Integration of Employee Attrition And Sentiment Analysis Model with User-Centric GUI

Mrs. Roshani V. Pawar[1], Varad R. Ijantkar[2], Shruti S. Bhandari[3],
Dinesh M. Madansure[4], Sakshi S. Jadhav[5]

Asst. Professor, Department of Computer Engineering[1]
Students, Department of Computer Engineering[2-5]
NBN Sinhgad Technical Institute Campus, Pune, India

Abstract: *Employee retention has become a critical challenge for modern organizations, with unexpected resignations causing operational setbacks and increased recruitment costs. While machine learning models are frequently used to identify potential attrition risks, they often fail to consider the emotional drivers behind an employee's decision to leave. This work presents a dual-model framework that combines an oversampled Random Forest classifier—trained on structured HR data—with a BERT-based sentiment analysis model trained on employee feedback. Unlike traditional systems, this platform allows for real-time predictions triggered by data uploads or edits, and provides visual insights through a user-centric GUI. The integration of emotional feedback and structured analysis offers deeper, context-aware prediction results, helping HR teams act swiftly and accurately to address potential churn. The system is designed with modularity and ease of use in mind, ensuring scalability across varying organizational environments.*

Keywords: Employee Turnover, Hybrid HR Analytics, Feedback-Driven Prediction, BERT Sentiment Scoring, Attrition Detection System