

Data-Driven Strategies for Sustainable Employee Retention: Leveraging Machine Learning to Predict and Prevent Attrition

Shobhanam Krishna* and Debajyoti Borah**

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Abstract

Employee attrition is a persistent concern for businesses since it has an adverse effect on production, economic conditions, and morale. With rising attrition rates, particularly in sectors like information technology, understanding and predicting employee turnover is critical for organizational success and sustainability. The primary objective of this research is to employ machine learning techniques for understanding, predicting, and mitigating attrition. This study is dedicated to thoroughly exploring attrition dynamics using a dataset crafted to closely resemble real-world HR scenarios within a fictional organization. This study utilizes a machine learning technique to evaluate the effectiveness of three classifiers in predicting employee attrition: Logistic Regression, SVM, and Random Forest. Performance evaluation is done using the confusion matrix and AUC-ROC curve. The study reveals that on the test set, the logistic regression framework performs the best among all. The paper emphasizes the significance of developing effective retention strategies that tackle the root causes of attrition to reduce the attrition rate, enhance employee satisfaction, and create a more stable work environment. Incorporating the strategic implications presented in this paper can result in sustained growth and success for organizations while fostering sustainable economic, social, and environmental advancement. Additionally, future research could explore other machine learning methods, such as unsupervised learning and reinforcement learning, to gain a more comprehensive understanding of employee behavior and motivating factors.

Key Words

Employee attrition, Logistic regression, Machine learning, Sustained growth, Support Vector Machine (SVM)

Author Biography

Shobhanam Krishna

Research Scholar, Department of Organizational Behaviour and Human Resources, Indian Institute of Management Shillong, Shillong, India; and is the corresponding author. E-mail: shobhak.phd22@iimshillong.ac.in

Debajyoti Borah

Officer, Department of Technology Management, Defence Institute of Advanced Technology, Pune, India. E-mail: debuborah@gmail.com

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