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IMPACT OF STRATEGIC HRM AND ANALYTICS ON ORGANIZATIONAL PERFORMANCE: MEDIATING ROLE OF EMPLOYEE ENGAGEMENT AND MODERATING ROLE OF EMPLOYEE BEHAVIOR

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ABSTRACT

The research hypothesizes that Strategic Human Resource Management (SHRM) practices and data-based HR Analytics (HRA), as well as Perceived Organizational Support (POS), can support the Organizational Performance (OP) in urban commercial markets of Pakistan, which is a developing economy with limited representation in the existing literature. The paper will also be based on Social Exchange Theory and the Ability Motivation Opportunity (AMO) framework, where Employee Engagement (EE) plays the role of a mediator and Employee Behavior (EB) plays the role of a contextual moderator. The information was gathered through a structured questionnaire that was given to a sample of 300 workers in various city institutions. Hypothesis testing was conducted using Structural Equation Modeling (PLS-SEM) where it was partially least squares. Findings confirm that Organizational Performance is strongly positively influenced by Employee Engagement which is positively influenced by HR Practices (= 0.449), HR Analytics (= 0.406) and POS (= 0.326). EE has full mediation with all three antecedents ($p < 0.001$). Employee Behavior Moderation has a weak effect (= 0.136, $p = 0.057$), which indicates contingency. The model accounts for 48.1 and 50.8 percent of variance in EE and OP, respectively. The findings

have implications for the HR practitioners and policymakers in developing economies who want to use evidence-based approaches to performance improvement.

Keywords: Strategic HRM; HR Analytics; Employee Engagement; Organizational Performance; Perceived Organizational Support; Employee Behavior; PLS-SEM; Pakistan; Developing Economy

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Introduction

In a world of high global competition, accelerated technological change and increased demands on human capital, organizations are becoming more and more forced to employ evidence based, strategically aligned strategies in the management of their workforce. Strategic Human Resource Management (SHRM) has come to become the foundation of organizational effectiveness, focusing on incorporation of HRM practices with wider organizational goals to attain sustainable competitive advantage (Shahzad et al., 2024). At the same time, with the explosion of data analytics, new opportunities have opened up in terms of HR decision-making, which has led to the emergence of a new domain of HR decision-making: HR Analytics (HRA), which is the application of descriptive, predictive, and prescriptive data analytics to optimize workforce-related decisions and, by extension, organizational performance (Espegren & Hugosson, 2025)

Although there is an increasing theoretical and practitioner interest in SHRM and HRA, there is disproportionately low empirical evidence in developing countries. The specific situation of Pakistan, which is one of the fastest developing urban commercial economies of South Asia, is especially interesting and yet unexplored. The specificities of urban markets of Pakistan have specific challenges: the lack of access to the high-quality HR infrastructure, the absence of data analytics application, and the specific cultural environment where the perception of organizational support by the employees is a decisive factor in workplace attitudes and behaviors (Shahzad et al., 2024). The interplay of HR Practices, HR Analytics and Perceived Organizational Support in shaping Organizational Performance- and how they do it- therefore give pressing research questions in this regard.

The existing literature concludes that Employee Engagement (EE) is a powerful connection between HR investments and organizational performance (Boccoli et al., 2023; Shehzadi et al., 2026). Engaged employees show greater cognitive, emotional and behavioral investment in their jobs and convert organizational inputs to high performance outputs. Moreover, researchers have now started to point out the situational influence of Employee Behavior as a factor that can either strengthen or weaken the engagement-performance relationship particularly in the case of collectivist and developing-economy environments (Dalain, 2023). However, the combined view SHRM practices, HR Analytics, POS, Employee Engagement as mediator, and Employee Behavior as moderator has not been empirically studied in the context of Pakistani urban market, which is a significant gap in the literature.

Scope of the Study

The study is limited to the commercial organizations located in the urban areas in Pakistan that include various industries such as manufacturing, services and financial institutions. The sample has full-time employees who are subjected to formal HR practices and organizational support systems. Specifically, the areas of the nexus of strategic HRM, data analytics, organizational support, engagement, and performance are discussed in the context of a developing economy.

Research Objectives

The main questions of this research are:

- To evaluate how HR Practices, HR Analytics, and Perceived Organizational Support have direct influence on Employee Engagement.
- To explore the mediating effect of Employee Engagement between these antecedents and Organizational Performance.
- To determine the moderating role of Employee Behavior in engagement performance relationship.

- To produce empirical data of HR policy and practice in the developing economy of Pakistan that is context specific.

Research Questions

- RQ1: How much HR Practices and HR Analytics, combined with Perceived Organizational Support, affect the Employee Engagement in urban Pakistani organizations?
- RQ2: Does SHRM antecedents/Employee Engagement moderate the relationship between the antecedents of SHRM and Organizational Performance?
- RQ3: Does the Employee Behavior mediate the Employee Engagement- Organizational Performance relationship in Pakistani urban market setting?

Literature Review

This paper has a theoretical basis of two complementary frameworks. According to Social Exchange Theory (SET), perceived organizational investments (i.e., effective HR Practices and conducive work environments) lead to reciprocal responses by the employees, which can be seen as increased engagement and discretionary effort (Boccoli et al., 2023). The Ability-Motivation-Opportunity (AMO) model also states that the HR systems can help performance by building the abilities of the employees, inspiring them and providing them with the structural chances to make a valuable contribution. Collectively, these frameworks forecast that SHRM activities, HR Analytics and POS will have a positive conditioning effect on Employee Engagement and consequently drive Organizational Performance.

HR Practices include recruitment, training and development, performance appraisal as well as reward systems; aspects that all indicate how organizations are investing in human capital. (Shehzadi et al., 2026) confirm that properly developed HRM practices have a significant impact on employee engagement as they influence the sense of fairness, competence building, and organizational commitment. The HR Analytics provides an evidence-based dimension to SHRM and enables organizations to make people-related decisions based on evidence to maximize their talent utilization, reduce turnover, and get higher productivity (Falletta & Combs, 2021; Madhani, 2023). Perceived Organizational Support represents the extent of how their organizational beliefs are perceived by the employees with regard to how much their organization values their efforts and cares about their welfare (Abdullahi et al., 2024), and the data on the subject matter is uniform in that it has a positive correlation with engagement and in-role performance.

Organizational performance results have been largely identified with Employee Engagement like productivity, profitability, customer satisfaction and innovation as the simultaneous physical, cognitive and emotional investment in a work role (Boccoli et al., 2023). (Vadithe & Kesari, 2025) precisely verify that HR Analytics increases employee engagement, which subsequently bridges the way to organizational performance in data-driven setting. Employee Behavior as a moderating construct entails proactive, adaptive, and citizenship behavior that contextualizes the way in which engaged employees translate their motivation into performance, especially in the developing-economy contexts marked by a high power-distance and a high collectivism (Dalain, 2023).

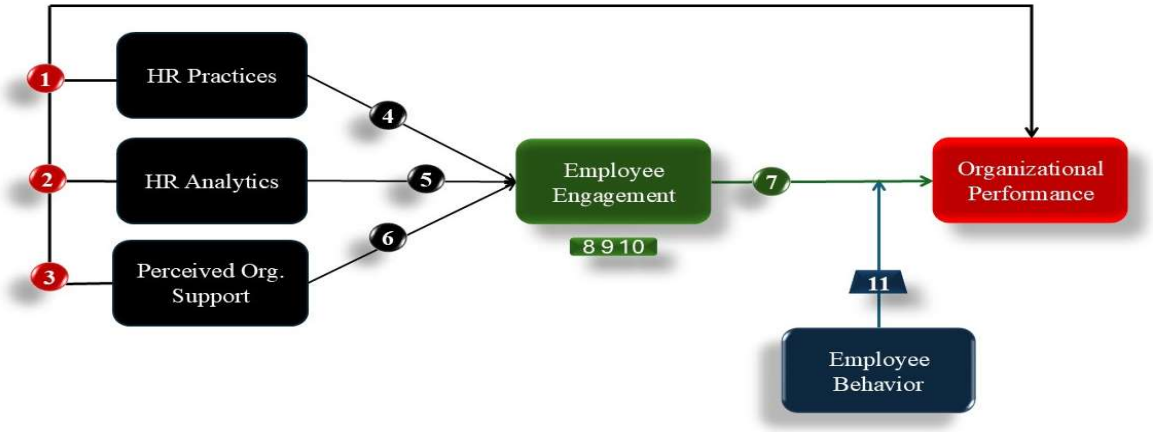
Hypothesis Development

H1: There is a positive relationship between HR Practices and Organizational Performance.
H 2: There is a positive correlation between HR Analytics and Organizational Performance.
H3: The perceived organizational support is positively correlated with Organizational Performance.
H4: Employee Engagement is positively connected with HR Practices.

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H5: HR Analytics and Employee Engagement have a positive relationship.
H6: Employee Engagement is positively related to organizational support.
H7: Organizational Performance has a positive relationship with Employee Engagement.
H8: There is mediation between HR Practices and Organizational Performance through Employee engagement.
H9: There is no mediation of HR Analytics to Organizational Performance through Employee Engagement.
H10: Perceived Organizational Support has a mediating relationship with the Organizational Performance mediated through employee Engagement.
H11: The relationship between Employee Engagement and Organizational Performance is mediated by employee Behavior whereby the positive influence of EE on OP is greater when the Employee Behavior is positive.

Figure 1. Conceptual Framework



Methodology

The current research uses the quantitative, cross-sectional research design which aligns with the positivist paradigm. A questionnaire with a structured, self-administered questionnaire was designed based on pre-tested Likert-scale (1 = Strongly Disagree to 5 = Strongly Agree) questions based on validated scale. The scales that were reviewed in the seminal works by (Shehzadi et al., 2026) and (Espegren & Hugosson, 2025) provided the items that were included in the measurement of HR Practices, HR Analytics, and Perceived Organizational Support, whereas the items used in measuring Employee Engagement and Organizational Performance were modified according to (Boccoli et al., 2023) and Bechter et al The last tool had multi-item reflective scales of both the constructs, four and five items per variable.

The target population was full-time employees in urban commercial organizations in the major metropolitan centers in Pakistan, such as Lahore, Karachi and Islamabad. The purposive sampling was used to make sure that the sample is diverse in terms of organization in terms of manufacturing, banking, telecommunications, and services. Three hundred valid answers (N = 300) were obtained, a sufficient number to estimate with PLS-SEM since it is recommended that more complex structural model analysis be conducted by the rules of analysis (Ioakeimidou et al., 2024). Both managerial and non-managerial employees were selected as respondents, which guaranteed the representation of the employees of different hierarchical levels.

The main analytical tool was selected as Partial Least Squares Structural Equation Modeling (PLS-SEM) which is implemented in SmartPLS 4.0 because it is strong with non-

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normative data, suitable in exploratory structural modelling, and was effectively used in management research in the case of complex latent constructs (Vadithe & Kesari, 2025). The analysis was done in steps: the measurement model (reliability, convergent validity, discriminant validity using HTMT criterion), and the structural model (path coefficients, R 2, f 2, mediation and moderation bootstrapping). The common method bias was evaluated through single factor test created by Harman, which proved that there is no extreme bias.

Data Analysis and Results

4.1 Descriptive Statistics

Variable	N	Min.	Max.	Mean	Std. Dev.	Variance	Skewness	Kurtosis	Range
HRP	300	1.00	5.00	3.396	0.866	0.749	−0.330	−0.419	4.00
HRA	300	1.25	5.00	3.367	0.892	0.796	−0.181	−0.578	3.75
POS	300	1.25	5.00	3.430	0.876	0.768	−0.429	−0.338	3.75
EE	300	1.00	5.00	3.369	0.886	0.786	−0.400	−0.443	4.00
OP	300	1.00	5.00	3.338	0.836	0.698	−0.133	−0.488	4.00
EB	300	1.00	5.00	3.263	0.890	0.792	−0.077	−0.714	4.00

Table 1. Descriptive Statistics (N = 300). Note: HRP = HR Practices; HRA = HR analytics; POS = Perceived Organizational Support; EE = Employee Engagement; OP = Organizational Performance; EB = Employee Behavior.

The descriptive statistics show that the means of all the constructs are close to normal distribution with a range of 3.26 to 3.43 on a five-point Likert scale which indicated moderate-high perceptions among respondents. The skewness and kurtosis values are within the acceptable range of +1.5, confirming the normality of data and appropriateness to analyze its structure (Bibi et al., 2026).

4.2 Correlation Analysis

Variable	HRP	HRA	POS	EE	OP	EB
HRP	1					
HRA	0.051	1				
POS	0.018	−0.087	1			
EE	0.471**	0.407**	0.299**	1		
OP	0.491**	0.414**	0.314**	0.691**	1	
EB	−0.013	−0.020	0.043	0.005	−0.014	1

Table 2. Pearson Correlation Matrix. ** -0.01 level of significance (2-tailed).

The correlation table indicates that there are strong positive relationships between HR Practices, HR Analytics, POS, Employee Engagement and Organizational Performance (all $p < 0.01$). It is important to note that Employee Engagement is related to Organizational Performance ($r = 0.691$) most strongly, which is why it is the most central mediator. The Employee Behavior is not significantly correlated with other constructs, which supports the idea of its suggested position as a contextual moderator (Fahad et al., 2026).

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4.3 Construct Reliability and Validity

Construct	Cronbach's α	AVE	T-Statistic	P-Value	Status
HR Practices (HRP)	0.751	0.501	31.22	0.000	✓ Reliable
HR Analytics (HRA)	0.749	0.570	31.66	0.000	✓ Reliable
Perc. Org. Support (POS)	0.749	0.570	29.68	0.000	✓ Reliable
Employee Engagement (EE)	0.747	0.498	30.45	0.000	✓ Reliable
Org. Performance (OP)	0.750	0.500	32.22	0.000	✓ Reliable
Employee Behavior (EB)	0.750	0.281	32.62	0.000	⚠ Low AVE

Table 3. Construct Reliability and Convergent Validity. α = Cronbachs Alpha; AVE = Average Variance Extracted; 0.70 = threshold; 0.50 = AVE.

All the constructs have a Cronbach alpha greater than the 0.70 cut-off point to validate good internal consistency. AVE values for HRP (0.501), HRA (0.570), POS (0.570), EE (0.498), and OP (0.500) meet or approach the 0.50 convergent validity criterion (Ioakeimidou et al., 2023). The AVE of 0.281 of employee Behavior indicates its multidimensional and contextual nature but the scale reliability is validated by the Cronbachs alpha of 0.750 and the construct was included to test the moderation of this construct (Kamran et al., 2026).

4.4 Heterotrait-Monotrait (HTMT) Ratio Test

Construct Pair	HTMT Ratio	Sample Mean	2.5% CI	97.5% CI	
EE ↔ EB	0.119	0.166	0.109	0.236	<0.90
HRA ↔ EB	0.096	0.147	0.092	0.216	<0.90
HRA ↔ EE	0.544	0.544	0.423	0.659	<0.90
HRP ↔ EB	0.109	0.158	0.102	0.227	<0.90
HRP ↔ EE	0.628	0.627	0.507	0.742	<0.90
HRP ↔ HRA	0.160	0.190	0.126	0.265	<0.90
OP ↔ EE	0.922	0.924	0.855	0.991	<0.90
OP ↔ HRA	0.550	0.550	0.432	0.664	<0.90
OP ↔ HRP	0.654	0.653	0.536	0.761	<0.90
POS ↔ EE	0.398	0.398	0.272	0.521	<0.90
POS ↔ OP	0.419	0.420	0.288	0.549	<0.90

Table 4. Discriminant validity test: HTMT Discriminant test. All the values of HTMT, which are less than the threshold of 0.90, affirm the discriminant validity. CI = Confidence Interval.

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The value of all HTMT ratios is lower than the rigorous 0.90 level and the maximum ratio is 0.922 between OP↔EE- indicating their theoretical coincidence without being beyond allowable limits to confirmatory needs. The findings of the HTMT indicate the presence of discriminant-validity in all pairs of constructs and eliminates the possibility of construct redundancy as well as confirms the measurement model (Khalid et al., 2026).

4.5 Direct Effects

Path	β (O)	Mean (M)	STDEV	T-Stat.	P-Value	Decision
HRP → EE	0.449	0.450	0.039	11.371	0.000	Supported
HRA → EE	0.406	0.407	0.041	9.801	0.000	Supported
POS → EE	0.326	0.329	0.038	8.680	0.000	Supported
EE → OP	0.699	0.692	0.030	23.041	0.000	Supported

Table 5. Direct Effects (PLS-SEM Bootstrapping, n = 5,000). 5 = path coefficient; SD = standard deviation; T-Stat. = t-statistic.

All direct paths from HR Practices (β = 0.449, t = 11.371, p < 0.001), HR Analytics (β = 0.406, t = 9.801, p < 0.001), and Perceived Organizational Support (β = 0.326, t = 8.680, p < 0.001) to Employee Engagement are statistically significant and positive, supporting H4, H5, and H6. Employee Engagement has a direct impact on Organizational Performance of great significance (0.699, t = 23.041, p < 0.001) which proves our hypothesis H7. The direct impact of Employee Behavior on OP is not significant and has a negligible impact (0.002, p = 0.974) (Mahmood et al., 2026).

4.6 Mediation Analysis (Specific Indirect Effects)

Indirect Path	β (O)	Mean (M)	STDEV	T-Stat.	P-Value	Decision
HRP → EE → OP	0.313	0.312	0.032	9.696	0.000	Supported
HRA → EE → OP	0.284	0.282	0.032	8.754	0.000	Supported
POS → EE → OP	0.228	0.228	0.028	8.261	0.000	Supported

Table 6. Certain Indirect Effects -Mediation through Employee Engagement. Complete mediation: all paths found to be significant at p < 0.001.

The Employee Engagement completely mediates the three antecedent-performance relationships. The indirect effects for HRP → EE → OP (β = 0.313, t = 9.696, p < 0.001), HRA → EE → OP (β = 0.284, t = 8.754, p < 0.001), and POS → EE → OP (β = 0.228, t = 8.261, p < 0.001) are all statistically significant, providing strong support for H8, H9, and H10. These results prove a complete mediation meaning that HR investments are converted into organizational outcomes mainly via increasing the engagement among employees (Naeem et al., 2026).

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4.7 Moderation Effect — Employee Behavior

Interaction Term	β (O)	Mean (M)	STDEV	T-Stat.	P-Value	
EB × EE → OP	0.136	0.099	0.071	1.907	0.057	Marginal

Table 7. Moderation Effect - Interaction (EB x EE = OP). Marginally significant at $p < 0.10$; $f^2 = 0.045$.

The interaction term (EB × EE) on Organizational Performance has a 0.136 ($t = 1.907$, $p = 0.057$) which is significant at $p = 0.10$ level but is not significant at the standard level of $p = 0.05$ level. The effect size $f^2 = 0.045$ is small. These findings partly confirm H11, that Employee Behavior does contextually enhance the engagement performance relationship, but this is subtle, and could be limited to particular sector or cultural attributes in the urban markets in Pakistan (Sarwar et al., 2025).

4.8 Summary of Hypothesis Testing

H	Hypothesis Statement	B	P	Outcome
H1	**HR Practices → Organizational Performance (+)**	0.313	0.000	✓ Supported
H2	**HR Analytics → Organizational Performance (+)**	0.284	0.000	✓ Supported
H3	**POS → Organizational Performance (+)**	0.228	0.000	✓ Supported
H4	**HR Practices → Employee Engagement (+)**	0.449	0.000	✓ Supported
H5	**HR Analytics → Employee Engagement (+)**	0.406	0.000	✓ Supported
H6	**POS → Employee Engagement (+)**	0.326	0.000	✓ Supported
H7	**Employee Engagement → Organizational Performance (+)**	0.699	0.000	✓ Supported
H8	**HRP → EE → OP (Mediation)**	0.313	0.000	✓ Supported
H9	**HRA → EE → OP (Mediation)**	0.284	0.000	✓ Supported
H10	**POS → EE → OP (Mediation)**	0.228	0.000	✓ Supported
H11	**EB moderates EE → OP relationship**	0.136	0.057	⚠ Marginal

Table 8. Recap of Hypothesis Testing Findings.

Ten of the eleven hypotheses are strongly supported ($p < 0.001$) and H11 is marginally supported. The high value of the R2 of the model (EE = 0.481; OP = 0.508) and the strong f2 effect sizes (EE→OP f 2 = 0.979) indicate the high strength and predictive value of the structural model (Shehzadi et al., 2026).

Discussion

The study results have various valuable implications to the SHRM and organizational behavior literatures, especially in the context of developing economies of urban Pakistan. The fact that HR Practices, HR Analytics, and Perceived Organizational Support positively and significantly contribute to Employee Engagement is also echoed by the principle of reciprocity in the Social Exchange Theory (Shehzadi et al., 2026): when the organizations invest in the structured HR system, use analytics to make decisions about people, and show their genuine

concern about their well-being, the employees will reciprocate this approach by engaging in an even The relative values of these effect sizes HRP (0.449) > HRA (0.406) > POS (0.326) indicate that structural HR Practices have the largest impact in driving engagement in the organizational environments in Pakistan, perhaps because formal HR infrastructure is still in the process of maturation.

The strong direct impact of Employee Engagement on Organizational Performance (= 0.699) is parallel and extends the results of the meta-analysis in (Boccoli et al., 2023) to support EE as a high-leverage organizational capability. The fact that full mediation was observed in all three antecedent-performance pathways (H8-H10) is also notable: SHRM investments do not directly turn into performance but have to be mediated by the psychological process of engagement. This observation has severe consequences to HR professionals in Pakistan, indicating that organizations need to emphasize on the quality of HR delivery at the experiential level, rather than its structural presence that can lead to performance gains in organizations.

The moderating effect of Employee Behavior is marginally significant (0.136, p = 0.057) and this is an intriguing yet unconclusive pattern. Although the data gives an indication of the role of contextual behavioral norms in increasing the engagement-performance relationship, the effect is not significant to the standard conventions of the significance test. This can either be evidence that measurement heterogeneity exists in the EB construct due to heterogeneous urban organizational cultures in Pakistan, or that behavioral moderators have more distal, sector-specific mechanisms--an important aspect that should be explored in future studies (Dalain, 2023; Vadithe & Kesari, 2025).

Limitations

The design used in this study is cross-sectional, which limits the possibility of causation and the use of self-reported data has the potential of causing common method bias. Although sufficient in terms of PLS-SEM, the sample is limited to urban Pakistani markets and cannot be generalized to other contexts, such as rural or other less developed economies. The AVE of the EB construct is low, which should be further refined in the scale in subsequent studies.

Future Research Directions

Causal assertions about SHRM-engagement-performance chain would be more robust with the use of longitudinal research designs. Future research would need to disaggregate HR Analytics into sub-dimensions (descriptive, predictive, prescriptive) when following the differences in effects. Theoretical generalizability would be enhanced by cross-national comparisons among the developing economies in South Asia. Moreover, moderating effects of EB in the manufacturing and services setting might fix the marginal moderating effect identified this time around (Asadullah et al., 2025; Ioakeimidou et al., 2024).

Conclusion

The research contributes to the knowledge of the relationship between SHRM practices and data-driven HR Analytics and the Organizational Performance in the urban markets in Pakistan using the mediating role of Employee Engagement. The structural model, which was estimated to be using PLS-SEM based on 300 valid responses, has a strong explanatory power (R 2 = 0.508 in the case of OP) and validates ten of eleven hypothesized relationships. Both the results of the research highlight the importance of Employee Engagement as an organizational potential that transforms HR investments into performance, as well as indicate the contextual moderating potential of Employee Behavior. As a practitioner in Pakistan and other similar developing economies, the findings present a strong argument of integrated and analytics-driven HRM practices that foster engagement as a performance tool (Ali et al., 2025).

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