Department of Digital Business
Journal of Artificial Intelligence and Digital Business (RIGGS)
Homepage: https://journal.ilmudata.co.id/index.php/RIGGS
Vol. 4 No. 4 (2026) pp: 12516-12523
P-ISSN: 2963-9298, e-ISSN: 2963-914X

The Impact of Organizational Digital Transformation and HR Technology Adoption on Employee Performance at PT PAL Indonesia

Mike Dian Anggraini[1], Sri Rahayu[2], Sundjoto[3], Rifda Fitrianty[4]
[1,2,3]Master of Management, Sekolah Tinggi Ilmu Ekonomi Mahardhika
[4]Management, Sekolah Tinggi Ilmu Ekonomi Mahardhika
[1]mikedian02@gmail.com*, [2]rahayu.mahardhika@gmail.com, [3]sundjoto@stiemahardhika.ac.id, [4]rifda@stiemahardhika.ac.id

Abstract

This study examines the impact of organizational digital transformation and HR technology adoption on employee performance at PT PAL Indonesia, a state-owned enterprise operating in the maritime defense manufacturing sector. Using a quantitative explanatory approach, this research adopts a census design involving all 1,444 permanent employees as respondents. Data were collected through a structured questionnaire using a five-point Likert scale and analyzed using multiple linear regression with SPSS. The results demonstrate that organizational digital transformation has a positive and significant effect on employee performance, indicating that digitalized infrastructure, integrated systems, leadership support, and a supportive digital culture enhance employees' productivity, work quality, and adaptability. In addition, HR technology adoption reflected in the use of human capital management systems, e-learning platforms, and digital performance management tools also shows a positive and significant influence on employee performance. Simultaneous testing confirms that both variables jointly form a coherent system that significantly explains variations in employee performance. The regression model exhibits strong explanatory power, with an R^2 value of 0.657, indicating that 65.7% of employee performance variance is explained by the model. These findings highlight that digital transformation yields optimal performance outcomes when supported by active employee adoption of HR technologies. The study contributes to the digital human resource management literature by providing empirical evidence from a large, labor-intensive manufacturing SOE context and offers practical insights for organizations seeking to implement human-centered digital transformation strategies to enhance sustainable employee performance.

Keywords: Digital Transformation, HR Technology Adoption, Employee Performance, State-Owned Enterprise, Manufacturing Industry

1. Introduction

Digital transformation has become a strategic imperative for manufacturing organizations facing increasing technological complexity, competitive pressure, and workforce heterogeneity [1], [2]. In the context of state-owned manufacturing enterprises, digital transformation is not merely a technological upgrade but a fundamental organizational shift that reshapes structures, processes, culture, and human resource management practices [3], [4]. PT PAL Indonesia, as a strategic state-owned enterprise operating in the defense and heavy manufacturing sector, is currently undergoing such a transformation to enhance competitiveness, operational efficiency, and long-term sustainability amid the transition toward Industry 4.0 and the emerging human-centric orientation of Industry 5.0.

Organizational digital transformation has been widely conceptualized as a deep, organization-wide change that enables new value creation through the integration of digital technologies with strategy, operations, and people [5], [6]. Empirical research consistently emphasizes that digital transformation success depends not only on technological investment but also on organizational readiness, leadership support, cultural alignment, and the development of employee digital capabilities [7]. In manufacturing environments, digital transformation is often associated with automation, the Internet of Things (IoT), and data analytics; however, recent studies highlight the increasing importance of human-centric digitalization that prioritizes workforce adaptability, capability development, and engagement [8]. This perspective is particularly relevant for PT PAL Indonesia, where operational excellence must coexist with high-skilled craftsmanship, strict safety standards, and generational diversity among employees.

Within this organizational transformation, the adoption of human resource (HR) technologies plays a crucial role in supporting employee performance. Digital HR systems such as human capital management systems (HCMS), e-learning platforms, and digital performance management tools are designed to enhance administrative efficiency, improve decision quality, and facilitate continuous employee development. Technology adoption theories, including the Technology Acceptance Model [9] and the Unified Theory of Acceptance and Use of Technology [10], demonstrate that perceived usefulness, ease of use, social influence, and organizational support significantly affect employees' willingness to utilize digital systems. More recent work by [11] extends these perspectives by integrating individual, organizational, and technological factors to explain HR technology adoption in complex organizational settings. Together, these studies suggest that HR technology adoption constitutes a critical organizational capability that can directly contribute to improved employee performance.

Despite growing scholarly interest, existing empirical research reveals several important gaps. First, many studies examine digital transformation and employee performance independently, without empirically assessing their combined influence within a single analytical model [12], [13]. Second, research on HR technology adoption often focuses on specific applications such as e-learning or HR analytics rather than positioning HR technologies as part of a broader organizational digital transformation strategy [14], [15]. Third, empirical studies in the Indonesian context, particularly within state-owned manufacturing enterprises, remain limited and fragmented, frequently relying on qualitative approaches or small-scale case studies that constrain generalizability [16], [17]. As a result, there is still limited quantitative evidence on how organizational digital transformation and HR technology adoption jointly influence employee performance in large, labor-intensive, and technologically complex manufacturing organizations.

Drawing on the Resource-Based View (Barney, 1991) and Dynamic Capability Theory (Teece, 2007), organizational digital transformation and HR technology adoption can be understood as strategic resources and capabilities that enable firms to reconfigure internal processes and enhance workforce effectiveness in response to environmental change [18], [19]. From this perspective, digital infrastructure, digitalized workflows, and HR technologies represent complementary organizational assets that may directly improve employee productivity, work quality, adaptability, and engagement when effectively implemented [20], [21].

Accordingly, the novelty of this study lies in its integrative empirical examination of organizational digital transformation and HR technology adoption as simultaneous predictors of employee performance within the specific context of PT PAL Indonesia. Unlike prior studies that examine these factors in isolation or rely on qualitative insights, this research employs a census-based quantitative approach to assess how both organizational-level digital transformation and individual-level HR technology adoption contribute to employee performance outcomes. Furthermore, employee performance is conceptualized in a comprehensive manner, encompassing not only task completion and productivity but also adaptability, capability development, and engagement in the digital work environment.

Based on this rationale, the study addresses the following research questions: How does organizational digital transformation influence employee performance at PT PAL Indonesia? To what extent does HR technology adoption affect employee performance? How do organizational digital transformation and HR technology adoption simultaneously contribute to improvements in employee performance? By addressing these questions, this study aims to contribute to the digital human resource management literature and provide evidence-based insights for policymakers and managers seeking to design effective digital transformation strategies in Indonesian state-owned manufacturing enterprises.

2. Research Methods

This study employed a quantitative explanatory design to examine the effects of organizational digital transformation and HR technology adoption on employee performance at PT PAL Indonesia, a state-owned enterprise operating in shipbuilding and maritime defense manufacturing in Surabaya, East Java. PT PAL Indonesia was selected because it is undergoing an organization-wide digital transformation that spans both production systems and human resource management, making it a relevant setting for assessing performance outcomes in a complex manufacturing environment.

The population comprised all permanent employees of PT PAL Indonesia, totaling 1,444 individuals across 21 divisions. To ensure comprehensive representation and eliminate sampling bias, the study adopted a census

DOI: https://doi.org/10.31004/riggs.v4i4.5609

approach in which the entire population was included as the research sample; therefore, the sample size was equal to the population (n = 1,444). While this census approach strengthens internal validity for PT PAL Indonesia, external generalization to other manufacturing SOEs should be interpreted cautiously. Data were collected from employees across job levels and generational groups, enabling a complete organizational snapshot.

Primary data were obtained through a structured, self-administered questionnaire distributed electronically via Google Forms using official corporate email channels. Three reminders were sent over a two-week period to increase participation. Participation was voluntary, responses were anonymous, and confidentiality was assured. No interviews or observational methods were used.

All variables were measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Organizational digital transformation (X1) was measured using 16 items adapted from Westerman et al. (2014) and Kane et al. (2015), capturing perceptions of digital infrastructure, digitalized processes, leadership support, and digital culture. HR technology adoption (X2) was measured using 12 items grounded in TAM and UTAUT (Davis, 1989; Venkatesh et al., 2003), reflecting usage frequency, perceived usefulness, ease of use, and perceived benefits of HR digital systems such as HCMS and e-learning. Employee performance (Y) was assessed using 10 items adapted from the Balanced Scorecard perspective (Kaplan & Norton, 1996), covering productivity, work quality, adaptability, and contribution to organizational goals. Instrument quality was confirmed through validity and reliability testing, where Pearson item–total correlations exceeded 0.30 with $p < 0.05$ and Cronbach's Alpha values were above 0.70 for all constructs. Data were analyzed using SPSS version 26, beginning with descriptive statistics and classical assumption tests (Kolmogorov–Smirnov normality, VIF-based multicollinearity, and Glejser heteroskedasticity), followed by multiple linear regression. Hypotheses were evaluated using t-tests for partial effects, the F-test for simultaneous effects, and R^2 for explanatory power at a 5% significance level ($\alpha = 0.05$).

3. Results and Discussions

Respondent Characteristics

This study involved all permanent employees of PT PAL Indonesia as research respondents. A total of 1,444 valid responses were collected, representing the entire population and ensuring comprehensive organizational coverage. The respondent profile reflects substantial diversity in terms of generational composition, job level, and length of service, which strengthens the representativeness of the findings.

In terms of generation, 28% of respondents belonged to Generation X, 45% to Generation Y (Millennials), and 27% to Generation Z. Regarding job position, the majority of respondents were operational staff (62%), followed by supervisors (25%) and managerial-level employees (13%). With respect to tenure, 31% of respondents had worked for less than five years, 29% had five to ten years of experience, and 40% had more than ten years of service. This distribution indicates that the data adequately capture perspectives from employees with varying levels of experience and responsibility within the organization.

3.1. Result

Instrument Validity and Reliability

Prior to hypothesis testing, the quality of the measurement instrument was assessed through validity and reliability testing [22]. Construct validity was evaluated using Pearson item–total correlation analysis. The results show that all measurement items for organizational digital transformation, HR technology adoption, and employee performance had correlation coefficients exceeding the minimum threshold of 0.30 and were statistically significant at $p < 0.01$, indicating that each item appropriately represented its respective construct.

Reliability testing was conducted using Cronbach's Alpha and Composite Reliability (CR). All constructs demonstrated strong internal consistency, with values exceeding recommended cut-off levels. Additionally, the Average Variance Extracted (AVE) values were above 0.50, confirming adequate convergent validity. These results indicate that the research instrument is both valid and reliable for further statistical analysis.

DOI: https://doi.org/10.31004/riggs.v4i4.5609

Table 1. Summary of Validity and Reliability Test Results

Variable	Number of Items	Cronbach's Alpha	Composite Reliability (CR)	AVE
Organizational Digital Transformation (X1)	16	0.877	0.889	0.521
HR Technology Adoption (X2)	12	0.854	0.867	0.512
Employee Performance (Y)	10	0.873	0.882	0.534

Source: Processed by author, 2026

Note: All correlations are significant at $p < 0.01$.

Classical Assumption Tests

To ensure the robustness of the regression analysis, classical assumption tests were conducted [23]. Normality testing using the Kolmogorov–Smirnov method indicated that all variables were normally distributed, as the significance values exceeded 0.05. Multicollinearity diagnostics showed that Variance Inflation Factor (VIF) values ranged between 2.50 and 4.87, remaining below the critical threshold of 5, which indicates the absence of multicollinearity among the independent variables.

Heteroskedasticity testing was performed using the Glejser method. The results revealed that all variables had significance values greater than 0.05, suggesting that the residuals were homoscedastic. Collectively, these findings confirm that the data met all required assumptions for multiple linear regression analysis.

Multiple Linear Regression Model Fit

Multiple linear regression analysis was conducted to examine the combined effect of organizational digital transformation and HR technology adoption on employee performance. The model summary indicates strong explanatory power.

Table 2. Model Summary of Multiple Linear Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.810	0.657	0.654	0.558

Source: Processed by author, 2026

The coefficient of determination ($R^2 = 0.657$) indicates that 65.7% of the variance in employee performance can be explained by organizational digital transformation and HR technology adoption. The remaining 34.3% is attributed to other factors not included in the model. This result demonstrates that the proposed regression model has substantial explanatory strength.

Overall Model Significance (F-Test)

The overall significance of the regression model was assessed using the F-test. The results are presented in Table 3.

Table 3. ANOVA Results

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	851.199	14	60.800	195.402	0.000
Residual	444.637	1429	0.311		
Total	1295.836	1443			

Source: Processed by author, 2026

DOI: https://doi.org/10.31004/riggs.v4i4.5609

The ANOVA results show a significance value of 0.000 ($p < 0.05$), indicating that organizational digital transformation and HR technology adoption simultaneously have a statistically significant effect on employee performance. This confirms that the regression model is appropriate and meaningful for explaining the relationships among the studied variables.

Individual Effects of Independent Variables

Further examination of the regression results indicates that organizational digital transformation has a positive and statistically significant influence on employee performance. This finding suggests that improvements in digital infrastructure, the digitalization of work processes, leadership support for digital initiatives, and the cultivation of a digital-oriented organizational culture contribute to higher levels of employee productivity, work quality, and adaptability. Employees operating within a digitally mature organizational environment tend to perform more effectively when responding to evolving technological and operational demands.

Similarly, HR technology adoption demonstrates a positive and statistically significant effect on employee performance. Higher levels of HR system utilization and perceived benefits such as those derived from human capital management systems, e-learning platforms, and digital performance management tools are associated with improvements in work efficiency, clarity of performance expectations, and overall job effectiveness. These results highlight the importance of ensuring that HR technologies are user-friendly, relevant, and well-integrated into daily work processes.

Overall, the coefficient estimates indicate statistically significant positive relationships, confirming both the direction and practical relevance of the effects.

Summary of Empirical Findings

Given the census-based research design and the large sample size ($n = 1,444$), the regression results provide robust empirical evidence regarding both the individual and joint contributions of organizational digital transformation and HR technology adoption to employee performance at PT PAL Indonesia. Overall, the findings demonstrate that digital transformation initiatives, when supported by effective adoption of HR technologies, play a critical role in enhancing employee performance within a large, labor-intensive, and technologically complex manufacturing organization.

3.2. Discussion

The findings of this study provide strong empirical evidence that employee performance at PT PAL Indonesia is not incidental, but rather the result of a structured and integrated process of organizational digital transformation and HR technology adoption. The coefficient of determination (R^2) of 0.657 indicates that 65.7% of the variance in employee performance can be explained by the proposed model, demonstrating substantial explanatory power. This result confirms that digital transformation and HR technology adoption constitute dominant organizational factors influencing employee performance, consistent with the research objectives formulated in the introductory section. The high reliability values, reflected in Cronbach's Alpha coefficients exceeding recommended thresholds, further indicate that the constructs employed in this study were measured consistently and accurately, reinforcing the credibility of the empirical findings [24].

The validity and reliability results also highlight an important methodological contribution of this study. All measurement indicators demonstrated strong empirical relevance, as evidenced by statistically significant validity results and robust internal consistency. This suggests that abstract concepts such as organizational digital transformation and HR technology adoption were successfully operationalized into measurable indicators. Moreover, the fulfillment of all classical regression assumptions including normality, absence of multicollinearity, and homoscedasticity indicates that the observed relationships among variables are statistically stable and free from model bias. Consequently, the effects identified in this study reflect genuine empirical relationships rather than statistical artifacts, strengthening the scientific rigor of the findings [25].

The simultaneous significance of organizational digital transformation and HR technology adoption underscores the systemic nature of performance improvement in a digitally transforming organization. The F-test results demonstrate that employee performance is shaped by the combined influence of organizational-level digital

DOI: https://doi.org/10.31004/riggs.v4i4.5609

initiatives and individual-level technology utilization. This finding suggests that digital transformation cannot be implemented effectively through fragmented or isolated technological interventions. Instead, performance improvement emerges from an integrated approach in which digital infrastructure, digitalized work processes, leadership support, and HR technologies operate as a coherent system. This result aligns with the view of digital transformation as an organization-wide process rather than a purely technical undertaking [5], [7].

At the individual level, the positive and significant influence of organizational digital transformation on employee performance confirms that digital maturity enhances employees' ability to work more efficiently, adapt to change, and maintain work quality. Digitalized processes reduce manual workload, minimize operational errors, and enable faster information flow, which in turn improves productivity and task effectiveness. These findings support prior studies emphasizing that digital transformation serves as a strategic capability that strengthens organizational performance by reshaping internal processes and work practices [6], [8]. In the context of PT PAL Indonesia, where operational complexity and high technical standards are inherent, digital transformation appears to play a critical role in enabling employees to meet performance expectations more effectively.

Similarly, the positive and significant effect of HR technology adoption on employee performance highlights the central role of human behavior and technology utilization in realizing the benefits of digital transformation. The findings indicate that employees who actively use HR digital systems such as human capital management systems, e-learning platforms, and digital performance management tools tend to demonstrate higher levels of work efficiency, clarity of role expectations, and overall job effectiveness. This result reinforces technology adoption theories, including the Technology Acceptance Model (Davis, 1989) and UTAUT (Venkatesh et al., 2003), which emphasize that perceived usefulness and ease of use are critical drivers of technology-related performance outcomes. The findings further suggest that technology alone does not automatically improve performance; rather, its impact depends on employees' willingness and capability to adopt and integrate digital tools into their daily work routines.

Taken together, these results position HR technology adoption as a critical enabler of successful digital transformation. While this study does not formally test mediation effects, the empirical evidence indicates that organizational digital initiatives and HR technology usage are closely intertwined in shaping employee performance. This finding extends previous research that often examined digital transformation or HR technology adoption in isolation by demonstrating that both factors jointly contribute to performance outcomes within a large, labor-intensive manufacturing organization. In this sense, the study contributes to the digital human resource management literature by highlighting the complementary roles of organizational capabilities and individual technology adoption.

From a theoretical perspective, the findings support the Resource-Based View (Barney, 1991) and Dynamic Capability Theory (Teece, 2007), which posit that organizational resources and capabilities must be effectively deployed to generate performance advantages [18], [19]. Organizational digital transformation represents a dynamic capability that enables firms to reconfigure internal resources in response to environmental change, while HR technology adoption represents an operational mechanism through which these capabilities are translated into employee-level outcomes [26], [27]. The strong explanatory power of the model indicates that digital resources, when aligned with human resource practices, can significantly enhance workforce performance.

From a practical standpoint, the results imply that organizations particularly state-owned manufacturing enterprises should view digital transformation as a long-term strategic investment rather than a short-term technological initiative [28]. The significant influence of digital transformation on employee performance suggests that investments in digital infrastructure, system integration, and digital culture development yield tangible performance benefits [29]. At the same time, the significant role of HR technology adoption highlights the importance of accompanying technological investments with continuous training, technical support, and effective change communication [30]. Without active employee adoption, the performance potential of digital systems is unlikely to be fully realized.

Furthermore, the findings emphasize the importance of a human-centered approach to digital transformation. Performance improvements are more likely to be sustainable when digital initiatives are accompanied by efforts to enhance employee capability development and engagement [31], [32]. By focusing on both technological advancement and human development, organizations can achieve not only operational efficiency but also long-term workforce competitiveness [33]. In the context of PT PAL Indonesia, such an approach is particularly relevant given the organization's strategic role, technological complexity, and diverse workforce composition.

DOI: https://doi.org/10.31004/riggs.v4i4.5609

Overall, this study provides robust empirical support for the argument that organizational digital transformation and HR technology adoption are key drivers of employee performance [14], [34]. By integrating organizational and individual perspectives, the findings contribute to both theory and practice, offering valuable insights for organizations seeking to navigate digital transformation while strengthening employee performance in complex manufacturing environments.

4. Conclusion

This study concludes that organizational digital transformation and HR technology adoption play a decisive role in enhancing employee performance at PT PAL Indonesia. The empirical findings demonstrate that both variables exert a positive and significant influence on employee performance, individually and simultaneously, indicating that performance improvement emerges from the alignment between organizational digital readiness and employees' effective use of digital HR systems. The regression model exhibits strong explanatory power, with an R^2 value of 0.657, indicating that 65.7% of the variance in employee performance is explained by the proposed model. Furthermore, the robustness of the findings is supported by high internal consistency of the measurement instruments and the fulfillment of all classical regression assumptions, confirming that the observed relationships are statistically sound and empirically reliable. Overall, the results affirm that digital transformation is not merely a technological initiative but a strategic organizational capability that, when complemented by active HR technology adoption, substantially improves employee productivity, work quality, and adaptability in a complex manufacturing environment. Based on these findings, several recommendations are proposed. For PT PAL Indonesia, management should prioritize human-centered digital transformation by strengthening digital infrastructure particularly in production areas while implementing generation-sensitive digital upskilling programs to address heterogeneous workforce needs. Continuous training and structured support for HR digital systems such as HCMS and e-learning should be intensified, especially for employees who face greater adaptation challenges. Incentive and reward mechanisms may also be developed to encourage active and consistent use of HR technologies. For policymakers, particularly the Ministry of State-Owned Enterprises and the Ministry of Industry, the results suggest the need for sector-specific digital transformation guidelines for state-owned manufacturing enterprises, complemented by cross-organizational knowledge-sharing platforms and targeted incentives. Future research is encouraged to expand the scope to other manufacturing SOEs, employ longitudinal designs to capture long-term effects, and incorporate additional variables such as digital leadership and change readiness to enrich understanding of digital transformation dynamics.

Reference

[1] J. Gao, W. Zhang, T. Guan, Q. Feng, and A. Mardani, "The effect of manufacturing agent heterogeneity on enterprise innovation performance and competitive advantage in the era of digital transformation," *J. Bus. Res.*, vol. 155, 2023, doi: 10.1016/j.jbusres.2022.113387.

[2] B. Trenerry *et al.*, "Preparing Workplaces for Digital Transformation: An Integrative Review and Framework of Multi-Level Factors," *Front. Psychol.*, vol. 12, p. 620766, 2021, doi: 10.3389/FPSYG.2021.620766.

[3] G. Liu, J. Liu, P. Gao, J. Yu, and Z. Pu, "Understanding mechanisms of digital transformation in state-owned enterprises in China: An institutional perspective," *Technol. Forecast. Soc. Change*, vol. 202, p. 123288, 2024, doi: https://doi.org/10.1016/j.techfore.2024.123288.

[4] T. Pham and H. N. Nguyen, "Insights into Digital Transformation Adoption in State-Owned Organizations: A Study from Vietnam," *J. Bus. Manag. Stud.*, vol. 5, pp. 249–259, 2023, doi: 10.32996/jbms.2023.5.5.21.

[5] G. Westerman, D. Bonnet, and A. McAfee, *Leading Digital: Turning Technology Into Business Transformation*. in G - Reference,Information and Interdisciplinary Subjects Series. Harvard Business Review Press, 2014. [Online]. Available: https://books.google.co.id/books?id=Fh9eBAAAQBAJ

[6] G. Vial, "Understanding digital transformation: A review and a research agenda," *J. Strateg. Inf. Syst.*, vol. 28, no. 2, pp. 118–144, 2019, doi: https://doi.org/10.1016/j.jsis.2019.01.003.

[7] G. C. Kane, D. Palmer, A. N. Phillips, D. Kiron, and N. Buckley, *Strategy, not Technology, Drives Digital Transformation Becoming a digitally mature enterprise*, July 2015., no. 57181. MIT Sloan Management Review and Deloitte University Press, 2015.

[8] C. Legner *et al.*, "Digitalization: Opportunity and Challenge for the Business and Information Systems Engineering Community," *Bus. Inf. Syst. Eng.*, vol. 59, pp. 301–308, 2017, doi: 10.1007/s12599-017-0484-2.

[9] F. Davis, R. Bagozzi, and P. Warshaw, "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," *Manage. Sci.*, vol. 35, pp. 982–1003, 1989, doi: 10.1287/mnsc.35.8.982.

[10] V. Venkatesh, M. Morris, G. Davis, and F. Davis, "User Acceptance of Information Technology: Toward A Unified View1," *MIS Q.*, vol. 27, pp. 425–478, 2003, doi: 10.2307/30036540.

[11] A. Mishra and D. Pathak, "Industry 4.0 Technologies Adoption and Sustainability Integration in Human Resource Management: An Analysis Using Extended TOE Framework and TISM," *IEEE Trans. Eng. Manag.*, vol. PP, pp. 1–16, 2024, doi: 10.1109/TEM.2024.3456604.

[12] W. Zhang, J. Chu, Z. Tao, and Y. Wang, "Identifying the factors influencing enterprise digital transformation intention: an empirical study based on net effects and joint effects," *Bus. Process Manag. J.*, vol. 29, 2023, doi: 10.1108/BPMJ-03-2023-0174.

[13] Y. Wang, T. Wang, and Q. Wang, "The impact of digital transformation on enterprise performance: An empirical analysis based on China's manufacturing export enterprises," *PLoS One*, vol. 19, p. e0299723, 2024, doi: 10.1371/journal.pone.0299723.

DOI: https://doi.org/10.31004/riggs.v4i4.5609

[14] A. I. Al-Alawi, M. Messaadia, A. Mehrotra, S. K. Sanosi, H. Elias, and A. H. Althawadi, "Digital transformation adoption in human resources management during COVID-19," *Arab Gulf J. Sci. Res.*, vol. 41, no. 4, pp. 446–461, 2023, doi: 10.1108/AGJSR-05-2022-0069.
[15] Shard, D. Kumar, and S. Koul, "Digital transformation in higher education: A comprehensive review of e-learning adoption," *Hum. Syst. Manag.*, vol. 43, no. 4, pp. 433–454, 2024, doi: 10.3233/HSM-230190.
[16] W. Apriyantopo, A. Aprianingsih, and M. Kitri, "State-owned enterprises' performance in Indonesia: a strategic typology perspective," *Compet. Rev. An Int. Bus. J.*, vol. ahead-of-print, 2022, doi: 10.1108/CR-01-2021-0019.
[17] T. Tambunan, *Development of Small-scale Industries During the New Order Government in Indonesia*. Ashgate, 2000. [Online]. Available: https://books.google.co.id/books?id=h0u1AAAAIAAJ
[18] C. Kero and A. Bogale, "A Systematic Review of Resource-Based View and Dynamic Capabilities of Firms and Future Research Avenues," *Int. J. Sustain. Dev. Plan.*, vol. 18, pp. 3137–3154, 2023, doi: 10.18280/ijsdp.181016.
[19] P. Maijanen, "Approaches from strategic management: Resource-based view, knowledge-based view, and dynamic capability view," 2020, pp. 47–68. doi: 10.1515/9783110589542-003.
[20] S. Setiawan, U. Rusilowati, A. Jaya, Hetilaniar, and R. Wang, "Transforming Human Resource Practices in the Digital Age: A Study on Workforce Resilience and Innovation," *J. Comput. Sci. Technol. Appl.*, vol. 2, pp. 84–92, 2025, doi: 10.33050/corisinta.v2i1.80.
[21] A. Rustam, I. Astuti, and U. Safitri, "Strategies for Improving Employee Competencies in the Digitalization Era through Training and Human Resource Development," *J. Acad. Sci.*, vol. 1, pp. 849–857, 2024, doi: 10.59613/bewkpf69.
[22] L. Sürücü and A. Maslakci, "Validity and Reliability in Quantitative Research," *Bus. Manag. Stud. An Int. J.*, vol. 8, pp. 2694–2726, 2020, doi: 10.15295/bmij.v8i3.1540.
[23] G. Mardiatmoko, "The Application of the Classical Assumption Test in Multiple Linear Regression Analysis (a Case Study of the Preparation of the Allometric Equations of Young Makila)," *JTAM (Jurnal Teor. dan Apl. Mat.*, vol. 8, p. 724, 2024, doi: 10.31764/jtam.v8i3.22179.
[24] D. Hossan, B. Wolfs, N.-E.-M. Jesmin, and M. Petkovic, "QUESTIONNAIRE VALIDITY AND RELIABILITY: A REVIEW WITH PRACTICAL GUIDELINES," vol. 13, pp. 135–186, 2025.
[25] M. Maula and W. Stam, "Enhancing Rigor in Quantitative Entrepreneurship Research," *Entrep. Theory Pract.*, vol. 44, no. 6, pp. 1059–1090, 2020, doi: 10.1177/1042258719891388.
[26] M. Naeem, S. Ali, S. Memon, K. Khan, and S. A. O. Hyder, "From green HRM to lean operations: the mediating role of digital green transformation: a dynamic capabilities perspective," *J. Ethics Entrep. Technol.*, pp. 1–17, 2025, doi: 10.1108/JEET-05-2025-0026.
[27] L. Shen, X. Zhang, and H. Liu, "Digital technology adoption, digital dynamic capability, and digital transformation performance of textile industry: Moderating role of digital innovation orientation," *Manag. Decis. Econ.*, vol. 43, pp. 2038–2054, 2021, doi: 10.1002/mde.3507.
[28] X. Zhao, L. Zhao, X. Sun, and Y. Xing, "The incentive effect of government subsidies on the digital transformation of manufacturing enterprises," *Int. J. Emerg. Mark.*, vol. 19, pp. 3892–3912, 2023, doi: 10.1108/IJOEM-05-2022-0766.
[29] M. Alojail and S. B. Khan, "Impact of Digital Transformation toward Sustainable Development," *Sustainability*, vol. 15, no. 20, 2023, doi: 10.3390/su152014697.
[30] S. J. Zosu, F. A. Kelani, B. A. Adewuyi, T. Education, S. S. Education, and L. State, "ANALYZING EMPLOYEE TRAINING PROGRAMS AND THEIR IMPACT ON THE ADOPTION OF EMERGING TECHNOLOGIES IN INVESTMENT AND RISK MANAGEMENT IN PRODUCTION," *Niger. J. Manag. Stud.*, vol. 25, no. 2, pp. 165–180, 2023.
[31] C. B. Chrusciak, A. L. Szejka, O. C. Junior, and J. L. Schaefer, "Human-centric process improvement through digital transformation: contributions and limitations," *Production*, 2025, [Online]. Available: https://api.semanticscholar.org/CorpusID:277538902
[32] N. Izzatilah, L. A. Manafe, and K. A. Rahardjo, "Unlocking the Power of Digitalization: How Technology Shapes Employee Engagement and Organizational Performance," *RIGGS J. Artif. Intell. Digit. Bus.*, vol. 4, no. 2, pp. 3585–3592, 2025, doi: 10.31004/riggs.v4i2.1075.
[33] A. G. Kalandarovna, A. Mushtariybegim, and A. Qizi, "Development and Increase of Competitiveness of The Organization," *ASEAN J. Educ. Res. Technol.*, vol. 2, no. 3, pp. 265–274, 2023.
[34] F. S. P. Putri, L. A. Manafe, and E. Emmywati, "The Digital Leap: How Technology Shapes Employee Perceptions of Professionalism and Productivity in Project Supervision," *RIGGS J. Artif. Intell. Digit. Bus.*, vol. 4, no. 2, pp. 3627–3635, 2025, doi: 10.31004/riggs.v4i2.1091.

DOI: https://doi.org/10.31004/riggs.v4i4.5609