

ABSTRACT

In today's increasingly digital business world, integrated and analytical management of sales and inventory data has become a critical need for retail companies like Nuhsantara Merchandise. The company faces challenges in manually managing sales and inventory data from various platforms and lacks a system capable of identifying customer purchasing patterns as the basis for product recommendation and promotion strategies. Therefore, this study aims to develop a data warehouse system using the Nine Step Kimball method, create an interactive visual dashboard with Power BI, and apply the FP-Growth algorithm to identify customer purchasing patterns based on actual transaction data. The research methodology includes the development of a star schema-based data warehouse, ETL processes using Pentaho Data Integration, and OLAP data visualization in Power BI. Additionally, association analysis was conducted using the FP-Growth algorithm in the Streamlit platform, with a minimum support parameter of 0.02 and a confidence level of 0.7. The analysis of 48,030 transactions yielded 287 frequent itemsets, 184 association rules, and 10 simplified rules, which were used as the basis for automatic product recommendations. The results were visualized in the form of tables and interactive cards, enabling easy interpretation of the results by non-technical users. The system built proved capable of improving efficiency in sales monitoring, inventory management, and providing strategic recommendations for promotions and product bundling. Thus, this system can serve as a solution to support data-driven managerial decision-making and provide added value for the company.

Keywords: *Data Warehouse, Nine Step Kimball, Power BI, FP-Growth, Streamlit, Recommendation System.*