Human Resource Analytics as a Moderator of the Relationship between HR Capabilities and Performance: Empirical Evidence in Government Agencies

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Abstract

This study aims to analyze the influence of Human Resource (HR) Capabilities on Organizational Performance with HR Analytics as a moderating variable in government agencies in Medan City. The method used is a quantitative approach with the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique using SmartPLS 4.0. The results of the analysis show that HR Capabilities, HR Analytics, and the moderating effect of HR Analytics × HR Capabilities do not significantly influence organizational performance ($p > 0.05$). The R^2 value of 0.533 indicates that the model has moderate explanatory power. Meanwhile, the results of the model feasibility test (SRMR = 0.141; NFI = 0.406) indicate that the model is not yet optimally fit. This finding indicates that the implementation of HR Analytics in the public sector is still in its early stages and has not been fully able to convert HR capabilities into improved organizational performance. The implications of this study emphasize the importance of digital readiness and an evidence-based work culture in the public bureaucracy.

Keywords: HR Capabilities, HR Analytics, Organizational Performance

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Introduction

In the era of digital transformation and increasing public demand for the effectiveness of state apparatus, government agencies in Indonesia are faced with the need to improve service performance, accountability, and human resource (HR) efficiency. HR capabilities, encompassing skills, knowledge, competencies, and the ability to adapt to change, are strategic resources that determine the success of public organizations. Research findings that emphasized that human capital capability has a significant influence on organizational performance, particularly in the context of innovation and institutional competitiveness [1]. However, many public agencies still face a gap between the potential capabilities of HR and the achievement of optimal performance.

In the context of Medan City, public service delivery continues to present a number of challenges that require attention. According to the 2024 Medan City Government Public Satisfaction Index (IKM) report, the average level of public satisfaction with public services remains in the "good" category but has not yet reached "very good," with an aggregate score of around 81.2 on a scale of 100. Several service units continue to face public complaints regarding lengthy service processes, lack of coordination between employees, and poor digital response to public complaints. This indicates that improvements in apparatus performance have not fully aligned with the modernization of technology-based services. The low utilization of HR data and analytics in employee performance planning is also a factor hampering the effectiveness of performance management within the regional bureaucracy.

Medan City demonstrates a strong commitment to realizing digital-based governance (going digital) through the integration of various public services into the digital ecosystem. For example, the Medan City Smart City Master Plan document emphasizes that "The Medan City Government must now utilize advances in information technology to process, manage, channel, and distribute public information and services" [2]. Furthermore, programs such as online complaint services, an integrated monitoring system (Command Center), and a licensing application reflect the smart city vision, which emphasizes efficiency, transparency, and public accessibility. This digital transformation is a strategic pillar in efforts to improve service quality, accelerate bureaucratic processes, and strengthen the role of human resources in supporting adaptive and responsive governance to citizen needs.

The development of information technology presents new opportunities for the public sector to optimize HR management through a data-driven approach known as Human Resource Analytics (HRA). HRA enables organizations to systematically collect, integrate, and analyze HR data to support evidence-based decision-making. Through this analysis, organizations can predict competency needs, identify performance factors, and design more accurate HR policies. [3] found that the implementation of HRA significantly contributes to improving organizational performance through alignment between HR strategy and business strategy. In the public sector context, [4] revealed that the adoption of HR analytics in government institutions still faces obstacles in terms of data readiness, employee digital competency, and policy support.

The context of local government, particularly in Medan City, presents its own complexities. Hierarchical bureaucratic structures, limited analytical technology, and traditional work cultures often hinder the optimization of HR capabilities. Therefore, the integration of HRA as a moderating variable is expected to strengthen the relationship between HR capabilities and organizational performance by increasing transparency, accountability, and the effectiveness of data-driven decision-making. Similarly, [5] demonstrated that HRA practices not only directly impact performance but also strengthen the effectiveness of human capital management in public service-oriented organizations.

From a theoretical perspective, this research is based on the Resource-Based View (RBV) which emphasizes the importance of valuable, rare, and difficult-to-imitate internal resources

as a source of organizational advantage [6]. Within the RBV framework, HR capabilities are viewed as strategic assets that can create performance advantages if supported by a robust analytical system such as HRA. Thus, this research is important to: (1) broaden the empirical understanding of the moderating role of HRA in the relationship between HR capabilities and performance; (2) contribute to the literature on analytics-based public management; and (3) provide practical recommendations for the Medan City government in strengthening data- and technology-based HR development policies.

This research is expected to bridge the gap between human resource potential and the performance outcomes of government organizations by utilizing an HR Analytics approach as a strategic instrument in the digital governance era. Thus, the results will make a tangible contribution to strengthening adaptive, transparent, and results-oriented human resource governance in local governments.

Literature Review 2.1 Organizational Performance

Organizational performance is a central concept in public management and business studies, used to assess the extent to which an organization achieves its strategic goals efficiently and effectively. In the context of public organizations, performance is measured not only by achieving administrative targets, but also by the organization's ability to create public value and provide services that impact society [7].

According to Neely et al. (2005), organizational performance is defined as an organization's ability to achieve desired results through the integration of strategy, processes, and resources. In the public sector, this includes employee productivity, bureaucratic efficiency, public satisfaction, and the sustainability of service innovation. The Public Value Theory approach emphasizes that public sector performance must be viewed from three main dimensions: public value creation, legitimacy and political support, and the organization's operational capacity to achieve these results. In other words, the success of government agencies is measured not only by administrative output, but also by social outcomes and public trust.

2.2 HR Capability

Human resource capability is an organization's collective ability to mobilize employee knowledge, skills, and competencies to achieve strategic goals. Conceptually, Human Capital Theory [8] asserts that organizational investment in employee training, education, and work experience will increase overall productivity and performance. In this context, human resources are not merely a factor of production, but a strategic asset that determines the effectiveness of public organizations.

Furthermore, the Resource-Based View (RBV) positions human resource capabilities as valuable, rare, inimitable, and non-substitutable (VRIN) resources, which form the basis of sustainable competitive advantage. In public sector organizations, human resources with analytical skills, collaborative capabilities, and a commitment to the values of public service can serve as strategic resources that are difficult to imitate [9].

2.3 Human Resources Analytics (HRA)

Human Resource Analytics (HRA) is a data-driven approach to HR management that aims to improve decision-making through statistical, algorithmic, and predictive analysis of personnel data. [10] define HRA as a systematic process for identifying relationships between HR practices and business outcomes using valid data and scientific analytics. HRA is one dimension of evidence-based HRM that transforms the role of HR from administrative to strategic.

According to [11], the strategic value of HRA emerges when HR data is used not only for reporting (descriptive analytics) but also for predictions and recommendations (predictive and prescriptive analytics). Implementing HRA can strengthen the relationship between HR capabilities and organizational performance by providing quantitative insights that enable leaders to make evidence-based decisions.

Research Methodology

This study uses an associative approach with a correlational analytical design. Correlational research aims to reveal correlative relationships between variables. In this study, the sample was drawn using a census technique, where the entire population was sampled to provide more concrete results. Therefore, the sample in this study consisted of all 103 civil servants.

Results 4.1 Evaluation of Measurement Models (Outer Model)

This section presents the results of the measurement model evaluation, which includes tests of convergent validity, discriminant validity, and construct reliability to ensure that all indicators are appropriate and accurately represent the research variables.

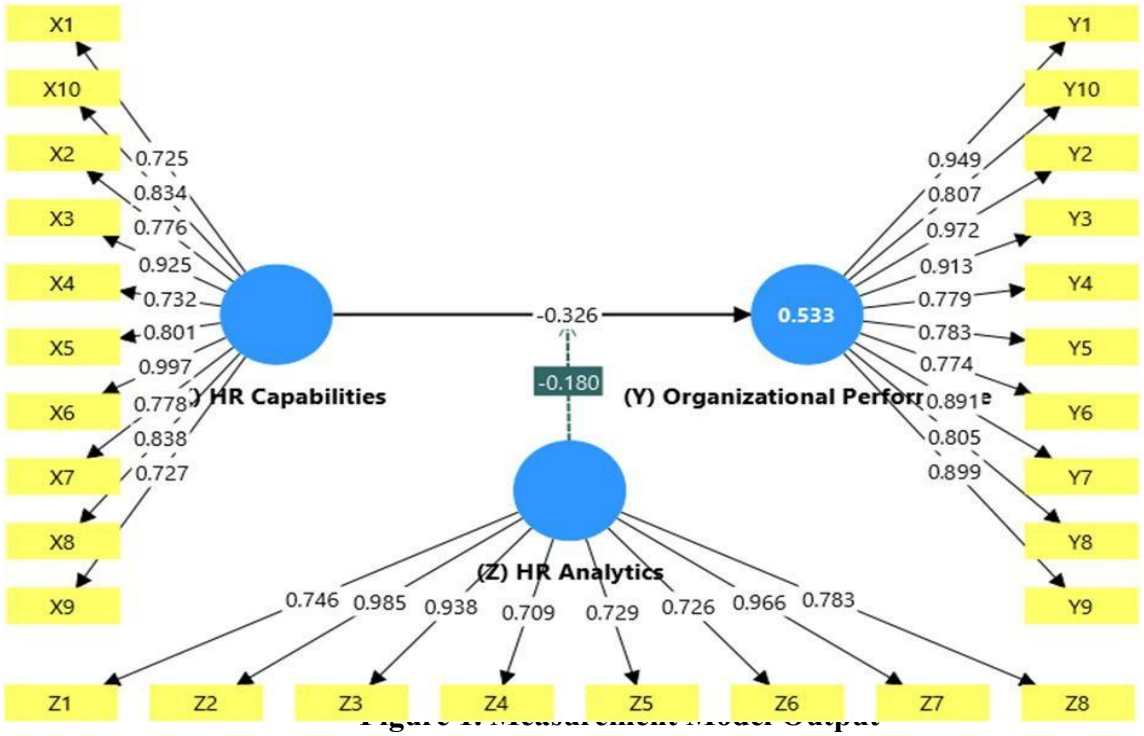

Figure 1. Measurement Model Output

Measurement model evaluation was conducted to assess construct validity and reliability. Based on SmartPLS 4.0 results, the Cronbach's Alpha value for each construct was above 0.70 (HR Capabilities = 0.815; Organizational Performance = 0.867; HR Analytics = 0.799), indicating good internal reliability [12]. The Composite Reliability (CR) value was also greater than 0.80, indicating that all constructs have high internal consistency.

However, the Average Variance Extracted (AVE) value for each construct was still below the ideal threshold of 0.50 (HR Capabilities = 0.400; Organizational Performance = 0.465; HR Analytics = 0.412). This indicates that the indicators are not fully able to explain more than 50% of the construct's variance. Nevertheless, a high CR value can still justify that the model has adequate convergent validity for an exploratory context [13].

Table 1. Average Variance Extracted (AVE)

Construk	Cronbach's Alpha	Composite Reliability	AVE	Interpretation
HR Capabilities	0.815	0.868	0.400	Reliable; moderate validity
Organizational Performance	0.867	0.892	0.465	Reliable; moderate validity
HR Analytics	0.799	0.812	0.412	Reliable; moderate validity

Brief conclusion:

All constructs are reliable (α and CR > 0.70) → the measurement model is suitable for use. However, convergent validity is still moderate (AVE < 0.50) → the indicators need strengthening for further research.

4.2 Structural Model Evaluation (Inner Model)

The structural model was tested to determine the relationships between latent variables, the model's predictive power, and its overall fit. The R-squared (R^2) value for the Organizational Performance construct was 0.533, and the Adjusted R^2 was 0.519, indicating that 53.3% of the variation in organizational performance can be explained by HR Capabilities and HR Analytics, while the remaining 46.7% is explained by factors outside the model. Based on the interpretation, an R^2 value of 0.50 falls into the moderate predictive accuracy category.

Table 2. Inner Model

Variable	R-Square	R-Square Adjusted	Interpretation
Organizational Performance	0.533	0.519	Moderate

4.3 Goodness of Fit Measurements

The results of the model fit test showed a SRMR value of 0.141, NFI = 0.406, and Chisquare = 1452.583. An SRMR value > 0.08 indicates that the model has not achieved optimal fit. However, given the exploratory nature of this study with the complexity of the moderation model, the model is still conceptually acceptable for explaining empirical phenomena in the context of public organizations.

Table 3. Goodness of Fit

Indeks Fit	Value	Eligibility Limits	Interpretatation
SRMR	0.141	≤ 0.08	Not Optimal Fit
NFI	0.406	≥ 0.90	Not FIt
Chi-Square	1452.583	-	Complex, Exploratory Model

4.4 Bootstrapping Results and Hypothesis Testing

Based on the bootstrapping results (5,000 subsamples), the following path coefficients and p-values were obtained:

Table 4. Bootstrapping Results and Hypothesis Testing

Path Correlation	Koefisien (β)	T-Statistic	P-Value	Information
HR Capabilities → Organizational Performance	0.011	0.080	0.936	Not Significant
HR Analytics → Organizational Performance	0.013	0.092	0.927	Not Significant
HR Analytics × HR Capabilities → Organizational Performance	0.013	0.112	0.911	Not Significant

These results indicate no significant relationship between the main variables. This means that neither HR capability, HR Analytics, nor their moderating effects have a significant impact on organizational performance. However, the R^2 value of 0.533 indicates that the combination of independent variables is still able to explain some of the variation in organizational performance.

4.5 The Influence of HR Capabilities on Organizational Performance

The analysis results show that HR Capabilities have a negative effect on Organizational Performance ($\beta = -0.326$). This finding indicates that improving HR capabilities is not always accompanied by improved organizational performance, especially if the organization is unable to optimize digitalization and data-driven coordination processes. This condition aligns with the view of that in public organizations, improvements in individual competencies often do not align with the effectiveness of collective work systems.

Furthermore, according to [14], in his Dynamic Capabilities theory, public organizations tend to be slow in reconfiguring resources due to rigid bureaucratic structures, so the effect of individual capabilities on performance is indirect. Empirically, this negative relationship indicates that strengthening HR capabilities without the support of a data-driven management system can lead to inefficiency, role redundancy, or misalignment with strategic objectives. In the context of the Medan City government, which is transforming toward digitalized services, improving employee competencies needs to be accompanied by information system integration and an adaptive work culture to positively contribute to organizational performance.

4.6 The Moderating Role of HR Analytics on the Relationship between HR Capabilities and Organizational Performance

The negative moderation path coefficient ($\beta = -0.180$) indicates that the presence of HR analytics actually weakens the relationship between HR capabilities and organizational performance. This result is consistent with [15] observation that in the early stages of HR analytics implementation, organizations often face a data-decision gap, where the use of new data uncovers previously hidden internal inefficiencies.

In the long term, this effect can turn positive if organizations improve data literacy and integrate HR analytics into managerial strategies. Therefore, this result further indicates a transition phase toward an evidence-based work culture, as proposed by [16].

Conclusion

These findings convey an important message for public organizations: the success of performance transformation depends not only on individual capabilities, but also on the readiness of analytical systems, data integration, and organizational culture change. HR analytics should be viewed not as a complementary administrative tool, but as a strategic foundation for creating effective, efficient, and results-oriented HR governance.

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