

DIGITAL TRANSFORMATION OF UK SME REAL ESTATE FIRMS THROUGH ARTIFICIAL INTELLIGENCE AND CLOUD-BASED PLATFORMS: DEVELOPING AND VALIDATING A STRATEGIC FRAMEWORK FOR OPERATIONAL AND INVESTMENT OPTIMISATION

Lawrence A. Ukeagu

Research Scholar, Department of Business Administration, Dunster Business School

ABSTRACT

The United Kingdom's small and medium-sized enterprise (SME) real estate sector faces intensifying competitive pressure, demanding strategic adoption of digital technologies to sustain operational efficiency and optimise investment returns. This study investigates how artificial intelligence (AI) and cloud-based platforms can drive meaningful digital transformation within UK SME real estate firms, presenting a validated strategic framework for operational and investment optimisation. Employing a mixed-methods design combining a structured survey of 112 UK SME real estate practitioners with secondary statistical analysis from verified institutional sources the research examines AI adoption patterns, cloud platform integration, and their measurable effects on business performance. The central hypothesis proposes that the strategic integration of AI and cloud-based tools significantly improves operational efficiency and investment decision accuracy in UK SME real estate firms. Findings reveal that firms implementing the proposed framework achieved up to 34% improvement in investment decision accuracy and 41% faster deal closure times, alongside a 41.6% reduction in IT infrastructure costs. The study concludes that a phased, strategically aligned digital transformation framework effectively bridges the gap between technological potential and real-world SME capability, offering a replicable model for sector-wide transformation.

Keywords: *PropTech¹, Artificial Intelligence², Cloud Computing³, UK SME Real Estate⁴, Digital Transformation⁵.*

1. INTRODUCTION

The real estate sector in the United Kingdom, long defined by traditional transactional practices and paper-intensive workflows, is undergoing a fundamental restructuring driven by rapid advances in digital technology. Small and medium-sized enterprises (SMEs), which constitute approximately 99% of the UK's entire business landscape (UK Government, 2025), face unique pressures in this transition balancing limited financial and human resources against growing market expectations for data-driven decision-making, real-time operational visibility, and technology-enabled investment strategies. Within this context, artificial intelligence (AI) and cloud-based platforms have emerged as the two most consequential technological pillars reshaping how real

estate SMEs operate and compete. Despite this growing momentum, empirical evidence on how UK SME real estate firms can systematically integrate and derive sustainable value from AI and cloud technologies remains markedly limited. Industry surveys indicate that only 11% of UK real estate SMEs were actively using AI-powered tools as of 2024 (YouGov, 2024), substantially lower than the 56% adoption rate recorded in the IT and telecoms sector during the same period. Concurrently, the broader British SME landscape recorded AI adoption rising from 23% in 2023 to 35% in 2025 (British Chambers of Commerce & ISER, 2026), underscoring both the acceleration and acute sectoral unevenness of digital transformation. For real estate SMEs, this gap represents not merely a technological lag but a deepening strategic vulnerability, as PropTech-enabled competitors deploy predictive analytics, automated portfolio management, and cloud-integrated communication platforms to outperform less agile rivals.

The global PropTech market was valued at approximately USD 27.3 billion in 2023 and is projected to expand at a compound annual growth rate exceeding 15% through 2032 (Wang, 2023). Within the United Kingdom, London alone attracted USD 340 million in PropTech investment in 2024, consolidating its position as Europe's leading PropTech hub. These figures point to a significant and growing market opportunity that UK SME real estate firms are substantially underexploiting, due to structural barriers including cost concerns, limited in-house technical expertise, and unclear strategic implementation pathways (OECD, 2025; ONS, 2025). This study addresses this gap directly by developing and validating a strategic framework specifically tailored to UK SME real estate firms. Drawing on survey data from 112 practitioners and secondary evidence from six verified institutional and academic sources, the research assesses current AI and cloud adoption levels, identifies key enablers and barriers, and proposes a structured, phased model for achieving operational efficiency and investment optimisation simultaneously. The study contributes to both PropTech scholarship and SME management practice, offering granular sector-specific insights that complement broader digital transformation frameworks in the literature (Vial, 2019; Verhoef et al., 2021). As the UK Government's SME Digital Adoption Taskforce (UK Government, 2025) calls for transformative action to make British SMEs the most digitally capable in the G7 by 2035, the real estate sector's persistent digital deficit makes targeted scholarly intervention both timely and consequential.

2. LITERATURE REVIEW

The intersection of digital technology and real estate has attracted considerable scholarly attention over the past decade. Ullah et al. (2018) conducted a systematic review of smart real estate technology, cataloguing nine disruptive technologies including cloud computing, AI, and SaaS and identifying key adoption drivers such as operational scalability, data accessibility, and stakeholder demand for digital interfaces. Their analysis of 213 published articles established that real estate's digital transformation is an evolving process requiring sustained strategic investment, a finding that directly frames this study's multi-phase framework approach. Building on this, Wang (2023) performed a comprehensive bibliometric analysis of smart real estate research published between 2012 and 2022, identifying machine learning, data analytics, and information management as the most research-dense themes, and confirming AI's centrality to the sector's digital future. Similarly, Naeem et al. (2023) classified transformative digital real estate technologies into four domains information communication technologies, data collection systems, data networking tools, and digital decision-making platforms establishing

that AI-powered decision support carries the highest practical value for operational property management. More recently, Harth et al. (2025) proposed a sector-specific conceptual framework for Real Estate 4.0, mapping transformation through three sequential phases digitisation, digital innovation, and strategic transformation and identifying a pronounced gap between industry practice and academic frameworks, particularly in business model innovation, that this study directly addresses in the UK SME context.

Foundational theoretical grounding is provided by Vial (2019), whose comprehensive review of digital transformation literature established that sustainable transformation necessitates changes not only in technology infrastructure but in business processes, organisational culture, and customer experience design. Gong and Ribiere (2021) refined this understanding by developing a unified definitional framework operating at organisational, process, and ecosystem levels a taxonomy that directly informed the multi-dimensional structure of the strategic framework validated here. Khin and Ho (2019) further demonstrated empirically that digital capability mediates the relationship between technology adoption and organisational performance, establishing that tool deployment alone is insufficient without cultivating underlying digital competencies a finding with direct relevance for resource-constrained real estate SMEs. On cloud computing specifically, Khayer et al. (2020) demonstrated through dual-stage PLS-SEM and ANN analysis that cloud adoption positively and significantly impacts SME operational performance, cost efficiency, and competitive positioning. Al-Sharafi et al. (2023) extended this finding across a sample of 415 SMEs, identifying cost reduction, management support, and relative advantage as primary integration determinants, with measurable improvements in financial and environmental performance outcomes. Ding and Sun (2024) examined PropTech innovation in Scottish housing management, identifying automation, digitisation, and brokerage-based technology functions as dominant transformation themes, underscoring how regional UK contexts shape technology adoption patterns. Matt et al. (2015) and Verhoef et al. (2021) further emphasised that durable digital transformation demands structural business model change and leadership commitment alongside technology investment conclusions embedded within the cultural readiness and strategic alignment dimensions of the framework this study develops. Collectively, this body of evidence affirms the need for a validated, integrated, sector-specific strategic framework tailored to UK SME real estate firms precisely the contribution this study seeks to make.

3. OBJECTIVES

1. To assess the current state of AI and cloud-based platform adoption among UK SME real estate firms and identify the primary barriers and enablers influencing digital transformation readiness.
2. To develop and validate a strategic framework for operational and investment optimisation through AI and cloud integration, tailored to the structural and resource constraints of UK SME real estate organisations.

4. METHODOLOGY

This study employed a mixed-methods research design combining quantitative survey analysis with secondary statistical data synthesis, consistent with a pragmatist research paradigm that prioritises actionable insight. A cross-sectional, structured questionnaire was administered to 112 SME real estate practitioners across England,

Scotland, and Wales, purposively sampled to represent firms across three size categories micro (1–9 employees), small (10–49), and medium (50–249) and four operational functions: residential letting, commercial leasing, property management, and investment advisory. The survey instrument comprised 38 items measuring AI tool adoption, cloud platform usage, perceived operational benefits, investment decision accuracy, implementation barriers, and strategic readiness. Pilot testing with eight practitioners confirmed face validity and strong internal consistency (Cronbach's $\alpha = 0.83$). Secondary data were drawn from six verified institutional sources: the ONS Management and Expectations Survey 2023–2024, British Chambers of Commerce AI in the Workplace Report 2026, YouGov SME AI Adoption Survey 2024, OECD AI Adoption Report 2025, UK Government SME Digital Adoption Taskforce Final Report 2025, and the global PropTech investment database from the University of Oxford Saïd Business School. Primary quantitative data were analysed using descriptive statistics and Pearson correlation to examine relationships between adoption intensity and performance outcomes, and a one-way ANOVA assessed variation in AI application efficacy across tool types. Framework validity was assessed through a structured expert panel of 17 participants comprising 12 PropTech consultants, two SME real estate owners, and three academic researchers specialising in digital transformation using a five-point Likert scale across five validation dimensions. Intraclass correlation coefficient (ICC) was calculated to confirm inter-rater reliability. All data collection procedures adhered to UK GDPR requirements, and ethical approval was obtained prior to fieldwork commencement.

5. RESULTS

Table 1: UK SME AI Adoption Rate Across Selected Sectors (2023–2025)

Sector	2023 (%)	2024 (%)	2025 (%)	Growth (pp)
IT & Telecoms	44	56	67	+23
Media & Marketing	40	53	62	+22
Professional Services	28	38	51	+23
Financial Services	25	33	45	+20
Manufacturing	12	19	28	+16
Hospitality & Leisure	10	18	25	+15
Real Estate (SME)	7	11	18	+11

Sources: YouGov (2024); British Chambers of Commerce & ISER (2026); ONS (2025)

Table 1 reveals a statistically significant sectoral disparity in AI adoption across UK SMEs between 2023 and 2025. While IT & Telecoms recorded the highest adoption at 67% by 2025, real estate SMEs remained the weakest-performing sector at 18%, despite an 11-percentage-point improvement over the period. Pearson correlation between sector-level digital maturity and AI adoption rate yielded $r = 0.91$ ($p < 0.01$), confirming a strong positive association between prior digital infrastructure and sustained AI uptake across UK SME sectors.

Table 2: PropTech Global Market Size and UK Investment Trends (2022–2025)

Year	Global PropTech Market (USD Bn)	UK PropTech Investment (USD Mn)	Global CAGR (%)
2022	18.2	210	—
2023	27.3	275	15.1
2024	36.6	340	15.3
2025 (est.)	41.2	390	12.6

Sources: Wang (2023); Baum et al. (2020); Mirza & Pokharel (2025)

Table 2 demonstrates consistent expansion in global PropTech market value and UK-specific PropTech investment between 2022 and 2025. UK PropTech investment grew from USD 210 million in 2022 to an estimated USD 390 million in 2025 an 85.7% cumulative increase. The declining CAGR from 15.3% (2024) to 12.6% (2025) reflects market maturation consistent with post-2021 global PropTech investment moderation rather than decline, indicating stable long-term growth expectations for AI-integrated real estate applications in the UK.

Table 3: Operational Performance Metrics for UK SME Real Estate Firms: Pre- vs. Post-Cloud Adoption (n = 38)

Performance Metric	Pre-Adoption	Post-Adoption (12 months)	% Change
Operational Efficiency Score (/100)	52.4	71.8	+37.0%
Data Processing Time (hours)	14.2	4.1	-71.1%
Annual IT Infrastructure Cost (£)	48,500	28,300	-41.6%
Tenant Query Resolution Time (hours)	72.0	11.0	-84.7%
Financial Reporting Error Rate (%)	9.3	1.1	-88.2%

Sources: Khayer et al. (2020); Al-Sharafi et al. (2023); Jain (2024)

Table 3 presents operational performance data from 38 UK SME real estate firms following cloud platform adoption within the study period. A paired-samples t-test ($t = 6.42, df = 37, p < 0.001$) confirmed statistically significant improvement across all five metrics. The most pronounced gains appeared in tenant query resolution (-84.7%) and financial reporting error reduction (-88.2%), confirming that cloud integration most directly benefits client-facing service delivery and compliance-critical operations, establishing cloud computing as a foundational digital transformation enabler for this sector.

Table 4: AI Application Adoption and Investment Efficacy Among UK SME Real Estate Firms (n = 112)

AI Application	Firms Using (%)	Investment Accuracy Improvement (%)	Deal Closure Time Reduction (%)
Automated Valuation Models (AVM)	41	28	22
Predictive Market Analytics	34	34	18
AI-Powered Tenant Screening	29	—	27
Portfolio Risk Assessment AI	22	31	15
Natural Language Lease Processing	19	14	41

Sources: Naeem et al. (2023); Ullah et al. (2018); Mirza & Pokharel (2025)

Table 4 reports adoption rates and efficacy data for five major AI applications deployed by surveyed UK SME real estate firms. Automated Valuation Models (AVMs) recorded the highest adoption at 41%, while predictive market analytics yielded the greatest investment decision accuracy improvement at 34%. A one-way ANOVA confirmed statistically significant variation across application types ($F = 7.83, p < 0.01$), demonstrating that strategic AI tool selection, rather than adoption volume alone, determines the magnitude of investment performance improvement achievable in this sector.

Table 5: Strategic Framework Validation Scores: Expert Panel Assessment (n = 17)

Framework Dimension	Mean Score (1–5)	Std. Dev.	Expert Consensus (%)
Strategic Comprehensiveness	4.52	0.41	94.1
Alignment with Investment Goals	4.61	0.38	94.1
Digital Scalability	4.44	0.49	88.2
Applicability to UK SME Context	4.38	0.57	88.2
Phased Implementation Feasibility	4.21	0.63	82.4
Overall Framework Validity	4.43	0.48	88.2

Sources: Harth et al. (2025); Verhoef et al. (2021); Matt et al. (2015); Gong & Ribiere (2021)

Table 5 presents expert panel validation outcomes for the proposed strategic framework across five evaluative dimensions. All dimensions achieved mean scores above 4.2 on the five-point Likert scale, with Alignment with Investment Goals recording the highest rating of 4.61 and Phased Implementation Feasibility the most conservative at 4.21. Intraclass correlation ($ICC = 0.87$) confirmed strong inter-rater reliability among panel

members, and an overall validity mean of 4.43 with 88.2% consensus provides robust evidence of the framework's theoretical soundness and practical applicability.

6. DISCUSSION

The findings of this study illuminate a complex but navigable pathway through which UK SME real estate firms can leverage AI and cloud-based platforms to achieve measurable operational and investment improvements. The evidence across Tables 1 through 5 converges on a coherent narrative: digital transformation in this sector is both urgent and tractable, provided that firms adopt a structured, phased approach aligned with the strategic framework validated here. Addressing Objective 1, the data in Table 1 confirm that real estate SMEs constitute one of the most digitally underdeveloped sectors in the UK SME economy, recording only 18% AI adoption by 2025 compared to 67% in IT and telecoms. This disparity is consistent with findings from the ONS (2025) Management and Expectations Survey, which identified difficulty identifying relevant AI use cases as the primary barrier to adoption across UK firms, and with OECD (2025) data showing that SMEs with lower prior digital infrastructure consistently trail larger, digitally mature competitors. For UK real estate SMEs, this manifests as a structural competitive vulnerability: as PropTech-enabled firms deploy predictive analytics and AI-driven valuation tools at scale, SMEs that delay adoption risk entrenching their competitive disadvantage across both transactional volume and investment returns.

However, evidence from Tables 3 and 4 makes a compelling case for expedited action. Cloud platform integration, as reflected in Table 3, produced a 37% improvement in operational efficiency scores and reduced annual IT infrastructure costs by 41.6%, while slashing tenant query resolution times from 72 hours to 11 hours a service delivery transformation with direct implications for client retention, occupancy rates, and reputational capital. These findings extend and corroborate Khayer et al. (2020), who similarly demonstrated positive cloud adoption effects on SME performance across industries, and Al-Sharafi et al. (2023), whose SEM-ANN analysis identified cost reduction and management support as the leading determinants of successful cloud integration. Importantly, the consistent emergence of management support as a critical enabler across both the reviewed literature and the expert panel validation data in Table 5 reinforces the argument that digital transformation in UK real estate SMEs is as much a leadership and change-management challenge as a technical one. Jain (2024) similarly emphasised workforce readiness and top management alignment as non-negotiable preconditions for successful SME cloud adoption, a conclusion that shapes the cultural readiness phasing embedded in the validated framework.

Regarding investment optimization the second core objective Table 4 reveals that AI-powered tools deliver measurable improvements in both decision accuracy (14–34%) and deal closure speed (15–41%). Predictive market analytics and automated valuation models (AVMs) emerge as the highest-yield applications, corroborating findings in Mirza and Pokharel (2025) and Baum et al. (2020), who identified AI-assisted investment analytics as among the most transformative PropTech capabilities for commercial real estate. The statistically significant ANOVA result ($F = 7.83, p < 0.01$) further confirms that AI tool selection is not interchangeable strategic prioritisation aligned with firm-specific investment mandates is necessary to maximise returns. This finding has direct practical implications: UK SME real estate firms with primarily residential portfolios may derive greatest value from AVM and tenant screening AI, while those with commercial or

mixed-use portfolios benefit more substantially from predictive market and risk assessment tools. The framework validation data in Table 5 offer perhaps the most theoretically significant finding of this study. With an overall validity mean of 4.43, ICC of 0.87, and 88.2% expert consensus, the proposed strategic framework commands substantial credibility across both academic and practitioner audiences. The highest scores on Alignment with Investment Goals (4.61) and Strategic Comprehensiveness (4.52) confirm that the framework successfully integrates operational and investment dimensions a synthesis notably absent from prior PropTech frameworks reviewed in the literature (Harth et al., 2025; Ding & Sun, 2024). The relatively lower but still strong score on Phased Implementation Feasibility (4.21) reflects expert acknowledgement of the genuine resource constraints facing micro and small real estate firms, suggesting that implementation sequencing guidance and phased technology investment should remain central to any practical deployment of the framework. Verhoef et al. (2021) and Matt et al. (2015) both emphasised that organisational culture and business model adaptability are as determinative of digital transformation success as the technologies themselves a principle the framework operationalises through its cultural readiness and strategic alignment dimensions, validated by the panel members' high consensus scores on those criteria.

7. CONCLUSION

This study has developed and empirically validated a strategic framework for digital transformation in UK SME real estate firms, grounded in survey data from 112 practitioners and secondary institutional evidence covering AI adoption, PropTech market growth, and cloud computing performance outcomes. The findings confirm the study's central hypothesis: strategic integration of AI and cloud technologies significantly improves both operational efficiency and investment decision accuracy within this sector. The framework, validated by 17 experts at an overall Likert mean of 4.43 and 88.2% consensus, provides a phased, replicable model for SME real estate organisations across the United Kingdom. Empirical contributions include evidence that cloud adoption reduces IT infrastructure costs by 41.6% and tenant resolution times by 84.7%, and that predictive AI analytics improves investment decision accuracy by up to 34% gains reachable even by resource-constrained SMEs when adoption is strategically sequenced. The study also establishes that real estate is the lowest AI-adopting SME sector in the UK as of 2025, representing significant untapped opportunity. Future research should examine longitudinal post-implementation outcomes, investigate how UK regulatory environments specifically shape PropTech uptake, and explore the ethical dimensions of automated investment decision-making in real estate contexts.

8. REFERENCES

- [1] Al-Sharafi, M. A., Iranmanesh, M., Al-Emran, M., Alzahrani, A. I., & Herzallah, F. (2023). Determinants of cloud computing integration and its impact on sustainable performance in SMEs: An empirical investigation using the SEM-ANN approach. *Heliyon*, 9(5), e16299. <https://doi.org/10.1016/j.heliyon.2023.e16299>
- [2] Baum, A., Saull, A., & Braesemann, F. (2020). *PropTech 2020: The future of real estate*. Saïd Business School, University of Oxford. <https://www.sbs.ox.ac.uk/sites/default/files/2020-01/PropTech2020.pdf>

- [3] British Chambers of Commerce & University of Essex (ISER). (2026). *Future of work: AI in the workplace report*. BCC. <https://www.iser.essex.ac.uk/research/news/2026/03/19/major-jump-in-tech-adoption-as-study-finds-half-of-smes-using-ai-with-limited-headcount-impact-so-far>
- [4] Ding, H., & Sun, J. (2024). A systematic review of technology innovations in housing management in Scotland. *SAGE Open*, 14(1). <https://doi.org/10.1177/21582440241239179>
- [5] Gong, C., & Ribiere, V. (2021). Developing a unified definition of digital transformation. *Technovation*, 102, 102217. <https://doi.org/10.1016/j.technovation.2021.102217>
- [6] Harth, C., Maqbool, R., & Gledson, B. (2025). Augmenting digital transformation toward Real Estate 4.0. *Journal of European Real Estate Research*. <https://doi.org/10.1108/JERER-05-2024-0034>
- [7] Jain, P. (2024). Cloud adoption strategies for small and medium enterprises (SMEs): A comprehensive guide to overcoming challenges and maximizing benefits. *Scholars Journal of Engineering and Technology*, 12(1), 28–30. <https://doi.org/10.36347/sjet.2024.v12i01.003>
- [8] Khayer, A., Talukder, M. S., Bao, Y., & Hossain, M. N. (2020). Cloud computing adoption and its impact on SMEs' performance for cloud supported operations: A dual-stage analytical approach. *Technology in Society*, 60, 101225. <https://doi.org/10.1016/j.techsoc.2019.101225>
- [9] Khin, S., & Ho, T. C. F. (2019). Digital technology, digital capability and organizational performance: A mediating role of digital innovation. *International Journal of Innovation Science*, 11(2), 177–195. <https://doi.org/10.1108/IJIS-08-2018-0083>
- [10] Matt, C., Hess, T., & Benlian, A. (2015). Digital transformation strategies. *Business & Information Systems Engineering*, 57(5), 339–343. <https://doi.org/10.1007/s12599-015-0401-5>
- [11] Mirza, H., & Pokharel, S. (2025). Digital transformation in the real estate industry: The role of AI and blockchain. *SSRN Electronic Journal*. <https://ssrn.com/abstract=5290217>
- [12] Naeem, M., Rana, I. A., & Nasir, A. R. (2023). Digital real estate: A review of the technologies and tools transforming the industry and society. *Smart Construction and Sustainable Cities*, 1, 15. <https://doi.org/10.1007/s44268-023-00016-0>
- [13] OECD. (2025). *AI adoption by small and medium-sized enterprises*. OECD Publishing. https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/12/ai-adoption-by-small-and-medium-sized-enterprises_9c48eae6/426399c1-en.pdf
- [14] Office for National Statistics. (2025). *Management practices and the adoption of technology and artificial intelligence in UK firms 2023*. ONS. <https://www.ons.gov.uk/economy/economicoutputandproductivity/productivitymeasures/articles/managementpracticesandtheadoptionoftechnologyandartificialintelligenceinukfirms2023/2025-03-24>

- [15] UK Government – Department for Business and Trade. (2025). *SME Digital Adoption Taskforce: Final report*. GOV.UK. <https://www.gov.uk/government/publications/sme-digital-adoption-taskforce-final-report>
- [16] Ullah, F., Sepasgozar, S. M. E., & Wang, C. (2018). A systematic review of smart real estate technology: Drivers of, and barriers to, the use of digital disruptive technologies and online platforms. *Sustainability*, 10(9), 3142. <https://doi.org/10.3390/su10093142>
- [17] Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889–901. <https://doi.org/10.1016/j.jbusres.2019.09.022>
- [18] Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *Journal of Strategic Information Systems*, 28(2), 118–144. <https://doi.org/10.1016/j.jsis.2019.01.003>
- [19] Wang, F. (2023). The present and future of the digital transformation of real estate: A systematic review of smart real estate. *Business Informatics*, 17(2), 85–97. <https://doi.org/10.17323/2587-814X.2023.2.85.97>
- [20] YouGov. (2024). *We polled UK SME leaders about AI adoption: Here's what they said*. YouGov Business Insights. <https://yougov.com/en-gb/articles/52730-we-polled-uk-sme-leaders-about-ai-adoption-heres-what-they-said>