UNIVERSITI TEKNOLOGI MARA

FORECASTING FUEL AND PRODUCT SALES FOR PETRONAS AULONG SDN.BHD USING PREDICTIVE ANALYTICS

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ABSTRACT

The objective of the project was to analyze and forecast fuel and product sales trends for Petronas Aulong Sdn. Bhd. through the development of a predictive analytics dashboard known as PetroCast. The project was conducted to address several issues, including difficulty in analysing historical sales manually, limited forecasting support for future sales planning, and the absence of an interactive dashboard to visualize fuel sales, product sales, and performance trends. The study applied the CRISP-DM model, which consists of business understanding, data understanding, data preparation, modelling, evaluation, and deployment. Historical sales data from 2024 and 2025 were collected, cleaned, and prepared before being used for analysis and model development. Three forecasting algorithms were implemented, namely Random Forest Regression, ARIMA, and SARIMA. Random Forest Regression was developed using RapidMiner, while ARIMA and SARIMA were implemented using Python. The models were evaluated using performance metrics such as Root Mean Square Error (RMSE), Mean Absolute Error (MAE), and Mean Absolute Percentage Error (MAPE) to compare the accuracy of each forecasting method. Based on the evaluation results, ARIMA produced the most suitable forecasting performance for the available fuel sales dataset, while Random Forest Regression also showed acceptable predictive results. SARIMA recorded a higher error because the available monthly data was limited, making it difficult to capture strong seasonal patterns. The forecasting results and historical sales analysis were then visualized using Microsoft Power BI. The dashboard presents fuel sales trends, product category performance, profit information, prediction results, and model performance comparison in an interactive format. Overall, this project shows that predictive analytics and business intelligence visualization can support Petronas Aulong Sdn. Bhd. in understanding sales patterns, improving sales monitoring, and making better data-driven decisions for future business planning.