



Leadership and Employee Performance in Digital Transformation: A Systematic Review (2020–2025)

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Abstract: This study investigates how research on Leadership and employee performance has evolved within the digital transformation landscape through a Systematic Literature Review (SLR) of publications from 2020 to 2025. The literature search was conducted in Scopus and Google Scholar using the Publish or Perish tool, with search terms including "Leadership," "digital transformation," and "employee performance." The review adhered to the PRISMA framework, which comprises sequential phases: identifying relevant studies, screening titles and abstracts, assessing eligibility, and determining final inclusion. Of 500 initial publications, 30 met all criteria and were analysed comprehensively. The synthesis reveals that both transformational and digital Leadership consistently contribute positively to outcomes such as employee performance, motivation, innovation, and adaptability. The bibliometric results further indicate three dominant thematic groupings: digital Leadership, employee performance, and organisational responses to technological change. Overall, the evidence underscores that effective digital transformation requires not only technological infrastructure but also competent human resources and Leadership approaches that support organisational change. This review enriches theoretical understanding of current research patterns and offers practical guidance for enhancing Leadership capability and human resource development in the digital era.

Abstrak: Studi ini menyelidiki bagaimana penelitian tentang Kepemimpinan dan kinerja karyawan berkembang dalam lanskap transformasi digital melalui Tinjauan Pustaka Sistematis (TPS) dari publikasi tahun 2020 hingga 2025. Pencarian literatur dilakukan di Scopus dan Google Scholar menggunakan alat Publish or Perish, dengan kata kunci pencarian meliputi 'Kepemimpinan', 'transformasi digital', dan 'kinerja karyawan'. Tinjauan ini mengikuti kerangka kerja PRISMA, yang terdiri dari beberapa tahap berurutan: mengidentifikasi studi yang relevan, menyaring judul dan abstrak, menilai kelayakan, dan menentukan inklusi akhir. Dari 500 publikasi awal, 30 memenuhi semua kriteria dan dianalisis secara menyeluruh. Sintesis menunjukkan bahwa baik Kepemimpinan transformasional maupun digital secara konsisten memberikan kontribusi positif terhadap hasil seperti kinerja karyawan, motivasi, inovasi, dan kemampuan beradaptasi. Hasil bibliometrik lebih lanjut menunjukkan tiga kelompok tematik utama: Kepemimpinan Digital, kinerja karyawan, dan respons organisasi terhadap perubahan teknologi. Secara keseluruhan, bukti tersebut menegaskan bahwa transformasi digital yang efektif tidak hanya membutuhkan infrastruktur teknologi, tetapi juga sumber daya manusia yang kompeten dan pendekatan kepemimpinan yang mendukung perubahan organisasi. Tinjauan ini memperkaya pemahaman teoretis tentang pola penelitian saat ini dan menawarkan panduan praktis untuk meningkatkan kemampuan kepemimpinan dan pengembangan sumber daya manusia di era digital.

A. Introduction

Digital transformation is reshaping organisational systems worldwide, driving fundamental shifts in work structures, operational models, and human resource practices. Rapid developments in artificial intelligence, automation, and data-driven technologies demand that organisations move toward more adaptive, collaborative, and digitally enabled work environments (Kane et al., 2019; Prasad & De, 2024). In this landscape, employee performance is increasingly defined by the capacity to utilise digital tools, engage in technology-mediated collaboration, and contribute to analytical, data-informed decision-making. Consequently, digital literacy and adaptive competence have emerged as essential components supporting effective digital implementation (UNESCO, 2018; Madrid et al., 2024).

In the Indonesian public sector, digital transformation has been advanced through bureaucratic reform initiatives and the modernisation of administrative systems. Despite these efforts, empirical assessments indicate persistent challenges, including limited proficiency with digital systems, inadequate data integration, and uneven digital capabilities among employees (Rahmadanita & Hidayat, 2023). Structural rigidity, resistance to change, and disparities in technological readiness further hinder organisational responsiveness and performance (Salju et al., 2023; Çini et al., 2023). These challenges indicate a growing requirement to synthesize behavioural, technological, and Leadership dimensions into a comprehensive framework for understanding employee performance in digital settings, especially in institutions characterized by strong hierarchy and administrative control (Orkamo et al., 2025).

Various cutting-edge studies indicate that research on Leadership and digital transformation is increasingly complex. Lin (2025) found that digital Leadership is emerging as a strategic factor in driving innovation and organizational capabilities, yet the existing literature remains fragmented and has not fully integrated various perspectives. Kaser (2020) highlights that digital transformation has fundamentally changed organizational structures and work processes. Despite this growth, many prior investigations prioritised technical factors while overlooking how employees' digital skills influence their performance outcomes. Meanwhile, Omol (2024) shows that research on organizational digitalization has grown over time. Still, much of the literature offers only conceptual insights and lacks a comprehensive framework to explain how human resource readiness shapes performance. Consistent with this, Alghfeli et al (2024) found a notable rise in studies examining digital Leadership styles and organisational performance. However, the research primarily highlights the direct link between Leadership and performance, without examining how Leadership interacts with digital literacy and employee performance.

These findings indicate that the development of science still requires more integrative mapping to understand how digital Leadership, digital capabilities, and employee performance are interconnected in the context of digital transformation. Thus, a systematic review is needed that not only identifies research trends and developments but also develops a conceptual structure that more fully describes the relationships between

variables. The use of a Systematic Literature Review grounded in PRISMA procedures, combined with bibliometric analysis, allows for a detailed understanding of worldwide research trends during 2020–2025 and facilitates the mapping of dominant topics, conceptual relationships, and prospective research directions. The synthesis of findings is also expected to support the development of a more integrative conceptual model linking Leadership, digital competence, and organisational culture to employee performance.

This study is guided by three main research questions: (RQ1) What are the trends and key characteristics of scholarly publications examining employee performance in digital transformation settings? (RQ2) What dominant themes and influencing factors have shaped employee performance in the digital transformation literature over the past five years? and (RQ3) What conceptual structures and thematic relationships can be identified through bibliometric analysis? Based on these questions, the study aims to describe publication trends and study characteristics, map the dominant themes and factors influencing employee performance, and uncover the conceptual structures and relationships among key variables in the literature. The findings are expected to strengthen theoretical and empirical understanding and provide evidence-based guidance for developing digital capability and enhancing employee performance in organisations undergoing digital transformation.

B. Method

A combined approach using a Systematic Literature Review (SLR) and bibliometric analysis was employed to trace, review, and map the development of scholarship on Leadership, digital transformation, and employee performance between 2020 and 2025. The review procedure followed PRISMA 2020 guidelines (Page et al., 2021). These steps consist of identification, screening, eligibility evaluation, and determination of the final set of included studies. Integrating SLR with bibliometric analysis enabled the researchers to conduct a comprehensive scientific synthesis while simultaneously visualising knowledge structures and research trends through bibliometric mapping.

The literature search strategy was conducted using two major academic databases: Scopus, selected for its credibility and extensive coverage of reputable international journals, and Google Scholar, accessed through the Publish or Perish (PoP) application to broaden the search scope. The search keywords were formulated using Boolean operators to ensure precision and relevance. The main search terms included combinations of "Leadership," "digital Leadership," and "organisational management," paired with "digital transformation" or "digitalisation," and "employee performance," "performance management," or "organisational effectiveness." All retrieved articles were exported into Mendeley for reference management and into Excel or Word for staged screening.

The inclusion and exclusion criteria were formulated to guarantee that the studies reviewed were relevant and met the required quality standards. Articles to be included must be peer-reviewed, indexed, published between 2020 and 2025, available in full text, and directly address topics such as digital or transformational Leadership, digital literacy or capabilities, or employee performance within the context of digitalisation. Conversely,

publications such as proceedings, books, book chapters, editorials, theses, duplicate articles, or studies that focus solely on technological aspects without linking to human or organisational dimensions are excluded from the analysis. The selection standards were established in accordance with the principles outlined in the PRISMA 2020 framework, as recommended by Moher et al (2016). During the identification stage, all articles found through database searches were collected as initial records. The next stage involved screening titles and abstracts to exclude publications irrelevant to the study's focus. The remaining articles then proceeded to the eligibility assessment stage, which involved a detailed evaluation of their content to ensure compliance with the inclusion criteria.

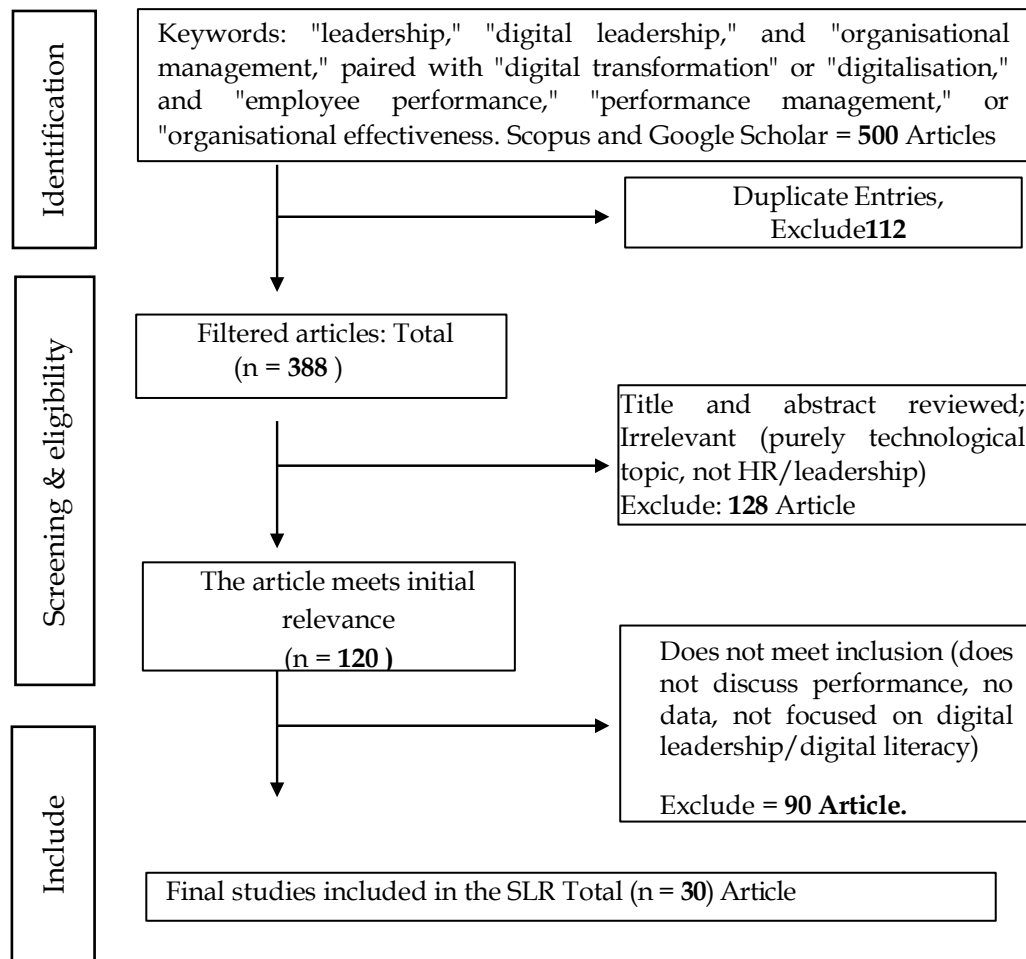


Figure 1. PRISMA Diagram

In addition to the SLR, this research utilises bibliometric techniques to visualise the intellectual framework and developmental trends of studies examining employee performance amid digital transformation. The mapping process was carried out using VOS viewer 1.6.20, following the approach recommended by Van Eck & Waltman (2017). Metadata from 30 selected articles were extracted, including author names, keywords, citation counts, and author collaboration patterns. The analysis was then conducted using several bibliometric techniques, namely co-occurrence analysis to map keyword

relationships, co-authorship analysis to examine scientific collaboration networks, and bibliographic coupling to identify the proximity between articles based on shared references. Visualisation was performed using four main modes: network, overlay, density, and cluster visualisation, to reveal thematic relationships and the evolution of concepts. The parameters used included a minimum keyword occurrence of three times, normalisation using Association Strength, and the LinLog/modularity layout to make cluster structures more clearly readable. The bibliometric component strengthens the SLR outcomes by presenting an extensive overview of prevailing themes, relationships among concepts, and the evolution of international research during the past five years.

C. Result

Literature Review Result

An analysis of the 30 articles selected for this review indicates a clear, repeated pattern linking Leadership factors, digital skills, and employee performance during digital transformation. Experimental and survey-based studies in education and public organisations report that transformational or digital Leadership, when combined with technology-oriented initiatives, leads to significant improvements in performance indicators such as academic achievement, job productivity, and digital competence (Razak & McKenzie, 2024; Öngel et al., 2024; Madrid et al., 2024). Simultaneously, digital Leadership is being recognised as a critical organisational capability that fosters innovation, enables virtual teamwork, and strengthens learning processes within digitally intensive workplaces (Orkamo et al., 2025; Tiodora et al., 2025).

A second group of studies highlights the role of digital literacy and related digital competencies as direct or moderating predictors of employee performance. Empirical evidence from Malaysia and Indonesia demonstrates that higher levels of digital literacy strengthen employee agility, innovative work behaviour, and job performance, particularly when supported by transformational Leadership and adequate IT training. (Chong & Zainal, 2024; Mita et al., 2024; Salju et al., 2023). The findings imply that achieving strong performance in digital environments requires more than effective Leadership; it also relies on workers' proficiency with digital systems, their capacity to manage information, and their adaptability to technology-integrated job routines.

A third theme concerns the organisational conditions surrounding digital transformation. Bibliometric and empirical studies in universities and public institutions indicate that digital transformation initiatives tend to improve strategic and operational performance when accompanied by sufficient infrastructure, management support, and digital workplace design; however, they can also generate technostress and uneven employee readiness (Al-Wedyan et al., 2025; Aleidi, 2025; Çini et al., 2023). These studies emphasise that the success of digitalisation depends on a combination of technological enablers, supportive culture, and human resource policies that reduce resistance and build digital confidence.

Overall, the SLR indicates that transformational/digital Leadership and digital

competence are repeatedly identified as key drivers of employee performance in various sectors. Yet, most empirical studies examine these elements separately or in different organisational settings. Only a few articles simultaneously consider Leadership behaviour, digital skills, and performance outcomes within a single analytical model, and none focus on semi-military police education. The collective findings establish an empirical platform for this study, which examines transformational Leadership and digital literacy as concurrent determinants of employee performance and positions the analysis within the distinctive setting of a semi-military police educational organisation.

Table 1. Systematic Literature Review Result

No	Researcher	Journal	Research Result
1	Razak, H. B. M., & McKenzie, S. (2024).	Journal of Education and Learning Practices, 2(5), 20-31.	There has been a notable increase in academic performance ($p < 0.001$), teacher satisfaction ($p < 0.01$), and digital competence ($p < 0.001$) in schools that received digital Leadership and innovation training compared to the control group.
2	Rojak, J. A. (2025).	International Journal of Service Science, Management, Engineering, and Technology (IJSSMET), 7(3), 11-17.	Digital technology enhances collaboration, the efficiency of academic and administrative services, and access to information. However, barriers include limited infrastructure and gaps in digital literacy.
3	Öngel, M., Uzun, C., Erkan, B., & Kosa, M. (2024).	Behavioral Sciences (MDPI, Q2 Scopus Indexed).	Findings indicate that digital Leadership contributes meaningfully to increases in individual creativity ($\beta = 0.497$, $p < 0.01$), which, in turn, has a substantial Influence on performance outcomes ($\beta \approx 0.80$, $p < 0.01$). Creativity fully bridges the connection between digital Leadership and performance, with the mediating effect more pronounced among younger cohorts such as Gen Y and Gen Z.
4	Madrid, C., Chimborazo, L., Morales García, W. C., Quispe-Sanca, D., Huanchuire Vega, S., Sánchez Garcés, J., & Saintila, J. (2023).	Journal of Educators Online (Scopus Q3).	Results indicate that digital competence ($\beta = 0.28$, $p < 0.01$) and transformational Leadership ($\beta = 0.76$, $p < 0.01$) significantly enhance lecturer performance. The structural model exhibits strong goodness-of-fit statistics (CFI = 0.952; TLI = 0.942; RMSEA = 0.078), with the two variables collectively accounting for 85% of the variance in performance.
5	Chong, Y. K., & Zainal, S. R. M. (2024).	Cogent Business & Management, 11(1), 2337447.	Digital literacy and transformational Leadership strongly Influence employee agility ($\beta = 0.462$; $\beta = 0.513$, $p < 0.01$), which, in turn, affects job performance ($\beta = 0.684$, $p <$

No	Researcher	Journal	Research Result
			0.01). The model accounts for 79% of the variance in performance outcomes ($R^2 = 0.79$).
6	Lewaherilla, N. C., Rahayu, M., & Limpo, L. (2024).	Journal of Management, 3(2), 281-295.	Transformational Leadership correlates strongly with motivation and performance ($r = 0.674$; $r = 0.739$), and motivation further boosts performance ($r = 0.682$). The model explains 60.8% of the variance ($R^2 = 0.608$), and the F-test ($F(2, 75) = 75.320$, $p < 0.001$) confirms the combined significance of the two predictors.
7	Orkamo, M., Ukko, J., Rantala, T., & Saunila, M. (2025).	Digital Business, 5(2), 100155	Digital era Leadership comprises effective Leadership, digital competence, digital acceptance, and digital innovation. Transformational Leadership most strongly enhances digital competence and performance, driven by change orientation and relational behaviour.
8	Tiodora, W., Bangun, Achmadi, Meilani (2025)	Milestone: Journal of Strategic Management (2025)	AI literacy and transformational Leadership improve employee performance. AI anxiety and workplace FOMO significantly mediate. Digital visionary leaders and employees' AI skills enhance productivity and adaptation in the AI era.
9	Khristian, Sulistiowati, & Fauzan. (2025).	Manajemen Business Innovation Conference (MBIC), 8, 174-184.	Transformational Leadership plays a crucial role in accelerating digital adoption by MSMEs. Digitalization enhances operational efficiency and marketing capabilities. An adaptive organizational culture and a flexible structure are key to success.
10	Salju, Junaidi, & Goso (2023).	Problems and Perspectives in Management, 21(1), 107-119.	IT training and digital infrastructure have a significant effect on digital literacy; work-family conflict is also substantial; management has no significant effect; and digital literacy has a significant impact on performance.
11	Khan, I.U., Gan, G.G.G., Khan, M.T.I., & Saif, N. (2023).	Administrative Sciences, 13(4), 101.	Transformational Leadership has a more substantial impact on academic performance than transactional Leadership. Organizational justice partially mediates this relationship, indicating that fair procedural, distributive, and interactional practices enhance leader-employee dynamics and improve lecturer performance. Transformational Leadership, characterized by inspiration, motivation, individual attention, and intellectual stimulation, proves more effective than

No	Researcher	Journal	Research Result
			transactional approaches that rely solely on rewards and punishments.
12	Shin, J., Mollah, M. A., & Choi, J. (2024)	Sustainability, Volume 15, Year 2023	The results indicate that digital Leadership has a substantial positive impact on organisational performance ($\beta = 0.743$; $p < 0.001$), with digital culture ($\beta = 0.419$; $p < 0.001$) and employee digital skills ($\beta = 0.340$; $p < 0.001$) serving as partial mediators.
13	Alkhoori, A. A., Sedik, S., & Al-Shami, S. A. (2021).	Webology, 18(Special Issue 2), 344–356	All hypotheses are accepted. Leadership Factors have a significant effect on Successful Technopreneurship. Digital Enablers (which include Digital Access, Communication, Commerce, and Digital Literacy) mediate the Influence of Leadership on technopreneurial success. Entrepreneurial Skills strengthen this relationship.
14	Abdullahi, M. S., Raman, K., Solarin, S. A., & Adeiza, A. (2021).	Journal of Applied Research in Higher Education, 15(1), 83–97.	Results demonstrate that ERP contributes positively to both EP and EE, and that EE further boosts performance. Employee engagement partially mediates the relationship between effective relational practices and employee performance.
15	Diana, I. N., Supriyanto, A. S., Ekowati, V. M., & Ertanto, A. H. (2021).	Journal of Asian Finance, Economics and Business, 8(2), 545–553.	Democratic Leadership boosts organisational culture and employee performance. Culture also drives performance and mediates the link between Leadership and performance. Leaders who listen to subordinates build a positive culture and raise performance.
16	Prasad, K. D. V., & De, T. (2024).	Humanities and Social Sciences Communications, 11(1).	Generative AI has a significant positive effect on employee engagement and performance by fostering trust and organizational commitment. Trust mediates the relationship between user perception and organizational commitment, and engagement mediates the relationship between commitment and performance.
17	Grzesiak, L., & Ulrych, W. (2025).	Central European Management Journal, 33(1), 20–39.	A digital work environment partially mediates the effect of management support on performance. The effect is greater when trust, flexibility, and technological support are present. Diversity factors moderate the relationship, with managers showing larger effects; complete mediation is observed among younger employees and in hybrid teams.

No	Researcher	Journal	Research Result
18	Astuti, S. D., Shodikin, A., & Uddin, M. (2020).	Journal of Asian Finance, Economics and Business, 7(11), 1059–1068.	Islamic Leadership and Islamic work culture do not directly affect employee performance. However, both indirectly Influence it through work motivation and job satisfaction. Motivation and job satisfaction become key drivers of improved employee performance.
19	Khan, M. A., Ismail, F. B., Hussain, A., & Alghazali, B. (2020).	SAGE Open, 10(1), 1–16.	Transformational and transactional Leadership have a significant positive effect on innovative work behavior. Laissez-faire results are not significant. OCB moderates the relationship between Leadership and innovation. Organizational culture mediates the relationship between Leadership and innovation.
20	Al-Wedyan, A., Alzoubi, M., & Ababneh, A. (2025).	International Journal of Management and Sustainability, 14(2), 711-724.	Digital transformation significantly impacts strategic performance, including enhanced decision-making, increased productivity, improved adaptability, and the achievement of organizational goals. Universities with better funding and infrastructure demonstrate higher performance. The main challenges are a lack of funds, employee resistance, and weak digital infrastructure.
21	Sarwar, U., Aamir, M., Bichao, Y., & Chen, Z. (2023).	Frontiers in Psychology, 13, 1084963.	Authentic Leadership directly boosts performance through PsyCap. PsyCap is the main psychological bridge between Leadership and performance. High POS further strengthens the effects of authentic Leadership on PsyCap and, ultimately, on performance.
2	Alyami, A., Sammon, D., Neville, K., & Mahony, C. (2024).	Information & Computer Security, 32(1), 53–73.	The study identified 11 factors critical to SETA success, from design through evaluation, including needs assessment, tailored content, annual planning, Leadership support, communication, and behavioural assessment. Preferences for evaluation frequency varied, but none were statistically significant. The findings informed five principles to strengthen cybersecurity culture and awareness.
23	Amalina, N. N., Armanu, & Susilowati, C. (2022).	International Journal of Research in Business and Social Science, 11(4), 95–105.	Studies show that transformational Leadership boosts academic staff performance directly and through organizational justice. Fairness, transparency, and equality strengthen this effect. Leaders who inspire and uphold justice generate better

No	Researcher	Journal	Research Result
			performance, higher commitment, and more proactive behaviour.
24	Aleidi, A. I. (2025).	Journal of Logistics, Informatics and Service Science, 12(1), 307-324.	Job satisfaction, POS, and affective commitment significantly affect performance, with POS having the most substantial effect ($\beta = 0.570$). Affective commitment mediates the relationship between satisfaction and support. Psychological conditions and supportive culture contribute to the success of digital transformation.
25	Masaeed, M. J. N., Shehada, S. A. J., & Mersal, M. A. S. (2023).	Frontiers in Education, 10, 1440731.	Digital transformation tools enhance the quality and accuracy of teacher performance evaluations, thereby strengthening transparency, objectivity, and performance feedback in schools. Digital systems help make the assessment process more fair, quick, and informative.
26	Dewi, N. N., & Wibowo, R. (2020).	Management Science Letters, 10(8), 2037-2044.	Leadership style, organizational culture, and motivation significantly influence lecturer performance, both individually and simultaneously. These three variables are the main factors in improving faculty performance at higher education institutions.
27	Çini, M. A., Erdirençelebi, M., & Akman, A. Z. (2023).	Central European Business Review, 12(4), 33-52.	Studies highlight that when employees view digital transformation positively, their performance improves. Yet, digital changes can also elevate technostress, which may hinder productivity. Consequently, organisations must prioritise strategies to reduce technology-related stress to achieve effective transformation. Crucial factors include robust digital infrastructure, supportive management, ongoing training, and adequate individual digital skills.
28	Guterresa, L. F. D. C., Armanu, & Rofiaty. (2020).	Management Science Letters, 10(7), 1497-1504.	Motivation mediates how Leadership style shapes performance, but not the effects of education and training. Training directly boosts performance but doesn't increase motivation. Leadership improves performance both directly and through motivation. This indicates that, in Timor-Leste's public bureaucracy, Leadership is vital for motivation and performance, whereas training is vital for technical competence.
29	Xu, Y., & Zhang, M. (2022).	Frontiers in Psychology, 13, 938951.	Empowering Leadership boosts lecturers' adaptive performance by improving leader-

No	Researcher	Journal	Research Result
			member exchange and psychological empowerment. More trust and autonomy help lecturers adapt to change. Promotion focus encourages innovation and proactivity, while prevention focus promotes careful, error-avoidant behaviour.
30	Yapa, S., Wickramasinghe, V., & Bandara, W. (2025)	Communications of the Association for Information Systems, 57, 365-383.	BPM improves the performance. The assessment and documentation system enhances the accuracy of employee evaluations, increases transparency in the process, and fosters a culture of continuous improvement.

Bibliometric Synthesis

A bibliometric analysis of 30 articles using VOSviewer 1.6.20 identified 14 keywords that meet the minimum occurrence criterion of ≥ 3 , which are divided into 6 clusters. The network map (network visualisation) shows that employee performance occupies the most central position, with the highest total link strength, and is strongly connected to keywords such as digital transformation, organisational culture, job satisfaction, perceived organisational support, and management support. This confirms that employee performance is understood as the primary outcome of a combination of Leadership factors, managerial support, and digital transformation processes.

a. Network Visualisation

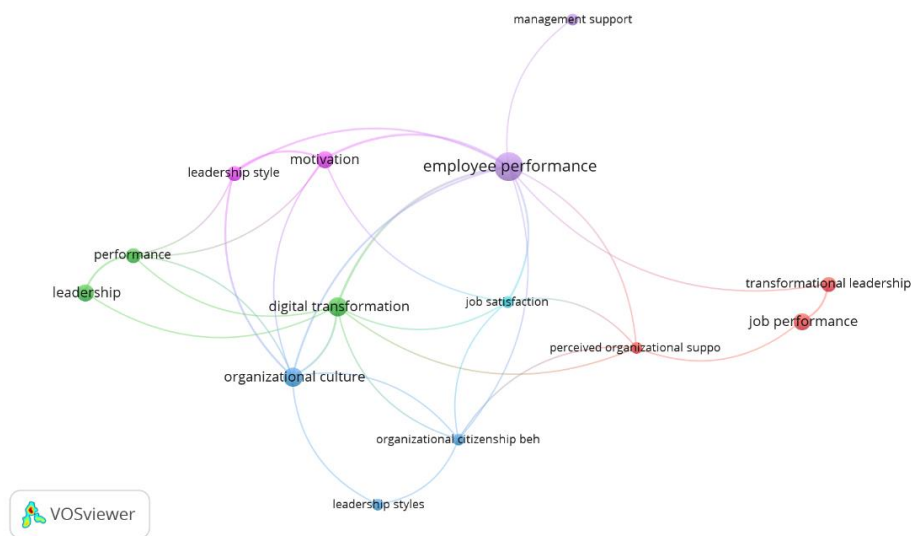


Figure 2. Network Visualization

Figure 2 presents the results of the network visualisation mapping, illustrating relationships among keywords (co-occurrence analysis) from 30 research articles on employee performance in the context of digital transformation during 2020-2025. Node

size reflects the occurrence rate of each keyword in the dataset, whereas link thickness denotes the intensity of the conceptual association between terms. The colouring differentiates clusters formed algorithmically based on thematic proximity. In summary, the resulting network map highlights four primary clusters that shape the intellectual landscape of employee performance research in digital transformation contexts.

First cluster centres on the keyword pair Leadership–performance, which includes the terms Leadership, performance, and Leadership style. This cluster represents classic research linking Leadership style to employee performance. The second and third clusters group digital transformation with organisational culture and organisational citizenship behaviour, highlighting how these constructs support the success of digital transformation. Other clusters include motivation, job satisfaction, and perceived organisational support, highlighting the role of psychological factors and managerial support as essential mechanisms in explaining performance.

b. Overlay Visualisation

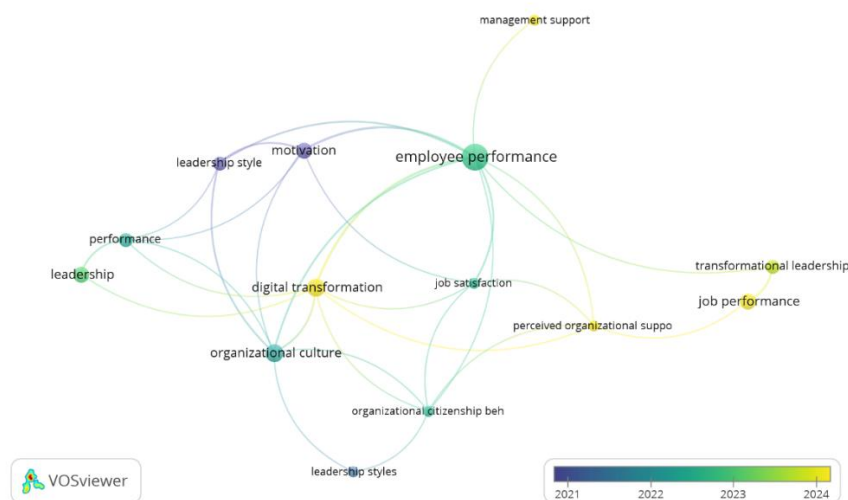


Figure 3. Overlay Visualization

The purple colour indicates the early research period (2021), the green colour represents the transition phase (2022–2023), and the yellow colour signifies the most recent research focus (2024). These findings illustrate a clear shift in research direction, from a predominantly technology-oriented perspective to a more human-centred approach to digital transformation.

In the early phase (2021–2022), research primarily focused on foundational constructs such as Leadership, performance, organisational culture, and digital transformation, reflecting an emphasis on organisational readiness for technological change. During the transition stage (2022–2023), research gradually shifted toward the behavioural and psychological aspects of employees, with topics such as motivation, Leadership style, and organisational citizenship behaviour (OCB) gaining prominence, underscoring the growing importance of integrating human factors with technology to enhance organisational effectiveness.

In the most recent phase (2023–2024), keywords such as transformational Leadership, employee performance, and job performance emerged as dominant, indicating a new research orientation that emphasises the role of transformational Leadership in strengthening digital-based performance outcomes. Studies in this phase also highlight the importance of mediating variables such as job satisfaction and perceived organisational support. The chronological shift from purple to yellow indicates a transition from technological determinism to a human–technology integration model, in which humans are recognized as central actors shaping organizational performance in the digital transformation era.

c. Density Visualisation

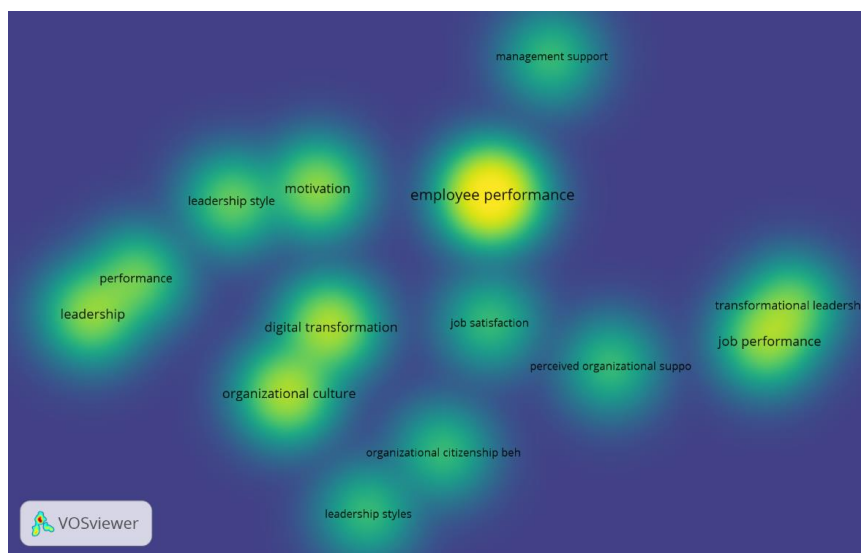


Figure 4. Density Visualization

Figure 4 presents the results of the density visualisation. The density visualization confirms this pattern: the areas with the highest density are around employee performance, digital transformation, and organisational culture, followed by motivation and job satisfaction. Overall, the literature analysed still centres on the relationship among Leadership/organisational support, the digital transformation process, and employee performance as the primary outcome. Meanwhile, the terms explicitly representing digital literacy or digital competence do not appear as hotspots in the keywords, although this concept is present in some individual studies.

D. Discussion

From 2020 to 2025, research rapidly expanded, shifting from tech-focused digital transformation to more human-centred approaches. Bibliometric mapping shows that employee performance consistently emerges as a central concept, interconnected with transformational Leadership, digital transformation, digital competence, motivation, and organisational culture. This pattern reflects a broader theoretical movement in global scholarship: performance is no longer seen merely as an output, but as a multidimensional

construct shaped by the interaction between human capability, technological readiness, and organisational context. Overlay visualisation further illustrates a temporal evolution of research trends – from early emphasis on system implementation and digital tools toward themes such as digital readiness, organisational support, employee agility, behavioural adaptability, and psychological acceptance of digital change. These shifts indicate that the quality of human and organisational responses increasingly determines the success of digital transformation.

The evidence obtained in this study aligns with [Aleidi \(2025\)](#), who shows that successful digital transformation relies on organisational support and affective commitment, ultimately influencing performance outcomes. [Rawashdeh et al \(2020\)](#) found that implementing digital systems for performance evaluation enhances transparency and data accuracy, thereby positively influencing educators' performance. Similarly, [Chong & Zainal \(2024\)](#) demonstrate that the synergy between digital competence and adaptive Leadership enhances employee agility, which supports the outcomes of this study. Additionally, confirm that digital readiness and Leadership are key predictors of performance, although technological change can induce technostress. [Grzesiak & Ulrych \(2025\)](#) also emphasise the significance of managerial support and a productive work environment in digital performance. Meanwhile, [Dewi & Wibowo \(2020\)](#) highlight that motivation and culture remain essential, and reaffirm that technology alone is insufficient without organisational alignment and human readiness.

The present study advances performance management theory in the digital era by introducing the Tripartite Human Digital Performance Model. This conceptual framework integrates three critical dimensions: transformational Leadership, digital literacy, and adaptive organisational culture. The model is grounded in the understanding that employee performance in digital transformation contexts is shaped not by technology alone, but by the interaction between human capability, Leadership behaviour, and organisational environment. Based on transformational Leadership theory, the model highlights how leaders Influence employees' digital readiness, motivation, and commitment to technological change. Leaders function as catalysts who Influence not only the technical adoption of digital systems but also the psychological acceptance and behavioural adaptability needed to sustain performance improvements. From the perspective of digital competence, the model aligns with contemporary digital literacy frameworks that emphasise a combination of technical proficiency, critical thinking, communication skills, and problem-solving abilities. In digitalised work environments, these competencies become central mechanisms through which employees engage with technologies, make data-driven decisions, and collaborate effectively.

The cultural component of the model draws on organisational culture theory, which highlights the function of shared values, norms, and workplace climate in enabling or constraining change. An adaptive, learning-oriented culture supports experimentation, reduces the fear of failure, and mitigates technostress, thereby creating conditions that will allow digital transformation to translate into improved performance. The integration of

Leadership, competence, and culture within a single conceptual structure advances prior frameworks that tended to examine these dimensions separately. Empirical patterns observed in bibliometric clusters and co-occurrence analyses reinforce this integration: transformational/digital Leadership, digital literacy, and organisational culture consistently co-occur in the literature on employee performance. These patterns signal an emerging but previously under-theorised configuration of factors shaping digital-era performance.

By formalising this structure, the Tripartite Human Digital Performance Model provides a detailed account of how human capabilities and organisational conditions interact to shape performance during digital transformation. This contribution enriches earlier theories by positioning human factors at the core of performance analysis in technologically advanced contexts. The model also offers a conceptual roadmap for future empirical work across different organisational types, particularly those characterised by strong hierarchy and procedural rigidity.

E. Implication

This study contributes theoretically by proving that employee performance in digital environments is shaped by the interaction of transformational leadership, digital competence, and organisational culture, as integrated in the Tripartite Human Digital Performance Model. Bibliometric evidence consistently highlights leader competence culture clusters, confirming that aligning individual capabilities, leadership behaviour, and organisational values is essential for successful digitalisation and supports a more human-centred digital performance theory applicable across diverse contexts, including hierarchical and semi-military organisations. Practically, organisations should strengthen digital-transformational leadership, systematically improve digital literacy through training in technical skills, analytical thinking, digital communication, and complex problem-solving, and build an adaptive, collaborative, and innovative culture that ensures psychological safety to reduce technostress, supported by transparent digital monitoring and performance evaluation to enhance accountability and trust. At the policy level, governments and institutional leaders should establish a national digital competence framework covering leadership standards, digital literacy, and innovative culture indicators, reinforce HR development to build digital capacity both technically and adaptively, and strengthen governance through regulations on interoperability, information security, and consistent digital transformation, including innovation incentives, technostress management, and digital well-being programmes to protect employee welfare.

F. Limitations and Suggestions for Further Research

This study has methodological limitations, including keyword and indexing inconsistencies that may bias bibliometric clustering (e.g., digital competence vs. digital literacy), potential database bias from relying mainly on Scopus and Google Scholar, the use of PRISMA without meta-analysis which prevents statistical testing of variable

relationships, and the limited depth of bibliometric methods in capturing social, cultural, and organisational dynamics across specific contexts such as government, education, and semi-military institutions. These limitations suggest future research should incorporate meta-analysis to quantify relationships among digital leadership, digital literacy, organisational culture, and performance; investigate AI-based digital leadership roles in decision-making and employee coaching; develop machine-learning-based performance evaluation systems for greater objectivity and early detection of technostress or low competence; and apply mixed-methods, context-based studies to better understand cultural and structural factors in hierarchical organisations, thereby strengthening digital performance theory and evidence.

G. Conclusion

This study achieved its goals by outlining research trends, significant themes, and conceptual structures related to employee performance in digital transformation. SLR and bibliometric analysis showed that transformational Leadership, digital literacy, and organisational culture are key determinants of digital-era performance. These findings offer a more integrated view of how human and organisational factors interact to shape the success of digital transformation.

Theoretically, this research contributes by developing the Tripartite Human Digital Performance Model, which unites Leadership behaviour, digital competence, and cultural adaptability into a single conceptual framework. This model offers a more comprehensive theoretical foundation and can serve as a reference for empirical testing across various types of organisations, including hierarchical and semi-military institutions. The study has limitations in its scope, as it focuses solely on open-access literature and lacks empirical validation. Therefore, future research should expand the database to include emerging constructs such as digital trust, AI-based Leadership, machine-learning-based performance evaluation, and resilience, and test the developed model using quantitative, qualitative, or mixed methods across different structured organisational contexts.

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