

## **ABSTRACT**

*Pulmonary tuberculosis (pulmonary TB) is still a serious health problem in Indonesia, especially in cases with comorbidities that often escape early diagnosis. The identification process based on conventional methods still has limitations in terms of time efficiency related to diagnosis results. This study aims to develop a classification system for pulmonary TB and pulmonary TB with comorbidities using the Extreme Gradient Boosting (XGBoost) algorithm based on clinical factors. The methodology used in this study is CRISP-DM, which includes business understanding, data understanding, data preparation, modeling, evaluation, and system deployment. The data used comes from medical records of hospital patients that include clinical symptoms, medical history, and laboratory test results. Model evaluation is carried out by dividing training and testing data, as well as finding the best configuration through hyperparameter tuning. This study obtained the best model at a ratio of 80:20 with an accuracy of 96.67%, an AUC value of 99.79%, and a loss of 7.14%. Based on the feature importance analysis, it shows that ESR, Platelets, Age, and Body Weight are the most influential attributes in this classification. The system is also developed into a web-based interactive dashboard that allows users to make predictions and see the main risk factors of the disease visually. Thus, this system functions as an early warning system to support medical decision-making and educational media for the community.*

**Keywords—***comorbidity, extreme gradient boosting, feature importance, interactive dashboard, pulmonary tuberculosis*