

Online shopping recommendation mechanism and its influence on consumer decisions and behaviors: A causal map approach

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Abstract

Purpose of this paper: Online product recommendation mechanism (agents) are becoming increasingly available on websites to assist consumers with reducing information overload, provide advice in finding suitable products, and facilitate online consumer decision-making. Central of these services is consumers' satisfaction with recommendation results. Traditional recommendation mechanism (TRM) is based content and/or collaborative filtering approach. However, the remaining problem concerning TRM is how to analyze the causal relationships between quantitative and qualitative factors, and investigate their impact on the central routes and peripheral routes through which both quantitative and qualitative factors can affect customer online shopping decisions. It is well known that qualitative factors are hard to codify yet they have a significant effect on a customer's decision-making process in the form of causal relationships with quantitative factors. Thus, a new online recommendation mechanism is required that incorporates qualitative factors systematically with quantitative factors to analyze their combined influence on customers' purchasing decision-making process. So, our study suggest that causal maps based recommendation mechanism (CMRM).

Design/methodology/approach: ELM was applied to build hypotheses concerning how consumers' decision satisfaction and online shopping behavior are affected by CMRM. Specifically, the performance of the proposed CMRM is analyzed empirically by garnering the experiment data from 250 qualified respondents who were asked to refer to the proposed CMRM before making purchasing decisions on mobile phones.

Findings: Statistical results proved that the proposed CMRM could enhance consumers' decision satisfaction, attitude towards the recommended products, as well as positive purchase intentions and actual purchase.

Practical implications: CMRM can be easily implemented on the web, allowing target consumers to experience a real recommendation process. And, a wide variety of qualitative factors that seem crucial to most consumers can be pre-defined through a survey, and incorporated into causal maps. Thus, such causal maps will improve the personalization effect on the target consumer's purchase intentions.

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Keywords: Causal map; Traditional recommendation mechanism (TRM); Elaboration likelihood model (ELM)

1. Introduction

Recently, information technology has been utilized to help companies maintain competitive advantage (Nissen & Sengupta, 2006). Data mining techniques with recommendation systems are a widely used information technology for extracting customer's knowledge and further supporting marketing decisions (Balabanovic & Shoham,

1997). The buying patterns of individual customers and groups can be identified via analyzing customer data (Maes, Guttman, & Moukas, 1999), but also allows a company to develop one-to-one marketing strategies that provide individual marketing decisions for each customer (Lampel & Mintzberg, 1996; Murthi & Sarkar, 2003). Recommendation systems are technologies that assist businesses to implement such strategies, and provide a type of mass customization that is becoming increasingly popular on the internet (Ansari, Essegaiar, & Kohli, 2000; Lee & Lee, 2005). They have emerged in e-commerce applications

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to support product recommendation. The recommendation systems use customer purchase history to determine preferences and identify products that a customer may wish to purchase. Schafer, Konstan, and Riedl (2001) presented a detailed taxonomy of recommendation systems in e-commerce, and determined how they can provide personalization to establish customer loyalty. Generally, recommendation systems increase the probability of cross-selling; establish customer loyalty; and fulfill customer needs by discovering products in which they may be interested.

The traditional recommendation mechanism (TRM) is a web-based system designed to help customers sort through available products and/or services on the online shopping malls and advise customers about what products to buy, based on the needs expressed by the customers. Through a variety of tasks such as defining needs, forming consideration sets, making recommendations, and negotiating purchases (West et al., 1999), the TRM serves to potentially reduce the cost of thinking (Shugan, 1980), as well as the uncertainty surrounding an online shopping purchasing decision, and thus both reduce the difficulty of making a choice while increasing the confidence associated with it. Since the TRM is perceived by customers to be highly credible and to have particular expertise in the decision context, its positive impact is expected to intensify. However, the remaining problem concerning TRM is how to analyze the causal relationships between quantitative and qualitative factors, and investigate their impact on the central routes and peripheral routes through which both quantitative and qualitative factors can affect customer online shopping decisions. It is well known that qualitative factors are hard to codify yet they have a significant effect on a customer's decision-making process in the form of causal relationships with quantitative factors. Thus, a new online recommendation mechanism is required that incorporates qualitative factors systematically with quantitative factors to analyze their combined influence on customers' purchasing decision-making process.

To accomplish this, the first objective of this study is to propose an alternative online recommendation mechanism where causal relationships, possibly existing among quantitative and qualitative factors that seem relevant to customers' online shopping decisions. For this purpose, causal mapping is introduced to analyze causal relationships among quantitative factors and qualitative factors and help customers revise prior decisions that were based on quantitative factors alone. Quantitative factors in the case of mobile phones include such terms as handset price, folder type, rate of communication charge, brand, etc. In contrast, qualitative factors indicate customers' tacit preferences towards body color, design, usefulness, etc., all of which reside mentally and have causal relationships with quantitative factors. Causal mapping is a widely accepted methodology for analyzing causal relationships rigorously (Eden, 1989; Nelson, Nadkarni, Narayanan, & Ghods, 2000). A causal map, therefore, looks at the pattern or

structure of assertion of causal relationships among variables and not at how or why variables or their causal relationships come to be part of the map (Ford & Hegarty, 1984). Causal maps have been shown to be relatively stable and thus capable of providing the basis for prediction (Bonham & Shapiro, 1976). The first objective of this study then is to propose a causal map-driven online recommendation mechanism, named CMRM, to (1) analyze causal relationships among both quantitative factors as well as qualitative factors, (2) help customers revise their prior online shopping behaviors based on quantitative factors alone, and (3) prove its validity statistically with respect to customer decisions satisfaction and behaviors (i.e., attitude towards recommended products, purchase intention, actual purchase) in comparison with TRM.

2. Theoretical backgrounds

2.1. Recommendation mechanisms and decision making

On the Internet, recommendation mechanisms are becoming more important in providing personalized support to a customer's decision-making process by reducing the difficulty associated with choosing between alternatives (Haubl & Trifts, 2000). And, recommendation mechanisms have been found to help consumers efficiently filter available alternatives, increase the quality of their considered set and increase their product choice satisfaction (Haubl & Trifts, 2000; Urban et al., 1999). Knowledge of appropriate recommendation mechanisms using customer's information can be used to improve decision quality toward recommendation products (Ansari et al., 2000; Tam & Ho, 2005). Customers are typically good at selecting variables that are relevant in the decision process, but weak at integrating and retaining large amounts of information. Effective decision aids (i.e., recommendation systems) should be designed to capitalize on the strengths and compensate for the inherent weaknesses of their users (Hoch & Schkade, 1996). So, customers need to examine and assimilate relevant recommendation information in the decision-making process before choice products which match with their preference. If a product recommendation from an information source is available to customers, they can either decide not to consult it, consult and follow it, or consult and not follow it (Senecal, Kalczynski, & Nantel, 2005). Senecal et al. (2005) investigate how different online decision-making processes used by consumers, influence the complexity of their online shopping behavior. So, this paper shows CMRM effect on consumers' decision satisfaction and online shopping behavior, and increase actual purchase.

2.2. Cognitive map

Due to incomplete and uncertain objective information, as well as lack of sufficient knowledge, experts may find it difficult to describe their tacit knowledge precisely. Causal

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