



# “Hyper-personalization, artificial intelligence, and customer loyalty in Islamic banking: The mediating role of Minangkabau cultural congruence”

<b>AUTHORS</b>	Susriyanti  Fitri Yeni
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Susriyanti, Dr. Department of Management, Universitas Putra Indonesia YPTK Padang [University of Putra Indonesia YPTK Padang], Indonesia.

Fitri Yeni, Dr. Department of Management, Universitas Putra Indonesia YPTK Padang [University of Putra Indonesia YPTK Padang], Indonesia. (Corresponding author)

Susriyanti (Indonesia), Fitri Yeni (Indonesia)

# HYPER-PERSONALIZATION, ARTIFICIAL INTELLIGENCE, AND CUSTOMER LOYALTY IN ISLAMIC BANKING: THE MEDIATING ROLE OF MINANGKABAU CULTURAL CONGRUENCE

## Abstract

This study addresses the growing importance of integrating advanced digital technologies with local cultural values in enhancing customer loyalty in Islamic banking. The study aims to examine the mediating role of Minangkabau culture in the relationship between hyper-personalization, artificial intelligence (AI), and customer loyalty. A quantitative cross-sectional survey was conducted among 206 Islamic bank customers in Padang City, Indonesia, during 2025. Data were collected using structured questionnaires distributed via online platforms and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. The results reveal that hyper-personalization ( $\beta = 0.387$ ,  $p < 0.001$ ) and AI ( $\beta = 0.183$ ,  $p < 0.01$ ) have significant positive effects on customer loyalty. Both variables also significantly influence Minangkabau culture ( $\beta = 0.360$  and  $\beta = 0.369$ , respectively), which in turn has a strong effect on loyalty ( $\beta = 0.409$ ,  $p < 0.001$ ). The mediating analysis confirms that Minangkabau culture significantly mediates the relationships between hyper-personalization and loyalty ( $\beta = 0.147$ ,  $p < 0.01$ ) as well as AI and loyalty ( $\beta = 0.151$ ,  $p < 0.01$ ). The model demonstrates substantial explanatory power, with an  $R^2$  value of 0.773 for customer loyalty. The findings indicate that aligning digital personalization and AI with local cultural values enhances customer trust and strengthens long-term loyalty. This study highlights the importance of culturally embedded digital strategies in Islamic banking and provides practical insights for developing ethically grounded and culturally relevant financial services.

## Keywords

loyalty, hyper-personalization, artificial intelligence, cultural, Islamic banking, Indonesia

## JEL Classification

M31, G21, O33, Z10

## INTRODUCTION

The advancement of digital technologies has significantly reshaped the financial services sector, including Islamic banking in Indonesia. The expansion of digital banking services has intensified market competition while simultaneously increasing the strategic importance of customer loyalty (Otoritas Jasa Keuangan, 2024; Yusuf et al., 2023). This transformation is further accelerated by the widespread adoption of internet and mobile technologies globally, which continuously influence customer expectations toward faster, more efficient, and highly personalized financial services (DataReportal, 2024). Within Islamic banking, digital transformation extends beyond technological implementation, as it also requires alignment with religious principles and cultural values that influence customer perceptions and behavior. The growing application of artificial intelligence (AI), such as automated interaction systems and recommendation algorithms, has enabled banks to enhance service efficiency and personalization (Ameen et al.,



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2021; Alrawahna et al., 2025). In parallel, hyper-personalization has developed into a key strategic approach by utilizing real-time data and predictive analytics to improve customer experience (Jain et al., 2021; Mendia & Cuautle, 2022).

Nevertheless, the ability of these technologies to generate sustainable customer loyalty remains a significant concern. Previous studies indicate that loyalty is still largely influenced by fundamental factors such as service quality, customer satisfaction, and digital experience (Budiman, 2020; Sutomo & Rofiuddin, 2022). While AI and personalization are proven to enhance service performance, their effectiveness is often shaped by contextual elements, including trust, perceived fairness, and cultural compatibility (Cloarec et al., 2022; Weidig et al., 2024; Lappeman et al., 2023). In the context of Islamic banking, ethical considerations and compliance with Sharia principles are critical, as customers tend to evaluate services not only based on functional performance but also on their consistency with religious and socio-cultural values (Amin et al., 2013; Albaity & Rahman, 2021; Kashif et al., 2015).

In Indonesia, particularly in West Sumatra, the Minangkabau community upholds the philosophy of Adat Basandi Syarak, Syarak Basandi Kitabullah (ABS-SBK), which represents the integration of customary practices and Islamic teachings. This cultural framework plays a significant role in shaping social interactions, economic behavior, and institutional trust, including within financial services (Hafizah et al., 2021; Mukti et al., 2022). Consequently, the acceptance and interpretation of digital banking innovations may vary depending on how well these technologies align with deeply rooted cultural values.

However, prior research on banking digitalization has predominantly emphasized technological and functional dimensions, with limited exploration of cultural factors as an active mechanism influencing customer responses. Culture is often treated merely as a contextual backdrop rather than as a mediating variable that can shape the relationship between digital innovation and behavioral outcomes such as customer loyalty (Fam et al., 2023; Jimenez et al., 2019). This limitation highlights a research gap in understanding how AI and hyper-personalization interact with cultural values in determining customer behavior within Islamic banking.

Accordingly, the scientific problem addressed in this study is to explain how digital personalization strategies can be effectively translated into customer loyalty within culturally embedded environments. Specifically, it remains unclear how cultural congruence, rooted in local values, influences the effectiveness of AI-driven and personalized banking services in fostering long-term customer relationships.

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## 1. LITERATURE REVIEW

The growing adoption of digital technologies in financial services has substantially transformed the way organizations engage with their customers, particularly through the implementation of advanced personalization techniques and artificial intelligence (AI). The development of digital banking is closely linked to the increasing utilization of big data analytics and intelligent systems aimed at improving both customer experience and operational performance (Baabdullah et al., 2019; Vuković et al., 2025). As a result, financial institutions are no longer limited to standardized service delivery but are increasingly adopting flexible, data-driven

approaches that enhance customer interaction and engagement. Within this transformation, hyper-personalization has become a central strategic instrument, utilizing real-time data processing, predictive analytics, and machine learning to provide highly customized services across various customer touchpoints (Jain et al., 2021; Weidig et al., 2024; Albous, 2024). In the context of Islamic banking in Indonesia, customer loyalty has been shown to be strongly associated with digital service quality, satisfaction, and trust (Bahtiar & Ansori, 2024; Ramadhani, 2024), while additional studies emphasize the role of perceived value and relational dynamics in influencing loyalty (Hasbi, 2024; Permatasari & Adiba, 2024).

Hyper-personalization is widely acknowledged as a mechanism for enhancing customer satisfaction, perceived value, and relational closeness. By aligning services with individual preferences and behavioral patterns, organizations can create a stronger sense of relevance and personal recognition, which in turn reinforces customer relationships (Mendia & Cuautle, 2022; Vishwakarma et al., 2025). Furthermore, empirical evidence suggests that personalization contributes to higher levels of customer retention and engagement when supported by effective data management practices (Boudet et al., 2019). However, the success of hyper-personalization is not determined solely by technological sophistication. Existing literature highlights the existence of a personalization-privacy paradox, where excessive data utilization may lead to concerns over privacy, ultimately reducing customer trust (Awad & Krishnan, 2006; Cloarec et al., 2022; Acquisti et al., 2015). Consequently, achieving an optimal balance between personalization benefits and ethical considerations such as transparency, fairness, and responsible data governance is essential (Guan et al., 2022).

Artificial intelligence serves as a key enabler that strengthens and extends personalization capabilities. Technologies such as chatbots, recommendation engines, and predictive analytics have significantly enhanced service efficiency and quality within the banking industry (Ameen et al., 2021; World Economic Forum, 2023; QuantumBlack, 2023). Empirical studies indicate that AI-based services improve customer satisfaction by increasing responsiveness, accuracy, and consistency in service delivery (Eren, 2021; Lappeman et al., 2023). Besides, trust has been identified as a critical mediating factor linking AI service performance with customer behavioral outcomes (Alagarsamy & Mehroliya, 2023). Recent research further demonstrates that AI integration in financial services not only supports better decision-making processes but also enables more effective personalized marketing strategies, thereby strengthening long-term customer relationships (Alrawahna et al., 2025; Vuković et al., 2025).

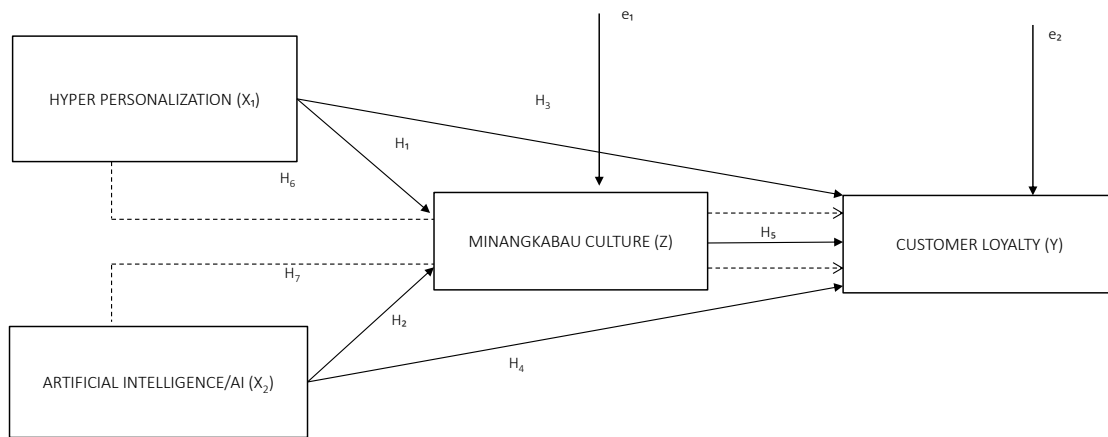
Despite the benefits offered by hyper-personalization and AI, their influence on customer loyalty is not universal and often depends on contextual factors. Cultural elements play a significant role in

shaping how customers perceive and respond to digital services. In environments where culture is deeply embedded, customer evaluations are influenced not only by functional attributes but also by the degree of alignment between service characteristics and local values. This perspective is consistent with self-congruity theory, which suggests that individuals are more likely to form positive attitudes and exhibit loyalty when there is congruence between their personal values and those represented by a service or brand (Sirgy et al., 2008; Rodriguez et al., 2012; Jimenez et al., 2019).

Within Islamic banking, cultural and religious values are particularly influential in determining customer behavior. Financial services are expected to comply with principles such as fairness, trustworthiness, and social responsibility, which are closely aligned with both Sharia law and local cultural norms (Amin et al., 2013; Albaity & Rahman, 2021; Kashif et al., 2015). In West Sumatra, the Minangkabau philosophy of Adat Basandi Syarak, Syarak Basandi Kitabullah (ABS-SBK) reflects a distinctive integration of cultural traditions and Islamic teachings that guide social and economic practices (Hafizah et al., 2021; Mukti et al., 2022). This cultural foundation provides an important framework through which customers assess the legitimacy and appropriateness of digital banking services.

However, previous studies on banking digitalization have predominantly concentrated on technological and functional determinants of customer loyalty, including service quality, satisfaction, and trust (Kim & Yang, 2025; Roberts-Lombard & Petzer, 2025). Cultural factors, in contrast, are often treated merely as contextual variables rather than as active mechanisms that influence the relationship between digital innovation and behavioral outcomes (Fam et al., 2023). As a result, there remains a limited understanding of how cultural congruence mediates the relationship between hyper-personalization, artificial intelligence, and customer loyalty, particularly within the Islamic banking context.

Therefore, this study aims to examine the effect of hyper-personalization and artificial intelligence on customer loyalty through the mediating role of cultural congruence based on Minangkabau values (ABS-SBK).



**Figure 1.** Research framework

Study hypotheses are as follows:

- H1: *Hyper-personalization positively affects Minangkabau culture.*
- H2: *Artificial intelligence positively affects Minangkabau culture.*
- H3: *Hyper-personalization positively affects customer loyalty.*
- H4: *Artificial intelligence positively affects customer loyalty.*
- H5: *Minangkabau culture positively affects customer loyalty.*
- H6: *Minangkabau culture mediates the relationship between hyper-personalization and customer loyalty.*
- H7: *Minangkabau culture mediates the relationship between artificial intelligence and customer loyalty.*

## 2. METHODOLOGY

This study adopts a quantitative research design with a cross-sectional approach to analyze the relationships among hyper-personalization, artificial intelligence, Minangkabau cultural values, and customer loyalty in Islamic banking. A quantitative approach is particularly suitable for testing theoretical relationships between latent variables and identifying causal linkages among constructs (Sugiyono, 2019; Hair et al., 2019). The study was

conducted in Padang City, Indonesia, where Minangkabau cultural values are deeply rooted in both social and economic activities. Data collection took place over a three-month period from January to March 2025.

The population of this study comprises customers of Islamic banks operating in Padang City. A total of 206 respondents were included, meeting the recommended minimum sample size for Partial Least Squares Structural Equation Modeling (PLS-SEM), especially for models involving multiple constructs and measurement indicators (Hair et al., 2019). A probability-based simple random sampling method was employed to provide equal selection opportunities for all members of the population. The sampling frame was based on active users of Islamic banking services, and respondents were randomly reached through digital distribution channels. This sampling strategy supports the representativeness of the data and strengthens the generalizability of the results.

Data were collected using a structured questionnaire distributed through online platforms, including Google Forms. The measurement items were adopted and adapted from previously validated studies on hyper-personalization, artificial intelligence, cultural values, and customer loyalty (Jain et al., 2021; Ameen et al., 2021; Hafizah et al., 2021; Amin et al., 2013). The use of established measurement instruments supports the validity and reliability of the constructs being examined (Hair et al., 2019). All items were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

The questionnaire was constructed to measure four primary constructs: hyper-personalization, artificial intelligence, Minangkabau culture, and customer loyalty. Each construct was operationalized through multiple indicators reflecting its theoretical dimensions. The instrument was designed to maintain clarity, coherence, and alignment with the study objectives. Prior to the main data collection, the questionnaire was reviewed and refined to ensure its content validity and contextual appropriateness.

Ethical considerations were strictly observed throughout the research process. Participation was entirely voluntary, and respondents were provided with clear information regarding the purpose of the study. Informed consent was obtained before participation, and anonymity as well as confidentiality were guaranteed. No personally identifiable data were collected, and all information was used solely for academic purposes in accordance with standard research ethics.

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS version 4. The analytical procedure followed a two-step approach, consisting of measurement model evaluation (outer model) and structural model assessment (inner model) (Hair et al., 2019). The measurement model was examined in terms of convergent validity, discriminant validity, and reliability. Meanwhile, the structural model was evaluated using the coefficient of determination ( $R^2$ ), effect size ( $f^2$ ), and hypothesis testing through bootstrapping to assess the significance of the relationships among variables.

A total of 206 Islamic bank customers in Padang City participated in this study. The demographic profile indicates that 59.71% of respondents were female and 40.29% were male. The majority of respondents were above 40 years old (41.75%), followed by those aged 21–30 years (25.24%). In terms of education, most respondents had completed senior high school (40.78%) or held a Bachelor’s degree (33.50%). Regarding occupation, respondents were primarily students (21.84%) and private employees (20.87%). Most respondents used Islamic banking services for savings purposes (75.24%).

**Table 1.** Respondent characteristics

Source: Data processed, 2025.

Category	Frequency (n)	Percentage (%)
<b>Gender</b>		
Male	83	40.29
Female	123	59.71
<b>Age</b>		
< 20 years	25	12.14
21-30 years	52	25.24
31-40 years	43	20.87
> 40 years	86	41.75
<b>Education</b>		
Senior high school	84	40.78
Academy/diploma	15	7.28
Bachelor (S1)	69	33.50
Master (S2)	31	15.05
Doctorate (S3)	7	3.40
<b>Occupation</b>		
Student	45	21.84
Private employee	43	20.87
Civil servant (PNS)	38	18.45
Entrepreneur	25	12.14
Housewife	25	12.14
Others	30	14.56
<b>Islamic bank product</b>		
Savings	155	75.24
Financing	7	3.40
Savings & Financing	44	21.36

Overall, respondents reported favorable perceptions of hyper-personalization, artificial intelligence, Minangkabau cultural congruence, and customer loyalty, as reflected by mean scores approaching the upper range of the measurement scale.

### 3. RESULTS AND DISCUSSION

The measurement model was assessed to evaluate convergent validity and indicator reliability. Outer loading values were examined, with a threshold of 0.70 indicating acceptable validity. Prior to indicator elimination, three items showed outer loading values below 0.70 and were subsequently removed from the model. After elimination, all remaining indicators demonstrated outer loading values above the recommended threshold, indicating satisfactory convergent validity.

As illustrated in Figure 2, the evaluation of the measurement model indicates that all retained indicators satisfy the required validity standards. Following the elimination of three indicators

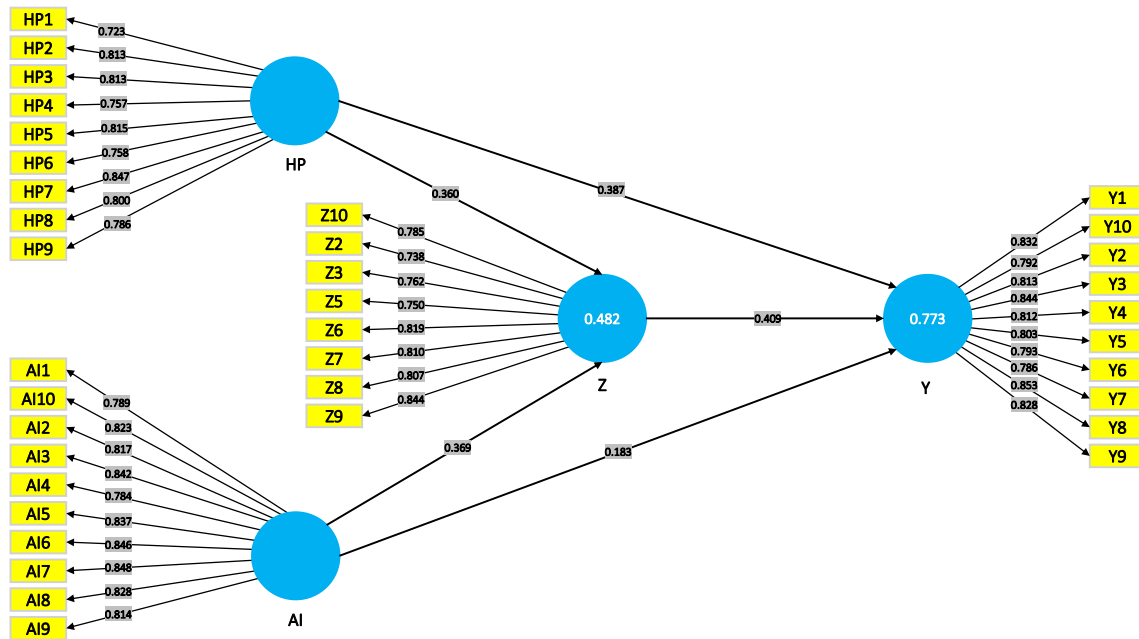


Figure 2. Outer loading after elimination

with outer loadings below 0.70 (HP10, Z1, and Z4), the remaining items exhibited loading values exceeding the recommended threshold, confirming acceptable indicator reliability and convergent validity.

Convergent validity was also examined using the Average Variance Extracted (AVE). The results show that all constructs achieved AVE values above the minimum criterion of 0.50, indicating that each construct can explain more than half of the variance of its corresponding indicators.

Table 2. Results of Average Variance Extracted (AVE) test

Source: Data processed, 2025.

Variable	Cronbach's alpha	Composite reliability (rho_a)
AI	0.947	0.948
HP	0.925	0.927
Y	0.944	0.944
Z	0.914	0.920

The reliability of the constructs was assessed using Cronbach's alpha and composite reliability coefficients. All constructs produced values above the recommended cutoff of 0.70, demonstrating adequate internal consistency among the measurement items (Hair et al., 2019).

Table 3. Results of construct reliability test

Source: Data processed, 2025.

Variable	Cronbach's alpha	Composite reliability (rho_a)
AI	0.947	0.948
HP	0.925	0.927
Y	0.944	0.944
Z	0.914	0.920

The structural model results indicate that hyper-personalization and artificial intelligence have positive effects on Minangkabau cultural congruence, which in turn positively influences customer loyalty. Besides, both hyper-personalization and artificial intelligence directly affect customer loyalty. The structural equations are as follows:

$$Z = 0.360X_1 + 0.369X_2 + e_1 \tag{1}$$

$$Y = 0.387X_1 + 0.183X_2 + 0.409Z + e_2. \tag{2}$$

These findings show that cultural congruence is strongly influenced by both hyper-personalization and artificial intelligence, while customer loyalty is primarily driven by cultural congruence and hyper-personalization.

The coefficient of determination ( $R^2$ ) indicates that the model explains 77.3% of the variance in customer loyalty and 48.2% of the variance

in Minangkabau cultural congruence, suggesting substantial and moderate explanatory power, respectively.

**Table 4.** R-square results

Source: Data processed, 2025.

Variable	R-square	R-square adjusted
Y	0.773	0.769
Z	0.482	0.477

Hypothesis testing using bootstrapping shows that all direct relationships are statistically significant at the 5% level. Hyper-personalization significantly influences cultural congruence ( $\beta = 0.360$ ,  $p = 0.001$ ) and customer loyalty ( $\beta = 0.387$ ,  $p < 0.001$ ). Artificial intelligence also significantly affects cultural congruence ( $\beta = 0.369$ ,  $p = 0.003$ ) and customer loyalty ( $\beta = 0.183$ ,  $p = 0.005$ ). Furthermore, cultural congruence significantly influences customer loyalty ( $\beta = 0.409$ ,  $p < 0.001$ ).

Indirect effect testing confirms that Minangkabau cultural congruence partially mediates the relationship between hyper-personalization and customer loyalty ( $\beta = 0.147$ ,  $p = 0.004$ ), as well as between artificial intelligence and customer loyalty ( $\beta = 0.151$ ,  $p = 0.004$ ).

The findings of this study provide empirical evidence that hyper-personalization and artificial intelligence influence customer loyalty not only directly but also indirectly through cultural congruence in Islamic banking. This indicates that tech-

nological strategies alone are insufficient to fully explain customer behavior without considering socio-cultural contexts.

The positive effect of hyper-personalization on Minangkabau cultural congruence suggests that personalized digital interactions can strengthen the perceived alignment between banking services and local values. This finding is consistent with prior studies showing that personalization enhances customer experience and perceived relevance (Jain et al., 2021; Weidig et al., 2024). However, this study extends previous research by demonstrating that personalization does not merely improve functional outcomes but also reinforces cultural compatibility. This supports the self-congruity perspective (Rodriguez et al., 2012), indicating that customers respond more positively when services reflect their cultural identity. At the same time, the results remain aligned with the personalization–privacy paradox (Cloarec et al., 2022), implying that the effectiveness of personalization depends on maintaining trust and transparency.

The significant effect of artificial intelligence on cultural congruence indicates that AI-driven services can be perceived as culturally appropriate when aligned with local norms. This finding supports earlier research highlighting the role of AI in enhancing service quality and engagement (Ameen et al., 2021), but it also adds a new perspective by showing that AI acceptance is influenced by cultural embeddedness. In line with

**Table 5.** Result of hypothesis testing – direct effects

Source: Data processed, 2025.

Variable	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	t-statistics ((O/STDEV))	p-values
HP → Z	0.360	0.360	0.107	3.353	0.001
AI → Z	0.369	0.372	0.125	2.949	0.003
HP → Y	0.387	0.384	0.066	5.835	0.000
AI → Y	0.183	0.182	0.065	2.818	0.005
Z → Y	0.409	0.410	0.055	7.432	0.000

**Table 6.** Result of hypothesis testing – indirect effects

Source: Data processed, 2025.

Variable	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	t-statistics ((O/STDEV))	p-values
HP → Z → Y	0.147	0.149	0.052	2.846	0.004
AI → Z → Y	0.151	0.151	0.052	2.878	0.004

Alagarsamy and Mehroliya (2023), trust remains a key mechanism; however, this study suggests that trust is partially shaped by cultural alignment rather than purely technological performance.

The direct influence of hyper-personalization on customer loyalty confirms that personalized services enhance customer engagement and relational commitment. This result is consistent with Mendia and Cuautle (2022) and Jain et al. (2021), who emphasize the role of personalization in strengthening long-term relationships. However, this study contributes further by demonstrating that the impact of personalization is amplified when it resonates with local cultural values, indicating that emotional and cultural relevance plays a critical role alongside functional benefits.

Similarly, the positive effect of artificial intelligence on customer loyalty supports previous findings that AI improves service efficiency, responsiveness, and customer satisfaction (Eren, 2021; Ameen et al., 2021). Besides, the findings are consistent with Awad and Ghonim (2025), who highlight the strategic importance of AI in enhancing marketing performance. Nevertheless, this study advances the literature by showing that AI effectiveness is not purely determined by technological capability but also by its ability to align with customers' cultural expectations.

The strong influence of Minangkabau culture on customer loyalty highlights the importance of cultural alignment in shaping customer behavior. This finding supports self-congruity theory (Sirgy et al., 2008) and aligns with prior studies in Islamic banking emphasizing the role of trust and ethical compatibility (Albaity & Rahman, 2021).

However, this study provides a more context-specific contribution by empirically validating the role of the ABS-SBK philosophy as a mechanism that strengthens the legitimacy of financial services and fosters long-term customer commitment.

The mediation results further reinforce the central role of cultural congruence. Minangkabau culture significantly mediates the relationship between hyper-personalization and customer loyalty, indicating that personalization strategies are more effective when culturally aligned. This finding extends previous research (Vishwakarma et al., 2025) by positioning culture not merely as a contextual factor but as an active mechanism that transforms technological inputs into behavioral outcomes.

Similarly, the mediating role of Minangkabau culture in the relationship between artificial intelligence and customer loyalty suggests that the effectiveness of AI is inherently socio-cultural. This finding is consistent with studies emphasizing the importance of trust and perceived legitimacy in AI adoption (Lappeman et al., 2023; Vuković et al., 2025). However, this study advances the discussion by demonstrating that cultural congruence serves as a critical pathway through which AI influences customer loyalty.

Overall, these findings highlight that the integration of hyper-personalization and artificial intelligence in Islamic banking should not be approached solely from a technological perspective. Instead, their effectiveness depends on the extent to which they are aligned with local cultural values, which act as a key mechanism in shaping customer perceptions and loyalty.

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## CONCLUSION

This study examines the effect of hyper-personalization and artificial intelligence on customer loyalty through the mediating role of Minangkabau cultural congruence (ABS-SBK) in Islamic banking in Padang City.

The findings reveal that hyper-personalization and artificial intelligence have significant direct and indirect effects on customer loyalty. Minangkabau cultural congruence plays a crucial mediating role, indicating that the effectiveness of technology-driven banking services is strongly influenced by their alignment with local cultural and religious values. These results suggest that technological advancement alone is insufficient to foster sustainable customer loyalty without cultural integration.

From a practical perspective, the findings imply that Islamic banks should not only invest in advanced digital technologies but also ensure that their services reflect culturally embedded values such as trust, fairness, and ethical responsibility. Integrating cultural elements into digital strategies can enhance customer trust, emotional attachment, and long-term relational commitment.

This study contributes to the literature by empirically demonstrating that cultural congruence functions as a key mechanism linking hyper-personalization and artificial intelligence to customer loyalty. Specifically, it is among the first studies to integrate these variables within a single mediation framework in the context of Islamic banking and Minangkabau culture.

Despite these contributions, several limitations should be acknowledged. This study focuses on Islamic banking customers in Padang City and employs a cross-sectional design, which may limit the generalizability of the findings. Future research is encouraged to examine different cultural settings, apply longitudinal approaches, and incorporate additional variables such as trust, perceived value, or digital literacy to provide a more comprehensive understanding of customer behavior in digital banking.

## AUTHOR CONTRIBUTIONS

Conceptualization: Susriyanti, Fitri Yeni.

Data curation: Susriyanti, Fitri Yeni.

Formal analysis: Susriyanti, Fitri Yeni.

Funding acquisition: Susriyanti, Fitri Yeni.

Investigation: Susriyanti, Fitri Yeni.

Methodology: Susriyanti, Fitri Yeni.

Project administration: Susriyanti, Fitri Yeni.

Resources: Fitri Yeni.

Software: Fitri Yeni.

Supervision: Fitri Yeni.

Validation: Fitri Yeni.

Visualization: Fitri Yeni.

Writing – original draft: Fitri Yeni.

Writing – review & editing: Fitri Yeni.

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