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Competitors' Influence Analysis of a Retailer by Using Customer Value and Huff's Gravity Model

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Abstract : Customer relationship analysis is vital for retail stores, especially for supermarkets. The point of sale (POS) systems make it possible to record the daily purchasing behaviors of customers as an identification point of sale (ID-POS) database, which can be used to analyze customer behaviors of a supermarket. The customer value is an indicator based on ID-POS database for detecting the customer loyalty of a store. In general, there are many supermarkets in a city, and other nearby competitor supermarkets significantly affect the customer value of customers of a supermarket. However, it is impossible to get detailed ID-POS databases of competitor supermarkets. This study firstly focused on the customer value and distance between a customer's home and supermarkets in a city, and then constructed the models based on logistic regression analysis to analyze correlations between distance and purchasing behaviors only from a POS database of a supermarket chain. During the modeling process, there are three primary problems existed, including the incomparable problem of customer values, the multicollinearity problem among customer value and distance data, and the number of valid partial regression coefficients. The improved customer value, Huff’s gravity model, and inverse attractiveness frequency are considered to solve these problems. This paper presents three types of models based on these three methods for loyal customer classification and competitors’ influence analysis. In numerical experiments, all types of models are useful for loyal customer classification. The type of model, including all three methods, is the most superior one for evaluating the influence of the other nearby supermarkets on customers' purchasing of a supermarket chain from the viewpoint of valid partial regression coefficients and accuracy.

Keywords : customer value, Huff's Gravity Model, POS, Retailer
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