Journal of Contemporary Research in Business, Economics and Finance
ISSN: 2641-0265
Vol. 7, No. 2, 191-207
2025
Publisher: Learning Gate
DOI: 10.55214/jcrbef.v7i2.11471

Exploring digital transformation and innovation factors in Tunisian hospitality: Impacts on service quality and operational performance

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Abstract: Digital technologies are transforming the hospitality industry, offering hotels new opportunities to improve guest experience, optimize operations, and remain competitive. While prior research has explored digitalization broadly, limited studies have examined how emerging digital innovations such as artificial intelligence, cloud-based management systems, and data analytics directly impact hotel performance. This study explores how Tunisian hotels mobilize technological, organizational, and managerial capabilities to implement digital innovations and how these efforts shape service quality and operational outcomes. Using a qualitative research design based on semi-structured interviews with hotel managers and staff, the findings reveal that digital transformation generates the greatest benefits when supported by innovation-oriented cultures, flexible structures, continuous strategic renewal, and flexible management practices. Hotels that successfully align digital technologies with redesigned processes and enhanced workforce capabilities report notable improvements in service personalization, process optimization, guest satisfaction, and resource efficiency. By identifying the mechanisms through which digital transformation and innovation factors drive performance, this study contributes to theoretical discussions on organizational capabilities in hospitality and provides practical guidance for hotel managers seeking to strengthen service quality and operational performance in an increasingly digital and competitive environment.

Keywords: *Customer experience, Digital transformation, Emerging technologies, Hospitality industry, Innovation factors, Operational performance, Strategic alignment.*

1. Introduction

The hospitality industry is undergoing a profound metamorphosis, driven by the accelerating adoption of advanced digital technologies and a parallel rethinking of business models, operational processes, and guest-service paradigms. This transformation goes far beyond a mere upgrade of information systems: artificial intelligence (AI), cloud-based property management systems, the Internet of Things (IoT), and emerging immersive technologies are enabling hotels to optimize resource utilization, automate repetitive tasks, and deliver highly personalized guest experiences (Deputat, Podolian, Zhupnyk, Terletska, & Gorishevskyy, 2024; Jonathan, 2025). In Tunisia, a growing number of hotels, from boutique city hotels in Tunis to seaside resorts along the Sahel, are beginning to experiment with these technologies, acknowledging that digital readiness is increasingly a determinant of competitiveness, especially in a post-pandemic tourism environment characterized by demanding, digitally literate customers (Nagara, 2025).

Consider, for example, a mid-size hotel in Sousse that has recently implemented an AI-powered virtual assistant accessible via its website and mobile app, capable of answering guest inquiries 24/7 about room availability, local attractions, and restaurant services. Guests receive instant responses, and the system is programmed to learn guest preferences over time (language preferences, room type, amenities), allowing the hotel to tailor offers, for instance, suggesting spa sessions or seaside excursions

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to returning guests based on their past stays. This not only streamlines booking and pre-arrival communications but also enhances the guest's sense of being understood and valued (Sofi, Bashir, Alshiha, Alnasser, & Alkhozaim, 2025). Meanwhile, on the operational side, the hotel's back-office teams notice fewer repetitive phone calls, reduced front-desk congestion during peak hours, and more efficient resource allocation, illustrating how AI can drive both customer experience and operational efficiency.

Beyond AI, IoT technology presents another frontier of transformation for the hospitality sector. Smart-room systems with IoT-enabled sensors allow hotels to monitor and adjust energy consumption dynamically (Ghanekar & Naidu, 2024) (for example, turning off lights and HVAC systems automatically when rooms are unoccupied or optimizing water usage based on guest presence). Complementing AI and IoT, cloud-based property management systems (PMS) and integrated digital platforms are transforming how hotels handle reservations, housekeeping, maintenance, and guest feedback in real-time. Traditional PMS solutions, often localized and siloed, are being replaced with cloud-based, modular platforms offering scalability, interoperability, and data centralization (Aunugu & Vathsavai, 2025; Jonathan, 2025) (for example, the cloud platform consolidates feedback and reviews from online travel agencies (OTAs), hotel websites, and direct surveys, providing management with dashboards for guest satisfaction metrics, average response time, and common complaints. Looking further ahead, immersive technologies such as virtual reality (VR), augmented reality (AR), and nascent metaverse-inspired applications are beginning to offer novel layers of guest interaction and marketing potential (Balasubramanian, Kunasekaran, Konar, & Sakkthivel, 2022; Javeed, Rasool, & Pathania, 2024) (for example, guests browsing online may immerse themselves in a 360° VR tour of a deluxe suite or pool area before booking).

These technological advances, however, must be accompanied by innovative business models that reimagine value creation, revenue streams, guest engagement strategies, and service delivery processes. Without such strategic adaptation, technology adoption risks yielding only superficial efficiency gains, without sustainable competitive advantage or improved guest loyalty (Gursoy, 2025; Valentini et al., 2024). By aligning digital capabilities with a restructured business model, hotels can not only optimize operations but also differentiate themselves through experience, personalization, and sustainability attributes increasingly valued by both domestic and international guests.

Nonetheless, the path to value creation is fraught with challenges. Workforce adaptation represents a major barrier: employees accustomed to traditional hospitality practices must acquire new digital skills, from managing cloud-based PMS to monitoring IoT dashboards or responding appropriately to AI-driven guest interactions. Training programs require time, resources, and a cultural shift that values continuous learning. Moreover, cybersecurity and data privacy become central concerns when handling guest data, online payments, and digital identities. Hotels must invest in robust security infrastructure and establish clear data governance policies, often be a heavy burden for small and medium-sized properties with limited budgets. Further, integrating new systems with legacy infrastructure, especially in older buildings, may involve substantial retrofit costs, technical complexity, and operational disruption (Rahardja, 2025; Rolando, Chandra, & Widjaja, 2025). For smaller Tunisian hotels or family-run guesthouses, these constraints may limit the scope or pace of digital transformation, raising equity concerns within the industry.

Despite these challenges, digital transformation ultimately reinforces a firm's capacity to innovate by strengthening the foundational resources and capabilities that enable innovation. Key factors such as knowledge circulation, technical expertise, R&D efforts, and organizational awareness of innovation serve as essential pathways through which digital transformation enhances innovation performance (Chen & Kim, 2023; Smith, Landry, & Benoit, 2019; Vasconcelos, Coelho, & Teixeira, 2020). By facilitating access to real-time information, supporting collaborative practices, and promoting more agile processes, digital technologies create favorable conditions for generating, testing, and implementing new ideas more efficiently.

From an information-processing perspective, digital transformation significantly enhances a firm's capacity to acquire, interpret, and utilize information in real time. Firms with stronger information-

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DOI: 10.55214/jcrbef.v7i2.11471

processing capabilities are more responsive to environmental changes and better positioned to identify opportunities for innovation (Moser, Ghosh, & Rossi, 2017). The integration of digital tools accelerates the capture and diffusion of relevant information, allowing organizations to innovate more rapidly and with greater precision.

In this perspective, investing in advanced technologies emerges as a critical lever for enhancing knowledge management, improving organizational performance, and fostering innovation. According to the Resource-Based View (RBV) (Barney, 1991), internal resources that are valuable, rare, and difficult to imitate form the foundation of sustainable competitive advantage. Digital transformation, as a strategic technological asset, reinforces this logic by enabling more efficient exploitation of cognitive and informational resources (Mills, Platts, & Bourne, 2003). At the same time, the Dynamic Capabilities framework (Teece, 1996) expands this view by emphasizing knowledge as the firm's most critical resource, whose management and deployment are central to maintaining competitiveness (Alzate, López, Manotas, & Boada, 2024; Essabiry, Bouzid, & ACHELHI, 2025).

In order to understand how digital transformation and innovation factors shape service quality and operational performance within the Tunisian hospitality sector, this study adopts a qualitative research design. Data will be gathered through 18 semi-structured interviews with hotel managers, IT/operations officers, and frontline staff across a diverse sample of hotels ranging from economy guesthouses in coastal towns to upscale resorts in tourist hubs. This diversity aims to capture variations in resource availability, technological readiness, and strategic orientation. Thematic analysis will be used to identify common patterns, key innovation drivers, barriers to digital adoption, and emerging mechanisms linking digital transformation and innovation factors to improvements in service quality and operational performance.

Practically, this study offers concrete guidance for hotel managers and key stakeholders within the Tunisian hospitality industry. The insights generated suggest several strategic actions, including prioritizing investments in scalable cloud-based platforms, developing structured and progressive digital adoption plans, and implementing continuous training programs to strengthen both digital competencies and guest-oriented service mindsets. Hotels may also benefit from designing hybrid business models that integrate digital tools with traditional service delivery, as well as adopting environmentally sustainable practices supported by IoT-based resource monitoring. Collectively, these recommendations can enhance operational resilience, improve cost efficiency, elevate the guest experience, and reinforce the long-term competitiveness of Tunisian hotels in an increasingly digital global tourism environment.

The paper is structured to reflect this logic and narrative arc. It begins with a comprehensive literature review, synthesizing research on digital transformation in hospitality, AI/IoT/Cloud/Immersive technologies, innovation factors, and performance outcomes, with a special focus on emerging economies and Mediterranean contexts. Next, the methodology section details the qualitative design, sampling strategy, interview protocols, and data analysis procedures. The findings and discussion section presents themes and mechanisms emerging from empirical data, illustrating how innovation is adopted, adapted, and leveraged in Tunisian hotels, and highlighting enablers and obstacles. The article then extrapolates theoretical implications and draws managerial recommendations tailored to the Tunisian hospitality sector. Finally, the conclusion summarizes the study's contributions, discusses limitations, and proposes avenues for future research.

2. Theoretical Background

2.1. Theoretical Frameworks Mobilized in the Study

The Dynamic Capabilities theory builds directly upon the foundations of the Resource-Based View (RBV), which was originally developed by Wernerfelt (1984) and later formalized by Barney (1991). Introduced by Teece, Pisano, and Shuen (1997), the dynamic capabilities framework has since become a cornerstone of strategic management research. Teece et al. (1997) define dynamic capabilities as a firm's ability to integrate, build, and reconfigure internal and external competencies in order to address

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rapidly changing environments. This perspective highlights the importance of organizational flexibility, continuous learning, and ongoing transformation as essential drivers of sustained competitive advantage.

Whereas the RBV emphasizes the possession of valuable, rare, inimitable, and non-substitutable resources, the dynamic capabilities approach extends this logic by stressing the need to renew, adapt, and upgrade these resources to maintain their strategic value in increasingly complex and digitalized environments. Within this framework, a firm's ability to integrate emerging technologies, leverage organizational knowledge, and foster innovation becomes a critical determinant of performance and competitiveness (Catalan-Matamoros, Prieto-Sanchez, & Langbecker, 2023; Teece, 2018; Wilden, Lin, Hohberger, & Randhawa, 2023).

Dynamic capabilities support organizational learning, proactive decision-making, and strategic transformation (Alzate et al., 2024; Essabiry et al., 2025). Digital transformation enhances knowledge processes by automating the collection, analysis, and dissemination of strategic information, thereby facilitating knowledge creation and the continual reconfiguration of organizational know-how (Mikalef, Conboy, Lundström, & Popovič, 2022).

Overall, digital transformation enhances decision-making capabilities through predictive analytics, decision-support tools, and strategic simulation systems. Such tools enable faster, more reliable, and forward-looking decisions, representing a second mediating pathway linking technology adoption to improved performance (Brock & Von Wangenheim, 2019).

2.2. Digital Transformation

Digital transformation has become a central topic in academic research and managerial practice due to its capacity to reshape organizational functioning and enhance performance across industries. Initially framed mainly as the adoption of digital technologies, the concept has progressively evolved toward a more holistic understanding. Scholars now agree that digital transformation encompasses the deliberate integration of digital tools to redesign business processes, create new forms of value, and improve customer experiences, while simultaneously requiring deeper organizational changes involving culture, leadership, talent development, and strategic alignment (Bansal, Panchal, Jabeen, Mangla, & Singh, 2023; Gong & Ribiere, 2021; Nath, Onib, Barsa, & Anika, 2025). From this broader perspective, digital transformation is conceptualized as a transformative process through which firms reconfigure their operations, business models, competencies, and organizational mindset in response to the opportunities enabled by emerging technologies (Bresciani, Huarng, Malhotra, & Ferraris, 2021; Feroz & Kwak, 2024; Liere-Netheler, Packmohr, & Vogelsang, 2018; Seppänen, Ukko, & Saunila, 2025). This reconfiguration relies on enhanced data collection, stronger interconnectivity of processes, improved customer interfaces, and richer information exchange supported by advanced communication technologies (Frank, Dalenogare, & Ayala, 2019; Matt, Hess, & Benlian, 2015; Pramanik, Suja, Zain, & Pramanik, 2019).

A large body of research highlights the impact of digital transformation on operational performance. Digital technologies enable the optimization of processes, reduction of costs, and productivity improvements by automating routine tasks, limiting human error, and allowing employees to focus on higher-value-added activities. Empirical studies show that systems such as ERP and CRM enhance workflow coordination and decision-making accuracy (Al-Assaf et al., 2024) while big data analytics supports real-time monitoring, predictive insights, and better resource allocation (Aljohani, 2023). These contributions demonstrate the ability of digital tools to streamline operations and reinforce organizational efficiency (Emon & Khan, 2024).

The effects of digital transformation are particularly pronounced in service-oriented sectors, where organizational performance is tied to customer interaction and service quality. Customer-centric digital initiatives, including personalized marketing, AI-driven analytics, and automated service channels, improve customer experiences, strengthen loyalty, and ultimately enhance operational outcomes. Advanced analytics capabilities enable firms to understand customer behavior more accurately, refine

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demand forecasting, and tailor services to individual needs, resulting in superior service delivery and operational efficiency (Aldoseri, Al-Khalifa, & Hamouda, 2024).

Although digital transformation has generated positive effects across multiple industries, its diffusion has historically been slower in the energy sector due to cautious technological adoption (Maroufkhani, Desouza, Perrons, & Iranmanesh, 2022). Recent developments, however, indicate an acceleration driven by the implementation of machine learning, IoT systems, and advanced analytics for production optimization, leak detection, and price forecasting (Hanga & Kovalchuk, 2019; Li, Lepour, Heymann, & Maréchal, 2023). In upstream operations specifically, digital tools can enhance safety, reliability, and communication through intelligent IoT-based solutions (Singh, Kumar, & Hötzel, 2018). As energy companies increasingly rely on digital infrastructures to integrate new energy sources and coordinate operations efficiently (Huang & Lin, 2023), digital transformation emerges as a critical driver of competitiveness and long-term survival in the sector (Angelopoulos, Kontakou, & Pollalis, 2019; Chwiłkowska-Kubala, Cyfert, Malewska, Mierzejewska, & Szumowski, 2023).

2.3. Innovation Factors

The innovation factor refers to the resources and capabilities associated with innovation. It is argued that innovation factors may be an important way in which digital transformation affects performance (Chen & Kim, 2023; Smith, Busi, Ball, & Van Der Meer, 2008; Vasconcelos, Santos, & Andrade, 2020). Successful digital transformation requires organizations to approach it as a multidimensional and deeply embedded organizational process rather than a purely technological initiative. Beyond the adoption of new technologies, firms must simultaneously consider their digital strategy, organizational resources and structures, and corporate culture, all of which shape the pace and effectiveness of transformation.

From a technological standpoint, companies must continuously adapt to rapid technological shifts while maintaining a balance between exploiting existing systems and exploring emerging innovations (Kane, Palmer, Nguyen-Phillips, Kiron, & Buckley, 2017; Karippur & Balaramachandran, 2022). Dynamic capabilities highlight how current technological capabilities influence the firm's potential for future advancements (Teece, 2018; Wilden et al., 2023). Exploration activities, including competitor benchmarking and monitoring best-in-class digital practices, enable firms to blend established e-business tools with more advanced digital solutions (Frank et al., 2019; Gill & VanBoskirk, 2016).

Equally important is the development of a coherent digital strategy that aligns with the overall business strategy and provides clear objectives, performance indicators, and directions for the transformation effort (Matt et al., 2015). A well-articulated digital strategy signals managerial competence and must be consistently followed by effective execution and ongoing monitoring; insights gained throughout implementation feed into strategic renewal and adjustment (Gill & VanBoskirk, 2016; Karippur & Balaramachandran, 2022; Tortorella, Saurin, Hines, Antony, & Samson, 2023). Once strategic priorities are established, firms must ensure the availability of adequate resources, financial, technological, and human, as well as appropriate structural adaptations that support the diffusion and use of digital capabilities across the organization (Ghobakhloo & Iranmanesh, 2021). Knowledge accumulation, formal role assignments, recruitment, and continuous training are crucial to ensure that digital skills permeate the entire workforce and that responsible units possess the expertise required to drive transformation effectively (Akcay Kasapoglu, 2018; Al Shehab, Bakry, Hill, Alsulaimani, & Abbassy, 2022; Ivan, Marina, Andrey, Mikhail, & Perepanova, 2019).

Organizational culture also plays a decisive role in fostering digital transformation, as it blends top-down leadership support with bottom-up employee engagement. Communicating a clear digital vision, encouraging idea generation, and promoting learning behaviors help cultivate a culture that is open to change, experimentation, and responsible risk-taking (He et al., 2023; Karippur & Balaramachandran, 2022; Tay & Low, 2017). Digital transformation ultimately emerges from the interplay of these elements: insufficient financial resources can hinder digital skill development; a weak digital strategy can delay technological exploration; and cultural resistance can slow down organizational adoption.

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ISSN: 2641-0265
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2.4. Effects of Digital Transformation on Service Quality and Operational Performance

Manufacturing and competitive strategies are central to a firm's ability to operate efficiently and sustain a competitive position in the market (Slack, Chambers, & Johnston, 2010). Achieving strategic objectives requires strong operational performance, commonly assessed through key outcomes such as cost efficiency, reliability, flexibility, service effectiveness, speed, dependability, and overall quality (Dióssy, Losonci, Aranyossy, & Demeter, 2025). Within this framework, service quality emerges as a critical driver of organizational performance. Its impact extends beyond interactions with external customers to include the quality of internal services exchanged among employees and departments (Frost & Kumar, 2000). Internal service quality, encompassing the support, information, and resources employees receive directly, shapes their satisfaction, productivity, and ability to deliver superior customer experiences (Seyhan, 2021; Skarpeta, Koemtzi, & Aidonis, 2020). High levels of service quality foster effective coordination, communication, teamwork, and problem-solving across organizational units, thereby reinforcing global operational performance (Voss, Loeffen, Bakker, Klaassen, & Wulf, 2005). Conversely, inadequate service quality can undermine employee effectiveness and diminish customer satisfaction. Consequently, service quality constitutes a foundational mechanism through which operational capabilities translate into sustained service excellence and competitive advantage (Demirel, 2009).

A growing body of empirical research demonstrates that digital transformation significantly enhances organizational outcomes, particularly in terms of operational performance and service quality. Numerous studies confirm that the effective adoption of digital technologies leads to more efficient processes, improved resource utilization, and stronger decision-making capabilities, ultimately boosting operational performance (Dióssy et al., 2025; Dubey et al., 2020; Yu, Wang, & Moon, 2022). Digital tools streamline workflows, reduce operational bottlenecks, and promote real-time coordination across departments, enabling firms to respond more rapidly and accurately to changing market conditions.

In parallel, research also highlights the positive effects of digital transformation on service quality. By leveraging advanced technologies such as data analytics, artificial intelligence, and automation, organizations can deliver more personalized, consistent, and efficient services (Elibol, 2024; Masoud & Basahel, 2023). These technologies enhance internal communication, support faster problem resolution, and improve overall service reliability, which translates into higher customer satisfaction and loyalty. Recent evidence further suggests that digital transformation strengthens service ecosystems by enabling seamless interaction between employees, systems, and customers, thereby fostering superior service experiences (Nath et al., 2025).

Overall, the literature converges on the idea that digital transformation acts as a dual driver of improved operational efficiency and elevated service quality, positioning it as a strategic imperative for organizations seeking sustainable competitiveness.

3. Qualitative Study in the Tunisian Hotel Sector

This research aims to examine the effect of digital transformation and innovation factors on service quality and operational performance of Tunisian hotels. To address this objective, 18 semi-structured interviews were conducted with hotel professionals occupying managerial and operational roles. In Tunisia, technological innovation is gaining momentum, creating favorable conditions for the digitalization of the hospitality sector. According to Oxford Insights (2022), Tunisia ranks 4th in Africa and 70th worldwide, reflecting the country's growing readiness to adopt and leverage digital technologies. This strong positioning highlights the presence of supportive public policies, adequate digital infrastructure, and a skilled workforce, thereby fostering an environment conducive to integrating digital innovations into the hotel industry.

3.1. Data Collection

A total of 18 semi-structured interviews were conducted to deepen the understanding of key themes identified in the literature. Participant characteristics and interview durations are presented in Appendix

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1. Semi-structured interviews offer flexibility in guiding discussions (Henriksen, Englander, & Nordgaard, 2022) and enable the researcher to explore topics in depth while adapting questions according to participants' responses. This approach is particularly suited to exploratory research, where prior knowledge may be limited (Kallio, Pietilä, Johnson, & Kangasniemi, 2016).

A purposive sampling strategy was adopted to select participants based on their expertise and experience related to the research topic (Easterby-Smith, Thorpe, Jackson, & Jaspersen, 2021; Giannelloni & Vernette, 2012). This method ensures the relevance and reliability of responses, aligned with the study's objectives (Curtis, Gesler, Smith, & Washburn, 2000).

Two qualitative sampling principles guided participant selection: diversification and saturation (Blanchet, 1992). Diversification was achieved by including respondents from various hotel categories, departments, and positions, following Michelat's (1975) recommendations. Data saturation determined the final sample size; interviews were conducted until no new insights or themes emerged (Guest, Namey, & Chen, 2020).

An interview guide was developed based on the literature review. The thematic structure followed a hybrid approach: themes were defined a priori from existing theoretical frameworks, while inductive analysis of interview data helped enrich and refine them by identifying context-specific subcodes relevant to Tunisian hotels. The final themes thus emerged from an iterative dialogue between theory and empirical evidence (see Appendix 2).

3.2. Data Analysis

The qualitative data were recorded, transcribed, and analyzed using NVivo 10, following the six-phase thematic analysis process proposed by Braun and Clarke (2006). The procedure involved: familiarization with the data, generation of initial codes, identification of preliminary themes, theme revision, theme definition and naming, and final reporting.

Initially, all transcripts were thoroughly examined to capture meaningful patterns within the data. Subsequent coding allowed the organization of relevant excerpts into coherent categories, which were progressively grouped into broader themes aligned with the research objectives. These themes and subthemes were iteratively refined to ensure conceptual clarity and analytical depth. Finally, the entire analytical process and its main findings were synthesized in a comprehensive report, ensuring a transparent and rigorous presentation of results (Kumar, 2022).

4. Findings and Discussion

4.1. Digital Transformation in Tunisian Hotels

The interviews reveal that digital transformation is becoming a strategic priority for many Tunisian hotels, driven by growing competitive pressure, evolving customer expectations, and the need to optimize operational processes. Most participants emphasized that digitalization is no longer optional but a requirement for survival in the post-COVID and highly competitive hospitality landscape.

Participants reported significant progress in adopting advanced technologies, especially AI-enabled tools and cloud-based property management systems. Cloud PMS platforms (such as Cloudbeds, Opera Cloud, or Protel Air) are now widely used to centralize reservations, automate check-ins, manage housekeeping tasks, and synchronize online distribution channels.

One manager explained:

"With the cloud PMS, everything is centralized. Front office, housekeeping, and sales work on the same real-time system. It has reduced errors and improved coordination across departments." (Hotel Manager, 4-star)

AI applications are also increasingly integrated into customer service processes. These include chatbot-based guest communication, AI-driven dynamic pricing systems, and predictive analytics for demand forecasting.

"We use an AI chatbot on our website and WhatsApp. It answers guest questions instantly and handles simple bookings, which reduces the workload of the front desk." (Front Office Supervisor, 5-star)

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Some higher-end hotels also deploy IoT-enabled smart devices for room automation, energy optimization, and maintenance alerts. Motion sensors, smart thermostats, keyless room entry, and connected maintenance systems are cited as key implementations.

IoT has helped us control energy consumption. When the guest leaves the room, the lights and AC adjust automatically. It saves a lot of costs, especially in high-season months. (Technical Operations Manager, 5-star)

Although still limited, some hotels have begun experimenting with VR and AR for marketing and guest engagement purposes. VR virtual tours are used to showcase rooms, conference halls, and spa facilities, particularly for international travelers.

"We offer VR tours for conference clients. They help them visualize the space before booking, especially international corporations." (Sales Director, 5-star)

Augmented reality is primarily used to enhance guest experiences through interactive maps, digital menus, and gamified activities for children in resort contexts.

Despite these advancements, participants highlighted challenges such as high investment costs, limited digital skills among employees, and dependence on external vendors for system maintenance.

4.2. Innovation Factors

Most hotels have not yet developed a formal digital strategy, but they follow an implicit direction shaped by competition and market trends. Only upscale international-chain hotels reported having a clear roadmap with measurable digital goals.

"We do not have an official digital transformation strategy, but we follow the group's guidelines and try to align with global standards." (General Manager, 4-star)

Independent hotels adopt a more reactive approach, investing in technologies based on immediate needs and budget availability.

Hotels with stronger IT departments and trained staff reported faster adoption of digital technologies. However, many participants emphasized that resource limitations—financial, human, and technological- remain significant barriers.

"The biggest issue is not the technology itself, but the lack of digital competencies. Many employees need continuous training to use new tools efficiently." (HR Manager, 4-star)

Structural flexibility is also essential. Hotels that reorganized their workflow around digital tools (e.g., digital housekeeping modules, centralized inventory systems) observed smoother integration and better performance.

Cultural readiness emerged as a central factor. Hotels promoting open communication, experimentation, and cross-department collaboration were more likely to adopt innovation successfully.

"Some employees were afraid of technology at first. But once they saw how digital tools make their jobs easier, they became more motivated to learn." (Operations Manager, 3-star)

Resistance to change remains a challenge, especially among older staff or those with limited technical literacy. To address this, some hotels implemented internal digital champions or peer-learning initiatives.

"We created a small group of 'digital ambassadors' who help their colleagues understand the systems. It helped reduce resistance." (IT Officer, 4-star)

4.3. Service Quality Enhancements Through Digitalization

Digital transformation has significantly affected both internal and external service quality. Internally, cloud-based systems, digital communication tools, and automated workflows have improved coordination between departments.

Before digital tools, housekeeping and the front office were always misaligned. Now, updates are instant. Rooms are ready faster for guests. (Supervisor, 4-star)

Externally, customers interact with hotels through mobile apps, AI chatbots, digital check-in/check-out, and personalized communication channels. These tools increase responsiveness, reduce waiting times, and offer more personalized services.

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Guests appreciate the fast check-in and digital room keys. It reduces queues at reception and creates a smoother arrival experience. (Hotel manager, 5-star).

Digitalization also enables hotels to collect and analyze feedback more effectively. Online reviews, sentiment analysis, and digital surveys inform continuous improvements.

We track guest reviews daily and use AI sentiment tools. It helps us identify issues quickly and improve service quality. (Guest Relations Manager, 5-star)

However, several participants noted the risk of losing the "human touch" in hospitality if digitalization becomes excessive. Many argued for a hybrid model combining technology with personalized interaction.

4.4. Operational Performance Improvements

Across the interviews, participants consistently emphasized the positive impact of digital tools on operational performance. Benefits include process efficiency, cost reduction, faster decision-making, and flexibility.

Automation reduced manual tasks, improved accuracy, and accelerated workflows.

Inventory management used to take hours. Now it is automated and updated in real time. (Hotel Manager, 4-star)

IoT energy management, digital documentation, and automated processes significantly lowered operational costs.

Energy savings after implementing smart sensors were remarkable. It reduced our monthly expenses. (Financial Manager, 5-star)

Digital dashboards, analytics systems, and PMS reports have improved real-time visibility and strategic decision-making.

Managers now have access to live data. We can react much faster to occupancy changes or pricing opportunities. (Hotel Manager, 5-star)

Hotels have become more agile in responding to market fluctuations, customer demands, and operational challenges.

During peak season, digital coordination allows us to reorganize teams quickly and avoid bottlenecks. (Operations Director)

Overall, operational performance improvements were most significant in hotels with a strong digital strategy, adequate resources, and a supportive organizational culture.

4.5. Discussion

The findings of this study indicate that digital transformation delivers the greatest performance benefits when embedded within a broader organizational environment characterized by an innovation-oriented culture, flexible structures, continuous strategic renewal, and adaptive management practices. These results are consistent with prior research suggesting that digital transformation is a complex, holistic process that extends beyond mere technological adoption, requiring the alignment of technology, strategy, and human resources (Bansal et al., 2023; Gong & Ribiere, 2021; Seppänen et al., 2025). Hotels that successfully integrate digital technologies with redesigned processes and enhanced workforce capabilities report substantial improvements in service personalization, operational efficiency, guest satisfaction, and resource management.

Organizational culture emerged as a critical enabler of digital transformation. Hotels that promote experimentation, risk-taking, and cross-departmental collaboration achieve higher levels of technology adoption and innovation. An innovation-oriented culture facilitates the acceptance and effective use of advanced technologies such as AI, IoT, cloud-based property management systems (PMS), and immersive tools like VR and AR. Strong internal communication of digital objectives and active involvement of employees in digital initiatives further support engagement and motivation, reinforcing the critical role of culture in digital adoption (Aldoseri et al., 2024; Bresciani et al., 2021; He et al., 2023; Malewska, Cyfert, Chwiłkowska-Kubala, Mierzejewska, & Szumowski, 2024).

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Flexible organizational structures also play a pivotal role in translating digital adoption into tangible performance improvements. Hotels that adapt operational processes to accommodate cloud-based PMS and IoT-enabled monitoring systems facilitate real-time data sharing, predictive maintenance, and faster decision-making. This flexibility enables management to respond quickly to market changes, optimize occupancy, and improve resource allocation. From a dynamic capabilities perspective, these findings highlight the importance of integrating, building, and reconfiguring organizational resources to respond to rapidly evolving environments (Osorio-Gómez, Herrera, Prieto-Osorio, & Pellicer, 2024; Shahzad, Imran, & Butt, 2025; Wilden et al., 2023).

Innovation factors, including digital strategy, organizational resources, structural flexibility, and workforce capabilities, were particularly evident in enhancing performance outcomes. Hotels with clearly defined digital strategies, supported by training programs and dedicated IT staff, deploy technologies more effectively, resulting in measurable improvements in both service quality and operational performance (Dióssy et al., 2025; Masoud & Basahel, 2023; Yu et al., 2022). These results indicate that digital transformation alone does not automatically improve performance; it must be supported by organizational readiness, skilled staff, and flexible structures that encourage experimentation and continuous learning (Liere-Netheler et al., 2018; Vasconcelos et al., 2020). AI-driven chatbots, predictive analytics, and AR/VR applications were noted as particularly effective in enhancing guest interaction, service personalization, and operational efficiency (Deputat et al., 2024; Javeed et al., 2024; Sofi et al., 2025).

Service quality emerged as a central mechanism linking digital transformation and innovation factors to performance outcomes. Internal service quality, defined as the support employees receive from colleagues and systems, was strengthened by digitalization, which in turn improved service delivery to external customers (Elibol, 2024; Masoud & Basahel, 2023; Skarpeta et al., 2020). Cloud-based PMS, AI-driven customer insights, and IoT-enabled operations enhanced cross-departmental coordination, reduced errors, and enabled employees to focus on value-added guest interactions. These findings align with literature indicating that internal service quality is foundational for external service excellence, highlighting how digital tools support organizational learning and coordination (Seyhan, 2021; Skarpeta et al., 2020).

Continuous strategic renewal and adaptive management practices further amplified the benefits of digital transformation. Hotels that periodically revised digital strategies, encouraged bottom-up innovation, and maintained flexible leadership were able to capitalize on emerging technologies more effectively. AI analytics, VR/AR applications for marketing, and cloud-based PMS demonstrate how strategic foresight transforms technology adoption into measurable operational and service improvements.

Challenges were also identified. Smaller hotels and family-run guesthouses often faced budget constraints, limited technological infrastructure, and lower digital literacy, which slowed adoption and reduced immediate benefits. However, hotels that fostered an innovative culture and strategically utilized available resources still reported meaningful performance improvements, demonstrating that organizational factors can partially mitigate resource limitations.

Overall, these findings highlight the interdependence of digital transformation and innovation factors. Culture, structure, strategic alignment, and workforce capabilities collectively determine the effectiveness of digital technologies in enhancing service quality and operational performance. Tunisian hotels that integrated these organizational factors with advanced AI, IoT, cloud-based PMS, and immersive technologies achieved superior operational efficiency, optimized resource allocation, and improved guest satisfaction. The results underscore that the interaction between technology and organizational capabilities is critical for achieving sustainable competitive advantage in a digitalized hospitality sector.

Journal of Contemporary Research in Business, Economics and Finance
ISSN: 2641-0265
Vol. 7, No. 2: 191-207, 2025
DOI: 10.55214/jcrbef.v7i2.11471

5. Conclusion

This study investigates how digital transformation and innovation factors influence service quality and operational performance in the Tunisian hospitality sector. The findings demonstrate that digital transformation delivers the most significant benefits when embedded within an organizational context characterized by an innovation-oriented culture, flexible structures, continuous strategic renewal, and adaptive management practices. Hotels that successfully integrate advanced technologies such as AI, IoT, cloud-based property management systems, and immersive tools like VR and AR with redesigned processes and enhanced workforce capabilities achieve notable improvements in service personalization, operational efficiency, guest satisfaction, and resource optimization. These results underscore the interdependence between technological adoption and organizational capabilities, highlighting that digital transformation is a holistic phenomenon rather than a purely technological initiative.

From a theoretical perspective, this research extends the literature on dynamic capabilities and the Resource-Based View by demonstrating how digital transformation interacts with organizational resources, structure, culture, and strategic alignment to drive performance outcomes. It illustrates that technology alone is insufficient; rather, the combination of digital tools with innovation-oriented capabilities enables organizations to reconfigure processes, foster organizational learning, and generate sustainable competitive advantages. The findings also reinforce the concept that service quality serves as a mediating mechanism through which digital transformation and innovation factors translate into improved operational performance. This study contributes to the growing body of research that emphasizes the systemic and integrative nature of digital transformation in service-oriented sectors, particularly in emerging markets.

For hotel practitioners, the study offers concrete guidance on effectively leveraging digital technologies to drive performance. Managers are advised to strategically adopt scalable solutions such as cloud-based property management systems, AI-powered analytics, and immersive technologies to enhance guest experiences. Equally important is cultivating an innovation-oriented culture that encourages experimentation, knowledge sharing, and responsible risk-taking, enabling employees to actively contribute to digital initiatives. Developing flexible organizational structures and adaptive management practices allows hotels to respond swiftly to market changes and capitalize on emerging opportunities. Aligning digital initiatives with clearly defined strategic objectives, supported by comprehensive employee training and capability-building programs, ensures that technology investments translate into tangible benefits. Moreover, emphasizing internal service quality through robust communication, coordination, and employee support systems strengthens the link between workforce performance and guest satisfaction. By integrating these strategies, hotels can improve operational efficiency, optimize resource utilization, elevate service quality, and maintain a sustainable competitive advantage in an increasingly digitalized hospitality landscape.

Despite its contributions, this study has several limitations. First, the research is based on a qualitative design with 18 interviews from Tunisian hotels, which may limit the generalizability of findings to other contexts or countries. Second, the study relies on self-reported perceptions of managers and staff, which may introduce subjective biases. Third, the study focuses primarily on the short- to medium-term effects of digital transformation and does not capture long-term performance outcomes or the evolving impact of emerging technologies.

Future studies could address these limitations by employing longitudinal designs to examine the sustained impact of digital transformation on operational performance and service quality. Comparative studies across different countries, hotel types, and service industries could provide further insights into contextual factors influencing digital transformation success. Quantitative research could complement qualitative findings by testing the relationships between digital transformation, innovation factors, service quality, and performance outcomes. Additionally, future research could explore the role of sustainability, ethical AI adoption, and cybersecurity practices as moderating factors in the relationship between digital transformation and organizational performance.

Journal of Contemporary Research in Business, Economics and Finance
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In conclusion, this study highlights the critical interplay between digital technologies and organizational capabilities in driving superior performance in the hospitality sector. It provides both theoretical and practical guidance, emphasizing that digital transformation is most effective when combined with an innovation-oriented culture, flexible structures, strategic renewal, and workforce development, offering a roadmap for hotels seeking to thrive in an increasingly digital and competitive environment.

Transparency:

The author confirms that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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Appendix

Appendix 1.
Respondent profile table.

Respondent ID	Position/Role	Hotel Type (Star)	Years of Experience	Digital Responsibility	Region
R1	General Manager	Luxury Resort (5-star)	12	Oversees DT strategy	Tunis
R2	IT Manager	Hotel (4-star)	8	Manages PMS & cloud systems	Sousse
R3	Manager	Business Hotel (4-star)	10	Uses CRM & AI tools	Tunis
R4	Technical Operations Manager	Resort (5-star)	15	IoT & resource management	Hammamet
R5	Sales Director	Luxury Resort (5-star)	7	VR/AR guest experience	Sousse
R6	IT Officer	Mid-range Hotel (4-star)	5	PMS & internal systems	Monastir
R7	Operations Manager	Hotel (3-star)	9	Oversees DT adoption	Tunis
R8	Operations Manager	Resort (5-star)	14	Coordinates digital tools	Hammamet
R9	Supervisor	Hotel (4-star)	6	Uses AI & analytics tools	Monastir
R10	Guest Relations Manager	Luxury Hotel (5-star)	11	Implements cloud solutions	Tunis
R11	HR Manager	Resort (4-star)	10	Digital training & staff development	Monastir
R12	Financial Manager	Mid-range Hotel	8	IoT & PMS	Kairouan

		(4-star)			
R13	Marketing Officer	Luxury Resort (5-star)	9	VR/AR & guest engagement	Hammamet
R14	IT Officer	Hotel (4-star)	6	CRM & PMS	Tunis
R15	General Manager	Hotel (5-star)	13	DT & innovation strategy	Kairouan
R16	Financial Manager	Resort (5-star)	12	Oversees digital operations	Hammamet
R17	Manager	Luxury Hotel (5-star)	8	AI & service personalization	Tunis
R18	HR Manager	Hotel (3-star)	7	PMS & cloud-based tools	Monastir

Appendix 2.
Interview Guide – Tunisian Hotel Sector.

Warm-up questions

Could you briefly introduce yourself and your role in the hotel?

How long have you been working in the hotel industry?

Can you describe the main activities or responsibilities within your position?

1. Digital Transformation

A. Digital Technologies and Adoption

What digital technologies are currently implemented in your hotel (e.g., PMS, CRM, ERP, mobile check-in, AI chatbots, smart devices)?

How would you describe the level of digitalization in your hotel?

What motivated your hotel to adopt these technologies (e.g., competition, customer expectations, efficiency needs)?

B. Digital Strategy

Does your hotel have a clear digital strategy or vision?

How does top management support digital initiatives?

What challenges do you face in implementing or expanding digital transformation?

C. Organizational Readiness

How would you describe the digital skills of employees in your hotel?

What training or support is provided to help staff use new technologies?

To what extent do existing processes and structures facilitate or hinder digital transformation?

2. Innovation Factors

A. Drivers of Innovation

What factors encourage innovation in your hotel (e.g., customer needs, competition, technology trends, management support)?

How does your hotel identify and evaluate new innovative opportunities?

B. Internal Capabilities

What internal resources (knowledge, skills, infrastructure) support innovation efforts?

How does your hotel promote creativity, new ideas, or continuous improvement?

C. Barriers to Innovation

What main obstacles limit innovation (e.g., cost, resistance to change, lack of competencies, regulations)?

How does your hotel try to overcome these obstacles?

3. Service Quality

How would you describe communication and coordination between different hotel departments?

Do employees receive the support and resources they need to deliver quality services?

What internal processes contribute most to improving service quality?

How do digital tools enhance customer experience (speed, personalization, accuracy, convenience)?

How does your hotel collect and use customer feedback to improve service quality?

Have customer expectations changed with digitalization? If yes, how?

4. Operational Performance

Journal of Contemporary Research in Business, Economics and Finance
ISSN: 2641-0265
Vol. 7, No. 2: 191-207, 2025
DOI: 10.55214/jcrbef.v7i2.11471

In what ways has digital transformation improved daily operations (speed, cost reduction, error reduction, workflow coordination)?

Are there specific examples of processes that have become more efficient due to technology?

How has digitalization improved your hotel's ability to respond to market changes or customer requests?

What indicators do you use to evaluate operational performance (KPIs such as occupancy rate, service speed, customer satisfaction, cost efficiency)?

In your opinion, how strongly does digital transformation contribute to overall performance improvements?

5. Closing Questions

From your perspective, what are the priorities for Tunisian hotels in terms of digital development in the coming years?

What recommendations would you give to hotels seeking to improve their digital transformation and performance?

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