

## **Human resource analytics and employee outcomes: challenges for human resource managers at De united foods industries limited (DUFIL)**

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### **Abstract**

*Despite the growth and adoption of human resource (HR) analytics, it remains unknown whether HR analytics can impact employee outcomes. As such, this study aims to address this important issue by examining the impact of Human Resource Analytics (HRA) on employee job satisfaction, engagement and performance at De United Foods Industries Limited (DUFIL) among others. Using data collected from 135 members of DUFIL, Pearson's product Moment Correlation and multiple regression were employed in testing the hypotheses. The study found that Human Resource Analytics (HRA) positively impacts job satisfaction, engagement, and performance at DUFIL, enhancing HR's ability to address employee needs. However, challenges exist in data quality, analytical skills, and ethical concerns—specifically around privacy and fairness—which impact trust and the effectiveness of HRA initiatives. The study recommended that to optimise HRA's impact, DUFIL should invest in data management systems, enhance HR analytical skills through training, and establish ethical guidelines to ensure transparency and employee trust in data-driven HR practices.*

**Keywords:** *Analytical skills, data quality, employee job satisfaction, ethical concerns, performance*

### **1. Introduction**

In an era where data-driven decision-making has permeated nearly every sector, Human Resource (HR) departments are increasingly adopting analytical approaches to improve employee outcomes. Human Resource Analytics (HRA), or the implementation of data analytics to HR functions, offers significant promise in refining how organisations manage their workforce, boost productivity, and enhance employee satisfaction. By using sophisticated tools to analyse workforce-related data, HR managers can make evidence-based decisions to improve hiring, retention, engagement, and performance, while simultaneously facing complex challenges (Kumar, Kumari, Rao, Kumari, Janaki, Lakshmi & Krishna, 2022). Despite its benefits, implementing HRA involves hurdles, including data access, privacy concerns, and the need for skill development in HR departments. The evolution of data analytics in HR reflects broader shifts in technology and organisational strategy. HRA represents a paradigm shift from traditional HR practices that rely on intuition and experience to more scientific approaches that leverage data to understand employee behaviours and forecast future trends. Today, approximately 70% of organisations globally use HRA to gain a foresight into employee performance, engagement, and retention (Deloitte, 2023). This data-oriented approach enables HR managers to identify key drivers of employee satisfaction and develop interventions to enhance productivity and morale.

HRA is categorised into descriptive, predictive, and prescriptive analytics. Descriptive dimension of HRA focuses on historical trends and data; the predictive aspect infuses statistical models to anticipate future outcomes, while prescriptive proposes actionable strategies based on findings (Marler & Boudreau, 2017). Each type of analysis plays a role in supporting HR managers in making informed decisions, reducing turnover, and fostering a productive work environment. For instance, by applying predictive analytics, HR departments can forecast which employees are at peril of leaving, allowing selected retention strategies (Zebua, Santosa & Putra, 2024).

Employee outcomes, including job satisfaction, engagement, performance, and retention, are critical indicators of an organisation's health. Studies indicate that when organisations focus on improving these outcomes, they experience higher levels of profitability and productivity. For example, a report by Gallup (2022) highlighted that workplaces with higher employee engagement often face 23% high profitability and lower turnover rates compared to those with disengaged workforces. As such, the ability to measure and enhance employee outcomes through HRA provides companies with a competitive edge, emphasising the value of HR in strategic decision-making (Kumar, et al., 2022).

Regardless of the many benefits of the implementation of HRA, it hitherto has its challenges on data accessibility. Data relevant to HR analytics, such as performance metrics, employee engagement scores, and turnover data, often reside in disparate systems, creating data silos that hinder effective analysis (Rasmussen & Ulrich, 2015). Organisations need to establish integrated systems to centralise and streamline data collection to make HRA effective. Furthermore, ensuring data accuracy is critical, as inaccurate data can lead to misguided conclusions that negatively impact employee morale and organisational efficiency.

Data privacy and ethical considerations also present significant challenges. HR data often includes sensitive information, raising concerns about how data is collected, stored, and analysed. Certain rules such as the General Data Protection Regulation (GDPR) in the European Union underscore the importance of handling employee data responsibly (European Union, 2018). HR managers must implement robust data protection policies to ensure compliance and foster trust among employees, as any misuse of data could damage the organisation's reputation and lead to legal consequences. Another significant barrier to HRA implementation is the skill gap within HR departments. Many HR professionals lack the technical expertise to analyse data effectively, limiting the value derived from analytics tools (Rasmussen & Ulrich, 2015). To address this, organisations need to invest in upskilling HR personnel, providing them with training in data analytics and familiarising them with advanced analytical tools. A study by Deloitte (2023) noted that 58% of HR professionals believe that inadequate training in analytics impedes their ability to make data-driven decisions.

Addressing these challenges requires a strategic approach that encompasses technology adoption, employee training, and data governance. Firstly, organisations must integrate HRA tools into their HR structure to eliminate data silos and create uninterrupted flow of data across departments. Cloud-based human capital management (HCM) systems have become increasingly popular as they provide HR professionals with real-time data access, enabling quicker and more accurate analysis (Rana & Sharma, 2023). Such systems also facilitate collaboration between HR and IT, enhancing the alignment of HRA with overall organisational goals. Employee education and upskilling are essential to building a data-driven HR culture. Organisations can bridge the analytics skill gap by offering targeted training programmes and fostering collaboration with data science departments. This ensures that HR professionals not only understand how to use analytics tools but also can interpret data to make informed decisions. Building this capability within HR enhances their strategic influence within the organisation, shifting HR from a traditionally supportive role to a pivotal driver of business outcomes.

Ethical data governance is crucial. HR managers must prioritise transparency, and that employees acknowledge how their information will be functional and implementing safeguards to protect sensitive information. This builds trust within the organisation, enabling smoother data collection processes and better data accuracy (European Union, 2018). Ethical considerations should also extend to the analytics process itself, ensuring that algorithms and predictive models used in HRA do not perpetuate biases or inequalities. By embedding ethical practices in HRA, organisations can foster a respectful and fair workplace (Wang, Zhou, Sanders, Marler & Zou, 2024).

As organisations continue to invest in HRA, the role of HR will evolve toward greater strategic importance. Emerging technologies, such as artificial intelligence (AI) and machine learning (ML), offer new opportunities for HRA by automating data analysis and enhancing predictive capabilities. For instance, AI-driven HRA tools can monitor employee engagement in real-time and provide instant recommendations for improving workplace satisfaction (Forbes, 2023). However, as technology advances, the need for responsible data management and ethical considerations will remain crucial.

The rise of remote work and flexible work arrangements also impacts HRA. HR managers must adjust their analytical approaches to account for these changes, examining how remote work affects engagement and productivity. Such insights will be invaluable as organisations adapt to new working models and strive to optimise employee outcomes. This paper seeks to investigate the significance of Human Resource Analytics in improving efficiency in HR functions. Due to evident analytical outcomes regarding how organisations find, hire, train, and retain employees, HR data analysis plays a crucial role in the business operations. This paper therefore focuses on

human resource analytics and employee outcomes appraising its challenges for human resource managers at De United Foods Industries Limited (DUFIL).

### **Objectives of the Study**

This study seeks to examine human resource analytics and employee outcomes, as well as its challenges for human resource managers. The specific objectives are to:

- i. To examine the impact of Human Resource Analytics (HRA) on employee job satisfaction and engagement at De United Foods Industries Limited (DUFIL),
- ii. To assess the role of HRA in enhancing employee performance at De United Foods Industries Limited (DUFIL),
- iii. To analyse data quality challenges faced by HR managers in implementing HRA at De United Foods Industries Limited (DUFIL),
- iv. To investigate the relationship between HR managers' analytical skills and the effectiveness of HRA at De United Foods Industries Limited (DUFIL),
- v. To identify ethical concerns in the use of HRA at De United Foods Industries Limited (DUFIL).

### **Research Hypotheses**

The following null propositions are used as working hypotheses for the research study.

- H0<sub>1</sub>:** Resource Analytics (HRA) has no positive impact on employee job satisfaction and engagement at De United Foods Industries Limited (DUFIL).
- H0<sub>2</sub>:** HRA significantly does not enhance employee performance at De United Foods Industries Limited (DUFIL).
- H0<sub>3</sub>:** HR managers at De United Foods Industries Limited (DUFIL) do not face significant data quality challenges that hinder the effective implementation of HRA.
- H0<sub>4</sub>:** HR managers' analytical skills are not positively correlated with the effectiveness of HRA at De United Foods Industries Limited (DUFIL).
- H0<sub>5</sub>:** Ethical concerns, such as data privacy and bias, do not influence the use of HRA at De United Foods Industries Limited (DUFIL).

## **2. Literature review**

### **2.1 Empirical review**

#### **Human resource analytics (HRA) and employee job satisfaction and engagement**

Kumar et al. (2022) investigated HR analytics as a moderating role in effective employee engagement and its outcomes. The authors affirmed that in today's business environment, all business organisations recognise the relevance of employee engagement for better productivity. HR analytics plays a vital role in engaging employees and making better decisions in each department related to all HR activities like HR planning, recruitment and selection, training and development, talent management, performance appraisal, etc. Employee engagement is one of

the most critical areas of HR where analytics should be applied. Employee engagement can be defined as the emotional bonding of employees with an organisation. HR analytics helps to manifest satisfaction levels, intention to quit, OCB, organisational commitment and productivity. The study analyses the moderating role of HR analytics in effective employee engagement which results in the productivity of employees. The study was conducted resulting in how the HR analytics maturity levels of organisations related with engagement levels.

### **Human resource analytics (HRA) and employee performance**

A review of the literature was carried out by Zebua et al. (2024), titled “the role of HR Analytics in enhancing organisational performance: A review literature”. The authors stressed that the advent of Human Resource (HR) analytics has revolutionised the way organisations manage their workforce, enabling data-driven decision-making and strategic planning. This literature review aims to synthesise recent research on the role of HR analytics in enhancing organisational performance. By systematically analysing studies published over the past decade, the paper identifies key themes, methodologies, and findings that highlight the impact of HR analytics on various performance metrics. The review reveals that HR analytics contributes significantly to improving recruitment processes, employee retention, talent management, and overall organisational effectiveness. Moreover, the integration of advanced analytics tools and techniques, such as predictive modelling and machine learning, has been shown to provide deeper insights into employee behaviour and organisational dynamics. Despite its benefits, the implementation of HR analytics faces several challenges, including data privacy concerns, the need for specialised skills, and resistance to change within organisations. The review concludes by discussing the implications for HR practitioners and offering recommendations for future research to address the existing gaps and further harness the potential of HR analytics in driving organisational success.

### **Data quality challenges faced by HR managers in implementing human resource analytics (HRA)**

Malla et al (2023) leveraged HR analytics for data-driven decision-making using a comprehensive review. The authors emphasised that Human Resource (HR) Analytics has emerged as a critical tool for organisations to effectively manage their workforce and make informed decisions. The research paper aims to provide a comprehensive review of HR analytics, highlighting its importance, methodologies, benefits, and challenges. The paper explores the various applications of HR analytics in areas such as recruitment and selection, performance management, employee engagement, talent development, and retention. Additionally, it examines the key data sources, metrics, and analytical techniques used in HR analytics, including descriptive, predictive, and prescriptive analytics. Furthermore, the paper discusses the potential impact of HR analytics on organisational performance, employee satisfaction, and overall business outcomes. Lastly, it addresses the ethical considerations and privacy concerns

associated with HR analytics implementation. The findings of this research paper emphasize the significance of HR analytics in enabling evidence-based decision-making and fostering a data-driven HR function within organisations.

### **HR managers' analytical skills and the effectiveness of human resource analytics**

Wang, Zhou, Sanders, Marler and Zou (2024) examined the determinants of effective HR analytics Implementation using an in-depth review and a dynamic framework for future research. The authors stressed that human resources (HR) analytics implementation is a field that continues to evolve, keeping pace with the increasing speed of digital innovation. However, despite its practical significance, there is a lack of knowledge of effective HR analytics implementation. Therefore, in the study, by conducting an in-depth analysis of 89 peer-reviewed HR analytics studies published during the past twenty years, the paper presents a comprehensive summary of determinants of successfully implementing HR analytics in organisations. Furthermore, using adaptive structuration theory, the paper proposes a dynamic framework of HR analytics implementation, offering guidance to both HR practitioners and HR scholars. Finally, the paper provides a research agenda aimed at stimulating future research endeavours in HR analytics.

### **Ethical Concerns and the Use of Human Resource Analytics**

Rakesh (2023) conducted a study on ethics and data privacy about the backbone of trustworthy healthcare practices. The paper conforms with today's rapidly evolving digital landscape, the healthcare industry has embraced data-driven technologies to enhance patient care and medical research. However, this transformation brings forth the crucial responsibility of safeguarding sensitive patient data and adhering to ethical principles. This article delves into the paramount significance of data privacy and ethics in healthcare, placing a strong emphasis on maintaining patient trust and upholding research integrity. Implementing robust security measures, including encryption and access controls, is imperative to protect patient information from unauthorised access. Ethical considerations underpin the responsible handling of patient data, emphasising the importance of obtaining informed consent and maintaining transparent communication. Striking a delicate balance between innovation and patient privacy involves leveraging privacy-preserving techniques while harnessing the potential of Artificial Intelligence (AI) and big data analytics. Empowering patients in data privacy decisions, through granting access to their health data and fostering transparent policies, further solidifies the foundations of trust in the healthcare sector. Upholding data privacy and ethics not only aligns with regulatory compliance but also embodies a moral obligation to prioritise patient dignity and foster progress in the dynamic realm of healthcare.

## **3. Methodology**

This study employed the use of a descriptive (survey) research method. This is a type that gives a vivid description of a situation and events. It made use of questionnaires as a means of gathering useful and accurate data relating to the topic under study. As gathered from the Corporate Affairs Department of the study area, the population of De United Foods Industries Limited is located at Atan-Idiroko expressway, Sango-Ota, Ogun State, Nigeria with over 410 population. Following the Slovin formula, the amount taken with a 90% accuracy level is as follows:

$$n = \frac{410}{1+410 (0.07)^2}$$

$$n = \frac{410}{1+410 (0.0049)}$$

$$\frac{410}{1+410 (2.009)}$$

$$\frac{410}{3.009}$$

$$n = 136.26$$

Therefore, one hundred and thirty-six (136) employees of DUFIL were the study respondents. The study adopts the simple random sampling technique. The simple random sample is a subset of a statistical population in which each member of the subset has an equal probability of being chosen. A simple random sample is meant to be an unbiased representation of a group therefore the method was used to select the sample size of one hundred and thirty-five (135) from the population. The administered questionnaire was adapted from past validated instruments. Items related to human resource analytics (10 items) were adapted from the scale of Vignoli, Mattarelli and Makinen, (2018) while employee outcomes (10 items) were taken from the scale of Vignoli, et al (2018). The Cronbach alpha reports of the instruments adapted were 0.78 and 0.88 respectively, indicating the suitability of the questionnaire. Further data analysis was carried out using Pearson Correlation and regression analysis.

#### **4. Results/data analysis**

From the one hundred and thirty copies of the questionnaires administered to the respondents from DUFIL, the researcher was able to retrieve one hundred and twenty (120) copies, representing 88.9% of the instruments used for the analysis.

#### **Test of Hypotheses**

##### **Hypothesis One:**

**H<sub>1</sub>: Human Resource Analytics (HRA) has a positive impact on employee job satisfaction and engagement at De United Foods Industries Limited (DUFIL)**

**Table 1. Correlation**

	Human analytics	resource	Employees' job satisfaction and engagement
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<b>Human resource analytics</b>	Pearson Correlation	1	.716**
		Sig. (2-tailed)	.000
		N	120
	Pearson Correlation	.716**	1
		Sig. (2-tailed)	.000
		N	120

**\*\*.** Correlation is significant at the 0.01 level (2-tailed).

### Interpretation of Result

Table 1 reveals that there exists a strong significant relationship between Human Resource Analytics (HRA), employee job satisfaction and engagement at De United Foods Industries Limited (DUFIL). The table also shows the Pearson Correlation Coefficient 0.716 with  $p = .000$  implying that Human Resource Analytics (HRA) has a positive impact on employee job satisfaction and engagement at De United Foods Industries Limited (DUFIL).

### Hypothesis Two:

**H<sub>2</sub>: Human Resource Analytics significantly enhances employee performance at De United Foods Industries Limited (DUFIL).**

**Table 2. Correlations**

		<b>Human Analytics</b>	<b>Resource</b>	<b>Employee Performance</b>
<b>Human Analytics</b>	Pearson Correlation	1		.724**
	Sig. (2-tailed)			.000
	N	120		120
<b>Employee Performance</b>	Pearson Correlation	.724**		1
	Sig. (2-tailed)	.000		
	N	120		120

**\*\*.** Correlation is significant at the 0.01 level (2-tailed).

### Interpretation of Result

Table 2 reveals that there exists a strong significant relationship between Human Resource Analytics and employee performance. The table also shows the Pearson Correlation Coefficient 0.724 with  $p = .000$  implying that HRA and employee performance  $r$  is significantly related in this study. Therefore, the null hypothesis is rejected and concluded that Human Resource Analytics significantly enhances employee performance at De United Foods Industries Limited (DUFIL).

### Hypothesis Three:

**H<sub>3</sub>: HR managers at De United Foods Industries Limited (DUFIL) face significant data quality challenges that hinder the effective implementation of HRA.**

**Table 3. Correlations**

		<b>HR Managers</b>	<b>Data Quality &amp; HRA Implementation</b>
<b>HR Managers</b>	Pearson Correlation	1	.555**
	Sig. (2-tailed)		.000
	N	120	120
<b>Data Quality &amp; HRA Implementation</b>	Pearson Correlation	.555**	1
	Sig. (2-tailed)	.000	
	N	120	120



\*\*, Correlation is significant at the 0.01 level (2-tailed).

### Interpretation of results

Table 3 reveals that HR managers face significant data quality challenges that hinder the effective implementation of HRA. The table also shows the Pearson Correlation Coefficient 0.555 with  $p = .000$  implying that HR managers at De United Foods Industries Limited (DUFIL) face significant data quality challenges that hinder the effective implementation of HRA and are significantly related to this study.

### Hypothesis Four:

**H<sub>4</sub>:** HR managers' analytical skills are positively correlated with the effectiveness of HRA at De United Foods Industries Limited (DUFIL).

**Table 4a. Regression summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.837 <sup>a</sup>	.778	.778	1.482

a. Predictors: (Constant), HR managers' analytical skills

The regression summary in Table 4a shows the multiple correlation coefficient and coefficient of determination. The result shows that the *R-value* of 0. 837 indicates a high degree of correlation while the  $R^2$  value of .778 indicates that 83% of total variation recorded in HR managers' analytical skills are positively correlated with the effectiveness of HRA at De United Foods Industries Limited (DUFIL).

**Table 4b. Summary of F-test result showing overall model fit**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4521.575	2	5521.575	2413.665	.000 <sup>b</sup>
	Residual	664.425	118	2.197		
	Total	5286.000	120			

b. Predictors: (Constant), HR managers' analytical skills

Table 4b shows the significance of the model (model fit). The coefficient of  $F_{(2348)} = 2413.665$ ,  $\text{prob.} < 0.05$ , shows that overall, the regression model statistically and significantly predicts HR managers' analytical skills and HRA effectiveness.

**Table 4c. Regression results showing the influence of HR managers' analytical skills on the effectiveness of Human Resource Analytics**

Model		Unstandardized Coefficients	Std. Error	Standardized Coefficients	T	Sig.
		B		Beta		
1	(Constant)	-6.126	.503		-12.169	.000
	HR Managers' analytical skills	.697	.014	.837	50.136	.000

a. Dependent Variable: HRA Effectiveness

Table 4c shows a simple regression analysis of the influence of HR managers' analytical skills on the effectiveness of HRA. The coefficient of HR Managers' analytical skills is 0.679. Meanwhile, the t-value of the variable is 50.136 while the probability value is 0.000. From the result, it can be inferred that HR managers' analytical skills ( $t=50.136$ ,  $prob. < 0.05$ ) predict the influence of HR Managers' analytical skills on the effectiveness of HRA at DUFIL. Since the significant value is less than 0.05 level of significance, the study reject the null hypotheses and conclude that HR Managers' analytical skills ( $F_{(2348)} = 2413.665$ ,  $prob. < 0.05$ ), are positively correlated with the effectiveness of HRA at De United Foods Industries Limited (DUFIL)

#### **Hypothesis Five:**

**H<sub>5</sub>:** Ethical concerns, such as data privacy and bias, influence the use of HRA at De United Foods Industries Limited (DUFIL).

**Table 5a. Regression summary**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.255 <sup>a</sup>	.065	.062		1.18

Predictors: (Constant), ethical concerns (data privacy & bias)

The regression summary in Table 5a shows the multiple correlation coefficient and coefficient of determination. The result shows that the *R-value* of 0.255 indicates a high degree of correlation while the  $R^2$  value of .065 indicates that 26% total variation recorded in the use of HRA was explained by ethical concerns.

**Table 5b. Summary of F-test result showing overall model fit**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	13.772	2	33.772	22.21	.000 <sup>b</sup>
	Residual	385.442	118	1.395		
	Total	419.214	120			

a. Dependent Variable: Ethical concerns (data privacy & bias)

b..Predictors: (Constant), Use of HRA

Table 5b shows the significance of the model (model fit). The coefficient of  $F_{(2348)} = 22.21$ ,  $prob. < 0.05$ ), shows that overall, the regression model statistically and significantly predicts ethical concerns like data privacy and bias in the manufacturing sector.

**Table 5c. Regression results show if ethical concerns, such as data privacy and bias, influence the use of HRA**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	15.078	.401		37.583	.000
	Use of HRA	-.054	.011	-.255	-4.920	.000

a. Dependent Variable: Ethical concerns

Table 5c shows a simple regression analysis of ethical concerns, such as data privacy and bias, influencing the use of HRA at De United Foods Industries Limited (DUFIL). The coefficient of ethical concerns is -0.054. Meanwhile, the t-values of the variable are 4.920 while the probability value is 0.000. From the result, it can be inferred that the use of HRA ( $t = -4.920$ ,  $prob. < 0.05$ ) predicts ethical concerns. Since the significant value is less than 0.05 level of significance, the study reject the null hypotheses and conclude that ethical concerns such as data privacy and bias influences ( $F_{(2\ 348)} = 22.21$ ,  $prob. < 0.05$ ), the use of HRA at De United Foods Industries Limited (DUFIL).

### **Discussion of findings**

Human Resource Analytics (HRA) has transformed workforce management by offering data-driven insights into critical employee outcomes such as satisfaction, engagement, and performance. However, challenges such as data quality, limited analytical skills, and ethical concerns underscore the need for organisations to invest in foundational improvements and develop robust ethical frameworks for HRA.

### **Human resource analytics' impact on job satisfaction and engagement**

HRA facilitates better job satisfaction and engagement by enabling organisations to identify key drivers through advanced analytics. For instance, tools that analyze feedback and performance data allow HR managers to design tailored initiatives for employee well-being and growth (Biswas, 2023). Personalized interventions aligned with employee preferences boost morale and productivity. However, poor data quality undermines these efforts, leading to inaccurate insights and misguided strategies (Gartner, 2023). Investing in high-quality data infrastructure and analytical skills training for HR professionals is critical to ensure reliable outcomes. Additionally, a culture of continuous engagement supported by ethical data practices fosters trust and alignment between employees and organisational goals (McKinsey, 2023).

### **Enhancing employee performance**

Human Resource Analytics contributes to performance improvement by identifying skills gaps and guiding individualized training plans. Predictive analytics enhances workforce capabilities, providing actionable insights into performance bottlenecks (SHRM, 2023). However, leveraging these tools effectively requires HR teams to possess strong analytical expertise. Research suggests that HR managers with advanced data skills are better equipped to interpret metrics and translate them into meaningful interventions (Peero, 2023). Therefore, organisations must prioritize skill-building initiatives to empower HR professionals. Moreover, ethical guidelines are essential to ensure that performance data is used fairly, avoiding punitive or biased applications that could harm employee trust.

### **Data quality challenges in human resource analytics**

Data quality is a cornerstone for effective HRA implementation. Challenges such as incomplete, outdated, or inconsistent data hinder actionable insights (Top Employers Institute, 2023). For instance, inaccurate data can lead to flawed conclusions about employee performance or satisfaction, risking counterproductive interventions. Establishing robust data governance frameworks is crucial to address these issues. Organisations should invest in technologies that ensure data accuracy, while also training HR staff to maintain data integrity and compliance with privacy laws like the GDPR (Gartner, 2023). High-quality data not only improves decision-making but also strengthens the credibility of HRA systems among employees and stakeholders.

### **Analytical skills and HRA effectiveness**

HR managers' analytical skills are pivotal in extracting meaningful insights from complex datasets. Studies indicate that many HR professionals lack the technical proficiency to effectively utilize HRA tools, limiting the potential impact on organisational outcomes (Fadamiro & Adeoye, 2019). Comprehensive training programmes focused on data interpretation and the use of analytics software can bridge this gap. Moreover, collaboration between HR and data science teams can enhance analytical capacity and foster a more strategic application of HRA insights (McKinsey, 2023). Building such cross-functional capabilities ensures that organisations maximise the return on their investment in HRA.

### **Ethical concerns in human resource analytics**

Ethical concerns remain a critical barrier to the widespread adoption of HRA. Issues such as data privacy, bias, and lack of transparency risk undermining employee trust in HR processes (SHRM, 2023). For example, algorithms used for hiring or promotions may inadvertently reflect historical biases, reinforcing systemic inequalities (Peero, 2023). To address these challenges, organisations should develop ethical guidelines that prioritise fairness, accountability, and transparency in HRA practices. These guidelines should also include mechanisms for informed consent, ensuring employees are aware of how their data will be used. Regular audits of HRA systems can further safeguard against unethical practices and promote organisational integrity (Gartner, 2023).

### **Conclusion and recommendations**

This study highlights the valuable role of Human Resource Analytics (HRA) in improving job satisfaction, engagement, and employee performance at DUFIL. HRA has proven effective in enabling data-driven HR practices, which, in turn, help meet employee needs and drive organisational growth. Nevertheless, critical challenges hinder its full potential. Data quality issues—such as accuracy, consistency, and completeness—pose significant barriers to the reliability of insights generated from HRA, underscoring the need for improved data management practices. HR managers' analytical skills directly impact the success of HRA initiatives, suggesting the importance of skill enhancement programmes within HR departments. Ethical considerations, including transparency, privacy, and fairness, are also essential, as these factors influence employee trust and acceptance of analytics in the workplace. Addressing these challenges through strategic interventions can optimize HRA's benefits, supporting a balanced approach that fosters both performance and trust in HR practices. This study concludes that

HRA's effectiveness in boosting job satisfaction, engagement, and performance at DUFIL, despite data quality, skills, and ethical challenges that impact its full potential.

Human Resource Analytics (HRA) is a transformative tool for enhancing employee outcomes, optimising organisational strategies, and driving sustainable success. To fully leverage its potential, organisations must address critical factors related to strategy, collaboration, and ethics.

### **Develop comprehensive analytics strategies**

A well-defined analytics strategy is foundational for the effective implementation of HRA. This includes establishing clear objectives, defining key performance indicators (KPIs), and aligning analytics initiatives with organisational goals. Organisations should invest in robust data collection and integration systems that aggregate data from various sources, including employee surveys, performance metrics, and HR databases (Gartner, 2023).

Training HR professionals in analytical thinking and equipping them with modern tools like predictive analytics and machine learning are vital to ensure that analytics efforts translate into actionable insights (Top Employers Institute, 2023). Additionally, organisations should prioritise continuous evaluation and improvement of their analytics frameworks to remain adaptive to changing business needs and technological advancements.

### **Foster collaboration between HR and IT departments**

Collaboration between HR and IT departments is crucial for the successful deployment of HRA systems. IT expertise is essential for ensuring data security, system scalability, and seamless integration of analytics platforms with existing HR management systems. Joint teams should work to build user-friendly interfaces that allow HR professionals to easily access, analyse, and act on data insights (SHRM, 2023). Establishing cross-functional teams also facilitates knowledge-sharing and problem-solving. For example, IT professionals can address technical challenges, while HR teams contribute domain knowledge about workforce dynamics. This collaboration ensures that HRA tools are both technologically advanced and practical for HR applications.

### **Establish clear ethical guidelines**

Ethical concerns are a significant barrier to HRA implementation, particularly regarding employee privacy and data usage. Organisations should develop comprehensive ethical guidelines that govern how employee data is collected, analysed, and shared (McKinsey, 2023). These guidelines should comply with local and international data protection laws and include protocols for obtaining informed consent from employees.

Transparency is key to building trust among employees. Organisations should communicate how data will be used and ensure that analytics practices are designed to benefit both the organisation and its workforce. Establishing an ethics committee to oversee HRA activities can further safeguard against misuse and promote accountability.

**Invest in data quality:** High-quality data is the backbone of effective analytics. Organisations should prioritise data cleaning, validation, and governance to minimise inaccuracies and biases in decision-making (Peero, 2023).

**Promote a data driven culture:** Leadership support is essential for fostering a culture that values data-driven decision-making. Regular training sessions, workshops, and success stories can help build this culture across all organisational levels (Forbes, 2023).

**Adopt scalable solutions:** Organisations should select HRA tools that are scalable and adaptable to future needs, ensuring long-term relevance and cost-efficiency.

### **Limitations of the Study**

Findings may not apply universally due to organisational differences in culture, size, and industry-specific factors. Dependence on secondary data and limited empirical analysis restricts robust validation of claims. Evolving HR technologies may outdate study findings, necessitating regular updates. Addressing ethical concerns fully is challenging due to varying global privacy laws and subjective interpretations of fairness. The study assumes baseline analytical capabilities in HR professionals, which may differ widely across regions and organisations.

### **Suggestions for future research**

Future research should investigate industry-specific challenges in adopting HR analytics, such as varying data accessibility, regulatory requirements, and workforce dynamics across sectors like healthcare, manufacturing, and technology. These studies can uncover sector-specific best practices and hurdles. Longitudinal studies on HR analytics could explore its sustained impact on employee performance, satisfaction, and organisational outcomes over time. Such research would provide insights into how continuous investment in data quality, analytical tools, and ethical practices contributes to long-term success, fostering strategic decision-making and adaptability in dynamic business environments.

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