Research and Modelling on the E-commerce Consumer Behavior based on Intelligent Recommendation System and Machine Learning

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Abstract

In this paper, we conduct research on the E-commerce consumer behavior based on the intelligent recommendation system and machine learning. Closely associated with consumer network information search of a problem is that the consumer's information demand as can be thought of consumer's information demand is leading to trigger the power of consumer network information search behavior, when consumer is willing to buy goods, in a certain task under the influence of factors, environmental factors, individual factors, consumers and the task object interaction to form the demand of consumer cognition. Under this basis, this paper proposes the new idea on the related issues that will solve the related challenges.

Keywords: E-commerce Consumer, Behavior, Intelligent Recommendation System, Machine Learning.

Introduction

Consumer network behavior refers to the purchase or consumption for the purpose or the relevant consumer network operation behavior, usually including demand confirmation, network information search, project evaluation, purchase decision and purchase evaluation after five stages, on behalf of the integrity of the network shopping consumer consumption process. Social commerce is users can collaborate online e-commerce platform as users get advice from trusted individuals, find the target and purchase goods and services. Social commerce has three key attributes: social media technology, group interaction and business practices that can be summarized as the follows.

- To join the commercial attribute of social networking sites, such as Facebook, LinkedIn, and several other social networking sites, they open application interface, allows members to business activities.
- To join the social interaction ability of e-commerce sites, such as the amazon, they use the power of social networks allows the website to have a better understanding and the service consumers.

Closely associated with consumer network information search of a problem is that the consumer's information demand as can be thought of consumer's information demand is leading to trigger the power of consumer network information search behavior, when consumer is willing to buy goods, in a certain task under the influence of factors, environmental factors, individual factors, consumers and the task object interaction to form the demand of consumer cognition, when decided to solve the problem of lack of information on the Internet, will naturally produce network information search behavior, so that the core network consumer

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behavior "the consolidation information demand in the generalized information search model is a must". As an extension in the field of electronic commerce in wireless communication, mobile commerce has both across organizational boundaries in the form of electronic commerce, etc. and has the characteristics of technology and mobile service features, made in cross-organizational workflow modeling and the general management, mobile commerce and e-commerce has both generality and difference. In common: both workflow across organizational boundaries. Mobile commerce cross-organizational workflow like electronic commerce across the value chain members the organizational boundaries of the enterprise, involving multiple are relatively independent and cooperative members of the enterprise to each other. In the process of the service, all need through the information system for collaborative. Cross-organizational workflow involves a series of value chain activities across the border from members of the enterprise, must accomplish across organizational coordination, the sequence of each activity in the process of implementing business relationship. The figure one shows the principles.

Figure 1. The E-commerce Consumer Behavior Demonstration.

In this paper, we conduct research on the E-commerce consumer behavior based on the intelligent recommendation system and machine learning. In the following sections, we will discuss in detail.

The Proposed Methodology

The Consumer Behavior Principles. Consumer behavior is built on the basis of that consumer psychology, accurate grasp of consumer psychology, attaches great importance to the important role of consumers in the market is the premise to guarantee the accuracy of the direction of the enterprise marketing strategy. At the same time, because of the difference of the different regional economic development level, consumers show the psychological and behavior is also different, and enterprise should according to particular case is particular treatment. The influence factors of the consumer behavior analysis can be generally summarized as the follows.

- Related groups can play a reference role for consumers, consumer behavior can be and the behavior of the group members and belief. For example, consumers due to the influence of the relevant group members to enjoy a certain brand of clothing. The influence degree of the related group of the consumer purchase decision depends on the consumer sensitivity to the relevant effects on the group and combined with the group.
Social class has influence on many aspects of our life. For example, you can effect the value orientation of our activities, education investment, and style. Because of the social stratum has influence on many aspects of people's lives, can also affect the consumers' purchase decision.

Economic conditions impact is embodied in two aspects: first, the product price is decided whether consumers to buy the decisive factor. Second, the law of diminishing marginal utility. Consumers to buy a particular commodity is, in order to get the utility from the goods, so, utility is big, the price customers are willing to pay is high and small utility, consumers are willing to pay the price is low.

Consumers in brand comparison, when the choice, if you have any purchase experience and the product is full of information consumers will according to the immanent quality of the product itself or objectively evaluate the quality of products and choice. But usually, the average consumer does not have judgment, to evaluate the quality of the products within the skills and the knowledge. When consumer lack of consumption experience and inner quality of the products themselves don't know when will be information gathering. If the information cost is too high, more than information of revenues or cost of some consumers are willing to pay for access to the information, or some of this information is difficult to obtain, consumers to buy and lack of confidence, based on the incomplete information, consumers will be more to use product of external clues, make whole deduction for the product quality.

The Recommendation System. Retrieval system by constructing mathematical model, based on the analysis of the query log, mining user retrieval behavior of the potential model, then use this knowledge to predict users may access the retrieval results, intelligent selection, recommended to the user interest close to network information. Recommendation system is one of the key success factor is the availability and quality of user profile, user configuration is usually difficult to obtain and difficult to guarantee its quality. User configuration information can be explicitly input by the user or that implicitly by software agents to record the user's activity.

In the next few years, in the social challenges of recommended mainly can be divided into three categories: one is how to improve the accuracy of the recommendation system using as the social network, The second is how to build a better mechanism to promote the social recommendation, such as building good privacy policy, perfecting the relevant laws and regulations, etc. Three is how to introduce social trust relationship to the recommendation system, because it is believed that social influence behavior similarity is more important than history. User model is the expert system for man-machine interface design and interface design of intelligent education system first it refers to the user information related to use the system. Mainly involves two aspects; One is to obtain model; Second it is the demand of users and their features of the expression, that is the user's personality characteristics and requirements of personalized characteristic. Research model access can validate user participation what effect on the system and the system in the future will be how to improve in order to reduce of the user. The figure two shows the principles.
The Machine Learning E-commerce. E-commerce recommendation system's biggest advantage is that it can be of the interest to the user information collection, and according to the active user's interests to make a personalized recommendation for the user. In this way, every time when the user input user name and password to log in the e-commerce sites, the recommendation system will automatically according to the degree of user preferences of recommended to the user's favorite N products, and gives recommendations are updated in real time. Commodity attribute refers to the real prices of goods, function, appearance, material or the purpose to mark the commodity characteristics, such as the concept of set, can be extracted from the commodity related Web document commodity attribute words. While knowledge attribute category describes the concept of commodity and the inner semantic relationship between commodity attribute as property category knowledge represent a semantic relations. Only the introduction of fine-grained knowledge of the goods but can a detail description of goods, more clear that can accurate and convenient for consumers to choose goods.

Therefore, it is necessary to enlarge the domain and range of electronic commerce research, emphasizes the multidisciplinary crossover study, through the establishment of general e-commerce complexity research methodology and build solid, feasible and effective experimental platform, to further promote the discipline basic theory of cross application in e-commerce, and learn from each other. On the one hand, can through the experiment platform of evaluation and validation of the laws of the basis of basic theory research and mechanism is applied to practical problems and system; Experimental platform, on the other hand, also can obtain the real data from the practice of electronic commerce application and enterprise issues of concern, so as to extract basic theory and methodology of application value. The "research - platform - the application" virtuous circle as will help to promote basic theory research in the field of electronic commerce, and promote the theoretical research of the cross application. Current research evaluation index system for e-commerce site is more, but these studies are generally analysis of website evaluation index, failed to combine service quality evaluation system for in-depth analysis. It will, of course, were proposed by the Parasuraman classic service quality evaluation system is introduced into the evaluation of online retailers, but retailers are simply be extended to online retail service quality evaluation. Anyhow at home and abroad has not been seen for e-commerce site service quality evaluation system research, especially for that B2C e-commerce site seen from related research literature in the blank. The development of the B2C e-commerce sites is the embodiment of China's e-commerce development, for B2C e-commerce site, timely grasp of the service quality evaluation of the site, but specific solutions to the problems of service quality that will reduce the distance with customers before, which would be helpful to the development of better myself.
The Consumer E-commerce Model. When it comes to the success of e-commerce cannot fail to mention it to the rational use of modern network advantages, all the advantages of it can be said to be from the network, Internet or Intranet network to the electronic commerce rapid, accurate, paperless way of working. But the electronic commerce theory should not be satisfied with current success, success is only equivalent to the existing business model now left intact, moved to a network or the revising, in today's international economic environment, this is not only get more success.

The co-occurrence of the literature of the retrieved map network relationships, according to the results of the analysis of the high frequency keywords in this field of research in addition to the "electronic commerce" "online shopping" "consumer behavior", including "purchase intention" "purchase," "purchase decision" and other specific purchase behavior research; "Impact factor" and "perceived risk" and other factors that affect consumers intend to research; "Technology acceptance model" and "planned behavior theory," "the theory of rational behavior" such as the theory basis for research. Overall, the domestic study of consumer behavior intention in e-commerce environment is divided into the following three categories.

- Set up e-commerce consumer behavior preferences and general decision-making mechanism, different promotions are verified by the simulation modeling of different gender, age, income, and environment of consumer buying behavior (purchase rate).
- Electronic commerce consumer information search before its purchases, such as asymmetric information or information overload will online information characteristics will affect its behavior.
- Site risk control mechanism, such as the privacy, security, payment security, transaction monitoring have a positive impact on consumer trust in order to have a positive impact on consumer e-commerce purchase behavior.
- Word of mouth information sources, word of that mouth information propagation direction, community members to their own conditions as the members of the community interaction in the virtual community of word of mouth and product factors of members in the process of e-commerce behavior has a significant effect.

Conclusion

In this paper, we conduct research on the E-commerce consumer behavior based on the intelligent recommendation system and machine learning. Consumer information, more and more valued brand contains quite a number of consumers is based on brand awareness, rather than the product itself attributes to make the purchase decision. As the consumers to the brand familiarity with improved, especially the improvement of loyalty, collect the activities of the other brands will be reduced. Consumers once become loyal type and it is very difficult to that competes product. Sustainable development of world economy and material abundance, also makes the consumption becomes a form of recreation and individuality; Service consumption in the proportion of people's consumption structure increasing, service production and general consumption of identity characteristics also make customer consumption process that extends to the production process, consumption experience has become a source of customer value creation. This paper proposes the new perspective of the issues that will enhance the further development of the corresponding theories.
References


