UNIVERSITI TEKNOLOGI MARA

PREDICTIVE ANALYTICS FOR STUDENT WELFARE CLASSIFICATION AND ZAKAT AID DISTRIBUTION AMONG STUDENTS UITM CAWANGAN PULAU PINANG

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ABSTRACT

This was a project to streamline the student welfare classification system of the zakat aid distribution process at Universiti Teknologi MARA (UiTM) Cawangan Pulau Pinang by creating a predictive analytics system. Despite implementing an online zakat application system, the overall decision-making process is still semi-mechanized and is largely reliant on manual evaluation, a factor capable of producing inconsistencies, inefficiency, and delays in dispensing aid. To overcome these issues, Cross-Industry Standard Process of Data Mining (CRISP-DM) methodology was employed by implementing classification technique and testing with 3 outstanding machine learning algorithms which are Naïve Bayes, Decision Tree and Random Forest. These algorithms were created and tested using RapidMiner software to classify the students into zakat categories: “Fakir”, “Miskin” and “Fisabilillah”. The assessment outcomes revealed high predictive accuracy of the Random Forest model of 97.40% and 99.54% in 5-fold and 10-fold cross-validation, respectively, which showed a high degree of consistency and reliability. Moreover, an aid distribution model was developed to predict the students to three levels of priority that are: “sangat memerlukan”, “memerlukan”, and “kurang memerlukan”. This ensures fair, systematic, and effective distribution of limited zakat funds based on different levels of financial need. The proposed Power BI dashboard would depict the welfare classification outcomes, aid priority rates, and zakat application trends at the four stages of the application, thus facilitating better monitoring, planning, and decisions based on data. Comprehensively, this project has shown that predictive analytics and business intelligence can help a great deal in making the Zakat Aid Distribution System more transparent, efficient and just, which can help to create a more legitimate and productive student welfare management practice for all university students.