

ABSTRACT

This study analyzes the distribution of scores from the National Insight Test (TWK), General Intelligence Test (TIU), and Personal Characteristics Test (TKP) of 2,490 candidates in the 2024 Ministry of Finance CPNS exam using machine learning methods to identify weaknesses in the test design and recommend data-driven improvements. Clustering with the K-means method ($k=3$) grouped participants into three clusters: high TKP but low TWK/TIU scores (approximately 65% pass rate), relatively balanced scores across all three tests (about 55% pass rate), and low TKP but high TWK scores (around 30% pass rate), with a Silhouette Score of 0.59, indicating a reasonably good clustering quality. Classification models—Logistic Regression (accuracy 0.7897), Random Forest (accuracy 0.9779), and XGBoost (accuracy 0.9809)—demonstrated strong performance, especially the ensemble models. However, the presence of false negatives highlights the dominance of less discriminative TKP scores and limited variation in TIU and TWK scores. These findings reveal an imbalance in the weighting of the test components, suggesting the need to revise the TKP section by incorporating more complex ethical scenarios, increase the difficulty of TIU questions through more challenging logic or data analysis, and update TWK content with contemporary national issues. Such improvements are expected to enhance the overall discriminatory power of the tests. This study provides important empirical insights to optimize CPNS test design, aiming to ensure a more valid, fair, and data-driven selection process through value pattern analysis using machine learning.

Keywords: *Recruitment Prediction, Machine Learning, Recruitment Decision Classification, CPNS Selection*