Multidisciplinary Output Research For Actual and International Issue (MORFAI Journal) ISSN (e): 2808-6635
Volumes 6 No. 2 (2026)

MODELING DIGITAL ADOPTION IN THE HALAL SECTOR: A UTAUT-BASED QUANTITATIVE STUDY OF MSMES IN EAST KALIMANTAN

Tikawati[1], Siti Qomariah[2]
Faculty of Economics and Islamic Business UIN Sultan Aji Muhammad Idris Samarinda, Indonesia
Ilmu Komputer UIN Sultan Aji Muhammad Idris Samarinda, Indonesia
E-mail: tikawati@uinsi.ac.id[1], siti.qomariah@uinsi.ac.id[2]

Received	: 01 October 2025	Published	: 31 December 2025
Revised	: 10 October 2025	DOI	: https://doi.org/ 10.54443/morfai.v6i2.4894
Accepted	: 09 December 2025	Publish Link	: https://radjapublika.com/index.php/MORFAI/article/view/4894

Abstract

Objective: This study aims to examine the factors influencing the adoption of digital marketing among halal MSMEs in East Kalimantan using the UTAUT framework, by testing hypotheses H1–H8: the effects of performance expectancy (PE), effort expectancy (EE), and social influence (SI) on behavioral intention (BI); the effect of personal innovativeness (PI) on BI; the effect of BI on use behavior (UB); and the moderating role of PI on the relationships between PE→BI, EE→BI, and SI→BI. **Methods:** This study employed a quantitative survey approach using primary data collected through questionnaires from 100 halal MSME actors in East Kalimantan, selected using non-probability purposive sampling with the following criteria: marketing halal products, domiciled in East Kalimantan, and having used at least one digital marketing channel. Respondents were predominantly female (84%), aged 31–50 years, and business owners (87%). The latent variables measured included PE (2 indicators), EE (3), SI (2), PI (2), BI (3), and UB (1). Data were analyzed using PLS-SEM with bootstrapping procedures and one-tailed significance testing ($\alpha = 0.05$). **Results:** The findings indicate that the intention to use digital marketing among halal MSMEs is more strongly shaped by social influence and individual innovativeness than by perceived performance benefits or perceived ease of use. The formed intention is consistently associated with actual digital marketing usage behavior. In addition, personal innovativeness was found to moderate the effects of perceived usefulness and perceived ease of use on intention, but did not moderate the influence of social factors on intention. This pattern suggests that digital marketing adoption decisions among halal MSMEs in the study area are primarily driven by social dynamics and the innovative disposition of business owners, while usefulness and ease of use are not always direct determinants when business actors already have initial exposure to digital channels. **Implications:** The findings emphasize the importance of strengthening social ecosystems (communities, networks, and customer encouragement) and enhancing the personal innovativeness of business owners to reinforce intention and promote actual use of digital marketing among halal MSMEs. Practical recommendations include community-based mentoring, digital literacy programs emphasizing guided experimentation, and training in performance measurement. Future studies are encouraged to expand sample size and diversity, enrich the measurement of use behavior with multi-item or behavioral indicators, and incorporate implementation determinants (e.g., facility support and digital capabilities) to improve explanatory power.

Keywords: Digital marketing; halal MSMEs; UTAUT; behavioral intention; use behavior; social influence; personal innovativeness.

INTRODUCTION

Digital transformation has shifted MSME marketing practices from one-way communication toward the orchestration of measurable digital channels (such as social media, search engines, and marketplaces), making the adoption of digital marketing increasingly viewed as a determinant of business performance and competitiveness in many countries (Sharabati et al., 2024). In the Indonesian context, the digitalization agenda for MSMEs continues to be positioned as a driver of productivity and business resilience; however, the literature indicates that digital adoption is often non-linear because it is influenced by resource readiness, skills, and supporting ecosystems (Purnomo et al., 2024). National survey findings involving thousands of MSME actors also confirm that digital adoption is shaped by business characteristics and the operational environment, rendering the generalization that "MSMEs can easily go digital" insufficient to explain the variation in adoption behavior observed in practice

(Dwiputri et al., 2025). Although the benefits of digital marketing for MSMEs have been widely discussed, a persistent implementation gap remains, particularly in terms of limited digital literacy, access to infrastructure and services, and organizational capacity to manage digital channels consistently. Empirical evidence shows that implementation barriers are often associated with uneven digital capabilities and literacy, which ultimately constrain MSMEs from optimally extracting business value from digital marketing activities (Bahtiar et al., 2025; Surti, 2025). Literature reviews on digital marketing trends and challenges among Indonesian MSMEs further indicate that the issue lies not merely in the "availability of platforms," but in the "ability to utilize platforms" for value creation, customer engagement, and strategic sustainability (Ekaputra et al., 2024).

The urgency of this research is further strengthened when the issue of digital marketing adoption is situated within the halal MSME sector, as business practices in this segment are required not only to be market-effective but also to remain consistent with sharia compliance and the strengthening of the halal economic ecosystem. Several studies highlight that halal orientation and government policies/support shape the dynamics of social media utilization and MSME performance, suggesting that the relationship between digital adoption and performance must be understood within specific value and institutional configurations (Azwar & Bin Sarip, 2024; Bernando & Ray, 2025). At the regional level, empirical evidence from halal MSMEs in East Kalimantan indicates that digital marketing is associated with enhanced competitiveness; however, variations in usage intensity and channel utilization leave room for further analysis of the factors that drive or hinder adoption intention and usage behavior (Norvadewi & Zaroni, 2024).

To theoretically explain these variations, technology adoption research commonly positions behavioral intention as a proximal mechanism mediating perceptual factors and actual usage behavior, with PLS-SEM frequently applied to test the strength of relationships among constructs (Camilleri, 2024). Within technology acceptance theory, the UTAUT/UTAUT2 framework consistently identifies performance expectancy, effort expectancy, and social influence as key predictors of intention to use technology, making it relevant for examining digital marketing adoption as a form of marketing technology. Recent studies applying core UTAUT constructs across digital contexts further confirm that these variables remain influential determinants of intention—albeit with varying magnitudes—when users assess benefits, ease of use, and social pressures in their environment (Merz et al., 2025; Padma Kiran & Vedala, 2025).

However, technology acceptance literature also emphasizes that individual characteristics can modify the strength of UTAUT relationships, indicating the need for dispositional variables to explain heterogeneous responses among MSMEs toward digital opportunities and complexity (Alkawsi et al., 2021). Personal innovativeness has been widely discussed as a driver of willingness to try new technologies and as a moderator that may strengthen or weaken the relationship between perceived usefulness/ease of use and intention to use technology (Herzallah et al., 2025). Recent evidence further suggests that the moderating effect of personal innovativeness is not universally significant across all paths, making its empirical testing important to avoid assuming homogeneity in user behavior and to capture the conditions under which innovativeness truly matters (Hoang & Ngo, 2025).

Based on this need for more precise explanation, this study is positioned as a quantitative investigation examining digital marketing adoption through the UTAUT framework, extended with personal innovativeness, in line with prior studies demonstrating that UTAUT-based digital marketing adoption models can be empirically tested among Indonesian MSMEs using survey and structural modeling approaches (Renaningtias et al., 2022). The relevance of this approach is further supported by studies of Indonesian MSMEs that apply core technology acceptance constructs to analyze social media adoption for marketing purposes, confirming the contextual suitability of PE, EE, and SI in explaining digital adoption decisions (Bin-Nashwan et al., 2021; Bindas et al., 2025). Accordingly, this study aims to examine the factors influencing digital marketing adoption among halal MSMEs in East Kalimantan using the UTAUT framework, with the following research hypotheses:

1. PE has a significant positive effect on BI;
2. EE has a significant positive effect on BI;
3. SI has a significant positive effect on BI;
4. PI has a significant positive effect on BI;
5. BI has a significant positive effect on UB;
6. PI moderates the relationship between PE and BI;
7. PI moderates the relationship between EE and BI;
8. PI moderates the relationship between SI and BI.

The hypotheses were tested using primary data collected through questionnaires from 100 halal MSME owners in East Kalimantan, selected based on purposive sampling criteria defined in the research design.

The first scientific contribution of this study lies in strengthening the empirical foundation of digital marketing integration within the halal MSME context, as systematic studies on halal business practices (including the implications of halal certification) emphasize the need for more operational strategies that enable MSMEs to convert halal compliance into sustainable market value (M. Topit Hidayat & Sri Rahma Witta, 2024). Furthermore, existing literature on digital marketing adoption among halal-oriented MSMEs highlights both opportunities and challenges, making research focused on developing regions such as East Kalimantan essential for enriching cross-contextual understanding of digital adoption determinants within the halal ecosystem (Suleiman et al., 2025).

The second contribution lies in the model's novelty through positioning personal innovativeness as both a predictor and a moderator within the core UTAUT relationships influencing intention. This is particularly relevant for halal MSMEs that often face resource constraints and must adapt rapidly to technological change and regulatory or halal compliance requirements (Dawam et al., 2023). From a practical perspective, strengthening intention and actual digital marketing use is strategically important, as empirical MSME studies indicate that digital marketing adoption contributes to sustainable growth, including performance improvement. Consequently, identifying the drivers and barriers of adoption provides a foundation for more targeted intervention strategies. From a policy and capacity-building standpoint, the literature also emphasizes that digital literacy and capability development are prerequisites for MSME transformation, and the findings of this study are expected to inform the design of digital competency programs tailored to the characteristics of halal MSME actors in regional contexts (Dianta et al., 2025; Wulandari et al., 2024).

LITERATURE REVIEW

The Unified Theory of Acceptance and Use of Technology (UTAUT) is positioned as an integrative framework for explaining technology acceptance and use through core constructs such as performance expectancy, effort expectancy, and social influence, which influence behavioral intention as a proxy for psychological readiness prior to actual usage behavior. This framework is relevant for studies of digital marketing adoption among MSMEs, as recent literature emphasizes that psychosocial barriers and perceptions of technological value and usefulness are key drivers shaping intention and adoption decisions, particularly when technology is positioned as a tool to enhance work effectiveness and marketing decision quality (Lee et al., 2025; Xue et al., 2024).

Within the digital marketing research stream, empirical organizational-level studies demonstrate that the implementation of digital marketing strategies (e.g., social media, SEO, online advertising, and customer engagement) is associated with improved business performance. Consequently, digital marketing adoption is viewed not merely as a communication choice but as a strategic capability influencing business outcomes (Sharabati et al., 2024). In the Indonesian MSME context, quantitative studies modeling digital marketing adoption using UTAUT-family frameworks (e.g., UTAUT3) show that technology acceptance constructs can effectively explain the psychological and technological factors shaping intention and the propensity to use digital marketing tools among MSME actors (Renaningtias et al., 2022).

Previous studies also indicate a trend toward extending UTAUT to accommodate MSME-specific conditions, such as incorporating competitive pressure as an external contextual factor that strengthens digital adoption motivation. This suggests that intention to adopt technology is influenced not only by perceived usefulness and ease of use, but also by competitive dynamics faced by MSMEs (Kwarteng et al., 2024). Furthermore, research on social media utilization among MSMEs demonstrates that contextual variables—such as complexity, cost, and resource availability—also explain variation in digital channel usage intensity, leading many studies to integrate adoption constructs with environmental and internal capability factors (Fu et al., 2024).

Research on digital marketing adoption among halal-product MSMEs further reveals that much of the existing literature remains descriptive, focusing on opportunity–challenge mapping or cross-country comparisons rather than rigorous causal testing of technology acceptance constructs. As a result, opportunities remain to strengthen quantitative evidence based on behavioral models (Suleiman et al., 2025). At the same time, studies examining digital marketing relevance for halal MSMEs highlight the importance of aligning digital strategies with halal market characteristics, yet often fail to explain the psychological mechanisms underlying why some halal MSMEs exhibit high adoption intention while others do not (Ardiansyah et al., 2022). Another research gap emerges at the individual level, as several studies suggest that personal innovativeness influences technology acceptance through individuals' propensity to try new technologies. However, empirical evidence on how personal innovativeness operates as a contingent factor within adoption models remains inconsistent across contexts and technologies. Recent studies reinforce that personal innovativeness may moderate the relationship between adoption determinants and behavioral intention, indicating the importance of explicitly testing moderation effects to avoid

assuming homogeneity among users (Dao & Anh, 2024; Hoang & Ngo, 2025). Applications of UTAUT in halal-related information systems further demonstrate that the framework is suitable for analyzing adoption behavior within compliance-driven business environments, supporting its relevance for examining digital marketing practices among halal MSMEs (Wagiyem et al., 2025). In the Indonesian MSME context, studies applying UTAUT/UTAUT2 to digital adoption—particularly social commerce—show that core acceptance constructs remain informative, yet often require contextual adaptation to reflect local business characteristics and environmental conditions (Arista et al., 2023). Accordingly, this study addresses these gaps by quantitatively testing the relationships between PE, EE, and SI on BI, as well as BI on UB, while incorporating personal innovativeness as both a predictor and moderator among halal MSMEs in East Kalimantan.

Contemporary UTAUT studies increasingly employ SEM-PLS and heterogeneity testing (e.g., multi-group analysis) to capture variations in path strengths across user segments, reinforcing the suitability of PLS-SEM for predictive modeling and theory development in digital application contexts. Systematic reviews of UTAUT/UTAUT2 research further confirm the dominance of quantitative survey-based approaches and the growing tendency to enrich models with mediating and moderating variables to enhance explanatory power for behavioral intention and use behavior across technological domains (Akbar et al., 2023; Bashir et al., 2023). Consistent with technology acceptance theory, behavioral intention is widely recognized as a key predictor of actual use behavior, making the BI–UB relationship a logical foundation for assessing whether intention translates into real usage (Izkair & Lakulu, 2021). In line with digital adoption studies among MSMEs that emphasize the role of perceived usefulness and ease of use, the conceptual synthesis of this study positions PE, EE, and SI as determinants of BI, with personal innovativeness acting as both a direct predictor and a moderator, prior to BI influencing actual digital marketing use (Tenriyola et al., 2025).

METHOD

This study employs a quantitative survey strategy with an explanatory design to examine causal relationships among constructs within the Unified Theory of Acceptance and Use of Technology (UTAUT) framework, namely Performance Expectancy (PE), Effort Expectancy (EE), and Social Influence (SI) as predictors of Behavioral Intention (BI), and BI as a predictor of Use Behavior (UB). Personal Innovativeness (PI) is positioned both as a direct predictor of BI and as a moderating variable in the relationships between PE and BI, EE and BI, and SI and BI. The use of a latent variable structural modeling approach is consistent with technology adoption research practices that emphasize simultaneous testing of measurement and structural models, including both direct and moderating effects within a predictive framework (Shela et al., 2023).

The data source for this study consists of primary data collected through questionnaires administered to halal MSME actors in East Kalimantan. The unit of analysis is halal MSMEs, represented by respondents who are knowledgeable about and involved in marketing decision-making. The sample comprised 100 respondents, of whom 84% were female and 16% male; the majority were aged 31–50 years, and 87% were business owners. All data were cross-sectional and used to model intention and actual digital marketing usage behavior within the context of halal MSMEs in East Kalimantan, without extending the unit of analysis beyond the defined population. Data were collected using a structured questionnaire. All constructs were modeled as reflective latent variables, measured using BI (3 indicators), EE (3 indicators), PE (2 indicators), PI (2 indicators), SI (2 indicators), and UB (1 indicator), using a five-point Likert scale.

The inclusion criteria for respondents were as follows: (1) MSME actors marketing halal products, (2) domiciled in East Kalimantan, and (3) having used at least one digital marketing channel. Exclusion criteria were applied to respondents or data entries that did not meet these conditions or contained incomplete or unusable responses. These criteria are consistent with the principles of purposive sampling in quantitative research when the study targets a population with specific characteristics directly relevant to the analytical objectives (Memon et al., 2025). The sampling technique employed was non-probability sampling using a purposive approach, whereby respondents were selected based on their suitability and relevance to the research criteria rather than random selection. This approach is justified given that the target population comprised halal MSME actors who had already been exposed to digital marketing practices. While purposive sampling is appropriate for theory testing within a specific group, its methodological implications—particularly regarding limitations in generalizability—are explicitly acknowledged (Ahmed, 2024). Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM), as the research model is predictive in nature and involves multiple latent constructs as well as moderation effects through interaction terms. The analysis followed a two-stage procedure: (1) evaluation of the measurement model (assessing indicator reliability and convergent and discriminant validity) and (2) evaluation of

the structural model to test the significance and direction of hypothesized relationships (H1–H8). This analytical procedure aligns with recommended PLS-SEM reporting practices, which emphasize the separation of measurement quality assessment from structural inference to ensure that causal conclusions are drawn only from valid and reliable constructs (Kante & Michel, 2023). Parameter significance was assessed using the bootstrapping procedure. Moderation effects were tested by constructing interaction terms for each hypothesized moderating relationship (PE×PI, EE×PI, and SI×PI) within the PLS-SEM model. Reporting of model quality criteria and analytical procedures—including data suitability for PLS-SEM, discriminant validity assessment (e.g., HTMT), and documentation of analytical steps—follows established methodological recommendations to ensure transparency and replicability of results (Ringle et al., 2023).

Direct Effect Hypotheses

These hypotheses test the direct causal relationships among the constructs in the UTAUT-based model:

H1: Performance Expectancy (PE) has a positive effect on Behavioral Intention (BI).
H2: Effort Expectancy (EE) has a positive effect on Behavioral Intention (BI).
H3: Social Influence (SI) has a positive effect on Behavioral Intention (BI).
H4: Personal Innovativeness (PI) has a positive effect on Behavioral Intention (BI).
H5: Behavioral Intention (BI) has a positive effect on Use Behavior (UB).

Moderating Effect Hypotheses

These hypotheses examine whether Personal Innovativeness (PI) strengthens or weakens the relationships between the independent variables and behavioral intention:

H6: Personal Innovativeness (PI) moderates the relationship between Performance Expectancy (PE) and Behavioral Intention (BI).
H7: Personal Innovativeness (PI) moderates the relationship between Effort Expectancy (EE) and Behavioral Intention (BI).
H8: Personal Innovativeness (PI) moderates the relationship between Social Influence (SI) and Behavioral Intention (BI).

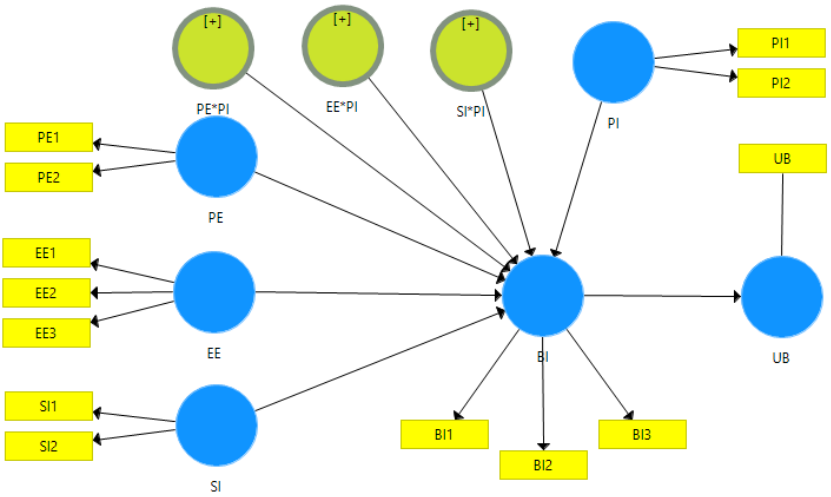

Image: Conceptual Framework

RESULTS AND DISCUSSION

Based on data from 100 halal MSME actors in East Kalimantan (predominantly female; dominant age range 31–50 years; mostly business owners), the analysis employed the SEM-PLS approach to examine causal relationships among UTAUT constructs (PE, EE, SI) on Behavioral Intention (BI), the effect of Personal Innovativeness (PI) both as a direct predictor and as a moderator, as well as the role of BI in driving Use Behavior (UB). PLS-SEM is commonly applied when the primary objective of research is prediction and explanation of variance in endogenous constructs, particularly in technology adoption studies involving latent variables and interaction effects (Shela et al., 2023).

Measurement Model Evaluation (Outer Model)

Table 1. Outer Loadings of Measurement Items

	BI	EE	EE*PI	PE	PE*PI	PI	SI	SI*PI	UB
BI1	0.701								
BI2	0.832								
BI3	0.847								
EE * PI			1.026						
EE1		0.845							
EE2		0.791							
EE3		0.810							
PE * PI					0.923				
PE1				0.929					
PE2				0.897					
PI1						0.936			
PI2						0.844			
SI * PI								1.046	
SI1							0.907		
SI2							0.861		
UB									1.000

The outer loading values of reflective indicators for the core constructs demonstrate adequate measurement quality: BI1 = 0.701; BI2 = 0.832; BI3 = 0.847; EE1 = 0.845; EE2 = 0.791; EE3 = 0.810; PE1 = 0.929; PE2 = 0.897; PI1 = 0.936; PI2 = 0.844; SI1 = 0.907; SI2 = 0.861; UB = 1.000. According to PLS-SEM guidelines, indicator loadings are recommended to exceed approximately 0.708 to demonstrate sufficient contribution to their respective constructs. Most indicators in this study meet or exceed this threshold, supporting convergent validity, including BI1, which is very close to the recommended cutoff (Pereira et al., 2024).

Structural Model Evaluation (Inner Model)

Table 2. Coefficient of Determination (R^2)

	R Square	Adjusted R Square
Behavioral Intention	0.643	0.616
Use Behavior	0.361	0.354

The structural model results indicate R^2 values of 0.643 for BI (Adjusted R^2 = 0.616) and 0.361 for UB (Adjusted R^2 = 0.354). Conceptually, R^2 reflects the proportion of variance in endogenous constructs explained by exogenous variables in the model. In UTAUT-based studies, R^2 for behavioral intention is often used as an indicator of the model's predictive strength in explaining technology acceptance within a given empirical context (Chen et al., 2023).

Path Coefficients

The estimated path coefficients toward BI were as follows: PE → BI = 0.140, EE → BI = 0.014, SI → BI = 0.458, and PI → BI = 0.374. The path from BI to actual use behavior was BI → UB = 0.600. For moderation effects, the interaction coefficients were PE × PI → BI = −0.205, EE × PI → BI = 0.221, and SI × PI → BI = 0.066. These coefficients indicate the direction and magnitude of effects, while statistical significance was determined through bootstrapping in the hypothesis testing stage.

Discussion of Hypothesis Testing Results

Table 3. Path Coefficients and Hypothesis Testing Results

	Sampel Asli (O)	Rata-rata Sampel (M)	Standar Deviasi	T Statistik	P Values
BI --> UB	0.600	0.606	0.061	9.825	**0.000**
EE --> BI	0.014	0.026	0.083	0.163	**0.871**
EE*PI --> BI	0.221	0.233	0.090	2.466	**0.014**
PE --> BI	0.140	0.130	0.100	1.402	**0.161**
PE*PI --> BI	-0.205	-0.197	0.117	1.744	**0.082**
PI --> BI	0.374	0.369	0.091	4.129	**0.000**
SI --> BI	0.458	0.469	0.097	4.727	**0.000**
SI*PI --> BI	0.066	0.049	0.094	0.703	**0.482**

H1 (PE → BI): Rejected

Performance expectancy did not significantly influence behavioral intention to use digital marketing. In the UTAUT framework, PE is generally considered a key determinant of adoption intention because users tend to adopt technologies perceived as improving performance (Jiang & Zhang, 2025). However, the nonsignificant effect in this study suggests that perceived performance benefits of digital marketing have not yet been internalized as a clear value proposition among halal MSMEs in East Kalimantan. This may reflect the fact that sales or efficiency gains are not directly attributed to digital channels by business owners. Similar findings have been reported in certain UTAUT-based studies, indicating that perceived usefulness may be overshadowed by social or psychological factors in specific contexts (Reva Ngulya Savi'ah et al., 2024).

H2 (EE → BI): Rejected

Effort expectancy did not significantly influence behavioral intention. Although EE theoretically reflects perceived ease of use and is expected to facilitate adoption, its insignificance here suggests that ease of use is no longer a determining factor for respondents. This may be because respondents had already used at least one digital marketing channel, meaning that the initial learning barrier had been overcome or compensated for through peer support or community assistance. Empirical studies across contexts similarly report that EE may lose explanatory power once users pass the trial stage of technology adoption (Kaya & Adıgüzel, 2025).

H3 (SI → BI): Supported

Social influence had a positive and significant effect on behavioral intention. This finding reinforces the argument that social norms, peer recommendations, and environmental expectations strongly shape technology adoption decisions among MSMEs. In digital marketing ecosystems, where practices are often shaped by trends, peer benchmarking, and customer expectations, social influence becomes a dominant driver of adoption (Yi et al., 2025). For halal MSMEs, social networks—including family, business communities, and customers—serve as legitimacy mechanisms that encourage digital engagement. This aligns with prior studies indicating that halal orientation and social endorsement jointly reinforce digital marketing adoption (Bernando & Ray, 2025). While some studies report insignificant SI effects in other contexts, the present findings highlight the socially embedded nature of adoption decisions among halal MSMEs in East Kalimantan (Alwadain et al., 2024).

H4 (PI → BI): Supported

Personal innovativeness significantly and positively influenced behavioral intention. PI reflects an individual's willingness to experiment with new technologies and tolerate uncertainty, which is particularly relevant in MSMEs where adoption decisions are often owner-driven. Owners with higher innovativeness are more inclined to test digital platforms, experiment with content, and invest time in learning, thereby strengthening their intention to use digital marketing. This finding is consistent with prior research identifying PI as a key psychological driver of digital adoption (Herzallah et al., 2025).

H5 (BI → UB): Supported

Behavioral intention significantly influenced actual use behavior. This finding aligns with the core assumption of UTAUT and related acceptance models that intention is the most proximal predictor of actual technology use (Huang, 2023). In the MSME context, once intention is formed, digital marketing activities can be easily operationalized through posting, promotion, and customer engagement. Prior research also shows that digital

marketing adoption is closely associated with improved business performance, reinforcing the strategic relevance of strengthening intention (Bruce et al., 2023).

H6 (PE × PI → BI): Supported

Personal innovativeness significantly moderated the relationship between performance expectancy and behavioral intention. Conceptually, this means that perceived performance benefits translate into intention more strongly among individuals with higher innovativeness. Interestingly, the interaction coefficient was negative (−0.205), indicating that at higher levels of PI, intention may form even when perceived performance benefits are not particularly strong. This suggests that highly innovative individuals may adopt digital marketing out of exploratory motivation rather than purely instrumental considerations. Similar moderation patterns have been reported in studies emphasizing the role of innovativeness in technology experimentation (Hoang & Ngo, 2025).

H7 (EE × PI → BI): Supported

Personal innovativeness also moderated the effect of effort expectancy on behavioral intention. This finding supports the view that perceived ease of use is contingent upon individual characteristics. Innovative individuals are more likely to tolerate complexity and overcome usability barriers, reducing the importance of ease of use as a determinant of intention. This aligns with studies showing that individual traits can weaken or reshape the influence of classical UTAUT predictors in rapidly digitalizing contexts (Nikolopoulos & Likothanassis, 2025).

H8 (SI × PI → BI): Rejected

Personal innovativeness did not moderate the relationship between social influence and behavioral intention. This suggests that social pressure or encouragement operates uniformly across individuals, regardless of their level of innovativeness. In the halal MSME context, social expectations—such as customer demand, peer practices, and community norms—function as collective forces that override individual differences. Similar findings have been reported in studies where social influence acts as a dominant and uniform driver of adoption (Hernando et al., 2025). For halal MSMEs, compliance with social and market expectations may be perceived as obligatory rather than discretionary (Suleiman et al., 2025).

Implications of the Structural Model

The dominance of Social Influence and Personal Innovativeness as predictors of Behavioral Intention, coupled with the strong BI → UB relationship, indicates that strategies to enhance digital marketing adoption among halal MSMEs in East Kalimantan should prioritize:

Strengthening social ecosystems (MSME communities, peer networks, customer encouragement, and local role models), and Enhancing individual innovativeness through mindset development, experimentation-oriented training, and performance literacy.These findings suggest that adoption is driven more by social–behavioral dynamics and learning orientation than by abstract perceptions of usefulness or ease of use. This aligns with broader evidence that MSME digital transformation is shaped by experiential learning and social embeddedness rather than purely technological rationality (Tenriyola et al., 2025).

Moreover, the varying significance of PE and EE across studies reinforces the argument that classical UTAUT determinants are context-dependent. Incorporating individual-level variables such as personal innovativeness enhances model sensitivity and explanatory power when analyzing heterogeneous MSME populations (Y. Kim et al., 2024). Finally, the strong BI–UB relationship confirms the role of behavioral intention as a critical mechanism translating perceptions into actual digital marketing practices, highlighting the importance of interventions that strengthen intention through social support and innovation-oriented capacity building (Meiranto et al., 2024).

CONCLUSION

This study examines digital marketing adoption among halal MSMEs in East Kalimantan using an extended UTAUT framework that incorporates personal innovativeness (PI) as both a direct predictor of behavioral intention (BI) and a moderating variable, while also assessing how BI drives actual use behavior (UB). Structurally, the model demonstrates strong explanatory power for behavioral intention (R^2 BI = 0.643) and moderate explanatory power for use behavior (R^2 UB = 0.361), indicating that the selected UTAUT constructs and the inclusion of PI are effective in explaining intention, although actual usage behavior remains influenced by additional factors beyond the model. Hypothesis testing using a one-tailed approach confirms that social influence and personal innovativeness are the primary determinants of intention to adopt digital marketing, while the relationship between BI and UB is strong and significant. These findings indicate that, within the context of halal MSMEs in East Kalimantan, adoption intention is shaped more by social pressures and expectations (e.g., customers, business communities, and local networks) and

by the innovative disposition of business owners than by perceived performance benefits (PE) or perceived ease of use (EE), both of which were not significant as direct predictors. At the model extension level, personal innovativeness significantly moderates the relationships between PE and BI as well as between EE and BI (based on one-tailed testing), whereas moderation on the SI–BI relationship is not supported. Substantively, this suggests that the innovative character of business owners alters how perceived usefulness and ease of use are translated into intention, but does not substantially weaken or strengthen the influence of social pressure, which appears to operate uniformly across respondents. The scientific contribution of this study lies in providing empirical evidence from a regional halal MSME context (East Kalimantan) that social factors and individual innovativeness play a central role in digital marketing adoption. The findings also demonstrate that extending the UTAUT model by incorporating personal innovativeness as both a predictor and a moderator enhances its explanatory capability by capturing heterogeneity among MSME actors in processing technological benefits and ease of use. Accordingly, this study advances the literature by showing that within halal MSME ecosystems, technology acceptance mechanisms are not necessarily dominated by performance expectancy or effort expectancy, but may instead be more strongly driven by social norms, social support, and the innovative disposition of business owners.

RECOMMENDATIONS AND IMPLICATIONS

From a practical perspective, the findings suggest that strategies to accelerate digital marketing adoption among halal MSMEs in East Kalimantan should emphasize the following. First, strengthening the social ecosystem: this includes establishing halal MSME learning communities, implementing network-based mentoring programs, providing local role models, and designing interventions that leverage customer and community recommendations to enhance the legitimacy and acceptance of digital marketing channels. Second, strengthening the personal innovativeness of business owners: training programs should not be limited to technical or operational skills, but should also cultivate an experimental mindset, encourage willingness to try new digital features and channels, and develop the ability to evaluate digital campaign outcomes in a simple and practical manner. Such efforts enable business owners to translate perceptions of usefulness and ease of use into sustained intention and actual usage. Given that performance expectancy and effort expectancy were not directly significant, digital literacy programs that merely emphasize that "digital marketing is useful and easy" are likely to be less effective if they are not accompanied by strong social mechanisms (e.g., peer support and community engagement) and the development of innovative dispositions (mindset and practical experimentation skills).

For future research, several directions are recommended. First, replication studies using more representative sampling designs or broader samples (across districts/cities and halal subsectors) are needed to test the stability of the effects of social influence and personal innovativeness and to enhance the generalizability of findings across the wider halal MSME population. Second, future studies should incorporate additional constructs that may better explain actual use behavior, such as facilitating conditions, digital capability, resource constraints, policy support, or infrastructure quality, in order to improve the explanatory power of the model and provide more actionable policy insights. Third, richer measurements of use behavior are recommended, including multi-item scales or objective behavioral indicators (e.g., frequency of use, diversity of digital channels, advertising intensity, or customer engagement metrics), to allow more accurate testing of the BI–UB relationship. Fourth, future research may explore mediation effects or apply multi-group analysis (e.g., by age, gender, business tenure, or level of digital experience) to better understand heterogeneity among halal MSME actors and to identify segments requiring different intervention strategies. Finally, longitudinal research designs should be considered to examine how intentions and usage behaviors evolve over time, particularly following training interventions, market changes, or shifts in regulatory and halal ecosystem environments.

REFERENCES

Ahmed, S. K. (2024). How to choose a sampling technique and determine sample size for research: A simplified guide for researchers. Oral Oncology Reports, 12(September), 100662. https://doi.org/10.1016/j.oor.2024.100662

Akbar, G. G., Muchtar, Aji Abdul Wahid, Ikeu Kania, Annisa Deliana Putri, & Dini Turipanam Alamanda. (2023). Applying UTAUT Model to Understand Use of Behavior Health Applications User in Indonesia During the COVID-19. Jurnal Ilmu Administrasi: Media Pengembangan Ilmu Dan Praktek Administrasi, 20(1), 29–45. https://doi.org/10.31113/jia.v20i1.900

Alkawsi, G., Ali, N., & Baashar, Y. (2021). The moderating role of personal innovativeness and users experience in accepting the smart meter technology. Applied Sciences (Switzerland), 11(8). https://doi.org/10.3390/app11083297

Alwadain, A., Fati, S. M., Ali, K., & Ali, R. F. (2024). From theory to practice: An integrated TTF-UTAUT study on electric vehicle adoption behavior. PLoS ONE, 19(3 March), 1–19. https://doi.org/10.1371/journal.pone.0297890

Ardiansyah, M. R., Suaidah, & Batubara, M. (2022). Muslim Jafar 1 , Devy Aisyah 2 , Amrina 3. International Journal of Economics, Business and Accounting Research (IJEBAR), 2338(4), 13–34.

Arista, A., Ernawati, I., Ho Purabaya, R., & Fadzli Hasan Syed Abdullah, E. (2023). The Extension of the UTAUT2 Model: A Case Study of Indonesian SMEs Acceptance of Social Commerce. International Journal On Informatics Visualization, 7(4), 2404–2414. www.joiv.org/index.php/joiv

Azwar, A., & Bin Sarip, M. M. (2024). SME support for halal industry and sharia economy in Indonesia: SWOT analysis. Asian Journal of Islamic Management (AJIM), 6(1), 35–49. https://doi.org/10.20885/ajim.vol6.iss1.art4

Bahtiar, H., Rabbany, L. R., Bele, Y. F., Husna, M., & Matulessy, G. S. (2025). Digital transformation towards sustainability: Challenges and opportunities for Indonesian MSMEs. Jurnal Ekonomi Dan Bisnis, 28(1), 131–150. https://doi.org/10.24914/jeb.v28i1.13935

Bashir, M. A., Imtiaz, S., Ullah, H., & Hameed, W. U. (2023). Systematic Review of Studies Using Utaut and Utaut2 to Explore the Factors Affecting Adoption of Mobile Banking. Sustainable Business and Society in Emerging Economies, 5(3), 267–278. https://doi.org/10.26710/sbsee.v5i3.2735

Bernando, F. O., & Ray, E. L. (2025). Social Media Adoption, Halal Orientation, and Government Policy: Impacts on Business Performance of Food and Beverage SMEs in Indonesia. Society, 13(1), 504–519. https://doi.org/10.33019/society.v13i1.821

Bin-Nashwan, S. A., Abdul-Jabbar, H., Dziegielewski, S. F., & Aziz, S. A. (2021). Moderating Effect of Perceived Behavioral Control on Islamic Tax (Zakah) Compliance Behavior among Businessmen in Yemen. Journal of Social Service Research, 47(2), 292–302. https://doi.org/10.1080/01488376.2020.1767260

Bindas, A., Suharno, S., Lusiana, L., & Sari, S. (2025). Adopsi Media Sosial dalam Strategi Pemasaran UKM Radiant Buket Pendekatan Model UTAUT Social Media Adoption in the Marketing Strategy of Radiant Buket. 14, 2004–2017.

Bruce, E., Shurong, Z., Ying, D., Yaqi, M., Amoah, J., & Egala, S. B. (2023). The Effect of Digital Marketing Adoption on SMEs Sustainable Growth : Empirical Evidence from Ghana. 1–24.

Camilleri, M. A. (2024). Factors affecting performance expectancy and intentions to use ChatGPT: Using SmartPLS to advance an information technology acceptance framework. Technological Forecasting and Social Change, 201(January), 123247. https://doi.org/10.1016/j.techfore.2024.123247

Chen, L., Jia, J., & Wu, C. (2023). Factors influencing the behavioral intention to use contactless financial services in the banking industry: An application and extension of UTAUT model. Frontiers in Psychology, 14(March). https://doi.org/10.3389/fpsyg.2023.1096709

Dao, N. T. B., & Anh, D. N. T. (2024). the Impact of Personal Innovativeness on the Behavioral Intention To Using Tourism Mobile Applications of Generation Z in Ho Chi Minh City, Vietnam. Geojournal of Tourism and Geosites, 55(3), 1186–1197. https://doi.org/10.30892/gtg.55319-1291

Dawam, K., Laela, S. F., Hendrasto, N., Rehman, H. M., & Hasan, M. K. (2023). Determinants of Micro and Small Enterprise's Interest to Participate in Self-Declare Halal Certification. Journal of Digital Marketing and Halal Industry, 5(1), 1–22. https://doi.org/10.21580/jdmhi.2023.5.1.15041

Dianta, I. A., Sinaga, H. R., Wicaksono, J., & Zusrony, E. (2025). The Impact of Digital Marketing Adoption on Sustainable Growth Mediated by Firm Performance: An Empirical Study of SMEs. Jurnal Informatika Ekonomi Bisnis, 7, 811–815. https://doi.org/10.37034/infeb.v7i4.1287

Dwiputri, I. N., Permana, Y. H., & Prastiwi, L. F. (2025). Driving Digital Adoption within Small Business: A Study Case of Indonesia Micro-Small-Medium Enterprises. Jurnal Economia, 21(2), 304–315. https://doi.org/10.21831/economia.v21i2.67494

Ekaputra, A., Sari, R. D., Yuniarsih, Y., & Algunadi, M. (2024). Are Digital Marketing Trends and Challenges Aligned with SDGs?: A Review of Indonesian SMEs. Sinergi International Journal of Economics, 2(2), 50–61. https://doi.org/10.61194/economics.v2i2.242

Fu, C. J., Silalahi, A. D. K., Yang, L. W., & Eunike, I. J. (2024). Advancing SME performance: a novel application of the technological-organizational-environment framework in social media marketing adoption. In Cogent

Business and Management (Vol. 11, Issue 1). https://doi.org/10.1080/23311975.2024.2360509
Hernando, H., Shahzad, S., & Nurmalasari, N. (2025). Technological Factors and Social Media Adoption Among Micro-Enterprises: the Moderating Role of Personal Innovativeness. Jurnal Ekonomi Dan Bisnis Airlangga, 35(1), 49–65. https://doi.org/10.20473/jeba.v35i12025.49-65
Herzallah, F., Abosamaha, A. J., Abu-Siam, Y., Amer, M., Sajjad, U., & Hamid, K. (2025). Determinants of mobile wallet usage among Gen Z: Extending the UTAUT2 model with moderating effects of personal innovativeness and gender. International Journal of Information Management Data Insights, 5(1), 100336. https://doi.org/10.1016/j.jjimei.2025.100336
Hoang, V. H., & Ngo, Q. D. (2025). Embracing the Digital Frontier: Unveiling the Moderating Role of Personal Innovativeness on University Choice Decisions in Vietnam. SAGE Open, 15(1), 1–19. https://doi.org/10.1177/21582440251329600
Huang, T. (2023). Expanding the UTAUT2 framework to determine the drivers of mobile shopping behaviour among older adults. PLoS ONE, 18(12 December), 1–29. https://doi.org/10.1371/journal.pone.0295581
Izkair, A. S., & Lakulu, M. M. (2021). Experience moderator effect on the variables that influence intention to use mobile learning. Bulletin of Electrical Engineering and Informatics, 10(5), 2875–2883. https://doi.org/10.11591/eei.v10i5.3109
Jiang, J., & Zhang, X. (2025). Chinese music teachers value effectiveness, social, and facilitating factors over ease of use in ICT integration: A PLS-SEM study. Plos One, 20(11 November), 1–18. https://doi.org/10.1371/journal.pone.0334186
Kante, M., & Michel, B. (2023). Use of partial least squares structural equation modelling (PLS-SEM) in privacy and disclosure research on social network sites: A systematic review. Computers in Human Behavior Reports, 10(September 2022), 100291. https://doi.org/10.1016/j.chbr.2023.100291
Kaya, M. H., & Adıgüzel, T. (2025). Exploring the acceptance of ChatGPT in higher education: a comprehensive quantitative study of university students and faculty. Frontiers in Education, 10(September), 1–15. https://doi.org/10.3389/feduc.2025.1652292
Kim, B., Nam, H. J., Lee, H., Park, H., & Yoon, J. Y. (2025). Intention to use a health information platform in supportive housing for people with disabilities: An application of the UTAUT model. Plos One, 20(10 October), 1–15. https://doi.org/10.1371/journal.pone.0332072
Kim, Y., Blazquez, V., & Oh, T. (2024). Determinants of Generative AI System Adoption and Usage Behavior in Korean Companies: Applying the UTAUT Model. Behavioral Sciences, 14(11). https://doi.org/10.3390/bs14111035
Kwarteng, M. A., Ntsiful, A., Diego, L. F. P., & Novák, P. (2024). Extending UTAUT with competitive pressure for SMEs digitalization adoption in two European nations: a multi-group analysis. Aslib Journal of Information Management, 76(5), 842–868. https://doi.org/10.1108/AJIM-11-2022-0482
Lee, A. T., Ramasamy, R. K., & Subbarao, A. (2025). Understanding Psychosocial Barriers to Healthcare Technology Adoption: A Review of TAM Technology Acceptance Model and Unified Theory of Acceptance and Use of Technology and UTAUT Frameworks. Healthcare (Switzerland), 13(3). https://doi.org/10.3390/healthcare13030250
M. Topit Hidayat, & Sri Rahma Witta. (2024). Halal Certification and Implications for MSMEs: A Systematic Literature Review. Journal of Business Management and Islamic Banking, 03(2), 151–166. https://doi.org/10.14421/jbmib.v3i1.2373
Meiranto, W., Farlyagiza, F., Faisal, F., Nur Afri Yuyetta, E., & Puspitasari, E. (2024). The mediating role of behavioral intention on factors influencing user behavior in the E-government state financial application system at the Indonesian Ministry of Finance. Cogent Business and Management, 11(1). https://doi.org/10.1080/23311975.2024.2373341
Memon, M. A., Thurasamy, R., Ting, H., & Cheah, J. H. (2025). Purposive Sampling: a Review and Guidelines for Quantitative Research. Journal of Applied Structural Equation Modeling, 9(1), 1–23. https://doi.org/10.47263/JASEM.9(1)01
Merz, A., Moser, I., & Bergamin, P. B. (2025). Performance expectancy and social influence drive the acceptance of immersive virtual reality for professional collaboration. Virtual Reality, 29(3). https://doi.org/10.1007/s10055-025-01182-5
Nattakorn, P., Walailak, A., & Wirachchaya, C. (2024). Examining the Intention to Adopt an Online Platform for Examining the Intention to Adopt an Online Platform Theory and. Mdpi, May.
Nikolopoulos, F., & Likothanassis, S. (2025). Influencing Factors of Behavioral Intention to Use Cloud Technologies

in Small–Medium Enterprises. Journal of Theoretical and Applied Electronic Commerce Research, 20(4), 264. https://doi.org/10.3390/jtaer20040264

Norvadewi, N., & Zaroni, A. N. (2024). Preserving MSMEs Competitive Advantage: Moderation by Business Size. Journal of Accounting and Strategic Finance, 7(1), 39–61. https://doi.org/10.33005/jasf.v7i1.468

Padma Kiran, K., & Vedala, N. S. (2025). Exploring behavioral intentions of consumers towards different digital payment services through the interplay of perceived risks and adoption factors. Humanities and Social Sciences Communications, 12(1), 1–13. https://doi.org/10.1057/s41599-025-05468-6

Pereira, L. M., Sanchez Rodrigues, V., & Freires, F. G. M. (2024). Use of Partial Least Squares Structural Equation Modeling (PLS-SEM) to Improve Plastic Waste Management. Applied Sciences (Switzerland), 14(2). https://doi.org/10.3390/app14020628

Purnomo, S., Nurmalitasari, N., & Nurchim, N. (2024). Digital transformation of MSMEs in Indonesia: A systematic literature review. Journal of Management and Digital Business, 4(2), 301–312. https://doi.org/10.53088/jmdb.v4i2.1121

Renaningtias, N., Hidayat, P. I., & Erlansari, A. (2022). Analisis Perilaku Adopsi Digital Marketing Pada UMKM Menggunakan Model UTAUT3 Analysis of Digital Marketing Adoption Behavior in MSMEs Using the UTAUT3 Model. Jurnal Computer Science and Information Technology (CoSciTech), 3(2), 226–233.

Reva Ngulya Savi'ah, Joko Tri Nugraha, Yuni Kurniasih, & Matheus Gratiano Mali. (2024). Analysis Of Use Behavior In The Perspective Of The UTAUT In The Procurement Of Government Goods And Services At The Regional Secretariat Of Magelang City. Jurnal Info Sains : Informatika Dan Sains, 14(02), 118–132. https://doi.org/10.54209/infosains.v14i02.4377

Ringle, C. M., Sarstedt, M., Sinkovics, N., & Sinkovics, R. R. (2023). A perspective on using partial least squares structural equation modelling in data articles. Data in Brief, 48. https://doi.org/10.1016/j.dib.2023.109074

Sharabati, A. A. A., Ali, A. A. A., Allahham, M. I., Hussein, A. A., Alheet, A. F., & Mohammad, A. S. (2024). The Impact of Digital Marketing on the Performance of SMEs: An Analytical Study in Light of Modern Digital Transformations. Sustainability (Switzerland), 16(19), 1–25. https://doi.org/10.3390/su16198667

Shela, V., Ramayah, T., Aravindan, K. L., Ahmad, N. H., & Alzahrani, A. I. (2023). Run! This road has no ending! A systematic review of PLS-SEM application in strategic management research among developing nations. Heliyon, 9(12), e22476. https://doi.org/10.1016/j.heliyon.2023.e22476

Suleiman, A. M., Adamu, A. I. B., & ... (2025). The Adoption of Digital Marketing by MSMEs Selling Halal Products: Opportunities and Challenges. Malacca: Journal of …, 2(2), 97–103. http://e-journal.bustanul-ulum.id/index.php/malacca/article/view/207%0Ahttp://e-journal.bustanul-ulum.id/index.php/malacca/article/download/207/142

Surti, S. (2025). Implementation Gaps and Their Impact on Digital Capability and MSME Performance. Journal of Regional Economics Indonesia, 6(1), 1–10. https://doi.org/10.26905/jrei.v6i1.15283

Tenriyola, A. P., Baharuddin, N., Lestari, T. D., & Mas'ud, A. A. (2025). Digital Marketing Strategies for Seaweed SMEs in South Sulawesi: An Application of the Technology Acceptance Model (TAM). Jurnal Manajemen Dan Kewirausahaan, 12(2), 194–206. https://doi.org/10.26905/jmdk.v12i2.14231

Wagiyem, W., Sudarmadi, S., & Putri, R. C. (2025). UTAUT Model: Approach to the Use and Acceptance of Halal Information System (SIHALAL) in Small and Medium Food Businesses in the Solo Raya Area. Jurnal Maksipreneur: Manajemen, Koperasi, Dan Entrepreneurship, 14(2), 517–532. https://doi.org/10.30588/jmp.v14i2.1939

Wulandari, A., Marcelino, D., Suryawardani, B., & Adithya, D. (2024). Digital Capability and Literacy for MSME Transformation: Perspectives of Digital and Business Performance. Asia Pacific Management and Business Application, 13(2), 109–128. https://doi.org/10.21776/ub.apmba.2024.013.02.2

Xue, L., Rashid, A. M., & Ouyang, S. (2024). The Unified Theory of Acceptance and Use of Technology (UTAUT) in Higher Education: A Systematic Review. SAGE Open, 14(1), 1–22. https://doi.org/10.1177/21582440241229570

Yi, R., Liu, D., Sun, X., & Zhou, B. (2025). Exploring the link between AI usage intention and digital competence among college PE teachers: A moderated mediation model based on SCT and UTAUT. Plos One, 20(11 November), 1–24. https://doi.org/10.1371/journal.pone.0334699

Yu, X., Yang, Y., & Li, S. (2024). Users' continuance intention towards an AI painting application: An extended expectation confirmation model. PLoS ONE, 19(5 May), 1–25. https://doi.org/10.1371/journal.pone.0301821