ABSTRACT

Company bankruptcy prediction is a crucial aspect of financial risk management. This study develops a bankruptcy prediction system based on ensemble learning to evaluate and compare the effectiveness of various methods in identifying companies at risk of bankruptcy. Eight ensemble models were implemented—Gradient Boosting, AdaBoost, XGBoost, CatBoost, Voting Classifier, Bagging, Random Forest, and LightGBM—using the Taiwan Economic Journal dataset (1999–2009), which contains 95 financial attributes of companies. The best-performing model was selected based on the highest recall score for the bankrupt class. Experimental results indicate that all models achieved high accuracy in detecting non-bankrupt companies (with an average accuracy above 96%). Among them, AdaBoost outperformed other models in predicting bankruptcies, achieving a recall of 24%, while maintaining an overall accuracy of 96%. As a practical implementation, an interactive dashboard was also developed using Flask, allowing users to predict company bankruptcy easily. This dashboard facilitates the visualization of classification results and provides an option to download prediction outcomes, thereby supporting more efficient and structured decision-making.

Keywords: bankruptcy prediction, ensemble learning, machine learning, dashboard, model evaluation