UNIVERSITI TEKNOLOGI MARA

SALES PREDICTION FOR ADHA STATION BY USING PREDICTIVE ANALYTICS

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ABSTRACT

In today's increasingly data-driven corporate landscape, predictive analytics is pertinent for improving operational efficiency and decision-making in small enterprises. This project addresses the existing issues in the business processes at Adha Station, a Thai restaurant in Malaysia. This research presented a technique for projecting sales utilising current data through a machine learning algorithm. The CRISP-DM approach was employed to execute the project across the phases of business understanding, data preparation, modelling, assessment, and deployment. Sales data were manually gathered and documented from January 2023 to December 2024 using receipts, and Microsoft Excel was employed to transfer the raw data from the receipts and do preliminary processing. Additionally, pre-processing is conducted using the RapidMiner application prior to mapping the cleaned data with three distinct algorithms for predictive analysis: Decision Tree, Random Forest, and Multiple Linear Regression techniques. To assess the models accurately, 10-fold Cross Validation was employed, utilising established criteria for regression metrics, specifically Mean Absolute Error (MAE), Root Mean Square Error (RMSE), and a high Pearson correlation coefficient between the predicted and actual Net Sales. A Power BI dashboard was developed to assist management in strategic planning by visualising current sales patterns, actual and projected performance, product-specific sales, and more data. The results indicate that Decision Tree regression produced the optimal performance, exhibiting the lowest MAE, RMSE, and correlation coefficients of 4.813+/-6.405, 8.012+/-0.000, and 0.984, respectively. The results demonstrate that predictive analytics may reduce waste, improve forecasting, and facilitate more judicious business decisions. In the future, it is advisable to collect additional contextual information, such as a compilation of public holidays and promotions, implement real-time modifications, evaluate more advanced algorithms and enhance staff training and data literacy. This study demonstrates the function of sales forecasting inside predictive analytics to transform the traditional procedure into an intelligent and sustainable approach for small enterprises.

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