# DATA DRIVEN HUMAN RESOURCE MANAGEMENT: A SELECT LITERATURE REVIEW

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**Abstract**
*Data-driven HR, or DDHRM, is essentially about using data and analytics to inform decisions related to human resource management. It's a departure from the more traditional, intuition-based ways of doing things. Instead of relying on gut feelings, DDHRM uses data from various sources to really understand how the workforce operates, predict what might happen in the future, and generally improve HR processes. This helps organizations make better strategic choices and improve efficiency, ultimately leading to better results for both employees and the company as a whole. HR professionals gather and analyze data – from employee surveys and performance metrics, to turnover rates and labor market trends – to gain a comprehensive view. This kind of comprehensive understanding of the workforce dynamics is what DDHRM offers. Integrating data into all aspects of HR, from hiring to training, is a key component of DDHRM. Organizations need to set clear objectives for their analytics efforts to be sure they are gathering useful data and making real progress. Various analytics tools – people analytics, predictive analytics, and workforce analytics – can be used to get practical insights and improve decision-making. This paper offers a quick review of current literature on DDHRM.*

***Keywords**: Data driven HR, Human Resources Management, Employees, Strategic Choices*

## Introduction

Data-driven HR management represents a shift in how organizations approach human resources. Rather than relying on intuition or traditional methods, DDHRM utilizes data and analytics to guide decision-making. This involves leveraging data from a variety of sources to better understand workforce trends, predict future needs, and ultimately refine HR processes. The goal is to make more strategic choices that improve efficiency and deliver better results for both the company and its employees. In other words, DDHRM places emphasis on data to inform decisions across crucial areas such as talent development, recruitment, employee engagement, and performance reviews. HR professionals gather and interpret data from a range of sources, including employee surveys, turnover rates, and performance indicators, and external labor market dynamics, offering a complete view of the workforce. Integrating data into all HR processes, from initial recruitment to ongoing training initiatives, is a must. To maximize the value of these analytics efforts, organizations must clearly define their objectives, ensuring the collection of relevant data and driving real progress. Workforce analytics, predictive analytics, and other tools can provide actionable insights for making more informed decisions. Recent literature on DDHRM is reviewed in this paper.

## Review of Literature

In recent years, as Kimura (2023) points out, business organizations have increasingly turned to data analytics within human resource management, or HRM, aiming to predict how employees might behave. This is often referred to as HR analytics. It leverages various employee attributes, including their personal values, which are typically understood as relatively stable traits reflecting the individual employee. Research indicates that these personal values can impact an employee's attitudes, behaviors, and even the performance of their team, making the assessment of these values quite important in HRM. Traditionally, personal values have been measured using self-report questionnaires, but such methods are not without their issues, notably the social desirability bias. Newer approaches, therefore, suggest using machine learning on linguistic or visual data as alternatives. This study offers a review of research on personal values, focusing on measurement methods, their usefulness, and the challenges they present. We will also discuss potential future research directions in this area.

Okon et al. (2024) explore how data-driven analytics are being integrated into HRM, examining their potential to improve decision-making and overall organizational effectiveness. Their central aim is to synthesize research on strategies for using data analytics to optimize core HR functions, such as talent acquisition, performance management, employee retention, and workforce planning. Through a broad review of academic and industry sources, the paper provides an overview of how data-driven insights can reshape HR practices. The findings suggest that organizations that adopt data analytics in their HRM processes tend to see more accurate decision-making, reduced biases, and better predictive abilities regarding workforce trends. The review underscores the positive effect of data-driven HRM on employee engagement, the

alignment of talent with organizational goals, and the organization's overall agility in responding to changes in the market. The paper also delves into the strategic implications of this integration, including the need for HR professionals to develop data literacy and the ethical considerations surrounding data privacy and algorithmic decision-making. Furthermore, it identifies potential obstacles to the adoption of analytics in HRM, such as inadequate technological infrastructure and internal cultural resistance. Okon et al. emphasize the considerable opportunities that data-driven HRM presents for driving organizational success and look ahead to future trends, including the increasing role of artificial intelligence in HR analytics and the possibility of more personalized employee experiences, indicating a move towards more data-centric HR practices.

Mateen et al. (2024) have investigated the role of big data in improving HRM effectiveness, specifically looking at the mediating influence of big data–driven HR practices and electronic human resource management. The research also considers the moderating effect of a data-driven culture on both big data–driven HR practices and electronic HRM. Data were gathered from HR managers and executives in the hospitality industry. The analysis is built on data from 248 managers. Partial least square-structural equation modeling, or PLS-SEM, was used for the analysis. The results showed that big data has a positive and significant impact on HRM effectiveness. What's more, big data–driven HR practices and electronic HRM further strengthen the link between big data and HRM effectiveness. The findings also support the idea that a data-driven culture moderates the relationship of both big data–driven HR practices and electronic HRM. This research breaks new ground by exploring the relationships between big data and HRM using quantitative methods. Moreover, the study adds to the existing body of literature on digitized HRM by examining the underlying mechanisms at play.

Majam and Jarbandhan (2022) suggest the Fourth Industrial Revolution offers avenues for improving government services, notably policy-making and organizational design. Recent studies also indicate that the 4IR and big data have the potential to enhance public resources, particularly human resources (HR), by improving service delivery through data analytical tools for managing employee performance, promotions, retention, and talent management. Consequently, one might consider how big data optimizes public service human resource management (HRM). This study undertakes a theoretical and conceptual analysis, exploring the complex nature of HR data analytics within the South African Public Service, informed by a literature review to support underlying assumptions and implications. Interestingly, the literature suggests limited big data usage within the South African Public Service. Furthermore, this research indicates the importance of HR specialists leveraging forecasting and data applications to anticipate skills demand and supply, which helps in service delivery improvement. Big data is primarily utilized in the private sector, with public sectors in countries like Australia, New Zealand, and South Korea adopting its utility. This presents a ripe opportunity for the South African Public Service to investigate big data's application to public service enhancement; a situation made more complex by a gap in scholarly activity that would explore the link between big data and HRM effectiveness. This may be achieved via incorporating two distinct streams of digitized HRM which have not been studied together so far, i.e., big data–driven HR practices and electronic HRM.

Jensen-Eriksen (2016) argue that the HR role has evolved from administrative to a more strategic partnership over time. Technological development, particularly in data collection, storage, and processing, has been a key driver. However, academics and practitioners have consistently questioned HR's success in becoming more strategic. A persistent challenge lies in producing accurate information on people-related issues and making fact-based strategic HRM decisions. However, there is a growing belief that HR analytics could answer these challenges, improving data-driven HRM to help HR achieve its strategic position. Still, relatively limited research explores HR analytics, leaving its real potential somewhat of a question mark. The purpose of this thesis is therefore to deepen the understanding of HR analytics and its implementation. The research examines possible connections between HR analytics and the broader concept of data-driven HRM, and is based on data from HR professional blogs on five major online HR communities in the US and Europe. Data was collected from 2009-2015 based on predefined keywords, totaling 510 blog posts. Quantitative methods with Leximancer software were used in the initial data analysis phase, followed by qualitative analysis aimed at uncovering the most prominent discussions among HR professionals related to HR analytics implementation and data-driven HRM. Thesis findings indicate that HR is still in its infancy in HR analytics and data-driven HRM. HR, as a function, appears to be routine-oriented, focusing mainly on universal HR processes and metrics without further analysis. Data-driven HRM as a term isn't widely used among HR professionals. It

was concluded that to achieve a strategic role, HR needs to become more decision-oriented with a focus on generating value to the business, especially through the application of HR analytics. HR analytics is sometimes floated as a solution, but its nuances remain largely unknown to many HR professionals, often being channeled towards financial metrics and basic descriptive analyses. The consensus seems to be that HR analytics and data-driven HRM are context-dependent; they should be strategically implemented based on the organization's individual circumstances. In other words, the effectiveness of HR analytics hinges on the people using the tools – their grasp of its potential and knowing the right tool for the job.

Tuli et al. (2018) propose a method for integrating predictive HR indicators with workforce analytics to bolster data-driven HRM decisions in today's digital world. Their study delves into the challenges, opportunities, execution strategies, and optimal approaches for merging workforce analytics and predictive HR metrics. It also aims to identify the policy implications for both businesses and lawmakers. By thoroughly examining prior work and secondary data, the research underscores the importance of data quality, organizational alignment, leadership support, collaboration, training, iterative improvement, and ongoing adaptation. Key policy takeaways include the need for data governance frameworks, robust training initiatives, regulatory guidance, and incentives to promote innovation, all intended to assist businesses in leveraging data for improved workforce management and better organizational outcomes in digitized environments.

Zhou and Zou (2023) argue that even though digital technology's integration into human resource management (HRM) has long been seen as vital, recent findings suggest that digital HRM systems aren't always effective in practice, and research increasingly points to potential downsides. Their article probes whether a harmonious alignment between the internal consistency levels of a digital HRM system and a pre-existing high-performance work system (HPWS) influences a firm's ability to produce data-driven insights. The findings indicate that alignment, or congruence, between the digital HRM system and the original HPWS can negatively affect a firm's capacity for data-driven insight generation. Interestingly, organizations displaying high internal consistency in *both* their digital and non-digital HRM systems generate better insights compared to those with low consistency in both. The results also show that congruence's negative effect impacts financial performance, with data-driven insight generation acting as a mediator. The study emphasizes the necessity to carefully consider the characteristics of both digital and traditional HRM systems, while also encouraging additional research on this topic.

Conte and Siano (2023) suggest that whilst previous studies assume that Industry 4.0 technologies, especially big data, might significantly enhance HR communication strategies, there's surprisingly little evidence on how these tools are actually used in employee and labor market relationships. This study offers an initial perspective on the adoption of a data-driven HR/talent management approach, enriching the dialogue around Industry 4.0. Specifically, the research aims to explore the deployment of 4.0 technologies within HR and talent management, with a focus on utilizing big data analytics for internal and recruitment communication. This analysis... An examination of existing research allows for the formulation of research inquiries; subsequently, a web-based exploratory survey was conducted using a structured questionnaire. The subject of this empirical survey includes the communication and marketing executives from 90 Italian firms, as highlighted in the Mediobanca Report on "Leading Italian Companies." The results suggest a limited utilization of 4.0 technologies and comprehensive data analytics in employee and labor relations, and reveal differences across sectors regarding the integration of 4.0 technologies. The study also indicates that HR analytics development is often hindered by short-term planning, issues related to data quality, and a shortage of analytical skills. Given the nature of the exploratory research design and the restricted sample from one nation (Italy), additional cross-national research is needed. This research offers communication executives applicable ideas to improve data-driven HR/talent management strategies, which represents a major asset for maintaining sustained competitive advantages and maximizing business performance. The research provides a broad summary of the application of big data analytics within internal and recruitment communications. Considering that Italian and European patterns in the usage of big data and the implementation of HR analytics are generally aligned, the findings might also be relevant to other European organizations.

Yang et al. (2021) argue that as large firms increase their diversified and specialized business practices, those enterprises will assume expanding social responsibilities. Organizational mission and prestige are key components of sound corporate growth. Problems related to corporate social responsibility within human resource management often arise with the sophisticated integration of enterprise management and computer technology.

Transitioning from traditional HR models toward a people-focused social responsibility approach highlights "strengthening effectiveness" as a central research focus within enterprise management in the electronic era. Accordingly, by utilizing a discrete modeling technique with extensive data, this study creatively introduces the interconnectedness of corporate social responsibility and enterprise human resource management that is based on a grey correlation algorithm. Unlike current mainstream enterprise human resource management research that relies on trapezoidal data analysis and cluster center methods, this algorithm innovatively analyzes the dynamic data on corporate social responsibility and enterprise human resources, which further allows the researchers to establish a coupling model. This model facilitates dynamic tracking of human resource data and more effective utilization of characteristic information pertaining to the interplay between human resource management and corporate social responsibility. Analyzing big data such as employee benefits, compensation, training, overtime, and the promptness of transaction processing can contribute to the understanding of social issues, like corporate social responsibility assessment, turnover rates, and enterprise income, thus it can provide theoretical frameworks to inform business strategies.

Strohmeier and Piazza (2013) contend that the rise in published material regarding data mining in human resource management (HRM) suggests a budding new research field. The current study seeks to analyze this existing research on HR data mining, to systematically reveal advancements while positing avenues for additional research. Building upon domain driven data mining, an initial framework with significant domain-specific criteria is formed. Relevant scholarly contributions are identified and assessed in view of this conceptual framework. This review demonstrates that HRM is an especially noteworthy new area for data. Mining research often focuses heavily on methods and technology. Yet, the unique needs of particular fields – think about measuring success within that field or adhering to legal rules – don't always get the attention they deserve. This piece demonstrates that paying systematic attention to these field-specific requirements can really shape the future direction of data mining research, especially in Human Resources Management. Actually, HRM data mining future is inextricably tied to acknowledging domain realities.

## Conclusion

Data-driven HR management signifies a change in the way HR departments function within an organization. Instead of only using past practices or gut feelings, DDHRM looks at data and uses analytics to make smart decisions. It's about using data from different places to really understand what's happening with the workforce, foresee what might be needed down the road, and make HR processes better. The aim is to make smarter choices that boost how well things work and improve things for both the company and the people who work there. Put simply, DDHRM emphasizes using data to help guide decisions in vital areas such as helping employees grow, finding new talent, getting employees involved, and assessing performance. HR staff gather and look at information from various places, like employee surveys, how often people leave, and how well they're doing, along with what's happening in the job market, to get a full view of the workforce. Getting data woven into every part of HR, from hiring to training, is essential. Now, to really get the most out of these data-focused efforts, organizations should clearly state what they want to achieve, ensure they're collecting the right data, and thus push for real advancements. Analytics like workforce and predictive analytics can offer valuable perspectives for better decision-making.

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