Transactions on Economics, Business and Management Research
ISSN: 2960-1789, eISSN: 2960-2254 | Volume 13
BMMFT 2024

Evaluating the Effectiveness of Social Recommender Systems on Consumer Satisfaction and Purchase Intentions

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Abstract. With the widespread adoption of social media platforms, consumers increasingly rely on recommendations from social networks. Simultaneously, mutual recommendations among family and friends also play a significant role in purchase decisions. Social recommendation systems analyze users' social networks, behavioral data, and interest preferences to recommend personalized products or services. This method enhances the accuracy and relevance of recommendations, increases users' trust and satisfaction, and boosts merchants' revenues. This study aims to investigate the impact of social recommendation systems (such as friend recommendations and social media recommendations) on consumer purchase decisions. The primary objectives of this research include: Firstly, examining the role of friend recommendations in the consumer decision-making process and exploring their impact on enhancing consumers' trust and purchase intentions. Secondly, studying the accuracy of recommendation algorithms to understand their effect on meeting consumer needs and influencing purchase intentions. Thirdly Based on the research findings, providing reference suggestions for optimizing recommendation systems to e-commerce platforms, brick-and-mortar retailers, and merchants, assisting them in formulating precise marketing strategies. Through this study, we hope to offer new insights to both academia and industry, promoting the further development and application of social recommendation systems. Additionally, we aim to provide valuable theoretical support and practical guidance for optimizing recommendation systems on e-commerce platforms, for brick-and-mortar retailers, and for merchants.

Keywords: social recommendation; algorithm accuracy; consumer satisfaction; personalization.

1. Introduction

With the development of information technology, Social Recommendation System (SRS) is increasingly used in online shopping and social media platforms. Social Recommendation System (SRS) makes use of the social relationship between users and their historical behavioral data to provide consumers with personalized recommendations of goods or content, which in turn influences consumers' purchase intention. In this paper, we will explore how friend recommendations and social media recommendations in social recommender systems affect consumers' purchasing decisions and analyse the impact of the accuracy and personalization of recommendation algorithms on consumer satisfaction and purchase intention.

2. Key Concepts

2.1. Social media recommendation

Social recommendation system is a system that recommends personalised content or friends to users based on their behaviour and social relationships in social networks and analyses their interests and preferences through algorithmic models. Its goal is to improve user experience, increase user stickiness, and promote the activity of social network.

2.2. Friend recommendation

Friend recommendation is a recommendation method based on social network relationship. By analyzing the interaction data between users and their friends, such as likes, comments, shares, etc., the recommendation system can recommend the products that friends buy or like for users. The advantage of this recommendation method is its high credibility and relevance [1-4].

2.3. Social media recommendation

Social media recommendation is to recommend relevant content and products for users by analysing their behavioural data on social media platforms, such as likes, shares and comments. Due to the large amount of user behavior data on social media platforms and frequent updates, the social media recommendation system can capture changes in user interests in real time and provide more personalized recommendations to optimize the user's use and shopping experience. The advantages of this recommendation method are its large amount of data, frequent updates and strong personalised recommendation capability. By analyzing users' behavioural data on social media, the recommender system can provide users with more accurate and relevant recommendations.

3. The impact of social recommender systems on consumer purchasing decisions

Social recommender systems significantly influence consumer purchasing decisions by increasing the relevance and credibility of recommendations. The following section discusses in detail the impact of friend recommendation and social media recommendation on consumer purchasing decisions.

3.1. Impact of recommendations

Research has shown (and additional data is needed) that consumers are more likely to accept recommendations from acquaintances because such recommendations have higher credibility and carry less risk of false promotion. For example, on a shopping website, if a user sees that a friend has purchased a certain item, he or she may believe that the item has a certain quality assurance, thus increasing the willingness to purchase. Friend recommendation can not only increase the exposure rate of the commodity, but also enhance the user's trust in the recommended commodity, thus directly affecting the consumer's purchasing decision [5-8].

In addition, friend recommendation can also enhance the user's social experience. In social networks, users tend to share their shopping experience and purchase decisions, and this sharing behaviour can not only increase the exposure of products, but also promote interaction and communication between users. For example, if a user shares the goods he or she has purchased on the social network, his or her friends may be interested in purchasing when they see it, thus increasing the willingness to purchase.

3.2. Impact of social media recommendations

By providing more personalised recommendations to optimise the user's use and shopping experience social media recommendations can also bring considerable impact on product sales. By analysing the user's behavioural data on social media, the recommendation system can provide users with more accurate and relevant recommendations, thus increasing the effectiveness of advertising and the probability of consumer purchase. For example, if a user frequently pays attention to information about a certain type of product on social media, the social media recommendation system will recommend related products or services for the user based on these behavioural data. This recommendation method can more accurately capture the user's interest and enhance the relevance of the recommendation, thus influencing the consumer's purchase decision.

In addition, social media recommendations can also enhance users' brand loyalty. When users find that a platform's recommendation system can consistently provide products or content that match

their interests, their satisfaction and loyalty to the platform will increase significantly, which will in turn increase the likelihood of shopping on the platform. For example, if a user frequently uses a recommendation system to purchase goods on a social media platform, over time, the user may develop a higher level of dependence and trust in the platform, thereby increasing the frequency and amount of purchases.

4. Recommendation algorithms

4.1. The Impact of recommendation algorithm accuracy on consumer satisfaction

The accuracy of a recommendation algorithm refers to the ability of a recommender system to accurately predict a user's interests or needs. A recommender system with high accuracy is able to provide goods or content that meets the user's interests, thereby increasing the user's satisfaction and enhancing the consumer's willingness to purchase [9-11].

4.2. Definition of accuracy in recommender systems

The accuracy of a recommender system is usually measured by a series of metrics, such as Hit Rate, Precision, Recall and F1 Score. These metrics reflect the performance of the recommender system in predicting user interests or needs.

4.2.1. Hit Rate

Hit Rate refers to the proportion of recommended products by the recommender system that are actually selected by users. The higher the hit rate, the higher the accuracy of the recommendation system.

4.2.2. Precision

Precision refers to the proportion of commodities recommended by the recommender system that actually meet the interests of users. The higher the precision rate, the higher the accuracy of the recommendation system.

4.2.3. Recall

Recall rate refers to the proportion of commodities recommended by the recommender system that actually meet the user's interests. The higher the recall rate, the wider the coverage of the recommender system.

4.2.4. F1 Value (F1 Score)

F1 Value is the reconciled average of Precision Rate and Recall Rate, which is used to comprehensively measure the accuracy and coverage of the recommender system.

4.3. Analysis of the impact of accuracy

The accuracy of recommender system directly affects user experience and satisfaction. A recommender system with high accuracy can reduce the time and energy consumed by users in selecting products or content and improve user satisfaction. If an e-commerce platform's recommender system can accurately recommend the goods that users are interested in, users will be more convenient when shopping and their reliance on the platform will be improved.

In addition, a recommender system with high accuracy can also increase the trust of users, making them more willing to accept recommendations, which will in turn increase their willingness to buy, and also increase the usage rate of the shopping platform. When users feel that the recommended goods or contents are highly matched with their interests, their satisfaction and willingness to purchase will be improved. However, the accuracy of recommender systems is not the only factor that affects consumer satisfaction. Factors such as personalisation, real-time and privacy protection of recommender systems also have a significant impact on consumer satisfaction. Therefore, when

designing recommender systems, it is necessary to consider the combined impact of various aspects in order to improve overall user satisfaction.

5. Personalisation

5.1. Definition of personalisation in recommender systems

Personalisation refers to the ability of a recommender system to provide users with tailored recommendation content based on their individual characteristics and behavioural data. Personalised recommendation provides users with more accurate and relevant recommendations by analysing factors such as users' historical behavioural data, interests and social relationships.

Personalised recommendation systems provide tailored recommendations to users by analysing factors such as users' historical behavioural data, interests and social relationships. Personalised recommendation systems usually adopt machine learning and data mining technologies to provide users with personalised recommendations by constructing User Profile and Interest Model.

User Profile: User profile is a comprehensive description of the user's individual characteristics and behavioural data, including the user's basic information, interests, purchasing history, browsing records, etc. User profile is the basis for personalized recommendation systems. User profile is the basis of personalised recommendation system, through the construction of user profile, the recommendation system can understand the user's individual characteristics and interests and preferences, so as to provide personalised recommendations.

Interest Model: Interest model is a mathematical representation of user's interests and needs, including the user's interest in different types of commodities or content. The interest model is usually represented by a Vector Space Model or a probability model. By analysing the user's behavioural data, the recommender system is able to construct the user's interest model and thus provide personalised recommendations.

5.2. Analysis of the impact of personalisation

The personalised recommendation system can improve the relevance of the recommended content based on the user's shopping history and browsing records, increase their trust and satisfaction with the platform, and increase the likelihood of purchase.

5.3. Main ways

(1) Improving the relevance of recommended content: personalised recommendation systems provide users with recommended content that meets their interests by analysing their historical behavioural data and interests. If a user frequently buys sports equipment, the recommendation system can recommend the latest sports shoes and sportswear for him. This highly relevant recommendation content can attract consumers' attention, improve users' satisfaction and trust in the platform, and increase their willingness to buy.

(2) Enhance the user's shopping experience: the personalised recommendation system can reduce the user's time and energy consumption when choosing products and enhance the user's shopping experience. Recommendation system can be based on the user's browsing records and purchase history, combined with its consumer preferences and purchasing power to recommend products that meet its interests, reducing the user's selection time and energy consumption. This convenient shopping experience can enhance user satisfaction and increase the willingness to buy.

(3) Improve the user's dependence on the recommender system: personalised recommender systems can continuously provide recommended content that meets the user's interests and increase the frequency of the user's use of the recommender system. If a user frequently uses the recommendation system to purchase goods on a social media platform, over time, the user may develop a high degree

of dependence and trust in the platform and the recommendation system, thereby increasing the frequency and number of purchases.

6. Case Study

In order to better understand the impact of social recommendation systems on consumer purchase decisions, this paper will analyse two specific cases: the social recommendation system of an e-commerce platform and the recommendation system of a social media platform.

6.1. Case study 1: The social recommender system of Pinduoduo

The e-commerce platform "Jinduoduo" has significantly increased the conversion rate of users' purchases by introducing the friend recommendation and sharing function "Jinduocircle". Users can see the purchase records and evaluations of their friends on the platform, and this social recommendation enhances users' trust and confidence in the products, thus increasing their purchase intention and likelihood.

Background and Methods: The e-commerce platform provides users with the functions of friend recommendation and information sharing by obtaining and analysing users' contact lists, friend relationships and purchase behaviours. Users can see the purchase records and evaluations of their friends on the platform. This recommendation method expands the scope of product promotion, enhances the attractiveness to users, and improves the credibility of the platform.

Results and analyses: After the introduction of the friend recommendation function, the platform's purchase conversion rate increased significantly, reducing the platform's promotional and marketing costs. In addition, friend recommendation also enhances the social experience of users and promotes interaction and communication between users.

Conclusion: The friend recommendation function significantly increases the purchase conversion rate and satisfaction of users. By taking advantage of users' social relationships, the platform can reduce the pressure of promotion, obtain zero-cost spontaneous publicity, and also directly influence users' purchasing decisions through friends' evaluations.

6.2. Case study 2: Recommender system of "Little Red Book" platform

On the "Xiaohongshu" platform, users can share their daily lives or publish content to find partners with the same hobby, which provides the platform with analysable user behaviour data. The platform's recommendation system uses advanced machine learning algorithms to capture changes in users' interests in real time and provide personalised recommendations. This type of recommendation not only improves user satisfaction, but also increases the platform's user activity and stickiness.

The social media platform provides personalised recommendations to users by analysing their behavioural data, such as posting, liking and commenting, and recommending relevant goods and content. By using advanced machine learning algorithms to build accurate user profiles and interest models, it captures the changes in users' interests in real time and gives more accurate push and interest matching.

Results and Analysis: The personalised recommendation system significantly improves user satisfaction and purchase intention. Recommended content that matches users' interests can increase the platform's user activity, stickiness and willingness to buy. In addition, the personalised recommendation system enhances users' goodwill and loyalty to the platform, making them more willing to make purchases on the platform.

Personalised recommendation systems significantly increase user satisfaction and purchase intention. High fit push can greatly increase users' purchase intention and satisfaction and thus directly influence their purchase decision.

7. Conclusions

Although social recommender systems have shown significant results in improving consumer satisfaction and purchase intention, there are still many aspects that are insufficient and deserve further research. For example, how to protect user privacy, how to balance the accuracy and personalization of recommender systems, and how to improve the real-time and response speed of recommender systems.

Taking user privacy as an example, recommender systems need to collect and analyse a large amount of user behavior data when providing personalized recommended content, which may involve user privacy issues. How to protect user privacy while ensuring the performance of recommender systems is an important research direction. As far as existing technologies are concerned, Differential Privacy can be used to protect user privacy during data analysis, or Federated Learning can be used to train models without collecting user data, but we still need to focus on this research.

In practice, the accuracy and personalisation of recommendation systems are often in conflict. Too much pursuit of accuracy may lead to a lack of diversity in the recommended content, reducing the user's interest in exploration, while too much pursuit of personalization may lead to a lack of diversity in the recommended content affecting the user's judgement. Therefore, how to balance the accuracy and personalization of the recommender system is also an issue worthy of in-depth study.

Overall, the role played by social recommendation systems on online shopping and social media platforms has become more and more important, and their influence on consumers' purchase intentions has gradually increased. By improving the accuracy and personalisation of recommendation algorithms, platforms can significantly increase consumer satisfaction and purchase intention, optimise the consumer shopping experience through accurate pushing, and also make profits from it, reaching a win-win situation. In the future, with the continuous progress of technology and the increase of data collection, social recommendation systems will play a more important role in people's online shopping and bring convenience to people's life.

This paper provides a reference for future research by exploring how social recommendation systems (e.g., friend recommendation, social media recommendation) affect consumers' purchasing decisions, and analysing the impact of recommendation algorithms' accuracy and personalisation on consumers' satisfaction and purchase intention. It is hoped that the research in this paper can provide useful insights for the design and optimization of social recommender systems in the consumer domain and promote the application and development of social recommender systems in online shopping and social media platforms.

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