

Integrating data mining and social network analysis for the product-to-shelf assignment problem

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ABSTRACT

Nowdays, retailers provide comprehensive activities such as displaying popular products or providing free taste trial to attract more consumers. Those activities try to make customers spend more time in the store. At the same time, retailers try to make consumers purchase products not in their expectation. To achieve the goal, retailers not only use promotions but also product-to-shelf assignment strategy to increase the cross-sell possibility. A well product-to-shelf assignment strategy can help customer easily find product items and dramatically increase the retailing store profit. Previous studies in this area usually applied the space elasticity to optimize space allocation models with history transaction data and then obtain local optimal solution. However, a well product-to-shelf assignment strategy should not only reallocate all products in the store since this will eliminate the original consumer behavior/patterns. This research uses social network analysis to find out whether products are suitable to move or not. That is, this research successfully integrates data mining and social network analysis for solving the product-to-shelf assignment problem. According to result of the proposed method, product network is constructed by association mining and then figure out the role of each product with SNA. This novel method use a mathematical function to evaluate preference of each product. The preference consists of network preference and location preference. Finally, a simulated transaction data is used to construct product network and solve product-to-shelf task based on the preference of each product.

Keyword: Shelf allocation 、 Association rule 、 Product network 、 Social network analysis