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The Impact of AI-Powered IT Resources and Infrastructure, AI-Powered Cloud Platform Readiness and AI-Based Skills and Knowledge on Employee Job Performance: A Review of Literature

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Abstract

The growing digital transformation of the construction industry has intensified the need to understand how artificial intelligence (AI)–powered technologies can enhance employee job performance in complex, project-based work environments. Motivated by the increasing reliance on AI-driven systems and the persistent challenges of workforce productivity, adaptability, and technology adoption in construction settings, this review paper synthesizes existing literature on the impact of AI-powered IT resources and infrastructure, AI-powered cloud platform readiness, and AI-based skills and knowledge on employee job performance. Specifically, the review examines job performance through both task performance and contextual performance dimensions while integrating key technological factors, including perceived complexity, perceived compatibility, and perceived relative advantage, associated with AI-based IT systems and infrastructure. In addition, the study reviews strategic readiness and operational readiness as critical organizational capabilities that support the successful deployment and sustained use of AI-powered cloud platforms. The literature further highlights the importance of AI-related skills and knowledge—particularly perceived ease of use, perceived usefulness, and intention to use—in shaping employees' acceptance and effective utilization of AI technologies. The key contribution of this review is to offer an integrated conceptual understanding of how technological infrastructure, organizational readiness, and employee competencies collectively influence workplace performance outcomes in the construction industry. By consolidating fragmented literature into a coherent framework, this study enhances its relevance to both academic readers and industry practitioners. It provides a foundation for future empirical investigations and strategic digital transformation initiatives.

Keywords: Employee Job Performance, AI-Powered it Resources And Infrastructure, AI-Powered Cloud Platform Readiness, Ai-Based Skills And Knowledge, Construction Industry

Introduction

The construction industry is increasingly utilizing artificial intelligence (AI)–based IT systems and cloud platforms to enhance employee job performance, strengthen decision-making processes, and optimize workforce efficiency in response to growing project complexity and digital transformation demands (Chanthati, 2025; Nwankwo *et al.*, 2024). Recent studies have emphasized that AI-powered technologies function as strategic organizational assets by enabling real-time data integration, predictive analytics, automated workflows, and improved collaboration across project teams (Najafzadeh & Yeganeh, 2025; Morfovasilis *et al.*, 2025). This technological shift has intensified the need to understand how AI-driven systems influence employee performance, particularly in labor-intensive, project-based environments such as the construction sector.

The motivation for this study arises from the increasing challenges construction firms face in translating technological investments into measurable workforce performance outcomes. Despite significant advancements in AI-powered IT systems and cloud infrastructure, many organizations continue to struggle with adoption and implementation due to insufficient employee preparedness, uneven digital capability development, and organizational resistance to change (Rane *et al.*, 2024; Wu, 2025). As a result, concerns regarding task performance and contextual performance have become increasingly important in evaluating whether AI-based digital transformation initiatives effectively improve employee productivity, collaboration, and adaptability (Savaş, 2025; Vinh & Hùng, 2025). This challenge highlights the need for a more comprehensive understanding of how technological resources, readiness factors, and employee competencies interact to shape job performance outcomes.

Further literature suggests that the effectiveness of AI-powered IT systems is influenced by multiple technological determinants, including perceived complexity, compatibility with existing business processes, and perceived relative advantage over conventional systems (Paiva, 2024; Masod & Zakaria, 2024). At the same time, the successful implementation of AI-enabled cloud platforms requires strong organizational capabilities, particularly strategic readiness to align technology initiatives with long-term business goals and operational readiness to support day-to-day execution and system integration (Dunn, 2025; Savaş, 2025). Moreover, employee-level factors such as AI-based skills and knowledge, perceived ease of use, perceived usefulness, and intention to use AI technologies significantly affect the acceptance and effective use of these systems in workplace settings (Ramanda *et al.*, 2025; Chen, 2025). These interconnected dimensions indicate that AI adoption in construction is not solely a technological issue but also a socio-organizational and human capability challenge.

Although prior studies have explored AI applications in construction project management and digital infrastructure development, a clear research gap remains in integrating technological, organizational, and human capability perspectives into a unified framework focused on employee job performance (Weaich *et al.*, 2024; Wu, 2025). The existing literature has largely focused on technical efficiency and project-level outcomes, with limited emphasis on employee-level performance and readiness-based adoption mechanisms (Sohail *et al.*, 2025).

Therefore, the key contribution of this study is to provide a comprehensive literature review that synthesizes these fragmented perspectives into an integrated understanding of how AI-powered IT resources and infrastructure, cloud platform readiness, and AI-based skills and knowledge collectively influence employee job performance in the construction industry. This contribution enhances the study's relevance by bridging the gap between digital transformation literature and workforce performance research, while also offering practical insights for construction organizations seeking to strengthen digital readiness, improve workforce capability, and achieve sustainable competitive advantage through AI technologies (Silitonga & Jin, 2024; Wang *et al.*, 2024).

Literature Review

Employee job performance in the construction industry is commonly conceptualized as task and contextual performance, which are important for achieving project efficiency and organizational success in complex work environments (Song, 2024; Nwaogbe *et al.*, 2025). Task performance refers to the ability of employees to fulfill their core technical responsibilities, such as executing projects, resolving technical problems, and following construction standards, while contextual performance involves discretionary behaviors such as teamwork, communication, and organizational support for the completion of projects (Jing, 2006; Motowidlo *et al.*, 1997). Recent studies suggest that AI-powered IT resources and infrastructure enhance both dimensions through real-time data access, automated decision support, and improved collaboration among project teams (Iuonaș *et al.*, 2025; Prasetya *et al.*, 2025). However, the effectiveness of the system depends on technological attributes such as complexity, compatibility with existing systems, and relative advantage, which influence employees' adaptability to AI applications in their daily activities (Russo, 2024). As a result, companies that overcome technological barriers effectively tend to exhibit higher levels of employee efficiency, accuracy, and productivity in construction projects (Thakkar *et al.*, 2025).

AI-powered cloud platform readiness has also been recognized as an important organizational factor influencing employee job performance through the strategic and operational readiness dimensions (Natasha *et al.*, 2025; Chanthati, 2025). Strategic readiness involves top management's commitment to the digital vision and the allocation of resources to implement AI technologies. In contrast, operational readiness refers to the organization's ability to integrate AI systems into existing workflows during project execution (Brillianto *et al.*, 2024). AI-based skills and knowledge within employees significantly affect the successful adoption of technology, with perceived ease of use, perceived usefulness, and intention to use being important factors in determining employees' behavior towards AI-powered technologies (Shah *et al.*, 2025; Khan *et al.*, 2024). Employees with higher levels of AI literacy are more likely to use cloud tools effectively, thereby enhancing the efficiency and collaboration performance of construction projects (Mujtahidin *et al.*, 2025). Integrating technological readiness with human capability offers a solid foundation for enhancing employee job performance in AI-based construction settings (Prasanna *et al.*, 2025).

Employee Job Performance

Employee job performance is a multidimensional construct that focuses on how employees effectively perform their roles and meet organizational expectations at work (Blaich *et al.*, 2008; Akib & Behzadan, 2025; Bernik & Šprajc, 2025). In construction, employee job performance is mainly focused on task performance and contextual performance, which

contribute to project success and organizational sustainability (Egemen, 2024; Sawicki *et al.*, 2026; Başaran *et al.*, 2025). Task performance reflects the efficiency, effectiveness, and correctness with which employees fulfill their core technical roles, including project coordination, problem-solving, and compliance with engineering standards (Sulistyorini & Wening, 2025; Asai & Henry, 2026; Mani & Paramasiva,2025). Contextual performance refers to voluntary actions undertaken by employees, including teamwork, communication, knowledge sharing, and support for team members, that can improve the working environment and project outcomes (Silaen & Silaen, 2025; Hertel *et al.*, 2000; Mohamad *et al.*, 2026). Recent literature in construction management asserts that adopting digital tools and AI can enhance both aspects of job performance by reducing process delays and improving decision-making (Hatim *et al.*, 2025; Li *et al.*, 2025).

AI-Powered IT Resources and Infrastructure

The terms AI-powered IT resources and infrastructure refer to innovative systems, data processing capabilities, cloud applications, and AI-based solutions that aid construction activities in organizations (Parekh & Mitchell, 2024; Nwankwo *et al.*, 2024; Chen *et al.*, 2025). The significance of these resources has increased in the construction sector primarily due to the complexity of construction projects and the need for real-time decision-making support (Opara *et al.*, 2025; Gao *et al.*, 2026; Başaran *et al.*, 2025). Among the dimensions, complexity, compatibility, and relative advantage are highly influential in driving employee inclination to adopt these solutions (Zhao *et al.*, 2024; Khoshkones *et al.*, 2025). Compatibility refers to whether the new AI infrastructure aligns with organizational workflows, operations, or project management systems (Masod & Zakaria, 2014). Relative advantage is based on the organization's perception of the advantages offered by AI systems over manual systems, such as enhanced speed of operation and accuracy in decision-making, leading to improved employee job satisfaction with their work activities (Witara & Witara, 2025).

AI-Powered Cloud Platform Readiness

AI-powered cloud platform readiness pertains to the organizational readiness required to deploy AI-based cloud solutions across operational and strategic aspects of organizations (Verravalli, 2025; Chen *et al.*, 2025; Gao et al., 2026). The construct is evaluated through strategic and operational readiness, which are significant in the context of digital transformation for construction organizations (Zhu *et al.*, 2023; Naji *et al.*, 2012). Strategic readiness includes leadership commitment to embracing AI technology, developing an organization-wide technology transformation vision, and allocating resources effectively to adopt AI within long-term planning frameworks (Hojeij, 2025; Khoshkones *et al.*, 2025). Operational readiness encompasses workflow integration, training and support mechanisms, technical maintenance, and day-to-day operationalization (Zhang *et al.*, 2024). A subsequent line of recent studies confirms that organizations with higher levels of such readiness are more successful in leveraging AI cloud platforms to enhance employee efficiency, project coordination, and cross-functional collaboration (Aziz *et al.*, 2025). Accordingly, readiness serves as the organizational-level mechanism translating technological investments into workforce-level performance improvements (Malek *et al.*, 2023).

AI-Based Skills and Knowledge

AI-based skills and knowledge embody the employees' capability to understand, utilize, and derive value from AI-enabled systems and digital platforms at work (Aggarwal, 2025; Gunrid

et al., 2025; Mohamad *et al.*, 2026), entailing digital literacy, familiarity with AI systems, the ability to interpret data, and adaptive learning abilities to effectively use the platform in the construction project setting (Soni, 2025). The concept is measured using perceived ease of use, perceived usefulness, and intention to use, borrowed from the Technology Acceptance Model and widely used in digital transformation research (Winarno *et al.*, 2025; Hadalgekar & Desai, 2025). Perceived ease of use reflects the employees' belief that AI-enabled systems are easy to use and manageable at work (Winarno *et al.*, 2025). Perceived usefulness denotes the extent to which employees believe that using AI technologies facilitates their work performance and effectiveness (Yu & Arshad, 2025). Intention to use captures employees' inclination to continuously adopt and incorporate AI tools into their workflow, which strongly determines ultimate usage behavior and performance improvement (Chen, 2025). Recent insights indicate that employees' higher AI skills and perceptions of AI use significantly enhance task performance and collaborative outcomes on construction projects (Alhasan & Alawadhi, 2024).

Findings and Discussion

The synthesized content above elucidates the principal determinants influencing employee job performance in the construction industry, with a significant reliance on AI-powered IT resources and infrastructure, AI-powered cloud platform readiness, and AI-based skills and knowledge. Each of these constructs had positive implications for improving employee job performance, particularly in terms of task and contextual performance within increasingly digitized construction environments (Bahamnia & Kumar, 2024; Song, 2024). Emerging studies consistently emphasize that AI-powered system integration enhances operational efficiency, reduces workflow diversification, and promotes collaborative mechanisms among project stakeholders, thereby augmenting employee productivity and firm-wide performance outcomes (Bhalerao *et al.*, 2025).

Table 1 presents a comprehensive summary of studies on the key constructs explored in this review, including author(s), publication year(s), source, methodology, sample, context variables studied, and findings. The purpose of tabulating this information is to identify key technological, organizational, and human factors influencing the adoption effectiveness of AI-powered cloud platforms in organizations in the construction industry (Zhao *et al.*, 2024). According to recent research, compatibility, relative advantage, strategic readiness, operational readiness, perceived usefulness, and intention-to-use are recurring constructs that signal enhanced employee job performance in AI-driven environments for construction firms. Among these, organizational readiness and employee AI-based competencies stand out as critical success factors in achieving successful digital transformation outcomes.

In the construction sector, the readiness of AI-powered cloud platforms and AI-based skills and knowledge generally have a more significant impact on employee job performance than technological infrastructure factors alone (Chanthati, 2025; Wu, 2025). This is due to construction companies working in very dynamic, project-based environments that need not only technological investment but also strong strategic alignment, workflow integration, and workforce adaptability (Chen, 2025; Druzhynin *et al.*, 2022). Employees' perceived ease of use and perceived usefulness of AI systems significantly enhance their willingness to adopt and consistently utilize these platforms, thereby directly improving the quality of task execution and collaborative behaviors (Osman & Yatam, 2024; Shah *et al.*, 2025). AI-powered

IT infrastructure offers the essential technical foundation; however, it may not autonomously enhance performance without the backing of organizational preparedness and the advancement of employee digital competencies (Meng, 2025). Consequently, the results indicate that a harmonious integration of technology, preparedness, and human competence is crucial for the effective improvement of employee performance in the construction sector.

Table 1
Comparative Analysis of AI-Driven Factors and Their Effectiveness in Improving Employee Job Performance in the Construction Industry

No.	Author/Year	Variable / Theme	Methodology / Sample	Key Findings
1	Asai & Henry (2026)	Employee Job Performance	Explanatory cross-sectional survey; n = 152; Spearman rank correlation	Conversational AI tools greatly improve how well things work (r = 0.674).
2	Gao et al (2026)	AI-Powered IT Resources and Infrastructure, AI-Powered Cloud Platform Readiness	Systematic literature review; PRISMA approach; 392 articles from Scopus database	Identified mainstream AI applications include cost estimation, prediction, control, and optimization; time planning, scheduling, delay prediction, and cycle time prediction; safety worker monitoring, PPE detection, fall risk monitoring, and hazard identification; and promoting digital transformation.
3	Gu et al (2026)	AI-Powered IT Resources and Infrastructure, AI-Powered Cloud Platform Readiness	Bibliometric search; scientometric analysis; 191 highly cited articles (top 10%, past 5 years); Scopus, Google Scholar, WOS	Four research streams emerged: construction robotics, productivity and safety, intelligent algorithms and modeling, and factors associated with construction workers; a three-dimensional knowledge framework (technical layer, application layer, management layer) was established; this illustrates the co-evolutionary trajectory of AI technology and industry digital transformation
4	Mohamad et al (2026)	Employee Job Performance; AI-Based Skills and Knowledge	Systematic literature review; 200 peer-reviewed articles + corporate data from PwC, McKinsey	AI improves operational efficiency and skill development but increases stress and diminishes autonomy
5	Monfared & Alipouri (2026)	AI-Powered IT Resources and Infrastructure	Real-world construction site deployment; wristband IMU sensors; hybrid CNN-BiGRU algorithm; activity classification at two levels (direct/indirect/ineffective work)	Wristband IMU sensors and a hybrid CNN-BiGRU algorithm for automatically recognizing activities on construction sites
6	Ozuru et al (2026)	Employee Job Performance	Explanatory cross-sectional survey; n = 152; Spearman rank correlation	Predictive analytics makes operations faster, helps with resource planning, and lowers the number of mistakes (r = 0.685 with efficiency)
7	Sawicki et al (2026)	Employee Job Performance	Experimental comparison	Perceived performance went up by 21% (NASA-TLX), and productivity at the task level almost tripled.
8	Wang et al (2026)	Employee Job Performance; AI-Powered IT Resources and Infrastructure	Experimental case study (wooden wall panel manufacturing); LMMs; cognitive task analysis; T3 methodology	LMM can predict how cobots will affect workers' performance with 87.5% accuracy
9	Zhou & Flood (2026)	Employee Job Performance	Time-series analysis; probabilistic forecasting methods; construction labor productivity metric development	Probabilistic forecasting of construction labor productivity metrics; real-time control based on neural networks

No.	Author/Year	Variable / Theme	Methodology / Sample	Key Findings
10	Akib & Behzadan (2025)	Employee Job Performance	Systematic literature review	Finds the human factors that affect how well workers do their jobs, how they act, and how they feel about AI implementation.
11	Başaran et al (2025)	Employee Job Performance; AI-Powered IT Resources and Infrastructure	Literature review + ML model development; 6 ML algorithms tested; decision tree algorithm chosen; superstructure project validation	ML-based dynamic model for assessing subcontractor performance in real time; decision tree algorithm.
12	Bernik & Šprajc (2025	Employee Job Performance	Systematic literature review; WoS and Scopus databases; 16 articles	Chatbots improve employees' ability to work, be involved, and come up with new ideas.
13	Chen et al (2025)	AI-Powered IT Resources and Infrastructure, AI-Powered Cloud Platform Readiness	Quantitative analysis (594 WoS papers, 2013–2023) + qualitative analysis (91 high-citation papers); VOSviewer	Since 2018, AI research in infrastructure construction has grown quickly. Key AI technologies make construction safer and more efficient. Research focuses on safety monitoring/control, process management, cost estimation, and quality assessment.
14	Gunrid et al (2025)	AI-Based Skills and Knowledge	Exploratory, abductive research; document reviews, stakeholder interviews, operational observations; IDDS framework case study	AI adoption is slowed down by a lack of structured knowledge-sharing and training; getting employees involved is very important.
15	Khoshkones et al (2025)	AI-Powered IT Resources and Infrastructure, AI-Powered Cloud Platform Readiness	Mixed-method Design Science Research; PRISMA 2020; 12-week empirical validation study	The Lean 5.0 human-centric paradigm shows a 13% increase in Plan Percent Complete (PPC), a 22% decrease in rework, and a 42% increase in forecast accuracy. It links human cognition with predictive control.
16	Li et al (2025)	Employee Job Performance	Mixed-method; bibliometric analysis & systematic review (2014–2024); 3 layers: perception, inference, action	Human-centric human-robot collaboration puts both productivity and human well-being first.
17	Li et al (2025)	AI-Based Skills and Knowledge	Phenomenological qualitative; 20 stakeholder in-depth interviews; NVivo 14 thematic analysis	Suggests a four-pillar strategy for developing talent: institutional support, educational reform, business involvement, and group development
18	Kiruthiga et al (2025)	Employee Job Performance; AI-Powered IT Resources and Infrastructure	Deep learning framework (ResNet + Capsule Networks); feature importance analysis with SHAP	The deep learning framework (ResNet + Capsule Networks) predicts productivity (97.2%) and satisfaction (94.6%). Automation tools make productivity 45% better
19	Mani & Paramasiva (2025)	Employee Job Performance	GBM, SVM, CHAID, ANN training with PCA/RFE feature selection; real-world construction site data	CLHSPI finds dangerous work situations, which makes employees safer, happier, and more productive.
20	Munianda et al (2024)	AI-Based Skills and Knowledge	Systematic literature review; PRISMA method; 50 articles	C4.0 skills acknowledged; workforce training identified as a significant yet insufficiently explored challenge

No.	Author/Year	Variable / Theme	Methodology / Sample	Key Findings
21	Obi et al (2025)	AI-Based Skills and Knowledge	Systematic literature review and meta-analysis; PRISMA framework; VOSviewer; 17 key publications	Eight main areas of AI skills: Data Literacy, AI/ML Basics, Programming, Digital Collaboration Tools, and so on
22	Peng et al (2025)	AI-Powered IT Resources and Infrastructure, AI-Powered Cloud Platform Readiness, Employee Job Performance	Scoping review; 210 relevant articles from Scopus database (1993–2025); keyword co-occurrence analysis	Five main keyword clusters were found, and four main research areas were found: (1) AI techniques and applications, (2) the use of extended reality in HRC, (3) the problems with HRC, and (4) the use of HRC in the AEC sector. This gives researchers and practitioners a better understanding of AI in HRC
23	Putri et al (2025)	Employee Job Performance	Quantitative; Hayes PROCESS Model; 317 Gen Z employees in Indonesia	Servant leadership has a direct negative effect on turnover intention, but it also has a positive effect on principled ethical climate, which greatly increases turnover intention. This shows that Gen Z employees are affected in two ways
24	Taha et al (2025)	Employee Job Performance; AI-Powered IT Resources and Infrastructure	RF, XGBoost, SVR, KNN training with grid search and k-fold cross-validation; SHAP for interpretability	Random Forest predicts how much rebar will be used (R^2 = 0.901 for training and 0.877 for testing); SHAP finds the most important factors
25	Alhasan & Alawadhi (2024)	AI-Based Skills and Knowledge	Mixed method; 90 respondents; linear regression; hierarchical regression	The relationship between Industry 4.0 and performance is significantly changed by employee skill development (R^2 change = 0.009, $p < 0.01$).
26	Onatayo et al (2024)	AI-Based Skills and Knowledge	Six-stage systematic review; 120 papers from Google Scholar, Scopus, and Web of Science	Recognizes essential skills and competencies for successful AI integration; emphasizes the necessity for ongoing professional development

Conclusion

This research concludes that the integration of AI-powered IT resources and infrastructure, AI-powered cloud platform readiness, and AI-based skills and knowledge plays a significant role in improving employees' job performance in the construction industry. The findings indicate that employee performance is most effectively enhanced when technological capabilities are supported by strong organizational readiness and well-developed employee digital competencies, particularly in terms of perceived ease of use, perceived usefulness, and intention to use. Among the key factors examined, AI-based skills and knowledge, along with cloud platform readiness, are identified as the most critical determinants of successful AI adoption and performance improvement, while technological infrastructure provides the necessary enabling foundation. However, this study is primarily based on a literature review approach, which limits empirical validation and generalizability across different construction contexts. Future research should adopt empirical, longitudinal, and mixed-method designs to strengthen the robustness of findings and explore contextual variations such as organizational size, project complexity, and regional digital maturity. Despite these limitations, this study provides valuable theoretical and practical insights into how AI-driven technologies can be strategically leveraged to enhance workforce performance and support digital transformation in the construction industry.

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