Impact of HR Analytics on Organizational Performance in IT Industry: Mediating Role of Job Engagement

Karan Trehan[1*], Dr. Shikha N Khera[2], Dr. Deepali Malhotra[3]

[1*]Research Scholar, Delhi School of Management, Delhi Technological University (DTU)
karantrehan.dsm@gmail.com

[2]Associate Professor, Delhi School of Management, Delhi Technological University. shikhan.khera@dtu.ac.in

[3]Assistant Professor, Delhi School of Management, Delhi Technological University. deepalimalhotra@dtu.ac.in

HOW TO CITE:
Karan Trehan, Shikha N Khera, Deepali Malhotra (2026). Impact of HR Analytics on Organizational Performance in IT Industry: Mediating Role of Job Engagement. International Journal of Special Education, 41(8s), 1078-1101

ABSTRACT:
As researchers and experts seek to identify by what means facts will be converted into actionable perceptions directing to enhanced organizational performance of a company (Chierici et al., 2019; Fernandez & Gallardo-Gallardo, 2020; Ferraris et al., 2019; McCartney et al., 2020; Santoro et al., 2019; Singh and Del Giudice, 2019; Birmingham, L., 2020), the idea and handling of information and analytics in organizations have been receiving mounting consideration. In light of this, human resources management (HRM) has benefited greatly from this awareness, as demonstrated by the increasing amount of HR divisions employing HR analytics to advance the decisive process (Marler & Boudreau, 2017; Fernandez &Gallardo-Gallardo, 2020; Ferraris et al., 2019; McCartney et al., 2020; Singh & Del Giudice, 2019). HR analytics is not a wholly newfound notion, despite its increased popularity (Huselid, 2018; Jaysinghani, M., 2019). The study of the impacts of HR practices like recruitment, development, and presentation management takes an elongated record in the social studies and includes organizational behavior, trade and business psychology, human resource management. At its core, HR analytics focuses on understanding the link between HR practices and the organizational performance. This can involve rigorously tracking investments in human resources and the outcomes of those investments, as noted by Ulrich and Dulebohn(2015).In today's ever-changing business environment, organizations are recognizing the crucial role of human resources (HR) in driving organizational success. Effective workforce management has become growingly complex due to a variety of factors such as globalization, technological improvements, and changing workforce demographics, Boudreau JW, Cascio WF.

Keywords: HR, IT, Job Engagement.

Introduction:

As researchers and experts seek to identify by what means facts will be converted into actionable perceptions directing to enhanced organizational performance of a company (Chierici et al., 2019; Fernandez & Gallardo-

Gallardo, 2020; Ferraris et al., 2019; McCartney et al., 2020; Santoro et al., 2019; Singh and Del Giudice, 2019; Birmingham, L., 2020), the idea and handling of information and analytics in organizations have been receiving mounting consideration. In light of this, human resources management (HRM) has benefited greatly from this awareness, as demonstrated by the increasing amount of HR divisions employing HR analytics to advance the decisive process (Marler & Boudreau, 2017; Fernandez &Gallardo-Gallardo, 2020; Ferraris et al., 2019; McCartney et al., 2020; Singh & Del Giudice, 2019). HR analytics is not a wholly newfound notion, despite its increased popularity (Huselid, 2018; Jaysinghani, M., 2019). The study of the impacts of HR practices like recruitment, development, and presentation management takes an elongated record in the social studies and includes organizational behavior, trade and business psychology, human resource management. At its core, HR analytics focuses on understanding the link between HR practices and the organizational performance. This can involve rigorously tracking investments in human resources and the outcomes of those investments, as noted by Ulrich and Dulebohn(2015).In today's ever-changing business environment, organizations are recognizing the crucial role of human resources (HR) in driving organizational success. Effective workforce management has become growingly complex due to a variety of factors such as globalization, technological improvements, and changing workforce demographics, Boudreau JW, Cascio WF.

Today, Organizations place great emphasis on organizational performance as a result of increasing competition. The biggest and one of the most important assets of a company, the management of the workforce, is an effective and beneficial step in the right way. If the top-notch talent is to be handled, there has to always be a balance between individual aspirations and the strategic and financial demands of the firm. Narcisse and Harcourt (2008, p. 1152) highlight that organizational performance appraisal is one of the most emotionally charged aspects of business, as it involves evaluating an individual's contributions and abilities. The factors influencing organizational performance, as noted by, highlight the complexity of performance management. Individual personality traits, values, attitudes, and motivation all play significant roles in how employees perform. Employees create this advantage through their performance, leading organizations to constantly seek ways to increase the organizational performance (Liao and Chang, 2004; Al-Frijawy, J., Militaru, C., & Tonoiu, S., 2019). To improve this performance, it is essential to highlight factors such as management standards (Mackay et al, 2004; Adams, R., 2021), employee satisfaction, and training (Liao &Chang, 2004).

The employee is very critical in the process of executing the enterprise's mission of the entreprise, especially in the production field. In order to meet the standards set by the organization , employees need an environment that allows them to work freely in the firm so it can help them from reaching their true and full potential (Raziq & Maulabakhsh, 2015; Hiregoudar, S.S. & Patil, R.N., 2020). Every individual has a different and unique criterion for measuring their own job satisfaction. Factors such as the style of management as well as payments, working hours, schedule, benefits, stress level and flexibility. Job satisfaction is closely related to productivity, motivation, work performance and life satisfaction (Abuhashesh et al.,2019). This means that all these factors applies to the private lives of employees as well which is why job satisfaction is such an important element of the work safety (Wolniak and Olkiewicz, 2019; Niciejewska, 2017; Abdulrahman, N. A., 2018). Also, the employee or the human asset is a highly important component of any organization and is the key to its competitiveness and success. The investment in the human asset is one key area that lean organizations focuses on (Maskell, Baggaley,&Grasso, 2011).The retention of talent, fostering of customer loyalty, and the improvement of organizational performance and stakeholder value (Lockwood, 2007) is a translation of the high levels of employee engagement. Thus, lean organisations are emphasizing on use their employee's talents, knowledge, skills, and vigour (Bo-dankin & Tziner, 2009; Bastida, R., Marimon, F., & Carreras, L., 2018). Recognizing the fact that the engagement level of the employee workforce within the enterprise can empower the foundation for organizational change and on-going success enables the organizations to carefully pick the competency of their employee and ensure that the manpower is employed in their precise roles and are mentally, emotionally and behaviorally committed to their work (Dalas, Lam, Weiss, Weich, & Hulin, 2009; Deokar, P., Kulkarni E., Keskar R., 2021).

Zada and Ismael, through their study, made the conclusion that organizations with highly engaged employees usually tend to experience lower turnover rates, reduced absenteeism, and improved employee retention. Employee engagement is the emotional involvement of employees towards their work, the company as a whole, and its goals. (Xiang, J. 2020). On the other hand, the organizational performance represents the total effectiveness, productivity, and success of the organization. Kurniawati and Raharja [21] Improved customer satisfaction and loyalty is associated with the rising levels of employee engagement, as engaged employees are more likely to deliver exceptionally good customer service and fostering strong relationships with the customers.

The dearth of research examining how and how much HR analytics affects, also impacts organizational performance (Huselid, 2018; Minbaeva, 2018; Adanlawo, E. F., Nkomo, N. Y., & Vezi-Magigaba, M. F., 2023). With this as its base, the study endeavors to theorize and examine the core mechanisms of HR analytics to comprehend the ways it influences organizational performance and the reasons behind its impact. Several methods have been developed to demonstrate the highly important impact of HRM on organizational performance (Sinha et al., 2022; Wang et al., 2023). A number of influential factors that affects organizational effectiveness, with HRM's ability to impact human and organizational skills contributing to both short-term and long-term success have been identified through research (Schuler&MacMillan, 1984; Ahmad&Schroeder, 2003; Mdhlose. D., 2020).Employee engagement has becomevery important for organizational success in the modern era. It reflects employees' emotional connection to their work and organization, driving performance and business outcomes (Popaitoon and Siengthai 2014). Engaged employees are more aligned with organizational strategy and contribute to ongoing development. Engagement fosters collaboration, empowerment, and a work environment that supports success (Waseem et al. 2013; Aulawi, H., 2021). Retaining productive employees is vital for organizational success, as turnover can lead to loss of skills and experience. Competitive pay, benefits, and incentive programs are essential to promote retention (Guerci et al. 2015). Employee skills, performance, and commitment to the organization can be enhanced through the establishment and implementation of effective HR management practices (Linhartova, 2021; Desmond, C., 2018). With the growing demand for innovation in the market, HR practices are being designed and executed to address employee-related challenges (Bos-Nehles &Veenendaal, 2019; Stacho et al., 2021).Over the past decade, employee engagement has grown to become a key point of discussions among the top level management teams (Mojeed-Sanni, B.A., Shaikh, T.T., & Abbas, J.G., 2019; Anitha Jagannathan, 2014). Fostering employee engagement is now a primary goal of human resource functions. Furthermore, the use of HR analytics has strengthened and improved the strategic decision-making, enhancing HR's position as a strategic business partner, and ensured better alignment between HR initiatives and organizational objectives.

Literature Review:

Over the decade, notable contributions to the field of HR analytics have emerged, addressing key definitions and perspectives on this topic. HR analytics essentially a data-driven approach aimed at enhancing decision-making and actions related to personnel. Rather than subjective opinions, relying on objective data and logical analysis provides managers with valuable insights important for effectively managing employees to achieve organizational success(Kaur, A., 2019).

The evolution of HR analytics can be traced back decades, with formative works such as 1984's publication of Jac Fitz-enz's "How to Measure Human Resources Management". As time went on, the meaning and processes associated with HR analytics changed and improved significantly, reflecting its growing strategic importance for organizations and the rise of digital technologies. The evolution of business analytics can be divided into three key stages, each offering increasing levels of complexity, insight, and decision-making support (Awan, S.H., Habib, N., Akhtar, C.S., & Naveed, S.,2020). The first stage is "descriptive" analytics, which assesses what has occurred, why it happened, and its current state. The second stage, "predictive analytics," focuses on anticipating future events and the reasoning behind them. "Prescriptive analytics," which is the third stage, provides suggestions on what steps are to be takenand the thought behind those recommendations.

Due to the development of large data, digital technologies, and data science techniques within human resource field (e.g., Angrave et al., 2016; Chitra and Srivaramangai, 2018; Edwards, 2019), there has been an increased focus on developing specific capabilities for HR analytics (Kryscynski et al., 2017). In 2015, Ibrahim and Brobbey conducted a research to explore whether the performance of the financial sector of Ghana can be impacted by employee motivation.

Waiyaki (2017) studied the connection between motivation and organizational performanceby using Pam Golding Properties as an example. The results showed that even though management partially utilized motivational goal-setting, the goals were often not challenging or perceived as difficult by employees, despite their specificity. Zareen, Razzaq, &Mujtaba's (2013) study investigated the impact of job design on organizational performance, introducing a new variable termed psychological perception to emphasize employee responses to job design. Their conceptual framework included job design, job enrichment, and job enlargement as interconnected variables affecting performance. The study found that an individual's job performance is shaped by their personality, and that identifying these varying needs can contribute to improved productivity (Zareen, Razzaq, & Mujtaba, 2013; Shikhar, S. 2020).

The style of leadership and motivation can influence employees in many ways, to enhance job performance and job satisfaction levels. Job satisfaction is an essential factor in motivating employees and results in better performance outcomes (Raziq & Maulabakhsh, 2015; Garengo, P., Sardi, A., & Nudurupati, S. S., 2022). Many studies suggest that employees display increased satisfaction when they are under effective and communicative supervisors, meanwhile ineffective communication from leaders and the absence of effective communication often results in dissatisfaction (Schroffel, 1999; Raziq & Maulabakhsh, 2015). Increasing employee effectiveness and performance has been a primary concern for organizational leaders (Kelidbari et al., 2011). Relative to employee engagement is the employee effectiveness, where studies suggests that when employees are involved in the organizational process, performance and productivity increases, the workplace environment improves, and absenteeism and turnover rates decrease (Bin Shmailan, 2016; Akour, I., Obayssi, A., Albaity, M., & Zeidan, Y., 2021). According to Dr. P. Lakshmi Narayanamma, Dr. S. Neelima, and K. Mounika (2019) through their study "Employee

Engagement and Organizational Performance," engagement as an organizational strategy at a company sets out to develop employees' commitment to the mission and values of the organization and enable employees to feel motivated to participate in the overall success of the mission while enhancing their outcomes, or perception of job security. Employee engagement is an important operational variable related to organizational success becauseit is linked to productivity, job satisfaction, and other factors. When a large number of people are interested in carrying out their duties in a better way and supporting the organization's goals then the engagement occurs. The main motive of the study is to convey the thoughts of the researchers on the impact and connection between employee engagement and organizational performance, as well as any gaps that leave room for future study (Flemming, D., 2020).

Tetteh, Asieda, Odei, Bright-Afful, & Akwaboah (2012) explored the correlation between employees and their working environment. Their observations indicated a generally poor relationship between employees and their managers, concluding that the work environment significantly impacts performance at the produce buying company. The study recommended that organizations enhance working conditions to increase organizational performance (Tetteh, Asieda, Odei, Bright-Afful, & Akwaboah, 2012; Joshua S. Bendickson et Timothy D 2019).

Sharma et al. identify key objectives of HR analytics, including workforce pattern forecasting, assessing performance gaps, and informing managerial decisions. Jones and Brown (2021) delve into HR analytics in relation to performance and productivity operations. They found that employing Key Performance Indicators (KPIs) linked to human capital allows for an objective evaluation of organizational health. (Vinesh, D.N., 2021). Analyzing these metrics enables IT industry to create effective strategies to improve organizational performance and productivity, ultimately helping to maintain skilled human resources. , Thomas and White found that companies that were implementing HR analytics to monitor employee engagement levels achieved better performance and organizational commitment. Their study suggests that HR analytics can identify significantly low engagement levels, prompting organizations to take necessary actions to boost engagement and overall job satisfaction. Martinez & Fernandez (2020) demonstrated that technological (IT) companies utilizing HR analytics to evaluate training effectiveness experience greater performance improvements among their workforce. Armstrong and Taylor also highlighted how HR analytics can identify essential skills for employees, ensuring that training efforts are appropriately targeted.

Johnson et al. (2022) studied the linkage of training effectiveness and organizational performance within IT industry. They found that HR analytics aids in assessing employee progress in training initiatives and measuring the return on investment for these programs (Birmingham, L. (2020).

Positive employee behavior also enhances work efficiency by promoting the exchange of knowledge and ideas, facilitating problem-solving, and encouraging innovation. When employees engage with each other, they can offer cognitive and physical support, helping one another overcome difficulties and creating new solutions. Employees who show a commitment to understanding their tasks and resolving challenges through innovative thinking tend to outperform expectations and contribute to organizational success (Kelemen et al., 2021; Alsafadi, Y., & Altahat, S., 2021).

Research Gap

After examining the extensive literature review done, it is observed that while there is recognition of the potential of HR analytics to inform strategic decisions, there is a scope of more research to delve deeper into how HR analytics is integrated into the overall strategic decision-making process within IT companies and also what barriers or facilitators exist, and how can HR analytics be more effectively utilized to drive organizational strategy? Although there have been a few studies on HR metrics along with key performance indicators (KPIs) for IT companies, identifying the most relevant HR metrics and key performance indicators (KPIs) that have the greatest impact on Organizational and employee performance in the IT sector, considering factors like employee turnover, skills development, and workforce planning is also very important.

Research Objectives:

1. To examine the impact of HR analytical practices on Employee Engagement in IT organization in India.
2. To examine the impact of Employee Engagement on the various metrics of Organizational performance in IT organization in India.
3. To examine the impact of HR analytical practices on the Organizational performance's various metrics with mediation of Employee engagement in IT organization in India.

Research Methodology: The research methodology followed for this study will be a mixed research design method wherein this research will employ quantitative methods as well as qualitative research methods for the analysis of the impact of HR analytics on organization performance in the IT industry, and conducting interviews to explore the underlying mechanisms or contextual factors that influence this relationship.

The population of the study is top 10 IT companies (as per NASSCOM report September, 2024). The sampling technique is Convenience Sampling and the Sample size was 200, but the complete responses were 163.A few of the primary variables such as employees' engagement, perceived efficiency of HR analytics and retention prognosis will be measured by reliable scales in the provided survey.

Qualitative interview questions will be asked in surveys conducted with HR managers and employees in the HR analytics practices to gain a peek into their opinions and impressions. This will include both qualitative and quantitative methods to make sure that the analysis can be confirmed, and therefore provide a better knowledge of the HR analytics process in context of preserving, maintaining, engaging and retaining employees in the IT sector. This research will make sure that measures that addresses the different ethical consideration such as consent to participate in the research among the participants and the confidentiality of the responses provided by the participants are addressed.

Conceptual Framework:

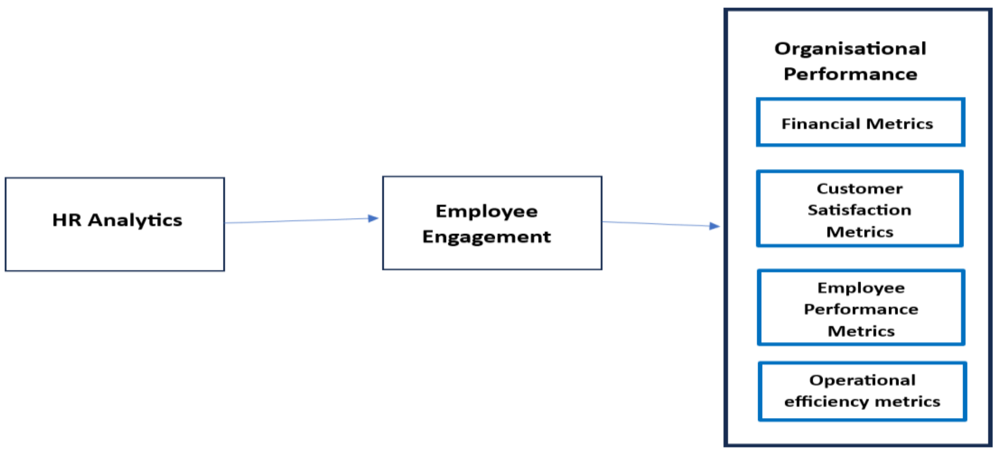

Figure 1: Proposed conceptual framework for role of HR analytics in Organizational performance with mediating role of Employee engagement

Where,

Hypothesis Formulation

Ho1: HR analytics has no significant impact on employee engagement in IT industry in India.

Ho2: Employee engagement has no significant influence on financial metrics in IT industry in India.
Ho3: Employee engagement has no significant influence on customer satisfaction metrics in IT industry in India.
Ho4: Employee engagement has no significant influence on employee performance metrics in IT industry in India.
Ho5: Employee engagement has no significant influence on operational efficiency metrics in IT industry in India.

Ho6: HR analytics has no significant impact on financial metrics of organizational performance with mediating effect of Employee engagement in IT industry in India

Ho7: HR analytics has no significant impact on customer satisfaction metrics of organizational performance with mediating effect of Employee engagement in IT industry in India
Ho8: HR analytics has no significant impact on employee performance metrics of organizational performance with mediating effect of Employee engagement in IT industry in India
Ho9: HR analytics has no significant impact on operational efficiency metrics of organizational performance with mediating effect of Employee engagement in IT industry in India

Data Analysis and Findings:

1. Variable Identification:-

The various variables identified for the study are as follows:-

Table 1: Variables and their Description

Field Lable	Data Field and Description
HR1	Data Quality- Your organization regularly conducts data quality audits to ensure the integrity of HR data.
HR2	Data Coverage- In your organization the current HR analytics system covers all stages of the employee lifecycle from recruitment to offboarding
HR3	Time to Insight- In your organization the HR analytics tools deliver insights in real-time, enabling rapid decision-making.
HR4	Adoption Rate- In your organization the adoption of HR analytics tools is widespread across the organization and not limited to a few departments.
HR5	Return on Investment- In your organization the HR analytics tools have provided measurable benefits, such as cost savings, improved employee engagement, and reduced turnover
HR6	Managerial Decision making- In your organization the Managers rarely rely on HR analytics tools to make informed decisions
HR7	Predictive Accuracy- In your organization the predictions made by HR analytics models, such as employee turnover and performance, are highly accurate and align with real outcomes.

EE1	Affective Engagement – In your organization the employees have high affective engagement, feel proud of their work, connected to the company, and motivated to perform at their best.
EE2	Cognitive Engagement - Employees of your organization use their thinking and reasoning skills to perform tasks, find innovative solutions, and analyze the importance of job
EE3	Behavioral engagement- Employees of your organization makes effort and take initiative into their tasks, including going above and beyond the minimum requirements.
F1	In your organization the revenue performance has met or exceeded expectations for the current fiscal year.
F2	In your organization the company's revenue growth is driven by strategic market expansion and innovation.
F3	Your organization regularly evaluates cost structures to eliminate waste and improve margins.
F4	Your organization tracks profitability per employee as a key metric for workforce productivity.
CS1	Your organization consistently meets or exceeds customer expectations.
CS2	In your organization the company ensures that products and services are delivered without defects or issues.
CS3	In your organization a high percentage of our customers are repeat customers, indicating strong loyalty.
CS4	In your organization the customer feedback is used to make informed decisions about product enhancements and service improvements
EP1	In your organization the employee effectively manages time to complete projects and tasks within deadlines.
EP2	In your organization the employee actively seeks to improve technical skills and stays up to date with the latest industry trends and technologies.
EP3	In your organization the employee demonstrates strong problem-solving skills by identifying issues and offering actionable solutions.
EP4	In your organization the employee adheres to best practices and industry guidelines to ensure the quality of deliverables.
OE1	Your organization continuously evaluates and refines its processes to eliminate inefficiencies and streamline operations.
OE2	Your organization consistently meets production targets, demonstrating high efficiency in converting resources into deliverables.
OE3	In your organization the Key performance indicators (KPIs) such as customer satisfaction and product quality are consistently above target.
OE4	In your organization you invest in new technologies and methodologies to improve operational performance and stay competitive in the market.

2. Analysis of Objective 1: To examine the impact of HR analytical practices on Employee Engagement in IT organization in India.

In the fast-evolving and competitive IT industry, particularly in India, organizations are increasingly relying on Human Resources (HR) analytics to enhance various aspects of workforce management. One of the most complex areas where HR analytics can make a significant impact is employee engagement. Employee engagement can be seen as a way to measure the level of enthusiasm, commitment, and emotional capability employees have towards their work and the organization. With the growing importance of highly committed workforce, HR analytics has become a famous tool in shaping the strategies aimed at improving employee engagement in IT industry. In India due to the fast-paced nature of the industry employee engagement is crucial, the high demand for skilled professionals, and the competitive landscape. The use of HR analytics in enhancing employee engagement can have several benefits for IT industry.

For the current study, various dimensions of HR Analytical practices have been taken to study the influence on Employee Engagement. Following hypotheses are formulated and are tested with the help of Structural Equation Modelling (shown in Figure 2)

Hypothesis Ho1: HR analytics has no significant impact on employee engagement in IT industry in India.

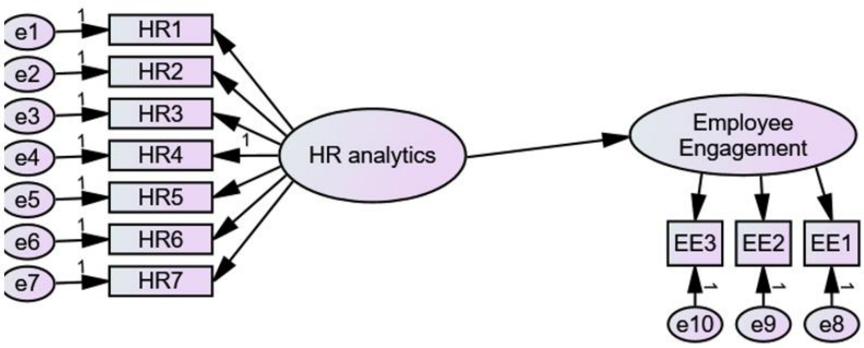

Figure 2: Structural Equation Model of "Role of HR analytics practices in Employee Engagement

Table 2: Regression Weights of Impact of HR analytics on Employee Engagement

Endogenous construct		Exogeneous construct	Estimate	S.E.	C.R.	P	Label
Affective Engagement	<---	HR Analytics	.754	.090	12.325	0.005	
Cognitive Engagement	<---	HR Analytics	.368	.085	8.430	0.001	
Behavioural Enagement	<---	HR Analytics	.560	.090	10.961	0.002	
Employee Engagement	<---	HR Analytics	.465	.090	8.317	***	12.7%

The outcome of data analysis is presented in Table 2. The analysis outcome highlights that the probability values of the influence of the HR Analytics practices on Employee Engagement is less than 5 %. Hence with 95 % confidence level the alternate hypotheses that there exists significant relationship between HR Analytics variables and Employee Engagement in Indian IT Industry may not be rejected. Hence, there exists significant relationship between HR Analytics variables and Employee Engagement.

The multiple squared correlations of 12.7% represents that 12.7% of the variations of the endogenous construct "Employee Engagement", may be attributed to the variations in the exogenous construct "HR Analytics".

Table 3: Summary of goodness of fit index

Model fit index	$\chi 2/df$	CFI	GFI	NFI	TLI	RMSEA
model	2.345	.935	.875	.856	.985	.0567
Cut-off values	<3	>0.9	>0.8	>0.8	>0.9	<0.08

The goodness of fit indices (represented in Table 3) such as CFI (0.935), NFI (0.856) and GFI (0.875) are high and badness of fit indices RMSEA (0.0567) is low representing that the structural model is fit.

3. Analysis of Objective 2: To examine the impact of Employee Engagement on the various metrics of Organizational performance in IT organization in India

Employee engagement has become a critical factor in enhancing organizational performance across industries. Engaged employees exhibit a high level of enthusiasm and commitment to their work, which in turn positively affects various organizational metrics. These metrics include productivity, quality of work, customer satisfaction, employee retention, financial performance, and innovation. The impact of employee engagement on these aspects is particularly noticeable in knowledge-driven industries, such as Information Technology (IT), where the quality and efficiency of work are crucial to organizational success.

For the current study, various dimensions of employee engagement practices have been taken to study the influence on operational performance. For this study, we have taken 4 constructs to measure organizational performance: Financial metrics, Customer Satisfaction Metrics, Employee Performance Metrics and Operational Efficiency Metrics.

Following hypotheses are formulated and are tested with the help of Structural Equation Modelling (shown in Figure 3).

Hypothesis:-

Ho2: Employee engagement has no significant influence on financial metrics in IT industry in India.

Ho3: Employee engagement has no significant influence on customer satisfaction metrics in IT industry in India.

Ho4: Employee engagement has no significant influence on employee performance metrics in IT industry in India.

Ho5: Employee engagement has no significant influence on operational efficiency metrics in IT industry in India.

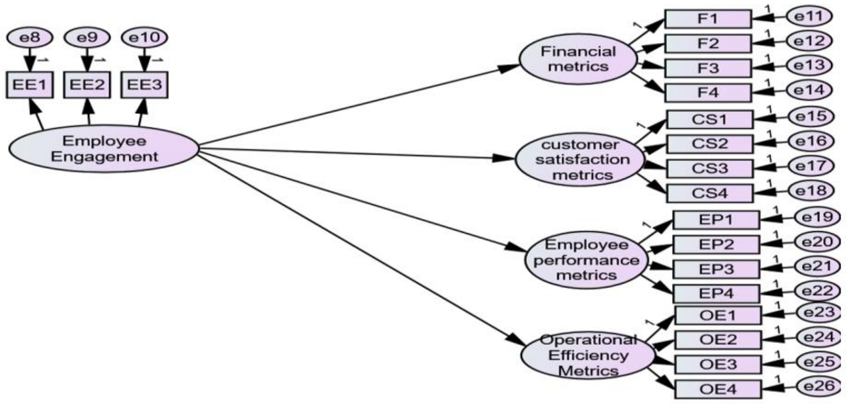

Figure3: Structural Equation Model of "Role of employee engagement practices in Organizational Performance"

Table 4: Regression Weights of Impact of Employee Engagement on Financial metrics of Organizational performance

Endogenous construct		Exogeneous construct	Estimate	S.E.	C.R.	P	Label
F1	<---	Employee Engagement	.759	.090	12.325	0.005	11.7%
F2	<---	Employee Engagement	.489	.085	9.430	0.001	
F3	<---	Employee Engagement	.571	.090	10.982	0.002	
F4	<---	Employee Engagement	.685	.090	11.417	0.000	
Financial Metrics	<---	Employee Engagement	0.485	0.085			

The outcome of data analysis is presented in Table 4. The analysis outcome highlights that the probability values of the influence of the Employee Engagement practices on Financial Metrics is less than 5 %. Hence with 95 % confidence level the alternate hypotheses that there exists significant relationship between Employee Engagement variables and Operational Performance in Indian IT Industry may not be rejected. Hence, there exists significant relationship between Employee Engagement variables and Financial Metrics. The multiple squared correlations of 11.7% represents that 11.7% of the variations of the endogenous construct "Financial Metrics", may be attributed to the variations in the exogenous construct "Employee Engagement".

Table 5: Regression Weights of Impact of Employee Engagement on Customer Satisfaction metrics of Organizational performance

Endogenous construct		Exogeneous construct	Estimate	S.E.	C.R.	P	Label
CS1	<---	Employee Engagement	.765	.090	12.525	0.005	
CS2	<---	Employee Engagement	.349	.085	8.532	0.001	
CS3	<---	Employee Engagement	.587	.090	10.875	0.002	12.7%
CS 4	<---	Employee Engagement	.479	.090	8.225	0.000	
Customer Satisfaction Metrics	<---	Employee Engagement	0.467	0.090	9.45	0.003	

The outcome of data analysis is presented in Table 5. The analysis outcome highlights that the probability values of the influence of the Employee Engagement practices on Customer satisfaction metrics is less than 5 %. Hence with 95 % confidence level the alternate hypotheses that there exists significant relationship between Employee Engagement variables and Customer satisfaction metrics in Indian IT industry may not be rejected. Hence, there exists significant relationship between Employee Engagement variables and Customer satisfaction metrics.

The multiple squared correlations of 12.7% represents that 12.7% of the variations of the endogenous construct "Customer satisfaction metrics", may be attributed to the variations in the exogenous construct "Employee Engagement".

Table 6: Regression Weights of Impact of Employee Engagement on Employee performance metrics of Organizational performance

Endogenous construct		Exogeneous construct	Estimate	S.E.	C.R.	P	Label
EP 1	<---	Employee Engagement	.743	.090	12.325	0.005	
EP2	<---	Employee Engagement	.389	.085	7.430	0.001	11.7%
EP3	<---	Employee Engagement	.538	.090	10.961	0.002	
EP4	<---	Employee Engagement	.493	.090	8.317	0003	

Endogenous construct		Exogeneous construct	Estimate	S.E.	C.R.	P	Label
Employee Performance Metrics	<---	Employee Engagement	.456	0.090	8.456	0.000	

The outcome of data analysis is presented in Table 6. The analysis outcome highlights that the probability values of the influence of the Employee Engagement practices on Employee Performance metrics is less than 5 %. Hence with 95 % confidence level the alternate hypotheses that there exists significant relationship between Employee Engagement variables and Employee Performance metrics in Indian IT industrymay not be rejected. Hence, there exists significant relationship between Employee Engagement variables and Employee Performance metrics.

The multiple squared correlations of 11.7% represents that 11.7% of the variations of the endogenous construct "Employee Performance metrics", may be attributed to the variations in the exogenous construct "Employee Engagement".

Table 7: Regression Weights of Impact of Employee Engagement on Operational Efficiency metrics of Organizational performance

Endogenous construct		Exogeneous construct	Estimate	S.E.	C.R.	P	Label
OE1	<---	Employee Engagement	.836	.090	13.432	0.005	
OE2	<---	Employee Engagement	.390	.085	7.340	0.001	
OE3	<---	Employee Engagement	.543	.090	10.993	0.002	10.7%
OE4	<---	Employee Engagement	.433	.090	8.943	0.002	
Operational Efficiency Metrics	<---	Employee Engagement	.467	0.090	8.883		

The outcome of data analysis is presented in Table 7. The analysis outcome highlights that the probability values of the influence of the Employee Engagement practices on Operational efficiency metrics is less than 5%. Hence with 95% confidence level the alternate hypotheses that there exists significant relationship between Employee Engagement variables and Operational efficiency metrics in Indian IT industry may not be rejected. Hence, there exists significant relationship between Employee Engagement variables and Operational efficiency metrics.

The multiple squared correlations of 10.7% represents that 10.7% of the variations of the endogenous construct "Operational efficiency metrics", may be attributed to the variations in the exogenous construct "Employee Engagement".

Table 8: Summary of goodness of fit index

Model fit index	χ2/df	CFI	GFI	NFI	TLI	RMSEA
model	2.346	.925	.866	.843	.934	.053
Cut-off values	<3	>0.9	>0.8	>0.8	>0.9	<0.08

The goodness of fit indices (represented in Table 8) such as CFI (0.925), NFI (0.843) and GFI (0.866) are high and badness of fit indices RMSEA (0.053) is low representing that the structural model is fit.

Conclusion: The impact of employee engagement on organizational performance in IT industry in India is undeniable. High levels of employee engagement lead to improvements in key performance metrics, including productivity, quality of work, innovation, employee retention, customer satisfaction, financial performance, collaboration, and corporate culture. As the Indian IT sector continues to grow and evolve, organizations must recognize the critical importance of fostering a culture of engagement to remain competitive and achieve long-term success. By investing in employee engagement initiatives, IT companies can unlock their workforce's full potential, driving sustainable growth and a stronger position in the global market.

4. **Analysis of Objective 3: To examine the impact of HR analytical practices on the Organizational performance's various metrics with mediation of Employee engagement in IT organization in India.**

Examining the mediation effect of employee engagement between the HR Analytics and organizational performance has been focused in this section. The objective is achieved with the help of Baron and Kenny method, and Bootstrap SEM applied on the collected responses. It is assumed that the HR Analytics improves the organizational performance directly as well as indirectly through enhancing the employee engagement of the organization. In the mediation effect the direct as well as indirect effect is estimated. The mediation is said to be significant if indirect effect is found significant. Further, the mediation effect of employee engagement can be divided into two categories namely full mediation and partial mediation. The full mediation is said to exist if the direct effect of HR Analytics on organizational performance is found to insignificant in the presence of mediating construct i.e. employee engagement. In case the direct effect of HR Analytics on organizational performance is found to significant in the presence of mediating construct i.e. employee engagement, the nature of mediation is known as partial mediation. The Baron and Kenny method as well as Bootstrap method using AMOS is applied to examine the mediating effect. The following hypothesis is examined for the mediating role of employee engagement between the HR Analytics and organizational performance:

Hypothesis:
Ho6: HR analytics has no significant impact on financial metrics of organizational performance with mediating effect of Employee engagement in IT industry in India
Ho7: HR analytics has no significant impact on customer satisfaction metrics of organizational performance with mediating effect of Employee engagement in IT industry in India
Ho8: HR analytics has no significant impact on employee performance metrics of organizational performance with mediating effect of Employee engagement in IT industry in India
Ho9: HR analytics has no significant impact on operational efficiency metrics of organizational performance with mediating effect of Employee engagement in IT industry in India

The results of the mediating effect are discussed below:

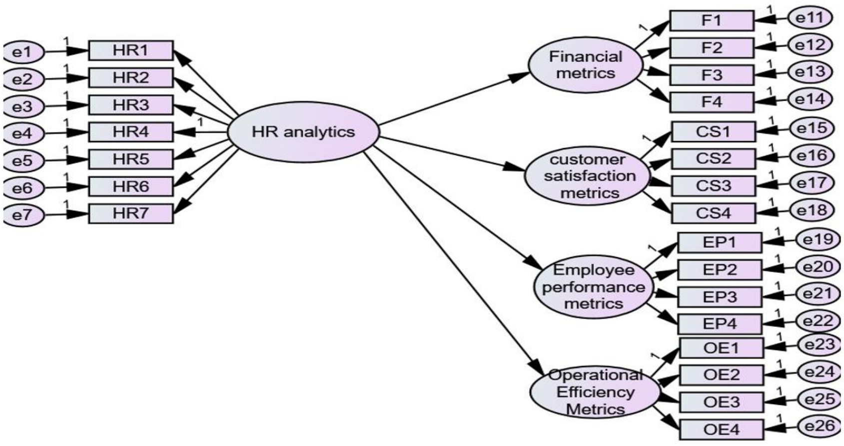

Figure **Error! No text of specified style in document.**: Total effect of HR Analytics on Organizational performance

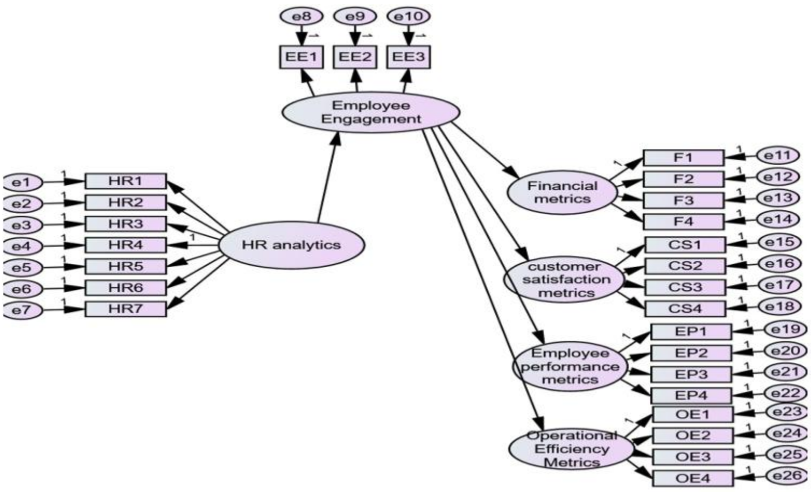

Figure 5: Direct effect of HR Analytics on Organizational performance with Employee engagement as mediating variable

Baron and Kenny Method

Indirect Effect

HR Analytics→Employee engagement→Financial Metrics

0.45*0.35 = 0.15

HR Analytics→Employee engagement→Customer Satisfaction Metrics

0.43*0.34 = 0.14

HR Analytics→Employee engagement→Employee Performance Metrics

0.41 * 0.38 = 0.91

HR Analytics→Employee engagement→Operational Efficiency Metrics

0.39 * 0.32 = 0.12

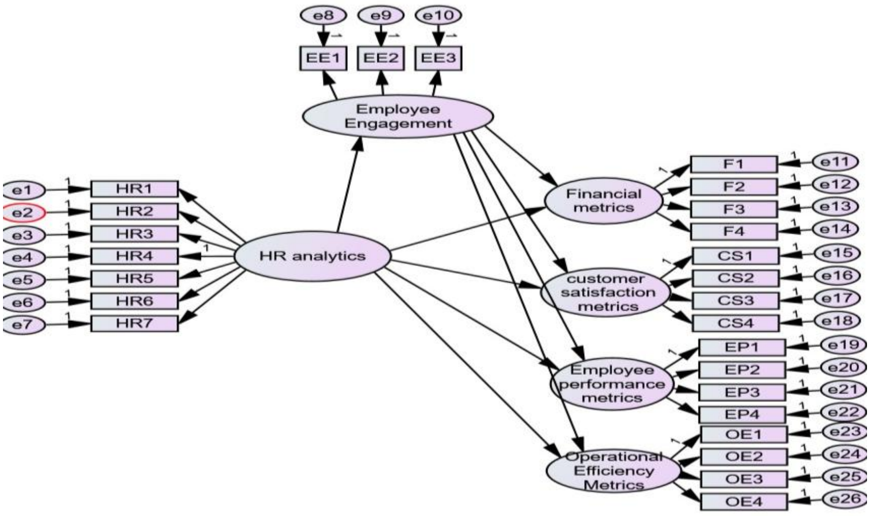

Figure 6: Indirect effect of HR Analytics on Organizational performance with Employee engagement as mediating variable

Type of Effect	Between	Standardized path Coefficient	P value	Variance Accounted from	Conclusion
Total Effect	HR Analytics→Financial Metrics	0.36	0.005	34.78%	Significant partial mediation exists
	HR Analytics→Customer Satisfaction Metrics	0.45	0.003		
	HR Analytics→Employee Performance Metrics	0.42	0.000		
	HR Analytics→Operational Efficiency Metrics	0.40	0.003		
Direct Effect	HR Analytics→Financial Metrics	0.35	0.000		
	HR Analytics →Customer Satisfaction Metrics	0.44	0.002		
	HR Analytics→Employee Performance Metrics	0.41	0.005		
	HR Analytics→Operational Efficiency Metrics	0.41	0.001		
	HR Analytics→Employee engagement→Financial Metrics	0.15	0.004		

Indirect Effect	HR Analytics→Employee engagement→Customer Satisfaction Metrics	0.14	0.001		
	HR Analytics→Employee engagement→Employee Performance Metrics	0.91	0.000		
	HR Analytics→Employee engagement→Operational Efficiency Metrics	0.12	0.000		

Conclusion: The result of the Bootstrap mediation test reported in the table depicts that the total effect of the HR Analytics on organizational performance is found to be 0.460. The probability value of the path coefficient of direct effect (0.460) is found to be less than 5 % level of significance. Thus, the total effect of the HR Analytics on organizational performance is positive and significant. The indirect effect of the HR Analytics to the organizational performance through the mediating construct employee engagement is found to be significant (path coefficient=0.16, p value=0.000). Therefore, it can be concluded from the result that the employee engagementplay a positive and significant mediating role between the HR Analytics and organizational performance. The direct effect of the HR Analytics on the organizational performance is found to be significant (path coefficient = 0.30, p value =0.022). Since, the direct effect of HR Analytics on the organizational performance is found to be significant, hence the mediation effect of employee engagement is said to be partial mediation effect. The variance accounted for (VAF) by the mediation effect of the employee engagement between the HR Analytics and organizational performance is found to be 34.78 %. Thus, it can be concluded from the result that the employee engagement play a strong positive and partial mediation effect between the HR Analytics and organizational performance.

Discussion and Conclusion:

This study was done with the purpose of examining that the success fuluse of HR analytics significantly contributes to creating organizational performance and it was also covered in its objectives to test that to what extent employee behavior impacts the employee commitment and employee performance (QA Al-Radaideh, E Al Nagi, 2012),. Here in this scenario the study explored several HR practices such as recruitment, newness during the integration process of HR, reward and compensation, employee feedback, training, and employee support etc (Vaz, S., 2021). This research proved that in those companies where the HR management introduces innovativeness while taking any decision or strategies regarding the employee's issues, the employees possess more energetic skills such as confidence, analytical mind, decision making, problem solving ability, and responsiveness, and they can execute their tasks in a more effective manner based on the nature of the related department. The research explained that in such a manner, HR practices shape behaviors and enhances employee commitment (Deepu Kumar, B. H. Suresh, 2018).

The fundamental idea behind HR analytics is its capacity to transform reams of data pertaining to HR into decision-supporting insights. Such insights facilitate HR professionals and organizational leaders to make informed decisions based on evidence, in contrast to relying on experience or intuition. In the technology sector, where talent is a core asset and staff turnover may be high, HR analytics offers a systematic framework for determining main drivers of performance, forecasting future workforce directions, and creating strong interventions to drive employee engagement, productivity, and retention (C.F. Chen, L.F. Chen, 2008). One can majorly understand from this report is how HR analytics can contribute to recruitment and talent acquisition. Using predictive models and pastre cords, IT industry can find the potential employee candidates who will perform better and can be in the organization for a long term. This minimizes the expenses of recruitment as well as enhances cultural match and performance. Further, budgetary control can be improved by compensation strategy management and workforce productivity.

Moreover, HR analytics also plays an important role to enhance customer satisfaction by making sure employees are motivated, trained properly, and line up to company values. Happy and satisfied employees usually provide us with an enhanced customer service, which increases the client satisfaction and loyalty, which us very crucial in IT Industry. If one uses HR analytics, the organizational performance will automatically enhance (Ali, A., Khan, F. U., Rehman, K., Khan, F., Hashim, S., & Khan, T.,2022). Nowadays, it is easy for organizations to keep a check on individual and group performance, further they can set specific goals, and can easily find training requirements using the data. This encourages open and fair culture among the organization which further promotes motivation and facilitates long-term talent development. Operation efficiency is also one of the many field that is affected by HR Analytics. By implementing HR functions, using and guiding the workforce effectively, and by a proper decision-making, organizations usually gain proper utilization of resources, also the administrative burden is minimized (Aba, I.E. & Enyioko, V., 2017).

Conclusively, we can say that HR analytics is not just a tool but instead it's a strategic tool that can improve financial well-being, improve and increase the employee and organizational efficiency, provide a good customer experiences, and improve the working structure of the company. According to the research, it can be said that the IT companies can attract and retain top talent by incorporating data-driven initiatives into their HR plans.

Suggestions and Recommendations:

If one wants to utilize the full power of HR analytics, then IT industry must take a systematic approach that aligns with their objectives. HR analytics helps organizations to make better decisions in main areas such as recruitment, performance management, employee engagement, and retention. This further improved the workforce planning, lower turnover, increased employee productivity, and improved financial performance of the organization.

If organizations carefully apply analytics for finding and analyzing the skill gaps and forecasting risk. These types of findings usually help the organization to form a better and productive workforce. Organizations who adopt HR analytics should invest in advanced HR technology platforms; they should further educate the HR professionals on how to do data analysis and also try to make an organization where date is factually checked instead of making an assumption.

Additionally, if we combine HR metrics with organizational KPIs such as customer satisfaction, operational efficiency, and financial performance this can ensure the high level of data driven contribution of HR to business success and help the organization to be effective and efficient. Moreover, it is advised to constantly review the key metrics because it will help in monitoring progress and making the desired changes.

In short, by adopting HR analytics and using it in our daily HR functions of the company, IT industry can improve both employee and organizational performance, ultimately attaining long-term growth and competitiveness by also achieving organizational goas effectively and efficiently.

Implications of the Study:

Theoretical Implications of Research-

Academically, the research expands the body of Research in the strategic function of HR analytics in improving organizational performance, especially among IT industry. Our report shows how human resource management theories impact the data-driven practices in changing the HR practices to shape behaviors of the employee and enhances employee commitment.

HR analytics provides a way to predict and positively affect the results of business decisions, to increase the quality of people related decisions and improve overall organizational performance. People who use HR analytics can support the organization in understanding far insight into an employee's work life by capturing, sharing, and analyzing their performance related data. This is why organizations observe and record what their employees do with customers and other employees and how they spend their time.

Once all information has been collected and gathered it can be seen that the research follows systems theory by clearly showing the relationship between HR practice and business organizational activities such as finance, operations, or customer service. HR analytics connects these systems together and provides a bigger picture of organizational health and performance.

Practical Implications of Research-

Importantly, this paper can be used by various scholars, practitioners, and students who seek to deepen their understanding of how HR Analytics concepts apply in real-world, data-driven contexts. It allows people to do further academic exploration and research into how analytics can help to analyze and evolve existing theories of organizational behavior, employee performance and strategic management. By implementing the data from our report, we can say that the research not only confirms theoretical models, but it also opens a new path for future theoretical research in HR field and organizational performance.

The outcomes of this research can be used by HR professionals, managers, and decision-makers across the IT sector. For HR professionals, it can be seen that the research highlights the value of building analytical strengths and investing in platforms related to HR Tech. Technologies nowadays can easily help us to find insights to opt for a better workforce planning, timely correcting the mistakes, and organizing more effective development programs for employees to enhance their performance. This can improve employee outcomes like increased job satisfaction, reduced turnover, and enhanced performance, all of which have a direct impact on organizational effectiveness.

If we look from a management point of view, the research invites scholors to see HR as a strategic partner to improve organizational performance. As we can see in the conceptual framework that if we Merge HR data with financial, operational, and customer service metrics it can enable companies to create a more detailed strategy that led us towards a long-term growth. Organizations can utilize these insights to utilize their resources effectively and efficiently, align people with business objectives, and react more rapidly to market needs.

Essentially, this research equips companies with the insight to shift from intuition-driven HR decisions to a more strategic, data-driven approach that drives employee success as well as overall organizational success.

Limitations:

While the study does have theoretical and practical implications, it has a few limitations. Although these limitations are expected to be removed by the researchers and practitioners who will use this report in future for their reference.

First, it can be seen that this research relied on only HR management practices for organizational and employee performance but in real time there are many other organizational and managerial elements that also have meaningful impacts on employee commitment and employee performance. The author however paid no attention to any elements beyond HR practices. It made the study limited in some respects.

Secondly, the sample size and research were limited to a small number of IT companies, which may further not be applicable to the whole industry. Also, only a restricted amount of data could be accessed because of privacy and confidentiality issues, which has prevented more in-depth analyses of the data. Additionally, time constraint is a problem that hampered the tracking of long-term impacts. In the future, it is possible that the findings may become less relevant due to the rapid change in HR technology as the IT sector and technology is constantly evolving. Also, failure to investigate the external factors like the economic or social environment may hindered the accuracy of the data.

Future Scope:

In the future, it is possible that its application is not just limited to one sector i.e IT but also to other industries. It can be extended and implicated across different sectors as HR practices are becoming common nowadays. Also, future studies can involve the variables that we have not yet covered in the current research but may help us as the studies evolve.

In this study, we have majorly focused on employee engagement as a key variable but in future there is scope to expand the studies by adding additional mediating variables in the research. Further, various other factors can be used to measure organizational performance as the industries and fields constantly evolve.

There is also a scope to conduct the comparative analysis of HR analytics between two or more industries which can further help us to know how it impacts the employee performance across various sectors.

References

Aba, I.E. & Enyioko, V. (2017). “Effects of Training and Development on Employee Performance at Abia State Polytechnic.” *International Journal of Economics and Business Management*, 3(9), 13-22.

Abdulrahman, N. A. (2018). “The influence of performance training and development on organizational performance: A case study of private banks in Kurdistan.” *International Journal of Advanced Engineering,Management Science*, 4(4), 239986.

Abuhashesh, M., Al-Dmour, R., Masa’deh, R., (2019). “Factors that affect Employees Job Satisfaction and Performance to Increase Customers’ Satisfactions”, *Journal of Human Resources Management Research*, 23, Article ID 354277, DOI: 10.5171/2019.354277.

Adams, R. (2021). “HR analytics in identifying skill gaps.” *Journal of Skill Development*, 15(3), 112-130.

Adanlawo, E. F., Nkomo, N. Y., & Vezi-Magigaba, M. F. (2023). “Compensation as a motivating factor of job satisfaction and performance.” *International Journal of Research in Business and Social Science (2147-4478)*, *12*(3), 131-139.

Ahmad, S., & Schroeder, R. G. (2003). “The impact of human resource management practices on operational performance: Recognizing country and industry differences.” *Journal of Operations Management*, 21(1), 19–43. doi:10.1016/S0272-6963(02)00056-6

Akerkar, 2013; Krumeich, Werth, & Loos, 2016; Lepenioti, Bousdekis, Apostolou, &Mentzas, 2020; Sivarajah et al., 2017.

Akour, I., Obayssi, A., Albaity, M., & Zeidan, Y. (2021). "The Moderated Mediation of Behavioral Intentionon Knowledge Management Systems." *International Journal of Sociotechnology and Knowledge Development*,13(1), 101–120.

Al-Frijawy, J., Militaru, C., & Tonoiu, S. (2019). "Planning Human Resources Management, Development and Training of Staff, and Their Impact on Organizational Performance, in the Iraq Oil Companies Sector." *AmericanAcademic Scientific Research Journal for Engineering, Technology, and Sciences*, 55(1), 121–138.

Ali, A., Khan, F. U., Rehman, K., Khan, F., Hashim, S., & Khan, T. (2022). "Linking HRM practices with Organizational performance through organizational trust: Evidence from HEI's in Pakistan." *Indian Journal of Economics and Business*, 21(1), 793–802.

Alsafadi, Y., & Altahat, S. (2021). "Human resource management practices and employee performance: The role of job satisfaction." *The Journal of Asian Finance, Economics, and Business*, 8(1), 519–529.

Angrave, D., Charlwood, A., Kirkpatrick, I., Lawrence, M., & Stuart, M. (2016). "HR and analytics: Why HR is set to fail the big data challenge." *Human Resource Management Journal*, 26(1), 1–11.

Anitha Jagannathan. "Determinants of employee engagement and their impact on employee performance." *International Journal of Productivity and Performance Management* 63(3):308-323.

Aroosiya, M., & Ali, H. (2013). "Impact of Job Design on Employees' Performance;With Special Reference to School Teachers in the Kalmunai Zone." *Journal of Management*, Volume VIII No. 1, 33.

Aulawi, H. (2021). "The Impact of Knowledge Sharing Towards Higher Education Performance in Research Productivity." *International Journal of Sociotechnology and Knowledge Development*, 13(1), 121–132.

Awan, S.H., Habib, N., Akhtar, C.S., & Naveed, S. (2020). "Effectiveness of Performance Management System for Employee Performance Through Engagement." *Sage Open Journal*, 10(4), 1-15.

Bastida, R., Marimon, F., & Carreras, L. (2018). "Human resource management practices and employee job satisfaction in nonprofit organizations." *Annals of Public and Cooperative Economics*, 89(2), 323–338.

Bin Shmailan, A.S., 2016. "The relationship between job satisfaction, job performance and employee engagement: An explorative study, Issues in Business Management and Economics", 4(1), 1-8, DOI:10.15739/IBME.16.001.

Birmingham, L. (2020). "HR analytics in recruitment and selection processes." *International Journal of Human Capital Management*, 18(3), 45-60.

Bos-Nehles, A. C., Veenendaal, A. A., (2019). "Perceptions of HR practices and innovative work behavior: the moderating effect of an innovative climate."*The International Journal of Human Resource Management*, 30(18), 2661-2683.

C.F. Chen, L.F. Chen, "Data mining to improve personnel selection and enhance human capital".*A case study in high-technology industry, Expert Syst. Appl*. 34 (1) 280–290,2008.

Cascio, W., & Boudreau, J. (2011). "*Investing in people: Financial impact of human resource initiatives. Upper Saddle River, NJ: Pearson Education, Inc*."

Chierici, R., Mazzucchelli, A., Garcia-Perez, A. and Vrontis, D. (2019), "Transforming big data into knowledge: the role of knowledge management practice", *Management Decision*, Vol. 57 No. 8, pp.

Dalal, R.S., Lam, H., Weiss, H.M., Welch, E.R. and Hulin, C.L. (2009). "A Within-Person Approach to Work Behavior and Performance: Concurrent and Lagged Citizenship-Counterproductivity Associations, and Dynamic Relationships with Affect and Overall Job Performance". *Academy of Management*, 52, 1051-1066.

Deepu Kumar, B. H. Suresh. "Workforce Diversity and its Impact on Employee Performance", *International Journal of Management Studies* V(4(1)):48, October 2018.

Deokar, P., Kulkarni E., Keskar R., (2021). “Predicting training needs using HR analytics.” *Journal of Training and Development*, 28(4),201-218.

Desmond, C. (2018). “Impact of HR analytics on talent management.” *Journal of Talent Development*, 12(1), 78-92.

Flemming, D. (2020). “Predicting employee satisfaction and engagement using HR analytics.” *Journal of Employee Well-being*,16(3), 112-130.

Garengo, P., Sardi, A., & Nudurupati, S. S. (2022). “Human resource management (HRM) in the performance measurement and management (PMM) domain: A bibliometric review.” *International Journal of Productivity and Performance Management*, 71(7), 3056–3077.

Guerci, M., Radaelli, G., Siletti, E., Cirella, S., & Rami Shani, A. B. (2015). “The impact of human resource management practices and corporate sustainability on organizational ethical climates: *An employee perspective.” Journal of Business Ethics*, 126(2), 325–342. doi:10.1007/s10551-013-1946-1

Hiregoudar, S.S. & Patil, R.N. (2020). “The Impact of Training and Development on Organisational Overall Performance in IT Industry”. 2(8). *International Research Journal on Advanced Science Hub*, 2(1): 174-180.

Huselid, M.A. (2018) “The science and practice of workforce analytics: Introduction to the HRM special issue.” Human Resource Management, 57, 679-684.

Huselid, M.A. (2018), “The science and practice of workforce analytics: introduction to the HRM special issue”, *Human Resource Management*, Vol. 57 No. 3, pp. 679-684

Ibrahim, M., &Brobbey, V. A. (2015). “IMPACT OF MOTIVATION ON EMPLOYEE PERFORMANCE”;. *International Journal of Economics, Commerce and Management* Vol. III, Issue 11,, 1218-1237.

Jaysinghani, M. (2019). “HR analytics in succession planning.” *Journal of Succession Management*, 24(3), 88-104.

Jones, M., & Brown, T. (2021). “The role of HR analytics in managing performance and productivity in IT firms.” *Information Systems Research Journal*, 40(3), 299-320.

Joshua S. Bendickson et Timothy D. “Operational performance: The mediator between human capital developmental programs and financial performance.” *Journal of Business Research.* Volume 94, 2019.

Kaur, A. (2019). “The use of HR analytics in workforce *planning.” Journal of Human Resources Management*, 25(2), 112-130.

Kelemen, M.; Polishchuk, V.; Gavurová, B.; Rozenberg, R.; Bartok, J.; Gaál, L.; Gera, M.; and Kelemen, M., Jr. (2021). “Model of Evaluation and Selection of Expert Group Members for Smart Cities, Green Transportation and Mobility: From Safe Times to Pandemic Times.” Mathematics, 9, 1287.

Kelidbari, H. R., Dizgah, M. R., Yusefi, A., 2011. “The relationship between organization commitment and job performance of employees of Guilan Province social security organization”, *Interdisciplinary Journal of Contemporary Research in Business*, 3(6), 555.

Kurniawati NI, Raharja E (2022) “The influence of employee engagement on organizational performance: a systematic review.” WSEAS Trans Bus Econ

Liao, H. and Chang, A. 2004, "A Multilevel Investigation of Factors Influencing Employee Service Performance and Customer Outcomes", *Academy of Management Journal*, Vol. 47, no. 1, pp. 41-58.

Linhartova, V. (2021). “Analyzing the Role of Public Expenditures in Human Development: Panel Data Analysis of EU-28 Countries.” *Montenegrin Journal of Economics*, 17(1), 85- 96.

Lockwood, N.R. (2007). “Leveraging Employee Engagement for Competitive Advantage.” *Society for Human Resource Management Research Quarterly*, 1, 1-12.

Mackay, C. J., Cousins, R., Kelly, P. J., Lee, S. and McCaig, R. H. 2004, "*Management Standards and Work-Related Stress in the UK: Policy Background and Science*", *International Journal of Work, Health and Organizations*, Vol. 18, no. 2, pp. 91-112.

Marler, J.H. and Boudreau, J.W. (2017), "An evidence-based review of HR analytics", *International Journal of Human Resource Management,* Routledge, Vol. 28 No. 1, pp. 3-26

Martinez, P., & Fernandez, S. (2020). "Assessing the effectiveness of training programs through HR analytics in IT companies." *Training and Development Journal*, 27(3), 145-160.

Maskell, B., Baggaley, B., & Grasso, L. (2011). "Practical Lean Accounting: A Proven System for Measuring and managing the lean enterprise (2nd ed.), Productivity Press."

Mdhlose. D. (2020). "An Evaluation of the Impact of Training and Development on Organisational Performance." *Journal of Human Resource and Sustainability Studies*, 48(8), 48-74.

Mojeed-Sanni, B.A., Shaikh, T.T., & Abbas, J.G. (2019). "Engendering High Performing Employees through Business Analytics, Organisational Social Capital Building (OSCB) and Employee Engagement: A Theoretical Review." *Journal of Educational and Social Research*, 9(3), 70.

Moran; Tziner, Aharon (2009), "Constructive Deviance, Destructive Deviance and Personality: How do they interrelate?", *Amfiteatru Economic Journal, ISSN 2247-9104, The Bucharest University of Economic Studies, Bucharest*, Vol. 11, Iss. 26, pp. 549-564.

Narayanamma P. L (2019). "Trends in Select Pharma Companies on Employee Engagement Practices." *Journal of Advanced Research inDynamical & Control Systems*, 11(7), pp.12-16.

Narcisse, S. and Harcourt, M. (2008)."Employee fairness perceptions of performance appraisal: a Saint Lucian case study*", International Journal of Human Resource Management*, Vol. 19 No. 6, pp. 1152-1169.

Nasriyah, R., Arham, Z., Aini, Q. (2016), "Profile matching and competency based human resources management approaches for employee placement decision support system (case study)."*Asian Journal of Applied Sciences*, 9(2), 75-86

Popaitoon, S., &Siengthai, S. (2014). "The moderating effect of human resource management practices on the relationship between knowledge absorptive capacity and project performance in project-oriented companies." *International Journal of Project Management*, 32(6), 908–920. doi:10.1016/j.ijproman.2013.12.002

QA Al-Radaideh, E Al Nagi, "Using data mining techniques to build a classification model for predicting employees performance." *International Journal of Advanced Computer Science and Applications*, Vol. 3, No. 2, 144-151,2012.

Raziq, A., Maulabakhsh, R. 2015. "Impact of Working Environment on Job Satisfaction. Procedia Economics and Finance", 23, 717-725.

Schroffel, A., (1999). "How Does Clinical Supervision Affect Job Satisfaction?. The Clinical Supervisor", 18(2), 91-105.

Schuler, R. S., & MacMillan, I. C. (1984). "Gaining competitive advantage through human resource management practices." Human Resource Management, 23(3), 241–255. doi:10.1002/hrm.3930230304

Shikhar, S. (2020). "Role of HR analytics in strategic workforce planning during mergers and acquisitions." *Journal of Organizational Change Management*, 36(4), 145-160.

Sinha, C., Kamra, N. B., Duggal, T., Sinha, R., Sujatha, R., &Mutsuddi, I. (2022). "Exploring the unison of socio-technical assemblage: Impact of employee job behavior on job satisfaction." *International Journal of Sociotechnology and Knowledge Development*, 14(2), 55–72. doi:10.4018/IJSKD.2022040104

Smith, K., & Johnson, P. (2020). "Data-driven HR practices: The key to employee engagement in the digital age*." International Journal of Human Resource Management*, 31(5), 1234-1256. https://doi.org/10.1080/09585192.2018.1554063

Tetteh, E. K., Asieda, C., Odei, G. A., Bright-Afful, C., &Akwaboah, L. (2012). "Work Environment and its impact on Employee performance"; *A case study of Produce Buying Company. Kumasi: Christian Service University College*.

Ulrich, D., &Dulebohn, J. H. (2015). "*Are we there yet? What's next for HR? Human Resource Management Review*", Vol. 25(2): 188–204.

Vaz, S. (2021). “HR analytics in performance evaluation.” *Journal of Performance Management*, 32(4), 201-218.

Vinesh, D.N. (2021). “Role of Training and Development in Employee and Organisational Performance.” *International Journal of Management and International Business Studies*, 4(2), 213-220.

Waiyaki, E. W. (2017). “Effects of Motivation on Employee Performance; A case study of Pam Golding Properties Limited; Nairobi. Nairobi: United States International University- Unpublished”

Wang, J., Hsu, J., Li, Y., &Gu, V. C. (2023). “Confronting Current Crises and Critical Challenges of Climate Change.” *International Journal of Sociotechnology and Knowledge Development*, 15(1), 1–17. doi:10.4018/ IJSKD.318695

Waseem, S. N., Frooghi, R., &Afshan, S. (2013). “Impact of human resource management practices on teachers' performance: A mediating role of monitoring practices.” *Journal of Education and Social Sciences*, 1(2), 31–55.

Wolniak, R., Olkiewicz, M., (2019). “The Relations Between Safety Culture and Quality Culture, System Safety: Human - Technical Facility – Environment”, 1(1), 10-17.

Xiang, J. (2020). “Role of HR analytics in workforce diversity and inclusion.” *Diversity and Inclusion Management Journal*, 22(4), 201-218.

Zada R, Ismael DS (2023) “A study on employee engagement and its impact on organizational effectiveness among IT companies in Iraq.” Tikrit J Adm Econ Sci. 19(64 part 2)

Zareen, M., Razzaq, K., &Mujtaba, B. G. (2013). “Job Design and Employee Performance: the Moderating Role of Employee Psychological Perception.” *European Journal of Business and Management*, Vol.5, No.5,, 56-55.