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The Dark Side of Human Resource Analytics: A Systematic Integrative Review

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Abstract

Advances in information technology are ushering in a new era of human resource analytics and data-driven decision-making in the corporate world. Organizations increasingly turn to human resource analytics to enhance human resource management practices such as reward management, performance appraisals, and employee well-being. This improvement in information technology has raised expectations among various management practitioners and experts and fostered a very optimistic outlook on human resource analytics. Using human resource analytics to manage people, on the other hand, poses many challenges and ethical implications. This paper investigates the risks of applying human resource analytics based on a PRISMA-guided systematic integrative review. Following established guidelines for systematic reviews, a transparent and reproducible search strategy was implemented across Emerald Insights, Taylor & Francis Online, and grey literature sources, with clearly justified inclusion and exclusion criteria to ensure methodological rigor. Two theories, the talent analytics maturity model and the technology acceptance model, form the conjectural structure for this paper to attain theoretical triangulation for the study. Inclusion criteria for the utilised articles included not more than five years old, articles in the English Language only, relevance to challenges/ethical issues in human resource analytics, full text-articles, business/social sciences articles, and only scholarly articles. The rejection criteria adopted were sources irrelevant to the study topic, sources more than 5 years old, sources not in English, pure science articles, and non-scholarly articles. The investigation identifies five challenges. Failure to diligently consider the unique aspects of human resource analytics can lead to unintended consequences such as techno-stress, invasion of workplace privacy, regulatory

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challenges, political challenges, bias, and discrimination. The review also revealed a lack of both qualitative and quantitative empirical studies. Not many organizations have advanced human resource analytics capabilities. The researcher suggests mixed-method and longitudinal empirical studies for each observed theme. Such studies provide a clear picture of the trends and patterns of human resource analytics challenges. Possible strategies for the menacing challenges can be found when empirical evidence is abundant.

Keywords: Artificial Intelligence, Human Resource Analytics, People Analytics, Talent Analytics, Workforce Analytics.

Introduction

Human resource analytics (HRA) is a systematic process of aggregating and analyzing human resource information to improve an organization's workforce operations (Edwards & Edwards, 2016). Collected human resource (HR) data is linked with organizational aims to determine how HR initiatives contribute to overall strategic business goals (Gebejes & Khokhlova, 2022). Said differently, HR analytics is a new technique for managing the organizational workforce facilitated by artificial intelligence (Fitz-enz & Mattox, 2014). This aspect involves data-driven, evidence-based decision-making to align people and business strategies within an organisation (Giermindl *et al*., 2021). In sum, human resource analytics today is regarded as an enabler of business efficiency, effectiveness, objectivity, and transparency by both practitioners and researchers (ibid). Even though various organisations have routinely collected data, HR analytics is a specialized form of analytics. It provides direction and useful insights into company operations, whether private or public-sector-oriented (Gebejes & Khokhlova, 2022). Through HRA, questions such as what the cost of hiring is, how long it takes to hire new employees, and the patterns in employee turnover can be answered (Polyakova *et al*., 2020). Thus, possible guesswork in company operations can be avoided.

HR analytics in practice

Large volumes of high-quality human resource data are collected and analyzed to evaluate strategic HR practices such as performance management, recruitment, and training (Gebejes & Khokhlova, 2022). It therefore implies that employee profile data, salary and promotion history, demographics, turnover, absenteeism, engagement, and training can be typical data sets collected in an organization. The data collection leads to the measurement stage, where data is continually measured against a set standard. In precise terms, this is the HR metrics application stage. In this case, key metrics to monitor include organizational performance metrics (absenteeism, turnover rate, and recruitment). Other essential metrics include operations, monitored through data that determine the effectiveness and efficiency of day-to-day HR procedures and staff headcount (Collmann & Matei, 2016; Gebejes & Khokhlova, 2022). Taking stock of the total number of people working in the organization at any given time is a crucial metric that enables managers to account for permanent, temporary, and stand-by staff. Knowledge of the organization enables analysis of how people can accomplish business goals, more efficient cost estimation, and healthier financial management. Furthermore, there is a process-optimization metric that combines data from the two aforementioned metrics to identify areas for improvement. These key metrics lead us to the analytical stage, where results from metric reporting are used to identify patterns and trends that impact organizational operations.

Depending on the organization's desired outcome, analytical methods can be descriptive, predictive, or prescriptive (Edwards & Edwards, 2016). In simple terms, descriptive analytics is concerned with questions such as "what happened" in the organization, based on data drawn from metrics and past workforce activities. Predictive analytics is all about answering questions like "What will happen next?", while prescriptive analytics attempts to answer questions like "How should organizational leaders and people practitioners act?" Clear policies and procedures are formulated to avoid future business challenges.

HRA seeks to advance the idea of measurement in human resource practices that Fredrick Winslow Taylor propounded in the 19th century. Nevertheless, it must be borne in mind that Taylor's scientific management had problems associated with treating people as machines in the workplace (Michale & Stephen, 2020). Human relations among the organizational workforce were thought to be nonexistent, as the main focus was on

achieving high organizational production. Equally, the rapid advance in artificial intelligence still carries the same connotations of moral and ethical challenges as did the scientific management concept. This is because treating employees in the workplace as equivalent to other quantifiable data objects, such as goods and money flows, is an underestimation of human complexity (Gal *et al*., 2020). Consequently, this would persuade organizations and managers to rely on human resource analytics in a biased, unbalanced way, resulting in grave operational challenges.

A careful analysis of some cited scholarly findings (Espegren & Hugosson, 2025; Mukuze *et al*., 2022) in this paper indicates that few organizations have adopted human resource analytics to the last step (prescriptive analytics). Most organizations in the corporate world have not adopted up-to-date levels due to various inhibiting factors related to both humans and organizations(Fernandez & Gallardo-Gallardo, 2021). It is at the descriptive analytics stage that most ethical disputes occur, because there is no clear framework for selecting what can be measured and retained. Descriptive analytics as a measurement tool, like many other people measurement techniques, has significant limitations that practitioners must seriously consider. This data analytical stage describes what is happening(Samson & Bhanugopan, 2022). Thus, it can be labeled a blunt instrument that lacks insight and analyzes the relationship between a couple of variables in the organization. It is impossible to learn why an organization has high staff turnover using descriptive analytics, since this tool can only display organizational events as they occur. A complete understanding of organizational reports and events requires running the full range of analytics to fully understand the operational situation. This technique can yield incorrect business insights when metrics are poorly selected and data quality is poor. Erroneous calculations can occur, and data duplication is possible because there is no clear-cut distinction between the custodians of workforce data (Thakur *et al*., 2024). Indeed, this underestimation of human complexity poses some moral and ethical challenges (Boudreau & Cascio, 2017). Therefore, this paper seeks to provide a critical overview of the challenges associated with human resource analytics, given the advances in technology in modern-day operations. This was done by answering the following question: "What are the challenges of human resource analytics to organizations and employees in the workplace"? Thus, uncovering such challenges helps expand the frontiers of knowledge in human resource analytics.

Literature Review

Theoretical framework

This section addresses critical theories appropriate to the study, focusing on defining the subject matter correctly, identifying key constructs, and connecting the researcher to extant knowledge. Accordingly, two theories (the talent analytics maturity model and the technology acceptance model) form the conjectural structure for this paper to attain theoretical triangulation for the study.

Talent Analytics Maturity Model

The model was propounded by Bersin (2014) and assumes that organizations adopt human resource analytics through different stages, from the first stage right up-to the fourth and last stage. The model results from both qualitative and quantitative research conducted to better understand talent analytics on an ongoing basis (Bersin *et al*., 2014). Different business organizations have many files in their custody as they tirelessly gather essential data on recruitment, such as qualifications, age, marital status, and other employment demographics, for planning purposes. Training and development records and turnover rates are also essential indicators of human resource practices that entities meticulously track. This and other data related to different human resources facets can be analyzed with business process data to understand different business relationships and make predictions. This would eventually lead to better business performance and strategic realization of goals. Bersin (2014) contends that talent analytics uses measurement and logical reasoning to identify, develop, and refine an organization's human resources. The Talent Analytics Maturity model demonstrates the four stages an organisation goes through as it evolves from a tactical, non-strategic function into a fully integrated value-add business process. This is a valuable model for different organizations, as it provides a snapshot of the organization's adoption of human resource analytics and areas that need improvement. Only some organizations, representing ten percent of the studied organizations, have adopted the highest level of prescriptive analytics, and many are practicing the people measurement concept at the primary level (Bersin *et al*., 2014).

The talent analytics maturity model was chosen for this study because it provides a crucial framework for understanding that the ethical challenges of HRA are not static but may

manifest differently at different levels of organisational analytical maturity. This model allows the study to contextualize challenges, acknowledging that an organisation at the descriptive analytics stage may face different privacy and data governance issues than one employing prescriptive analytics. By using this model, the review can move beyond a simplistic view of HRA challenges to consider how the very purpose and sophistication of data use can create unique ethical dilemmas. Consequently, it helps to explain why the literature reports a range of issues, from basic data duplication to complex algorithmic bias, as organisations progress through the models' four stages.

Technology Acceptance Model (TAM)

The researcher chose the Technology Acceptance Model as the second theory to better explain the study problem in this article. The model was propounded by Davis in 1989, as cited by Marikyan and Papagiannidis (2023). Three primary factors make up the critical assumptions of this model, thus perceptual experience of technology utility, the ease of use, and behavioral intent. The theory has other associated factors, such as attitude and actual system usage, but all are derived from the identified three parent factors.

Perceptual usefulness refers to a situation in which individual employees in an organization believe that using a new information system would enable them to complete work projects on time and with minimal errors.

Ease of use refers to the extent to which the intended user of an information system believes there will be no hassles in using it. People would certainly develop a negative attitude towards an information system if there were no good interface and many access rights were required.

Behavioral intention is the factor that leads business-people to use the organization's information system, and it is usually influenced by the general mental attitude of the intended users of the system. The intended users' attitude is usually influenced by external factors beyond the establishment. Factors such as age and gender were found to either positively or negatively affect the decision to use an information system in an organization (Thakur *et al.*, 2024). An employee's age plays an essential role in the adoption of technology in organizations. There are possible challenges of skills obsolescence in the elderly workforce born outside the internet age, as compared to younger

generations(Samson & Bhanugopan, 2022). Younger generations have the upper hand in technology adoption because they were born into a digital world and are eager to learn. Elderly employees have eyesight problems that prevent them from using new technologies (Espegren & Hugosson, 2025). Female employees are, in most cases, relegated to reproductive duties in social life, which often results in less access to technology than their male counterparts. The theory, a three-step procedure, assumes that the way a technology information system is designed triggers the mental reactions of intended users. Thus, expected users start to see the system as either easy to use or very useful in their duties (Davis, 1993). Operational challenges associated with the new information system will lead to resentment and eventual sabotage of the system. The Technology Acceptance Model is of great importance to this study, as it shifts the focus from organisational outcomes of human resource analytics to individual user perceptions, which can be a source of its "dark side." The model's core constructs, such as perceived usefulness and perceived ease of use, are directly linked to emergent themes, such as techno-stress, which arises when employees find a new system difficult to use or threatening to their job security. Furthermore, the TAM helps explain the political challenges and resistance to HRA, as a perceived lack of usefulness or a negative attitude towards the technology can lead to organisational "mudslinging games" and data hoarding, as identified in the findings. By grounding the employee's psychological and behavioural responses to HRA in the Technology Acceptance Model, the paper provides a deeper explanation for these human-centric challenges.

Empirical evidence literature review

Espegren and Hugosson's (2023) study discovered the challenges and benefits of adopting human resource analytics in organizations. Specifically, it was observed that the ability of individual employees and possession of numerical skills determine the rate and level of human resource analytics adoption. A lack of professional knowledge and business acumen affects communication skills, trust, and buy-in from relevant business stakeholders. Organizational culture and structure were noted as other stumbling blocks, especially when there is bureaucracy and an unfavourable organizational culture. Leadership support was noted to be positively influencing the adoption and utilization of human resource analytics.

It is possible to make data-driven strategic decisions and achieve strategic plans using human resource analytics. Occasionally, prescriptive analytics of human resource data would be conducted, as noted in the literature identified in the study(Espegren &Hugosson, 2023). A modest agreement on the utility of human resource analytics was observed. Some scholars and management practitioners believe it has the potential to improve organizational performance, while others remain unconvinced(Wang *et al*., 2024). Only some organizations have supportive measures in place to support people's measurement concepts. Numerical skillfulness and training were found to be lacking among HRM professionals (Hamza *et al*., 2023). On the other hand, Saxena *et al*.'s (2022) study revealed that the adoption and acceptance of HR analytics are not easy accomplishments. Certainly, the interested entity should thoroughly prepare its workforce to meet the demands of technological change by providing material support and impactful training. Well-trained organisational staff will have the right attitude towards new work processes. Mukuze *et al*. (2022) found that human resource analytics was yet to be fully adopted in state universities in Zimbabwe. The expected people practitioners do not have the skills and associated knowledge to properly utilize HRA. There was notable resistance to change and a need for more management support. Nevertheless, HRA adoption and reporting were observed at the first step of descriptive analytics. Over the past few years, the literature on human resource analytics has grown rapidly, but most research has focused on what analytics is and how it works (Peeters *et al*., 2020). Past research (Falletta & Combs, 2021; Krishna & Verma, 2025; Wang *et al*., 2024) on this subject portrayed a positive picture of the adoption of human resource analytics across different organizations. It was observed that an organization could improve efficiency and effectiveness, people's realization, and business strategic goals (Wang *et al*., 2024). The general picture that emerges from a scrutiny of the aforesaid research indicates that there is a low uptake of human resource analytics in organizations due to various personal and organizational factors, and that few empirical studies have been conducted. Scholars use different terms to define human resource analytics, indicating that the field is still evolving. Examples of labels in use include talent analytics (Alam *et al*., 2026), workforce analytics (Qamar & Samad, 2022), people analytics (Polzer, 2022), and human resource intelligence (Falleta, 2014). From another angle, Wang *et al*. (2024) and Marler and Boudreau (2017) used the terms human capital

analytics and human resource analytics, respectively. Undoubtedly, the point of convergence for all these labels is a measurement of human endeavor in organizational production processes. Against this backdrop, this researcher adopted the term human resource analytics. None of the above-identified past research (except Gal *et al*., 2020) addressed the ethical issues associated with human resource analytics in organizations. Instead, the vast majority of cited past research focused on the adoption and use of HRA across different organizations, which is a different problem. Therefore, this researcher seeks to advance the field by critically analyzing what is known about HR Analytics and the possible operational challenges associated with the practice.

Methods

The researcher used an integrative review to synthesize human resource analytics data from various research designs to reach an all-encompassing and reliable conclusion on the subject matter (Dhollande *et al*., 2021). Also called an orderly critical review, it is a scholarly survey of what other researchers have done in one's area of study. What is unique about this research method is that secondary data is gathered and critically evaluated, and research findings are combined. Orderly critical reviews are designed to provide an all-encompassing, thorough overview of contemporary explanations and evidence from published investigations, whether quantitative or qualitative (Siddaway *et al*., 2019). An integrative review was conducted in accordance with the guidelines of Kutcher and LeBaron (2022). Yusuf *et al*. (2024) note that integrative reviews offer a credible and transparent way to study a business issue. In this case, human resource analytics is a trending subject matter in both business circles and academia. Moreover, this methodology has empirical support from published works (Falletta &Combs, 2020; Giermindl *et al*., 2021).

Therefore, a literature review was conducted to avoid duplication. Key search terms used were the dark side of HR analytics, ethical issues in human resource analytics, challenges with people analytics, and artificial intelligence in human capital analytics. Literature published within the past five years was also used to add credibility and substantiate the authoritativeness of this paper's contention (Smart, 2020). Since the researcher was using the integrative review methodology on a relatively new topic, it was reasonably assumed

that using recent data sources and references would improve the quality and strength of the research evidence. Old sources have the notable challenge of not being sufficiently scrutinized and approved by other scholars. The other reason for maintaining recent sources is that older sources and their claims can be overtaken by changes, especially in technology. Thus, recent literature can serve as evidence of current knowledge. Drawing on scholarly advice (Bramer *et al*., 2017; Kutcher & LeBaron, 2022), two databases (Emerald Insights and Francis & Taylor Online) were used to gather relevant information on the subject. Data were organized, evaluated, analyzed, and synthesized to reach a conclusion (Oermann & Knafl, 2021;Toronto & Remington, 2020). Emerald Insights and Francis & Taylor Online search yielded 120 answers in this regard. On the same note, the World Wide Web was used to search for gray literature on ethical issues in human resource analytics, yielding 14 results. In this paper, grey literature sources simply mean information sources got from world wide web and found outside of other known indexed publishing houses. It can be information files from academia, government, and business reports. This is vital information to consider because all the aforesaid organisations post their verified information in the public domain for transparency and accountability. In practice, key professionals would have verified the authenticity of the information posted online. In this regard, grey literature enabled the researcher to connect with a diverse range of authors and organisations. The content therein can address emerging research areas that commercial publishers do not. The Emerald Insights database was chosen for its specialization in management and human resource management research, which are the core disciplinary areas of this investigation. The database is renowned for its comprehensive coverage of peer-reviewed journals that have published seminal works on HR analytics, information systems, and technology management, which are essential for understanding the intersection of Artificial Intelligence and human resource practices. Taylor and Francis Online was chosen as the second database for its extensive social science coverage, including over 2,500 journals, including The International Journal of Human Resource Management, which has featured critical debates on people analytics ethics. The data base complement Emerald by providing access to journals with different editorial perspectives, reducing the risk of missing relevant studies due to publication bias. The World Wide Web search was also used because human resource analytics is a rapidly evolving field, where

cutting-edge debates often first appear in industry reports, conference proceedings, and white papers before formal journal publication. Including grey literature enables methodological triangulation, allowing the researcher to compare and contrast findings from different source types, enhancing the credibility of the synthesised results.

Inclusion criteria explanation and justification

Not more than five years: human resource analytics and AI technologies evolve rapidly, and limiting to recent publications ensures that findings reflect current ethical debates. Older sources risk referencing obsolete systems.

Articles in English: English is a predominant language in international business and management research. The researcher's proficiency in English ensures accurate interpretation and synthesis of findings without translation-related errors.

Relevance to HR analytics challenges: the study sought to understand the dark side of HR analytics, and including only articles that address challenges, risks, or ethical dilemmas ensures a direct contribution to answering the research question and maintaining focus.

Full-text articles: full access to articles is essential for quality appraisal, extracting significant findings, and verifying methodological rigour. Abstracts alone cannot provide sufficient detail for meaningful synthesis.

Business or social sciences articles: Human resource analytics operates at the intersection of business management and social sciences. Limiting to these disciplines ensures relevance while excluding pure technical or engineering perspectives that lack organisational context.

Non-scholarly articles: Opinion pieces without empirical grounding, blog posts, and promotional context from software vendors and unverified online sources lack the methodological rigour and peer validation necessary for inclusion in a systematic academic review.

Exclusion criteria explanation and justification

Irrelevant to the study topic:articles focusing solely on the technical implementation of HR analytics software, general big data applications without an HR context, or purely positive

accounts without critical examination do not address the research question and would introduce irrelevant evidence.

More than five years old sources: The rapid pace of technological change means pre-2018 literature may describe HR analytics practices that are no longer representative.

Not in English language:Non-English articles could not be accurately interpreted or critically appraised, and including them would risk misinterpretation and compromise the validity of the results.

Pure science articles:articles from disciplines like data science, computer engineering, or statistics typically lack the organisational behaviour, ethical, and human-centric perspectives central to this investigation.

Non-scholarly articles:Unverified online sources lack the methodological rigour and peer validation necessary for inclusion in a systematic academic review.

The PRISMA diagram (Figure 1) below outlines how articles were selected for the ensuing appraisal and synthesis.

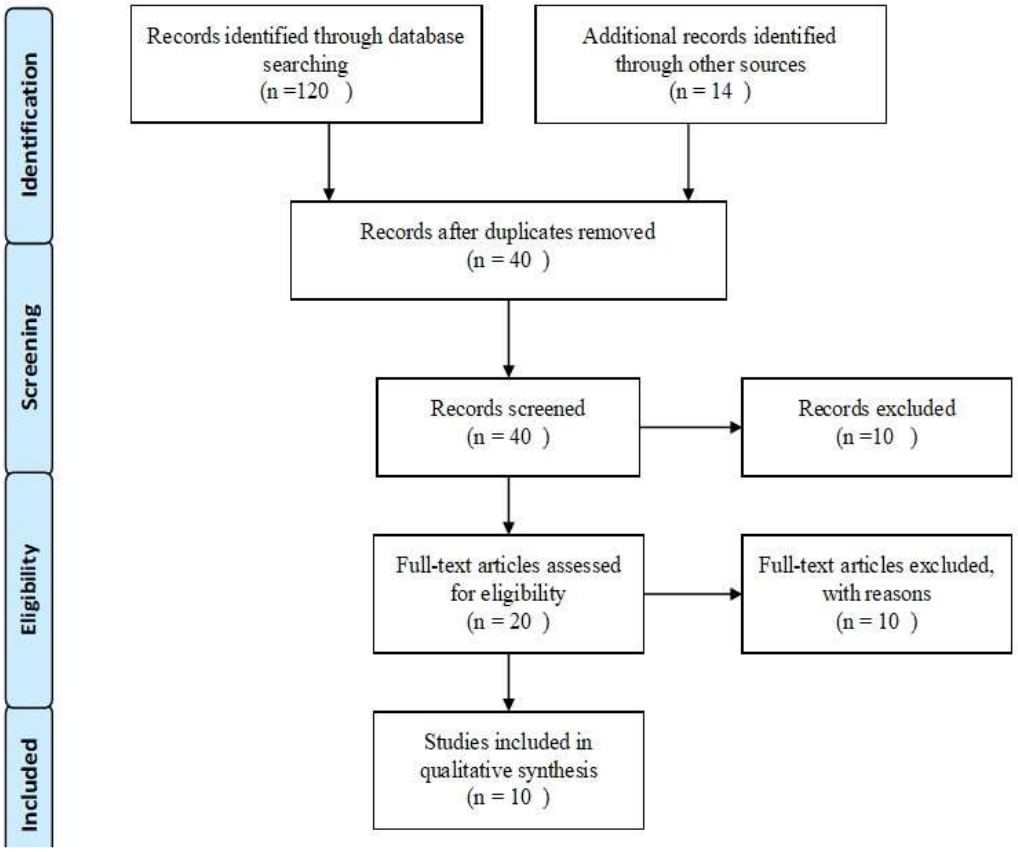

Figure 1: PRISMA Flow Diagram

Source: Own research (2025)

PRISMA Flow Process

Figure one above is a PRISMA four-phase flow diagram documenting the review process. Number one is the identification phase: Emerald Insights search (n=62), Taylor & Francis Online search (n=58), and grey literature search (n=14). The second step was the screening phase, where duplicates were removed (n=12), and titles and abstracts were screened against the inclusion criteria (n=122; n=87 excluded based on apparent irrelevance). The third step was the eligibility phase, where full-text articles were assessed for eligibility (n=35) and excluded for various reasons. The key reasons were focus on technical implementation only (n=12), purely positive or benefits-focused (n=8), and insufficient depth in ethical dimensions (n=5). The last step was the inclusion phase, where studies included in the qualitative assessment was done (n=10). Data were organised, evaluated, analysed, and synthesised to reach a conclusion (Toronto & Remington, 2020; Oermann & Knafl, 2021).

Findings

Ten sources were identified and included in the final qualitative synthesis. Thematic analysis followed. Recurring themes were identified from the scholarly survey and as directed by the research question. Five emergent themes from the ten source articles were then conceptualized in accordance with the research question in Table 1 below.

Table 1: Emergent Themes

Subject matter	**Rubric**	**Writer**	**Year of Publication**
Techno-stress, erosion of workplace privacy, regulatory and political flip sides.	Exploring the dark side of electronic human resource management: Towards a new PROMPT model	Behl *et al*.	2022

Bias and discrimination, erosion of workplace privacy, the regulatory flip side, transparency, and fairness	The ethics of people analytics: risks, opportunities, and recommendations	Tursunbayeva and Pagliari	2021
Erosion of workplace privacy	The HR analytics cycle: a seven-step process for building evidence-based and ethical HR analytics capabilities	Falleta and Combs	2020
Erosion of workplace privacy	The promise versus reality: a systematic review of the on-going debates in people analytics	McCartney&NaFu	2021
Erosion of privacy, lack of transparency, discrimination	The dark sides of people analytics: reviewing the perils for organizations and employees	Giermindl *et al.*	2022
Invasion of workplace privacy, legislation dilemma	A study on Human Resource analytics for decision-making in international business machines in India and the United States of America	Gohain and Saikia	2021
Invasion of privacy	Examining the dark side of human resource analytics: an empirical investigation using the privacy calculus approach	Chatterjee *et al.*	2021
Lack of Analytic competency and management support	The rise of HR Analytics: Exploring its implications	Upadhyay *et al.*	2021

	from a developing country perspective		
Technostress	Why not take a step further? Analysis of challenges in early-stage adoption of HR-Analytics in Swedish organizations	Beka and Behrami	2019
Invasion of workplace privacy, legislation dilemma	The Grey Area Ethical Dilemmas in HR Analytics: Perspectives from the global workforce	Guenole *et al.*	2018

Source: Scholarly survey (2025)

Techno-stress

Organizational leaders face stressors arising from the ever-changing learning environment. Specifically, the need to learn and unlearn new technology due to short dynamic technology cycles (Behl *et al*., 2022). HR analytics comprises statistics and analysis, and, in most cases, HR professionals and managers are not techno-savvy. Hence, the coming in of techno-stress. Similarly, working with new technology poses the challenge of employees fearing they may lose their jobs due to its introduction. Moreover, there is an assumption that human resource analytics reduces the value and competence of human beings in decision-making in organizations (Giermindl *et al*., 2021). This is usually true when there are no clear lines of communication and when key expected changes in job tasks within the organization are unclear (Arslan *et al*., 2021). The results above point to one form of stress, emphasizing the aspect of uncertainty. In most cases, employees are unsure how to keep pace with the fast-moving technical transformations in the corporate world. Another form of mental strain depicted here is the potential loss of employment due to technological replacement.

The third challenge here is the strain caused by the fear of not having the right qualifications to meet new technological demands. For sure, such a difficulty affects the productivity of individual employees in different organizations. Based on the preceding account, the author

developed a new definition of techno-stress. Specifically, techno stress is a person's psychological state and latent hostility resulting from his/her inability to accommodate and use technology beneficially. Thus, this paper identifies three overarching causes of workplace strain due to the computer technology revolution.

Erosion of workplace privacy

The intrusive tendency of human resource analytics poses sociological and cognitive challenges to employees in the workplace. Surveillance, the collection of sensitive data, and the tracking of workers and their work tools were found to impair employees' integrity and autonomy (Giermindl *et al*., 2022). Eventually, that evokes feelings of resentment and reduces employees' commitment to the organization's cause (ibid). Nevertheless, machine tracking and surveillance would be particularly useful in risky and creative industries to capture all vital business movements (Tursunbayeva *et al*., 2021). Health and safety programs in the workplace sometimes require employees to share their medical data, and such exchanges may lead to the unwarranted disclosure of employees' medical conditions. From an ethical perspective, this might lead to health inequalities(Chatterjee *et al*., 2021; Tursunbayeva & Pagliari, 2021). Gohain and Saikia (2021) maintain that privacy ethics must be upheld as the HR department collects data from outside the organization. Equally, health and sexual orientation data must be sufficiently safeguarded. Some organizations hire external companies to assess employees' health risks, and it is unclear how such records are kept securely (Falletta & Combs, 2020).

The typical lesson drawn from the above collection is that the advent of information technology in the corporate business world has caused organizations to trade their employee's privacy for convenience. The development has social and cognitive effects and challenges to both organizations and individual employees. Generally, this electronic gathering of employee data and monitoring of activities applies to specific industries, such as mining and construction.

Regulatory challenges

The subject of human resource analytics is relatively new, and the ethical dilemma is the lack of guiding statutes or precedent case references to consult. Some risk management laws do not apply to human resource analytics challenges (Tursunbayeva & Pagliari, 2021).

Vigorous education on employee rights and data protection laws is still lacking in third-world countries. Recognized employee unions are still in the dark as far as workers' privacy rights are concerned. Guenole *et al.* (2018) propose that legislation is insufficient to keep pace with ever-changing technologies. In some cases, business managers must apply risk laws according to the nature of human risk.

The above results indicate three categories of people responsible for enacting laws governing the application of human resource analytics in different organizations. To avoid operational challenges in HRA, national lawmakers should play a crucial role by engaging in diplomatic lobbying alongside company directors and interested practitioners. Equally, trade unionists are vital, as they represent large numbers of employees who subscribe to them, and must be protected by legal statutory instruments. Thus, through a tripartite arrangement, regulatory challenges associated with human resource analytics can be a thing of the past. Therefore, constant interaction, communication, and mutual understanding should be maintained among the three parties to achieve good results.

Political challenges

Ownership of HR analytics in organizations is a challenge; there is a raging debate about who exactly should be the custodian of HR analytics, either an independent analytics team or the HR department. Due to organizational mudslinging, organizations face many challenges, including data duplication, missing data, and a lack of centralized data storage (Guenole *et al.*, 2018). Typically, organizational activities are concealed, which brings in friction with regulatory authorities in some developed countries (Behl *et al*., 2022).

Given the above situation, human resource practitioners in different organizations should be the custodians of human resource analytics. This argument stems from the fact that data should be collected and analyzed by qualified practitioners who have been trained in the importance of gathering, storing, and interpreting data and linking it to broader organisational strategies. Therefore, such a position can be successfully adopted when relevant quantitative courses, such as business statistics and data analysis techniques, are compulsorily incorporated into tertiary institutions' study programs. In some developing countries' tertiary education institutions, the current position is that people management courses should not have compulsory numerical courses on offer. Practically, this severely

affects the performance of people management graduates and undermines some study programs. Thus, the researcher opines that such a perspective should be a thing of the past; tertiary institutions and professional bodies should regulate this field and enunciate practice requirements to avoid professional bullying in the corporate business world.

Bias and Discrimination

Human resource analytics enabled by machines can be biased towards a specific gender and discriminate against a particular category of potential employees. A typical example is the Amazon adventure story 2015, where their recruitment machine was set to recognize only male applicants (Tursunbayeva & Pagliari, 2021). The causative agents of such incidents are humans who train artificial intelligence systems with such bias and colleagues in the organization who lack appreciation for artificial intelligence. Discrimination in business practices, such as recruitment and training, can lead to class-action lawsuits in developed countries like the United States of America. It was observed that reducing human performance to numbers can devalue other aspects, such as satisfaction, that are harder to measure (ibid). Furthermore, a machine might not know when an employee has a running stomach problem and must be away from their desk.

Bias towards a specific gender can be addressed through extensive consultation with relevant stakeholders by human resource analytics software vendors. There must be consensus on job aspects to be put under camera surveillance and data analysis. This adds relevance to the point noted above in this paper that the nature of operations in some industries does not suit human resource analytics. Instead, there should be better, more practical ways to gather human resource data for analytical purposes without necessarily compromising workforce privacy.

Discussion

This paper sought to identify the dark side of human resource analytics in organisational management. An integrative literature review was conducted, and the research field was mapped using the theme-oriented approach as suggested by Leidner (2018). Beyond question, human resource analytics is associated with reduced labour costs, effective workforce management, and increased productivity. However, a literature review has demonstrated ethical challenges and problems associated with the praxis of analytics in

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organizations. Failure to diligently consider the unique aspects of human resource analytics can lead to unintended consequences such as techno-stress, invasion of workplace privacy, regulatory challenges, political challenges, and bias and discrimination.

Working with new technology presents a challenge of employees suspecting that they can end up losing their jobs due to the inception of technology. In light of this revelation, the author humbly submits that when there is a change in the organisation, transparency in communication and associated training are two key matters to be carefully handled. The general workforce needs to be educated about the reasons why new operational software or techniques are adopted. Associated training linked to a rewards strategy would address potential resistance to change among long-serving employees, who tend to adopt gate-keeping tendencies in the workplace. The elderly workforce, who can have difficulties in catching up with technological requirements due to certain health issues, need careful redeployment to certain points that do not require excess technology demands.

Regarding workplace privacy, the researcher argues that the business world would benefit from tailored advertisements about individual health cases, which would save lives. If used diligently, shared health data on some side effects and lifestyle habits can yield a major breakthrough in medical research. Maintaining privacy, in most cases, is an injury to the larger society, as only a few entities, including the government, would have access to certain information and the power to control its flow.

Due to constant changes in information technology, regulating the use of human capital analytics in organisations is very difficult, but it can be controlled through watertight regulations and regular surveys to understand customer satisfaction and usage challenges. Organisational leaders should obtain informed consent from the general workforce for the use of HRA software in the workplace. Furthermore, individual employee identification in areas under surveillance should be minimized to avoid challenges to workplace privacy. An in-depth understanding of legal matters and their associated impact should be sought from the organisation's legal department or externally. Historical data obtained through descriptive analytics would not align well with the business strategy; hence, proper data screening is advisable to avoid data misalignment. The control of organisational processes through codes of conduct, procedure manuals, and statutes will certainly address the

political challenges of data collection and interpretation posed by different organisational leaders. National leaders should include statistical and data analysis subjects in all human resource study programs to avoid the overbearing attitude of other professions. Rightly qualified people practitioners should manage human resources as a discipline.

As a result of the bias and discrimination observed in this study, it is encouraging that employers across organisations that have adopted human resource analytics seriously teach and disclose the predictive dimensions of the software used for recruitment. Important business stakeholders should be allowed to conduct an independent evaluation of the software to ensure it aligns well with overall business goals, cultural practices, and institutional mandate. These key steps would bring transparency to the entire employee resourcing process, enabled by intelligent business machines. Equally, human resource analytics vendors should strive to detect and reduce bias in their software tools. The review also revealed a lack of both qualitative and quantitative empirical studies. Not many organisations have advanced human resource analytics. Generally, the findings corroborate the talent analytics model and the technology acceptance model, which clearly indicate the levels of HRA adoption by organisations and the associated practice challenges, respectively.

Conclusions

The five ethical challenges of HRA identified by the integrative review are real, despite differences in the economic development of the countries where they are experienced. In first-world countries where companies fully embrace new technology in their operations, it is easy to appreciate the practical challenges they pose. In third-world countries, some of these challenges are hard to recognize due to either non-implementation or low operational level of human resource analytics. Whilst technology is advancing, machines cannot fully replace humans in the organisation. Rather, it is prudent to continuously train responsible personnel so they remain abreast of new analytics technologies. The researcher suggests mixed-method and longitudinal empirical studies for each observed theme. Such studies would provide a clear picture of the trends and patterns of human resource analytics challenges. Possible strategies to address the menacing challenges can be found in abundance through empirical evidence research. While there are opportunities for

organisations to utilise analytics, the exponential growth of artificial intelligence will further exacerbate the identified challenges if responsible stakeholders within organisations do not take due diligence measures. Hence, various organizations in the corporate world need to develop appropriate rules and guidelines for the use of human resource analytics in the workplace. This idea would work if first initiated by the responsible governments in different countries. Furthermore, an agreeable and unbiased position would be adopted on the real custodians of human resource analytics to avoid mudslinging, political games, and counterproductive behaviour in organisations.

Implications

Methodological implications: The review also revealed a lack of both qualitative and quantitative empirical studies. Not many organisations have advanced human resource analytics. Hence, the results of this study should be replicated in other contexts, and further qualitative, quantitative, and mixed-method studies can be conducted to support generalization. The researcher used two databases and the World Wide Web for a literature search to identify human resource analytics challenges articles. Therefore, future researchers can use more than two databases and conduct an ancestry search to learn more about the challenges associated with artificial intelligence in the workplace. An ancestry search would help reveal key patterns in human resource analytics problems and further add credibility to the study's findings.

Practical implications: Human resource practitioners and other managers responsible for people management and production processes can be informed about critical challenges associated with human resource analytics through this study. Thus, evidence-based decision-making and policy formulation are enabled in organizational operations. Watertight operational laws would be used to address challenges such as organisational political dynamics and employees' mental strain.

Theoretical implications: The two theories used as a theoretical framework supported the investigated phenomenon, but in very general terms without a precise degree of accuracy. The two theories appear useful for understanding the ethical challenges in human resource analytics. Thus, the theories have been partially supported, necessitating further study to

expand the theoretical framework. An expansion of the theoretical framework would help clarify the dark side of HRA, including sources of problems and possible corrective actions.

Limitations

The paper has limitations associated with its methodology. An integrative review methodology uses secondary data, which, in most cases, lack the depth of empirical studies. The paper used the inclusion criteria of English-language studies and similar context studies published within the past 5 years. Therefore, this criterion may lead to omitting current studies, and other papers in other languages may contain relevant information on the subject matter being studied. Reliance on academic papers and grey literature sources may overshadow practical insights from industry reports and practitioners. Finally, the rapid evolution of HR analytics and AI means some findings may become outdated as technology advances. These limitations suggest the need for further primary research to validate and expand upon the identified challenges.

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