

# Improvement of Layout and Design of Sales Strategies at OPQ Minimarkets using the FP-Growth Algorithm

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**Abstract.** The existence of shopping centers in the community certainly positively impacts human livelihoods. Indirectly, it helps and facilitates people in fulfilling their daily needs. On the other hand, shopping center management faces challenges to advance their business. One way to survive and compete is by implementing the right marketing strategy. In designing these strategies, it is necessary to have information related to the purchasing habits or patterns of products carried out by customers. This information can be historical purchasing data at a shopping center. This data or information will make purchasing patterns and association rules between purchased items known. Then, once the output is known, interpretation will be conducted for marketing strategy improvement and enhancement. This research aims to determine and identify association rules or combinations of items purchased by customers at the OPQ minimarket. Data was collected using a questionnaire, and 50 purchase transaction data were gathered. The data was processed using the AR-MBA (Association Rules-Market Basket Analysis) approach to discover rules and item combinations. The algorithm used was FP-Growth, which played a role in identifying purchasing patterns that frequently occurred in the 50 customer transaction data. Data processing was performed using Microsoft Excel to categorize product departments and transform the data. The categorization of departments formed a total of 13 departments, which facilitated data analysis. The process continued using RapidMiner to identify patterns or association rules. Afterward, suitable and valid association rules were determined based on confidence, support, and lift ratio values. The results obtained from the data processing using the FP-Growth algorithm revealed the formation of several association rules and inter-departmental decisions. Specifically, three association rules were established, indicating that items in these departments are often purchased together. This was substantiated by confidence values ranging from approximately 50% to 72%, falling into the reasonably good category. Furthermore, the support values went from 10% to 16%, providing sufficient support for these rules. These established rules are considered valid because they have a lift ratio greater than 1. In one of the association rules formed, a connection or item combination exists between Department 1 (Spices and Condiments) and Department 2 (Food and Snacks). This suggests that there is a high likelihood, around 72.7%, that customers will purchase both items together, with a support value of 16%. It is known that the established rules benefit the sustainability of sales at the OPQ minimarket. These results are a benchmark for improving the layout and designing marketing strategies. Improvements to the layout of the OPQ minimarket include bringing two departments closer together and creating a customer flow that allows them to pass through specific departments. Furthermore, for sales strategy design, bundling products can be completed at a relatively low price, targeting products that are less popular but are appealing when combined with other products. Additionally, discounts or price reductions can be offered to increase customer loyalty. Based on the processed customer transaction data, several conclusions have been drawn that can be applied by the management of the OPQ minimarket. The fundamental aspect of layout improvement and marketing strategy design is derived from the association rules or relationships among items purchased by customers. For layout improvement, consideration can be given to association rules with high support and confidence values. Meanwhile, the importance of support and confidence can also be considered for sales strategy design, but they can be adjusted according to the actual conditions in the mini market.

**Keywords:** association rules, customer transaction data, market basket analysis