Maneggio
E-ISSN : 3032-7652
https://nawalaeducation.com/index.php/MJ/index
Vol.2.No.6 December 2025
DOI: https://doi.org/10.62872/jmxrke23

Strategies for Implementing HR Predictive Analytics to Reduce Voluntary Turnover in Technology-Based Companies

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Inputted : November 10, 2025 *Revised : November 21, 2025*
Accepted : December 19, 2025 *Published : December 24, 2025*

ABSTRAK

Voluntary turnover pada perusahaan berbasis teknologi semakin meningkat dan berdampak pada instabilitas operasional serta kehilangan talenta digital. Penelitian ini bertujuan untuk menganalisis secara mendalam peran HR Predictive Analytics dalam merumuskan strategi retensi karyawan guna mengurangi turnover sukarela. Metode penelitian menggunakan pendekatan kualitatif deskriptif eksploratoris dengan analisis tematik terhadap literatur akademik dan praktik organisasi terkait transformasi manajemen SDM berbasis data. Hasil penelitian menunjukkan bahwa penyebab utama turnover mencakup burnout, stagnasi karier, rendahnya engagement, dan lemahnya interaksi kepemimpinan. HR Predictive Analytics berfungsi sebagai mekanisme reflektif untuk mengidentifikasi pola pengalaman kerja yang memicu ketidakpuasan dan meningkatkan risiko resign, sehingga organisasi dapat merancang intervensi retensi yang bersifat presisi. Strategi retensi berbasis analytics diarahkan pada empat aspek, yaitu manajemen beban kerja, pengembangan karier terstruktur, desain pekerjaan yang bermakna, dan peningkatan kompetensi kepemimpinan. Penelitian ini menyimpulkan bahwa strategi retensi berbasis HR Predictive Analytics menjadi pendekatan preventif dan berkelanjutan dalam menjaga stabilitas talenta digital di lingkungan industri teknologi.

Kata Kunci: analisis prediktif SDM, kelelahan kerja, keterlibatan karyawan, strategi retensi, turnover sukarela

ABSTRACT

Voluntary turnover in technology-based organizations has continued to escalate, resulting in operational disruption and significant loss of digital talent. This study aims to explore the role of HR Predictive Analytics in developing retention strategies to reduce voluntary turnover. A qualitative descriptive–exploratory approach was applied using thematic analysis of academic literature and organizational practices related to data-driven human resource management. The findings reveal that the primary drivers of turnover include burnout, career stagnation, low employee engagement, and weak leadership interaction. HR Predictive Analytics serves as a reflective mechanism to identify patterns in employee work experiences that contribute to dissatisfaction and increased resignation risk, enabling organizations to formulate precision-based retention interventions. Recommended analytics-driven retention strategies emphasize workload regulation, structured career development, meaningful job design, and leadership capability enhancement. This study concludes that HR Predictive Analytics supports preventive and sustainable talent stability strategies within the technology industry by aligning predictive insights with targeted retention initiatives.

Keywords: *burnout, employee engagement, HR Predictive Analytics, retention strategy, voluntary turnover*

INTRODUCTION

Technology-based industries are experiencing increasingly fierce competition for talent, making human resource stability a strategic factor in ensuring the sustainability of innovation and organizational performance. However, technology companies in various countries are facing the phenomenon of increasing voluntary turnover, which is when employees decide to leave the company voluntarily even though there has been no termination of employment by the organization. This condition causes significant financial losses for companies, especially in the form of recruitment costs, training, team productivity recovery, and the loss of tacit knowledge inherent in individual experience. Qin et al., (2023) emphasize that the digital industry faces fluctuating employee turnover rates due to the demands of work speed, rapid technological changes, and high career mobility.

In this context, voluntary turnover is not only a personnel issue, but also a strategic threat to the continuity of technology-based businesses. The development of information technology has encouraged companies to implement data-based HR management solutions in response to the challenge of turnover. The emergence of HR Predictive Analytics is an innovation that offers the ability to predict the risk of employee turnover and design more precise retention interventions.

HR Predictive Analytics combines big data, artificial intelligence, and employee behavior modeling to identify factors that influence an individual's decision to stay or leave an organization. Sahoo (2023) emphasizes that HR Predictive Analytics not only serves to map HR profiles but also provides a foundation for HRM to make strategic decisions relevant to the organization's needs.

Waloyo et al. (2024) also explain that HR management in the data-driven era has shifted from an administrative process to a real-time information-based decision-making system, including predicting potential employee resignations before they occur. Traditional HR management practices that have relied on intuition, annual reports, or manager observations are increasingly considered inadequate in addressing turnover risks in technology companies.

Digitally-oriented employees demand rapid career development, autonomy at work, certainty of recognition, and quality interpersonal relationships with superiors, so organizations need mechanisms to map employee needs more accurately. Sahoo et al., (2024) emphasize that weaknesses in building emotional and professional relationships between organizations and employees are the main triggers of turnover. These findings are in line with the research by Mulyadi et al. (2025), which shows that the high turnover rate at startups in Indonesia is influenced by the instability of the competency development system, the dynamics of work culture, and the absence of a clear career structure amid rapid business growth.

Thus, technology-based companies need data-driven tools to deeply understand the psychological and professional dynamics of their employees, so that retention strategies can be tailored to the specific needs of individuals and teams. The use of HR Predictive Analytics in formulating retention strategies is further reinforced by research findings on the relationship between technology, work engagement, and organizational behavior.

Saraswati et al., (2024) emphasize that the effectiveness of HR management systems in reducing turnover depends on the company's ability to connect HR processes with employee needs and operational goals. This is in line with Yanuarty's (2025) idea that strategic HR analytics enables HR to understand critical points in the employee work cycle, from engagement and competency development to the risk of losing motivation. Younis et al. (2023) add that managing turnover requires not only

risk detection but also a retention model based on social relationships and work structures to identify pressure points in daily work dynamics.

Although organizational awareness of the benefits of HR Predictive Analytics is increasing, its application in technology-based companies is not yet fully optimal. Velez's (2019) research reveals that most companies still focus on post-turnover responses rather than early prevention through risk identification. Chagadama et al., (2022) also shows that companies tend to design generic retention strategies without considering differences in characteristics and work experience among employees. This indicates a gap between the capabilities of analytics technology and managerial understanding in adopting it as an effective retention mechanism. Agustini (2024) shows that retention strategies require a combination of technological and human capital approaches, where data systems need to be accompanied by strengthened leadership, communication, and career development.

The research gap in this study is evident when comparing the findings of previous studies. Mulyadi et al. (2025) focused on retention strategies in Indonesian startups but did not examine the contribution of HR Predictive Analytics as an element of strategic decision-making. Younis et al. (2023) introduced a turnover prediction model based on organizational network analysis, but the study did not elaborate on how the prediction results were translated into concrete retention strategies. Waloyo et al. (2024) highlighted the potential of big data in HR management efficiency, but did not provide a specific implementation framework to reduce voluntary turnover in the context of technology companies. Thus, no research has analyzed how HR Predictive Analytics is implemented as a process of developing retention strategies, not just as a risk analysis tool.

The novelty of this research lies in its qualitative approach, which explores organizations' understanding of the use of HR Predictive Analytics in managing turnover risk and how companies formulate retention strategies based on the interpretation of this data. This approach positions predictive analytics not merely as a technology, but as a reflective component in the HR decision-making process. The purpose of this study is to analyze in depth how HR Predictive Analytics is understood, used, and integrated into the design of employee retention strategies in technology-based companies so that companies can reduce voluntary turnover in a sustainable manner.

METHODE

This study uses an exploratory descriptive qualitative approach to gain an in-depth understanding of the role of HR Predictive Analytics in reducing voluntary turnover in technology-based companies. A qualitative approach was chosen because the study aims to interpret organizational experiences, HR perceptions, and strategic decision-making processes, rather than testing statistical relationships between variables. This approach is in line with Qin et al., (2023) view that HR transformation through technology does not only occur at the operational level, but also at the conceptual level where organizations develop new ways of thinking in managing digital talent retention.

Data collection was conducted through analysis of organizational documentation, review of internal HR reports, academic literature studies, and narrative interpretation of data-based HR management practices in technology companies. Data analysis was performed using thematic analysis techniques, namely identifying patterns of meaning related to the application of predictive analytics, interpretation of turnover risk, and the formation of retention strategies. The thematic analysis approach allows researchers to

identify concept categories such as burnout, career stagnation, leadership quality, work experience, and professional expectations as the basis for retention strategies. Data validity is strengthened through source triangulation by comparing the results of documentation analysis, scientific literature, and organizational practices to ensure that interpretations remain objective and evidence-based.

RESULT AND DISCUSSION

Turnover Dynamics in the Context of the Technology Industry and HR Management Challenges

Voluntary turnover in technology-based companies is a multidimensional phenomenon rooted in psychological, professional, and organizational structural dynamics. Global competition for digital talent has created a highly liquid labor market, giving employees the freedom to move to companies that offer better challenges, compensation, and career growth.

In this context, traditional HR management is unable to track changes in employee motivation in real time, causing companies to often be late in identifying the risk of resignation. Sahoo et al., (2024) emphasize that turnover intention grows from the accumulation of emotional and professional dissatisfaction when employees no longer feel psychologically attached to the organization. This phenomenon is even stronger in technology companies due to the fast-paced, high-risk nature of the work and the pressure to innovate, which demands constant engagement.

The limitations of conventional HR systems are one of the causes of increased voluntary turnover because companies do not have the tools to holistically assess employee psychological trends and performance. Qin et al., (2023) explain that HR transformation through big data and AI technology has emerged as a response to these needs, but its adoption has not been uniform. Some companies still limit the use of data to administrative reporting rather than as a predictive mechanism. As a result, organizations tend to provide retention interventions after turnover occurs, rather than before the risk of departure arises. Yanuarty (2025) asserts that the effectiveness of HR management no longer depends on the number of HR policies, but on the company's ability to detect critical points in the employee life cycle and design data-driven interventions before problems arise.

Turnover dynamics in the technology industry are also inseparable from expectations of rapid career development. Digitally-oriented employees tend to evaluate work experiences based on opportunities for competency growth, job promotions, and professional learning. When career paths lack clarity, employees will seek other organizations that offer more promising social mobility. This is in line with the findings of Mulyadi et al. (2025) that one of the biggest causes of turnover in startups in Indonesia is the absence of a stable career development system amid rapid business growth. Thus, turnover in technology companies is not only a retention issue, but also a reflection of the organization's failure to provide an environment that allows employees to develop sustainably.

In addition, technology companies face the problem of intense work rhythms that lead to psychological fatigue. The need to respond to rapid changes in the digital market, project completion pressures, and high productivity demands have an impact on employee burnout. At this point, the limitations of recovery mechanisms and the lack of leadership support reinforce the decision to resign. Agustini (2024) emphasizes that modern employee loyalty is formed when organizations are able to provide a balance between performance demands and emotional needs to feel valued and develop. In the

reality of the technology industry, if employee psychological satisfaction is not reinforced, turnover becomes a rational response to work pressure.

This initial discussion shows that turnover in technology-based companies stems from overlapping emotional, professional, and structural dynamics. HR management cannot be supported solely by administrative policies and financial incentives, but requires a data-driven approach and a deep understanding of the employee experience. Thus, this discussion emphasizes the urgency of strategic HR transformation to anticipate turnover, not just respond to it.

The Role of HR Predictive Analytics as the Foundation for Formulating Voluntary Turnover Retention Strategies in Technology-Based Companies

HR Predictive Analytics plays a central role in shaping effective retention strategies in technology-based companies due to its ability to transform HR management processes from a reactive to a preventive approach. Before the adoption of analytics technology, the majority of companies were only able to follow up on turnover after employees decided to leave, so that retention strategies became a form of loss mitigation rather than early prevention of talent loss. Velez (2019) explains that traditional retention patterns are situational and tend to arise at times of crisis, so that companies lose the opportunity to retain employees in the early stages of declining work commitment. HR Predictive Analytics brings radical change because organizations no longer wait for explicit signs of resignation to appear, but analyze signals of changes in employee behavior and emotional conditions as indicators of the risk of leaving. Thus, predictive analytics functions as a strategic monitoring system that enables companies to continuously assess the psychological and professional health of their workforce.

Technology-based companies greatly benefit from predictive analytics because their work environment is characterized by a fast pace of innovation, high productivity expectations, and intense competition for digital talent between organizations. Without the ability to read employee behavior dynamics in real time, organizations risk failing to understand the reasons for declining work motivation and changes in professional aspirations that lead to turnover. Waloyo et al. (2024) explain that data-driven HR is the foundation of HR strategy efficiency because interventions are made based on risk priorities, not on subjective managerial perceptions. With predictive analytics, technology companies can classify employees based on their potential to leave and focus on designing retention strategies for high-risk groups, so that organizational resources are not wasted on interventions that are not needed by all employees.

The application of predictive analytics not only identifies risks but also structures work experience patterns that influence employee decisions. Sahoo (2023) emphasizes that HR analytics is only effective if companies are able to translate data patterns into decision-making that is relevant to the needs of individuals and work units. This means that predictive analytics is not the end goal, but a reflective instrument in the development of retention strategies. When data shows a decline in engagement, for example, companies can review job structures, leadership interactions, and rewards for contributions. Conversely, if career stagnation emerges as a dominant pattern, companies need to evaluate promotion paths, performance appraisal systems, and internal mobility opportunities. Thus, predictive analytics provides a deterministic direction in the formulation of retention strategies that are personal, not generic.

The role of predictive analytics is also related to the organization's understanding of the psychological balance of employees. The technology industry has a tendency to create high and fast workloads, making burnout a factor that is prone to increasing turnover. Agustini (2024) shows that employees remain when the organization is able

to provide an environment that supports emotional needs, well-being, and life balance. Predictive analytics can be used to identify work groups with the highest frequency of work pressure so that interventions are no longer random but target teams or departments that need adjustments to work rhythms and mental health policies. Thus, predictive analytics helps companies build retention based on empathy and business efficiency.

The dimension of leadership is also greatly influenced by the application of predictive analytics. Saraswati et al., (2024) prove that the quality of the relationship between superiors and employees is a major determinant of organizational commitment. However, without a data-based observation system, organizations are often unaware of unsupportive leadership patterns before employees decide to leave. Predictive analytics helps map the relationship between leadership style, employee engagement levels, and turnover tendencies, enabling companies to provide data-driven supervisory training for teams with weaknesses in communication, conflict management, or coaching. These interventions strengthen leadership quality as a structural retention strategy with long-term impact.

In addition to identifying turnover risks and providing an analytical basis for intervention, predictive analytics encourages a shift in organizational values regarding how talent is retained. Chagadama et al., (2022) explains that retention success is determined by a balance between organizational interests and employee needs, not merely by the provision of material compensation. Predictive analytics enables companies to continuously evaluate the effectiveness of retention strategies and improve approaches that are less successful. This is in line with the HR sustainability approach outlined by Younis et al. (2023), namely that retention must be built on a structural understanding of social interactions, workload patterns, productivity dynamics, and career development.

This discussion shows that predictive analytics serves as a strategic reflection mechanism, not just a statistical tool. Its implementation helps technology companies deeply understand the causes of turnover, design data-driven retention solutions, and create a work environment that can adaptively meet the needs of the modern workforce. Thus, this second discussion fully addresses the research objective that the implementation of HR Predictive Analytics strategies can reduce voluntary turnover through a precision-based, empathetic, and sustainable approach to digital talent retention.

Predictive Analytics-Based Retention Strategy Model for Technology-Based Companies

This discussion focuses on the formulation of a Predictive Analytics-based retention strategy model as a targeted framework for technology companies to reduce voluntary turnover. Unlike traditional generic retention approaches, predictive analytics-based strategies position retention as a differential process that considers the dynamics of each employee's work experience and psychological needs. Sahoo (2023) asserts that technology-based organizations require precision-oriented retention because the variety of digital jobs presents different work challenges for each individual and team. Therefore, the optimization of predictive analytics must be translated into a strategic structure capable of addressing the challenges of burnout, career stagnation, decreased engagement, and systemic leadership weaknesses.

To develop this strategic model, the discussion summarizes the core findings of the research into a risk profile-based retention framework. The table below illustrates the

mapping of risk factors that most frequently appear in turnover terminology and analytics-based retention intervention directions.

Table 1. Framework of Data-Driven Retention Strategies based on HR Predictive Analytics

Employee Risk Pattern	Root Cause Interpretation	Data Signals Observed	Precision-Based Retention Strategy
High burnout risk	Workload intensity and insufficient psychological recovery	Decline in energy, stress indicators, repeated overtime patterns	Workload redistribution, task balancing, mental-health protection programs
Low engagement	Reduced emotional attachment to the organization	Decreased participation, low recognition feedback cycles	Meaningful work redesign, recognition mechanisms, project ownership reinforcement
Career stagnation	Lack of promotion and unclear career direction	Long role plateau, learning stagnation	Structured career pathing, capacity development, internal mobility
Weak leadership interaction	Ineffective communication and low managerial support	Complaints, unresolved conflicts, low team climate index	Leadership coaching, supervisory capability development, feedback culture strengthening

The existence of this table shows that predictive analytics serves to identify risk patterns, while retention strategies serve to intervene in the causes of these risks. Waloyo et al. (2024) emphasize that the effectiveness of data-driven HR lies in the organization's ability to link data analysis with measurable modifications to HR policies. Thus, the table is not merely a list of recommendations, but a mechanism for aligning organizational data with managerial strategies that are directed at the individual and collective needs of employees.

Post-table analysis reinforces the understanding that retention is not merely a short-term administrative activity, but a continuous process that requires ongoing feedback between employee data and HR decision-making. Saraswati et al., (2024) explain that sustainable retention can only be achieved if organizations combine data evaluation systems, leadership improvement, and recognition of employee career aspirations. The strategic model in the table provides the following structural direction: workload is addressed through work rhythm management, career stagnation is addressed through promotion architecture, engagement is addressed through job design improvements, and leadership quality is addressed through data-driven supervisory training. Thus, the retention strategy formulated is not only a response to turnover but also an instrument for building a work environment that supports digital talent resilience.

Furthermore, analytics-based retention strategy framing helps technology companies shift from generic HR management patterns towards risk profile-based personalization. Chagadama et al., (2022) shows that retention approaches are

ineffective when companies treat all employees equally without considering their different work experiences. With predictive analytics, each strategy can be directed at the right group of employees, making HR investments more efficient and targeted. This ensures that retention not only increases employee satisfaction but also strengthens the long-term profitability and competitive advantage of technology companies.

CONCLUSION

This study confirms that voluntary turnover in technology-based companies is influenced by a combination of emotional, professional, and structural dynamics that cannot be managed using traditional HR management approaches. By understanding turnover through a qualitative approach, this study shows that burnout, career stagnation, decreased engagement, and weak leadership are the dominant factors driving employee exit decisions. HR Predictive Analytics provides a reflective framework for mapping employee work experiences and identifying turnover risks before resignation decisions arise, thereby addressing the research objective of the role of technology in strengthening retention decision-making.

The integration of predictive analytics into retention strategies offers a precision approach that places employee needs at the core of talent management design. Through data-driven risk mapping, companies can develop specific, goal-oriented retention interventions, including work rhythm adjustments to prevent burnout, career development architecture to overcome stagnation, job design enhancements to increase engagement, and leadership competency improvements to create supportive working relationships. Thus, HR Predictive Analytics-based retention strategies not only serve to reduce voluntary turnover, but also develop a work environment that supports the well-being and sustainable growth of digital talent.

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