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## EFFECTS OF HR ANALYTICS ON HRM PRACTICES: AN INTEGRATIVE REVIEW

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### Abstract

The current study investigates the impact of HR analytics on human resource management (HRM) practices. Based on a review of HRM literature, it is clear that HR analytics is increasingly recognized as a valuable tool that influences HRM practices, particularly in supporting strategic decision-making. The primary motivation for this study stems from a noticeable gap in research regarding the impact and adoption of HR analytics within organizations, especially in South Africa. A comprehensive analysis of academic journal articles from reputable databases revealed that HR analytics positively influences human resource management practices and enhances HRM efficiency by integrating various functions and enabling managers to make informed decisions. It is recommended that organizations consider key factors that contribute to the effective implementation of HR analytics to maximize its advantages and achieve a competitive edge. This study underscores the importance of utilizing HR analytics for South African organizations aiming to harness data-driven insights to improve HR processes, increase employee satisfaction, and boost overall business performance. Consequently, both employees and the organization stand to benefit significantly from this strategic approach.

**Keywords:** HR Analytics, HRM Practices, Strategic Decision Making, Organizational Culture and Competitive Advantage

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### 1. Introduction

Data is an essential component that is shared among various departments within an organization and plays a crucial role in the success of some of the industry giants such as Google, Amazon, and Facebook. Professionals from diverse domains have acknowledged the significance of information in business operations. Making informed decisions based on data not only leads to enhanced productivity but also generates economic value (Brynjolfsson *et al.* 2011). Analytical skills in human resource management are essential for HR professionals. Utilizing HR analytics can enhance the effectiveness of the HR department by offering a means to assess the effectiveness of practices and policies in alignment with strategic objectives. This data-driven approach also facilitates the identification of areas where current practices and policies may be falling short of expectations. (Rasmussen and Ulrich, 2015). While there is evidence suggesting the advantages of incorporating HR analytics into HR management strategies, adoption rates

remain low. Additionally, limited research is available on the correlation between HR analytics and HR management practices. As such, this study aims to shed light on the potential impact of HR analytics on HR management practices and propose areas for further exploration in future research endeavors.

## **2. Literature review**

### **2.1. Definition of HR analytics**

The utilization of large-scale data in the field of human resources has been referred to by various terms, including HR analytics, people analytics, skill analytics, and performance analytics. It is important to note that there is no universally accepted definition for HR analytics (Marler and Boudreau, 2017). Premised on the ongoing assertion Bassi (2011) provided a comprehensive definition of mid-century HR analytics, describing it as an evidence-based approach to enhancing decision-making in personnel management within business settings. Various tools and methods, ranging from basic HR metrics to predictive models, are employed in this field. The scope of HR analytics covers reporting essential HR metrics, developing strategic solutions with the aid of predictive models, and adopting innovative decision-making approaches. Marler and Boudreau (2017) provide an expanded definition of HR analytics as an IT-enabled HR practice that utilizes the connections between HR processes, human capital, organizational performance, and external business models to collect data and facilitate informed business decisions. Accordingly, Tursunbayeva *et al.* (2018) state that HR analytics is a discipline within people management that encompasses practice, research, and innovation. It utilizes information technology, descriptive and predictive analytics, and visualization tools to derive insights related to business performance, human capital, and the performance of individuals and teams. Additionally, it employs strategy tracking to enhance efficiency, effectiveness, and outcomes, while also improving the overall employee experience. Thus, HR analytics involves assessing numerous factors that impact business outcomes to facilitate informed decision-making and achieve organizational objectives (Van Den Heuvel and Bondarouk, 2017).

### **2.2. Evolution of human resource (HR) analytic**

The growing significance of business analytics as an organizational capability is essential for fostering data-driven human resource management and advanced analytics that align employee performance with key business value drivers (van der Togt and Rasmussen, 2017) and overall business performance (Guenole *et al.* 2017).

HR analytics has developed from its modest beginnings to offer diagnostic and predictive analytics which can enhance employee engagement and retention through digital solutions (Edwards and Edwards, 2016). While the initial focus was primarily on practical applications, there has been significant growth in academic research over the past decade. Today, the body of research in HR analytics is substantial yet unevenly distributed, indicating potential opportunities for new collaborations that can facilitate a deeper analysis of the current business landscape and enable organizations to transition from basic reporting to comprehensive analysis (Minbaeva, 2017).

### **2.3. Types of HR analytics**

In line with the preceding discussion on HR analytics, Krumeich *et al.* (2016) state that HR analytics is separated into three levels, each with different degrees of adversity, valuation, and judgment. The first type of HR analysis is concerned with descriptive analytics which serves as the foundational level within the analytics framework. The primary focus of this level involves the development of reports that detail company activities, often referred to as business reports. These reports provide a static overview of the organization's performance, which are distributed to informed employees, such as key decision makers, at regular intervals (e.g., daily, weekly, quarterly). Additionally, there are options for ad hoc reporting, allowing decision-makers to

generate customized reports using an intuitive drag-and-drop graphical user interface to address specific issues or decisions based on particular conditions (Ram and Delen, 2018).

The second is diagnostic analytics is a subset of descriptive analytics that involves examining existing data through various tools and techniques, including visualization, data discovery, detailed analysis, and big data search methods. This process aims to identify the root causes of specific issues (Delen and Zolbanin, 2018). Both descriptive and diagnostic analytics can be utilized to assess key metrics such as employee turnover, cost per hire, and absenteeism.

The third type of analytics involves predictive analytics which encompasses a range of statistical methods, including data science, modelling, and machine learning, to make informed forecasts about future events or uncertainties. (Thomas,2020).

#### **2.4. Human resource (HR) analytics and human resource management (HRM) practices**

The role of HRM includes making important decisions and managing activities, which can significantly impact employee behavior, job performance, motivation, and stress levels (Griffin and Moorland, 2011). Taking into consideration the ongoing assertion, HR analytics is an emerging factor in the broader field of HRM. It encompasses the utilization of statistical tools, metrics, and methods to inform optimal decision-making in areas such as HRM strategies and practices. The value of HR analytics lies in its ability to generate reliable data and evidence, which can be utilized in the development of new strategies when implementing HR initiatives involving current and other metrics. (Mohammed 2019).

This study aims to investigate the current body of literature surrounding the correlation between HR analytics and its potential to enhance current HRM practices and related functions. Thus, several studies have illuminated the effect of HR analytics on organizational HRM practices. Chatterjee *et al.* (2022) developed a theoretical model using existing knowledge and privacy calculus theory. This model serves as a tool for analyzing the advantages and potential drawbacks of HR analytics applications. To validate this theoretical model, it was tested with a sample size of 315 participants from different organizations using the Partial Least Squares Comparative Modeling (PLS-SEM) method. Findings revealed that HR analytics offers numerous advantages for both employees and organizations. Nevertheless, unauthorized access to employee information may lead to a breach of employee privacy. Additionally, the unregulated utilization of these applications poses security concerns. Monitoring employees without proper consent poses a potential risk. This study emphasizes the necessity for appropriate regulation in the usage of HR analytics. A study conducted by Madhani (2023) examines the advancement of HR analytics utilizing a three-phase development model. The study also helped in outlining the transition from conventional HR solutions to modern HR analytics. Therefore, HR analytics provides managers with the ability to make informed decisions through data analysis, predictions, research, and findings, thereby mitigating risks and leveraging relevant information about experience and hierarchy. By demonstrating the value of HR data, HR analytics showcases how individuals contribute to the organization's success and how this contribution can be harnessed and utilized effectively by HRM managers.

Kiran *et al.* (2023) surveyed managers at various levels of the service sector. The sample of three hundred participants was selected using a stratified random sampling technique. The study indicates that HR analytics is beneficial for various facets of human capital management. Furthermore, it demonstrates that HR analytics have a positive influence on the performance of business service organizations. Varma and Chavan, (2019) state that HR analytics is a valuable tool that enables the measurement of various functions within the organization and offers invaluable insight into employee performance and effectiveness. This information is crucial in guiding strategic decision-making and ultimately contributing to the organization's competitive edge.

In a study conducted by Ejo-Orusa and Okwakpam (2018), the impact of predictive human resource analytics (PHRA) application on HRM practices, including recruitment and selection, performance management, and succession planning, was examined. The research was conducted in Port Harcourt, and a cross-sectional study design was used with a self-administered questionnaire. The data for the study was collected from 159 human resource professionals at all

levels in Port Harcourt. The collected data were analyzed using the SPSS statistical tool version 20, which involved calculating mean scores and standard deviations to assess the performance of HR professionals in predictive human resource analytics (PHRA) application, recruitment and selection, performance management, and succession planning. The results of the correlation analysis indicate that there is a significant association between predictive human resource analytics (PHRA) and the HRM approach employed in the study.

To gain an understanding of the application and knowledge of HR analytics in the field of IT or business practices such as HRM. In a study by Sharma and Sharma (2017), primary data was gathered through a survey research approach with a sample size of 125 employees. Data collection involved direct methods, and the research was primarily aimed at exploring the topic. The analysis conducted relied on employee responses and data gathered from case studies. Findings suggest that HR analytics can broaden the impact of HR activities by integrating various functions. It can improve employee retention, facilitate training and development opportunities, and enhance workforce planning. Moreover, it provides support to recruitment efforts and helps in decreasing employee turnover within the company.

## **2.5. Recommendations on the adoption of HR analytics in organizations**

In today's highly competitive business environment, organizations face numerous challenges to operate effectively. Making well-informed decisions that have a positive impact on both employees and the overall business while keeping costs under control is essential. This is where HR analytics comes into play, as it enables organizations to make evidence-based decisions that ensure success. The adoption of HR analytics is revolutionizing the human resources landscape, particularly given the rapid advancements in technology. (Ratnam and Rama Devi, 2023). As a result, HRD teams must take initiative-taking in responding to changing needs for organizations to not only survive but also thrive in this intense competition. Depending on the organization's level of analytics development, HR teams need to possess a range of analytics skills and tool knowledge, from entry-level to advanced.

Based on the current discourse surrounding recommendations for the implementation of HR analytics in organizations, a study conducted by Tunsi *et al.* (2023) focused on analyzing the factors influencing the utilization of HR analytics by professionals in large Palestinian organizations. This research utilized a convenience sample consisting of 151 HR professionals from the service and manufacturing sectors, who participated in a survey. The findings revealed that self-efficacy, achievement expectations, effort expectations, resourcefulness, information availability, and social influence were identified as key factors positively impacting the adoption of HR analytics.

In a similar vein, Ekka and Singh (2022) employed a partial least squares structural equation modelling (PLS-SEM) approach to forecasting the utilization of HR analytics by human resources professionals, using the Unified Theory of Acceptance and Use of Technology (UTAUT) model. Their research, based on data collected from a survey of 270 HR professionals in India, highlighted a positive correlation between performance, social expectations, social impact, and ease of use of HR analytics. Interestingly, the study also revealed that the linkage between HR analytics adoption and leadership behaviors remained unaffected by organizational culture, underscoring the distinctive integration of cultural aspects within Indian institutions. This insight holds significance in recognizing and acknowledging the unique role of cultural institutions as custodians within the organizational framework.

Mukuze *et al.* (2023) used an integrative synthesis to conduct an integrative review of referred journal articles on HR analytics implementation from the findings it was recommended that effective adoption of HR analytics requires the implementation of a comprehensive work program that ensures all stakeholders are well-informed about its advantages and disadvantages would enhance clarity in organizational operations and relationships. Thus, a thorough understanding of the pros and cons of HR analytics adoption can naturally serve as an impetus for implementation policy regarding HR analytics. Additionally, providing ongoing education and promoting awareness of carefully crafted policies to all employees would help address any potential challenges related to the acceptance of HR analytics.

### **3. Methodology**

This study used an integrated literature review to evaluate and analyze data regarding the impact of HR analytics on human resource management. The integrative review helps empirical and non-experimental research identify the entire state of the evidence. (Whittemore and Knafl, 2005). This methodology applies to this study as it improves the rigor of reviewing a variety of primary studies with different methodologies. The study's search criteria included peer-reviewed research on HR analytics and human resources management practices within organizations. Data was collected through search engines such as Scopus, Emerald, Wiley Online and ABI Guide to list relevant studies. Based on the above, this study examines and discusses the relevant literature on the effect of HR analytics on HR management practices. Both secondary and primary data, including journal articles, reports, biographies, and many others were searched from different search engines using words like the effect of HR analytics on HR practices including recommendations for Adoption of HR Analytics in organizations.

### **4. Discussion**

The study investigated scholarly journal articles that analyze the effect of HR analytics on human resource management practices. The findings of the literature review on the impact of HR analytics on HR practices offer valuable insights into the development of HR analytics. The study discussed the inclusion of decision support system (DSS) tools, such as management information (MIS) models, which have been of interest since the 1960s and 1970s. (Watson, 2014). Further research by Marler and Boudreau (2017) defined HR analytics as an IT-enabled HR practice that enhances HR processes, human capital, performance, and organizational relationships with external resources. Kirtane (2015) emphasized the importance of human resources analysis in developing employees and improving organizational outcomes through informed decision-making. The literature review also highlighted the various approaches to HR analytics, including descriptive, diagnostic, and predictive data analytics. These approaches involve examining past actions, predicting future outcomes based on data, and using data analysis to make informed decisions with potential impacts.

To the objectives of this study, a comprehensive analysis of the literature was conducted to gain a deeper understanding of the significance and purpose of HR analytics. Results from the review posit an effect of HR analytics on HRM practices. The analysis of the data indicates a correlation between HR analytics and HRM practices, suggesting that HR analytics can offer numerous benefits to both employees and organizations. However, it is crucial to recognize that unauthorized access to employee information may result in a violation of privacy. Moreover, the improper use of these tools raises security issues, particularly when monitoring personnel without proper authorization. This study underscores the importance of effectively regulating the use of HR analytics. Furthermore, the results suggest that HR analytics empower managers to make informed decisions based on data analysis, predictions, research, and findings to mitigate risks and utilize information and hierarchy-related data. Ultimately, HR analytics showcase the significance of HR data in illustrating how individuals contribute to organizational success, and how HR managers can effectively harness and utilize this resource.

The findings of the literature review indicate that HR analytics can be beneficial for various facets of human resource management and have a positive effect on the performance of business service organizations. Additionally, the results of the correlation analysis suggest a favorable relationship between predictive human resource analytics (PHRA) and HRM practices. The findings from the literature review indicate that HR analytics has the potential to enhance the effectiveness of HRM practices through the integration of various functions. This can lead to improved employee retention, streamlined training and development processes, enhanced job preparedness, more strategic hiring decisions, and a reduction in employee turnover within the organization.

After conducting a thorough review of the literature, it is evident that organizations encounter numerous challenges to operate efficiently in today's highly competitive business landscape. Organizations must make informed decisions that not only benefit their employees but

also contribute to the overall success of the business while effectively managing costs. This is where the utilization of HR analytics becomes essential, as it enables organizations to make data-driven decisions that are crucial for achieving success. Nonetheless, it is advised to exercise caution and prudence when employing HR analytics to ensure optimal outcomes. The literature review highlights the growing impact of HR analytics on the HRM landscape, particularly considering rapid technological advancements (Ratnam and Rama Devi, 2023). As such, it is recommended that the HRD team adapt to these changes to ensure organizational success in a competitive environment. Depending on the organization's level of analytical maturity, the HR team should possess a range of analytical skills and technical expertise, from basic to advanced.

Further research by Marler and Boudreau (2017) defined HR analytics as an IT-enabled HR practice that enhances HR processes, human capital, performance, and organizational relationships with external resources. Madhani (2023) emphasized the importance of human resources analysis in developing employees and improving organizational outcomes through informed decision-making. The reviewed literature highlighted the various approaches to HR analytics, including descriptive, diagnostic, and predictive. These approaches involve examining past actions, predicting future outcomes based on data, and using data analysis to make informed decisions with potential impacts. It is evident from the research that HR analytics combines data analysis and critical thinking to enhance decision-making processes (Thomas, 2020).

Further, results from the review posit an effect of HR analytics on HRM practices. The analysis of the data indicates a correlation between HR analytics and HRM practices, suggesting that HR analytics can offer numerous benefits to both employees and organizations. However, it is crucial to recognize that unauthorized access to employee information may result in a violation of privacy. Moreover, the improper use of these tools raises security issues, particularly when monitoring personnel without proper authorization. This study underscores the importance of effectively regulating the use of HR analytics. Furthermore, the results suggest that HR analytics empower managers to make informed decisions based on data analysis, predictions, research, and findings to mitigate risks and utilize information and hierarchy-related data. Ultimately, HR analytics showcase the significance of HR data in illustrating how individuals contribute to organizational success, and how HR managers can effectively harness and utilize this resource.

The findings of the literature review indicate that HR analytics can be beneficial for various facets of human resource management and have a positive effect on the performance of business service organizations. Additionally, the results of the correlation analysis suggest a favorable relationship between predictive human resource analytics (PHRA) and HRM practices. These findings indicate that HR analytics has the potential to enhance the effectiveness of HRM practices through the integration of various functions. This can lead to improved employee retention, streamlined training and development processes, enhanced job preparedness, more strategic hiring decisions, and a reduction in employee turnover within the organization.

After conducting a thorough review of the literature, it is evident that organizations encounter numerous challenges to operate efficiently in today's highly competitive business landscape. Organizations must make informed decisions that not only benefit their employees but also contribute to the overall success of the business while effectively managing costs. This is where the utilization of HR analytics becomes essential, as it enables organizations to make data-driven decisions that are crucial for achieving success. Nonetheless, it is advised to exercise caution and prudence when employing HR analytics to ensure optimal outcomes. The literature review highlights the growing impact of HR analytics on the HRM landscape, particularly considering rapid technological advancements (Ratnam and Rama Devi, 2023). As such, it is recommended that the HRD team adapt to these changes to ensure organizational success in a competitive environment. Depending on the organization's level of analytical maturity, the HR team should possess a range of analytical skills and technical expertise, from basic to advanced levels.

Furthermore, research suggests that factors such as self-efficacy, performance expectations, effort expectations, resourcefulness, knowledge, and social influence play a crucial role in promoting the effective use of HR analytics. Management should prioritize these factors internally to optimize the benefits of HR analytics. Conversely, organizational culture can impede the successful utilization of HR analytics in HRM, underscoring the importance of evaluating and

addressing any negative aspects of the organizational culture. The research indicates that successful implementation of HR analytics is contingent upon a thorough examination that ensures all parties involved are well informed about its benefits and drawbacks, thereby enhancing business transparency and relationships. Furthermore, an in-depth comprehension of the pros and cons of HR analytics can serve as the guiding principle for the development of HR analytics implementation strategies. Additionally, offering consistent training to employees and establishing clear policies can effectively address any challenges associated with supporting HR analytics.

The managerial implication for this study is premised on the fact that integrative review allows HR professionals to recognize HR analytics as a highly effective tool that can drive results, particularly when considering the intersection of HR analytics and HRM business value leading to enhanced HRM impact. Therefore, it is crucial for human resource managers within organizations to acknowledge the impact of HR analytics on human resource management practices and to have a thorough understanding of its implementation processes. One key implication of the study is the importance of utilizing HR analytics as a valuable tool for managers to utilize data to effectively run their organizations and make informed decisions. Research has shown that implementing HR analytics can improve the impact of the HR department on overall business performance (Boakye and Ayerki Lamptey, 2020). The study also affirmed that HR analytics plays a crucial role in HRM practices, but it also warns against actions that may impede its effectiveness. As such, managers should carefully consider the recommendations for successful planning and implementation of HR analytics.

## 5. Conclusion

The purpose of the study was to examine the impact of HR analytics on HRM practices, as there is a lack of research on the advantages and use of HR analytics and its influence on HRM practices. The study offers insights into the development of HR analytics, including its definition. Additionally, it provides information on the several types of HR analytics: descriptive, predictive, and prescriptive analysis. The focus was to shed light on the impact of HR analytics on HRM practices.

The study also discussed HRM practices and their objectives, with the primary goal being to determine the perceived impact of HR analytics on HRM practices. It was acknowledged that HR analytics is an emerging field in business and that HRM practices involve statistical tools and metrics that aid in decision-making. The study found that HR analytics can produce reliable data and evidence to support the creation of new strategies when implementing HR initiatives, thus highlighting the potential benefits of HR analytics on HRM practices.

Despite the advantages of utilizing HR analytics for HRM practices, the study provides suggestions for the successful implementation of HR analytics in organizations. It is recommended that HR teams within organizations possess analytical skills and proficiency with relevant tools, from entry-level to advanced positions. The study also highlights factors such as self-efficacy, performance expectancy, effort expectancy, resource availability, and social influence as positively influencing the effective adoption of HR analytics. Additionally, the importance of organizational culture in HR analytics is acknowledged. The study also suggested the importance of comprehensively evaluating the benefits and drawbacks of adopting HR analytics. Despite some challenges that may impede the application of HR analytics within HRM practices, the study indicates that HR analytics have a positive effect on organizational HRM practices, particularly when implementing the recommendations outlined in the study.

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