

Presenting a retention marketing strategy with a customer credit determination approach using neural network data mining

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Abstract

The present study aims to provide a recurring marketing strategy with a customer credibility determination approach using neural network data mining. The method of this research is applicable in terms of purpose, and is of a mixed type (qualitative-quantitative) in terms of implementation. First, by using the content analysis method, the key components of recurring marketing were identified and the initial optimization framework was designed. Then, the Delphi method and structured interviews with experts in the field of marketing and customer management were used to validate the indicators. In this study, a combination of the K-Means++ clustering algorithm and the RFM model was used to segment customers and identify groups in need of marketing interventions. Also, by using decision trees and artificial neural networks, the rules for validating customers and the accuracy of predicting their behavior have been improved. The research findings show that this combined framework not only improves the accuracy of clustering, but also allows designing personalized strategies for each group of customers. The results indicate that the recency index has the greatest impact in determining customer value, and the integration of transactional data with demographic and behavioral characteristics provides more comprehensive insights for marketing decisions. By filling the gaps in previous research, especially in the area of interpretability and generalizability of models, this research has taken an effective step towards developing theoretical and applicable knowledge of return marketing.

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Extended Abstract

Introduction

Customer value is defined as the perception of what a product or service can be useful to the customer, compared to possible alternatives. By benefit, we mean whether the customer feels that he or she receives certain benefits by purchasing a product in exchange for a certain amount of money. Lifetime value shows the profit from the customer relationship for the entire period from the moment he saw the first advertisement or registered on the site to the last purchase. Lifetime value affects the amount of revenue: the more regular customers a company has, the higher its revenue. How can you calculate lifetime value? To calculate lifetime value, you can multiply the average purchase size by the number of purchases and the retention period. Or divide the total revenue by the total number of users for a given period. In this regard, customer credit is one of the crucial issues and is very important for maintaining the financial security and sustainability of the organization. One of the fundamental challenges in this area is identifying the appropriate indicators for crediting and scoring customers. Therefore, determining correct and reliable indicators is very challenging. Segmenting customers into different prominent groups and designing personalized activities for each cluster is a vital technique for determining marketing tactics (Rajesh et al., 2024). Also, to score customers, there must be an appropriate and fair scoring system. This system must be able to place customers in different categories by considering credit and behavioral criteria and assign them appropriate points based on their performance (Wulansari & Heikal, 2024). In addition, there is a need to develop methods to evaluate and monitor customers over time. The aim of this research is to present a return marketing strategy with a customer credit determination approach using data mining. However, so far, the inability to discover valuable information contained in the collected data has prevented this data from being converted into valuable and usable knowledge in the organization, and data mining tools can help organizations discover hidden knowledge in a large amount of data (Calisir et al., 2016). Therefore, this research seeks to answer the question: what does a return marketing strategy with a customer credit determination approach using data mining look like?

Theoretical Framework

Return Marketing

Return marketing is a suitable method for retaining current customers and increasing their loyalty. Using retention marketing techniques, customers can be encouraged to buy again and even share the brand with others (East et al., 2006).

Customer Loyalty

Loyalty is defined as an emotional and attractive connection to a brand and a practical action over time. In this definition, an individual prefers a particular brand to other brands and makes decisions as a psychological commitment to it. (Cardinale et al., 2016).

Moula et al. (2024) in a study on customer type discovery and its impact on increasing hotel revenue: a data mining approach, reached the following results. Demand estimation is a fundamental component of revenue management systems. The demand for a product can be determined from the customers who purchase it. Identifying customer types in this field is a challenging endeavor that has recently been solved using metaheuristic and mathematical techniques. The metaheuristic method takes advantage of the lack of data in the business ecosystem, starts with random samples, and uses a fit function as a guide throughout the operation. The approach proposed in this study builds the ecosystem by combining complementary data to identify valuable customer types. The researchers use a new periodic table with additional data to achieve this goal. Subsequently, the relevant data is reduced through a data mining clustering method, and finally an algorithm and fit function are used to

identify valuable customer types. To validate this approach, the proposed solution was compared with the latest research in the field, including genetic, memetic, and mathematical approaches. The researchers' results showed that the model has lower error, with a maximum reduction of 34% and an improvement in value of up to 7%.

Singh et al. (2024) examined customer churn in banking: A machine learning approach and a coherent program leveraging data science and management. According to this paper, customer churn in the banking industry occurs when consumers stop using the goods and services offered by the bank for a period of time and then discontinue their relationship with the bank. Therefore, customer retention is essential in today's highly competitive banking market. In addition, having a strong customer club helps in attracting new consumers by strengthening the trust and referrals of existing customers. These factors make reducing customer churn an important step that banks should follow. In their study, Singh et al. examined banking data and predicted which users were most likely to stop using bank services. The researchers used various machine learning algorithms to analyze the data and show a comparative analysis on different evaluation criteria.

Research Methodology

The method of this study is applicable in terms of purpose, and mixed (qualitative-quantitative) in terms of implementation. First, by using the content analysis method, the key components of remarketing were identified and the initial optimization framework was designed. Then, the Delphi method and structured interviews with experts in the field of marketing and customer management were used to validate the indicators.

Research Findings

In this study, a combination of the K-Means++ clustering algorithm and the RFM model was used to segment customers and identify groups in need of marketing interventions. Also, by using decision trees and artificial neural networks, the rules for validating customers and the accuracy of predicting their behavior were improved. The findings of the study show that this combined framework not only improves the accuracy of clustering, but also allows designing personalized strategies for each group of customers. The results indicate that the recency index has the greatest impact in determining customer value, and the integration of transactional data with demographic and behavioral characteristics provides more comprehensive insights for marketing decisions. By filling the gaps in previous research, especially in the area of interpretability and generalizability of models, this study has taken an effective step towards developing theoretical and practical knowledge of return marketing.

Conclusion

The present study was conducted with the aim of presenting a return marketing strategy with the approach of determining customer credibility using neural network data mining. The results of this study are in line with the results of Moula et al. (2024), Singh et al. (2024), Egorenkov (2024), Dwivedi et al. (2024), Hagi & Hamidi (2024), Khadivar & Mehmannaazan (2023), and Sharifi Esfahani et al. (2023). Dwivedi et al. (2024) showed that service quality and employee behavior have a positive and significant effect on customer satisfaction. To satisfy customers and retain them, customer relationship management must be strong and reliable. Therefore, customer relationship management plays a vital role in increasing market share, productivity, improving in-depth knowledge of the customer and his satisfaction to increase loyalty to the organization.

Based on the research results, the following recommendations were made:

Offering products tailored to age, occupation, or geographic region (e.g., student facilities for young customers).
Offering digital services (e.g., e-wallets) to customers who transact online.