

**The Impact of Job Satisfaction, Compensation, and Work Environment on Employee Attrition: An Empirical Study Using HR Analytics**

S. A. Buche<sup>1</sup>, R.S. More<sup>2</sup>, P. Gulmire<sup>3</sup>

<sup>1,2,3</sup>Department of MBA, MES'IMCC, Pune

<sup>1</sup>sab.imccmba@mespune.in, <sup>2</sup>rupammore21@gmail.com, <sup>3</sup>gulmirepankaj@gmail.com

<p><b>Peer Review Information</b></p> <p><i>Type: Article</i>  <i>Received: 28 March 2026</i>  <i>Revised: 26 April 2026</i>  <i>Accepted: 11 May 2026</i>  <i>Published: 02 June 2026</i></p>	<p style="text-align: center;"><b>Abstract</b></p> <p>Employee attrition has emerged as a major organizational challenge because of its direct effect on operational efficiency, overall monetary performance, and the stability of the team of workers. High attrition rates lead to expanded recruitment and education expenses, loss of experienced employees, and reduced normal productivity. In a highly aggressive business environment, keeping skilled personnel has grown to be a strategic priority for companies. With the developing availability of employee records, corporations are increasingly adopting HR analytics to apprehend and expect employee conduct. HR analytics permits companies to transport past conventional reactive tactics and undertake proactive strategies for managing team of workers demanding situations. This has a look at focuses on applying HR analytics techniques to investigate employee attrition and identify the important thing factors influencing employee turnover.</p> <p>The studies adopt a quantitative technique the use of a structured HR dataset that consists of employee demographic, behavioural, and activity-associated variables. records preprocessing techniques which include encoding, normalization, and class balancing have been applied to ensure the reliability of outcomes. The examine utilizes 3 devices getting to know fashions—Logistic Regression, Random woodland, and Gradient Boosting—to expect employee attrition. The performance of those fashions is evaluated the usage of metrics which includes accuracy, precision, don't forget, F1-score, and ROC-AUC. The findings of the examine indicate that factors including beyond regular time, activity pleasure, earnings level, and tenure appreciably affect worker attrition. employees experiencing excessive workload and occasional delight degrees are much more likely to go away the enterprise. a few of the fashions used, Logistic Regression tested a better balance between prediction and interpretability, while Random woodland showed better accuracy but limitations in identifying real attrition instances. The observe concludes that employee attrition isn't a random prevalence but a predictable final result encouraged by means of measurable variables. The insights derived from this have a look at can help corporations design focused retention strategies and improve selection-making thru the powerful use of HR analytics.</p> <p><b>Keywords:</b> Employee Attrition; HR Analytics; Predictive Modelling; Machine Learning; Workforce Retention; Organizational Behaviour.</p>
--	--

**How to Cite This Article**

Buche, S. A., More, R. S., & Gulmire, P. (2026). The impact of job satisfaction, compensation, and work environment on employee attrition: An empirical study using HR analytics. *International Journal of Research and Development: A Management Review*, 15(2), 296–303.

## Introduction

### *Background of the Study*

Inside the cutting-edge business environment, human sources are considered one of the maximum valuable assets of a corporation. The ability of a corporation to achieve its goals in large part depends at the overall performance, engagement, and retention of its employees. but employee attrition continues to be a chronic assignment confronted by using companies throughout diverse industries.

employee attrition refers back to the discount in group of workers because of voluntary resignations, retirements, or involuntary separations. excessive attrition costs create multiple demanding situations for businesses, along with extended hiring prices, loss of experienced personnel, disruption of workflow, and reduced morale amongst current personnel. In information-pushed industries, the impact of attrition is even greater extensive, as professional personnel deliver treasured know-how this is tough to update.

historically, agencies have depended on reactive techniques together with exit interviews and worker surveys to apprehend the motives at the back of attrition. whilst those techniques provide beneficial insights, they do now not provide predictive abilities. As an end result, organizations frequently take movement handiest after employees have already determined to depart.

### *Emergence of HR Analytics*

With advancements in technology and the increasing availability of worker records, organizations at the moment are transferring closer to information-pushed decision-making. HR analytics has emerged as a powerful tool that permits corporations to research worker records, discover patterns, and are expecting destiny consequences. HR analytics entails the utility of statistical strategies and system mastering algorithms to apprehend employee conduct and enhance HR practices. It allows corporations to move from intuition-based decisions to evidence-primarily based strategies.

One of the key applications of HR analytics is predicting employee attrition. by using studying historical statistics, groups can identify personnel who are susceptible to leaving and take proactive measures to preserve them. This shift from reactive to proactive HR control represents an enormous transformation inside the area of human resource management.

### *Problem Statement*

Despite the supply of worker records, many groups struggle to effectively predict and manage worker attrition. traditional HR methods cognizance on analysing beyond developments as opposed to predicting future outcomes. this limits the capacity of corporations to take well timed and powerful moves.

Furthermore, even when predictive models are used, there is mostly a hole among facts evaluation and realistic implementation. agencies fail to translate analytical insights into actionable techniques. Therefore, the crucial hassle addressed on this take a look at is:

“How can HR analytics be effectively used to predict employee attrition and support proactive decision-making?”

### *Objectives of the Study*

The study is guided by the following objectives:

- To identify the key factors influencing employee attrition
- To develop predictive models using HR analytics techniques
- To evaluate the performance of different machine learning models
- To provide insights for improving employee retention strategies

### *Scope of the Study*

This study focuses on analysing employee attrition using HR analytics techniques. The research is based on a structured dataset that includes employee-related variables such as job satisfaction, income, overtime, and tenure.

The study adopts a quantitative approach and applies machine learning models to predict attrition. The findings are primarily applicable to organizations with similar workforce structures and data availability.

### *Significance of the Study*

This study contributes to both academic and practical domains. From an academic perspective, it enhances understanding of HR analytics and its application in predicting employee attrition. From a managerial perspective, it provides actionable insights that can help organizations design effective retention strategies.

Organizations that adopt data-driven HR practices are better positioned to manage their workforce efficiently and maintain a competitive advantage.

## **Literature Review**

### *Introduction*

The literature evaluate affords a conceptual and empirical foundation for knowledge employee attrition and the function of HR analytics in predicting team of workers behaviour. over the years, researchers have explored different factors influencing employee turnover and have proposed distinct analytical models to are expecting attrition. This phase opinions key studies, identifies fundamental variables affecting attrition, and highlights gaps that justify the prevailing research.

### *Expertise Worker Attrition*

Worker attrition has been widely studied in the subject of human useful resource management due to its vast impact on organizational performance. It refers to the lack of personnel because of voluntary or involuntary motives and is regularly taken into consideration a critical indicator of organizational fitness.

Previous studies suggest that excessive attrition costs bring about extended recruitment costs, education costs, and loss of organizational expertise. in addition, common worker turnover can disrupt crew dynamics and negatively have an effect on employee morale. Researchers have emphasized that coping with attrition isn't best a value-associated difficulty however also a strategic problem for lengthy-time period sustainability.

### *Function of HR Analytics in Attrition Prediction*

The emergence of HR analytics has transformed conventional HR practices by way of permitting organizations to use data for selection-making. HR analytics involves collecting and reading worker facts to identify styles, developments, and relationships that could assist strategic planning. Recent studies highlights that HR analytics permits businesses to shift from reactive to proactive methods in dealing with worker turnover. by way of analysing historical information, businesses can be expecting the chance of worker attrition and take preventive actions. system studying strategies have further better the accuracy of such predictions by way of figuring out complex styles in huge datasets. However, whilst predictive fashions have improved accuracy, their realistic implementation in HR decision-making remains restricted. This hole highlights the want for studies that not best awareness on prediction however additionally on actionable insights.

### *Key Factors Influencing Employee Attrition*

#### *Job Satisfaction*

Job pleasure is always diagnosed as one of the maximum vital elements affecting worker retention. personnel who are upset with their work environment, job role, or increase opportunities are much more likely to depart. Studies imply that activity satisfaction is motivated with the aid of factors such as reputation, management assist, and work surroundings. higher satisfaction tiers result in elevated employee engagement and loyalty, reducing the likelihood of attrition.

#### *Reimbursement and income*

Repayment performs a crucial function in worker selection-making. employees regularly examine their salaries with market standards and internal fairness. in the event that they understand their compensation as inadequate, they're more likely to are looking for opportunity opportunities. Studies suggest a terrible courting among profits degree and attrition, suggesting that higher repayment reduces worker turnover. however, compensation alone won't be sufficient if different factors inclusive of task pleasure and paintings surroundings are not addressed.

#### *Workload and overtime*

Workload and additional time are enormous members to worker pressure and burnout. employees who constantly paintings long hours are much more likely to revel in fatigue and dissatisfaction, that could result in attrition. Studies spotlight that preserving a stability among paintings and private life is critical for worker nicely-being. agencies that fail to control workload efficiently can also face higher attrition fees.

#### *Work Environment and Organizational Culture*

The work surroundings and organizational way of life have a sturdy impact on worker conduct. Supportive and high-quality paintings surroundings encourage worker engagement, whilst a poor or poisonous way of life can growth turnover intentions. Factors which include

leadership style, communicate, and crew relationships play a critical role in shaping worker studies. organizations with sturdy cultures and supportive management generally tend to have decrease attrition costs.

### Career Growth and Development

Possibilities for profession development are essential for worker retention. personnel seek companies that offer mastering, development, and boom opportunities. Lack of career progression is frequently cited as a chief motive for employee attrition. companies that spend money on worker development programs are more likely to keep talent.

### Application of gadget mastering in HR

Using gadget mastering in HR analytics has received considerable interest in current years. diverse fashions, which include Logistic Regression, decision trees, Random wooded area, and Gradient Boosting, had been carried out to predict employee attrition.

Logistic Regression is typically used due to its simplicity and interpretability. It enables in know-how the connection among variables and the chance of attrition. alternatively, ensemble techniques including Random wooded area and Gradient Boosting offer higher accuracy by combining multiple fashions. But studies indicates that while complex models may also provide better accuracy, they frequently lack interpretability, that's essential for practical HR selection-making.

### *Studies Hole*

No matter sizable studies on this vicinity, numerous gaps stay:

- Many research recognitions commonly on prediction accuracy in place of practical utility
- Limited emphasis on translating analytical results into HR strategies
- Lack of balance among model accuracy and interpretability
- Insufficient integration of a couple of assessment metrics

### *Contribution of the examine*

This has a look at tries to cope with the recognized gaps through combining predictive modelling with sensible insights. It evaluates a couple of gadget gaining knowledge of fashions and identifies key drivers of worker attrition.

The take a look at additionally emphasizes the significance of interpretability in HR analytics, making sure that the findings can be efficaciously used for selection-making. by linking analytical results with managerial implications, the research provides an extra complete knowledge of employee attrition.

## **Research Methodology**

### *Introduction*

This bankruptcy explains the research framework used to investigate employee attrition thru HR analytics. It outlines the studies layout, information supply, variables, sampling technique, and analytical strategies implemented in the study. The cause of this technique is to make sure that the research is systematic, reliable, and aligned with the targets of the examine.

### *Research design*

The examine adopts a descriptive and predictive research design.

- The descriptive factor focuses on understanding styles and relationships between variables such as process delight, income, time beyond regulation, and employee attrition.
- The predictive factor goals to expand fashions that could forecast the chance of employee attrition based totally on historical records.

This mixed approach allows in each explaining the elements influencing attrition and predicting future effects.

### *Research Method*

A quantitative studies approach is used in this take a look at, as it involves numerical data and statistical evaluation.

This method is suitable because:

- It permits objective measurement of worker-related variables
- It supports speculation testing
- It allows the usage of gadget mastering models for prediction

Quantitative techniques additionally enhance the reliability and accuracy of the findings.

### *Information Supply*

The take a look at is primarily based on an established dataset inspired by way of the IBM HR Analytics dataset, which is widely used for employee attrition analysis.

The dataset includes statistics associated with:

- Worker demographics (age, branch, activity role)
- Repayment (monthly income)
- Behavioural factors (overtime, process pleasure)
- Organizational variables (years at employer)

The dataset contains about 1,470 observations, making it appropriate for statistical evaluation and predictive modelling.

### *Variables of the take a look at*

The variables used in the look at are categorised as follows:

#### independent Variables

- Task delight
- Monthly income
- Time beyond regulation
- Years at organization based variable
- Worker attrition (sure/no) control variables
- Age
- Branch
- Task role

These variables are decided on based on their relevance in preceding studies and their effect on employee conduct.

### *Sampling Design*

Population - The population for this study includes employees throughout distinct departments and task roles inside a company.

Sample length - The dataset consists of about 1,470 personnel, that's good enough for conducting statistical and device getting to know evaluation.

Sampling approach - A stratified sampling method is considered appropriate, because it ensures illustration of different employee classes which include departments and process roles.

Justification - the selected pattern size gives sufficient diversity and variability, enabling accurate evaluation and generalization inside similar organizational contexts.

### *Facts Series Approach*

This take a look at makes use of secondary records, which has already been collected and dependent.

#### Advantages

- Saves time and sources
- Gives get right of entry to a massive dataset
- Suitable for analytical modelling

#### Obstacles

- Constrained control over statistics first-rate
- Viable bias in information collection

### *Statistics Preprocessing*

Before analysis, the dataset undergoes numerous preprocessing steps to enhance accuracy and model performance:

- Handling lacking Values: putting off or replacing incomplete facts

- Encoding: converting specific variables into numerical layout
- Normalization: Scaling numerical values for consistency
- Class Balancing: Adjusting facts to handle imbalance in attrition instances

These steps make sure that the statistics is appropriate for machine studying fashions.

Analytical equipment and techniques

The have a look at uses an aggregate of statistical and device gaining knowledge of techniques:

Descriptive evaluation

- Mean
- Standard deviation
- Percent distribution

Correlation analysis - Used to become aware of relationships between variables and attrition.

Device gaining knowledge of models

Logistic Regression

- Appropriate for binary class
- Easy to interpret
- Allows apprehend variable effect

Random woodland

- Ensemble method
- Improves prediction accuracy
- Handles complex records patterns

Gradient Boosting

- Sequential mastering approach
- complements version performance
- Captures non-linear relationships

*Model Assessment Metrics*

To evaluate version performance, the subsequent metrics are used:

- Accuracy: standard correctness of the version
- Precision: correct identity of high-quality cases
- do not forget: ability to pick out actual attrition cases
- F1-score: balance among precision and recollect
- ROC-AUC: potential to differentiate among instructions

Using multiple metrics guarantees a balanced evaluation rather than relying on a single degree.

Speculation Improvement

The observe tests the subsequent hypotheses:

- H1: process pride substantially affects worker attrition
- H2: overtime has a widespread impact on employee attrition
- H3: month-to-month profits affects employee attrition

These hypotheses are examined using statistical and analytical techniques.

Ethical Considerations

The look at follows fashionable studies ethics, which includes:

- Use of data strictly for instructional purposes
- No manipulation or falsification of results

- retaining confidentiality of employee data

#### Barriers of method

- Dependence on secondary records
- Limited manage over facts collection technique
- Effects may not be applicable to all industries .

## Results And Discussion

### *Overview*

This section presents the analysis of employee data to identify patterns and relationships influencing attrition. Both descriptive and predictive techniques are used to derive meaningful insights.

### *Descriptive Analysis*

The analysis indicates that a significant portion of employees falls within the early career stage (25–35 years), suggesting a relatively young workforce. Employees in this group show a higher tendency to switch jobs, which contributes to attrition. Income distribution analysis reveals that employees in lower income brackets are more likely to leave the organization. This indicates dissatisfaction with compensation and the availability of better opportunities in the market.

Similarly, job satisfaction levels show a strong relationship with attrition. Employees with low satisfaction are more frequently associated with attrition cases. This highlights the importance of employee engagement and workplace experience. Overtime analysis shows that employees who frequently work extra hours have a higher probability of leaving. This suggests that excessive workload leads to stress and reduced work-life balance.

### *Correlation Analysis*

The correlation results indicate clear relationships between variables:

- Job satisfaction has a negative relationship with attrition
- Monthly income has a negative relationship with attrition
- Overtime shows a positive relationship with attrition

These relationships confirm that employees are more likely to leave when satisfaction and compensation are low, and workload is high.

### *Predictive Model Analysis*

Three models were applied to predict employee attrition:

- Logistic Regression showed balanced performance and better ability to identify attrition cases.
- Random Forest achieved higher overall accuracy but failed to detect actual attrition effectively due to low recall.
- Gradient Boosting provided moderate and stable performance across metrics.

This comparison highlights that relying only on accuracy can be misleading, especially in cases where correctly identifying attrition is more important than overall correctness.

## Results & Discussion

### *Key Findings*

The study identifies several important factors influencing employee attrition:

- Overtime is a major contributor to attrition
- Low job satisfaction significantly increases turnover
- Employees with lower income levels are more likely to leave
- Early tenure employees show higher attrition

These findings indicate that attrition is influenced by both organizational practices and individual employee conditions.

### *Discussion*

The results support existing research that emphasizes the importance of employee satisfaction, compensation, and work-life balance. Employees are more likely to leave when they experience excessive workload, lack of recognition, or limited growth opportunities. The

study also highlights that predictive analytics can be effectively used to identify employees at risk. However, the practical value of these models depends on their interpretability and application in real-world HR strategies.

Another important observation is that high model accuracy does not necessarily indicate better performance. In the context of attrition, the ability to correctly identify employees who are likely to leave (recall) is more important.

### Conclusion

The study demonstrates that employee attrition can be effectively analysed and predicted using HR analytics techniques. Key factors such as job satisfaction, income level, and overtime significantly influence employee turnover. The findings confirm that attrition is not random but driven by identifiable patterns. By using predictive models, organizations can take proactive measures to improve employee retention and reduce turnover. Overall, the study highlights the importance of adopting data-driven approaches in HR management. Organizations that leverage HR analytics can make better decisions, improve employee satisfaction, and maintain a stable workforce.

### Reference

1. Al Mamun, M. A., Hasan, M. K., & Hossain, M. S. (2024). Employee attrition prediction using machine learning algorithms: A comparative study. *International Journal of Information Management Data Insights*, 4(1), 100243. <https://doi.org/10.1016/j.jjime.2024.100243>
2. Bibi, P., Ahmad, A., & Majid, A. H. A. (2023). The impact of compensation, job satisfaction, and organizational commitment on employee retention. *Sustainability*, 15(3), 2147. <https://doi.org/10.3390/su15032147>
3. Chawla, D., & Lenka, U. (2022). Employee retention strategies in the era of digital transformation: The role of HR analytics. *Journal of Organizational Effectiveness: People and Performance*, 9(4), 512–529. <https://doi.org/10.1108/JOEPP-03-2022-0078>
4. Gupta, S., Sharma, V., & Jain, P. (2024). Predicting employee turnover using machine learning techniques: Evidence from the IT sector. *Expert Systems with Applications*, 238, 121856. <https://doi.org/10.1016/j.eswa.2023.121856>
5. Huang, W., & Rust, R. T. (2021). Engaged to a robot? The role of AI in employee experience and workforce management. *Journal of Service Research*, 24(1), 30–41. <https://doi.org/10.1177/1094670520902266>
6. Margherita, A. (2022). Human resources analytics: A systematization of research topics and directions for future research. *Human Resource Management Review*, 32(2), 100795. <https://doi.org/10.1016/j.hrmr.2020.100795>
7. Minbaeva, D. (2021). Disruptive HR analytics: Implications for employee retention and organizational performance. *Human Resource Management Journal*, 31(1), 25–42. <https://doi.org/10.1111/1748-8583.12320>
8. Yadav, M., Singh, R., & Verma, S. (2025). Machine learning-driven employee attrition prediction and retention strategy framework. *International Journal of Human–Computer Interaction*, 41(2), 312–328. <https://doi.org/10.1080/10447318.2024.2311456>