

COMPARISON-SHOPPING AND RECOMMENDATION AGENTS: A RESEARCH AGENDA

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ABSTRACT

This article serves as the introduction to the special issue on comparison-shopping and recommendation agents and provides a brief overview of the four papers included in the issue indicating their contributions. It also offers the guest editors' perspectives on the future research in this field.

Keywords: comparison-shopping, shopbots, recommendation agents, online retailing, B2C ecommerce

1. Introduction

The immense growth of the Internet and World Wide Web have had a profound impact on the way organizations and individuals conduct business and have led to the emergence of new services and business models. As the number of choices has increased, so has the need for tools to help online shoppers search for, aggregate, manage and utilize information on these for better decision making. As a result, comparison-shopping and recommendation agents have emerged in 1995 and gradually have become indispensable online shopping tools.

Comparison-shopping agents are Web-based intelligent software agents that can collect and aggregate price related product and service information from heterogeneous online vendors and then present them to online shoppers in a consistent and convenient format to inform their shopping decision. Recommendation agents are those Web-based intelligent software agents that can recommend products or services to online shoppers based on their preferences, shopping behavior, a shopper's individual characteristics or based on their similarities with a group of shoppers.

In the past 15 years, comparison-shopping agents have evolved from mere price comparison engines to comprehensive online shopping portals. Not only can online shoppers compare prices for the same product from different online vendors, but also compare similar products that share the same function and features. In addition to product price information, comparison-shopping service providers also collect and aggregate the ratings of products as well as services provided by online vendors, in essence providing aggregated reputation information. Such information allows online shoppers to make informed selections.

2. Current Research and Papers in the Special Issue

Comparison-shopping is now the third most popular online shopping option after eBay and Amazon. However, instead of being dominated by one big player, there are multiple service providers in this field that compete with each other. They include independent comparison-shopping service providers like shopping.com, nextag.com, shopzilla.com as well as services by established online portals or search engines like Bing Shopping by Microsoft and Google Product Search by Google. The large number of players makes the mutual learning and innovation in this field faster and edger – a fertile field for research.

Current research on comparison-shopping and recommendation agents is largely separated by different research disciplines, ranging from computer science and information systems, economics, consumer behavior, to electronic commerce. The research issues mainly covered the data wrapping techniques, design of shopbots, the impact of

price comparison on electronic markets, the shopping decision-making behavior with shopbots, and various B2C business models based on comparison-shopping and recommendation agents.

This special issue includes four papers that cover several issues mentioned above.

The first paper by Pathak is a comprehensive review of comparison-shopping agents from a decision support systems perspective. The author has organized and synthesized contemporary literature related to comparison-shopping agents into four components: data, models, interfaces, and user specific customization. In the data aspect, data retrieval, storage, and provision for comparison shopping are discussed. The data features of major shopbots have been analyzed and organized into a tabular format. In the models section, the DSS models used by comparison-shopping agents have been classified into operational models and analytical models. For each model, major works have been cited and algorithms discussed. In the user interface section, major findings on consumer comparison shopping usage behavior are presented. Important decision support features for major shopbots are also explored. In the user customization section, the author discusses some interesting personalization features of existing shopbots. Overall, this paper provided us a nice summary of existing research on comparison-shopping agents from multiple research disciplines.

The second paper by Tan et al. explores the impact of price comparison on online merchants from an experimental economics approach. Since comparison-shopping could significantly reduce the search cost for online shoppers in online shopping, researchers initially presumed that shopbots would increase competition among online vendors, resulting in commoditized markets, limited value of branding, and the convergence of products to the Cournot competition or price wars. Some later empirical studies indicated otherwise. Some found online shoppers do not choose to buy from online vendors that offer the lowest price. Others found price collusion between online vendors because the reduced search cost also benefits online vendors to observe price movements of competitors. This paper explores the conditions under which comparison-shopping websites are more or less likely to intensify market competition. The authors simulated an online comparison-shopping market with different combination of merchant characteristics (such as absence and presence of market power) and product types (such as commodity products and differentiated products). They conducted two experiments within this environment and identified different effects on market performance by various underlying comparison-shopping market structures. Compared with other simulations on shopbots, this paper provides a new perspective and method for us to understand the dynamics of the comparison-shopping market. We expect further studies following this track in the near future.

Product reviews is an integral part of comparison-shopping and recommendation services nowadays. The issues about product review range from incentive to contribute, presentation, to fraudulent review detection. One popular method for evaluating the quality of product reviews is to allow users to vote on the helpfulness of a review as exemplified by Amazon. However, the shortcoming of this method is that it takes time to accumulate user votes and potentially useful new reviews take a long time to be fully voted. To speed up the process, the third paper by Zhang and Tran proposes a linear model to predict the helpfulness of online product reviews. By implementing their classification algorithm, newly submitted product reviews can be quickly ranked and classified so online shoppers could use them and vote them together with those fully voted reviews. This paper represents a considerable stream of research on recommendation agents in the comparison-shopping field.

The last paper by Zhu and Madnick discusses the legal challenges and policy issues of comparison-shopping from a data reuse perspective. Since all comparison-shopping services relate to data reuse of product prices, the legal implications of copyrights are critical for the success of such services. This paper reviews and compares the data reuse policies in Europe and the United States. It also proposes strategies to anticipate likely policy choices. This paper provides a legal and policy perspective on comparison-shopping and recommendation agents.

Though we have a better understanding of comparison-shopping and recommendation agents now compared with 15 years before, the research in this field is still limited: there is little integrated or systematic research on this topic. We hope the four papers included in this special issue could give readers a taste of different research issue categories in this field.

3. Future Research

In addition to the research issues raised in the four papers, interested readers could find discussion of future research on comparison-shopping and recommendation agents from following: Wan and Peng [2010] has a forward-looking article about future research on comparison-shopping agents, especially desirable features of shopbots by online shoppers. Fasli [2009] suggested that the full potential of comparison shopping sites and agents will only be realized when we migrate from the current limited in capabilities shopbots and comparison sites to ones that can retrieve and reason with semantic information. The transition to the Semantic Web and the use of Web Services [Huhns, 2003] would alleviate the problems associated with current shopbots and comparison shopping sites and would enable vendor-independent comparison shopping services to emerge that could discover service and product

providers in real-time and would retrieve and aggregate information on multiple products using multiple attributes, thus, truly offering impartial comparison services to online shoppers. The other dimension that shopbots could improve on is that of personalization: the next generation of shopbots is expected to offer an enhanced shopping experience to online shoppers by utilizing user profiles to filter the results for products and services and offer tailor-made information to the user's needs. Advances in developing and maintaining dynamic user profiles will greatly aid in this direction [Liao et al., 2010; Chen et al., 2007].

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