

International Journal of Management and Marketing Intelligence	International Journal of Management and Marketing Intelligence, 3(1), 1-9.	
	Volume: 3	http://ijmmi.com
	Issue: 1	ISSN: 3080-860X
	Received: January 05, 2026	Accepted: March 11, 2026
	<i>Citation: Ahmad, A. & Alshurideh, M. T. (2025) From Technology Acceptance to Value Realisation: Extending UTAUT for Digital Facility Management Implementation. International Journal of Management and Marketing Intelligence 3(1), 1-9. DOI: https://doi.org/10.64251/ijmmi.107</i>	

From Technology Acceptance to Value Realisation: Extending UTAUT for Digital Facility Management Implementation

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ARTICLE DETAILS	ABSTRACT
<p>Article History Published Online: March 2026</p> <hr/> <p>Keywords Digital facility management Technology adoption UTAUT Implementation readiness Smart buildings IoT UAE</p> <hr/> <p>JEL Codes L90, O33, R30</p> <hr/> <p>Corresponding Author Email: u19106242@sharjah.ac.ae</p>	<p>Digital facility management (FM) systems are increasingly promoted as enablers of operational efficiency, sustainability, and smart building performance. Despite substantial investment in digital FM platforms, many organisations struggle to achieve sustained use and measurable operational value. Existing research has primarily focused on technology acceptance, offering limited insight into how adoption translates into effective implementation and value realisation. This study investigates the determinants of digital facility management adoption and extends acceptance theory towards a value-oriented perspective. This study contributes to the facilities management literature by extending UTAUT beyond technology acceptance to incorporate implementation readiness and value realisation. It proposes an integrated conceptual framework that positions digital facility management as a value-driven organisational capability, offering both theoretical advancement and practical guidance for FM professionals and policymakers. An explanatory sequential mixed-methods research design was employed. Qualitative data were collected through in-depth interviews and focus group discussions with facility managers to explore perceptions of digital FM adoption and implementation challenges. These insights informed a large-scale quantitative survey of 407 facility management professionals in the United Arab Emirates. Data were analysed using thematic analysis, relative importance index, principal component analysis, and ordinal regression, guided by the Unified Theory of Acceptance and Use of Technology (UTAUT). The findings confirm that performance expectancy and effort expectancy are the primary drivers of digital FM adoption intention. However, successful adoption outcomes are strongly influenced by implementation readiness factors, particularly technical infrastructure, compliance and regulatory alignment, resource availability, and organisational governance. Managerial level significantly moderates adoption perceptions, with senior managers emphasising strategic value and compliance, while frontline managers prioritise usability and workflow integration. For facility management practitioners, the results indicate that digital FM success depends not only on user acceptance but also on organisational readiness and governance capability. Digital FM initiatives should therefore be supported by readiness assessments, role-specific implementation strategies, and compliance-aware system design to bridge the gap between adoption and operational value.</p>

1. INTRODUCTION

Facility management (FM) has progressively evolved from a predominantly operational support function into a strategic organisational discipline that contributes directly to organisational performance, asset value, sustainability outcomes, and occupant experience (Barrett & Baldry, 2009; Becker & Steele, 1990; Elmualim et al., 2012). Contemporary FM integrates people, processes, place, and technology to support organisational objectives within increasingly complex built environments (Appleby, 2018). In recent years, digital transformation has emerged as a central imperative for the FM sector. Digital facility management systems, including integrated workplace management systems (IWMS), building information modelling (BIM), Internet of Things (IoT) platforms, and advanced data analytics, are promoted as enablers of improved operational efficiency, predictive maintenance, energy optimisation, and data-driven decision-making (Jia et al.,

2019; Kensek, 2015a; Prodders, 2014). Within smart buildings, digital FM platforms increasingly function as the operational interface between physical assets and digital intelligence (Buckman et al., 2014; Ghaffarianhoseini et al., 2018).

Despite growing investment in digital FM technologies, evidence from both academic research and industry practice suggests that successful adoption remains uneven. While many organisations deploy digital FM systems, a significant proportion struggle to achieve sustained use, organisational integration, and measurable operational value (Schulze, 2019; Trzaska et al., 2021). This persistent gap between digital adoption and realised value has become a recurring concern within the FM profession, raising questions about the effectiveness of prevailing implementation and governance approaches (Prodders, 2014). Existing research on digital transformation in FM has largely focused on technological capabilities and system functionalities, often assuming that technology deployment naturally leads to improved performance outcomes. Studies highlight benefits such as enhanced asset visibility, improved maintenance planning, and energy efficiency gains, particularly within IoT-enabled and smart building environments (Jia et al., 2019; Wong et al., 2018). However, such studies frequently underemphasise organisational readiness, managerial practices, and contextual constraints that influence whether digital technologies deliver sustained value in practice (Goulden & Spence, 2015). Also, within the information systems literature, technology acceptance models have been widely used to explain user adoption behaviour. The Unified Theory of Acceptance and Use of Technology (UTAUT) is among the most established frameworks, identifying performance expectancy, effort expectancy, social influence, and facilitating conditions as key determinants of behavioural intention and system use (Venkatesh et al., 2003). UTAUT has been validated across multiple organisational settings and has increasingly been applied in built environment and FM-related research (Curtis et al., 2017; Mawed & Al-Hajj, 2017). However, studies applying acceptance models within FM contexts tend to focus primarily on individual-level perceptions of usefulness and ease of use. Digital FM initiatives, by contrast, operate within complex organisational ecosystems characterised by regulatory requirements, legacy infrastructure, outsourced service arrangements, and hierarchical governance structures (Goulden & Spence, 2015). As a result, user acceptance alone does not guarantee effective implementation or value realisation. Emerging evidence suggests that factors such as technical infrastructure readiness, data quality, system interoperability, compliance alignment, and managerial support play a decisive role in shaping post-adoption outcomes (Kensek, 2015a; Schulze, 2019; Wong et al., 2018).

The Middle East, and the United Arab Emirates (UAE) in particular, provides a timely and relevant context for examining these dynamics. The UAE has invested heavily in smart city initiatives, intelligent infrastructure, and digital transformation across the built environment, positioning FM as a critical enabler of national sustainability and innovation agendas (Mawed & Al-Hajj, 2017). Facility managers in the region operate within technologically advanced yet highly regulated environments, making them well placed to provide insight into both the opportunities and challenges of digital FM adoption. Responding to calls within the FM literature for empirically grounded research that addresses the organisational realities of digital transformation, this study adopts an explanatory sequential mixed-methods approach to examine digital facility management adoption among FM professionals in the UAE. Building on prior qualitative and quantitative investigations, the study moves beyond acceptance-centric explanations to explore how adoption interacts with implementation readiness and organisational context. Specifically, the study extends the UTAUT framework by incorporating implementation-oriented factors, including technical infrastructure, governance structures, compliance considerations, and managerial role differentiation. By doing so, it positions digital facility management not merely as a technological intervention, but as a value-driven organisational capability that requires alignment between people, processes, and digital systems. To sum up, this paper makes three key contributions to the facilities management literature. First, it provides empirical evidence on the determinants of digital FM adoption and use within a rapidly digitising FM context. Second, it advances theory by extending UTAUT to incorporate implementation readiness and value realisation considerations relevant to FM practice. Third, it offers practical insights for FM professionals, policymakers, and technology providers seeking to bridge the persistent gap between digital investment and sustained operational value.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Evolution of facility management and digital transformation.

Facility management (FM) has undergone a substantial transformation over the past three decades, evolving from a function focused primarily on building maintenance and service delivery into a strategic organisational capability that supports business objectives, sustainability, and performance optimisation (Barrett & Baldry, 2009; Becker, 1990; Tucker & Masuri, 2016). Contemporary FM integrates physical assets, people, processes, and technology to enable organisational effectiveness across increasingly complex built environments (Appleby, 2018). Additionally, digital transformation has become a defining feature of this evolution. Early digital adoption in FM was characterised by the introduction of Computer-Aided Facility Management (CAFM) systems, which supported basic work order management and asset tracking (Prodders, 2014). More recently, FM digitalisation has expanded to include integrated workplace management systems (IWMS), building information modelling (BIM), Internet of Things (IoT) platforms, real-time analytics, and automation technologies (Jia et al., 2019; Kensek, 2015a). These technologies enable predictive maintenance, energy optimisation, data-driven decision-making, and enhanced service delivery across the FM lifecycle. Within smart building environments, digital FM systems increasingly serve as the operational interface between physical assets and intelligent infrastructure. IoT-enabled buildings integrate sensors, controllers, and analytics platforms to monitor and adapt building performance in real time, supporting energy efficiency, occupant comfort, and operational resilience (Buckman et al., 2014; Ghaffarianhoseini et al., 2018). However, empirical evidence indicates that the benefits of digital FM technologies are not automatically realised through deployment alone. Many organisations experience partial

implementation, underutilisation, or limited integration with organisational processes, resulting in a persistent gap between digital investment and value realisation (Schulze, 2019; Trzaska et al., 2021).

2.2. Digital facility management systems and smart building context.

Digital facility management systems represent an integrated approach to managing facilities through digital platforms that consolidate asset information, maintenance activities, energy data, and operational workflows. In IoT-enabled smart buildings, digital FM systems support real-time monitoring, predictive maintenance, and automated control of building subsystems such as HVAC, lighting, security, and energy management (Jia et al., 2019; Wong et al., 2018). The literature on smart buildings highlights significant potential benefits, including reduced energy consumption, improved maintenance efficiency, enhanced indoor environmental quality, and improved occupant satisfaction (Buckman et al., 2014; Ghaffarianhoseini et al., 2018). Recent studies also emphasise the role of IoT retrofitting in modernising legacy buildings, allowing organisations to achieve smart building capabilities without complete infrastructure replacement (Risteska Stojkoska & Trivodaliev, 2017). Despite these advantages, smart building and digital FM research consistently identifies implementation challenges. These include system interoperability, data quality, cybersecurity risks, integration with legacy infrastructure, and regulatory compliance requirements (Kensek, 2015a; Schulze, 2019; Wong et al., 2018). These challenges highlight the importance of organisational readiness and governance capability in determining whether digital FM systems deliver sustained operational value.

2.3. Technology acceptance research in facility management.

Understanding user acceptance has been a central concern in the adoption of digital technologies. Early models such as the Technology Acceptance Model (TAM) emphasised perceived usefulness and perceived ease of use as key predictors of technology adoption (Davis, 1989). Subsequent developments led to the Unified Theory of Acceptance and Use of Technology (UTAUT), which integrates multiple acceptance theories and identifies four core determinants of behavioural intention and use behaviour: performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). UTAUT has been widely validated across organisational and technological contexts and has increasingly been applied in built environment and FM research. Studies in FM contexts demonstrate that performance expectancy and effort expectancy are consistently strong predictors of digital system adoption, particularly when systems are perceived to enhance operational efficiency and reduce workload complexity (Curtis et al., 2017; Mawed & Al-Hajj, 2017). Your qualitative and quantitative investigations among UAE facility managers further confirm the relevance of UTAUT constructs in explaining digital FM adoption. Findings indicate that performance expectancy, particularly related to operational efficiency, financial impact, and quality assurance, is the dominant driver of adoption intention. Effort expectancy, influenced by usability, workflow integration, and training, also plays a critical role, particularly for frontline and middle-level managers.

2.4. Limitations of acceptance-centric explanations.

While UTAUT and related acceptance models provide valuable insights into adoption intention, their application within FM contexts reveals important limitations. Digital FM initiatives are embedded within complex organisational environments characterised by hierarchical management structures, outsourced service delivery models, regulatory constraints, and legacy technical systems (Goulden & Spence, 2015). In such contexts, individual acceptance does not necessarily translate into effective implementation or sustained system use. Empirical FM research increasingly demonstrates that facilitating conditions extend beyond basic technical support and training. Factors such as technical infrastructure readiness, system interoperability, data governance, compliance with legal and regulatory requirements, and organisational resource allocation significantly influence post-adoption outcomes (Kensek, 2015a; Schulze, 2019; Wong et al., 2018). Your qualitative findings reinforce this perspective, identifying technical infrastructure and compliance and legal aspects as critical themes influencing acceptance and effective use, particularly within highly regulated environments such as the UAE. These findings align with broader smart building literature, which emphasises that digital value creation depends on socio-technical alignment rather than technology deployment alone (Buckman et al., 2014; Jia et al., 2019). As such, acceptance-centric models must be extended to account for implementation readiness and governance capability to fully explain digital FM outcomes.

2.5. Theoretical positioning and research gap.

The review highlights a clear gap in the FM literature. While technology acceptance models such as UTAUT effectively explain individual adoption behaviour, they offer limited insight into how digital FM systems translate into organisational value. Conversely, smart building and digital infrastructure research emphasises technological capability but often underplays user acceptance and managerial behaviour. This study addresses this gap by extending UTAUT within the FM context to incorporate implementation readiness dimensions identified through empirical investigation. By integrating acceptance drivers with organisational, technical, and governance factors, the study responds to calls for more contextually grounded, practice-oriented FM research (Schulze, 2019; Trzaska et al., 2021). The resulting theoretical foundation positions digital facility management as a value-driven organisational capability, rather than a standalone technology adoption decision. This perspective underpins the conceptual framework developed in later sections and provides a robust basis for examining digital FM adoption and value realisation in complex FM environments.

3. METHODOLOGY

3.1. Research design.

This study adopts an explanatory sequential mixed-methods research design, combining qualitative and quantitative approaches to examine digital facility management adoption and value realisation. Mixed-methods designs are particularly appropriate for research in facilities

management, where socio-technical systems, organisational processes, and human behaviour interact in complex ways (Bryman, 2006; Creswell & Creswell, 2017). Additionally, the qualitative phase was conducted first to explore facility managers' perceptions, experiences, and contextual challenges related to digital FM adoption. Insights from this phase informed the design of the quantitative survey instrument and the interpretation of statistical findings. This sequential approach strengthens analytical depth and supports triangulation between qualitative insight and quantitative generalisability (Creswell & Creswell, 2017). Also, the study is underpinned by a pragmatic research philosophy, which prioritises practical problem-solving and methodological flexibility. Pragmatism is well suited to applied FM research, as it enables the integration of theory development with practitioner-relevant insights (Kwadwo Antwi & Hamza, 2015).

3.2. Research context.

The empirical context of the study is the United Arab Emirates (UAE). The UAE has experienced rapid development in smart cities, intelligent infrastructure, and digital transformation across the built environment. Facility managers in the UAE operate within technologically advanced yet highly regulated environments, making the context particularly suitable for examining both acceptance and implementation readiness in digital FM systems (Mawed & Al-Hajj, 2017). The FM sector in the UAE spans commercial, residential, healthcare, hospitality, and public infrastructure assets. Regulatory requirements related to safety, sustainability, data governance, and compliance further shape digital FM implementation practices, reinforcing the relevance of this context for examining post-adoption outcomes.

3.3. Qualitative research phase.

3.3.1. Data collection and sampling.

The qualitative phase employed semi-structured interviews and focus group discussions to capture facility managers' lived experiences of digital FM adoption. A purposive sampling strategy was used to select participants with direct responsibility for FM operations, system implementation, or digital decision-making. Participants represented senior, middle, and operational management levels to reflect the hierarchical structure of FM organisations. Data collection continued until thematic saturation was achieved, consistent with established qualitative research practices (Bryman, 2006). Interviews and discussions were conducted in English and Arabic to ensure inclusivity and were audio-recorded with participant consent.

3.3.2. Qualitative data analysis.

Qualitative data were analysed using thematic analysis, following a structured process of familiarisation, coding, theme development, and interpretation (Pope et al., 2000). Initial coding was guided deductively by UTAUT constructs, while inductive coding allowed additional themes to emerge from the data. Two themes extending beyond the original UTAUT framework, technical infrastructure and compliance and legal considerations, were identified as critical factors influencing digital FM adoption and effective use. These themes informed both the survey design and the extension of the theoretical framework. To enhance credibility and trustworthiness, coding decisions were reviewed iteratively and findings were cross-checked against quantitative results during interpretation (Creswell & Poth, 2016).

3.4. Quantitative research phase.

3.4.1. Survey instrument design.

The quantitative phase employed a cross-sectional survey design, commonly used in FM and technology adoption research (Ponto, 2015). The survey instrument was developed based on validated UTAUT constructs and adapted to the digital facility management context (Venkatesh et al., 2003). Findings from the qualitative phase were used to contextualise survey items and ensure relevance to FM practice. To reduce respondent burden and improve clarity, related factors were grouped into thematic constructs, following established approaches in FM research.

3.4.2. Data collection and sample characteristics.

The target population consisted of facility management professionals operating in the UAE. Due to the absence of a comprehensive national FM registry, a non-probability sampling approach was adopted, using professional networks and industry channels. A total of 407 valid responses were collected, exceeding minimum sample size requirements for reliable statistical analysis in applied social research (Bryman, 2006). Respondents represented diverse FM sectors and managerial levels, enhancing the robustness of the dataset.

3.4.3. Data analysis techniques.

Quantitative data were analysed using IBM SPSS. The analysis followed a multi-stage approach:

- Relative Importance Index (RII) analysis was used to rank adoption factors based on practitioner priorities (Al-Saleh & Al-Kadiri, 2000).
- Principal Component Analysis (PCA) was conducted to assess construct validity, supported by Kaiser–Meyer–Olkin and Bartlett's tests (Hair et al., 1998; Kaiser, 1974).
- Regression analysis was used to examine relationships between UTAUT constructs, behavioural intention, and use behaviour, accounting for the ordinal nature of the dependent variables (Agresti, 2012).
- Internal consistency reliability was assessed using Cronbach's alpha, with values exceeding accepted thresholds (Gliem & Gliem, 2003).

3.5. Ethical considerations.

Ethical approval was obtained prior to data collection. Participants were informed of the study's purpose, confidentiality measures, and their right to withdraw at any time. Informed consent was obtained, and all data were anonymised and securely stored in accordance with research ethics guidelines (Bryman, 2006).

4. ANALYSIS AND RESULTS

4.1. Qualitative results.

The qualitative phase examined facility managers' experiences with digital facility management adoption and use. Thematic analysis revealed strong alignment with the core constructs of the Unified Theory of Acceptance and Use of Technology (UTAUT), namely performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). In addition, two themes extending beyond the original UTAUT framework, technical infrastructure and compliance and legal considerations, emerged inductively, reflecting the contextual complexity of FM environments (Kensek, 2015a; Schulze, 2019).

4.1.1. Performance expectancy.

Performance expectancy emerged as the most influential theme shaping perceptions of digital FM adoption. Participants consistently associated digital FM systems with improvements in operational efficiency, maintenance planning, asset visibility, and cost control, which aligns with prior FM and technology adoption studies (Curtis et al., 2017; Mawed & Al-Hajj, 2017). Also, senior managers emphasised strategic benefits such as enhanced decision-making, performance monitoring, and alignment with organisational objectives, reflecting the managerial focus on value creation and governance outcomes in FM practice (Goulden & Spence, 2015). Middle and operational managers highlighted tangible operational improvements, including reduced response times and improved coordination of maintenance activities, consistent with role-based differences identified in FM research (Prodders, 2014).

4.1.2. Effort expectancy.

Effort expectancy was identified as a key determinant of digital FM acceptance, particularly among middle and operational-level facility managers. Participants emphasised system usability, intuitive interfaces, and integration with existing workflows as critical enablers of adoption, echoing findings from digital FM and IWMS studies (Wong et al., 2018). Systems perceived as complex or poorly aligned with operational processes were associated with increased workload and continued reliance on manual workarounds. Training quality and ongoing user support were repeatedly cited as factors influencing perceived effort, reinforcing the importance of capability development in digital FM implementation (Schulze, 2019).

4.1.3. Social influence.

Social influence emerged as a significant factor shaping adoption behaviour, particularly through visible management support and organisational culture. Participants reported that endorsement by senior management legitimised system use and encouraged engagement among FM teams, consistent with UTAUT-based findings in FM contexts (Curtis et al., 2017) (Venkatesh et al., 2003). Peer influence and informal knowledge sharing also contributed to acceptance, particularly in organisations with collaborative working practices. Conversely, inconsistent leadership messaging and limited managerial engagement were associated with reduced system uptake, reflecting governance-related challenges reported in FM literature (Goulden & Spence, 2015).

4.1.4. Facilitating conditions.

Facilitating conditions were consistently identified as foundational to effective digital FM adoption and use. Participants emphasised the availability of organisational resources, technical support, and alignment between digital FM systems and existing FM processes, consistent with prior acceptance and implementation studies (Schulze, 2019; Venkatesh et al., 2003). Two additional themes emerged within this domain:

- **Technical infrastructure:** Challenges related to legacy systems, data quality, system interoperability, and network reliability were frequently reported. Inadequate infrastructure was perceived as a major constraint on system effectiveness, aligning with findings from BIM-enabled FM and smart building research (Jia et al., 2019; Kensek, 2015a).
- **Compliance and legal considerations:** Regulatory requirements related to safety, data protection, and contractual obligations influenced system configuration and use. Participants noted that compliance constraints could delay implementation or limit system functionality, particularly in regulated FM environments, as reported in prior FM governance studies (Schulze, 2019; Trzaska et al., 2021).

4.2. Quantitative results.

4.2.1. Respondent profile.

The quantitative survey yielded 407 valid responses from facility management professionals operating in the UAE. Respondents represented diverse FM sectors, including commercial, residential, hospitality, healthcare, and public infrastructure. Participants occupied senior, middle, and operational management roles, providing a broad representation of FM organisational hierarchies, consistent with sampling practices in applied FM research (Bryman, 2006; Ponto, 2015).

4.2.2. Relative Importance Index (RII) analysis.

Relative Importance Index (RII) analysis was conducted to prioritise factors influencing digital FM adoption, following established methodological practice in construction and FM studies (Al-Saleh & Al-Kadiri, 2000). All examined factors achieved RII values exceeding accepted thresholds, indicating their relevance to FM practitioners. Factors associated with operational reliability, system usability, real-time data availability, and resolution of implementation challenges ranked highest. Factors related to infrastructure readiness and compliance alignment also demonstrated strong importance, supporting qualitative findings and reinforcing the role of implementation readiness in digital FM adoption (Kensek, 2015a; Schulze, 2019).

4.2.3. Reliability and validity assessment.

Internal consistency reliability was assessed using Cronbach's alpha. All constructs demonstrated acceptable to strong reliability, exceeding commonly accepted thresholds for social science research (Gliem & Gliem, 2003). Construct validity was evaluated using Principal Component Analysis (PCA). Kaiser–Meyer–Olkin values indicated sampling adequacy, and Bartlett's tests of sphericity confirmed the suitability of the data for factor analysis (Hair Jr. et al., 1998; Kaiser, 1974). Extracted components aligned with UTAUT constructs and the extended facilitating condition dimensions identified in the qualitative phase.

4.2.4. Regression analysis.

Ordinal regression analysis was used to examine relationships between UTAUT constructs and digital FM adoption outcomes, consistent with recommended approaches for ordinal dependent variables (Agresti, 2012). Performance expectancy and effort expectancy exhibited the strongest positive associations with behavioural intention to use digital FM systems, consistent with UTAUT-based adoption studies in FM contexts (Curtis et al., 2017; Venkatesh et al., 2003). Social influence and facilitating conditions also demonstrated statistically significant relationships, though with varying magnitudes across managerial levels. Managerial level emerged as a significant moderating variable. Senior managers showed stronger associations between performance expectancy and adoption intention, while middle and operational managers were more strongly influenced by effort expectancy and facilitating conditions, reflecting role-based differences identified in FM governance research (Goulden & Spence, 2015; Progdgers, 2014).

4.2.5. Summary of results.

The combined qualitative and quantitative results demonstrate strong convergence. UTAUT constructs explain digital FM adoption intention, with performance expectancy and effort expectancy emerging as dominant drivers (Venkatesh et al., 2003). However, effective system use and value realisation are strongly influenced by facilitating conditions, particularly technical infrastructure and compliance alignment, consistent with findings in digital FM and smart building research (Kensek, 2015b; Schulze, 2019; Wong et al., 2018).

5. DISCUSSION

5.1. Reinterpreting digital facility management adoption in FM contexts.

The findings of this study reinforce the relevance of technology acceptance theory for explaining digital facility management adoption, while simultaneously highlighting its limitations when applied in isolation. Consistent with prior FM and information systems research, performance expectancy and effort expectancy emerged as the dominant drivers of adoption intention (Curtis et al., 2017; Mawed & Al-Hajj, 2017; Venkatesh et al., 2003). Facility managers are more likely to engage with digital FM systems when they perceive clear operational and strategic benefits and when systems are perceived as usable and aligned with existing workflows. However, the results also demonstrate that acceptance alone does not ensure effective implementation or sustained value realisation. This finding supports growing concern within the FM literature that digital transformation initiatives frequently underperform because organisational and contextual conditions are insufficiently addressed (Schulze, 2019; Trzaska et al., 2021). In practice, digital FM adoption is embedded within complex socio-technical systems where organisational structures, governance arrangements, and regulatory environments shape outcomes beyond individual user perceptions.

5.2. Extending UTAUT through an FM implementation lens.

A central contribution of this study lies in its extension of the Unified Theory of Acceptance and Use of Technology within the facility management domain. While UTAUT identifies facilitating conditions as a determinant of use behaviour, the findings of this study indicate that this construct is under-specified for FM contexts characterised by asset complexity, regulatory oversight, and legacy infrastructure. The emergence of technical infrastructure and compliance and legal considerations as distinct themes demonstrates that implementation readiness operates as a structural layer influencing digital FM outcomes. Issues such as data quality, interoperability, integration with legacy systems, and regulatory compliance were shown to constrain system effectiveness even when acceptance was high. These findings are consistent with prior research in BIM-enabled FM and smart building environments, which emphasises the role of infrastructure and governance in shaping digital value creation (Buckman et al., 2014; Jia et al., 2019; Kensek, 2015a). By empirically identifying and integrating these dimensions, the study advances acceptance theory by repositioning facilitating conditions as an implementation readiness construct rather than a background enabler. This extension responds directly to calls for more context-sensitive and practice-oriented adoption models in FM research (Goulden & Spence, 2015; Schulze, 2019).

5.3. Managerial level and differentiated adoption dynamics.

The moderating effect of managerial level provides further insight into digital FM adoption dynamics. Senior managers exhibited stronger associations between performance expectancy and adoption intention, reflecting their focus on strategic value, compliance, and organisational performance. In contrast, middle and operational managers were more strongly influenced by effort expectancy and facilitating conditions, emphasising usability, workflow integration, and operational support. These differentiated perceptions align with FM governance literature, which highlights the distinct roles and responsibilities across managerial hierarchies (Goulden & Spence, 2015; Prodders, 2014). The findings suggest that digital FM initiatives are unlikely to achieve sustained success if implementation strategies do not account for role-specific priorities and constraints. This reinforces the need for targeted change management and training strategies that address the concerns of different FM stakeholder groups.

5.4. Explaining the adoption–value gap in digital FM.

A key insight from this study is its contribution to understanding the persistent gap between digital FM adoption and realised operational value. While previous studies often attribute this gap to resistance to change or insufficient training, the findings indicate a more nuanced explanation rooted in implementation readiness and organisational alignment (Schulze, 2019; Trzaska et al., 2021). Digital FM systems were frequently deployed in environments where data governance was fragmented, infrastructure integration was incomplete, or compliance requirements constrained system functionality. Under such conditions, even high levels of acceptance were insufficient to deliver sustained performance improvements. This supports socio-technical perspectives in smart building research, which argue that value creation depends on alignment between technology, organisational processes, and institutional context (Buckman et al., 2014; Ghaffarianhoseini et al., 2018).

5.5. Implications for FM theory.

From a theoretical perspective, this study contributes to FM scholarship in three important ways. First, it empirically validates the applicability of UTAUT in digital FM contexts while demonstrating the need for theoretical extension to capture implementation realities. Second, it introduces implementation readiness as a critical mediating layer between acceptance and value realisation. Third, it highlights managerial level as an important contextual moderator shaping adoption dynamics within FM organisations. Together, these contributions advance a more integrated theoretical understanding of digital FM adoption that reflects the complexity of contemporary FM practice, addressing longstanding calls for theory that is both rigorous and grounded in real-world FM contexts (Barrett & Baldry, 2009; Schulze, 2019).

5.6. Implications for FM practice.

The findings carry important implications for FM practitioners. Digital FM success requires more than technology procurement and user training. FM leaders must assess and strengthen organisational readiness, including infrastructure quality, data governance, regulatory alignment, and cross-functional coordination. Implementation strategies should be tailored to different managerial levels, ensuring that strategic objectives and operational usability are addressed simultaneously. For technology providers, the results highlight the importance of designing systems that integrate effectively with legacy infrastructure, support compliance requirements, and align with FM workflows. Policymakers and regulators also play a role by establishing frameworks that support interoperability, data governance, and secure digital FM deployment within the built environment.

6. CONCLUSION, IMPLICATIONS, LIMITATIONS AND FUTURE DIRECTIONS.

6.1. Conclusion.

This study set out to examine digital facility management adoption by moving beyond technology-centric and acceptance-only explanations towards a more comprehensive, value-oriented perspective. Drawing on an explanatory sequential mixed-methods design, the research combined qualitative insights from facility managers with quantitative evidence from a large-scale survey of FM professionals in the United Arab Emirates. The findings confirm the relevance of the Unified Theory of Acceptance and Use of Technology (UTAUT) in explaining digital FM adoption intention, particularly the central roles of performance expectancy and effort expectancy (Curtis et al., 2017; Mawed & Al-Hajj, 2017; Venkatesh et al., 2003). Facility managers are more likely to engage with digital FM systems when they perceive clear performance benefits and when systems are usable and aligned with operational workflows. However, the study also demonstrates that acceptance alone is insufficient to ensure effective implementation or sustained value realisation. Implementation readiness factors, notably technical infrastructure, data quality, interoperability, governance capability, and compliance alignment, were shown to play a decisive role in shaping post-adoption outcomes. These findings help explain the persistent gap between digital FM adoption and realised operational value identified in prior FM and digital transformation research (Schulze, 2019; Trzaska et al., 2021). By empirically extending UTAUT within the FM context, the study positions digital facility management as a value-driven organisational capability rather than a standalone technological intervention. This perspective reflects the socio-technical complexity of contemporary FM environments and aligns with emerging research on smart buildings and digitally enabled FM practice (Buckman et al., 2014; Jia et al., 2019).

6.2. Implications for facilities management practice.

The findings offer several important implications for FM practitioners. First, digital FM initiatives should not be evaluated solely on adoption rates or system deployment milestones. Instead, FM leaders should prioritise implementation readiness assessments that address

infrastructure quality, data governance, interoperability with legacy systems, and regulatory compliance before and during implementation. Second, the results highlight the importance of role-sensitive implementation strategies. Senior managers, middle managers, and operational staff evaluate digital FM systems through different lenses. Successful implementation therefore requires tailored communication, training, and change management approaches that reflect these differentiated priorities (Goulden & Spence, 2015; Prodders, 2014). Third, FM organisations should recognise digital FM systems as long-term organisational capabilities rather than one-off technology projects. Continuous investment in user capability development, system optimisation, and governance alignment is required to sustain value over time, particularly in complex and regulated FM environments (Schulze, 2019).

6.3. Implications for policy and technology providers.

For policymakers, particularly in regions pursuing smart city and digital infrastructure agendas, the findings emphasise the importance of regulatory frameworks that support interoperability, data governance, and secure digital FM deployment. Clear and consistent regulations can reduce implementation uncertainty and enable more effective use of digital FM systems across the built environment (Buckman et al., 2014; Ghaffarianhoseini et al., 2018). For technology providers, the study underscores the need to move beyond feature-driven system design towards solutions that align with FM workflows, compliance requirements, and organisational readiness. Systems that are interoperable, intuitive, and adaptable to regulatory constraints are more likely to achieve sustained adoption and deliver measurable value for FM clients (Kensek, 2015a; Wong et al., 2018).

6.4. Limitations and directions for future research.

As with all empirical research, this study has limitations. The focus on the UAE context may limit direct generalisability to regions with different regulatory environments or levels of digital maturity. Future research could replicate the study in other geographical contexts to test the robustness of the findings. The cross-sectional design captures adoption perceptions at a single point in time. Longitudinal research would enable examination of how acceptance, implementation readiness, and value realisation evolve as FM organisations progress along digital maturity trajectories (Trzaska et al., 2021). Future studies could also integrate objective performance indicators, such as energy savings, maintenance cost reductions, or system utilisation data, to complement self-reported measures. Finally, further research could explore additional contextual moderators, including organisational size, outsourcing models, and sector-specific regulatory regimes, to refine understanding of digital FM adoption dynamics.

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