

AI and Spiritual Compatibility: Examining Human-Technology Interaction in Gen-Z Muslim Pilgrimage

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Abstract

This study investigates the adoption of artificial intelligence (AI) in domestic Islamic pilgrimage (ziarah) among urban Generation Z Muslims in Indonesia. Using the Structural Equation Modeling–Partial Least Squares (SEM-PLS) approach, the study tests a conceptual model that incorporates perceived usefulness, AI-spiritual compatibility, trust in AI-generated religious content, perceived social norms, attitude, behavioral intention, and actual use behavior. Based on responses from 323 participants, the results indicate that attitude toward AI-assisted pilgrimage is the strongest predictor of both intention and actual usage. Perceived usefulness, trust, and social norms also significantly influence behavioral outcomes, while AI-spiritual compatibility exerts a weaker yet positive effect. These findings suggest that a combination of individual evaluation and socio-cultural context shapes the adoption of spiritual technology. The study contributes to the growing discourse on digital religion by demonstrating how AI can facilitate meaningful religious experiences. Implications for developers, religious leaders, and policymakers are discussed, along with directions for future research.

Keywords: Artificial Intelligence (AI); Generation Z Muslims; Religious Tourism; Digital Religion; Pilgrimage Behavior

INTRODUCTION

The growing integration of artificial intelligence (AI) into religious and cultural tourism reflects a broader transformation in how faith-based experiences are accessed and navigated in modern society. In Indonesia, where Islamic pilgrimage to domestic sacred sites—such as the tombs of wali, esteemed ulama, and historical Islamic landmarks—holds significant cultural and spiritual value, technology is increasingly playing a supportive role. AI-powered applications now assist Muslim travelers in locating ziarah sites, organizing travel routes, accessing historical information, and receiving spiritual content in real time (Alkhouri, 2024; Loewen-Colón & Mosurinjohn, 2022). These tools not only enhance logistical efficiency but also deepen users' engagement with the spiritual and historical meanings of the journey (Parker et al., 2024). Among the primary adopters of such technology are Muslim members of Generation Z, particularly those living in urban areas. As digital natives, they demonstrate a high degree of technological fluency and expect personalized, meaningful experiences—including in religious tourism. For these individuals, ziarah is not only a spiritual act but also a social and cultural activity shaped by convenience, digital platforms, and lifestyle preferences. Applications offering prayer time notifications, location-based recommendations, interactive learning about the wali and Islamic heritage, and even AI-guided spiritual reflections are becoming increasingly relevant (Al-Ajarma, 2022; Hassan et al., 2023; Waluyo et al., 2023).

However, this phenomenon raises important questions regarding the compatibility of AI with Islamic values. While many Gen-Z Muslims perceive AI as a helpful and trusted companion in their spiritual journeys, others question its appropriateness in mediating sacred experiences. Acceptance of AI in the context of ziarah is closely tied to perceived usefulness, trust in religious content, and alignment with Islamic teachings (Battour et al., 2023; Guerra-Tamez et al., 2024;

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Tjahyana, 2024). These concerns are amplified in urban Indonesian contexts, where religious devotion coexists with rapid digitalization and consumer lifestyles. Here, digital religious literacy becomes crucial in ensuring that AI use enhances rather than diminishes the spiritual depth of pilgrimage (Athoillah et al., 2023).

Furthermore, the adoption of AI in ziarah practices is influenced by socio-cultural dynamics. Social norms, peer influence, and portrayals of tech-enhanced religious experiences on social media shape young Muslims' perceptions and intentions regarding AI use during pilgrimage (Alkhouri, 2024; Santoso et al., 2024; Umbrello, 2023). Many are inspired by Muslim influencers, travel bloggers, and online communities that frame ziarah not just as a religious duty but as a shared spiritual lifestyle. This intersection of tradition and technology illustrates how AI is reshaping pilgrimage behavior as both a personal and social act (Loewen-Colón & Mosurinjohn, 2022; Z. Wang et al., 2024). This study investigates the behavioral mechanisms that influence the use of AI during domestic Islamic pilgrimage among Indonesian Gen-Z Muslims. By examining variables such as perceived AI usefulness, AI-spiritual compatibility, trust in AI-based religious content, social norms, attitudes, and behavioral intention, this research aims to provide a comprehensive understanding of human-AI interaction in sacred travel. The findings contribute to the discourse on digital spirituality in Southeast Asia and offer practical implications for app developers, religious institutions, and tourism stakeholders seeking to harmonize Islamic values with intelligent technology.

LITERATURE REVIEW

Perceived Usefulness of AI and Attitude Toward Pilgrimage Technology

The perceived usefulness of artificial intelligence (AI) plays a pivotal role in shaping Generation Z Muslims' attitudes toward integrating technology into their religious practices, particularly during pilgrimage. In the context of domestic Islamic pilgrimage in Indonesia, AI-based tools are increasingly employed to assist with planning travel routes, accessing site-specific religious and historical information, and delivering personalized spiritual content (Mokodenseho et al., 2024; Showail, 2022). These functionalities are not only seen as conveniences but as elements that enrich the overall ziarah experience, allowing users to engage with sacred spaces more meaningfully. When users perceive that AI applications enhance the quality and depth of their pilgrimage journey, their attitudes toward adopting such technologies become more favorable (Shafiq et al., 2024).

In addition to functional benefits, acceptance of AI is influenced by socio-cultural dynamics, including peer influence and communal perceptions. As digital-native Muslims increasingly share positive experiences with AI tools on social media or within their religious communities, this social reinforcement contributes to a broader normalization of AI in spiritual contexts (Idi & Priansyah, 2023). Moreover, the Indonesian context—characterized by religious moderation and openness to technological adaptation—provides fertile ground for aligning modern innovations with traditional values (Sulaiman et al., 2022). As such, perceived usefulness, when combined with a socially supportive environment, strengthens the likelihood of positive attitudes toward AI-assisted pilgrimage. Therefore, the following hypothesis is proposed:

H1: Perceived AI usefulness positively influences attitudes toward AI-assisted pilgrimage.

AI-Spiritual Compatibility and Acceptance of AI in Pilgrimage

The intersection between artificial intelligence (AI) and Islamic values presents a critical consideration for Generation Z Muslims as they navigate spiritual life in an increasingly digital environment. The perceived compatibility of AI with religious principles significantly affects attitudes toward its use in sacred contexts, including religious tourism and acts of worship. When AI is seen as supporting rather than undermining Islamic teachings—such as by providing accurate prayer guidance or digital access to Quranic reflections—it is more likely to be accepted as a meaningful tool for spiritual engagement (Khan, 2024). However, concerns about authenticity, misinformation, and the dilution of religious authority remain. Platforms such as IslamGPT, while convenient, may raise questions about the reliability of AI-generated content and the potential erosion of traditional religious scholarship (Niam, 2024).

To ensure AI can be integrated without compromising religious integrity, scholars have emphasized the need for collaborative frameworks involving technologists, educators, and religious authorities. Such cooperation is essential to guide ethical AI implementation in spiritual domains (A. Hakim & Anggraini, 2023). Moreover, a balanced approach is necessary—one that leverages AI's potential to enhance learning and spiritual reflection while preserving the sincerity and depth of human religious experience (Alkhouri, 2024). When AI is viewed as aligning with Islamic ethics and contributing positively to individual faith journeys, particularly in pilgrimage settings, users are more inclined to adopt it. Thus, AI-spiritual compatibility emerges

as a pivotal factor in shaping attitudes toward AI-assisted pilgrimage practices (Umbrello, 2023). Based on this understanding, the following hypothesis is proposed:

H2: AI-spiritual compatibility positively influences attitudes toward AI-assisted pilgrimage.

Trust in AI-Based Religious Content and Its Influence on Attitude

Trust is a pivotal determinant of technology acceptance, particularly in spiritually sensitive domains such as religious pilgrimage. In this context, users rely on AI applications not merely for logistical support but for delivering religious information, guidance, and personal spiritual reflections. The degree to which individuals perceive AI-generated religious content as credible, accurate, and aligned with their beliefs directly shapes their willingness to engage with such tools (Huang & Ball, 2024; Jermutus et al., 2022). Trust is especially crucial in sacred experiences like *ziarah*, where the personal and emotional depth of the journey requires assurance that the technology does not compromise spiritual integrity (Ball & Huang, 2023).

A key factor in cultivating this trust lies in the transparency of AI systems. When users understand how religious content is generated—through traceable sources, ethical filtering, and intelligible explanations—they are more likely to accept AI as a reliable spiritual companion (Haresamudram et al., 2023). This is particularly important given the potential for AI to misinterpret religious meanings or introduce bias in its recommendations. Furthermore, AI literacy among users also contributes to trust; individuals who understand AI's mechanisms are better positioned to assess its ethical appropriateness and accuracy critically (Zhu et al., 2025). In sum, trust not only mitigates user skepticism but also enhances openness to integrating AI into spiritual practices. Based on this reasoning, the following hypothesis is proposed:

H3: Trust in AI-based religious content positively influences attitudes toward AI-assisted pilgrimage.

Perceived Social Norms and Behavioral Intention Toward AI in Pilgrimage

The adoption of artificial intelligence (AI) by Generation Z Muslims, particularly in urban Indonesia, is significantly shaped by perceived social norms—namely, the expectations, behaviors, and endorsements present in their immediate social and religious environments. Social learning theory suggests that young individuals are heavily influenced by peers' and public figures' behaviors, particularly on social media platforms, where AI-enabled practices—such as using smart apps during *ziarah*—are frequently showcased (Alanzi et al., 2023; Kazançoğlu et al., 2024). These mediated experiences help construct a perception that using AI for religious purposes is not only acceptable but also encouraged. In this context, social validation and exposure through trusted influencers or peer groups serve as powerful motivators in shaping behavioral intentions (Li et al., 2022; Sebastián et al., 2022).

Moreover, broader psychological models, such as UTAUT, support the view that social influence is a strong predictor of behavioral intention to adopt technology. When individuals witness their community or religious leaders engaging positively with AI tools, especially in spiritual settings, it strengthens the legitimacy of AI use within that faith community (Biloš & Budimir, 2024; Rojali et al., 2024). This collective reinforcement creates a social environment in which the use of AI becomes normalized and even viewed as a shared religious or cultural practice. Additionally, the perceived usefulness of AI—amplified by seeing it successfully used by others—serves as a mediating factor that translates social exposure into concrete intention (M. Hakim & Supriyanto, 2024). In sum, when AI is framed as both socially accepted and functionally beneficial, Gen-Z Muslims are more likely to adopt it in their pilgrimage experiences. Thus, the following hypothesis is proposed:

H4: Perceived social norms positively influence behavioral intention to use AI in pilgrimage.

Attitude Toward AI and Intention to Use in Pilgrimage

As artificial intelligence (AI) becomes increasingly embedded in everyday life, its role in shaping spiritual engagement, particularly in the context of *ziarah* (Islamic pilgrimage), has gained scholarly attention. Attitudes toward AI reflect an individual's overall evaluation of the technology's relevance, comfort, and perceived value. A favorable attitude generally indicates a readiness to adopt innovations deemed meaningful enhancements to spiritual or religious practices. In religious tourism, AI-powered applications—such as chatbots, smart maps, and personalized prayer-time alerts—can enrich the pilgrimage experience, offering convenience and deeper emotional engagement with sacred sites (Q. Chen et al., 2023). This aligns with broader findings that perceived usefulness and ease of use significantly influence the formation of positive attitudes and, subsequently, the intention to adopt AI technologies (Gonçalves et al., 2024).

Beyond functionality, AI also has the potential to transform how spirituality is experienced and shared. In digital religious contexts, AI facilitates new forms of communal worship, learning, and personal reflection, contributing to more inclusive and accessible spiritual environments (Lomachinska & Hryshyna, 2024; Thomas

et al., 2024). These technological tools can alleviate psychological barriers—such as isolation during social disruptions—by enabling virtual religious gatherings and digital companionship (Alkhouri, 2024; Lipková & Jarolímková, 2023). As a result, individuals who perceive AI as adding spiritual and emotional value are more likely to develop favorable attitudes toward its use in pilgrimage. This openness to innovation can significantly strengthen their behavioral intention to use AI in their religious journey. Based on this, the following hypothesis is proposed:

H5: Attitude toward AI-assisted pilgrimage positively influences behavioral intention to use AI in pilgrimage.

Behavioral Intention and Actual Use of AI in Pilgrimage

Behavioral intention is a central construct in technology acceptance frameworks, reflecting an individual's readiness or motivation to perform a specific behavior. Among Gen-Z Muslims in Indonesia, a strong intention to use AI in religious activities—particularly during domestic pilgrimage—is a key predictor of actual technology adoption. The Technology Acceptance Model (TAM) and related theories emphasize the strength of behavioral intention in influencing real-world actions, especially when the perceived usefulness of a technology aligns with the user's goals (Nordin et al., 2023). Studies have shown that when Gen-Z Muslims view AI as beneficial for planning, navigating, and enriching their ziarah experiences, they are more likely to integrate it into their spiritual practices (Bougherra et al., 2023; Hussein & Azman, 2024).

The evolving motivations within religious tourism further reinforce this relationship. Younger pilgrims increasingly seek not only spiritual fulfillment but also cultural, logistical, and social enrichment—dimensions that AI technologies are well positioned to support (Hassan et al., 2023). However, intention alone does not guarantee action. The realization of these intentions into actual behavior is often facilitated by supportive environments, including peer influence, digital literacy, and accessibility of AI tools (Zhang & Boot, 2023). For Gen-Z Muslims, such external factors can help bridge the gap between willingness and practice. Therefore, when strong behavioral intention is paired with enabling conditions, the likelihood of actual AI usage during pilgrimage increases. Based on this rationale, the following hypothesis is proposed:

H6: Behavioral intention to use AI positively influences actual AI-assisted pilgrimage behavior.

The Direct Role of Attitude in Predicting AI-Assisted Pilgrimage Behavior

While behavioral intention is a widely recognized predictor of actual behavior, several theoretical models—such as the Theory of Planned Behavior (TPB)—acknowledge that attitudes can also exert a direct influence on behavior, particularly in high-involvement or emotionally charged contexts (Ng et al., 2022; Nursanti & Ellina, 2022). In the realm of religious practices, such as ziarah, users may rely more on internalized evaluations and emotional readiness than on deliberate intention when deciding to adopt AI technologies. Research in adjacent domains, such as traditional medicine and educational technology, supports the view that strong positive attitudes often lead to direct engagement with the behavior, even bypassing structured planning (Feng & Li, 2023; Ng et al., 2022).

In spiritual contexts, the affective and personal nature of decision-making can amplify this phenomenon. Studies show that highly favorable attitudes may lead to immediate action, particularly when individuals feel emotionally or spiritually aligned with the behavior (S. Chen et al., 2022; Nabilah et al., 2022). During pilgrimage, where spiritual motivations and cultural rituals intersect, a positive attitude toward AI may itself be sufficient to trigger actual use—especially when reinforced by subjective norms and perceived social expectations. Furthermore, strong attitudes toward prosocial or religious behavior have been shown to directly influence real-world actions, suggesting that similar mechanisms may be at play in tech-assisted religious journeys (X. Wang et al., 2023). Based on this reasoning, the following hypothesis is proposed:

H7: Attitude toward AI-assisted pilgrimage positively influences actual behavior.

METHODS

This study adopts a quantitative explanatory approach using Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the factors influencing the adoption of AI-assisted pilgrimage among Generation Z Muslims in Indonesia. Data were collected through an online questionnaire distributed to targeted respondents who met specific screening criteria. Participants were first asked a set of selection questions to ensure suitability with the study context: (1) whether they were aged between 18 to 26 years old, (2) identified as Muslim, (3) resided in major urban areas such as Jakarta, Bandung, or Surabaya, (4) had engaged in or expressed interest in religious pilgrimage, such as visiting Islamic historical or spiritual sites (e.g., graves of wali, Islamic museums, or pesantren heritage), and (5) had used or were open to using digital or AI

technologies in a religious or spiritual context (e.g., AI chatbots, Google Maps, or religious travel apps). Only respondents who answered "yes" to all five criteria were allowed to proceed to the full questionnaire.

The survey instrument measured seven constructs using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), including: perceived usefulness of AI, AI-spiritual compatibility, trust in AI-based religious content, perceived social norms, attitude toward AI in pilgrimage, behavioral intention, and actual AI-assisted pilgrimage behavior. Each latent variable was represented by 4 to 5 reflective indicators adapted from validated scales and contextualized for the Indonesian Muslim ziarah experience. The final sample, which exceeded the minimum threshold based on the 10-times rule in PLS-SEM, was analyzed using SmartPLS 4.0. The analysis included both measurement model assessment (for reliability and validity) and structural model testing (for hypothesis significance, path coefficients, and predictive relevance), using bootstrapping with 5,000 subsamples at $\alpha = 0.05$. Ethical procedures were followed throughout, and all respondents provided informed consent before participating.

RESULTS AND DISCUSSION

Respondent Profile

A total of 323 respondents participated in this study, all of whom met the inclusion criteria: aged between 18 and 26 years, identifying as Muslim, residing in major urban areas in Indonesia (such as Jakarta, Bandung, Surabaya, and others), having prior experience or interest in religious pilgrimage (e.g., visiting the tombs of wali, Islamic historical sites), and having used or expressed openness to using AI or digital technologies in a religious or spiritual context. Regarding gender distribution, 60.4% of respondents were female and 39.6% were male, indicating a slight predominance of females. The average age was approximately 20.4 years, aligning well with the study's focus on Generation Z Muslims. Geographically, the respondents were drawn from various urban areas across Indonesia, with the highest concentrations in Greater Bandung, Jakarta, Surabaya, Yogyakarta, Bekasi, and Depok—cities with relatively advanced technological infrastructure and digital literacy. Regarding educational background, 54.2% of participants were currently enrolled in or had completed senior high school (SMA), 41.2% held a diploma or undergraduate degree, and the remaining 4.6% were pursuing or had completed postgraduate or professional studies.

Regarding technological engagement, particularly with AI in religious or spiritual settings, participants were asked whether they had ever used tools such as AI chatbots (e.g., ChatGPT), Google Maps, or digital religious applications. The results showed that 51.1% of respondents reported frequent use, 32.8% reported occasional use, 11.1% reported using such technologies only once, and 5.0% reported never using AI in these contexts. These findings suggest a generally high level of familiarity and openness toward AI technologies among Gen-Z Muslims, supporting the relevance of this demographic for exploring AI-assisted religious experiences, particularly in the context of urban pilgrimage in Indonesia.

Measurement Model

The measurement model was assessed to evaluate the reliability and validity of the constructs before proceeding to structural model analysis. The analysis involved testing indicator reliability, internal consistency reliability, convergent validity, discriminant validity, and multicollinearity. As shown in Table 1, all outer loading values exceeded the recommended threshold of 0.70, indicating satisfactory indicator reliability. The loading values for each construct ranged from 0.755 to 0.926, demonstrating that each item contributed meaningfully to its corresponding latent variable.

Table 1. Outer Loadings of Measurement Items

Construct	Indicator	Loading
AI-Spiritual Compatibility	AISC1–AISC5	0.755–0.900
Attitude Toward AI	ATT1–ATT5	0.837–0.912
Behavioral Intention	INT1–INT4	0.880–0.926
Actual Use	BEH1–BEH4	0.802–0.902
Perceived AI Usefulness	PAU1–PAU5	0.837–0.901
Perceived Social Norms	SN1–SN5	0.764–0.892
Trust in AI Religious Content	TAR1–TAR4	0.892–0.906

Source: Research data, 2025

Internal consistency was measured using Cronbach's Alpha, rho_A, and Composite Reliability (CR). As presented in Table 2, all constructs had CR values exceeding the 0.70 threshold, ranging from 0.924 to 0.950, indicating high internal consistency. The Average Variance Extracted (AVE) values also exceeded the 0.50 threshold, with all constructs ranging from 0.710 to 0.815, thereby confirming convergent validity.

Table 2. Reliability and Convergent Validity

Construct	Cronbach's Alpha	rho_A	Composite Reliability	AVE
AI-Spiritual Compatibility	0.899	0.907	0.925	0.713
Attitude Toward AI	0.934	0.937	0.950	0.792
Behavioral Intention	0.925	0.929	0.946	0.815
Actual Use of AI	0.895	0.897	0.927	0.762
Perceived AI Usefulness	0.921	0.928	0.941	0.760
Perceived Social Norms	0.897	0.904	0.924	0.710
Trust in AI Religious Content	0.922	0.923	0.945	0.811

Source: Research data, 2025

Discriminant validity, as shown in Table 3, is supported by the square roots of each construct's AVE (diagonal values) being greater than its correlations with other constructs (off-diagonal values). Additionally, the HTMT ratio (not shown here) was tested, and all values were below the conservative threshold of 0.90, further confirming discriminant validity.

Table 3. Discriminant Validity

Construct	AISC	BEH	ATT	INT	PAU	SN	TAR
AI-Spiritual Compatibility	0.844	0.810	0.803	0.746	0.768	0.758	0.844
Actual Use of AI	0.810	0.873	0.800	0.783	0.778	0.800	0.815
Attitude Toward AI	0.803	0.800	0.890	0.894	0.799	0.864	0.771
Behavioral Intention	0.746	0.783	0.894	0.903	0.793	0.841	0.736
Perceived AI Usefulness	0.768	0.778	0.799	0.793	0.872	0.742	0.662
Perceived Social Norms	0.758	0.800	0.864	0.841	0.742	0.842	0.765
Trust in AI Religious Content	0.844	0.815	0.771	0.736	0.662	0.765	0.900

Source: Research data, 2025

To assess potential multicollinearity among indicators, the Variance Inflation Factor (VIF) was used. As shown in Table 4, all VIF values ranged from 1.81 to 4.47, well below the critical threshold of 5.0, indicating that multicollinearity was not a concern in this measurement model.

Table 4. VIF Values (Selected Indicators)

Indicator	VIF	Indicator	VIF
AISC1–AISC5	1.81–3.70	PAU1–PAU5	2.40–3.30
ATT1–ATT5	2.41–3.92	SN1–SN5	1.89–3.13
BEH1–BEH4	1.79–3.28	TAR1–TAR4	2.92–3.27
INT1–INT4	3.07–4.47		

Source: Research data, 2025

The results of the measurement model evaluation indicate that all constructs meet the criteria for indicator reliability, internal consistency, convergent validity, and discriminant validity. There are no issues with multicollinearity. Therefore, the measurement model is deemed valid and reliable, and the analysis can proceed to the evaluation of the structural (inner) model.

Structural Model

The evaluation of the structural model aims to test the significance of the hypothesized relationships among constructs and to assess the model's explanatory power and predictive relevance. This includes analyzing path coefficients, the coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and model fit indices. Table 1 and Figure 1 summarize the results of the hypothesis testing, showing the direct relationships between latent variables. Six out of seven paths were statistically significant ($p < 0.05$). The strongest relationship was found between Attitude Toward AI-Powered Pilgrimage and Behavioral Intention ($\beta = 0.660$, $t = 5.794$, $p < 0.001$), supporting the hypothesis that a favorable attitude significantly drives intention to use AI for religious pilgrimage. Similarly, Perceived AI Usefulness ($\beta = 0.434$, $p < 0.001$) and Trust in AI-Generated Religious Content ($\beta = 0.303$, $p = 0.006$) were significant predictors of attitude. In contrast, AI-Spiritual Compatibility had a marginally significant effect on attitude ($\beta = 0.214$, $p = 0.074$), indicating a weak influence in this model. Behavioral intention was also significantly influenced by Perceived Social Norms ($\beta = 0.270$, $p = 0.032$), and both attitude ($\beta = 0.499$, $p = 0.001$) and Intention ($\beta = 0.338$, $p = 0.033$) significantly predicted Actual Use of AI in Pilgrimage.

Table 1. Path Coefficients and Hypothesis Testing

Pathway	β (O)	t-stat	p-value	Result
AI-Spiritual Compatibility → Attitude Toward AI	0.214	1.790	0.074	Marginal
Perceived AI Usefulness → Attitude Toward AI	0.434	4.378	0.000	Supported

Pathway	β (O)	t-stat	p-value	Result
Trust in AI Religious Content → Attitude Toward AI	0.303	2.741	0.006	Supported
Attitude Toward AI → Behavioral Intention	0.660	5.794	0.000	Supported
Perceived Social Norms → Behavioral Intention	0.270	2.157	0.032	Supported
Behavioral intention → Actual Use of AI	0.338	2.136	0.033	Supported
Attitude Toward AI → Actual Use of AI	0.499	3.317	0.001	Supported

Source: Research data, 2025

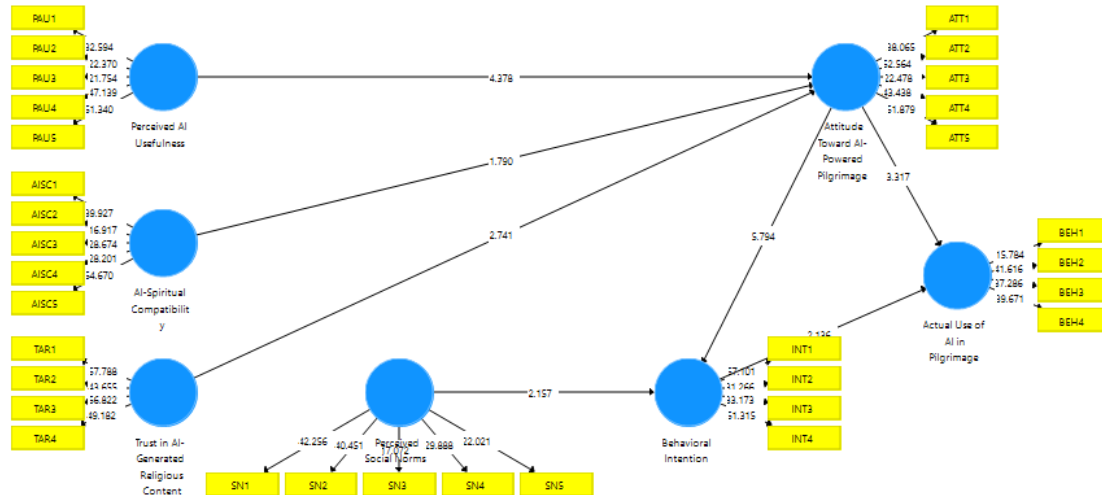


Figure 1. Evaluated Structural Model

Source: Research data, 2025

To assess the model's explanatory and predictive quality, we examined R^2 , Q^2 , and f^2 values (Table 2). The R^2 values indicate that: Behavioral Intention ($R^2 = 0.817$) is well explained by Attitude and Social Norms; Attitude Toward AI ($R^2 = 0.752$) is predicted by Perceived Usefulness, Trust, and Spiritual Compatibility; Actual Use of AI in Pilgrimage ($R^2 = 0.664$) is influenced by Attitude and Intention. All Q^2 values for endogenous constructs were above 0.35, indicating strong predictive relevance, particularly for Behavioral Intention ($Q^2 = 0.654$) and Attitude Toward AI ($Q^2 = 0.582$). The f^2 values suggest that the attitude → Intention relationship has the strongest effect size ($f^2 = 0.602$), followed by Perceived Usefulness → Attitude ($f^2 = 0.312$).

Table 2. R^2 , Q^2 , and f^2 Summary

Endogenous Variable	R^2	Q^2	Predictor	f^2
Attitude Toward AI	0.752	0.582	AI-Spiritual Compatibility	0.039
			Perceived AI Usefulness	0.312
			Trust in AI Religious Content	0.107
Behavioral Intention	0.817	0.654	Attitude Toward AI	0.602
			Perceived Social Norms	0.101
Actual Use of AI	0.664	0.496	Behavioral Intention	0.068
			Attitude Toward AI	0.149

Source: Research data, 2025

Although model fit is not the primary focus of PLS-SEM, several indices were evaluated. As shown in Table 3, the SRMR of the estimated model was 0.080, below the 0.10 threshold, indicating an acceptable fit. The Normed Fit Index (NFI) was 0.779, which is slightly below the ideal 0.90 but acceptable for exploratory models. Other fit indices, such as d_ULS, d_G, and Chi-Square, also support the adequacy of the model.

Table 3. Model Fit Indices

Fit Index	Value (Estimated)	Threshold	Interpretation
SRMR	0.080	< 0.10	Acceptable
NFI	0.779	> 0.70 (explor.)	Moderate fit
d_ULS	3.370	—	Acceptable
d_G	1.692	—	Acceptable
Chi-Square	1.053.313	—	Descriptive

Source: Research data, 2025

The structural model provides strong empirical support for most of the hypothesized relationships. Attitude plays a central mediating role between antecedents (such as usefulness and trust) and outcomes (behavioral intention and actual use). Additionally, the model demonstrates strong explanatory power (R^2) and excellent predictive capability (Q^2) for key constructs, making it a valuable framework for understanding AI adoption among Gen-Z Muslims in Islamic pilgrimage contexts.

Discussion

The structural model results confirm that attitude toward AI-assisted pilgrimage plays a central role in shaping both behavioral intention and actual AI use among Generation Z Muslims in urban Indonesia. Specifically, the strong and significant effect of attitude $\rightarrow$ Behavioral Intention ($\beta = 0.660$, $p < 0.001$, $f^2 = 0.602$) aligns with technology acceptance literature (TAM, TPB), suggesting that a positive evaluative disposition drives intention to use new technologies. This reflects how Gen-Z respondents perceive AI tools as meaningful enhancers of spiritual experiences, consistent with earlier findings on perceived usefulness and comfort as antecedents of attitude (Q. Chen et al., 2023; Gonçalves et al., 2024). Consistent with prior studies, Perceived AI Usefulness and Trust in AI-generated religious content significantly influenced attitude ($\beta = 0.434$, $p < 0.001$; $\beta = 0.303$, $p = 0.006$, respectively). These findings mirror established findings that credible, valuable information fosters positive attitudes toward technology adoption, especially in sensitive domains such as religion. While AI-Spiritual Compatibility had a positive but marginal effect ($\beta = 0.214$, $p = 0.074$), this suggests that alignment with Islamic ethics may be necessary but not sufficient to shape attitude—perhaps because Gen-Z users prioritize utility and trust over doctrinal alignment, echoing mixed evidence from (A. Hakim & Anggraini, 2023; Niam, 2024).

Moreover, Perceived Social Norms exerted a significant positive influence on Behavioral Intention ($\beta = 0.270$, $p = 0.032$, $f^2 = 0.101$), indicating that peer behaviors, community influences, and media exposure amplify the social validation of AI use. This resonates with research showing strong normative pressure among Gen-Z users to adopt digital innovations when framed as socially endorsed (Biloš & Budimir, 2024; Kazançoğlu et al., 2024). In this religious tourism context, witnessing peers or influencers using AI for ziarah seems to legitimize technology as part of spiritual practice. Finally, both Behavioral Intention ($\beta = 0.338$, $p = 0.033$) and attitude ($\beta = 0.499$, $p = 0.001$) significantly influenced Actual Use of AI, confirming both a mediated and a direct pathway. The high R^2 values (Behavioral Intention = 0.817; Actual Use = 0.664) and the predictive relevance ($Q^2 > 0.49$) indicate that the model robustly explains and predicts AI adoption behavior during pilgrimage. For app developers and religious-tourism planners, these results underscore the need to design AI tools that not only provide functional value and trustworthy content but also cultivate positive perceptions and social endorsement among Gen-Z Muslim communities.

Practical and Theoretical Implications

The findings of this study offer several practical implications for technology developers, religious leaders, and tourism policymakers in Indonesia. First, the strong influence of attitude and perceived usefulness on behavioral intention suggests that developers of AI-based pilgrimage applications should prioritize usability, personalization, and spiritual relevance. Features such as smart itinerary planning, contextual religious content, and real-time spiritual assistance can enhance user perception and foster adoption. Second, the significant role of trust and social norms implies that strategic collaborations with credible religious figures and influencers may legitimize AI tools in the eyes of young Muslim users. Endorsements from respected voices within the community can reinforce AI's alignment with Islamic values, especially when spiritual authenticity is a concern. From a theoretical perspective, this study advances the discourse on digital religion by empirically validating a model integrating constructs such as AI-spiritual compatibility, trust in AI-generated content, and actual AI use in sacred contexts. By extending the Technology Acceptance Model (TAM) (Davis, 1989) and incorporating elements from the Theory of Planned Behavior (TPB) (Ajzen, 1991), this research contributes to a nuanced understanding of AI-human interaction in religious tourism among Gen Z Muslims—a group often underrepresented in spiritual technology studies. The positive findings regarding trust, social norms, and actual use confirm that faith and technology are not in conflict but are increasingly co-evolving within contemporary spiritual life.

Limitations and Future Research

Despite these contributions, the study has several limitations. First, the sample is geographically concentrated in urban areas, particularly in cities like Bandung, Jakarta, and Surabaya. This urban-centric focus may limit the generalizability of findings to rural or non-metropolitan Muslim populations, where digital

infrastructure and AI literacy may differ significantly. Second, the study relied on self-reported measures, which may introduce social desirability bias or inaccuracies in reporting actual AI usage during ziarah. Future studies could incorporate behavioral tracking or usage logs for more objective data.

Additionally, while the model captures core psychological and social variables, it does not fully account for religious knowledge levels, denominational affiliations, or psychospiritual needs, which may influence how users perceive the role of AI in sacred experiences. Moreover, given the rapid evolution of AI technologies, longitudinal research is needed to explore how trust and attitudes may shift over time, particularly as AI systems become more autonomous and conversational. Expanding this model to other contexts—such as interfaith pilgrimages or international hajj experiences—could offer comparative insights into the global intersections of faith, technology, and youth culture.

CONCLUSION

This study explored the behavioral mechanisms underlying the adoption of artificial intelligence (AI) in domestic religious tourism—particularly ziarah—among urban Generation Z Muslims in Indonesia. Drawing upon constructs from the Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), and digital religion literature, the model integrated perceived usefulness, AI-spiritual compatibility, trust in AI-generated religious content, perceived social norms, attitude, behavioral intention, and actual use. The findings revealed that attitude toward AI-assisted pilgrimage is the most influential factor, significantly predicting both behavioral intention and actual use. Furthermore, perceived usefulness, trust, and social norms were also significant predictors, reinforcing the idea that both personal evaluation and social environment shape Gen Z's acceptance of AI in spiritual contexts. Although AI-spiritual compatibility had a positive yet weaker effect, it highlights the ongoing negotiation between technology and religious values. Importantly, both behavioral intention and attitude had direct effects on actual usage, affirming their roles as strong behavioral antecedents in this sacred context.

Future Research Direction

Future studies should consider a more diverse and nationally representative sample, including respondents from rural and pesantren-based communities, to explore contrasts in AI receptiveness across Islamic subcultures in Indonesia. Additionally, future research may incorporate longitudinal methods to assess how attitudes and behaviors evolve, especially as AI technologies become more integrated into religious infrastructure (e.g., smart mosques, AI khutbah assistants). Moreover, future research could examine the roles of religious literacy, denominational views, and spiritual maturity in mediating or moderating the relationships under study. It is also essential to investigate ethical and theological debates surrounding AI-generated fatwas, virtual muftis, and AI chatbots answering fiqh questions—topics that will become increasingly relevant as the line between human and machine authority continues to blur. In sum, this study demonstrates that AI and Islamic spirituality are not mutually exclusive; rather, they are co-evolving in ways that resonate with the values and practices of Generation Z Muslims. The future of pilgrimage and spiritual tourism will likely be mediated not only by sacred traditions but also by intelligent systems that offer new modes of interaction, guidance, and reflection.

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