UNIVERSITI TEKNOLOGI MARA

PRICE PREDICTION OF FRESH FRUIT BUNCHES IN SEPINTAS USING PREDICTIVE ANALYSIS

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JULY 2026

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ACKNOWLEDGMENT

Alhamdulillah, all praises and thanks to Allah SWT for His Almighty blessings, mercy, and guidance, which enabled me to successfully complete this Final Year Project within the allocated time frame.

To begin with, I would like to thank my supervisor, Dr. Farah Muna binti Mohamad Ghazali with great admiration and gratitude on the invaluable guidance, constant support and positive feedback during the period that this project was carried out. I would also like to thank Miss Nor Hasnul Azirah binti Abdul Hamid who has not given up on me and has been guiding and providing a critical feedback to my project. Their expertise, tolerance and commitment should be given much credit towards the recognition of the success of this project.

I can never fully thank my parents, Abdul Hakim bin Abas and Hashimah binti Hashim as well as my siblings in terms of the constant prayers, their unquestioning love, moral support and encouragement. They believed in me and it has been my driving force and strength in this journey.

To Mr. Mahadi from MAH Sepakat Enterprise, I would like to express my sincere appreciation for his valuable insights and information shared during the interview process. I am also deeply grateful for his assistance in preparing and providing the data required for this project. His cooperation, guidance, and willingness to share industry knowledge greatly enhanced my understanding of the Fresh Fruit Bunch(FFB) collection centre operations. The information and new knowledge gained throughout the completion of this project have been invaluable and contributed significantly to the success of this project.

I would also want to mention my friends especially my roommates, who have always been supportive, cooperating and encouraging. This project cannot be completed if not because of them. My stressful days become easier to go through and more pleasant because of their friendship, common experiences, and good attitude.

Also, to conclude, I would like to thank all of you who in some capacity or another helped with the completion of this project. It is very grateful to have your support, advice, and help.

ABSTRACT

Fresh Fruit Bunches (FFB) pricing is a key issue for collection centers and smallholders. Price changes can influence procurement planning, harvesting choices, and expected income. At MAH Sepakat Enterprise in Sepintas, the current pricing method relies heavily on daily price references obtained through the InfoSawit app. Historical transaction records are mainly stored for documentation and are not fully used for analysis. This project aimed to use predictive analytics for FFB price prediction and to display the results on an interactive dashboard. The project followed the CRISP-DM methodology, which includes Project Planning, Business Understanding, Data Understanding, Data Preparation, Modeling, Evaluation, and Deployment. Historical transaction records from June 2024 to November 2025 were collected, cleaned, formatted, and integrated, resulting in 2,179 records for analysis. Three regression algorithms, Random Forest, Decision Tree, and Linear Regression, were developed using RapidMiner and assessed using Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), and R Squared (R^2). Random Forest showed the best performance, recording the lowest MAE of RM66.476 and the highest R2 value of 0.963. It was chosen to estimate FFB prices for 2026. The prediction results and insights from historical transactions were shared through a Power BI dashboard. This dashboard shows FFB purchase activity, price trends, delivery patterns, smallholder contributions, and estimated future prices. Experts reviewed the dashboard and found it useful and clear. However, they suggested improvements for user guidance, chart explanations, visual clarity, and interface design. Overall, the project offers MAH Sepakat Enterprise and local smallholders a better way to examine FFB price trends and make planning decisions. Future enhancements could include longer historical data coverage, more external factors, and the exploration of other machine learning or time-series techniques.