

# Application of Association Rules-Market Basket Analysis through Sales Transaction in Retail NF

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**Abstract.** In the era of industrial revolution and technological advancements, society is pampered with the presence of various shopping centers. The proximity of these shopping locations provides various options for customers to visit, but this leads to intense competition among businesses. One of the shopping destinations is Retail NF, a retail center that provides daily necessities, especially for families and students. In its operations, Retail NF prioritizes customer service and comfort. Therefore, to maintain and enhance customer loyalty, Retail NF needs to create a marketing strategy that involves the application of Association Rule-Market Basket Analysis to understand customer shopping behavior patterns. This research aims to identify associative relationships among item purchases at Retail NF and find marketing strategy solutions to increase the sales. This research was conducted at Retail NF with 12 product departments. Data collection was carried out for 7 days from September 13th to September 20th, 2022. A dataset of 50 consumer shopping receipts was used, which had undergone pre-processing data and was subsequently processed using the Rapidminer software. By employing the AR-MBA method, the minimum support value used by the researcher is 10%, and the minimum confidence required in this study is 50%. Four rules meeting the criteria for valid association relationships have been identified. Department 2 (snacks) will be purchased together with department 4 (drinks), with the confidence level of 68% and supported by 26% of the overall data. Department 6 (toiletries) will be purchased together with department 2 (snacks), with the confidence level of 71% and supported by 10% of the overall data. Department 7 (bread) will be purchased together with department 2 (snacks), with the confidence level of 71% and supported by 10% of the overall data. Lastly, department 3 (cigarettes) will be purchased together with department 4 (drinks), with the confidence level of 77% and 14% of the overall data. The Association Rule-Market Basket Analysis revealed valuable insights for Retail NF in creating more effective marketing strategy. The results highlighted strong associations between snacks and drinks, as well as cigarettes and drinks, suggesting the promotion of product bundling opportunities. However, the associations involving toiletries and bread were supported by less data but still significant and can be enhanced by applying shopping coupons. A layout redesign for the store shelves is needed to address the observed simultaneous purchase of items from non-adjacent departments. The marketing strategy can leverage these associations for increased sales and customer loyalty. Limitations stem from the short data period, necessitating an extended analysis to capture seasonal trends and assess association stability. From the results of four association rules obtained and the analysis of consumer behavior, the recommended marketing strategies given are changing the layout, making shopping coupons, and promoting product bundling.

**Keywords:** association rules-market basket analysis, customer behaviour, marketing strategy