Universiti Teknologi MARA

Predicting Bankruptcy Using Ant Colony Optimization

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STUDENT'S DECLARATION

I certify that this report and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

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ABSTRACT

Personal bankruptcy is a process in which a debtor is declared bankrupt in compliance with the Adjudication Order issued by the High Court against a debtor if they are unable to pay at least RM30,000 in their debts. Once a person's assets have been declared bankrupt, they will all be put under the administration of DGI. This study will minimize concerns or firms from bankruptcy if it is possible to detect and fight the bankruptcy tendency at an early stage. This study developed a classification model using Ant Colony Optimization for predicting bankruptcy. Ant colony optimization has been inspired by the action of the actual ant colony and is used to solve discrete optimization issues. Ant Colony Optimization is suitable for predictive rules simplicity, precision, specificity, and sensitivity. The data set was collected by involving 250 respondents. This study focussed on Industrial Risk, Financial Flexibility, Credibility, Management Risk, Operating Risk, and Competitiveness. To achieve the set objectives, this research is conducted through three-phase of research activities which are Data pre-processing, Model Development, and Model Validation. Data pre-processing method carries out certain computations such as data transformation (normalization, aggregation) to improve data quality. In model development, Ant-Miner was used which consists of three steps. In model validation, to quantify accuracy by approving the informational collection, Ant Colony Optimization Algorithm was used and it was compared with the J48 algorithm. The accuracy of the model for J48 is 98% while the accuracy of Ant-Miner is 99.6%. The results have shown that the Ant Colony Optimization Algorithm produced a better predictive accuracy. Therefore, it is confirmed that the Ant Colony Optimization Algorithm produces the most accurate result in predicting bankruptcy. This study also has shown that Ant Colony Optimization was a suitable technique in developing the classification model.

Keywords: Bankruptcy Prediction, Ant Colony Optimization, Ant-Miner, Data Mining, J48

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