

Chapter 22

New Advances in E-Commerce

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ABSTRACT

Advances in computers design and communication technology have led to the introduction of global, dynamic, and intelligent e-business models and new tools for e-commerce. These models use artificial intelligence techniques and Web 2.0 technologies to perform online transactions between businesses and customers. As the number of clients over the internet grows rapidly, advanced intelligent e-business models are needed to efficiently respond to clients with an optimum selection for their requests. In B2C models there are a large number of buyers and sellers where buyers specify their preferences and sellers specify their products and selling prices. The major role of AI techniques in B2C e-commerce is to come up with the best match between a buyer and seller. In B2B the major role of AI techniques is supply chain management to help clients make the right decisions. Modern tools used by intelligent e-commerce models include algorithmic trading, decentralized autonomous corporations (DAC), crypto-currency systems, smart contracts, internet of things, cloud computing, and big data analytics.

INTRODUCTION

Advances in computer architecture and communication technology have led to introduction of global, dynamic and intelligent e-business models and new tools for doing e-commerce. These models use artificial intelligence techniques and web2 technologies to perform online transactions between businesses and customers. As the number of clients over the Internet grows exponentially enhanced intelligent e-business models are needed to efficiently respond to clients with an optimum selection for their requests. Agent based e-business models use intelligent agents, mobile agents, evolutionary agents, rational agents, data-mining agents to develop agent-based e-commerce models. Recommender systems provide intelligent assistance to online customers is CBR-based or collaborative filtering based e-business models. In B2C models there are a large numbers of buyers and sellers where buyers specify their preferences and sellers specify their products and selling prices. The major role of AI techniques in B2C e-commerce is to come up with the best match between a buyer and seller. Examples of e-commerce systems in B2C using AI techniques are product selection and recommendation, negotiation and auction systems. In

DOI: 10.4018/978-1-5225-7766-9.ch022

B2B the major role of AI techniques is supply chain management to help clients taking the right decisions. Modern tools used by intelligent E-commerce models include: algorithmic trading, decentralized autonomous corporations (DAC), crypto-currency systems, smart contracts, Internet of Things, cloud computing and big data analytics.

BACKGROUND

Intelligent Techniques

Intelligent techniques in E-commerce include:

Intelligent Agents

They are personalized software that function independently and use machine-learning algorithms to analyze data, adapt to their environment in order to achieve the goals on behalf of users. Main agents can use sub-agents to work under their supervision to achieve smaller tasks to help main agents achieve their pre-written goals. These agents can surf the Internet gathering information, searching e-market places looking for products and services satisfying users' preferences. With the help of intelligent agents customers can enter e-negotiations and take part in e-auctions. According to (Nwana, 1996), the intelligent agents important features include:

1. **Autonomy:** Agents achieve their goals independently and act proactively without human intervention.
2. **Cooperation:** Agents communicate with each other and negotiate on certain issues.
3. **Learning:** Agents are able to learn, react or interact with their environment and with other agents.

Intelligent agents allow sellers to track demand and market shares, perform knowledge mining, negotiate and learn from collaboration with buyer agents. Seller agents can gain money by selling services, they may create children that may either survive or die depending on whether they can get enough business. Broker agents, provider agents and merchant agents sell products and services required by sellers while comparison shopping agents are required for buyers to comparison shop (Sinmao, 1999). These types of agents get the required information from retailers' web sites using semantic web.

Types of intelligent agents include:

1. **Rational Agents:** They are autonomous computer programs that are capable of a goal directed behavior (Russell et al, 2003). The main goal of rational agents is to autonomously select the optimal outcome from possible preferences in a given situation. To achieve this goal the rational agents collect information about their environment which may be obtained from past experiences, they take actions considering obligations and duties then they evaluate the outcome to decide whether the final decision is the optimum one or not. If the final result is not optimum the rational agents adjust their behavior to improve results in the future.
2. **Evolutionary Agents:** They are agents that gain new knowledge from self-reasoning and through knowledge exchange with other agents. Evolutionary agents share information and knowledge with each other within a multi-agent environment regardless of their structures or objectives. The main

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