B2B (business-to-business) e-commerce alone will be valued at $6.9 trillion U.S. dollars by 2004 (Computerworld, 2001). Similar estimates in B2C (business-to-consumer) transactions (in both value and number of transactions) show similar increases to those of B2B estimates (Gartner, 2001; eMarketer, 2001). In this changing and growing environment, businesses continue to look for, and need, better and newer ways to deal with the increasing transaction volumes and the management of the complex e-commerce business environment. Individuals, in and out of organizations, need better ways to interact with the growing complexities that the internationalized business world is bringing to them, in order to achieve their goals and tasks.

This chapter describes a research project into the development of a cooperative communication intelligent agent conceptual model for e-commerce. We begin with the development of the model by illustrating a conceptual framework and architecture. The model, in its conceptual framework, applies to Internet commerce, mobile commerce and related electronic business areas, as well as today's wired e-commerce. The primary research emphasis is on business efficiencies, in particular labor efficiencies, with lateral research into such areas as, but not limited to: information dissemination, decision-making, and business intelligence.

Research Focus

Franklin and Graesser presented a taxonomy of software agents in 1996 (Franklin & Graesser, 1996). Figure 1 shows their taxonomy. Figure 2 illustrates the extension to Franklin and Graesser's taxonomy by Klusch (Klusch, 2000).

Our research flows along the lines of the cooperative agent branch of the software agent categories, as proposed by Franklin and Graesser (Franklin & Graesser, 1996) and extended by Klusch (Klusch, 2000). However, our conceptual model is directed toward the generic aspects of the e-business environment, including the transaction models of business-to-business (B2B), business-to-consumer (B2C), and business-to-employee (B2E) environments.

We are defining e-business in the broadest sense, which includes government, for-profit and not-for-profit organizations. We envision that our conceptual model will be able to be applied to the various types of electronic business, including mobile commerce and silent commerce, that go beyond the current transactions business model encompassing the entire spectrum of ubiquitous commerce. From the conceptual model, a more precise logical model will be derived. This perspective will be directed at specific-Internet based e-business environments and their use of intelligent agents. A complex example of this is given later in this paper.

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