Chapter 35
E-Commerce Business Models: Part 2

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ABSTARCT

In this article the author explained some of the common artificial intelligence techniques used in e-commerce web sites and how these techniques are implemented in auctions, intermediaries and e-marketplaces to increase customer's satisfaction, minimize the look up time, reduce costs and improve the usability of e-commerce Web sites so that visitors can quickly access the required information or perform required transactions without being overwhelmed or confused with the large amount of data.

INTRODUCTION

E-commerce business models are using computing and communication technologies to make transactions between a business and its customers online. As the number of clients on the Internet grows rapidly the computation also grows and efficient techniques are required to respond to client's requests within a short time. Artificial Intelligence (AI) is used to learn human behaviors and imitate human intelligence. AI is now playing an important role in e-commerce. 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 that are using AI techniques are product selection and recommendation, negotiation and auction systems. In B2B e-commerce the major role of AI techniques is supply chain management. They help clients taking the right decisions (Kwok, 2000).

BACKGROUND

In B2C e-commerce business models important AI techniques are:

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1. Intelligent agents: they are personalized software, member of the bot family and use machine-learning algorithms to accommodate user's preferences without extensive rewriting of code and rules. Intelligent agents can be used in information gathering, prediction purposes, searching e-marketplaces on behalf of their owners enabling one-stop shopping on the web, reducing shopping costs, give the customer the opportunity to set his preferences, choose what to buy and from whom to buy, they also help a customer to enter negotiations and participate in auctions. According to (Nwana, 1996), the most important characteristics of intelligent agents are:
    - Autonomy: means that agents process their work independently and proactively without any intervention from their owners.
    - Cooperation: means that agents are able to communicate with one another, negotiating on certain issues.
    - Learning: means that agents are able to learn as they react or interact with their environment and other agents.

Sellers use intelligent agents to track demand and market share changes, engage in competitive knowledge mining, negotiate and even learn through collaboration from buyer agents. Buyers may need decision agents to comparison shop, while sellers may need a broker, provider, and merchant agent to sell a product (Sinmao, 1999).

2. CBR technique (Prasad, 1995): CBR plays an important role in e-commerce applications for product recommendations by using context-sensitive information related to E-commerce as cases in CBR to help users take the right decision quickly (Kumar et al., 2005). CBR works as follows: Step-1: Take customer preferences. Customers preferences may vague or rate their preferences ranging from 'must have' to 'not important'. Step-2: Retrieve products with similar offers from case base and submit them to the customer. Step-3 Customer may accept a similar offer or quit the process if he is no longer interested. Step-4: Customer may modify his preferences and go to step 2. A widely used formula for CBR in identifying similar products is based on the similarity or disparity measure between two products. It uses the nearest neighbor retrieval approach based on the weighted Euclidean distance (Wettschereck and Aha, 1995). A most recent CBR-based system for recommending utilities in sports domain is presented in (Prasad and Clementi 2002). Figure 1 shows a CBR e-commerce system.
3. ACF technique (Hayes et al, 2001): is an Automated Collaborative Filtering that is similar to Case Base Reasoning (CBR). While the CBR produces a solution the ACF produces recommended components for the target user profile. It is defined as 'a method of making automatic predictions (filtering) about the interests of a user by collecting taste information from many users (collaboration)." (Encyclopedia.thefreedictionary.com 2004). In ACF based recommender web sites, each ACF customer profile contains records about the historical customer's consumptions of items with either explicit or implicit ratings. An ACF case is an incomplete one – it is essentially one row in the user–item matrix and will usually be quite sparsely populated. The goal of ACF is case completion which is an incremental enhancement of the user profile based on feedback given by the user. The system uses the information it has to retrieve similar user profiles and extract completion information for the case profile which is then offered to the user. ACF has a recommendation cycle with indefinite iterations of recommendation processes where items recommended for inclusion in the user

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