

Chapter 1.11

A Cooperative Communicative Intelligent Agent Model for E-Commerce

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ABSTRACT

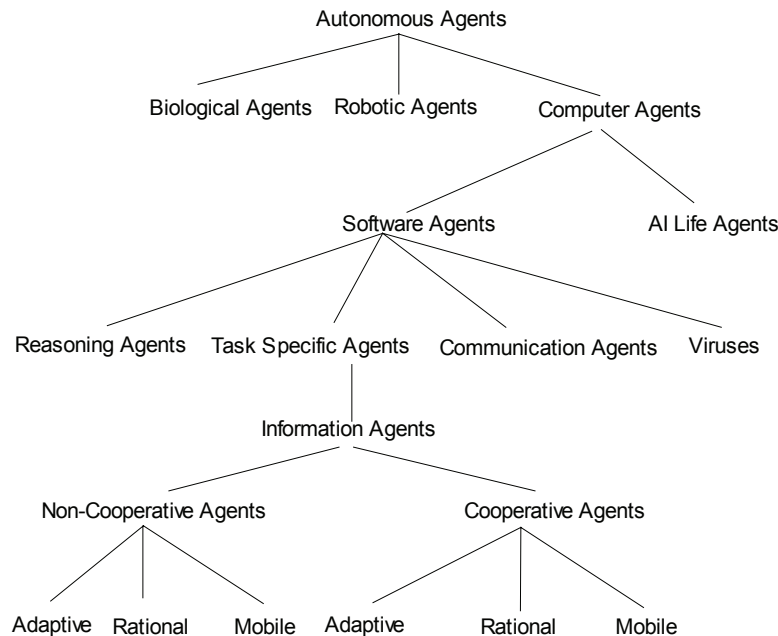
The complexities of business continue to expand. First technology, then the World Wide Web, ubiquitous commerce, mobile commerce, and who knows. Business information systems need to be able to adjust to these increased complexities, while not creating more problems. Here, we put forth a conceptual model 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 conducted has been accelerating. The acceleration is based on a range of develop-

ments 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) transac-

Figure 1. Franklin and Graesser agent taxonomy



of the Internet are imposing on businesses and individuals. The first step in the development of these applications is the design of appropriate models and architectures that can work with and for businesses and individuals. To this end, intelligent agents can be considered a viable and essential player in aiding business and individuals in labor efficiencies.

Agent Taxonomies

In 1996, a software agent taxonomy was proposed by Franklin and Graesser (Franklin & Graesser, 1996). This taxonomy is considered to be a classic example of software agent categorization. This taxonomy provides a mapping for researchers in their development of agent models and architectures, as well as broadening into other research areas.

Klusch in 2000 (Klusch, 2000) made an addition to Franklin and Graesser's (1996) software agent taxonomy diagram, as seen in Figure 2.

A new category was added to the cooperative agent's branch. This additional subcategory resides at the same level as adaptive, rational and mobile agents. This subcategory, "*communicative agents*," reflects recent research activities into software agents.

Klusch's addition to Franklin and Graesser's taxonomy brings up an important point. While non-cooperative agents, such as search robots and other software agents, are considered to be software tools, communicative agents need to display a cooperative behavior. This behavior depends on the particular context of the agent's activities. This behavioral component provides us with a means to branch out and further develop agent cooperative concepts for modeling a cooperative communicative intelligent agent framework and architecture. However, this does add complexity. This complexity includes cooperation among agents and intelligent agent communication that requires the use of one or more ontology's.

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