

## ABSTRACT

This research employs Naïve Bayes and K-Nearest Neighbor (KNN) machine learning algorithms to predict waiting periods for Telkom University alumni, because KNN utilizes the similarity of historical data, while Naïve Bayes copes well with data complexity and variation. Tracer studies at Telkom University, a prominent institution, collect alumni data, providing crucial feedback for educational enhancement and refining future graduates' caliber. This empirical research serves the central objective of gauging the success of educational programs in equipping graduates with the necessary knowledge, skills, and competencies for the professional realm. Four classification scenarios are explored, ranging from 2 to 5 labels, to determine the most accurate predictive model. The dataset undergoes meticulous preprocessing, including standardization, missing value handling, and variable conversion. Target variable transformation simplifies the prediction task, and feature selection is applied to focus on competency evaluation. The dataset is normalized and split into a training set and a test set for subsequent analysis. After that, the Naïve Bayes and K-Nearest Neighbors methods are applied, and evaluation of the machine learning models utilizes accuracy, precision, recall, and F1-score metrics. Comparative analysis reveals that Naïve Bayes and KNN demonstrate higher accuracy in binary classification, with Naïve Bayes achieving 87.22\% accuracy and KNN achieving 87.46\%. As the number of labels increases, accuracy diminishes, emphasizing the challenges in handling more complex classification scenarios.