

Employee Attrition Prediction Using Predictive Analytics: A Survey-Based Study

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Abstract: *Employee attrition has become a major concern for organizations across industries due to its impact on productivity, operational continuity, and organizational performance. High employee turnover results in increased recruitment costs, loss of experienced talent, and reduced employee morale. This study investigates the key factors influencing employee attrition and examines the effectiveness of predictive analytics in identifying employees who are at a higher risk of leaving an organization. Primary data were collected from 89 working professionals through a structured questionnaire, complemented by insights from secondary sources such as research articles and industry reports. The study identified factors including career growth opportunities, compensation and benefits, work-life balance, workload, training and development, recognition, supervisor support, and workplace culture as significant determinants of employee retention. The findings demonstrate that predictive analytics can assist organizations in analysing employee behaviour, recognizing attrition patterns, and supporting evidence-based human resource decisions. By leveraging data-driven models, organizations can implement timely retention strategies, improve employee engagement, and optimize workforce planning. The study concludes that integrating predictive analytics into human resource management can enhance employee retention, reduce voluntary turnover, and contribute to long-term organizational sustainability and competitive advantage.*

Keywords: Employee Attrition, Predictive Analytics, Human Resource Analytics, Employee Retention, Machine Learning, Business Analytics

I. INTRODUCTION

Employee attrition has become a significant challenge for organizations in today's competitive business environment due to evolving workforce expectations, rapid technological advancements, and increasing employment opportunities across industries. Organizations invest substantial resources in recruiting, training, and developing employees; however, retaining skilled professionals remains a persistent concern. High employee turnover not only increases recruitment and training costs but also affects productivity, organizational knowledge, employee morale, and overall business performance.

Employee attrition refers to the voluntary or involuntary separation of employees from an organization. Voluntary attrition, in particular, is influenced by various factors such as limited career growth opportunities, inadequate compensation, poor work-life balance, excessive workload, insufficient recognition, and lack of professional development. Understanding these factors is essential for organizations seeking to enhance employee satisfaction and build a stable workforce.

Predictive analytics has emerged as an effective approach to addressing employee attrition by utilizing historical employee data, statistical techniques, and machine learning algorithms to identify individuals who may be at risk of leaving the organization. These predictive insights enable human resource professionals to implement proactive retention strategies, improve workforce planning, and support evidence-based decision-making. This study examines the key factors influencing employee attrition and evaluates the role of predictive analytics in helping organizations



strengthen employee retention, improve organizational performance, and achieve sustainable human resource management practices.

II. REVIEW OF LITERATURE

Recent studies have demonstrated considerable advancements in the application of predictive analytics and machine learning techniques for employee attrition prediction. Researchers have increasingly emphasized the importance of data-driven approaches in identifying employees who are at risk of leaving an organization and supporting effective human resource decision-making.

Al Mamun et al. (2025) reported that factors such as job satisfaction, overtime, monthly income, and years at the company significantly influence employee attrition. Gattermann, Hoffmann, and Schumann (2024) highlighted that employee turnover is affected by multiple organizational and individual factors, including career development opportunities, leadership quality, organizational commitment, and workplace culture. Similarly, Larose and Larose (2023) emphasized that predictive analytics and machine learning algorithms provide reliable methods for analysing employee behaviour and improving workforce retention strategies.

Several studies have concluded that classification models such as Logistic Regression, Decision Trees, Random Forest, and XGBoost achieve high accuracy in predicting employee attrition when trained on historical HR datasets. The literature further suggests that integrating predictive models with human resource practices enables organizations to identify potential attrition risks, implement targeted retention initiatives, and optimize workforce planning. Although previous research has focused extensively on improving prediction accuracy, there remains a need to combine analytical findings with practical managerial recommendations. This study seeks to address this gap by examining employee perceptions alongside predictive analytics to support evidence-based retention strategies and sustainable human resource management.

III. RESEARCH GAP

Previous research has extensively explored the application of machine learning and predictive analytics techniques for forecasting employee attrition across various industries. Although these studies have demonstrated promising prediction accuracy, many have primarily concentrated on developing and comparing predictive models using historical human resource datasets. Relatively fewer studies have integrated employees' perceptions regarding job satisfaction, career growth, compensation, work-life balance, recognition, and workplace culture through primary survey-based research. Furthermore, limited attention has been given to combining predictive analytics outcomes with practical human resource interventions that support employee retention. This study addresses this gap by incorporating employee perspectives collected through a structured questionnaire and examining the key organizational factors influencing attrition. The research also highlights how predictive analytics can assist human resource professionals in developing proactive retention strategies, improving workforce planning, and supporting evidence-based decision-making for long-term organizational sustainability.

IV. RESEARCH OBJECTIVES

Primary Objective:

- To analyze employee attrition using predictive analytics and identify the key factors influencing employee retention in organizations.

Secondary Objectives:

- To identify the major factors contributing to employee attrition.
- To assess employees' perceptions regarding job satisfaction, compensation, career growth, and work-life balance.
- To examine employees' intention to leave their current organization and the reasons influencing attrition.



- To evaluate the role of predictive analytics in identifying employees who are at risk of leaving the organization.
- To recommend effective employee retention strategies based on the findings to support data-driven human resource management and improve organizational performance.

V. RESEARCH METHODOLOGY

This study adopts a **descriptive research design** to examine the factors influencing employee attrition and to evaluate the role of predictive analytics in supporting employee retention. The research focuses on understanding employees' perceptions regarding job satisfaction, compensation and benefits, career growth opportunities, work-life balance, workload, recognition, training and development, supervisor support, and turnover intentions. The study aims to identify the key factors associated with employee attrition and provide practical recommendations for improving workforce retention through data-driven decision-making.

Research Design

Descriptive Research

Data Sources

Primary Data: Collected through a structured questionnaire administered to working professionals from different organizations.

Secondary Data: Collected from research papers, academic journals, books, industry reports, websites, and published studies related to employee attrition, predictive analytics, human resource analytics, and machine learning.

Sample Size

A total of **89 respondents** participated in this survey.

Sampling Technique

Convenience Sampling

Data Collection Method

Google Forms questionnaire and direct responses from respondents.

Area of Study

Working professionals employed across various organizations in India, with a majority of respondents belonging to the IT/Software sector.

Data Analysis Tools

- Percentage Analysis
- Tabular Analysis
- Graphical Representation
- Microsoft Excel

Research Period

This study was conducted during the academic year 2025–26 as part of an MBA (Business Analytics) research project.

Particulars	Description
Research Design	Descriptive
Sample Size	89 Respondents
Sampling Technique	Convenience Sampling
Data Collection Tool	Structured Questionnaire (Google Forms)
Data Sources	Primary and Secondary
Industry	Multi-sector (Predominantly IT/Software)
Analysis Tools	Percentage Analysis, Tabular Analysis, Graphical Representation, Microsoft Excel
Area of Study	Working Professionals in India
Research Period	Academic Year 2025–2026

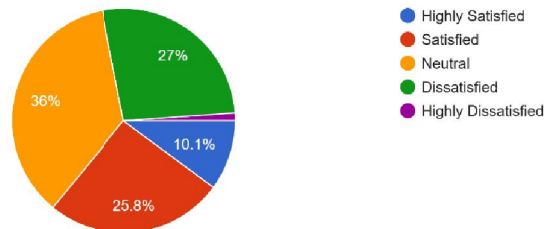


VI. RESULTS

1. Are you satisfied with your current compensation and benefits package?

Highly Satisfied
Satisfied
Neutral
Dissatisfied
Highly Dissatisfied

5. Are you satisfied with your current compensation and benefits package?
89 responses



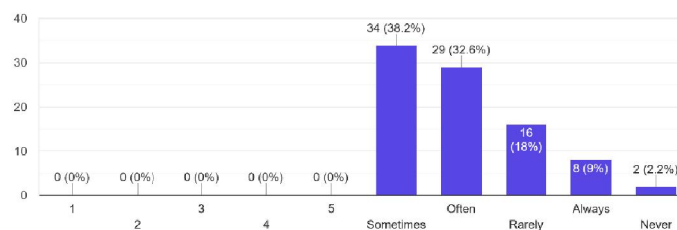
Interpretation:

Satisfaction Level	Percentage	Approx. Number of Respondents
Highly Satisfied	10.1%	09
Satisfied	25.8%	23
Neutral	36%	32
Dissatisfied	27%	27
Highly Dissatisfied	1.1%	1
Total	100%	87

2. Do you feel your workload is manageable?

Sometimes
1
2
3
4
5
Never

7. Do you feel your workload is manageable?
89 responses



Interpretation:

Response	Number of Respondents	Percentage
Sometimes	34	38.2%
Often	29	32.6%
Rarely	16	18%
Always	8	9%
Never	2	2.2%
Total	89	100%

VII. DATA ANALYSIS AND FINDINGS

Respondent Profile

The survey consisted of 89 working professionals, with the majority of respondents belonging to the IT/Software industry. Most participants were between 25 and 30 years of age, employed at the executive level, and had 1–3 years of work experience in their current organization. This respondent profile represents employees in the early and middle stages of their careers, making the findings relevant for analyzing employee attrition and retention factors.

Job Satisfaction

More than half of the respondents expressed satisfaction with their current jobs. However, a considerable proportion reported neutral or dissatisfied opinions, indicating opportunities for organizations to improve employee engagement and workplace satisfaction.

Compensation and Benefits

Compensation emerged as one of the major concerns among respondents. Although several employees were satisfied with their salary and benefits, many reported neutral or dissatisfied opinions, suggesting that competitive compensation plays a significant role in employee retention.

Work-Life Balance and Workload

The findings indicate that while many respondents rated their work-life balance as good, a substantial proportion experienced average or poor work-life balance. Similarly, many employees reported that their workload was manageable only sometimes, reflecting periodic work pressure that may influence turnover intentions.

Career Growth and Training Opportunities

Career growth opportunities were identified as one of the most important factors affecting employee retention. Many respondents expressed neutral or negative opinions regarding career advancement and training opportunities, indicating the need for organizations to strengthen professional development initiatives.

Recognition and Workplace Environment

Employee recognition, feeling valued, and maintaining positive relationships with immediate supervisors were found to have a considerable influence on employee satisfaction. Respondents indicated that consistent recognition, supportive leadership, and a respectful workplace culture contribute positively to organizational commitment.

Employee Attrition Intentions

A significant proportion of respondents reported that they had considered leaving their current organization either occasionally or frequently. The primary reasons identified for potential attrition were limited career growth opportunities, better salary prospects, higher education, work-life balance concerns, and management-related issues.



These findings suggest that both financial and non-financial factors influence employees' decisions to remain with or leave an organization.

Role of Predictive Analytics

The findings highlight the importance of predictive analytics in identifying employees who may be at risk of attrition. By analyzing factors such as job satisfaction, compensation, career growth, overtime, work-life balance, recognition, and turnover intentions, organizations can proactively design retention strategies, improve workforce planning, and support evidence-based human resource decision-making.

VIII. DISCUSSION

The findings of this study indicate that employee attrition is influenced by a combination of organizational and individual factors rather than a single variable. Career growth opportunities, compensation and benefits, work-life balance, overtime, employee recognition, training and development, and relationships with supervisors emerged as the most significant factors affecting employees' intention to leave their organizations. These findings are consistent with previous studies, which emphasize that employee satisfaction, organizational support, and career development play crucial roles in workforce retention.

The study also demonstrates the value of predictive analytics in supporting strategic human resource management. By analyzing employee-related data and identifying patterns associated with attrition risk, organizations can proactively recognize employees who may be likely to leave. Human resource managers can then implement targeted interventions such as career development programs, competitive compensation policies, employee recognition initiatives, flexible work arrangements, and personalized engagement strategies. This proactive, data-driven approach enables organizations to improve employee retention, optimize workforce planning, reduce recruitment costs, and enhance long-term organizational performance.

IX. RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proposed:

Implement predictive analytics systems to continuously monitor employee attrition risk and identify employees who may require timely retention interventions.

Develop personalized employee retention strategies by addressing individual needs related to career development, learning opportunities, work-life balance, and job satisfaction.

Strengthen career growth and training programs by providing transparent promotion policies, skill development initiatives, mentoring, and continuous learning opportunities.

Enhance compensation and reward systems by offering competitive salaries, performance-based incentives, recognition programs, and comprehensive employee benefits.

Promote work-life balance through flexible work arrangements, balanced workload distribution, employee wellness programs, and initiatives that reduce workplace stress and burnout.

Leverage advanced machine learning and HR analytics techniques to improve the accuracy of employee attrition prediction and support data-driven human resource decision-making.

Improve employee engagement and organizational culture by encouraging open communication, strengthening supervisor-employee relationships, recognizing employee contributions, and fostering an inclusive and supportive work environment.

X. CONCLUSION

Employee attrition continues to be a significant challenge for organizations as it directly affects workforce stability, productivity, operational efficiency, and long-term business performance. This study demonstrates that factors such as career growth opportunities, compensation and benefits, work-life balance, employee recognition, training and



development, supervisor support, and workplace culture play a vital role in influencing employees' decisions to remain with or leave an organization.

The research further highlights the importance of predictive analytics in identifying employees who may be at risk of attrition. By utilizing employee data to detect behavioral patterns and attrition indicators, organizations can implement timely and targeted retention strategies that enhance employee engagement, improve job satisfaction, and strengthen workforce planning. Therefore, integrating predictive analytics into human resource management is not only a technological advancement but also a strategic approach to reducing employee turnover, optimizing talent retention, and achieving sustainable organizational growth in an increasingly competitive business environment.

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