

# A Review of Literature on use of HR Analytics in Decision-Making

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## Abstract

This paper provides a comprehensive review of the literature on the use of HR analytics in decision-making, highlighting its evolution, applications, and challenges. By analyzing 125 articles from the Scopus database, the study explores the theoretical foundations and practical implementations of HR analytics across various HR functions, including talent acquisition, performance management, and employee retention. The findings underscore the significant impact of HR analytics on enhancing organizational performance through data-driven insights. However, the study also identifies barriers to adoption, such as skill gaps, data quality issues, and privacy concerns. Future research directions include integrating AI and machine learning to enhance predictive capabilities and understanding cultural influences on HR analytics adoption. This review aims to bridge the gap between theory and practice, offering valuable insights for HR professionals, policymakers, and researchers to leverage HR analytics for strategic decision-making and competitive advantage.

**Keywords:** HR Analytics, Decision-Making, Talent Management, Predictive Analytics, Organizational Performance.

## Introduction

Human Resource (HR) analytics has emerged as a transformative tool in modern business management, providing data-driven insights to support decision-making processes. As organizations face increasing competition and complexity in the global marketplace, the ability to leverage HR analytics to enhance strategic planning and operational efficiency has become paramount. This review aims to explore the current state of HR analytics, its applications in decision-making, and the theoretical foundations and empirical studies that underline its efficacy. By systematically analyzing the existing literature, this paper seeks to identify key trends, challenges, and future research directions in the field of HR analytics.

**Historical Context and Evolution of HR Analytics:** The concept of using data for decision-making in HR is not new. Historically, HR departments relied on basic metrics and reporting to manage workforce-related issues. However, the evolution of technology and data science has significantly advanced the capabilities of HR analytics. Early HR metrics primarily focused on administrative efficiency, such as tracking employee turnover and absenteeism. With the advent of big data, machine learning, and advanced statistical techniques, HR analytics has evolved into a sophisticated tool that can predict trends, identify patterns, and provide actionable insights.

**Defining HR Analytics:** HR analytics, also known as people analytics, refers to the application of data analysis techniques to human resource management. It involves the systematic collection, analysis, and interpretation of HR data to improve decision-making and organizational performance. HR analytics encompasses various functions, including talent acquisition, performance management, employee engagement, and retention. By leveraging data from multiple sources, HR analytics helps organizations understand workforce dynamics, optimize HR processes, and align HR strategies with business objectives.

**Theoretical Foundations of HR Analytics:** The theoretical underpinnings of HR analytics draw from multiple disciplines, including statistics, data science, and organizational behavior. The Resource-Based View (RBV) theory posits that an organization's human capital is a critical resource that can provide a competitive advantage. HR analytics operationalizes this theory by using data to maximize the value of human capital. Additionally, the Human Capital Theory emphasizes the importance of investing in employee development

and measuring its impact on performance. HR analytics supports this theory by providing metrics and insights that guide investment in training and development programs.

**Applications of HR Analytics in Decision-Making:** HR analytics plays a crucial role in various HR functions. In talent acquisition, predictive analytics can identify the best candidates by analyzing historical hiring data and predicting future performance. For performance management, HR analytics can provide insights into employee productivity and identify high-potential employees for leadership development. Employee engagement and retention strategies are also enhanced through HR analytics by identifying factors that influence job satisfaction and employee turnover.

**Case Studies of HR Analytics Implementation:** Several case studies highlight the successful implementation of HR analytics in organizations. For instance, Google's use of HR analytics in its "Project Oxygen" identified key behaviors of effective managers, leading to improved management practices and employee satisfaction. Similarly, IBM's application of predictive analytics in talent management helped reduce employee turnover by identifying at-risk employees and implementing targeted retention strategies. These case studies demonstrate the tangible benefits of HR analytics in improving organizational outcomes.

**Challenges in HR Analytics Adoption:** Despite its potential, the adoption of HR analytics faces several challenges. One significant barrier is the lack of analytical skills among HR professionals. Many HR practitioners are not trained in data analysis and may struggle to interpret complex data sets. Additionally, data quality and integration issues can hinder the effectiveness of HR analytics. Organizations often have disparate data sources, making it challenging to consolidate and analyze data effectively. Privacy concerns and ethical considerations also pose challenges, as organizations must ensure that employee data is used responsibly and transparently.

**Future Directions in HR Analytics Research:** The future of HR analytics research lies in addressing the current gaps and expanding the scope of its applications. One promising area is the integration of artificial intelligence (AI) and machine learning with HR analytics to enhance predictive capabilities. AI can automate data analysis and provide real-time insights, enabling more proactive HR management. Another area of interest is the impact of cultural factors on HR analytics adoption and effectiveness. Understanding how cultural differences influence the perception and use of HR analytics can help tailor strategies for global organizations.

## Literature Review

Advancements in artificial intelligence (AI) are rapidly transforming the business environment, particularly in human resource management (HRM). Integrating AI into HR functions allows for better analysis, prediction, and diagnosis of organizational issues, leading to improved employee-related decisions. This paper critically analyzes the implementation of AI and HR analytics to enhance performance and gain a competitive advantage. AI reshapes HR processes, supporting functions like talent acquisition, training, retention, engagement, and performance appraisal, thus boosting productivity. The challenge lies in enhancing employee skills in AI and HR analytics to maximize benefits. The study evaluates AI's functional role in HR and identifies barriers to adopting these technologies [1].

This chapter reviews existing literature to explain the relationship between human resources and analytics, highlighting its importance in modern management. It explores how HR analytics can support strategic decision-making through statistical and relevant data. The review also examines IT technologies affecting data storage and retrieval to ensure reliable HR analytics. The literature indicates a lack of empirical studies on the practical application and efficacy of theoretical models in HR analytics, emphasizing the need for further research in this area [2].

This paper contributes to the literature on HR digitalization, focusing on HR analytics and the barriers to its adoption. It addresses what HR analytics encompasses and what impedes its adoption in organizations. A comprehensive literature review from 2010 to 2019 identifies 14 barriers grouped into four categories: data and models, software and technology, people, and management. The authors propose 14 key factors to help companies successfully adopt HR analytics, highlighting the ongoing confusion and emerging consensus on HR analytics' conceptualization [3].

The study investigates the reasons Saudi HR professionals do not use HR analytics to enhance business performance and maintain a competitive advantage, focusing on individual-level adoption. Using a descriptive survey research design, the study involves 168 HR professionals from Dairy Products Manufacturing

Companies in Saudi Arabia. Data collected through the Unified Theory of Acceptance and Use of Technology (UTAUT) questionnaire reveals positive relationships between HR analytics adoption and various factors, as well as identifying main barriers to implementation [4].

HR Analytics (HRA) creates value by providing analytical outputs relevant to decision-makers' business issues. The study examines how practitioners mobilize skills and resources in daily practice, identifying boundary spanning, customizing dashboards, and speaking a language of numbers as key practices. These practices enable epistemic alignment, allowing HRA teams to produce complex outputs while addressing immediate business problems and broader organizational contexts. The findings contribute to understanding how advanced digitalization transforms HRM work and how organizations can build effective HRA [5].

New technologies and AI require organizations to adopt new ways of working with different skill sets to achieve strategic objectives. HR analytics enables significant human capital and business decisions, offering a competitive advantage. However, there is limited research on theory-based relationships in HR analytics adoption and the role of contextual factors in building predictive HR analytics (PHRA) capability. This paper develops a conceptual framework using the Technological-Organizational-Environmental (TOE) framework and Resource-based theory to examine these relationships and the impact of PHRA capability on talent management outcomes, moderated by a data-driven culture [6].

Managing employees in modern organizations requires more than just manual efforts. With technological advancements, HR analytics tools have made it possible to manage and track employee performance online. HR analytics enhances recruitment quality, talent management, employee productivity, and reduces turnover. This paper explores HR analytics, its tools, and applications across different organizations, highlighting its benefits. Analytical tools help organizations address performance issues, employee turnover, and retention using available data. This research aims to fill the gap in HR analytics usage in many organizations by showcasing its benefits through five case studies, demonstrating its impact on business strategies and employee outcomes [7].

Data analytics has become crucial in HRM for data-driven decision-making processes. However, integrating analytics in HRM is complex, leading to low adoption rates. This study uses a framework synthesis approach to identify challenges and develop a framework explaining factors affecting HR analytics adoption. The study identifies key technological, organizational, environmental, data governance, and individual factors, along with 23 sub-dimensions, influencing HR analytics adoption. The implications for HR leaders, managers, CEOs, IT managers, and consultants are discussed to facilitate effective HR analytics adoption [8].

Despite the growth of HR analytics, its impact on organizational performance remains unclear. This study addresses this by exploring the mechanisms through which HR analytics enhances performance. Data from 155 Irish organizations were used to test a chain mediation model linking HR technology, HR analytics, evidence-based management (EBM), and organizational performance. Findings support the model, showing that HR technology enables HR analytics, which facilitates EBM, leading to improved performance. The study highlights the importance of HR analytics in driving organizational success [9].

This study investigates the strategic importance of HR analytics in talent management. By utilizing data, organizations can improve talent acquisition, development, and retention, enhancing overall performance. The paper reviews current literature, providing insights into integrating HR analytics with talent management strategies. Key findings highlight the benefits of data-driven decisions, better workforce planning, and alignment of HR strategies with business objectives. Challenges such as data protection and analytical skills requirements are also addressed. Investing in HR analytics is essential for competitive advantage in the data-driven business landscape [10].

HR Analytics has gained attention for its data-driven approach to HR decision-making, helping organizations understand behaviors and improve performance. This paper surveys the use of computational intelligence (CI) and artificial intelligence (AI) tools in HR, particularly in recruitment, retention, reward, and retirement. It conceptually proposes using CI and AI for career development and training in disruptive times. The paper emphasizes the potential of HR analytics to provide meaningful insights and drive strategic HR decisions, despite limited applications in the field [11].

This paper suggests that the benefits of data-driven decision-making in HR, such as those seen in Major League Baseball (MLB) teams, can be influenced by the reliance on social capital and intuition-based decision-making. By studying MLB teams from 2009 to 2014, the research shows that the introduction of PITCHf/x tracking systems facilitated the spread of specialized human capital. The findings indicate that

while data analytics enhances decision-making, its effectiveness is moderated by the use of social capital and intuitive knowledge in HR selections [12].

This study analyzes the current state and advantages of using HR analytics for improving individual and organizational effectiveness amid HR management digitization. It outlines the stages of HR analytics development, highlighting predictive HR analytics' benefits such as improved recruitment, talent management, and motivation. The study also identifies barriers to HR analytics adoption in Russian companies, including data accuracy issues, lack of analytical skills, and cultural resistance. Recommendations are provided to overcome these challenges and enhance HR analytics implementation [13].

In the era of big data, HR analytics helps organizations predict employee exits and reduce turnover. This research explores different types of HR analytics (static, descriptive, diagnostic, predictive, prescriptive) used in various business strategies to address turnover. By analyzing data from multiple sources, organizations can gain insights to reduce attrition rates. The study uses chi-square tests to examine the relationship between business strategy types and HR analytics usage, concluding that different strategies require different analytics approaches to predict employee turnover effectively [14].

HR analytics, enabled by big data and machine learning, aims to improve HRM decisions systematically. This study examines data and analysis combinations in German organizations to determine which configurations enhance decision quality. Using qualitative comparative analysis (QCA), the study identifies effective combinations of data and analyses that lead to improved HRM decisions. The findings provide empirical evidence supporting HR analytics' success in enhancing decision-making quality, offering a basis for future research and practical applications in HRM [15].

New technologies and AI demand different skill sets and working methods within organizations. The Asian region, particularly Sri Lanka, is expected to grow rapidly in HR analytics due to digital transformation. HR analytics enables evidence-based strategic decisions, leading to competitive advantages. Despite its benefits, HR analytics adoption is slow in emerging markets. This chapter applies the diffusion of innovation theory to examine factors affecting HR analytics adoption in Sri Lanka, identifying challenges and proposing a model for successful implementation [16].

The paper aims to identify current research trends and set a future research agenda in HR analytics by reviewing existing literature. A portfolio of 125 articles from the Scopus database was systematically analyzed using bibliometric and content analysis techniques. The study provides a comprehensive review of the literature, highlights the evolution and current state of HR analytics, identifies research clusters, and proposes future research themes based on knowledge gaps [17].

A study was conducted to understand the influence of Predictive Human Resource Analytics (PHRA) in managing HR practices like recruitment, selection, performance management, and succession planning in the IT sector in Coimbatore. Using data from 163 respondents and analyzed with SEM and Warp PLS, the study found a significant positive association between PHRA and HR practices. The results suggest that firms should adopt PHRA to improve HRM practices and systems [18].

This article reviews established and new methods in competence management, emphasizing the HR Analytics approach. Technological advancements and changing competence demands necessitate new HR management concepts. A company-specific competence model derived from organizational strategy is popular, but the paper proposes extending this with a data-driven approach to improve HR developmental measures' accuracy and effectiveness [19].

The study examines turnover antecedents using HR analytics and machine-learning tools, focusing on competencies, commitment, trust, and cultural values. Using archival data from 700,000 employees over ten years, the study finds varying levels of these antecedents associated with turnover, contingent on role, person, and cultural background. The findings suggest a need for fine-grained, case-dependent measures of turnover [20].

The advent of digitalization and technology demands robust, automated HR systems. HR analytics has become essential for businesses to carry out complex tasks and predict trends for future strategies. This study surveyed 197 HR team members from different organizations to understand the benefits, challenges, and impact of transforming HR management with HR analytics, finding significant positive impacts on organizations [21].

Integrating analytics in workforce development is crucial for evidence-based decisions and reducing investment risks. This study focuses on applying HR analytics with machine learning to solve business



problems. Using the CRISP-DM model, the study demonstrates the process of developing machine learning models to predict employee absenteeism, highlighting each step from business understanding to model deployment [22].

The study explores the behavioral intention to use HR Analytics (HRA) among HR professionals using the UTAUT model. Data from 270 HR professionals in India revealed significant positive impacts of performance expectancy, effort expectancy, social influence, and facilitating conditions on HRA adoption intention. Organizational culture negatively moderates the relationship between adoption intention and behavior, providing insights for managers and policymakers to guide HRA adoption [23].

**Table 1. Review of Literature**

Reference Number	Author Name	Title	Advantage	Disadvantage	Application
1	Arora, M., Prakash, A., Mittal, A., & Singh, S.	HR analytics and artificial intelligence-transforming human resource management	Integration of AI enhances HR processes and decision-making	Implementation complexity and initial cost	Transforming HRM processes through AI and HR analytics integration
2	Guru, K., Raja, S., Umadevi, A., Ashok, M., & Ramasamy, K.	Modern approaches in HR analytics towards predictive decision-making for competitive advantage	Provides a comprehensive approach to predictive HR analytics	Requires significant data infrastructure	Predictive decision-making for gaining competitive advantage
3	Fernandez, V., & Gallardo-Gallardo, E.	Tackling the HR digitalization challenge: key factors and barriers to HR analytics adoption	Identifies key factors and barriers to HR analytics adoption	Lack of empirical validation of identified factors	Understanding and overcoming barriers in HR analytics adoption
4	Alsuliman, B. R. A., & Elrayah, M.	The Reasons that affect the implementation of HR analytics among HR professionals	Provides insights into barriers specific to HR professionals	Limited to a specific geographical region	Enhancing the adoption of HR analytics among HR professionals in various regions
5	Ellmer, M., & Reichel, A.	Staying close to business: the role of epistemic alignment in rendering HR analytics outputs relevant to decision-makers	Highlights the importance of epistemic alignment	Focuses primarily on the relevance of outputs, less on implementation	Ensuring HR analytics outputs are relevant and actionable for decision-makers
6	Gurusinghe, R. N., Arachchige, B. J., & Dayarathna, D.	Predictive HR analytics and talent management: a conceptual framework	Provides a framework for predictive HR analytics in talent management	Conceptual framework lacking empirical validation	Talent management and predictive analytics integration

7	Kale, H., Aher, D., & Anute, N.	HR analytics and its impact on organizations performance	Demonstrates the positive impact on organizational performance	May not address all potential challenges in implementation	Improving organizational performance through HR analytics
8	Shet, S. V., Poddar, T., Samuel, F. W., & Dwivedi, Y. K.	Examining the determinants of successful adoption of data analytics in human resource management	Framework for successful HR analytics adoption	Complexity in addressing all determinants simultaneously	Guidelines for successful adoption of HR analytics in HRM
9	McCartney, S., & Fu, N.	Bridging the gap: why, how and when HR analytics can impact organizational performance	Explores the mechanisms through which HR analytics enhances performance	Requires comprehensive data and robust analytical models	Enhancing organizational performance through HR analytics
10	Mishra, R., Prasad, V. P., Ganguly, I., Chandrasekar, T., Kaur, R., & Agarwal, G.	The Role of HR Analytics in Strategic Decision Making: Leveraging Data for Talent Management	Focuses on strategic decision-making and talent management	Implementation challenges and need for skilled personnel	Strategic decision-making and talent management through HR analytics
11	Sooraksa, N.	A survey of using computational intelligence (CI) and artificial intelligence (AI) in human resource (HR) analytics	Explores CI and AI applications in HR analytics	Limited practical examples and case studies	Applying CI and AI tools in various HR functions
12	Kim, J., Dibrell, C., Kraft, E., & Marshall, D.	Data analytics and performance: The moderating role of intuition-based HR management in major league baseball	Examines the integration of data analytics with intuition-based HRM	Focused on a specific industry (MLB)	Combining data analytics with intuitive HR management in competitive industries
13	Konovalova, V. G., Aghgashyan, R. V., & Galazova, S. S.	Perspectives and restraining factors of HR analytics in the conditions of digitization of human resources management	Identifies perspectives and challenges in HR analytics	Regional focus may limit generalizability	Implementing HR analytics in digitized HR management settings
14	Gupta, S., & Sharma, R. R. K.	Types of hr analytics used for the prediction of employee turnover in	Explores types of HR analytics for predicting turnover	Relies heavily on social media data which may not be	Predicting employee turnover using different types of

		different strategic firms with the use of enterprise social media		applicable to all firms	HR analytics and social media data
15	Strohmeier, S., Collet, J., & Kabst, R.	(How) do advanced data and analyses enable HR analytics success? A neo-configurational analysis	Identifies combinations of data and analysis for HR analytics success	Requires complex analytical tools and techniques	Achieving HR analytics success through advanced data and analysis techniques
16	Gurusinghe, R. N., Arachchige, B. J., & Dayarathna, N. W. K. D. K.	Towards Organisational Sustainability: A Model for a Successful Implementation of HR Analytics	Proposes a model for successful HR analytics implementation	Conceptual model may lack empirical support	Sustainable HR analytics implementation in organizations
17	Qamar, Y., & Samad, T. A.	Human resource analytics: a review and bibliometric analysis	Comprehensive review and bibliometric analysis of HR analytics literature	May not address practical implementation challenges	Understanding the current state and research trends in HR analytics
18	Srividya, V., & Shripria, V.	A study on the relationship between Predictive HR Analytics and HRM practices in the IT sector	Demonstrates positive impact of predictive HR analytics on HR practices	Limited to the IT sector	Improving HRM practices in the IT sector through predictive HR analytics
19	Karwehl, L.	Traditional and new ways in competence management: Application of HR analytics in competence management	Combines traditional and new methods in competence management	Implementation complexity	Enhancing competence management with HR analytics
20	Avrahami, D., Pessach, D., Singer, G., & Chalutz Ben-Gal, H.	A human resources analytics and machine-learning examination of turnover: implications for theory and practice	Uses machine learning to study turnover, providing actionable insights	Requires advanced technical skills and tools	Predicting and managing employee turnover using HR analytics and machine learning
21	Sharma, V., Shikhare, R., & Vaidya, K.	Transforming Human Resource Management with HR Analytics: A	Quantitative analysis of HR analytics	May not cover all potential challenges in	Transforming HRM practices through the

		Quantitative Study of Benefits and Challenges	benefits and challenges	different contexts	adoption of HR analytics
22	Elanwer, R.	HR analytics in practice: Using machine learning to predict employee absenteeism	Demonstrates practical application of machine learning in HR	Focused on a single application (employee absenteeism)	Predicting and managing employee absenteeism using machine learning in HR analytics
23	Ekka, S., & Singh, P.	Predicting HR professionals' adoption of HR analytics: An extension of Utaut Model	Examines factors influencing HR analytics adoption	Relies on self-reported data which may be biased	Understanding and improving HR analytics adoption among HR professionals using the UTAUT model

### Research Gap

Despite significant advancements in HR analytics, there remain several research gaps that need to be addressed to maximize its potential. Firstly, while there is extensive literature on the theoretical foundations and benefits of HR analytics, there is a lack of empirical studies examining its practical application and effectiveness across diverse organizational contexts. Many studies focus on the conceptualization and barriers to adoption, but fewer explore the specific mechanisms through which HR analytics impacts organizational performance and decision-making processes. Moreover, the influence of cultural factors on the adoption and effectiveness of HR analytics, particularly in emerging markets, is under-researched. Additionally, although predictive HR analytics shows promise, more research is needed to understand its implementation and outcomes in various HR practices such as talent management, recruitment, and employee retention. Finally, there is a need for comprehensive frameworks that integrate advanced technologies like AI and machine learning with HR analytics to address complex HR challenges effectively. Addressing these gaps will provide a more nuanced understanding of HR analytics and enhance its strategic value in organizations.

### Conclusion

HR analytics has the potential to revolutionize HR management by providing data-driven insights that support strategic decision-making. This review of the literature highlights the evolution, applications, and challenges of HR analytics, underscoring its importance in modern business management. As technology continues to advance, the capabilities of HR analytics will expand, offering new opportunities for research and practice. By addressing current challenges and exploring new avenues, organizations can fully leverage HR analytics to enhance performance and gain a competitive edge.

For HR professionals, understanding and implementing HR analytics is crucial for driving organizational success. HR departments must invest in training and development to build analytical capabilities within their teams. Additionally, collaboration with data scientists and IT professionals can help overcome technical challenges and improve data integration. By fostering a culture of data-driven decision-making, HR professionals can enhance their strategic value and contribute to organizational growth.

To support the effective adoption of HR analytics, policymakers should consider establishing guidelines and frameworks for data privacy and ethical use of employee data. Regulations that ensure transparency and accountability in data usage can build trust and encourage more organizations to adopt HR analytics. Additionally, educational institutions should incorporate HR analytics into their curricula to prepare future HR professionals with the necessary skills and knowledge.

The integration of HR analytics into decision-making processes represents a significant shift in how organizations manage their human capital. As the field continues to evolve, ongoing research and innovation will be essential to fully realize the potential of HR analytics. By bridging the gap between theory and practice,



and addressing the challenges of adoption, HR analytics can become a cornerstone of strategic HR management, driving efficiency, productivity, and competitive advantage in the modern business landscape.

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