*e-SJ 2.2 © IU Press*

# INTELLIGENT SUPPORT FOR SOPHISTICATED E-COMMERCE SERVICES: AN AGENT-BASED AUCTION FRAMEWORK MODELED AFTER THE NEW YORK STOCK EXCHANGE SPECIALIST SYSTEM

*Ken Griggs, Ph.D., Rosemary Wild, Ph.D.*

## ABSTRACT

The rapid development of commerce on the World Wide Web has been accompanied by the creation of new business models and customer relationships involving the use of some form of middleware. Frequently, the middleware is described as a "service." E-services are much like software agents, in that they are characterized by autonomy, perception, and intelligence and have been used primarily for search and data mining activities on the Web. A parallel trend in electronic commerce is the development of auction markets in contrast to traditional fixed posted price models. Most Web-based auction markets are structured on the "English Auction" model where a reserve price is established and bids are increased until the market is cleared.

This paper describes an e-service agent-based architecture for electronic commerce. The proposed architecture implements a continuous double auction modeled on the 200-year-old New York Stock Exchange specialist system. The complex functionality of the specialist system is replicated through dedicated agents and knowledge bases that interact with buyer and seller agents. The specialist system, thought to be superior to other auction systems, requires a relatively high level of intelligence.

The proposed architecture fully models the duties of a human specialist at a NYSE exchange post. These duties are broadly described as customer agent, principal, market catalyst, and auctioneer. In addition to describing the architecture, the paper includes a discussion of current research in electronic commerce auction markets and likely future impacts of the technology.