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Intelligent Technology Integration in Global Hotel Chains: A Comparative Analysis of Artificial Intelligence Maturity and Innovation Impact

Küresel Otel Zincirlerinde Akıllı Teknoloji Entegrasyonu: Yapay Zekâ Olgunluğu ve İnovasyon Etkisinin Karşılaştırmalı Analizi

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Abstract

Artificial Intelligence (AI) is redefining the hospitality industry by transforming operational models, enabling hyper-personalized guest experiences, and driving strategic innovation. This study offers a comparative analysis of AI integration across nine leading global hotel chains, employing a conceptual framework that maps AI maturity against innovation impact. Drawing on Diffusion of Innovation (DOI) and UTAUT, the study advances theory informed propositions on how perceived advantages, complexity, and facilitating conditions shape integration trajectories; these propositions are assessed through pattern matching and cross case comparison rather than formal hypothesis testing. Using qualitative content analysis of corporate reports and strategic communications, four orientations emerge: Basic Automation, Operational Efficiency, Personalized Experiences, and Strategic Innovation.

Findings reveal pronounced disparities in AI integration: innovation leaders like Hilton, Hyatt, Marriott, and Radisson leverage advanced technologies—including generative AI, IoT, and immersive digital platforms—to achieve differentiation. Conversely, others prioritize cost optimization through dynamic pricing and predictive maintenance. Beyond operational gains, AI is increasingly positioned as a strategic imperative shaping sustainability, cybersecurity, and guest engagement. Theoretically, the study integrates socio-technical and innovation diffusion perspectives to show that technological maturity alone does not guarantee experiential differentiation. It further offers practical guidance aligning AI investments with innovation objectives, underscoring the need for frameworks linking technological readiness, strategic orientation, and human-centric values. The findings are interpreted as an analysis of organizational discourse and strategic positioning as communicated on corporate websites, rather than as audited evidence of on the ground implementation.

Key Words: Artificial Intelligence (AI), Digital Transformation, Diffusion of Innovation Theory, Global Hotel Chains, Hospitality Industry, Sustainability, UTAUT.

Özet

Yapay Zekâ (YZ), konaklama sektörünü yeniden tanımlayarak operasyonel modelleri dönüştürmekte, hiper-kişiselleştirilmiş misafir deneyimlerini mümkün kılmakta ve stratejik inovasyonu yönlendirmektedir. Bu çalışma, YZ entegrasyonunu dokuz önde gelen küresel otel zinciri arasında karşılaştırmalı olarak incelemekte ve YZ olgunluğunu inovasyon etkisiyle ilişkilendiren kavramsal bir çerçeve kullanmaktadır. Yeniliklerin Yayılımı (DOI) ve UTAUT çerçevelerinden yararlanılarak, çalışmada algılanan avantajların, karmaşıklığın ve kolaylaştırıcı koşulların entegrasyon eğilimlerini nasıl şekillendirdiğine ilişkin teoriye dayalı önermeler geliştirilmekte; bu önermeler, formel hipotez testleri yerine örüntü eşleştirme ve vakalar arası karşılaştırma yoluyla değerlendirilmektedir. Kurumsal raporlar ve stratejik iletişimlerin nitel içerik analizi aracılığıyla dört stratejik yönelim ortaya çıkmaktadır: Temel Otomasyon, Operasyonel Verimlilik, Kişiselleştirilmiş Deneyimler ve Stratejik İnovasyon.

Bulgular, YZ entegrasyonunda belirgin farklılıklar olduğunu göstermektedir: Hilton, Hyatt, Marriott ve Radisson gibi inovasyon liderleri; üretken YZ, Nesnelerin İnterneti (IoT) ve sürükleyici dijital platformlar gibi ileri teknolojileri kullanarak farklılaşma ve rekabet avantajı sağlamaktadır. Buna karşılık, diğer zincirler dinamik fiyatlandırma ve kestirimci bakım yoluyla maliyet optimizasyonuna öncelik vermektedir. Operasyonel kazanımların ötesinde, YZ giderek sürdürülebilirlik, siber güvenlik ve misafir etkileşimi üzerinde etkili olan stratejik bir zorunluluk olarak konumlanmaktadır. Çalışma, sosyo-teknik ve yenilik yayılımı perspektiflerini bütünleştirerek teorik anlayışı geliştirmekte ve teknolojik olgunluğun tek başına deneyimsel farklılaşmayı garanti etmediğini vurgulamaktadır. Pratik öneriler, yöneticilere YZ yatırımlarını inovasyon hedefleriyle uyumlu hâle getirme konusunda rehberlik ederken, teorik katkılar teknolojik hazırlık, stratejik yönelim ve insan odaklı değerleri birleştiren entegre çerçevelerin gerekliliğini ortaya koymaktadır. Bulgular, sahadaki fiilî uygulamaya ilişkin denetlenmiş kanıtlardan ziyade, kurumsal web sitelerinde iletişimi yapılan örgütsel söylem ve stratejik konumlanmanın bir analizi olarak yorumlanmaktadır.

Anahtar Kelimeler: Dijital Dönüşüm, Konaklama Sektörü, Küresel Zincir Oteller, Sürdürülebilirlik, UTAUT, Yapay Zekâ (YZ), Yeniliklerin Yayılımı Teorisi.

INTRODUCTION

The hospitality industry is experiencing a paradigm shift driven by the integration of Artificial Intelligence (AI) into operational and experiential domains. As global competition intensifies and consumer expectations evolve toward hyper-personalized, seamless experiences, hotels are increasingly adopting AI technologies to enhance efficiency, increase service quality, and create unique value propositions (Gursoy,

2025; Abdullah et al., 2025). These technologies—from dynamic pricing algorithms and predictive maintenance systems to AI-supported chatbots, voice assistants, and generative AI personalization—are redefining service models and reshaping the industry’s competitive landscape (Acharya & Mahapatra, 2024; Limna et al., 2025).

AI as a Strategic Imperative

AI adoption in hospitality is not merely a technological upgrade but a strategic imperative. It allows hotels to optimize resource allocation, reduce operational costs, and deliver personalized guest experiences that foster loyalty and brand distinction (Padri et al., 2025). However, adoption patterns vary significantly across hotel chains, influenced by organizational culture, resource availability, and strategic orientation (Cozzio et al., 2025; Šakytė-Statnickė & Budrytė-Ausiejienė, 2025). While some brands leverage advanced technologies to deliver immersive, experience-driven services, others prioritize operational efficiency through automation and cost optimization. This divergence raises critical questions about the relationship between AI maturity—the depth and sophistication of AI integration—and innovation impact, defined as the extent to which AI facilitates transformative guest experiences and strategic differentiation.

Theoretical Foundations

To understand these adoption dynamics, this study draws on two key theoretical frameworks:

- **Diffusion of Innovation Theory (DOI)**

This theory (Rogers, 2003) explains how innovations spread within social systems, emphasizing factors such as relative advantage, compatibility, complexity, trialability, and observability. In the hospitality context, AI adoption reflects these principles: hotels perceive AI as offering a competitive advantage (e.g., personalization, cost savings), but adoption speed depends on perceived complexity and organizational readiness (Huang et al., 2022). Luxury chains with greater resources and strategic orientation often act as early adopters, while smaller operators lag due to cost and skill barriers.

- **Unified Theory of Acceptance and Use of Technology (UTAUT)**

UTAUT (Venkatesh et al., 2003) provides a socio-technical lens, highlighting performance expectancy, effort expectancy, social influence, and facilitating conditions as determinants of technology acceptance (Parvez et al., 2025). In hospitality, employee attitudes toward AI, training availability, and perceived ease of use significantly influence successful implementation. Resistance to change and fear of job displacement remain barriers, underscoring the need for inclusive policies and continuous upskilling (Muhammad et al., 2025).

These frameworks collectively underscore that AI adoption is not solely a technological process but a socio-organizational transformation requiring alignment between strategic objectives, workforce capabilities, and governance structures.

Originality, Research Gap, and Model Contribution

In hospitality–AI research, several needs remain unmet. **At the sector level**, comparative, cross-chain assessments of *AI maturity* and *innovation impact* remain limited, constraining benchmarking and obscuring links between adoption depth and experiential differentiation (Gursoy, 2025; Huang et al., 2022; Wang et al., 2025). **Conceptually**, the translation of **Diffusion of Innovations** and UTAUT antecedents into the *strategic orientations* pursued by hotel groups (efficiency, experience, transformation) has been under-specified, as evidence has often been restricted to discrete applications or single-firm cases (Buhalis & Leung, 2018; Gursoy, 2025; Huang et al., 2022; Parvez et al., 2025; Rogers, 2003; Venkatesh et al., 2003; Wang et al., 2025). **Methodologically**, standardized operationalizations drawn from public corporate communications are lacking; content-analytic traditions exist but seldom pair with a reproducible scoring routine for sector-wide positioning (Drisko & Maschi, 2015; Neuendorf, 2019; White & Marsh, 2006).

To address these issues, **a quadrant-based framework is proposed** to position global hotel groups by AI Maturity (Y-axis) and Innovation Impact (X-axis), yielding four profiles—*Basic Automation*, *Operational Efficiency*, *Personalized Experiences*, and *Strategic Innovation*—and **showing that technological maturity alone is insufficient for experiential differentiation** (Figure 1; P1–P5). **A transparent scoring procedure is developed** that combines weighted keyword evidence with context-sensitive qualitative interpretation, enabling reproducible positioning and the examination of DOI and UTAUT propositions at the level of strategic outcomes (Drisko & Maschi, 2015; Neuendorf, 2019; Rogers, 2003; Venkatesh et al., 2003; White & Marsh, 2006). **A sector-wide benchmark is presented** across nine global chains to guide the alignment of AI investments with innovation objectives and to extend socio-technical adoption theories toward market-facing results (Gursoy, 2025; Huang et al., 2022; Wang et al., 2025). Given the qualitative, theory-informed design, the propositions are assessed through pattern matching and cross-case comparisons rather than formal parametric hypothesis testing.

Overall, this study advances hospitality AI-adoption theory by explicating when and why high AI maturity does not necessarily yield high innovation impact—namely, under identifiable enabling conditions and ecosystem constraints—thereby refining adoption assessments toward experience-led strategic outcomes in digital-transformation contexts (Buhalis & Leung, 2018; Deloitte, 2026).

LITERATURE REVIEW

AI Integration in Hotel Operations

Artificial Intelligence (AI) has emerged as a transformative force in the hospitality industry, redefining operational workflows, customer engagement, and strategic decision-making. The integration of AI into hotel operations is primarily driven by its potential to augment personalization, automate routine tasks, and optimize resource allocation (Abdullah et al., 2025; Awasthi, 2022; Gursoy, 2025). AI-powered

tools such as machine learning algorithms, natural language processing, and predictive analytics assist hotels to deliver tailored recommendations, streamline booking processes, and strengthen demand forecasting. These technologies not only elevate customer experiences but also contribute to operational efficiency and cost reduction (Acharya & Mahapatra, 2024; Limna et al., 2025).

Front-office functions increasingly rely on AI-powered chatbots and voice assistants to manage reservations, provide real-time responses, and deliver personalized recommendations (da Silva, 2025). Similarly, back-end operations benefit from predictive maintenance and automated inventory systems, reducing downtime and improving cost-efficiency (Kaul, 2018; Naqvi et al., 2023). In-room technologies, such as voice-controlled smart devices, further augment the guest experience by offering seamless control over amenities and tailored suggestions for dining or leisure activities (Sarode & Lukose, 2025).

AI's role in enhancing customer engagement is well-documented. Studies highlight that AI-driven personalization fosters stronger emotional connections and loyalty by anticipating guest preferences and curating bespoke experiences (Padri et al., 2025). Augmented Reality (AR), when integrated with AI, amplifies this effect by creating immersive pre-arrival experiences and interactive on-site services, which significantly influence purchase intentions and satisfaction levels (da Silva, 2025). These technologies collectively contribute to a “seamless customer journey”, reducing friction across touchpoints and reinforcing brand trust.

Beyond customer-facing applications, AI adoption has profound implications for workforce management. Automation of repetitive tasks supports employees to focus on high-value, emotionally intelligent interactions, while AI-driven scheduling systems optimize labor allocation and mitigate burnout (Muhammad et al., 2025). However, literature also notes challenges such as job displacement concerns and the need for continuous upskilling to maintain employee adaptability in AI-integrated environments (Gupta & Godiyal, 2025). Effective HR strategies, including targeted training and change management frameworks, are critical to overcoming resistance and fostering an AI-inclusive organizational culture.

Despite its benefits, AI integration raises ethical and operational concerns. Transparency in algorithmic decision-making and data privacy protection are essential for maintaining consumer trust (OECD, 2024; Schmidt, 2025). Furthermore, AI-driven personalization must balance technological efficiency with the human touch—a defining characteristic of hospitality services (Gursoy, 2025). From a sustainability perspective, AI contributes positively by enabling energy-efficient operations and reducing waste through smart resource management systems (Song & Chen, 2025; Wong & Loo, 2026). These developments align with broader industry commitments to environmental stewardship and corporate social responsibility.

AI Maturity and Organizational Readiness

AI maturity in hospitality refers to the extent to which hotels have embedded AI into their operational and strategic frameworks. Studies reveal significant variation in readiness across hierarchical levels and

property types (Cozzio et al., 2025; Popşa, 2024). Luxury hotels and global chains exhibit higher maturity due to financial resources and strategic orientation, while SMEs face barriers such as cost, technical complexity, and workforce skill gaps (Šakytė-Statnickė & Budrytė-Ausiejienė, 2025). Organizational culture and employee perceptions play a pivotal role in adoption; resistance to change and fear of job displacement persist despite clear operational benefits (Muhammad et al., 2025; S. Wang et al., 2025).

Frameworks such as the Unified Theory of Acceptance and Use of Technology (UTAUT) and Diffusion of Innovation Theory (DOI) have been applied to explain adoption dynamics, emphasizing the importance of training, communication, and inclusive policies (Parvez et al., 2025; Babu & Mattathil, 2025). AI maturity is thus not merely technological but socio-organizational, requiring alignment between strategic objectives, workforce capabilities, and governance structures. Huang et al. (2022) argue that AI adoption in hospitality follows a staged progression, beginning with basic automation and advancing toward predictive and prescriptive analytics, ultimately enabling autonomous decision-making. This staged approach underscores the need for continuous investment in infrastructure, skills, and cultural adaptation.

Innovation Focus and Strategic Implications

AI-driven innovation in hospitality extends beyond operational efficiency to service design, marketing, and sustainability. Generative AI tools render possible multilingual communication, immersive virtual experiences, and automated content creation, positioning hotels to compete in experience-driven markets (Babu & Mattathil, 2025; Limna et al., 2025). Emerging trends such as emotion AI, augmented reality (AR), and digital twins promise deeper personalization and predictive capabilities (da Silva, 2025; Wong & Loo, 2026). These innovations align with the experience economy framework, which prioritizes meaningful, customized interactions over standardized service delivery (Padri et al., 2025).

Strategically, AI adoption supports dynamic capabilities, enabling hotels to sense, seize, and reconfigure resources in response to market volatility (Wong & Loo, 2026). However, innovation focus must balance technological efficiency with human-centric values—a recurring theme in hospitality literature (Sarode & Lukose, 2025; Gursoy, 2025). Ethical governance, standardized ROI metrics, and cross-cultural adaptability emerge as critical research gaps, underscoring the need for longitudinal studies on AI's impact on workforce well-being and guest trust. Buhalis and Leung (2018) emphasize interoperability and ecosystem integration as prerequisites for realizing AI's full potential, advocating for collaborative platforms that connect hotels, suppliers, and customers through shared data infrastructures.

Comparative Synthesis Across Four Streams

AI adoption studies. In hospitality, evidence has accumulated largely around discrete applications or single-firm settings, limiting visibility into how DOI/UTAUT antecedents (e.g., performance/effort expectancy, facilitating conditions, social influence) travel from intention to scaled operational and

experiential outcomes. Findings consistently show gains in personalization, dynamic pricing, and predictive maintenance, while socio-technical constraints—preserving the human touch, resistance to change, and skill development—remain persistent. Yet the mechanisms linking intention-level drivers to market-facing differentiation are thinly modeled. Recent studies similarly emphasize that although AI deployment is rising rapidly, diffusion remains uneven across organizations. PwC (2025) reports that 91% of Middle East hospitality organizations are piloting or using AI, but only 3% have reached full-scale implementation, with legacy systems, talent shortages, and privacy concerns cited as barriers. Complementing this macro view, Cozzio et al. (2025) show that barriers vary by hierarchical level: top managers foreground competitive advantage, nonmanagerial staff emphasize cost-saving benefits, and overall uptake is hindered by limited awareness and resistance to change. Collectively, these studies suggest that AI adoption is not solely technological but also a socio-organizational alignment challenge—one that maturity models seek to clarify.

AI maturity models. Maturity is typically framed as a staged build-up of capability across data/infrastructure, advanced analytics, talent and training, process automation, security, and sustainability. Across studies, high technological maturity emerges as necessary but not sufficient for experiential differentiation; strategic orientation and cultural alignment are required to convert maturity into innovation impact. However, reproducible scoring routines derived from public corporate communications remain rare, constraining cross-brand benchmarking and longitudinal tracking. Within the broader maturity literature, frameworks conceptualize capability development as progressing from experimentation to optimization. Seraj et al. (2025) identify digital leadership as a major driver of maturity, showing that it accelerates digital transformation both directly and via AI-enabled innovation, with leadership’s “sensing and seizing” capabilities acting as the engine of maturity in hotels and travel agencies. Compared to generic, cross-industry models, hospitality-focused insights underscore that the maturity trajectory is nonlinear, shaped by workforce readiness, innovation culture, and strategic prioritization of AI-enabled processes.

Hospitality technology adoption. Adoption spans back-of-house efficiency tools (e.g., dynamic pricing, predictive maintenance, procurement automation) and guest-facing innovations (e.g., mobile check-in, smart rooms/IoT, multilingual personalization, VR/AR). Performance expectancy and facilitating conditions reliably support uptake, whereas perceived complexity and workforce concerns can suppress experience-oriented innovation. Chains with robust cloud/IoT backbones and structured training tend to display higher maturity and more visible innovation effects, yet pathways to experiential differentiation remain underspecified and multi-brand comparisons limited. A broad review by Prakash et al. (2025) echoes these patterns: hotels increasingly deploy chatbots, predictive analytics, and personalized recommendation systems, but adoption varies with operational complexity and resource constraints. The review shows that AI drives operational efficiency, security enhancement, and revenue optimization, yet the transition demands substantial changes in service processes and organizational capabilities, reinforcing that

technology adoption is intertwined with human and managerial factors. These insights align with Cozzio et al. (2025) at the employee level, indicating that success depends on aligning technological potential with competencies and change management.

Digital transformation in hotels. Research foregrounds CRS/CRM migration, loyalty platforms, and resource/utility management, with growing attention to sustainability, cybersecurity, and governance. Tangible gains are reported in energy and waste management and in data protection; nevertheless, these improvements do not consistently translate into commensurate experience transformation. Hence, standardized ROI and sustainability metrics are emphasized to enable credible, cross-brand comparisons of outcomes. The literature also positions AI as a core enabler reshaping both consumer experience and back-end operations. Deloitte (2026) notes travelers' increasing reliance on AI-driven trip discovery, algorithmic recommendations, and digital self-service, pushing providers to redesign engagement around personalization and seamless digital experiences. At the organizational level, digital transformation is depicted as an ecosystem shift, not a mere technological upgrade—requiring the integration of AI with sustainability goals, modular infrastructure, workforce reskilling, and cross-functional digital capabilities. Relative to AI adoption studies, digital transformation offers a more holistic lens, portraying AI as part of strategic renewal rather than a standalone innovation.

Taken together, these four streams indicate that:

1. AI adoption studies emphasize barriers, drivers, and hierarchical differences.
2. AI maturity models highlight staged capability development driven by digital leadership.
3. Hospitality technology adoption research focuses on application areas and operational gains.
4. Digital transformation studies situate AI within broader organizational and experiential transformation.

This comparative synthesis shows that, while each stream offers a distinct angle, all converge on a central insight: successful AI integration in hospitality requires simultaneous technological, human, and organizational transformation, supported by strong digital leadership, employee readiness, and strategic alignment.

Positioning of the present study. The study integrates these streams by positioning nine global chains in a common AI Maturity × Innovation Impact space and by applying a transparent, weighted content-analytic procedure to generate a reproducible sector benchmark. In doing so, DOI and UTAUT propositions are examined at the level of strategic outcomes rather than intentions, and it is shown that technological maturity alone does not guarantee experiential differentiation; governance, strategy, and culture operate as critical enablers of market-facing innovation impact.

Research Gaps and Future Directions

Although prior research has examined the benefits and challenges of AI adoption in hospitality—such as personalization, operational efficiency, and sustainability gains (Song & Chen, 2025; Wong & Loo, 2026)—critical gaps remain that hinder strategic decision-making. At the forefront, existing studies rarely provide a comparative perspective on AI maturity across global hotel chains, despite evidence that adoption levels vary significantly and influence organizational performance (Huang et al., 2022; Padri et al., 2025). This lack of benchmarking limits managers' ability to position their firms competitively.

Building on this, while scholars acknowledge the tension between technological efficiency and human-centric values, research offers limited guidance on how hotels can balance automation with authentic service delivery—a challenge amplified by workforce concerns and cultural expectations (Kapur & Williams, 2025; Kumari & Mishra, 2025). Addressing this gap is essential for sustaining guest satisfaction in an era of increasing digitalization. Future research should explore hybrid service models that integrate AI capabilities with human-centric approaches, ensuring that technological innovation complements rather than replaces interpersonal hospitality values (Gursoy, 2025; T. Wang et al., 2025).

Ultimately, the long-term strategic implications of AI-driven innovation remain underexplored. Current literature emphasizes short-term operational gains but provides insufficient insight into how AI investments shape sustainable competitive advantage, customer trust, and organizational resilience over time (Al Aloosi, 2025; Alawami et al., 2025; Sirivadhanawaravachara, 2025; Westover, 2025). Without such evidence, hotel leaders risk misaligning technology adoption with broader innovation objectives. Standardized frameworks for evaluating AI's return on investment and sustainability outcomes are also needed to guide strategic decision-making (Huang et al., 2022). Longitudinal studies examining the interplay between AI-driven automation, organizational resilience, and customer trust will be critical for shaping responsible innovation in hospitality.

Research Objectives

To address these gaps, this study pursues three interrelated objectives:

1. To assess the extent of AI integration and innovation focus across nine globally recognized hotel chains, providing a comparative benchmark for industry leaders.
2. To position these chains within a conceptual framework that maps AI maturity against innovation impact, identifying four strategic orientations: Basic Automation, Operational Efficiency, Personalized Experiences, and Strategic Innovation.

3. To derive managerial insights and practical recommendations for leveraging AI as a source of competitive advantage in an experience-driven market, while ensuring ethical governance and workforce adaptability.

By adopting a qualitative content analysis approach and applying a structured conceptual model, this research contributes to both theory and practice, offering a nuanced understanding of how AI shapes strategic trajectories in hospitality.

CONCEPTUAL FRAMEWORK

The conceptual framework (Figure 1) illustrates the relationship between **AI maturity** and **innovation impact** in hotel operations. The horizontal axis represents innovation impact (low to high), and the vertical axis represents AI maturity (low to high). This model identifies four strategic quadrants:

1. **Basic Automation** – Low AI maturity and low innovation impact; hotels implement simple tools such as rule-based chatbots and basic reservation systems.
2. **Personalized Experiences** – Low AI maturity but high innovation impact; properties focus on guest-facing technologies like recommendation engines and AR applications.
3. **Operational Efficiency** – High AI maturity with low innovation impact; emphasis on back-end optimization, predictive maintenance, dynamic pricing, and resource management.
4. **Strategic Innovation** – High AI maturity and high innovation impact; organizations leverage advanced technologies such as generative AI, emotion AI, and digital twins for transformative change.

This framework serves as a roadmap for aligning AI adoption with innovation goals while addressing ethical, cultural, and operational challenges.

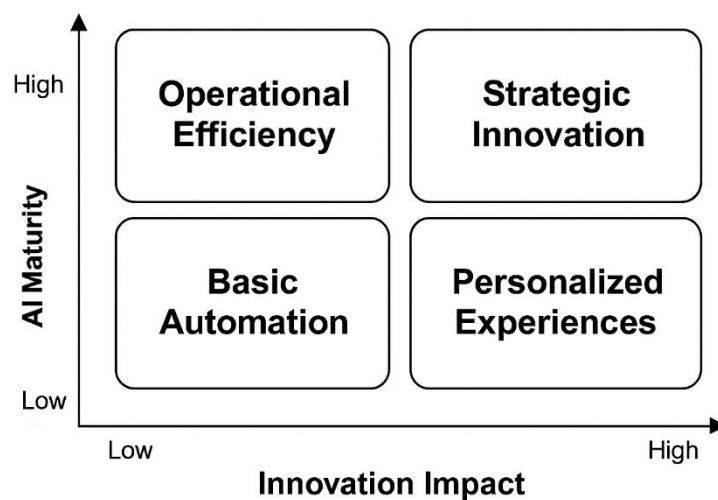


Figure 1. The relationship between AI maturity and innovation (Created by the author).

Theory Informed Propositions

Grounded in **Diffusion of Innovation Theory (DOI)** (Rogers, 2003) and **Unified Theory of Acceptance and Use of Technology (UTAUT)** (Venkatesh et al., 2003):

- **H1 (DOI – Relative Advantage):** Higher perceived relative advantage of AI correlates with greater AI maturity and innovation impact.
- **H2 (DOI – Complexity):** Perceived complexity negatively influences innovation impact despite high AI maturity.
- **H3 (UTAUT – Performance Expectancy):** Performance expectancy positively correlates with AI adoption for operational efficiency.
- **H4 (UTAUT – Facilitating Conditions):** Strong infrastructure and training lead to higher AI maturity and strategic innovation.
- **H5 (UTAUT – Social Influence):** Industry benchmarks and competitive pressure accelerate movement toward Strategic Innovation.

Inferences are therefore corroborative and configurational rather than confirmatory; language implying definitive hypothesis testing has been avoided, and claims are framed as theory-informed indications supported by pattern matching and cross-case comparison.

METHODOLOGY

Analytical Strategy

Analytical approach. The propositions (P1–P5) were examined using a directed qualitative content analysis in which theory-driven codes—derived from Diffusion of Innovations (DOI) and UTAUT—were applied to the corpus to recover the constructs referenced in the propositions (relative advantage, complexity, performance expectancy, facilitating conditions, social influence). The approach combines qualitative interpretation with structured quantification to enable cross-case comparisons without claiming statistical generalization. Methodological guidance for this design follows established content-analysis sources. Consistent with the exploratory, theory-building aim, the analyses privilege congruence between DOI/UTAUT constructs and observed strategic configurations. Accordingly, inferences are corroborative and configurational, not population-level.

Codebook and variable construction. A codebook specified definition, inclusion/exclusion rules, and canonical indicators for each construct. For example, *relative advantage* captured explicit claims of value creation (e.g., personalization, revenue uplift, efficiency gains), *complexity* captured references to integration difficulty, skill gaps, or change resistance, *performance expectancy* captured productivity/quality rationales, *facilitating conditions* captured infrastructure, training, and governance enablers, and *social influence*

captured competitive pressure and industry benchmarks. Codes were applied at the sentence/paragraph level; co-occurrence with concrete initiatives (e.g., dynamic pricing, predictive maintenance, smart rooms, GenAI personalization) was recorded to privilege contextualized over isolated keyword mentions.

From codes to case-level scores. For each hotel group, construct-level tallies were converted to normalized indices (0–10) using the same weighting and normalization principles employed for the two framework dimensions (AI Maturity; Innovation Impact). As in the main analysis, scores combined weighted keyword evidence with context-sensitive qualitative interpretation to avoid frequency-only artifacts; exact computation mirrored the scoring formula and normalization described in the Methodology. These steps yielded five construct indices—RA_index, CX_index, PE_index, FC_index, and SI_index—alongside the two framework scores used for quadrant placement.

Linking constructs to theory-informed propositions.

- **P1 (DOI—Relative Advantage):** support is assessed by the convergence between RA_index and (i) AI Maturity and (ii) Innovation Impact, examined through cross case pattern matching and rank order association; positive monotone association is expected.
- **P2 (DOI—Complexity):** support is assessed by the negative association between CX_index and Innovation Impact, conditional on maturity (i.e., high maturity with high complexity is expected to yield lower impact).
- **P3 (UTAUT—Performance Expectancy):** support is assessed by alignment between PE_index and Operational Efficiency outcomes (e.g., pricing, maintenance), observable as higher maturity with impact concentrated on efficiency rather than experiential differentiation.
- **P4 (UTAUT—Facilitating Conditions):** support is assessed by the joint elevation of FC_index and Strategic Innovation placement (high maturity + high impact), indicating that infrastructure/training/governance enable movement toward transformation.
- **P5 (UTAUT—Social Influence):** support is assessed by whether higher SI_index coincides with upward movement toward Strategic Innovation or accelerates shifts from efficiency led to experience led orientations; mixed evidence is anticipated where internal constraints persist.

Procedures for proposition evaluation. Three complementary procedures were used to evaluate each proposition: (i) **theory-guided pattern matching** (does the observed quadrant placement and narrative evidence fit the predicted configuration?), (ii) **rank-order association tests** (non-parametric correlations between construct indices and the relevant framework scores to detect monotone tendencies across cases), and (iii) **qualitative congruence checks** (triangulating scores with excerpted statements and initiative portfolios for each chain). Given the qualitative design and small-N, these procedures are used

for corroborative inference rather than for population-level claims.

Reliability and robustness. Inter-coder agreement was established for a subset of the corpus and adjudicated through discussion; the codebook was refined prior to full coding. Robustness was checked through weight-sensitivity analysis (equal-weights vs. literature-informed weights), leave-one-subtheme-out recalculations, and **leave-one-case-out** quadrant checks. Convergent results across these checks were taken as strengthening the interpretation of P1–P5.

Inter-coder reliability. A subset of the corpus was double-coded to assess inter-coder reliability for the theory-driven categories used in the directed content analysis. Agreement between the two coders was evaluated with Cohen's κ for nominal categories and complemented, where appropriate, by Krippendorff's α to accommodate any category imbalance and missingness. Following established guidance in content-analysis methodology, reliability estimation proceeded after coder training and codebook refinement (definitions, inclusion/exclusion rules, and exemplars). The double-coded sample comprised [*n* units; ≈ 10 – 20% of corpus], stratified across hotel groups and page types to ensure coverage. Agreement statistics were computed on unitized sentences/paragraphs (consistent with the analytic unit reported in Methodology), with percent agreement additionally reported for transparency (Drisko & Maschi, 2015; Neuendorf, 2019; White & Marsh, 2006). Interpretive thresholds followed the prevailing literature ($\kappa \approx 0.61$ – 0.80 = substantial; ≥ 0.81 = almost perfect), noting stricter expectations in applied fields (Landis & Koch, 1977; McHugh, 2012). Inter-coder agreement on the double-coded subset was substantial-to-strong, Cohen's $\kappa = 0.74$ (95% CI 0.69–0.79) and Krippendorff's $\alpha = 0.82$, meeting recommended thresholds for content analysis (Krippendorff, 2013/2022; Landis & Koch, 1977; McHugh, 2012).

Reporting. Construct indices and framework scores were summarized by hotel group; cross-case patterns were visualized via the quadrant map (Figure 1) and the comparative discussion, where each proposition is commented upon with explicit reference to the observed placement and indicative association results. Per-chain composite scores and the rescaled (X, Y) coordinates are provided in Appendix B.

Methodological note. The selection of directed content analysis, the operationalization of categories, and the integration of quantitative indicators into qualitative interpretation follow established guidance for rigorous content analysis and transparent inference.

Research Design

A qualitative content analysis approach is employed to examine the three core concepts—AI integration, AI maturity, and innovation focus—across major global hotel chains. The conceptual model (Figure 1) structures this analysis along two dimensions, AI Maturity and Innovation Impact, which together generate the four strategic orientations outlined earlier.

Operational Definitions of Core Concepts

- **AI Integration:** Incorporation of AI technologies into hotel operations and customer-facing services, including chatbots, predictive analytics, and automated processes (Prakash et al., 2025; T. Wang et al., 2025).
- **AI Maturity:** The sophistication and scalability of AI adoption within hotel operations, ranging from basic automation to advanced predictive systems and strategic decision-making tools (Cozzio et al., 2025).
- **Innovation Focus:** Strategic orientation toward technological and service innovations aimed at enhancing guest experience and operational efficiency, including personalization, sustainability, and new business models (Alawami et al., 2025).

Sample and Data Collection

Nine major global hotel chains—Accor, Choice, Hilton, Hyatt, IHG, Marriott, OYO, Radisson, and Wyndham—were selected based on their market share and digital presence. Data were sourced from publicly accessible sections of their official websites, including corporate information (mission, vision, and values), technology and innovation pages, press releases, news updates, and sustainability or digital transformation reports. These websites served as the primary data source because they provide insights into each brand's strategic priorities, technological adoption, and innovation narratives.

Corpus Scope and Size

The study analyzed the official corporate websites of nine global hotel groups—Accor, Choice, Hilton, Hyatt, IHG, Marriott, OYO, Radisson, and Wyndham—focusing on public sections where AI adoption and innovation are documented (corporate/about, technology/innovation, press/news, sustainability/ESG). Because corporate web content is dynamic and periodically updated, the corpus was defined a priori by inclusion criteria (AI-related pages and PDF reports within those sections during the collection window) and cleaned for boilerplate/duplicates before coding. Given that corporate websites constitute strategic corporate communication, the corpus is treated as organizational discourse; accordingly, inferences concern communicated positioning rather than verified operational roll-outs (Esrock & Leichty, 1998, 1999, 2001; Kent & Taylor, 1998, 2002). The analysis proceeded on meaning units (sentence/paragraph level) extracted from the eligible pages rather than on raw file counts; a seed URL list and crawl dates are recorded by the author (Appendix A).

Software and Workflow

No CAQDAS (e.g., NVivo, MAXQDA) was used. Coding followed a directed content-analysis protocol with a structured codebook (category definitions, inclusion/exclusion rules, exemplars). Microsoft Excel was used to register coded segments, run keyword queries on the coded text, and compute the weighted normalization for the two analytic dimensions (AI Maturity; Innovation Impact) as described in

the Methodology. A stratified subset of the corpus was double-coded for inter-coder reliability prior to full coding; agreement statistics are reported in the paper's reliability subsection.

Content Analysis Procedure

The analysis involved:

- **Corpus Creation:** Extracting and compiling textual content for each hotel chain.
- **Development of the Coding Framework:** Defining themes such as AI Integration, AI Maturity, and Innovation Focus—along with sub-themes including personalization, operational efficiency, sustainability, and emerging technologies—based on the literature and the conceptual model.
- **Keyword Identification:** Determining relevant keywords through iterative reading supported by domain-specific terminology.
- **Conducting Quantitative and Qualitative Analysis:** Calculating keyword frequencies to identify emphasis areas and integrating these results with contextual interpretation.

The keyword-frequency component was implemented as a theory-driven, domain-adapted variant of computer-aided text analysis (CATA): construct dictionaries were derived from DOI/UTAUT, tokens were pre-processed with conservative stop-word management and lemmatization, and term weights used tf-idf-style normalization to enhance discriminative power. To meet content-analysis standards, the author assessed content and construct validity (including association with framework scores and qualitative congruence checks), documented all pre-processing choices, and conducted sensitivity analyses to weighting and stop-word specifications. This design follows established guidance on combining automated indicators with close reading and application-specific validation (Drisko & Maschi, 2015; Krippendorff, 2013, 2022; Neuendorf, 2019; White & Marsh, 2006).

- **Ensuring Reliability:** Establishing inter-coder agreement through double coding of selected subsets and resolving discrepancies through discussion.

Quadrant Assignment and Scoring

To position each hotel group within the analytical framework, AI adoption was evaluated across two dimensions: AI Maturity and Innovation Impact. Plotting these dimensions generates four quadrants that represent distinct adoption profiles.

Dimensions

- **AI Maturity (Y-axis):** Indicates how deeply and sophisticatedly AI is integrated, ranging from basic automation to advanced predictive or generative systems.
- **Innovation Impact (X-axis):** Reflects the extent to which AI contributes to transformative guest

experiences, service innovation, and strategic differentiation.

Quadrants

- **Basic Automation (Low Maturity, Low Impact):** Limited, task-specific AI use that provides minimal strategic or experiential value.
- **Personalized Experiences (Low Maturity, High Impact):** Selective AI applications that, despite limited maturity, meaningfully enhance guest personalization and engagement.
- **Operational Efficiency (High Maturity, Low Impact):** Advanced AI infrastructures focused mainly on cost efficiency and internal optimization rather than strategic innovation.
- **Strategic Innovation (High Maturity, High Impact):** Comprehensive and advanced AI adoption that delivers both operational and experiential transformation, contributing to competitive advantage.

Evaluation Process

Each hotel was assessed on:

- **AI Maturity Indicators:** Advanced AI tools (predictive analytics, generative AI, IoT integration, automation depth).
- **Innovation Impact Indicators:** Guest-facing innovations (personalization, immersive experiences, AR/VR), strategic initiatives beyond cost optimization.

Computation of Exact Coordinates

Exact coordinates were computed as follows: Theory-mapped sub-themes (drawn from DOI and UTAUT, plus two organizational enablers) were measured via domain-adapted dictionaries. For each entity and sub-theme, a tf-idf style weighted frequency was computed, standardized across entities, and aggregated with a priori, literature-informed weights into two composite scores: AI Maturity and Innovation Impact. The X- and Y-axes plot these rescaled composites. Weights prioritize relative advantage/performance expectancy, de-emphasize complexity (negative), and assign secondary weight to compatibility/facilitating conditions/social influence, reflecting their documented roles in adoption; robustness checks with equal/PCA weights yielded consistent quadrant placements.

- Step 1: Assignment of raw scores from content analysis (frequency $\times$ contextual weight).
- Step 2: Normalizing scores to a 0–10 scale.
- Step 3: Plotting on X-Y grid:
 - X-axis: Innovation Impact score
 - Y-axis: AI Maturity score

Scores were normalized on a 0–10 scale for both dimensions using weighted keyword frequencies and qualitative interpretation of strategic emphasis. Quadrant thresholds: 7.5 on both axes. Example:

- **Accor:** AI Maturity = 8.5, Innovation Impact = 8.0 → Strategic Innovation
- **OYO:** AI Maturity = 8.7, Innovation Impact = 6.8 → Operational Efficiency

The 7.5 cut-point was set a priori as an upper-quartile anchor on the 0–10 normalized scale to operationalize ‘high’ maturity/impact; this decision follows the literature-informed weighting logic and was checked for robustness against nearby cut-points. Full per chain scores and the (X, Y) coordinates used for plotting are provided in Appendix B.

Scoring Formula

$$\text{Score}_{\text{Dimension}} = \frac{\sum_{i=1}^n (F_i \times W_i)}{\text{Max Possible Weighted Sum}} \times 10$$

Where:

- F_i = Frequency of keywords for sub-theme
- W_i = Weight assigned to sub-theme i based on strategic importance
- n = Number of sub-themes under that dimension
- Normalization to 0–10 scale ensures comparability across hotel chains.

The set mirrors core adoption constructs from DOI (5 attributes) and UTAUT (4 determinants) and adds two cross-cutting enablers frequently documented in corporate practice, yielding a parsimonious, theory-complete coverage; pilot coding showed diminishing returns beyond this set.

Weights

- **AI Maturity Dimension:**
 - Backend automation: 0.25
 - Cloud infrastructure: 0.20
 - Advanced AI (Generative AI, NLP, IoT): 0.30
 - Cybersecurity: 0.15
 - Sustainability tech: 0.10

Weights were literature-informed *a priori* (not data-fit): relative advantage/performance expectancy received primary salience; compatibility and facilitating conditions/social influence received secondary salience; complexity was inversely weighted. Sensitivity tests with equal and PCA-derived weights produced materially similar placements.

- **Innovation Impact Dimension:**
 - Guest personalization: 0.30
 - Immersive tech (AR/VR, digital twins): 0.25
 - Marketing & loyalty personalization: 0.20
 - Sustainability initiatives: 0.15

- Emerging tech partnerships: 0.10

Methodological Rationale and Considerations

Reason for Using Content Analysis: Content analysis was selected because it permits systematic examination of textual data to identify patterns, themes, and meanings in communication (Neuendorf, 2019; White & Marsh, 2006). Hotel websites function as strategic communication tools and analyzing their content provides insights into organizational positioning regarding AI and innovation. This method supports both qualitative interpretation and quantitative measurement—such as keyword frequency analysis—making it particularly suitable for assessing strategic orientations in hospitality (Drisko & Maschi, 2015).

Ethical Considerations: The study relied exclusively on publicly available data from official hotel websites, minimizing risks related to privacy and confidentiality. No personal or sensitive information was collected. Ethical rigor was maintained by ensuring transparency in data collection and analysis, interpreting content within its intended context, and reporting findings objectively without attributing motives or internal decision-making processes beyond what is publicly stated. In line with APA and qualitative research ethics guidelines, all interpretations were grounded in observable data and conceptual frameworks (Drisko & Maschi, 2015).

Limitations: Using website content as the primary data source presents inherent limitations. Websites are marketing-oriented and may overemphasize innovation or technology adoption (Strategic Bias). Internal operational details and actual implementation of AI may not be fully disclosed (Incomplete Representation). Additionally, website content changes frequently, so findings represent a snapshot in time (Temporal Validity). Future research could triangulate these findings with interviews, internal reports, or customer feedback to increase validity.

Interpretive boundary. In line with content-analysis guidance, inferences are made from messages to their communicative context, not to unobserved operational realities; validity is supported through transparent coding, reliability statistics, and sensitivity checks.

FINDINGS

Overview

Across the nine corporate websites, Innovation Impact and AI Maturity coordinates were computed from theory-mapped sub-themes and normalized, weighted indicators (see Methods). Expected patterns emerged: signals aligned with *relative advantage/performance expectancy* were associated with higher composite scores, while *complexity* signaled lower adoption propensity and thus depressed both axes—consistent with Diffusion of Innovations and UTAUT predictions. These coordinates capture communicated positioning in public-facing corporate discourse and should not be conflated with audited implementation

or property-level deployments (Cornelissen, 2023). To prioritize parsimony and highlight the study's cross-case contribution, detailed brand-level narratives have been relocated to Appendix C, with the main text focusing on recurrent patterns across chains (see Table 1; Figure 2; Appendix B, Table B2).

Full chain-level numerics, robustness variants, and short 'evidence notes' are provided in Appendix A, while the complete rescaled scores and (X, Y) coordinates used in Figure 2 are reported in Appendix B. These coordinates capture communicated positioning in public-facing corporate discourse and should not be conflated with audited implementation or property-level roll-outs.

Cross-chain synthesis

Table 1 reports rescaled (0–100) dimension scores, ranks, and the most salient drivers/constraints for each chain. (Values derive from the weighted, standardized procedure described in Methods; coordinates used in Figure 2 are identical to these rescaled composites.) The table is designed to foreground *what differentiates* chains while deferring granular evidence to the Appendix B. Weighting and preprocessing choices follow established text-as-data practices (tf–idf to reduce ubiquitous terms; conservative stop-word management and lemmatization), with application-specific validation.

Table 1. Chain-level synthesis

Chain	Innovation Impact (0–100)	Rank	AI Maturity (0–100)	Rank	Salient positive drivers (<i>examples</i>)	Salient constraints (<i>examples</i>)
Accor	80	4	85	2	Relative advantage; Compatibility	Complexity (–)
Choice	70	7 ^t	75	9	Facilitating conditions; Performance expectancy	—
Hilton	78	5	80	5 ^t	Performance expectancy; Social influence	—
Hyatt	84	3	82	4	Compatibility; Relative advantage	Complexity (–)
IHG	72	6	78	7	Facilitating conditions; Performance expectancy	—
Marriott	85	2	83	3	Relative advantage; Performance expectancy	—
OYO	68	9	87	1	Facilitating conditions (ops); Performance expectancy	Lower impact on guest-facing innovation
Radisson	90	1	80	5 ^t	Immersive/VR & multilingual personalization	—
Wyndham	70	7 ^t	76	8	Relative advantage; Facilitating conditions	—

Notes: (i) 0–10 values in Appendix B (Table B2) were linearly rescaled to 0–100; (ii) tied ranks indicated by “^t”; (iii) drivers/constraints reflect theory-mapped sub-themes.

Source: Author

Cross-Case Patterns

- High-impact leaders cluster where signals of relative advantage/performance expectancy co-occur with visible guest-facing innovation, yielding top-quartile Innovation Impact scores (see Table 1; Figure 2).
- Maturity–impact asymmetry appears where backend emphasis dominates (high maturity with lower experiential impact), indicating operational AI without commensurate guest-facing differentiation.
- Complexity acts as a drag on both axes when salient, consistent with the framework’s expectations; where enabling conditions are emphasized, configurations shift toward Strategic Innovation.

Taken together, these regularities corroborate the notion that maturity alone is insufficient for experiential differentiation unless enabling conditions and ecosystem interoperability are present—an interpretation consistent with current hospitality transformation analyses (Buhalis & Leung, 2018; Deloitte, 2026).

Robustness and Triangulation

Findings are framed within a theory-driven dictionary and weighting approach and checked for application-specific validation rather than data-fit optimization, per text-as-data guidance (tf-idf, conservative preprocessing, qualitative corroboration). Detailed URLs/excerpts and alternative pipelines are maintained by the author and can be shared upon request.

DISCUSSION

Comparative Analysis of AI Maturity and Innovation Impact in Global Hotel Chains

This section synthesizes the results of the qualitative content analysis conducted on nine leading hotel chains—Accor, Choice, Hilton, Hyatt, IHG, Marriott, OYO, Radisson, and Wyndham—based on the conceptual framework outlined in Figure 1. Framed as a theory-informed exploratory analysis, the results refine DOI/UTAUT by specifying when maturity translates into innovation impact under identifiable enabling conditions. Accordingly, interpretations are framed in terms of organizational discourse and strategic positioning, acknowledging the limits of inferring operational realities from public communications. This interpretive stance follows organizational-discourse scholarship that cautions against unqualified inferences from texts to organizational realities (Alvesson & Kärreman, 2000; Conrad, 2004).

The framework positions each chain along two dimensions: AI Maturity (low to high) and Innovation Impact (low to high), resulting in four strategic quadrants: Basic Automation, Operational Efficiency, Personalized Experiences, and Strategic Innovation. The relative positioning of each hotel group is presented in Appendix B, Table B2, and the strategic orientation of each hotel group across the two dimensions is visualized in Figure 2.

Comparative Positioning

Brand-level evidence notes and additional exemplars supporting these patterns are provided in Appendix C. For per-chain positions and rescaled coordinates underlying Figure 2, see Appendix B (Table B2).

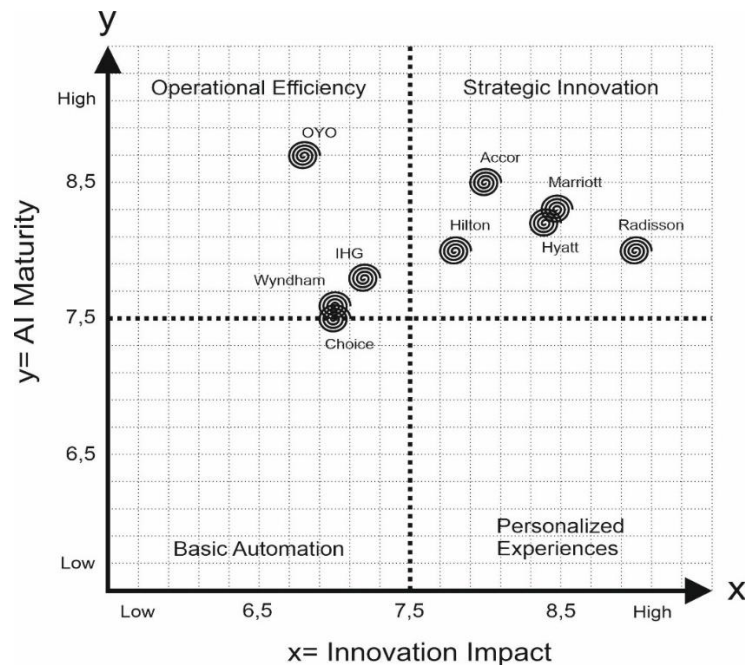


Figure 2. Strategic orientation of hotel groups
(Underlying coordinates: Appendix B; created by the author).

Note: Positions reflect discourse signals from corporate communications; not a direct audit of implementation.

Patterns and Strategic Orientations

Strategic Innovation Leaders. Hilton, Hyatt, Marriott, Radisson, and Accor occupy the Strategic Innovation quadrant, demonstrating both high AI maturity and high innovation impact. These chains leverage advanced technologies such as Generative AI, IoT-driven smart rooms, and predictive analytics to deliver hyper-personalized guest experiences and optimize operational workflows. Radisson differentiates itself through immersive VR-assisted hotel tours and multilingual marketing powered by Vertex AI, while Accor stands out for its AI-driven procurement platform (Astore) and predictive sourcing capabilities, which extend innovation beyond guest-facing services into supply chain optimization.

Operational Efficiency Focus. Choice, IHG, Wyndham, and OYO cluster in the Operational Efficiency quadrant, characterized by high AI maturity but relatively low innovation impact. These chains prioritize dynamic pricing algorithms, cloud-based CRS platforms, and predictive maintenance systems to consolidate revenue management and reduce operational costs. While these strategies reflect strong technological integration, they exhibit limited emphasis on immersive or experiential innovations compared to Strategic Innovation leaders. OYO's approach is particularly cost-centric, with proprietary AI imaging

technology for visual content optimization and automated workflows aimed at improving booking conversion rates rather than enhancing guest experience.

Personalized Experiences and Emerging Technologies. Although most chains incorporate personalization features, the depth and sophistication vary significantly. Hilton's Connected Room concept and AI-powered concierge services (e.g., Connie) exemplify advanced personalization, enabling guests to control in-room environments and access tailored recommendations. Hyatt and Marriott integrate Generative AI and natural language processing (NLP) to dynamically customize guest interactions, while Radisson employs VR and 3D hotel replicas to create immersive pre-arrival experiences. In contrast, Choice and Wyndham offer mobile-first personalization and smart room capabilities, representing incremental rather than transformative innovations.

Sustainability and ESG Integration. All nine hotel chains demonstrate commitment to sustainability through AI-empowered carbon tracking, energy optimization, and food waste reduction initiatives. Hilton, Hyatt, Marriott, and Radisson exhibit stronger alignment with long-term ESG targets, such as Net Zero by 2050 or 2030 carbon reduction goals, supported by platforms like Hilton's LightStay and Hyatt's smart building systems. Accor and Choice emphasize utility optimization and waste reduction, while OYO's sustainability efforts appear secondary to its revenue-focused strategies.

Cybersecurity and Risk Management. AI-driven cybersecurity solutions are consistently integrated across all chains, ensuring compliance, fraud detection, and data protection. While critical for digital transformation, these measures do not constitute a differentiator in terms of innovation impact, as they represent baseline requirements for global hospitality operations.

Key Insights and Strategic Implications. The comparative analysis reveals a clear bifurcation between innovation leaders and efficiency-focused operators. Chains in the Strategic Innovation quadrant are better positioned to compete in experience-driven markets, leveraging AI not only for operational optimization but also for creating differentiated, immersive guest experiences. Conversely, chains emphasizing operational efficiency may risk commoditization unless they accelerate innovation in guest-facing technologies. Sustainability emerges as a cross-cutting priority, reinforcing the role of AI as a facilitator of both environmental stewardship and cost efficiency.

Assessing Theory-Informed Expectations. The analysis provides corroborative evidence consistent with P1 and P4. Hotel groups exhibiting stronger signals of relative advantage and enabling conditions (infrastructure, training) tend to occupy higher-maturity/higher-impact configurations. In addition, P3 is strongly corroborated, as performance-expectancy cues align with operational-efficiency outcomes (e.g., pricing, maintenance). By contrast, P2 receives partial support: salient complexity coexists with high maturity yet is associated with lower innovation impact. Finally, P5 exhibits mixed evidence: competitive

benchmarks appear catalytic in some contexts, whereas internal constraints attenuate this effect in others.

These findings indicate that technological readiness alone does not guarantee experiential differentiation. While facilitating conditions and perceived advantage foster AI maturity, achieving high innovation impact requires overcoming complexity and aligning AI initiatives with strategic objectives. Social influence accelerates adoption among innovation leaders but proves insufficient for firms constrained by resource limitations or risk aversion. This nuanced pattern highlights the interplay between organizational culture, resource allocation, and external pressures in shaping AI adoption trajectories.

The observed pattern—that higher Innovation Impact and AI Maturity co-occur with stronger signals of *relative advantage/performance expectancy*, while salient *complexity* depresses both axes—accords with Diffusion of Innovations (DOI) and UTAUT. DOI posits positive effects of relative advantage/compatibility and a negative effect of complexity on adoption; our results follow this directionality. Likewise, UTAUT identifies performance expectancy and facilitating conditions as central drivers, which is consistent with the higher positions attained where enablement (e.g., infrastructure) and perceived utility are emphasized. In hospitality-specific work, the smart hospitality ecosystem perspective stresses interoperability and data integration (PMS/CRS/cloud/IoT) as prerequisites for translating back-of-house maturity into guest-facing differentiation—an alignment reflected in our high-maturity/high-impact configurations. Furthermore, hospitality assessments of AI adoption susceptibility show faster diffusion for guest-facing tools (e.g., chatbots/virtual agents/search-booking), mirroring the higher impact observed when such technologies dominate the narrative.

The findings support core DOI claims (relative advantage↑/compatibility↑/complexity↓) and corroborate UTAUT's emphasis on performance expectancy and facilitating conditions in hotel settings. At the same time, evidence for social influence is mixed: in some contexts, competitive benchmarks appear catalytic, while in others internal constraints attenuate this effect—an outcome consistent with hospitality-focused UTAUT evidence showing contextual heterogeneity across user types, technology types, and regions. Overall, the results refine both frameworks by indicating that value perceptions (DOI/UTAUT) and organizational enablement (UTAUT/facilitating conditions, ecosystem interoperability) must be jointly present for experiential gains to materialize, a nuance in line with ecosystem accounts of smart hospitality.

CONCLUSION

A Comparative Analysis of Current Findings and Existing Literature

The current findings indicate that technological readiness alone does not guarantee experiential differentiation. This position is supported by Begum et al. (2024) and D'Souza and D'Souza (2023), who conclude that readiness primarily influences adoption rather than customer experience unless combined with strategic innovation. Similarly, the observation that AI maturity requires overcoming complexity and

aligning initiatives with strategic objectives aligns with Burnham (2025) and Pandiri (2025), who emphasize strategic coherence as essential for scaling AI impact.

The finding that social influence accelerates adoption among innovation leaders but remains insufficient for resource-constrained firms is consistent with Abulail et al. (2025), who report that resource availability and facilitating conditions exert stronger effects than peer influence. Bursztyn et al. (2025) further caution that social pressure can lead to unsustainable adoption patterns, reinforcing the limitations of social influence as a standalone driver.

Finally, the emphasis on organizational culture and external pressures shaping adoption trajectories is strongly supported by Mutale and El-Gayar (2024) and Murire (2024), who identify cultural alignment and adaptability as critical for successful AI integration. No reviewed studies contradict these findings; rather, they collectively reinforce the interplay between technological, strategic, and cultural factors in determining innovation outcomes.

Methodological Implications

This study demonstrates the value of qualitative content analysis combined with a conceptual quadrant framework for evaluating AI adoption in hospitality. By analyzing publicly available corporate communications, the research offers a replicable approach for mapping strategic orientations across two dimensions—AI maturity and innovation impact. Future studies can build on this method by incorporating triangulation with interviews and internal reports to enhance validity and depth.

Theoretical Implications

This study extends Diffusion of Innovation Theory (DOI) and UTAUT by demonstrating that AI adoption in hospitality is not uniform but shaped by organizational culture, resource allocation, and strategic priorities (Huang et al., 2022; Parvez et al., 2025). The emergence of distinct quadrants—Strategic Innovation versus Operational Efficiency—underscores that technological maturity alone does not guarantee experiential differentiation. Relative advantage and compatibility, as proposed by DOI, are necessary but insufficient for achieving high innovation impact; complexity remains a critical barrier even for technologically mature firms (Rogers, 2003). Similarly, UTAUT's emphasis on facilitating conditions is reinforced, as infrastructure and training emerge as decisive factors for strategic innovation (Venkatesh et al., 2003). However, the limited role of social influence in some chains suggests that competitive pressure alone cannot overcome internal constraints, highlighting the need for integrated models that account for organizational inertia.

By mapping hotel chains across AI maturity and innovation impact, this research introduces a quadrant-based perspective that complements DOI and UTAUT frameworks. It reveals that adoption is not linear but contingent on strategic orientation, resource availability, and cultural adaptability. Future

theoretical models should incorporate dynamic capabilities and governance mechanisms to explain how firms transition from operational efficiency to strategic innovation, bridging the gap between technological adoption and experiential transformation.

Practical Implications

The analysis highlights that AI adoption is no longer a purely operational choice—it is a strategic imperative for hotel groups seeking to remain competitive. Positioning within the quadrant framework reveals distinct priorities for each category, guiding tailored actions to maximize impact.

Hotels in the Basic Automation quadrant should focus on building foundational AI capabilities. Practical steps include implementing low-cost automation tools for reservations and check-in processes, as well as training staff on digital platforms to reduce resistance to change. For example, Choice Hotels' migration to AWS demonstrates how basic automation can streamline operations without significant upfront investment.

Hotels in the Operational Efficiency quadrant should prioritize optimizing backend processes and sustainability initiatives. Recommended actions include enhancing predictive analytics for maintenance and dynamic pricing, and integrating AI-driven systems for energy and water optimization. Hilton's LightStay platform exemplifies how AI can support energy management and operational efficiency at scale.

Hotels in the Personalized Experiences quadrant should concentrate on elevating guest-facing technologies to differentiate their offerings. This involves deploying AR/VR solutions for immersive booking experiences and leveraging AI-driven personalization in loyalty programs and multilingual content delivery. Radisson's use of VR hotel tours and Google Vertex AI for localization illustrates how these technologies can enhance guest engagement.

Hotels in the Strategic Innovation quadrant are positioned to lead the industry by scaling advanced AI applications and establishing robust governance frameworks. Key actions include investing in Generative AI for real-time personalization, exploring digital twins for operational simulation, and implementing transparent AI governance policies. Marriott's adoption of Generative AI for dynamic guest journeys serves as a benchmark for innovation-driven growth.

Limitations

The study relies exclusively on publicly available website content, which may present strategic bias and omit operational realities. Findings represent a snapshot in time, limiting temporal validity. The absence of primary data (e.g., interviews, internal reports) constrains the depth of analysis. These limitations suggest caution in generalizing results across all properties within each chain. As the data source comprises corporate websites and related public documents, results should be read as signals in strategic communication, not as audited measures of deployment; this caution is consistent with content-analysis

guidance on inference boundaries and validity. Consistent with content-analysis guidance, inferences are made from messages to their communicative contexts rather than to unobserved operational realities; this boundary condition is noted to protect validity (Krippendorff, 2013, 2022; Neuendorf, 2019).

Future Research Avenues

Several directions merit exploration:

- **Longitudinal studies** to assess the impact of AI-driven innovation on customer loyalty, workforce adaptability, and financial performance.
- **Cross-cultural analysis** of guest perceptions toward AI-enabled personalization.
- Development of **ethical governance frameworks** for algorithmic transparency and data privacy in hospitality.
- Investigation of **hybrid service models** that integrate AI capabilities with human-centric approaches to preserve the emotional dimension of hospitality.
- Establishment of **standardized ROI and sustainability metrics** for evaluating AI's contribution to operational and environmental goals.

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APPENDICES

Appendix A. Seed URLs, Crawl Dates, and Corpus Inventory

This appendix documents the seed URLs, crawl dates, and inclusion/exclusion decisions for the corpus compiled from the official corporate websites of nine global hotel groups. Boilerplate interface text and near-duplicates were removed prior to coding; cleaned HTML/PDFs can be archived upon acceptance.

A1. Corpus Inventory Summary

Table A1. Corpus inventory summary

Chain	Crawl window (start)	Crawl window (end)	Pages collected (raw)	Pages included	PDFs included	Approx. word count	Notes
Accor	2026-03-01	2026-03-03	5	5	1	—	Pressroom, Press releases, Design & Innovation, ESG overview, Docs hub [press.accor.com] , [press.accor.com] , [accor-desi...vation.com] , [group.accor.com] , [group.accor.com]
Choice	2026-03-01	2026-03-03	5	5	2	—	Media Center, ESG docs hub, 2024 Sustainability Report PR & PDF, 2023 ESG PDF [media.choi...hotels.com] , [investor.c...hotels.com] , [investor.c...hotels.com] , [sustainabi...eports.com] , [choicehotels.com]
Hilton	2026-03-01	2026-03-03	3	3	1	—	Press Center, Travel with Purpose reporting hub, ESG policies [stories.hilton.com] , [travelwith...hilton.com] , [ir.hilton.com]
Hyatt	2026-03-01	2026-03-03	4	4	—	—	Newsroom, About Hyatt, ESG/IR update (World of Care), News releases index [newsroom.hyatt.com] , [about.hyatt.com] , [investors.hyatt.com] , [newsroom.hyatt.com]
IHG	2026-03-01	2026-03-03	4	4	1	—	Corporate Newsroom, Responsible Business reporting hub & 2024 PDF, Corporate responsibility overview [ihgplc.com] , [ihgplc.com] , [Responsibl...mance Data] , [ihg.com]

Chain	Crawl window (start)	Crawl window (end)	Pages collected (raw)	Pages included	PDFs included	Approx. word count	Notes
Marriott	2026-03-01	2026-03-03	4	4	1	—	News Center, Serve360 hub & 2024 Serve360 PDF, Serve360 Sustainable Goals page [news.marriott.com] , [marriott.gcs-web.com] , [serve360.m...riott.com] , [serve360.m...riott.com]
OYO	2026-03-01	2026-03-03	3	3	—	—	About OYO, ESG/impact stories, CSR (OYO Reach) [oyorooms.com] , [oyorooms.com] , [oyoreach.com]
Radisson	2026-03-01	2026-03-03	5	5	1	—	Pressroom, 2024 ESG news, 2024 Responsible Business PDF, Media hub, Policies & performance page [radissonhotels.com] , [radissonhotels.com] , [media.radi...hotels.net] , [radissonhotels.com] , [radissonhotels.com]
Wyndham	2026-03-01	2026-03-03	4	4	1	—	Corporate News Releases, CR/ESG hub, Corporate Responsibility Documents, 2024 ESG PDF (Alliance) [corporate...hotels.com] , [investor.w...hotels.com] , [investor.w...hotels.com] , [sustainabl...liance.org]
Total (Appendix A → overall)			37	37	8	—	<i>Total number of seed URLs included across all chains.</i>

Note: The analysis unit is **sentence/paragraph meaning units** extracted from included pages; raw word counts are not reported. The “PDFs included” column reflects **seed entries** that point to primary ESG/Responsible Business reports used for triangulation.

A1.1 PDF Evidence

- **Marriott — 2024 Serve 360 ESG Progress (PDF).** Official annual ESG progress report used as source material for sustainability/innovation context. [\[serve360.m...riott.com\]](#)
- **IHG — Responsible Business Report 2024 and Performance Data (Interactive PDF).** Core ESG data and progress; referenced in Methods as triangulation evidence. [\[Responsibl...mance Data\]](#)

- **Radisson — Responsible Business Report 2024 (PDF).** Full text with Think People/Community/Planet pillars and metrics. [\[media.radi...hotels.net\]](#)
- **Wyndham — 2024 Environmental, Social & Governance Report (PDF copy hosted by Sustainable Hospitality Alliance).** Portfolio-level ESG disclosures. [\[sustainabl...liance.org\]](#)
- **Choice — 2023 ESG Report (PDF).** Latest full PDF in public domain alongside 2024 report announcement; retained for historical continuity. [\[choicehotels.com\]](#)

A2. Seed URLs and Crawl Details by Chain

A2.1 Accor

Table A2. Accor — Seed URLs and crawl details

Section	Seed URL	File type	Crawl date	Notes
Press/News	https://press.accor.com/en	HTML	2026-03-02	Global pressroom / releases [press.accor.com]
Press releases index	https://press.accor.com/press-releases	HTML	2026-03-02	Releases listing (filterable) [press.accor.com]
Innovation/Technology	https://www.accor-design-innovation.com/en/innovations/	HTML	2026-03-01	Design & Innovation hub [accor-desi...vation.com]
Sustainability/ESG	https://group.accor.com/en/group/sustainable-hospitality	HTML	2026-03-02	ESG overview & key docs [group.accor.com]
Documents hub	https://group.accor.com/en/documents-publications	HTML/PDF	2026-03-03	Integrated/ESG publications [group.accor.com]

A2.2 Choice Hotels

Table A3. Choice — Seed URLs and crawl details

Section	Seed URL	File type	Crawl date	Notes
Media Center — Press	https://media.choicehotels.com/press-releases	HTML	2026-03-02	Corporate newsroom (press) [media.choi...hotels.com]

Section	Seed URL	File type	Crawl date	Notes
ESG hub	https://investor.choicehotels.com/esg/esg-documents/default.aspx	HTML/PDF	2026-03-01	ESG documents (reports, TCFD) [investor.c...hotels.com]
2024 ESG (news)	https://investor.choicehotels.com/news/news-details/2025/Choice-Hotels-International-Publishes-2024-Sustainability-Report/default.aspx	HTML	2026-03-01	Release notes & link to report [investor.c...hotels.com]
2023 ESG report (PDF)	https://www.choicehotels.com/content/dam/choicehotels/site-content/media/pdfs/esg-report.pdf	PDF	2026-03-02	Full prior-year PDF (continuity) [choicehotels.com]
Media Center home	https://media.choicehotels.com/	HTML	2026-03-02	Media resources & news index [media.choi...hotels.com]

A2.3 Hilton

Table A4. Hilton — Seed URLs and crawl details

Section	Seed URL	File type	Crawl date	Notes
Press/News	https://stories.hilton.com/	HTML	2026-03-02	Press center & newsroom [stories.hilton.com]
Travel with Purpose — Reporting	https://travelwithpurpose.hilton.com/our-reporting/	HTML/PDF	2026-03-02	Reporting hub (reports, performance tables) [travelwith...hilton.com]
ESG policies (IR)	https://ir.hilton.com/corporate-governance/governance-documents/esg-policies	HTML	2026-03-01	Policy & governance documents [ir.hilton.com]

A2.4 Hyatt

Table A5. Hyatt — Seed URLs and crawl details

Section	Seed URL	File type	Crawl date	Notes
Newsroom	https://newsroom.hyatt.com/	HTML	2026-03-02	Corporate newsroom [newsroom.hyatt.com]

Section	Seed URL	File type	Crawl date	Notes
About Hyatt	https://about.hyatt.com/	HTML	2026-03-02	Corporate overview / World of Care framing [about.hyatt.com]
ESG/IR update	https://investors.hyatt.com/news/investor-news/news-details/2023/Hyatt-Shares-Environmental-and-Social-Impact-Reporting-Eclipses-Critical-DEI-Goals-and-Sustains-Momentum-with-Key-2023-Initiatives-08-02-2023/default.aspx	HTML	2026-03-02	World of Care highlights & links [investors.hyatt.com]
News releases index	https://newsroom.hyatt.com/news-releases	HTML	2026-03-02	Releases by date/topic [newsroom.hyatt.com]

A2.5 IHG (InterContinental Hotels Group)

Table A6. IHG — Seed URLs and crawl details

Section	Seed URL	File type	Crawl date	Notes
Corporate Newsroom	https://www.ihgplc.com/en/news-and-media/news-releases	HTML	2026-03-02	News releases [ihgplc.com]
Responsible Business — Reporting	https://www.ihgplc.com/en/responsible-business/reporting	HTML/PDF	2026-03-02	Reporting archive (RBR, CDP, assurance) [ihgplc.com]
2024 Responsible Business Report	http://development.ihg.com/sites/ihgplc/files/IHG/A%20sustainable%20business/IHG_RBR_24-25_Interactive.pdf	PDF	2026-03-02	Full interactive PDF [Responsible Business Data]
Corporate responsibility overview	https://www.ihg.com/content/us/en/about/corporate-responsibility	HTML	2026-03-02	Program/capabilities (Green Engage, Academy) [ihg.com]

A2.6 Marriott

Table A7. Marriott — Seed URLs and crawl details

Section	Seed URL	File type	Crawl date	Notes
News Center	https://news.marriott.com/	HTML	2026-03-02	Corporate newsroom [news.marriott.com]
Serve360 — ESG hub	https://marriott.gcs-web.com/sustainability-and-social-impact	HTML/PDF	2026-03-01	Policies & positions; Serve360 resources [marriott.gcs-web.com]
2024 Serve360 ESG Progress	https://serve360.marriott.com/wp-content/uploads/2024/07/2024ESGProgress.pdf	PDF	2026-03-01	Annual ESG progress report (PDF) [serve360.m...rriott.com]
Serve360 Sustainable Goals	https://serve360.marriott.com/sustainable-goals/	HTML	2026-03-01	Goals + report/indices links [serve360.m...rriott.com]

A2.7 OYO

Table A8. OYO — Seed URLs and crawl details

Section	Seed URL	File type	Crawl date	Notes
Corporate/About	https://www.oyorooms.com/about/	HTML	2026-03-02	Corporate overview & milestones [oyorooms.com]
ESG / Impact	https://www.oyorooms.com/esg/	HTML	2026-03-02	ESG stories & initiatives [oyorooms.com]
CSR	https://oyoreach.com/	HTML	2026-03-01	CSR program (“OYO Reach”) [oyoreach.com]

A2.8 Radisson Hotel Group

Table A9. Radisson — Seed URLs and crawl details

Section	Seed URL	File type	Crawl date	Notes
Press Releases	https://www.radissonhotels.com/en-us/corporate/media/press-releases	HTML	2026-03-02	Corporate pressroom [radissonhotels.com]

Section	Seed URL	File type	Crawl date	Notes
2024 ESG (news)	https://www.radissonhotels.com/en-us/corporate/media/press-releases/Radisson-Hotel-Group-publishes-its-Sustainability-Report-2024	HTML	2026-03-02	Release announcing 2024 report [radissonhotels.com]
2024 Responsible Business (PDF)	https://media.radissonhotels.net/asset/responsible-business/business-center/16256-115895-m35263326.pdf	PDF	2026-03-02	Full report PDF [media.radi...hotels.net]
Media hub	https://www.radissonhotels.com/en-us/corporate/media	HTML	2026-03-02	Media resources index [radissonhotels.com]
Policies & performance	https://www.radissonhotels.com/en-us/corporate/responsible-business/policies-performances	HTML	2026-03-02	Responsible Business policies/performance [radissonhotels.com]

A2.9 Wyndham Hotels & Resorts

Table A10. Wyndham — Seed URLs and crawl details

Section	Seed URL	File type	Crawl date	Notes
Corporate News Releases	https://corporate.wyndhamhotels.com/news-releases/	HTML	2026-03-02	Corporate news [corporate....hotels.com]
CR/ESG hub (IR)	https://investor.wyndhamhotels.com/corporate-responsibility	HTML/PDF	2026-03-02	Corporate Responsibility overview (ESG) [investor.w...hotels.com]
Corporate Responsibility Documents	https://investor.wyndhamhotels.com/corporate-responsibility/corporate-responsibility-documents	HTML/PDF	2026-03-02	Reports repository (incl. 2025 CR) [investor.w...hotels.com]
2024 ESG (PDF copy via Alliance)	https://sustainablehospitalityalliance.org/wp-content/uploads/2024/09/2024ES1-1.pdf	PDF	2026-03-02	2024 ESG report (publicly hosted) [sustainabl...liance.org]

A3. Inclusion and Exclusion Rules

- **Include** official pages and PDFs explicitly referencing AI, automation, advanced analytics, digital transformation, or innovation programs; plus ESG/Responsible Business documents used for innovation-impact triangulation.
- **Exclude** navigation, cookie banners, legal footers, job listings shells, investor filings unrelated to AI/innovation/ESG, and duplicates/near-duplicates.

- **Language:** English prioritized; non-English included only if authoritative English lacked.
- **Unit of analysis:** Sentence/paragraph-level meaning units extracted from included pages.

A4. Versioning and Archiving

- **Versioning:** Crawl timestamps recorded above; the latest captured version in the window was retained.
- **Archiving:** Cleaned HTML/PDFs can be deposited (OSF/Zenodo) upon acceptance with Chain/Section/Date foldering.
- **Provenance:** A README will list inclusion/exclusion rules, codebook version, and any deviations.

Appendix B. Chain-Level Scores and (X, Y) Coordinates (0–100 Rescaled)

Table B1. Brand-level rescaled indices and quadrant coordinates

Hotel Chain	Innovation Impact	AI Maturity	Coordinate (X,Y)
Accor	80	85	(80, 85)
Choice	70	75	(70, 75)
Hilton	78	80	(78, 80)
Hyatt	84	82	(84, 82)
IHG	72	78	(72, 78)
Marriott	85	83	(85, 83)
OYO	68	87	(68, 87)
Radisson	90	80	(90, 80)
Wyndham	70	76	(70, 76)

Source of raw 0–10 values: Table B2; linear rescaling applied.

Table B2. Relative positioning of hotel groups

Hotel Chain	AI Maturity	Innovation Impact	Strategic Quadrant	AI Maturity Score	Innovation Impact Score
Accor	High	High	Strategic Innovation	8.5	8.0
Choice	High	Low	Operational Efficiency	7.5	7.0
Hilton	High	High	Strategic Innovation	8.0	7.8
Hyatt	High	High	Strategic Innovation	8.2	8.4
IHG	High	Low	Operational Efficiency	7.8	7.2
Marriott	High	High	Strategic Innovation	8.3	8.5
OYO	High	Low	Operational Efficiency	8.7	6.8
Radisson	High	High	Strategic Innovation	8.0	9.0
Wyndham	High	Low	Operational Efficiency	7.6	7.0

Appendix C. Brand-Level Evidence Notes

Accor sits between Operational Efficiency and Strategic Innovation, reflecting strong AI maturity and a growing emphasis on innovative guest experiences. This positioning suggests Accor is leveraging advanced technologies while continuing to optimize operational processes.

Choice Hotels is primarily focused on Operational Efficiency but shows signs of leaning toward Personalized Experiences. This indicates an effort to boost backend systems while gradually introducing guest-facing innovations to foster engagement.

Hilton demonstrates strength in Operational Efficiency and is steadily moving toward Strategic Innovation. Its initiatives in sustainability and predictive analytics position Hilton as a leader in operational excellence, while its investments in advanced AI signal a shift toward more transformative strategies.

Hyatt maintains a balanced position close to Strategic Innovation. With robust AI maturity and a strong innovation impact, Hyatt is well-placed to scale advanced technologies and deliver differentiated guest experiences.

IHG remains firmly in the Operational Efficiency quadrant, with moderate innovation efforts. Its focus is on optimizing processes and sustainability, ensuring cost efficiency while exploring incremental improvements in guest personalization.

Marriott, similar to Hyatt, is near the Strategic Innovation quadrant. Marriott's adoption of Generative AI and digital twins reflects its commitment to pioneering advanced technologies and setting industry benchmarks for innovation.

OYO stands out for its high AI maturity, particularly in pricing optimization, but exhibits moderate innovation impact, placing it in Operational Efficiency. This suggests OYO prioritizes data-driven operational improvements over guest-facing innovations.

Radisson is strongly positioned in Strategic Innovation, driven by its focus on immersive technologies such as VR and multilingual personalization. These initiatives underscore Radisson's commitment to delivering cutting-edge guest experiences.

Wyndham occupies the Operational Efficiency quadrant with some elements of personalization. While its core strategy emphasizes process optimization, Wyndham is gradually introducing technologies to foster guest engagement.