



SMART AGRICULTURE ECONOMICS AND ENGINEERING

UNVEILING THE INNOVATION BEHIND AI-ENHANCED RICE FARMING

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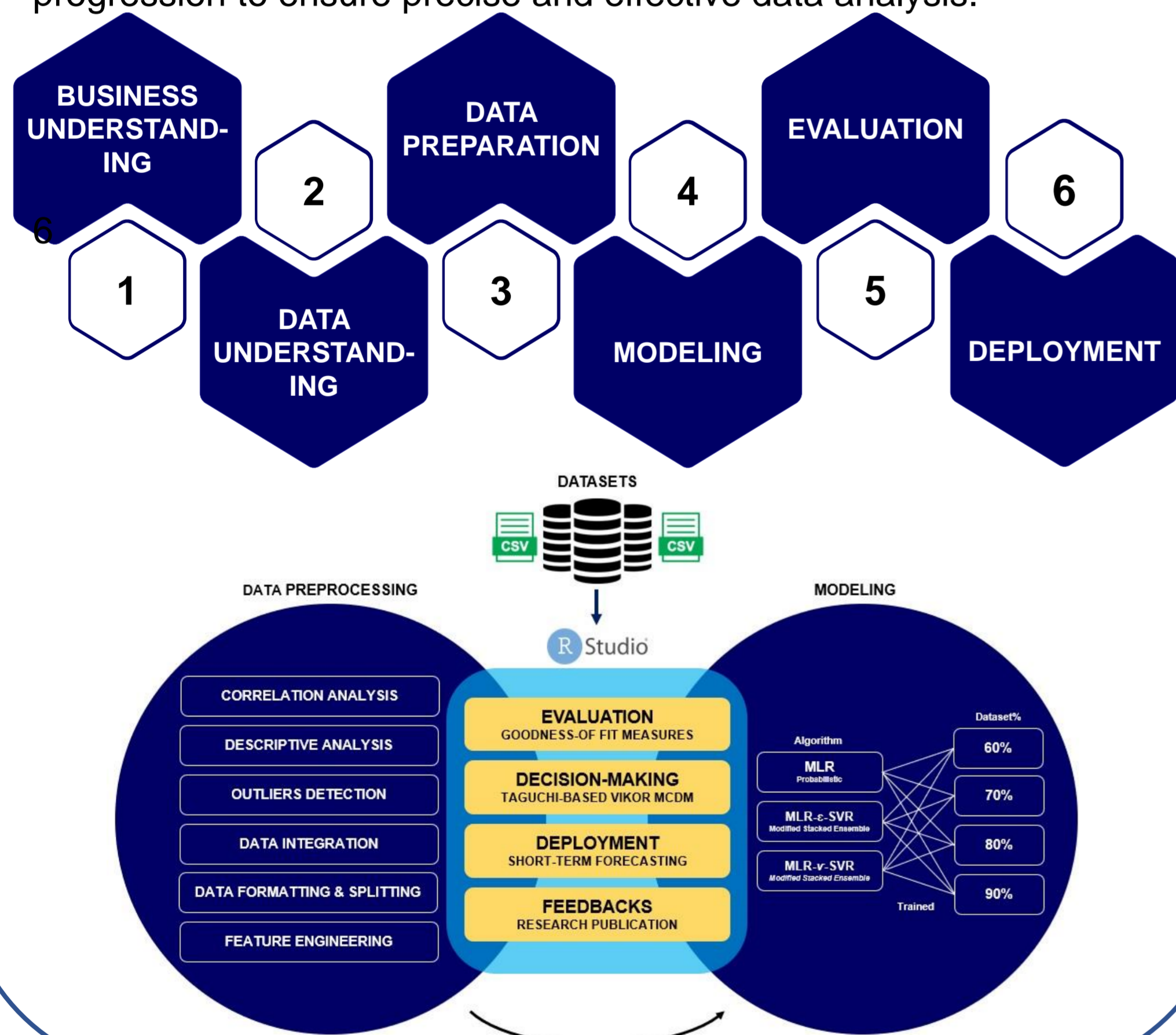
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1 RESEARCH BACKGROUND

This project addresses escalating food security challenges in Southeast Asia using an innovative AI-based predictive algorithm. Employing the CRISP-DM framework, the algorithm integrates features to predict short-term rice production, focusing on availability, accessibility, and stability dimensions. Key determinants affecting rice production are categorized into clusters of atmospheric, socioeconomic, and farming practices. The study utilizes a novel modified stacked MLR-SVR algorithm, demonstrating high predictive capability, especially in limited datasets. Forecasting outcomes for 5-year rice production across low-middle and upper-middle income nations in Southeast Asia were generally favorable, with exceptions noted for Cambodia. The research holds promise for academia and industry, impacting agriculture, food production, data analytics, and technology sectors. Its insights inform decision-making and policy development for enhancing food security and sustainability in the region.

2 METHODOLOGY

This project utilized the CRISP-DM framework, following a linear progression to ensure precise and effective data analysis.

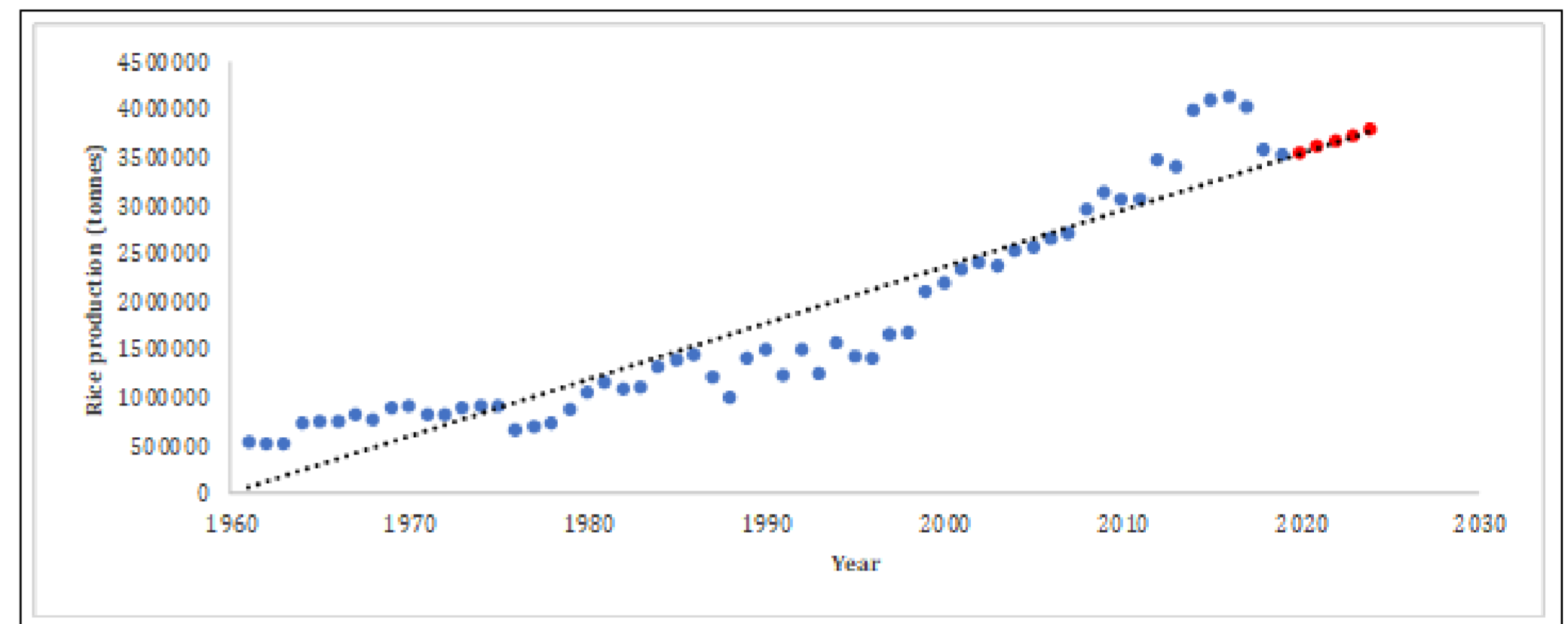


3 NOVELTIES

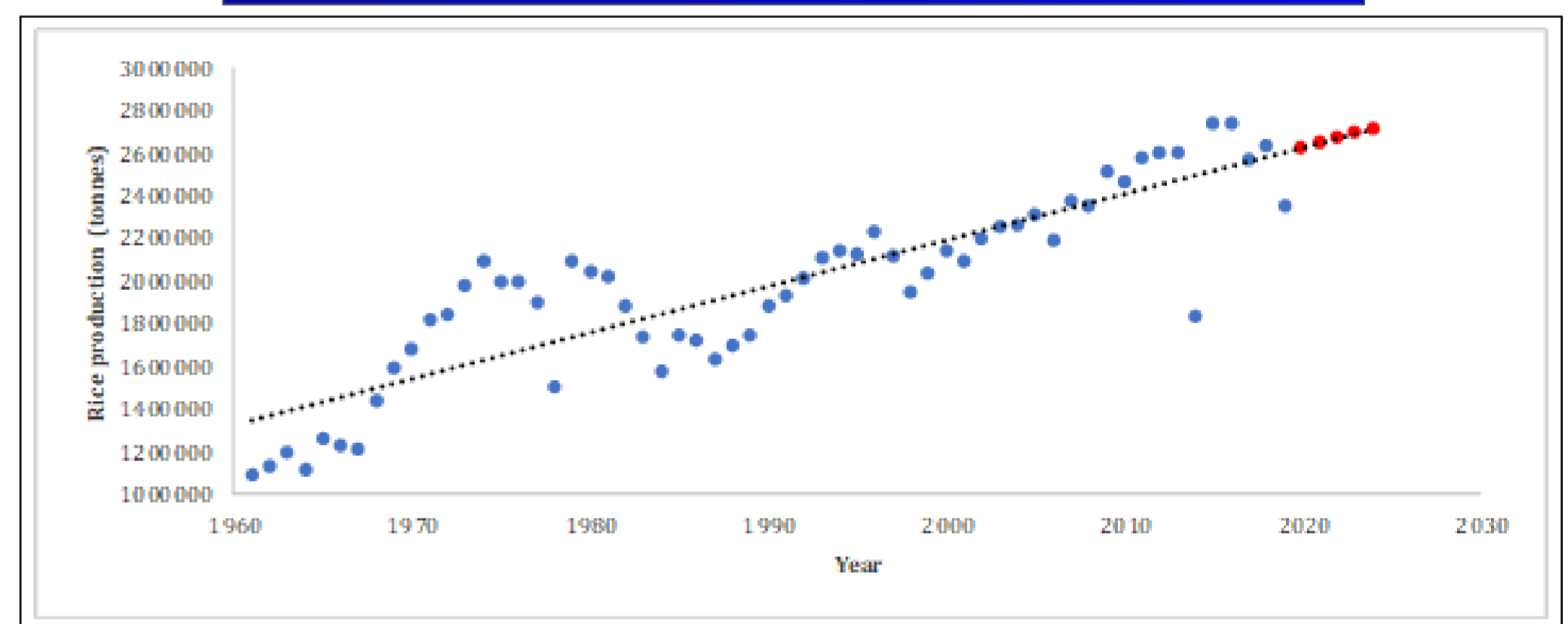
Unveiled Southeast Asia's pioneering modified AI-based predictive algorithm, reaching **Technology Readiness Level (TRL3)**, advancing accuracy and interpretability in agricultural forecasting.

4 ANALYSIS RESULTS

The following are the best and worst forecasting analysis results, selected based on the modified Taguchi-based VIseKriterijumska Optimizacija I Kompromisno Resenje (Taguchi-based VIKOR) multi-criteria decision-making algorithm.



MOST FAVORABLE OUTCOME: LAOS (LOW-MIDDLE-INCOME NATION)



LEAST FAVORABLE OUTCOME: MALAYSIA (UPPER-MIDDLE-INCOME NATION)

5 COMMERCIALIZED VALUE & POTENTIAL INDUSTRY COLLABORATOR

This study emphasized commercializing predictive insights for health products, agriculture, and policy decisions across Southeast Asia, featuring a collaboration with Dr. Sai Chong Yeh and Mr. Chong Teak Wei from Ever AI Technologies.

6 ACHIEVEMENTS

- ✓ Successfully completed Data Science Project (BAppSc (Data Analytics)(Hons))
- ✓ Awarded Silver for Final Year Project 2023 (STEM Category)
- ✓ Published in Data Analytics & Applied Mathematics Journal (2022, Indexed MyCite)
- ✓ Upcoming Proceedings Publication with industry collaboration (AIP Proceedings, Indexed Scopus)
- ✓ Manuscript under review with technical collaboration from UTeM and UPM for Jurnal Ekonomi Malaysia (Indexed Scopus)

7 ACKNOWLEDGMENTS

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