



THE ASSOCIATION OF HUMAN RESOURCE ANALYTICS AND ORGANIZATIONAL PERFORMANCE IN SAUDI COMPANIES.

Omar A. Baakeel

Department of Human Resources Management, College of Business at Alkamil, University of Jeddah, Jeddah, Saudi Arabia

ORCID: 0000-0001-5801-0883

Email: obaakeel@uj.edu.sa

Abstract

This study investigates how human resource analytics (HRA) influences organizational performance in Saudi Arabian companies. It focuses on three main areas: employee engagement analytics, talent acquisition analytics, and manpower planning analytics. A quantitative, descriptive research approach was employed. Data were collected via an electronic questionnaire distributed to employees at Saudi firms, yielding 281 responses through simple random sampling. The analysis was conducted in SPSS. The findings provide strong support for the strategic value of HRA in improving organizational performance in Saudi Arabia. They show that the three focus areas together account for a significant share of variance and affect performance. By offering empirical evidence from a specific, rarely studied context, the research contributes to the literature in this field. It also provides a clear understanding of human resource analytics, capturing the complexities of data-driven human resource management processes beyond basic models. Furthermore, it offers practical insights for Saudi companies seeking to use HR analytics to enhance performance, particularly within the framework of Saudi Arabia's Vision 2030.

Keywords: Human resource analytics; organizational performance; employee engagement analytics; talent acquisition analytics; manpower planning analytics; Saudi Arabia; Vision 2030; strategic HRM

1. Introduction

The rapid advance in technology has dramatically expanded the competitive market for businesses around the world. As a result, it has also created awareness of the value of human capital as one of the most critical components of an organization's competitive advantage. Due to this paradigm shift, the modern corporate landscape is being redefined (Vadithe & Kesari, 2025). As a result of the increasing emphasis placed on competitive advantages by organizations, human resource analytics (HRA) have emerged as tools to assist organizations in utilizing data-driven insights to provide direction for strategic human resource decisions (Sehrawat et al., 2025). As explained by Donthu et al. (2024), Human resource (HR) analytics utilizes statistical and analytical methods applied to employee data to assist organizations in improving human capital outcomes. The movement from intuition-based practices to evidence-based practices within human resources is particularly important in emerging markets such as Saudi Arabia, where there will be considerable impact on organizational performance. Therefore, this context presents an opportunity to study the degree to which HRA influences organizational performance.

Vision 2030 is an economic strategy that aims to diversify the economy of Saudi Arabia, reduce

dependence on oil, and develop a society based on knowledge. Vision 2030 represents a substantial economic transformation in the Kingdom of Saudi Arabia (Saudi Vision 2030, 2016). An important component of this transformation is understanding that sustainable growth relies on good workforce management and the development of human capital.

Saudi companies face unique challenges. Improving productivity, closing skills gaps, competing globally, and creating jobs are some of those challenges (Alanazi, 2022). Overcoming those challenges will require new approaches to human resource management (HRM); therefore, Saudi firms will need to adopt HR analytics. Utilizing data, they can make better decisions regarding employee training, recruitment, engagement, and performance management (Al-Shuwaikh et al., 2024).

2. Literature Review and Hypotheses Development

2.1. Human Resource Analytics

Human Resource Analytics is referred to by many names including people, workforce or talent Analytics. The use of analytical techniques applied to a variety of workforce metrics and data enables organizations to optimize their performance and inform better decision-making (Marler & Martin, 2024). HR analytics has evolved from being simply descriptive reports about an organization's history to predictive and prescriptive analytics (Varsha & Shree, 2023). First, human resource information systems (HRIS) provided basic administrative functions and reporting related to compliance matters and provided the basic historical workforce data on how much staff was hired and retained, along with payroll. As Business Intelligence tools developed, organizations began to recognize patterns in their workforce data, which allowed them to conduct more detailed descriptive analytics (Donthu et al., 2024).

Modern HR analytics now encompasses additional areas of focus, namely predictive and prescriptive capabilities to assist organizations in optimizing their HR strategies and forecasting future changes within their workforces (Mateen et al., 2025). Predictive HR analytics is the use of statistical modeling and machine learning techniques to estimate outcomes such as turnover and performance. Prescriptive HR analytics recommends specific actions that will achieve desired outcomes. The shifting focus of HR analytics follows broader trends in business analytics and the increasing availability of workforce data from multiple sources, including HRIS, employee surveys, and digital workplace tools (Betgeri & Chekuri, 2025).

A number of researchers have developed frameworks and approaches for assessing and measuring the maturity level of HR analytics and the capabilities that exist. For example, Marler and Martin (2024) reported that there was a positive correlation between higher levels of people analytics maturity and improved organizational performance. Therefore, the importance of using data-driven decision-making when developing strategic workforce plans is demonstrated. In addition, McCartney and Fu (2022) identified several factors that contribute positively to the effectiveness of HR analytics for organizational success. Specifically, they found that support from within the organization and the quality of analytical skills are important success factors for the effective use of HR analytics.

The integration of human resource management, organizational behavior, statistics, and information systems is conceptualized as of human resource analytics (Kale et al., 2022); it represents the growth toward evidence-based management in the field of HRM through the use of data to inform decision-making versus reliance on subjectivity and public opinion. Data from organizational behavior provides insight into the psychological and social factors that affect the attitudes and behaviors of employees. Quantitative analyses (statistical methods) are used to test hypotheses and establish cause-and-effect relationships in HR analytics. Additionally, HR analytics uses technology to collect, manage, analyze, and present workforce data.

HR analytics is becoming a strategic tool for HR managers by providing evidence to support managerial decision-making via projection modeling techniques, analytical software, and employee-related data. Research has demonstrated the utilization of HR analytics in areas such as staffing, employee engagement, and talent acquisition (Ferrar & Green, 2021). Research has also identified several different classifications

of HR analytics (operational, tactical, and strategic), with strategic examples of HR analytics including workforce planning, staffing, and employee engagement (Margherita, 2022).

A fundamental philosophical basis for HR analytics is that all organizational workforce information can be used as a source of knowledge about the business and its elements that are involved with the ability to produce results. As such, this information can be used by management to strategically develop and implement plans (Sivakumar & Alex, 2025). Many analytical tools identify trends and connections within an organization that may not be recognized through day-to-day operations or the review of routine reports. Most predictive tools allow organizations to predict what will happen in the future based on historical data and allow them to proactively address issues that could negatively impact organizational performance. Overall, HR analytics has many benefits, including better recruitment processes, higher employee retention, increased talent development, and, ultimately, improved organizational success (Zebua et al., 2024).

However, there are many challenges associated with utilizing HR analytics. Organizations need to address issues related to governance, ethics, privacy, and data quality (Rather & Abrar, 2025). To effectively utilize HR analytics, organizations must invest in training or hire analytic experts, since the effective use of analytics requires specialized skills that conventional HR teams often lack (Singh, 2025). Further, incorporating analytics into decision-making also requires a cultural shift for managers to trust and act upon analytics-based insights (Nurbaiti, 2021). These issues may be especially challenging for emerging markets such as Saudi Arabia, where HR analytics continues to evolve.

2.2. Employee Engagement Analytics

Employee engagement refers to a workplace psychological state, which includes energy, dedication, and immersion in an employee's work. It also leads to positive outcomes for individuals and employers (Vadithe & Kesari, 2025).

Analytics related to employee engagement include systematic measurement, analysis, and prediction regarding an organization's or department's employee engagement levels, including their underlying causes. To assess employee engagement, organizations use a variety of methods, including data collected during employee surveys and employee attitudinal assessments, as well as behavior-based metrics such as, but not limited to, attendance, participation, and productivity (Annamalaichamy et al., 2025). These analytics allow organizations to build work environments that support discretionary effort and motivation toward the organization through providing actionable insights into the level of engagement among their workforce.

Research indicates that the impact of employee engagement analytics has a direct relationship with a corporation's success because employees who are engaged produce more output at a higher quality than those who are disengaged. Furthermore, research suggests that employees who are engaged exhibit less absenteeism and demonstrate greater loyalty to the mission of the organization (Vadithe & Kesari, 2025). Chatbots and other artificial intelligence (AI)-powered tools are being used to provide continuous interaction between HR departments and employees. The purpose of this type of tool is to offer quick responses to employee questions and concerns, improve communication, and enhance the new hire process (Strohmeier, 2020). There is evidence to suggest that companies that utilize AI-based HR practices will see improvements in employee satisfaction, engagement, and retention as a result of better interactions and more adaptable HR processes (Brougham & Haar, 2018; Strohmeier, 2020). Companies in Saudi Arabia, especially in the private sector and among younger employees, continue to struggle with motivating employees and creating employee engagement. However, there may be a solution through the use of data-driven engagement analytics. Vadithe and Kesari (2025) demonstrated that HR analytics increases employee engagement, thereby improving organizational performance. Additionally, Annamalaichamy et al. (2025) discovered that advanced analytics can lead to increased employee retention and engagement and ultimately to improved organizational performance. Through identifying and addressing drivers of employee engagement, organizations can create an environment that supports

discretionary effort. As such, it is essential for organizations operating in Saudi Arabia to consider utilizing engagement analytics given the country's desire to enhance productivity and employment levels under Vision 2030 (Alsalman, 2025). The study, therefore, suggests that:

H1: Employee engagement analytics positively influences organizational performance from the perspective of employees.

2.3. Talent Acquisition Analytics

The use of data-driven approaches in talent acquisition helps enhance both the process of attracting and retaining the best candidates for an organization (Andrian et al., 2025). The techniques used include identifying which recruitment channel is the most successful at attracting high-quality applicants, using forecasting methods to estimate the quality of each applicant pool, reducing the time it takes to hire a new employee, and evaluating the success of the hiring process. Organizations collect data from many different types of data sources, including applicant tracking systems (ATS), assessment results, formal interview processes, and historical performance records after the individual has been hired. Organizations can then leverage this collected data to improve current talent acquisition strategies and build predictive models for future hires (Vrontis et al., 2022)

Analytics related to talent acquisition are primarily beneficial for identifying the most productive recruiting channels to attract top performers. For example, HR professionals compare how employees who were attracted via different channels (e.g., job boards, employee referrals, campus recruiting, social media) perform on the job and remain employed by the organization. Based on this information, companies are able to make better investments. In addition, predictive tools that measure a candidate's fit for the position provide confidence in making informed business decisions (Andrian et al., 2025).

In Saudi Arabia, the importance of talent acquisition analytics cannot be overstated due to the significant barriers that exist within the country regarding obtaining skilled laborers. Due to the lack of available qualified individuals, the competition for skilled workers creates a competitive environment. According to Al-Shuwaikhat et al. (2024), the strategies of recruitment and selection significantly impact organizational performance in Saudi telecommunications companies. Moreover, based on their findings, a one percent improvement in these two areas leads to a 1.637 percent gain in organizational performance. Similarly, Alateyah (2018) showed that e-recruitment can contribute to the success of the company through its ability to find employees who match the organization's strategic goals and culture using data-driven methods. Also, Ibrahim (2025) found that, in the case of Saudi telecommunications, the impact of best practices for talent management, including talent acquisition, effective onboarding, employee development, and organizational support, was positive toward both employee performance and overall company success.

HR analytics is now an important tool for HR departments to make informed decisions regarding workforce planning. According to recent studies, it appears that more and more Saudi organizations are beginning to implement HR analytics to help manage their talent, aid in decision-making, and support Saudi Arabia's economic diversification activities (Al-Harbi & Abu Al-Majd, 2025; Aljuwaiber, 2025).

Thus, the study suggests the following hypothesis:

H2: Talent acquisition analytics positively influences organizational performance from the perspective of employees

2.4. Manpower Planning Analytics

Manpower planning, or strategic manpower planning (Westover, 2025), is a process of making informed decisions regarding the correct number of staff, with appropriate levels of skill, in the correct job roles, at the correct time. Strategic manpower planning provides an overview of both short-term operational needs as well as long-term strategic workforce goals. Examples of strategic uses of manpower planning include maintaining employee skill inventories, developing succession planning strategies, analyzing potential gaps or surpluses of supply and demand for specific skills and/or positions, and forecasting demand (Singh, 2025).

Demand forecasting is a method of estimating an organization's future workforce demands through various methods, including projective modeling, historical data, and an examination of organizational business plans. The use of forecasting tools examines the impact of corporate initiatives such as restructuring, attrition, retirement, and new hiring or growth on the future workforce (Westover, 2025).

Supply analysis examines an organization's current workforce as well as its existing talent pool to determine possible candidates to fill critical or essential roles, which are anticipated to be vacant due to turnover and/or other reasons. Additionally, supply analysis identifies areas where recruiting externally will be necessary. A gap analysis compares an organization's projected demand for employees with the available workforce supply. Through this comparison, it can be determined whether there will be a surplus or shortage of qualified employees in certain departments or functions (Westover, 2025).

Finally, situation planning allows an organization to analyze the potential outcomes of differing business situations and assess how these will affect the future workforce. This is useful for strategic decision-making when uncertainty exists within an organization (Mateen et al., 2025).

Machine learning methods have been incorporated into manpower planning analytics to improve the predictive power of forecasts and to identify latent patterns of employment. Survival analysis has also been used to assess the probability of turnover (attrition) for an individual as well as from a team standpoint by analyzing employee tenure. Network analysis is used to determine who possesses critical knowledge or may be a candidate for succession. Skills analysis provides the link between the organization's skills profile and future expected skill shortages. All these analytic tools provide organizations with an opportunity to proactively manage their workforces and move away from simply being reactive when it comes to managing their workforces (Rather & Abrar, 2025). There is research showing that more advanced manpower planning analytics results in enhanced organizational performance. For example, Westover (2025) found that AI-based recruitment strategies and forecasting algorithms assist organizations in anticipating their upcoming staffing needs and creating proactive plans to meet those future talent demands.

Manpower planning analytics is designed to assist organizations in addressing challenges associated with nationalizing the workforce as a result of economic growth in Saudi Arabia (Mohammed, 2019). Organizations must strike a balance between maintaining operational capabilities and competitiveness and achieving Saudization objectives. Bafagih (2019) identified the need for strategic manpower planning to create a continuous employee flow for small- to large-sized businesses; specifically, the study focused on analytical techniques used by organizations to project skill demand and build internal talent pools, which would reduce dependency on external labor markets. Therefore, this study presents the following hypothesis:

H3: Manpower planning analytics positively influence organizational performance from the perspective of employees

3. Organizational Performance in the Saudi Arabian Context

Organizational performance is a critical component for all Saudi-based organizations as they are undergoing broad-reaching changes through their implementation of Vision 2030. Performance encompasses both non-financial and financial aspects. Examples of the non-financial aspects of performance are process efficiency, employee productivity and morale, and service quality and sustainability. Financial performance includes financial output (such as profitability, revenue growth), operational performance (such as product quality, efficiency), and market performance (such as market share, customer satisfaction, and competitor analysis). Human capital performance is defined as employees' contribution to productivity, job retention, and overall morale (Vadithe & Kesari, 2025). The relative importance of these different aspects will vary depending upon the specific industry, strategy, and stakeholders. However, there are several contextual issues that have been identified within Saudi Arabian research studies as being influential in performance outcomes. These include digital transformation. A recent Saudi Arabian-based study found that most firms believed that implementing digital transformation

strategies would lead to enhanced organizational performance. It achieved such performance improvements by improving the efficiency of Saudi-based firms, creating higher levels of customer service quality, and providing greater support for innovation (Alshihre, 2025).

There are many factors limiting or reducing organizational performance within the labor market in Saudi Arabia. One factor is that the Saudization policy has made it difficult for international firms (multinational corporations [MNCs]) and domestic firms to use foreign workers. MNCs and local firms that have implemented strategic human resource management (SHRM), through tools such as HR analytics, seem to be outperforming their competitors (Alhaider, 2023). In fact, research by Alanazi (2022) showed that if an organization can manage its workforce effectively, then its employees will be more satisfied and committed, leading to lower employee turnover and higher productivity, which lead to better overall organizational performance.

Research regarding small and medium-sized enterprises (SMEs) within the Kingdom of Saudi Arabia also indicates that smart technologies enhance digital transformation and business success. Therefore, it is imperative that organizations create ready and supportive environments to enable successful technology integration (AlMulhim, 2021).

The digital revolution is another major obstacle to organizational performance in Saudi Arabia. For example, Shibeika et al. (2025) investigated the influence of digitization on staff satisfaction in the private sector in Saudi Arabia, and they discovered strong positive impacts. They indicated that organizations utilizing digital HR tools (i.e., analytics platforms) tend to have higher levels of employee satisfaction. Higher levels of employee satisfaction positively correlate with overall performance and retention. Additionally, Alsalman (2025) studied how technological development influences HR practices in Saudi companies. He determined that their utilization resulted in greater HR efficiency and, ultimately, better organizational outcomes.

4. Theoretical Framework

4.1. Resource-Based View (RBV)

The resource-based view (RBV) (Vadithe & Kesari, 2025) is used as the framework for this research and outlines how organizations accomplish a maintainable competitive advantage through their ability to acquire and utilize VRIN resources—valuable, rare, inimitable, and non-substitutable. Analytical competencies enable organizations to unlock value from labor data using HR analytics within HR analytics capabilities. HR analytics capabilities have multiple characteristics of VRIN resources. First, they provide benefits to the organization due to improved decision-making and workforce optimization, thereby enhancing performance. Second, HR analytics capabilities are rare, as many organizations do not possess the required processes, expertise, or data infrastructure to support these capabilities. Third, while many organizations may attempt to copy HR analytics capabilities, such capabilities are difficult to replicate as they reside in the organization's culture and supporting processes. Fourth, the capabilities offered by HR analytics are irreplaceable, as there is no alternative labor strategy that can produce the same level of predictability as the data produced by HR analytics. From an RBV perspective, HR analytics converts generic human capital into a source of competitive differentiation for organizations, providing them with the capability to recognize, develop, and employ their talent effectively. Advanced analytics allows companies to optimize their staffing needs, determine which employees have high potential, forecast employee turnover, and make better recruitment decisions. The combination of advanced analytics with other organizational resources will allow companies to create a number of advantages relative to their competitors that are difficult to reproduce.

4.2. Human Capital Theory

Human capital theory asserts that an investment in the capabilities of employees will result in higher production levels and greater organizational success (Vadithe & Kesari, 2025). The theory also indicates that human resource analytics is a method through which organizations may maximize the returns from an investment in human capital. An organization using human resource analytics has a better ability to

allocate its human development resources, decide to whom to provide human development opportunities, and determine where it has the best opportunity to achieve returns from its human development activities. Additionally, analytics enables organizations to develop more effective human capital strategies based on the relationships among employee characteristics, training programs, and performance results.

According to human capital theory, the primary source of value within human capital exists at the level of the individual employee as well as within the entire body of the workforce (Alanazi, 2022). A human resource analytics framework enables organizations to make more effective decisions regarding the use of human capital. Organizations utilizing human resource analytics can ensure that employees are employed in jobs that utilize their competencies and abilities, that their skill sets are being enhanced to support the organization's needs, and that their engagement and motivation are maintained at optimal levels. The analysis and reporting provided by human resource analytics assist organizations in realizing greater returns on their investments in human development, education, and training in Saudi Arabia. In Saudi Arabia, human capital growth is critical to achieving Vision 2030 (Alsaman, 2025).

5. Methodology

5.1. Data Collection Procedures

Quantitative data collection methods based on questionnaires were employed. Probability-based sampling methods, specifically simple random sampling, were utilized. Ultimately, 281 participants comprised the sample, far in excess of the recommendations made by researchers and therefore providing a robust sample. For example, Hair et al. (2010) indicate a minimum sample size of 100–200 cases, with five to ten observations per item. Consequently, as there were 281 cases, the sample of 281 cases exceeds the recommendations. Additionally, Tabachnick and Fidell (2013) suggest $N \geq 50 + 8m$, where $m = 3$. Thus, $281 > 74$ cases. Likewise, Green (1991) suggests $N \geq 104 + m$, which would be 107 cases. Hence, both criteria have been met. Furthermore, according to Cochran (1977), it is typical that samples of 200 or greater are sufficient for large populations. Therefore, due to the sample size of 281 participants, the regression analysis has statistical strength and reliability. Surveys containing the research questions were sent via electronic means to several employees over a period of time from December 2025 through April 2026. In total, the target population was composed of 430 people. Of these, 281 were chosen; therefore, they represented approximately 65%. According to Krejcie and Morgan (1970), a sample of about 201 would suffice for a population of 430 at a 95% confidence level. As such, the present sample clearly exceeds the recommended sample size and increases both the internal validity and external validity of the study's results.

5.2. Pilot Study

Before conducting the primary data collection, a pilot study was completed using 30 survey participants in order to determine how well the surveys would work, whether they were clear, as well as the overall reliability of the surveys and their relevance to the subject matter of HRA. The pilot study allowed for an assessment of whether or not survey participants could easily understand and/or provide accurate answers regarding all of the questions. According to the literature on survey methodology (Sekaran & Bougie, 2016), and Hair et al. (2019), this number is large enough to be useful as a preliminary test.

5.3. Measurement

The current study utilized a multi-item scale that was derived from existing measures of human resource management (HRM), as well as analytics. The items were adjusted for the HRA dimension and organizational performance. The five-point Likert scale (from strongly disagree (1) to strongly agree (5)) was applied based on previous studies (Hair et al., 2019). The five employee engagement analytics items were adapted from Kulsoom (2020). The talent acquisition analytics dimension was measured using five questions developed by Bulan et al. (2025). The manpower planning analytics dimension consisted of five components altered from Albahussain et al. (2016) and Marwat et al. (2006). Organizational performance was examined via five items adapted from Alharbi and Aloud (2024) and Kuei et al. (2001).

5.4. Ethical Considerations

Research involving human participants is subject to established ethical guidelines. In this study, a registration number and application number were assigned by the Bioethics Committee of Scientific and Medical Research of the University of Jeddah (Registration Number: HAP-02-J-094; Application Number: UJ-REC-387) before data collection began. All participants were told what the study was for, that their answers would be treated confidentially, and that they could discontinue their participation at any stage without any consequence. They had complete choice to participate. In order to protect participants' identities and maintain confidentiality, all of the questionnaires were completed online with no personally identifiable information collected. Because the survey was conducted electronically, there was no requirement to obtain written consent.

The completion and submission of the online survey were strictly voluntary; therefore, they served as informed consent. This method has been widely used in other studies using online surveys, especially when an anonymous set of results is produced (Wright, 2005). The American Psychological Association (2017) assumes implied consent when participating in anonymous surveys because participation implies consent. Additionally, past studies suggest that online participation can serve as valid informed consent, provided that the participants are aware of the goal of the study, their confidentiality, and their ability to choose whether or not to participate prior to completing the questionnaire (Buchanan & Hvizdak, 2009; Wright, 2005).

5.5. Data Analysis

In addition to conducting data analysis via IBM SPSS Statistics, prior to hypotheses testing, it was important to assess the reliability and validity of each measurement scale. To determine internal consistency (the degree to which the items on a particular scale measure the same underlying construct), Cronbach's alpha was utilized. Construct validity (the degree to which a scale measures the construct it is intended to measure) was evaluated by means of corrected item-total correlations. Descriptive statistical methods were also used to summarize the data and deliver an summary of the demographic attributes of the sample. A Pearson correlation analysis was also conducted to examine the relationships between the variables under study. Finally, multiple regression analysis was applied to test the hypotheses related to this research question. Specifically, the objective was to examine how different dimensions of HR analytics influence organizational performance. There were no missing data points in the dataset since all participants were required to answer every question prior to submitting their survey responses. Therefore, there were no missing data points to require the use of imputation techniques. Potential outliers were identified using the z-score method. Values greater than ± 3 were classified as extreme based on Hair et al. (2019). The z-scores indicated that none of the data represented extreme values. Skewness and kurtosis were calculated to assess whether or not the data represented a normal distribution, as these are two assumptions needed for parametric analyses. According to Byrne (2016), if the skewness is between -2 and $+2$, and the kurtosis is between -3 and $+3$, then the data can be assumed to be approximately normally distributed. Based on the results in Table 1, the skewness for each scale ranged from -0.287 to -0.172 , thus representing slight negative skewness but still well within acceptable limits. Similarly, the kurtosis values ranged from 0.152 to 0.431 and therefore did not demonstrate any significant deviation from a normal distribution.

Table 1. Skewness and Kurtosis.

Constructs	Skewness	Kurtosis
Employee engagement analytics	-0.267	0.158

5.6.	Talent acquisition analytics	-0.216	0.228
	Manpower planning analytics	-0.172	0.152
	Organizational Performance	-0.287	0.431

Multicollinearity

Multicollinearity occurs when the independent variables have high correlations with each other, which can impact the accuracy of the predictions made by a regression model. Hair et al. (2019), as well as Tabachnick and Fidell (2007), indicate that multicollinearity can be assessed using tolerance or the variance inflation factor (VIF). The accepted ranges are tolerance $> .10$ and $VIF < 5$ (Pallant, 2020). The tolerance levels in the present study range from .506 to .542. All of these tolerance levels are greater than .10. The VIF levels in the present study range from 1.845 to 1.977. All of these VIF levels are less than 5. Therefore, there was no concern regarding multicollinearity, and the results of the regression analyses were considered reliable.

Table 2. Variance Inflation Factor (VIF) test of multicollinearity.

Independent variables	Tolerance	VIF
Employee engagement analytics	0.542	1.845
Talent acquisition analytics	0.506	1.977
Manpower planning analytics	0.535	1.871

5.7. Reliability and Validity of Measures

The validity and reliability of the measurement scales were evaluated using Cronbach's alpha and corrected item-total correlations, as presented in Table 3. As illustrated by the results, all measures exhibited adequate to high levels of internal consistency. With respect to employee engagement analytics, an acceptable level of reliability was observed, as indicated by a Cronbach's alpha of 0.750 and item-total correlations ranging from 0.638 to 0.684. Thus, employee engagement analytics was both reliable and valid. For talent acquisition analytics, similar to employee engagement analytics, evidence of adequate reliability was found, as indicated by a Cronbach's alpha of 0.703 and item-total correlations ranging from 0.582 to 0.715, each meeting or exceeding the minimum criteria established by Hair et al. (2019). Finally, manpower planning analytics displayed the greatest degree of reliability. The Cronbach's alpha was 0.779, while the item-total correlations ranged from 0.447 to 0.665. Although one item yielded a correlation of 0.447, this value fell within an acceptable range. In addition, organizational performance also displayed a very high level of reliability. Specifically, the Cronbach's alpha for organizational performance was 0.767, while the item-total correlations ranged from 0.610 to 0.704. Therefore, all constructs exceeded the thresholds of reliability ($> .70$) and validity (item-total correlation $> .30$) defined by Hair et al. (2019), thereby validating the reliability and suitability of the measurement scales for subsequent analyses.

Table 3. Reliability and validity of measurements.

Constructs	Items	Item–Total Correlation	Cronbach's Alpha
Employee engagement analytics	EE_1	0.661	0.750
	EE_2	0.684	
	EE_3	0.664	

	EE_4	0.651	
	EE_5	0.638	
	TA_1	0.582	
	TA_2	0.707	
Talent acquisition analytics	TA_3	0.715	0.703
	TA_4	0.621	
	TA_5	0.696	
	MP_1	0.447	
	MP_2	0.642	
Manpower planning analytics	MP_3	0.664	0.779
	MP_4	0.665	
	MP_5	0.629	
	OP_1	0.610	
	OP_2	0.693	
Organizational Performance	OP_3	0.704	0.767
	OP_4	0.639	
	OP_5	0.629	

6. Results

6.1. Demographic Characteristics

A summary of the participants' demographic characteristics is presented in Table 4. Females comprised a larger proportion than males. The majority are female (n=190;67.6%), compared to males (n=91; 32.4%). The largest age category consisted of individuals 30–35 years of age (n = 151; 53.7%), followed by those 36–40 years of age (n = 65; 23.1%), and those under 30 years of age (n = 48; 17.2%). Only a small percentage was over 40 (n=17; 6.0%). Regarding job roles, nearly half (n= 135; 48.0%) are categorized as employee with department heads (n=76; 27.0%) and managers (n=45; 16.0%) also represented, while other” make up a smaller portion (n=25; 9%). In terms of experience, most have 1–5 years (n=102; 36.3%) or 6–10 years (n=91; 32.4%), followed by 11–15 years (n=74; 26.3%), with a few having over 15 years (n=14; 5.0%).

Table 4. Demographic characteristics.

Variables	Characteristics	N	Percentage
Gender	Male	91	32.4
	Female	190	67.6
Age	Under 30 years old	48	17.2
	30–35 years old	151	53.7

Job title	36–40 years old	65	23.1
	Over 40 years old	17	6.0
	Employee	135	48.0
	Manager	45	16.0
	Head of Department	76	27.0
	Other	25	9.0
Years of experience	1–5 years	102	36.3
	6–10 years	91	32.4
	11–15 years	74	26.3
	More than 15 years	14	5.0

6.2. Descriptive Statistics

Table 5 presents descriptive statistics for the study's variables. The average scores for the variables, which were measured using a five-point Likert scale, ranged from 3.220 to 3.277, indicating that most respondents moderately agreed with each item. Manpower planning analytics had the highest mean ($M = 3.277$, $SD = 0.652$), while organizational performance ($M = 3.264$, $SD = 0.685$) ranked second. Employee engagement analytics ($M = 3.237$, $SD = 0.712$) ranked third. Talent acquisition analytics had the lowest mean ($M = 3.220$, $SD = 0.709$). All of the standard deviations (from .652 to 0.712) were relatively low, indicating that respondents tended to answer the questions similarly.

Table 5. Descriptive statistics.

Constructs	Mean	SD
Employee engagement analytics	3.237	0.712
Talent acquisition analytics	3.220	0.709
Manpower planning analytics	3.277	0.652
Organizational performance	3.264	0.685

6.3. Correlation Matrix

Correlation analyses demonstrated relationships among all study variables. Employee engagement analytics showed a positive and statistically significant association with both talent acquisition analytics ($r = 0.625$, $p < .01$) and manpower planning analytics ($r = 0.596$, $p < .01$). This suggests that employees who are engaged in their work will likely be employed by organizations that effectively attract new talent and plan their workforce. There was also a positive association between talent acquisition analytics and manpower planning analytics ($r = 0.631$, $p < .01$), which suggests that an organization's hiring practices are aligned with its overall workforce strategy. As for the dependent variable, organizational performance was moderately positively associated with employee engagement analytics ($r = 0.521$, $p < .01$), talent acquisition analytics ($r = 0.527$, $p < .01$), and manpower planning analytics ($r = 0.546$, $p < .01$). Therefore, these findings support the concept that enhancements in HR analytics dimensions are associated with improved organizational performance.

Table 6. Correlation matrix.

Constructs	Employee engagement analytics	Talent acquisition analytics	Manpower planning analytics	Organizational performance
Employee engagement analytics	1			
Talent acquisition analytics	0.625**	1		
Manpower planning analytics	0.596**	0.631**	1	
Organizational performance	0.521**	0.527**	0.546**	1

** Correlation is significant at the 0.01 level

6.4. Hypothesis Test

A multiple regression analysis was utilized to determine if employee engagement analytics, talent acquisition analytics, and manpower planning analytics were predictive of organizational performance for Saudi Arabian companies (Table 7). The total model was found to be statistically significant at a very low probability ($p < .01$); $F(3, 277) = 56.55$. This means that the total model explained approximately 38.0% of the variability in organizational performance (Adjusted $R^2 = .373$, $R^2 = .380$); this is considered an acceptable amount of variability. When examining each predictor separately, employee engagement analytics were shown to have a positive relationship with organizational performance ($t = 3.46$, $p < .001$, $B = 0.214$, $SE = 0.062$, $\beta = 0.222$), thus supporting Hypothesis 1. Talent acquisition analytics also demonstrated a positive relationship with organizational performance ($t = 3.175$, $p < .002$, $B = 0.204$, $SE = 0.064$, $\beta = 0.211$), which supported Hypothesis 2. Manpower planning analytics demonstrated the strongest relationship with organizational performance among all the predictors ($t = 4.323$, $p < .001$, $B = 0.294$, $SE = 0.068$, $\beta = 0.280$), therefore supporting Hypothesis 3. As such, all three HR analytics dimensions were positively associated with organizational performance.

Table 7. Multiple regression analysis.

Predictor	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
(Constant)	0.953	0.181	—	5.269	< .001
Employee engagement analytics	0.214	0.062	0.222	3.46	.001
Talent acquisition analytics	0.204	0.064	0.211	3.175	.002
Manpower planning analytics	0.294	0.068	0.280	4.323	.001

Note. $R = 0.616$, $R^2 = 0.380$, Adjusted $R^2 = 0.373$, $F(3, 277) = 56.55$, $p < 0.001$.

7. Discussion

This study investigated how human resource analytics (HRA) impacted organizational performance in Saudi Arabia in terms of three major categories: employee engagement analytics, talent acquisition analytics, and manpower planning analytics. The empirical analysis showed that HRA has strategic importance in increasing organizational performance in Saudi firms. Furthermore, it was found that all

three types of HRA—employee engagement analytics, talent acquisition analytics, and manpower planning analytics—contribute substantially to the variance explained in organizational performance. Prior studies have also emphasized the significance of HR analytics as one of many organizational factors contributing to firm success. The positive relationship found at the predictor level between employee engagement analytics and organizational performance is consistent with prior research. The present results support previous research indicating that employee engagement analytics provides insight into increasing employees' productivity, reducing absenteeism, and improving their organizational commitment (Vadithe & Kesari, 2025). With respect to the Saudi Arabian context, this was particularly relevant, as there are significant national priorities under Vision 2030 related to increasing workforce participation and improving workforce efficiency. As such, employee engagement analytics can be used to identify the causes of employee engagement and predict potential risks associated with disengagement according to the resource-based view (RBV) theory. It can create a sustainable competitive advantage through utilizing data-driven human capital management practices (Marler & Martin, 2024).

The positive effects of using talent acquisition analytics have been supported through previous studies and evidence indicating that the quality of new recruits will be positively impacted when they are recruited into high-quality positions. Therefore, the results from this study confirm those found by Al-Shuwaikhat et al. (2024) and Andrian et al. (2025), who reported that organizations that apply analytical techniques to their hiring processes are more likely to increase the overall quality of their workforces. Furthermore, this will lead to improved levels of innovation and productivity, as the organization will employ higher-quality staff. As such, talent acquisition analytics should not solely be viewed as an operations-based approach for improving decisions regarding staffing but rather as a strategic-based approach for enabling competitive advantage. Additionally, the strongest predictive relationship that was explored involving manpower planning analytics and organizational performance. The above finding supports recent research (Mateen et al., 2025; Singh, 2025; Westover, 2025), indicating that the application of AI in workforce planning is increasing in popularity, as well as its potential benefits for creating a competitive advantage. Furthermore, manpower planning analytics had the largest effect size of the other HR analytics approaches evaluated in terms of generating short-term organizational performance improvements. For example, generating forecasts of future workforce requirements and then deploying available talent resources efficiently while reducing current or anticipated skill shortages. In countries where rapid changes in the economy occur, like Saudi Arabia, it is critical that organizations develop an effective plan for managing their internal labor force so that it meets changing demands for strategic and economic purposes (Bafagih, 2019). Overall, the study provides additional evidence to support the existing body of literature related to HR analytics by demonstrating empirically that there is a link between HR analytics and organizational performance in Saudi Arabia, an area that has historically been underrepresented in past studies.

8. Theoretical Contributions

This research adds to the body of knowledge about human resource analytics (HRA), as it shows different types of influence that HRA has with respect to performance outcomes. The research used empirical analysis to examine the effect of employee engagement, talent acquisition, and manpower planning analytics on organizational performance and illustrates that each type of analytics has a unique role in influencing these performance dimensions. Importantly, the focus of the research on manpower planning analytics highlights the strategic value of utilizing predictive analytics as opposed to other forms of HR analytical tools. Furthermore, the study extends the resource-based view by providing additional empirical evidence regarding achieving competitive advantage model. According to this model, an organization's competitive advantage is dependent on both the possession of valuable assets such as human capital and the manner in which those valuable assets are utilized and managed. In this manner, HRA demonstrates a high level of organizational capability that increases the value, rarity, and inimitability of human resources.

9. Managerial Implications

From an executive or manager's perspective, the results clearly demonstrate how organizations can establish priorities. It is suggested by this research that HR analytics departments have a more strategic role to play in workforce planning as it relates to both productivity and organizational performance. For example, executives and managers need to use predictive manpower planning to accurately forecast workforce needs, identify needed skills, and strategically allocate resources. At the same time, analytical measures concerning employee engagement and talent acquisition need to be utilized to increase the quality and retention rate of the workforce. Therefore, it is recommended that executives and managers move from using only gut instinct when making decisions regarding employee engagement and recruitment; instead, they should use data to evaluate the level of employee engagement and make better recruitment decisions. In conclusion, all decision-making within the organization should be based on empirical data rather than anecdotal evidence and should continuously monitor what drives employee engagement and optimize the recruitment process.

10. Limitations and Future Research Directions

The first limitation is due to the cross-sectional nature of this data, which makes it difficult to establish causal links and allows only the inference of associations. The second limitation stems from the model's moderate level of explanatory power with respect to organizational performance. Thus, there may be some unaccounted-for variables such as organizational culture and leadership styles. The third limitation is related to the fact that the study focused exclusively on Saudi Arabian organizations. Therefore, further studies will be needed to generalize these findings. To do so, future researchers will need to use longitudinal designs to evaluate the causal relationships included in the study. In addition, future researchers will need to include mediation and moderation variables to better explain the relationships included in the study. Finally, future researchers will need to add other variables representing different aspects of organizational performance to improve the explanatory power of the model.

11. Conclusion

HR analytics is extremely important for improving organizational performance in Saudi Arabia. The study also indicates that employee engagement analytics, talent acquisition analytics, and manpower planning analytics have all shown positive results; however, manpower planning analytics was found to be the most significant. Therefore, HR departments need to move away from their traditional HR activities to include predictive analytics to improve future performance. Ultimately, the results confirm the importance of human capital through successful HR analytics. Organizations should consider developing an analytics-based HR strategic approach to maximize organizational performance.

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