THE IMPLEMENTATION OF MSME CREDIT LOAN ELIGIBILITY DETERMINATION USING MACHINE LEARNING TECHNOLOGY WITH K-NEAREST NEIGHBORS (KNN) ALGORITHM

MUCHAMAD TAUFIK NAWAWI
Informatics Study Program, Faculty of Science and Technology
University of Technology Yogyakarta
Jl. Ringroad Utara, Jombor, Sleman, Yogyakarta
E-mail: nawawisk2@gmail.com

ABSTRACT

This study aims to develop a predictive model to determine loan eligibility for Micro, Small, and Medium Enterprises (MSMEs) using the K-Nearest Neighbors (KNN) algorithm. The dataset used includes variables such as business duration, number of employees, total assets, and net turnover. The data was divided into training and testing sets with a 70:30 ratio. The KNN model was trained on the training data to classify loan eligibility based on a specified value of k. The prediction output consists of a binary decision—whether the loan is approved or rejected—along with the probability of each outcome. The results show that the KNN model achieved an accuracy rate of 83.939% in predicting loan eligibility. Based on the predictions, 929 MSME entries were deemed eligible for loans according to the KNN model, while 170 were classified as ineligible. The study also highlights the significance of the k parameter in determining data proximity and its impact on prediction results. In conclusion, the KNN algorithm proves to be an effective tool in identifying MSMEs that are eligible for credit, offering valuable support for financial institutions in making more accurate lending decisions. These findings contribute to the advancement of decision support systems in the banking and financial sectors, especially for evaluating MSME loan eligibility.

Keywords: *K-Nearest Neighbors, MSMEs, Loan Eligibility, Predictive Model, KNN Algorithm.*