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Artificial Intelligence (AI) Service Adoption in Muslim-Friendly Hotels: Extending TAM with Shariah-Compliance Trust, Tech-Savviness, and Halal Integrity Threat

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Abstract - This paper extends the Technology Acceptance Model (TAM) to examine the determinants of Artificial Intelligence (AI) service adoption within Malaysian Muslim-friendly hotels. Synthesizing literature across information systems, internal quality management, and Islamic hospitality, the study develops a robust conceptual framework that bridges technical automation with socio-religious values. The model maps out consumer tech-savviness and Shariah-compliance trust as independent variables, perceived usefulness and ease of use as mediators, and adoption intention as the dependent variable. The framework reveals that while trust and tech-savviness drive technical acceptance, perceived halal integrity threats act as a critical negative moderator that weakens adoption intentions. Ultimately, these insights provide hotel operators with a strategic blueprint to deploy smart features without compromising religious compliance, successfully protecting internal service quality while mitigating customer anxieties.

1. INTRODUCTION

The global market for Muslim-friendly tourism and halal hospitality is expanding fast, driven largely by shifting demographic trends and the rapid growth of the global Muslim population. Malaysia has long been a leader in this space, pioneering formal standardisations like the "MS 2610:2015 Muslim-Friendly Hospitality Services — Requirements" guidelines to regulate how hotels serve Muslim guests (Hashim & Mohd Fauzi, 2022). At the same time, the wider tourism sector is pushing hard into digital transformation. Destinations are adopting smart city concepts, electronic tracking tools, and interactive systems to

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improve travel planning (Azmadi et al., 2023). However, when you drop autonomous technology into a space governed by strict religious requirements, it creates psychological challenges that standard hospitality models cannot fully explain.

Traditional technology adoption models usually look at consumer behaviour through a purely functional lens. Efficiency, speed, and convenience dominate the conversation. But in value-driven sectors like halal hospitality, efficiency is only half the story. Muslim travelers are not just looking for a fast check-in; they need absolute certainty that their religious obligations remain intact throughout their stay. Introducing autonomous AI systems that operate without visible human oversight can trigger cognitive dissonance and anxiety for practicing Muslims. When human touchpoints disappear, guests judge digital systems by specific e-service quality traits, viewing system reliability, responsiveness, and privacy protections as vital parts of a good brand experience (Mohd Ridzuan et al., 2022).

To deal with these shifts, researchers are modifying standard adoption models to see how digital platforms shape consumer attitudes. Classic frameworks focus heavily on how easy a system is to use (Davis, 1989). Yet, empirical evidence from the hospitality industry shows that customer satisfaction fully mediates the relationship between using self-service systems and a guest's long-term behavioral intentions (Hamid et al., 2022). In the halal market, customer choices are guided by structural risk factors that directly impact trust, satisfaction, and whether a guest will recommend a hotel to others (Al-Ansi et al., 2019). Unmonitored automated systems can heighten these perceived risks, leaving a major gap in our understanding of how religious compliance and automation work together.

2. LITERATURE REVIEW

2.1 Core Theoretical Foundation: Technology Acceptance Model (TAM)

Technology Acceptance Model, developed by Davis (1989), is still the go-to framework for predicting how people accept new technology. Rooted in consumer psychology, TAM argues that a user's behavioral intention to adopt a system depends on two core cognitive beliefs functioning as mediating variables. In his seminal work, Davis (1989) explicitly defined Perceived Usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance". Furthermore, the second core construct, Perceived Ease of Use, was defined as "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989). Hospitality researchers have tested this model across various tools, from mobile check-in apps to self-service kiosks. If a smart hotel interface is intuitive and easy to navigate, guests naturally view the system more favorably.

In the classic model, ease of use directly improves usefulness because a system that is easy to manage helps users extract its functional benefits with less frustration (Davis, 1989). Hospitality scholars have expanded these basic variables to look at modern digital systems, proving that user self-efficacy and system configurations heavily shape final intentions. In value-laden service environments, simple models fall short. Researchers argue that the standard parsimonious variables of TAM must be supplemented with contextual determinants to capture the nuanced realities of customer psychology when digital systems are integrated into interactive hotel settings (Venkatesh et al., 2003). Therefore, we treat traditional TAM constructs as vital psychological mediators standing between internal consumer traits and final adoption choices.

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2.2 Technology and E-Service Environments in Hospitality

Hotels are increasingly relying on self-service technologies (SSTs) and online applications to streamline operations and improve service delivery. How guests evaluate these digital platforms depends heavily on e-service quality parameters, where system availability, privacy protections, and overall efficiency drive positive customer engagement (Mohd Ridzuan et al., 2022). When a hotel switches to automated tools, the user's initial interaction with the digital interface sets the tone for how they view the brand's reliability. Furthermore, green and sustainable hotel research confirms that customer satisfaction completely mediates the relationship between interacting with self-service systems and a guest's long-term behavioural intentions (Hamid et al., 2022).

Smart tourism tools in value-driven markets must adapt to the specific expectations of the target audience. In Malaysia, hotel operators have to balance automated customer interfaces with localized hospitality standards. Modern travelers expect seamless electronic interactions throughout their trips, making it essential for operators to understand how electronic service quality links up with technology acceptance (Mohd Ridzuan et al., 2022). This balance helps hotels maintain their competitive edge while deploying smart systems across regional hotel networks.

2.3 Internal Metrics and the Concept of Muslim-Friendly Hotels (MFH)

The Muslim-Friendly Hotel (MFH) concept in Malaysia provides a clear operational framework designed to align hospitality services with Shariah principles. Research shows that keeping service quality stable in an MFH depends heavily on internal quality metrics and human workforce variables (Islam et al., 2022). Structural modeling confirms that the internal measurement of service quality (INTQUAL)—which looks at management expectations and service reliability—alongside employee relations, including superior and co-worker influences, serves as a critical driver predicting overall organizational service performance (Islam et al., 2022).

These internal dynamics and employee relationships traditionally form the backbone of service quality in certified hotels. However, introducing customer-facing automated systems shifts this human-centric baseline (Islam et al., 2022). Moving operational tasks from human staff to autonomous AI applications changes the visible signs of service quality that guests rely on. To prevent technology adoption from disrupting this internal service ecosystem, technology acceptance models must incorporate domain-specific religious variables. This allows us to evaluate how automation changes customer perceptions of service performance, building directly on established internal quality baselines (Islam et al., 2022).

2.4 Shariah Principles and Technical Integrity

When technology is used to execute or monitor processes governed by religious law, Shariah compliance becomes a strict requirement. For instance, in digital finance, innovations like blockchain-based smart contracts are recognized as valid tools to enforce Shariah agreements, provided they actively minimize structural risks and align with Islamic ethics (Zulkepli et al., 2023). Similarly, using AI in halal hospitality shifts the job of verifying eligious compliance from human staff to digital algorithms. This transition introduces a unique psychological threat: the fear that a data miscalculation or an automated error could breach religious rules.

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This intersection highlights the role of Shariah-Compliance Trust (SCT) as a core Independent Variable in our framework. In value-driven hospitality environments, structural risks and psychological threats can easily wipe out the benefits of technical convenience (Zulkepli et al., 2023). For an automated system to be perceived as useful, consumers must trust that the technology will accurately maintain strict religious guidelines without making mistakes. Understanding how digital systems interface with religious compliance requires a balanced look at technical capabilities, structural risks, and religious trust.

3. METHODOLOGY

To validate this conceptual framework empirically, we recommend a quantitative, cross-sectional survey design. This approach aligns with established methods used to study smart tourism adoption and technical preferences in the Malaysian hospitality landscape (Hamid et al., 2022). The target population consists of domestic and international Muslim tourists who use digital services or stay in recognized smart accommodations across Malaysia's primary tourism hubs. Because a centralized, exhaustive list of all hotel guests is unavailable, researchers should use a non-probability purposive and convenience sampling approach, mirroring successful empirical data collection strategies used in regional hospitality studies (Islam et al., 2022; Mohd Ridzuan et al., 2022).

Measurement scales should rely strictly on verified items adapted from leading literature to ensure high content validity. The baseline constructs of Perceived Usefulness and Perceived Ease of Use should be drawn directly from foundational technology acceptance indices (Davis, 1989). Items for internal hotel service benchmarks should be adapted from validated internal quality metrics (INTQUAL) used to measure service performance in Muslim-friendly environments (Islam et al., 2022). Technical interface quality and systemic risk dimensions should be structured using established e-service quality and technical acceptance frameworks (Mohd Ridzuan et al., 2022). All items should be evaluated using a standardized 7-point Likert scale to ensure measurement precision.

Given the structural complexity of this model —which involves simultaneous mediating pathways and a key moderating construct—Partial Least Squares Structural Equation Modelling (PLS-SEM) represents the most appropriate statistical technique. To properly analyze the quantitative data, this study will strictly follow the standard two-step approach involving the evaluation of the measurement model and the structural model to establish indicator reliability, internal consistency reliability, convergent validity, and discriminant validity before testing the hypothesized direct and indirect structural paths (Hamid et al., 2022; Mohd Ridzuan et al., 2022).

4. FINDINGS AND DISCUSSION

4.1 Proposed Conceptual Framework

Based on the thorough synthesis of technology acceptance literature and Islamic tourism dynamics, this paper presents a comprehensive conceptual framework. The model demonstrates how traditional cognitive elements interact with deep-seated religious values and technical capabilities to dictate final consumer adoption patterns.

The theoretical model synthesized in this study extends the boundaries of traditional technology acceptance frameworks by integrating specific socio-religious parameters. The primary

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structural pathways are formally defined through six core research propositions:

1. P1: Perceived ease of use (Mediator) exerts a direct positive influence on the perceived usefulness (Mediator) of AI services in Muslim-friendly hotels.
2. P2: Perceived usefulness (Mediator) exerts a direct positive influence on the customer's intention to adopt AI services (Dependent Variable).
3. P3: Perceived ease of use (Mediator) exerts a direct positive influence on the customer's intention to adopt AI services (Dependent Variable).
4. P4: Consumer tech-savviness (Independent Variable) acts as a direct positive antecedent to the perceived ease of use of AI systems.
5. P5: Shariah-compliance trust (Independent Variable) exerts a strong positive influence on both the perceived usefulness and final adoption intention of AI services.
6. P6: Perceived halal integrity threat (Moderator) negatively moderates the relationship between Shariah-compliance trust and adoption intention, such that the positive effect of trust is significantly weakened when the perceived threat is high.

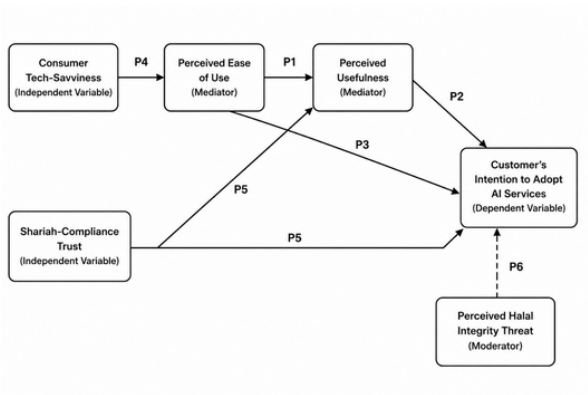

Figure 1. Conceptual Framework

4.2 Theoretical Synthesis

The structural relationships between Perceived Ease of Use, Perceived Usefulness, and Behavioral Intention form the baseline cognitive engine of the proposed framework, consistent with the foundational tenets of technology acceptance theory (Davis, 1989). In a smart hospitality environment, when an AI-powered service layer is perceived as frictionless and easy to operate, consumers are significantly more likely to recognize its functional utility, thereby mirroring empirical validation patterns observed across diverse tourism applications (Venkatesh et al., 2003). Furthermore, these primary paths align with models demonstrating that digital systems are positively received when they provide clear, actionable benefits that enhance the overall efficiency of the experience (Hamid et al., 2022).

However, the introduction of technology alters the internal dynamics traditionally governed by human workforce relationships. Prior research establishes that internal service quality (INTQUAL) and supportive employee relations are the primary structural determinants securing hospitality performance in accredited environments (Islam et al., 2022). The proposed framework shows that when automation modifies these human interactions, Shariah-compliance trust functions as an essential independent variable to restore consumer confidence. In value-driven markets, functional utility cannot be evaluated independently of the system's moral and religious legitimacy.

Crucially, the framework establishes Halal Integrity Threat as a powerful negative moderator, capturing the unique psychological friction that arises when automated systems introduce operational uncertainty. In general smart tourism planning, technical errors are often treated as minor inconveniences that merely disrupt consumer engagement configurations (Mohd Ridzuan et al., 2022). However, within the halal sector, systemic

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risks regarding compliance carry significant weight, directly affecting trust and organizational reputation (Zulkepli et al., 2023). By positioning halal integrity threat as a moderator, the framework explains why a highly tech-savvy consumer might completely reject a functionally superior AI service if they perceive that the underlying algorithm poses a risk to their religious compliance.

5. CONCLUSION AND IMPLICATIONS

5.1 Theoretical Contributions

This paper makes several vital contributions to hospitality and technology management literature by successfully contextualizing the Technology Acceptance Model within the specialized domain of halal hospitality. It directly answers academic calls to incorporate specific socio-religious variables into consumer psychology, moving beyond generic risk and utility metrics (Davis, 1989; Venkatesh et al., 2003). By linking Shariah-compliance trust, technical efficacy, and halal integrity threats to established internal hotel quality benchmarks, the study establishes a rigorous theoretical foundation that bridges data-driven information systems with value-driven Islamic marketing principles, expanding the scope of smart tourism research (Hamid et al., 2022; Islam et al., 2022; Mohd Ridzuan et al., 2022).

5.2 Practical Industry and Policy Implications

For hotel operators and technology developers targeting the Malaysian Muslim-friendly tourism market, the practical insights derived from this model are explicit. Management must recognize that deploying advanced AI systems without transparent religious validation can alienate their primary consumer base, meaning that automated systems must be designed to complement the internal quality metrics (INTQUAL) and positive employee relationships that traditionally secure service performance standards in certified hotels (Islam et al., 2022).

Hotels should implement front-facing digital interfaces that clearly display real-time, AI-verified halal sourcing and privacy configurations to mitigate consumer anxiety, thereby building trust and minimizing perceived integrity threats (Mohd Ridzuan et al., 2022; Zulkepli et al., 2023). Furthermore, regulatory bodies can utilize this conceptual framework to design digital audit guidelines, ensuring that smart tourism developments in Malaysia remain sustainably aligned with both technological progress and religious preservation (Hamid et al., 2022).

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