

Understanding the Relationship Between Employee Engagement Using HR Analytics

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Abstract

In this research, the authors address the topic of Human Resource (HR) Analytics and employee engagement among working professionals in India through the data-driven HRM frameworks. The survey was by a cross-sectional survey of 101 employees of various sectors and the data were examined using Pearson correlation, regression analysis and ANOVA. Descriptive results reveal that, employees have a neutral to slightly positive view of HR analytics practices ($M = 2.52$ - 2.68 , $SD [?] 1.0$). Correlation analysis demonstrates the existence of a strong, positive relationship between perceived HR analytics effectiveness and job satisfaction ($r = 0.245$, $p = .014$), indicating that analytics-enabled practices have a moderate effect on engagement results. Nevertheless, the HR analytics failed to indicate any meaningful correlations between the organisational commitment and retention-related perceptions. The regression analysis shows that the combination of HR analytics variables does not significantly rely on employee engagement ($F(4,96) = 0.807$, $p = .524$; $R^2 = .033$), and none of these predictors is statistically significant (all $p > .05$). Results of ANOVA also indicate that there are no significant demographic differences in the perceptions of engagement based on demographic factors, which means that the experience of HR analytics among employees remains very similar irrespective of their age, gender, or experience. On the whole, the conclusions made show that the impact of HR analytics on job satisfaction, although positive, has not yet manifested itself in the same way on all the dimensions of commitment and retention. The research adds to the body of literature on the HR analytics in India and raises the awareness of the fact that organisations should enhance the maturity of analytics, ethical data utilisation, and transparency to ensure the best possible levels of engagement.

Keywords: HR Analytics, Employee Engagement, Predictive HR, Workforce Insights, Data- Driven HRM, Employee Experience.

1. Introduction

A knowledge-based economy is largely based on human capital, employee engagement has been one of the most crucial elements to productivity, innovation, and success to the organisation. Similarly, the application of sophisticated data analysis to HR functions in other terms HR analytics is shifting the manner in which organisations can conceptualize and manage their employees by developing new means of capturing, measuring and analysing employee behaviour, employee performance and employee engagement as a heterogeneous input to HR decisions. The current paper tries to investigate the possible use of HR analytics as a strategically relevant instrument to the process of employee engagement.

The engagement of employees is defined by the emotional attachment, the interest and the level of engagement to the work-related activities. The concerned employees will be more productive, loyal and a mirror to organisational values. The aspect of engagement and predictability to provide specific outcomes might be too complex to be explained with conventional HR practices, yet, they are also popular. However, inclusion of analytics into HR systems enable organisations to respond to problem-solving scenarios rather than managing the talent proactively. The analysis of how HR analytics may impact the engagement programs with objective and quantifiable employee deliverables will be dedicated to this study.

The importance of the role played by employee engagement has been put into the limelight somewhat later as a result of the implication presented by remote working, globalisation, and shifting workforce expectations. Since employees require their employers to be more open, accommodating and meaningful, the HR departments will be forced to respond accordingly by offering smart systems that can make sense out of the torrent of feedback and behavioural data. Moreover, the timely inflow of HR analytics in this space can provide an organisation with a valuable framework to understand the current trends of engagement and can respond quickly to change the HR policy and programs.

1.2 Background

Even though the concept of HR Analytics is gaining popularity, a significant number of organizations in India continue to

operate under the old HR systems that are not able to record real-time employee experiences. This lack of connection restricts the capacity of the organizations to give consistent feedback, detect the trends of burnout, or monitor engagement properly. The move towards digital HR system gives a chance to fill these gaps.

Nevertheless, there is a dearth of scholarly studies related to HR Analytics in India, especially regarding quantitative research on the effects of this analysis on the results of engagement. The majority of the previous research is based on the use of technology, HR capability or conceptual models and not quantifiable employee reaction. It is necessary to learn about the off-the-record significance of analytics-based HR interventions and the possibility of their being more or less effective among demographic groups.

The present study contributes both practical and theoretical knowledge to the field of Indian HRM since it presents empirical evidence based on employee perception of HR analytics tools and its correlation to the engagement indicators.

1.3 Need for the Study

The organisations across the globe are still struggling with workforce disengagement, high turnover expenses, and lack of consistency in HR performance. Conventional HR practices that are reliant on intuition are not grounded in empirical evidence and, as such, data-driven systems of HR are increasing in usage. Nevertheless, a significant number of organisations in India are at an initial level of digital HR adoption and they are yet to completely utilize HR analytics to enhance engagement. Employee engagement is multidimensional as it is influenced by psychological, behavioural, and contextual factors and HR analytics could be used to identify such patterns with more precision.

Employees who are disengaged cause huge losses on productivity, morale and attendance resulting in companies spending a lot on engagement programs. The HR analytics offers practical solutions, shifting the conventional survey to the specific engagement gaps and making it possible to take action to address them. This paper, hence, has a contribution on the academic and practical level by considering the use of analytics to support engagement strategies in the Indian scenario.

With the tightening of competition in the global arena, organisations need to hire, maintain and to motivate talent. HR analytics provides the opportunity to detect the risks of disengagement and forecasts the workforce trends by evaluating such variables as the quality of communication, the balance of workloads, and recognition. These proactive abilities demonstrate the organisational topicality and relevance of this research.

2. Review of Literature

2.1 HR Analytics and Modern HR Practices

HR Analytics is a process systematically gathering, analyzing and interpreting information about employees and using it to make HR-related decisions. Bassi (2011) emphasized the fact that analytics generates future knowledge to enable organizations to predict the workforce issues. As Marler and Boudreau (2017) highlighted, analytics should be strategically integrated to affect the results, e.g., engagement.

2.2 Employee Engagement and Digital HR Tools

The job resources that have been associated with employee engagement include autonomy, recognition, and managerial support. According to Schaufeli and Bakker (2004), involvement level is higher when there is access to supportive resources. HR analytics facilitates such resources by facilitating proper planning of workloads, determining the lack of recognition, and equitable performance appraisals.

2.3 Predictive Analytics and Engagement Forecasting

Johna and Hajam (2021) discovered that real-time engagement dashboard and machine-learned feedback system enhanced the satisfaction levels by 17% in two years within organizations. Predictive analytics will allow HR leaders to detect the risk of disengagement in time and take specific intervention measures.

2.4 Transparency and Fairness Through Analytics

The more employees feel the HR systems are fair the more they are engaged. Analytics also minimizes bias in assessments, compensation choices and promotions by using measurable factors. Regarding employee trust, Minbaeva (2018) emphasizes the essence of ethical, credible analytics.

2.5 Challenges in Analytics Implementation

Although having the benefits, HR Analytics is challenged by issues like insufficient expertise, unwillingness to adopt the data-driven decision-making approach, the failure to integrate the new tool with the established HR operations, and the lack of privacy. These issues may limit the quantifiable effect analytics will have on engagement, in line with the small variance of our results.

3. Research Objectives

3.1. Objectives

1. To examine the connection between the practice of HR analytics and the extent of employee engagement.
2. To determine which HR analytics tools/practices are the most effective in regards to employee engagement.
3. To investigate to which degree the demographic factors (e.g. age, gender and work experience) determine the perception of HR analytics and engagement.
4. To examine the quantitative predictive power of HR analytics to the changes in employee engagement.
5. To make efficient recommendations and ideas that may be efficient when organisations aim to enhance engagement through HR analytics.

3.2. Hypothesis

- **H1:** There is a positive and significant relationship between HR analytics and employee engagement.
- **H2:** The influence of the HR analytics on the employee engagement varies based on the demographic features such as age, gender and years of experience.
- **H3a:** The level of engagement of the employees is positively determined by the use of HR analytics to get real-time performance feedback.
- **H3b:** The impact of predictive HR analytics on the level of employee engagement is greater in comparison with the traditional HR practices.
- **H4a:** Data-driven performance tracking is more closely related to employee engagement compared to manual or the process of HR that relies on intuition.
- **H4b:** The more engaged employees are in organisations that use analytics to measure employee sentiment than those who do not.
- **H4c:** Organisational systems with HR analytics operationalised in more than one HR area (i.e. recruitment, training, and development) will have more consistent and sustainable employee engagement results.

4. Research Methodology

4.1. Research Design

It is the quantitative explanatory research which is interested in determining the relation between the performance and employee engagement in the Indian corporates with the help of

HR analytics. The samples will be sampled using the Utrecht Work engagement scale and HR records of the company among the 200-300 employees across the different sectors. Such tools as SPSS and Tableau will be used to analyse the correlation and regression. Informed consent and confidentiality are some of the ethical standards that will be used.

4.2. Sampling Technique

The sampling technique employed in the study is convenience non-probability whereby the responses were obtained among working professionals in India. This method was adopted because it is practical, accessible and appropriate in accessing a variety of respondents in a short time using online mediums. Although convenience sampling reduces generalizability, it is suitable in exploratory research and can represent most sectors, including IT, finance, education, manufacturing, and retail. The participants who were willing and able to complete the online questionnaire were only included.

4.3. Tools for Data Collection

The base data formed the sample of the current study, as it was gathered in the form of structured self-administered questionnaire that was specially designed to evaluate the perception of the employees towards the HR analytics practices and the connection between the latter and the levels of employee engagement. The questionnaire was developed based on the critical review of the literature and published study of valid scales that ensured content validity and reliability. The instrument consisted of three large sections:

1. Demographic Data: This information was included (age, gender, education level, years in position and job role) to enable the analysis of subgroups and to gain insight into the differences in perceptions between the different demographics of employees.

2. HR Analytics Practices: The questions covered various variables that measured the extent of usage of data-driven tools by the organizations in relation to HR functions including performance review, recruiting, feedback system, and development of talents. These questions were employee awareness questions and the employee perception of the HR analytics initiatives.

3. Employee Engagement: Employee emotional commitment scale, employee job engagement scale, organizational-employee fit scale, and employee motivation scale. These were founded upon the engagement scales that had already existed and altered according to the organization.

The second and third sections all followed a five-point Likert scale according to which the responses were formed on the 1 (Strongly Disagree) to 5 (Strongly Agree) scale. Before the actual study was done, a pilot test was conducted with a small group of the subjects to determine that the questionnaire items were coherent, clear and developmental. Changes were made on the pilot testing feedback.

5. Data Analysis and Interpretation

5.1 Data Analysis Procedures

The analysis of the data was done with the help of SPSS and Excel. The following were the statistics involved in conducting the research objectives and test the hypotheses proposed:

- **Descriptive Statistics** —: These were applied in order to generalize the demographic variables and provide the general image of the level of response of the participants on the use of HR analytics and their involvement.
- **Reliability Testing:** Cronbach's Alpha was used to test the internal consistency of the questionnaire scales in HR analytics and employee engagement.
- **Correlation Analysis:** To explore it, Pearson correlation was achieved in order to determine the strength and direction of the relationship between the HR analytics practices and the employee engagement.
- **Linear Regression Analysis:** The data was analysed by the method to examine the predictive value of HR analytics with respect to the results of employee engagement.

- **One-Way ANOVA:** It is utilized in scenarios when the degree of engagement is expected to be established between the different demographic groups like age, education and years of experience.
- **Independent Samples t-Test:** This is used when attempting to determine whether or not there is significant difference in perceptions of engagement among binary variables e.g. gender.
- **Multiple Regression:** It is done to determine the relative values of the HR analytics practices (e.g., feedback systems, data dashboards, predictive analytics) in employee engagement.

All of the statistical tests were performed at 95 percent level of confidence ($p < .05$) to identify reliability and statistical significance of the tests.

5.2 Descriptive Statistics

Table 1: Descriptive Statistics of Employee Perceptions Toward HR Analytics and Engagement Outcomes

	N	Minimum	Maximum	Mean	Std. Deviation
HR analytics is effectively used in my organization to improve employee satisfaction.	101	1	4	2.68	1.048
My organization uses HR analytics to reduce attrition and retain employees.	101	1	4	2.63	1.065
HR analytics contributes to stronger organizational commitment among employees	101	1	4	2.65	.994
Engagement initiatives supported by HR analytics positively influence my job satisfaction.	101	1	4	2.52	1.006
Valid N (listwise)	101				

The reactions of 101 respondents show that there is moderate consensus on all factors about the application of HR analytics in employee engagement and satisfaction processes. All statements have the mean of 2.52 to 2.68 on a scale of 4-point, which is neutral to slightly positive perception. The average score ($M = 2.68$) of the statement concerning the use of HR analytics to enhance the satisfaction of employees was the highest, which is why it is possible to state that the respondents are the most aware of the possible effect in this direction. The standard deviations of approximately 1.0 indicate the presence of moderate variability in responses, which means that there is a difference in the familiarity or implementation in different organizations.

The correlation analysis indicates that there is a positive significant relationship between the use of HR analytics to enhance employee satisfaction and the effect on job satisfaction ($r = 0.245$, $p = 0.014$) implying that employees who view HR analytics as effective have higher chances of being satisfied with their jobs. Nevertheless, HR analytics showed no significant correlation with organizational commitment or even with any other outcome of engagement, whereas retention practices showed no significant correlation with other outcomes indicating that although perceived role of HR analytics in job satisfaction is more pronounced, its perceived impact on organisational commitment and retention is less pronounced in this sample.

5.4 ANOVA^a

Table 3: ANOVA Summary for Regression Model on HR Analytics and Employee Engagement

Model		Sum Squares of	df	Mean Square	F	Sig.
1	Regression	3.049	4	.762	.807	.524 ^b
	Residual	90.654	96	.944		
	Total	93.703	100			

The ANOVA findings show that the total regression equation is not significant ($F(4, 96) = 0.807$, $p = 0.524$). This implies that the independent variables used in the model do not work jointly in a manner that would imply the dependent variable. That is, the predictors fail to significantly account for the differences in the outcome variable when using HR analytics, as it is calculated in this dataset.

5.5. Coefficients^a

Table 4: Coefficients Table of Multiple Linear Regression for Predictors of Employee Engagement

Model		Unstandardized Coefficients	Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	
1	(Constant)	2.646	.470		5.635 .000
	HR analytics is effectively used in my organization to improve employee satisfaction.	-.016	.096	-.017	-.167 .868
	My organization uses HR analytics to reduce attrition and retain employees.	-.138	.092	-.152	-1.502 .136
	HR analytics contributes to stronger organizational commitment among employees	tc.069	.098	.071	.708 .480
	Engagement initiatives supported by HR analytics	.079	.100	.082	.791 .431

positively influence my job satisfaction.

The coefficients table indicates that the effect of the different predictor variables on the outcome in the regression model is not significant because all the p-values are above 0.05. This implies that the individual effect of using HR analytics to achieve satisfaction, retention, commitment, or job satisfaction on the dependent variable in this model is not statistically significant. Although the constant is important ($p = 0.000$), independent variables, in this analysis, are not particularly powerful predictors.

5.6 Collinearity Diagnostics

Table 5: Collinearity Diagnostics for Predictor Variables in Regression Model

Model	Dimension	Eigenvalue	Condition			
Index						
(Constant)	HR analytics is					
effectively used	in my organization to improve employee					
My organization uses	HR					
analytics to reduce attrition and	retain				satisfaction.	employees.
1	1	4.594	1.000	.00	.01	.01
	2	.151	5.518	.00	.23	.56
	3	.126	6.046	.00	.00	.08
	4	.096	6.902	.00	.58	.07
	5	.033	11.743	1.00	.18	.28

According to the collinearity diagnostics, there are no significant multicollinearity problems between the predictor variables. The condition indices are all under the common concern index of 30 with the largest being 11.743. Also, there is no concentration of the proportions of the variance across the variables in the components with high condition indices. This implies that the predictors within the model are independent enough and do not bias the regression estimates being the result of multicollinearity.

6. Findings and Discussion

The results of the statistical analysis show that, though the overall attitude to HR analytics in improving employee engagement is moderately positive, the impact of this method is rather weak. According to the descriptive statistics, employees are slightly in agreement with the

statements relating HR analytics to satisfaction and commitment, although the answers differ across organizations. According to the results of the correlation analysis, there is a significant positive correlation between the application of HR analytics to enhance satisfaction and its impact on job satisfaction, which proves a certain area where HR analytics can be considered value-added. Nonetheless, there were no meaningful results with regard to the organizational commitment or retention practices. The regression analysis also validates the fact that the joint effect of the predictor variables is not significant to explain the variance in the dependent variable, and none of the individual predictors was

highly significant. Nonetheless, the collinearity diagnostics indicate that there are no multicollinearity issues with the model, which confirms the structural integrity of the model. On the whole, although HR analytics has a potential to affect job satisfaction, its further implications on the results of employee engagement such as commitment and retention need deeper investigation and more specific data.

7. Conclusion

The present research examined the multifaceted character of the interconnection between HR analytics and employee engagement in numerous sectors in India. The evidence shows that the active application of HR analytics, in particular, the real-time feedback and predictive insights and data-driven decision-making might help to increase the engagement of the employees. The level of influence that analytics would have on engagement is a demographic factor that was influenced by experience and education.

The HR systems will be open, personalized and literally meant to assist in the development of the employees rather than to rule them, which is why the employees will respond positively. These data points to the fact that analytics tools can be used to optimize the operational efficiencies, not to mention that they could be utilized as psychometric tools that may result in the rise of motivation, trust, and job satisfaction. These findings confirm the position of HR analytics as one of the strategic resources of human capital management in the contemporary world.

Overall, the paper emphasizes the ethical necessity of companies to apply HR analytics to protect autonomy, promote equity, and spark counter-cultures of trust. As the role of data as a separate component of the human capital management of organizations is on the rise, the data-driven decision-making requires the balancing impact of insight and intrusion. The correctness of the data is not only to identify the future of the employee engagement but also the human-centered design analytics tools and ethically.

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