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A REAL-TIME INTELLIGENT SYSTEM FOR ORDER PROCESSING IN B2C E-COMMERCE

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Abstract. *The development of a real-time intelligent order processing system is one of today's challenging issues in B2C e-Commerce. This kind of systems can process customers' orders intelligently and real-timely based on their requirements, such as goods quantity and expected delivery time. However, this kind of systems applicable in B2C e-Commerce is scarce. Hence, we aim to develop such a system by agent technologies in B2C e-Commerce. The system is a robust one applicable in e-Commerce environment. In the paper, we analyze the key tasks and the flow of real-time intelligent order processing in e-Commerce through making reference to manual order processing. The principles of these key tasks with theories and technologies of Artificial Intelligence are investigated. Based on the analysis of the key tasks, a three-layer hierarchical structure of the real-time intelligent order processing in B2C e-Commerce is presented and a multi-agent systematic structure of the processing is designed, in which each agent structure for the corresponding key task is designed according to the three-layer hierarchical structure. Finally, we develop the real-time intelligent order processing system for an online urban bookstore to demonstrate the feasibility of the system in B2C e-Commerce. The application results show that the research is beneficial to improving the intelligence and real-time performance of e-Commerce order processing.*
Keywords: E-Commerce, Order processing, Real-time, Agent, Artificial Intelligence

1. **Introduction.** In the past decade, the strategic importance of order processing in e-Commerce has been widely recognized in practice as well as in academic research. Order processing involves all of the activities from the point of a customer's purchase decision until the product is delivered to the customer and he/she is fully satisfied with its quality and functionality [1].

Increasing orders which need immediate response raise a new challenging problem: real-time intelligent order processing. To address this problem, many researches have been conducted recently, which can be grouped under two categories.

The first category is the study on online negotiation before validating the customers' purchase decision in order processing, especially in B2B e-Commerce. Typical examples are the following: Calosso *et al.* presented an analytical model for order negotiation between a generic customer-supplier pair and proposed a system based upon an intervenor which allows the parties to reach efficient utility-sharing solutions [2]. Tsai *et al.* developed a conversational system based on network integration and provided solutions to e-Commerce order services with multiple modes [3]. Kaiyu Dai *et al.* developed an e-Commerce integration system with characteristics of man-machine interaction and three-dimension [4]. Though these researches can increase the speed of response to clients' demands and most of them paid attention to how to reach an agreement among parties,