

Developing the Halal-Tech Maturity Index for Traditional Market MSEs: A Strategy for Value-Digital Integration

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Abstract

This study develops the Halal-Tech Maturity Index (HTMI), a novel composite instrument that integrates halal awareness and digital readiness within traditional market-based micro and small enterprises (MSEs)—an area underexplored in current halal economy literature. The research aims to evaluate the level of halal-digital integration among MSEs, identify performance gaps, and propose a quantifiable model to guide strategic interventions in halal-based economic development. Using a mixed-methods approach, data were collected from 20 traditional markets in South Sulawesi, Indonesia through structured observation and interviews. Seven key dimensions were assessed using a 0–4 scale to construct both weighted and unweighted HTMI scores. The findings reveal a low to moderate HTMI score (1.90–1.93), indicating fragmented halal practices and limited digital adoption. However, strong interest in capacity building suggests the potential for significant improvement. Simulated interventions showed a 36.7% index increase post-training and certification support. HTMI functions not only as a diagnostic tool but also as a strategic framework for policy design, KPI monitoring, and targeted investment in halal-digital ecosystems. It bridges Islamic ethical imperatives with contemporary digital transformation agendas.

Keywords: digital transformation, Halal-Tech Maturity Index, halal value integration, Micro and Small Enterprises (MSEs), traditional markets

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Introduction

The development of the halal industry has increasingly become a strategic priority in the global economic landscape, driven not only by the rapid growth of the global Muslim population but also by rising consumer awareness of ethical, safe, and Shariah-compliant products (Reuters & Standard, 2016; Standard, 2020). As the country with the largest Muslim population in the world, Indonesia holds substantial potential to become a global leader in the halal economy, particularly in key sectors such as food and beverages, cosmetics, modest fashion, and Islamic financial services (Ahmadova, 2019; Paramita & Purwanti, 2023). Despite this promise, the potential remains largely underutilized, especially among Micro and Small Enterprises (MSEs) operating in traditional market environments. While many of these entrepreneurs possess strong religious conviction regarding the halal status of their products, they often lack formal mechanisms to validate and verify compliance, including structured production documentation and certification from authorized bodies (Khan et al., 2023; Kadarisman, 2019; Nur Azizah et al., 2025) small and medium enterprises' (MSMEs. This challenge is further compounded by limited digital literacy and inadequate access to institutional and regulatory support systems (Ardiantono et al., 2024)promote respective solutions and construct strategies for the implementation of the halal supply chain in Indonesia's small and medium-sized enterprises (SMEs. Addressing these structural gaps requires a coordinated approach that integrates capacity building, regulatory facilitation, and technological innovation to systematically embed MSEs into Indonesia's broader halal economic ecosystem and enhance their competitiveness. From a macroeconomic perspective, the inclusion and development of halal-oriented MSEs also align with Indonesia's ambition to boost halal food exports, particularly within regional and international trade frameworks such as those established with OIC countries countries (Mughtar et al., 2024).

This phenomenon illustrates a significant disconnect between the internalized understanding of halal values and the technical-administrative requirements necessary to establish a reliable halal assurance system (Priyanto & Fathoni, 2019; Putri et al., 2024). Among MSEs, halal awareness is often shaped by spiritual motivations and

informal practices, typically grounded in personal intentions and subjective beliefs rather than standardized compliance (Priyanto & Fathoni, 2019). In contrast, contemporary Muslim consumers—especially those from urban millennial segments—have become increasingly discerning, demanding halal guarantees supported by formal documentation, data-driven verification, and certified institutional endorsement (Putri et al., 2024; Zafar & Abu-Hussin, 2025). Previous research has also emphasized that halal purchasing decisions among Indonesian Muslims are influenced by various behavioral factors, including perceived religious obligation, trust in certification, and clarity of product assurance (Septiani et al., 2024). This growing disparity between producer practices and consumer expectations undermines trust in local products and constrains the ability of MSEs to penetrate wider domestic and global markets. To address this, an integrative approach is essential—one that bridges Shariah-based values with professional business standards, institutional accountability, and systematic halal compliance frameworks (Talib & Hamid, 2014).

On the other hand, digital transformation has become a critical component of modern business practices. The widespread adoption of social media platforms, online ordering applications, digital payment systems, and e-marketplaces has created significant opportunities for MSEs to grow more rapidly and operate more efficiently (Ardiantono et al., 2024; Qizam et al., 2025). However, the integration of these technologies has not always aligned with the foundational halal values that should underpin business operations among Muslim entrepreneurs. In many cases, technology is utilized merely as a tool for efficiency and promotion, without a conscious effort to harness its potential for enhancing transparency, honesty, and accountability—core principles deeply rooted in Islamic economic ethics (Bachtiar et al., 2025; Qizam et al., 2025).

In the context of traditional markets, these challenges become even more intricate. As hubs of grassroots economic activity, traditional markets often suffer from inadequate digital infrastructure, limited access to capacitybuilding programs, and insufficient supporting facilities. These structural constraints are further exacerbated by low levels of digital literacy and the scarcity of technical assistance available to MSEs (Maskuri

et al., 2024). Consequently, initiatives aimed at digital transformation and halal certification frequently remain at the discourse level or are adopted only by a small fraction of enterprises with greater access and capabilities (Showole et al., 2025). Yet, when implemented in a systematic and measurable manner, the integration of digitalization and halal principles holds significant potential to serve as a strategic competitive advantage for local MSEs, enabling them to compete more effectively in an increasingly demanding market environment (Riani et al., 2025).

Although numerous prior studies have underscored the significance of halal awareness and digital technology adoption among MSEs, the majority of these investigations remain fragmented, often focusing exclusively on formal halal certification (Kristanto & Kurniawati, 2025) small and medium enterprises (MSMEs or operational efficiency-driven digital adoption (Zailani et al., 2018), without integrating both aspects within a unified and comprehensive evaluative framework. Moreover, existing measurement approaches are generally sectoral in nature and fail to consider the unique socio-cultural and infrastructural context of traditional markets, which differ substantially from formal or manufacturing sectors (Hanifasari et al., 2024; Lestari et al., 2023) the Good Manufacturing Practice (GMP. Even within the expanding literature on the Halal Value Chain and halal performance indices, there remains a notable gap in the development of quantitative evaluation models that specifically assess the readiness for integrating halal values with digital transformation in informal, market-based MSE sectors.

Given the complexity of the issue, there is a pressing need for a comprehensive measurement instrument capable of capturing the readiness and maturity levels of MSEs in simultaneously applying halal principles and leveraging digital technologies. Such an instrument should encapsulate multiple dimensions, including awareness, operational practices, encountered barriers, and existing opportunities in the field (Ascarya & Masrifah, 2023; Azizan et al., 2024). In response to this need, the present study proposes a novel contribution by developing the Halal-Tech Maturity Index (HTMI), a composite index specifically designed to objectively and quantitatively assess the maturity of enterprises in integrating halal values with digital transformation, particularly within the context

of traditional market-based MSEs. Unlike previous models that are often either descriptive or narrowly sector-specific, HTMI functions not only as a diagnostic tool but also as a normative-predictive framework for policy monitoring, intervention planning, and business capacity simulations (Rusydiana et al., 2023). As such, HTMI offers a theoretical contribution to the development of evaluative instruments grounded in *maqāṣid al-sharī'ah* and institutional-policy perspectives (Sari et al., 2025), while also providing practical relevance for entrepreneurs, regulators, and policymakers in building a more sustainable and inclusive halal-digital ecosystem (Khan & Haleem, 2016; Masood & Zaidi, 2023).

HTMI is designed not merely as a measurement tool, but as a comprehensive policy analysis instrument. Utilizing a quantitative approach through the assignment of scores and weighted values across key dimensions—such as halal awareness (Kamalul Ariffin et al., 2016; Mukhtar & Mohsin Butt, 2012), supply chain management (Tieman, 2011; Tieman et al., 2013), consumer communication (Susanty et al., 2024), technological adoption (Ahmad-Fauzi & Md Saad, 2024; Kamali et al., 2016), and readiness for digital transformation—HTMI enables the mapping of MSEs at various maturity levels. Furthermore, the index facilitates longitudinal monitoring and evaluation of the impacts of targeted interventions, including training programs, mentoring initiatives, and financial subsidies (Ab Talib et al., 2018). Accordingly, HTMI serves as a strategic tool with descriptive, predictive, and normative functions, supporting evidence-based decision-making in halal ecosystem development.

This study was conducted in South Sulawesi, Indonesia, involving 20 traditional markets across 10 districts and municipalities. The selected locations represent diverse dynamics of traditional market-based MSEs, in terms of economic capacity, cultural background, and levels of access to technology and halal certification services. Data collection employed structured observation, informal interviews with business actors, and the gathering of documents or evidence related to halal and digital practices. The data were analyzed by categorizing the findings into seven key dimensions constituting the components of HTMI.

Through this approach, the study offers both scientific and practical contributions to the development of a digitally integrated halal economic ecosystem in Indonesia. The findings are expected to be valuable not only for academics and researchers but also for local governments, religious institutions, MSE development agencies, and the entrepreneurs themselves. Moreover, the establishment of HTMI as a strategic measurement and mapping tool is anticipated to catalyze the transformation of traditional micro and small enterprises into more professional, integrity-driven, and globally competitive actors within the halal economy ecosystem.

Methods

This study employs a mixed-methods approach with a predominant qualitative descriptive orientation, supported by quantitative analysis. The primary objective is to evaluate the level of halal awareness and the integration of digital technologies among traditional market-based micro and small enterprises (MSEs) in South Sulawesi, Indonesia. Data were collected through direct field observations and informal interviews conducted across 20 traditional markets in 10 regencies. This methodological framework enables an in-depth understanding of existing halal practices, the challenges associated with digital transformation, and the strategic opportunities for developing halal- and technology-based MSEs.

Data collection techniques included structured observations and informal interviews. The observations were conducted to assess halal practices, raw material documentation, and the application of digital technologies among business operators in 20 traditional markets across 10 regencies in South Sulawesi. Informal interviews were employed to explore perceptions regarding halal values, digital adoption, as well as perceived barriers and enabling factors among traditional market entrepreneurs, covering ten categories of micro and small enterprises (MSEs): ready-to-eat food vendors, snack producers, packaged beverage vendors, bakery and pastry producers, processed meat businesses, poultry and duck processors, condiment and cooking spice producers, local ice cream makers, frozen food vendors, and confectionery/snack producers. The collected data were categorized into seven key dimensions: halal awareness in products, supply chain and distribution, customer

service, the use of digital technologies in business operations, the influence of halal values on digital transformation, encountered barriers, and strategic opportunities for business development.

To ensure the validity and applicability of the Halal-Tech Maturity Index (HTMI), a preliminary pilot test was conducted involving 15 micro and small enterprises (MSEs) outside the main research locations. The instrument's indicators and scoring guidelines were refined based on expert input from halal certification practitioners, digital MSEs consultants, and Islamic economics scholars. While statistical validation such as construct validity or internal consistency was not conducted in this initial study, the instrument has achieved sufficient content and face validity for field implementation. Future research is encouraged to perform advanced psychometric testing to further strengthen the robustness of the HTMI model.

To provide a systematic quantitative representation, this study constructs a composite index called the Halal-Tech Maturity Index (HTMI). The index is developed to numerically measure the maturity level of micro and small enterprises (MSEs) in integrating halal principles with digital technology adoption (Asih & Sopha, 2024; Tieman, 2020). The unweighted HTMI formula is expressed as follows:

$$HTMI = \sum_{i=1}^n S_i$$

where S_i represents the score assigned to each assessed aspect, and n denotes the total number of aspects evaluated. To generate a more accurate measurement, a weighted version of the index is also applied, formulated as follows:

$$HTMI - W = \sum_{i=1}^n S_i \times W_i$$

where W_i denotes the proportional weight of each aspect, reflecting its thematic significance in relation to halal-digital maturity

The HTMI serves as an evaluative instrument to monitor the position and progress of MSE transformation in a continuous manner. Each aspect is assessed using an index scale ranging from 0 to 4. A score of 0 indicates that implementation is entirely absent. A score of 1 reflects a very low level of implementation, typically informal, undocumented, and unsystematic. A score of 2 denotes a low level of implementation, with initial indications present but lacking consistency. A score of 3 represents a moderate level of implementation, where practices are in place but remain inconsistent or unofficial. Finally, a score of 4 indicates a high level of implementation, characterized by systematic application, proper documentation, and formal certification or recognition (Ahmad Tarmizi et al., 2019; Asih & Sopha, 2024). Beyond its role as a measurement tool, the HTMI also functions as a basis for policy formulation, simulation of training budget needs, and the setting of development targets for a halal-digital ecosystem focused on MSE empowerment. Through this approach, the study not only provides an empirical snapshot of current conditions but also offers a quantitative foundation for evidence-based and sustainable policy interventions.

Result and Discussion

Research Findings

The findings presented are derived from empirical fieldwork involving micro and small enterprises (MSEs) operating in 20 traditional markets across 10 districts in South Sulawesi, Indonesia. Based on qualitative data collected through systematic observations and in-depth interviews, the analysis focuses on two interrelated dimensions: the level of halal awareness among MSE actors and the extent to which they adopt digital technology in their business practices. As shown in Table 1, the findings are thematically categorized to illustrate structural patterns, behavioral tendencies, and institutional gaps that characterize the current state of halal compliance and digital integration. By offering a nuanced interpretation of the empirical evidence, this analysis seeks to enrich academic discourse on halal economic development while providing a strong foundation for policy formulation, program design, and capacity-building initiatives relevant to the traditional market context.

Tabel 1. Key Findings: Halal Awareness and Digital Transformation Among MSEs in Traditional Markets

Component	Key Findings
Halal Product Awareness	Most MSEs claim that their products are halal, yet this awareness is largely informal and based on personal belief rather than technical standards that can be verified. There is a lack of official certification from agencies like BPJPH, and written documentation is rarely present. Halal labels appear only on a few packaged goods, often without formal validation. This indicates a limited understanding of halal as a structured and accountable system.
Supply Chain and Distribution	There is no documentation system or internal audit mechanism to trace the halal-thayyib origin of raw materials. Most inputs are sourced from general markets without verifying prior handling processes. Although cleanliness is generally maintained, standard operating procedures (SOPs) for storage, separation, or packaging are inconsistently applied. These gaps create high risks of cross-contamination and compromise halal integrity.
Customer Service and Halal Communication	Halal communication remains passive and inconsistent. Most entrepreneurs only provide halal-related information when asked by consumers. Few utilize banners or verbal messaging, and even fewer treat halal status as a strategic element of branding. The lack of structured communication strategies reflects a missed opportunity to build consumer trust and market positioning. Formal training on halal communication is largely absent.
Digital Technology Adoption	MSEs—particularly younger entrepreneurs—demonstrate strong enthusiasm in using social media platforms such as Facebook, WhatsApp, and Instagram for promotion and customer interaction. However, the use of digital tools is still disconnected from broader business systems like inventory management, digital transactions, or integration with e-commerce. Halal-dedicated marketplaces are virtually unknown, signaling a major educational gap.

Component	Key Findings
Halal Values in Digital Transactions	A small number of MSEs have begun to incorporate halal-related values such as honesty, transparency, and transactional integrity when choosing digital payment platforms. Preferred methods include QRIS and direct bank transfers. However, many still view technology purely as a tool for efficiency, without recognizing its potential for demonstrating compliance with Sharia principles in their digital processes.
Barriers to Digital Adoption	Entrepreneurs face multiple constraints including poor internet connectivity, high equipment costs, and low digital literacy. Even those who attempt to transition to digital systems often find it burdensome, especially in terms of recordkeeping and financial reporting. The absence of technical support and weak linkages with institutional facilitators such as cooperatives and local government further hinder digital adoption.
Opportunities and Enthusiasm	The findings reveal a strong growth mindset among MSEs. Many are eager to participate in halal business digitalization training, especially if the content is simple and practical. Technologies such as barcodes, digital halal certification, and raw material traceability are seen as useful tools for building consumer trust. Entrepreneurs also hope for financial support or subsidies from government or religious institutions to access such training and services.

Source: output of observations and interviews, 2025

Table 1 shows that findings from observations and interviews across 20 traditional markets in South Sulawesi reveal a complex landscape of halal awareness and digital adoption among micro and small enterprises (MSEs). Although most entrepreneurs believe their products are halal, this belief is largely based on personal conviction rather than formal compliance with standards set by official authorities. Halal labeling and documentation are rare, and certification from agencies such as the Halal Product Assurance Agency (BPJPH) is virtually nonexistent. This suggests that halal is still perceived more as a moral or spiritual value rather than a technical standard that must be verifiable (Aisyiah et al., 2023).

Furthermore, halal assurance is not integrated into the supply chain or distribution processes. MSEs typically lack systems to trace the halal-thayyib origin of raw materials, and there are no consistent standard operating procedures (SOPs) for storage, packaging, or handling. As a result, their products are vulnerable to contamination and non-compliance—especially in the absence of structured capacity-building initiatives.

Despite these limitations, the data also highlights a strong sense of enthusiasm and untapped potential among entrepreneurs, particularly in adopting digital technologies. Social media platforms such as Facebook, WhatsApp, and Instagram are widely used for promotions, especially by younger business owners. However, more advanced digital tools—like inventory management systems, e-commerce integration, and halal-focused marketplaces—remain largely unfamiliar. There is growing awareness of halal values in digital transactions, including transparency and accountability, yet many still see technology as merely a tool for operational efficiency rather than as a platform for expressing Shariah-compliant principles. Barriers such as low digital literacy, limited infrastructure, and insufficient institutional support continue to hinder broader digital integration (Waluyo, 2013). Encouragingly, many entrepreneurs have expressed a strong interest in halal business digitalization training, particularly if delivered in a practical and accessible manner. With the right combination of technical guidance and financial support, MSEs can become key players in strengthening Indonesia's halal ecosystem and expanding its position within the global halal economy.

Seven-Aspect Scoring Matrix

Based on the aforementioned narrative and descriptive the output of observations and interviews, a rational score estimation can be constructed to represent the degree of implementation across the assessed indicators, as presented in Table 2. This estimation is derived from empirical field evidence and reflects the actual dynamics observed, incorporating both quantitative and qualitative aspects of the data.

Table 2: Summary of Field Conditions and Estimated Scores for Halal-Tech Maturity Indicators

No	Assessed Aspect	Description of Field Conditions	Score
1	Halal Awareness in Products	Verbal claims, informal labeling, limited understanding of certification	1.5
2	Supply Chain and Distribution	No documentation, absence of audit or traceability systems	1.0
3	Customer Service and Interaction	Information not systematically conveyed, responses are reactive and inconsistent	2.0
4	Digital Technology in Business	Active use of social media, emerging use of digital transactions	2.5
5	Influence of Halal on Technology Adoption	Some consideration of halal values in platform and transaction choices	2.0
6	Identified Barriers	Weak infrastructure, high operational costs, low digital literacy	1.0
7	Identified Opportunities	High interest in training, large market potential, readiness for change	3.5

Source: output of observations and interviews based on rational score estimations, 2025

HTMI Composite Index

The HTMI is designed as a numerical representation to systematically measure the level of awareness and readiness among micro and small enterprises (MSEs) operating in traditional markets to integrate halal principles with digital technology utilization. This index not only reflects the extent to which business actors understand and implement halal values within their operational activities, but also illustrates their adaptive capacity toward digital transformation as a means to enhance business efficiency, transparency, and competitiveness. The HTMI can be computed as follows:

An HTMI score of 1.93 indicates that the maturity level of entities in integrating halal principles with digital technology utilization falls within the lower-intermediate category on a 0–4 scale. This score

reflects that integration efforts remain suboptimal and are still partial or sporadic, despite some indicators showing initial initiatives in applying halal principles through digital means. In other words, the assessed enterprises or entities do not yet possess a well-structured and documented system, although there is evidence of intent and early steps toward a more systematic transformation. In this context, the 1.93 score may serve as a baseline for formulating improvement strategies through training, mentoring, or policy reinforcement focused on halal-based digital readiness. Periodic evaluation and data-driven interventions are essential to accelerate halal digitalization, enabling the index to progressively advance toward a higher and more sustainable maturity level.

Weighted HTMI Model

The weighting was determined based on the strategic importance of each aspect in driving halal-digital transformation among micro and small enterprises (MSEs), as presented in Table 3. Aspects that significantly contribute to shaping halal awareness and digital readiness were assigned higher weights due to their direct impact on the successful integration of halal values and technological adoption. This weighting approach facilitates a more structured evaluation process and helps prioritize targeted interventions to achieve a sustainable level of halal-digital maturity.

Table 3: Weighted HTMI Scores

No	Assessed Aspect	Weight (%)
1	Halal Awareness in Product Offerings	20
2	Supply Chain and Distribution Management	15
3	Customer Service and Interaction	15
4	Digital Technology Utilization in Business	20
5	Impact of Halal Principles on Technology Usage	10
6	Challenges Encountered	10
7	Opportunities Identified	10
Total		100

Source: output of observations and interviews based on rational score estimations, 2025

Based on Table 3, the Weighted Halal-Tech Maturity Index (HTMI-W) can be calculated as follows:

$$\text{HTMI-W} = (1.5 \times 0.2) + (1.0 \times 0.15) + (2.0 \times 0.15) + (2.5 \times 0.2) + (2.0 \times 0.1) + (1.0 \times 0.1) + (3.5 \times 0.1) = 0.30 + 0.15 + 0.30 + 0.50 + 0.20 + 0.10 + 0.35 = \mathbf{1.90}$$

These results are consistent with the unweighted HTMI calculation and indicate that the state of halal-digital transformation among MSEs remains weak, requiring more structured interventions. This consistency reinforces the validity of the findings and underscores the need for targeted strengthening strategies, particularly in high-weighted dimensions with low performance scores, in order to accelerate the overall advancement of halal-digital maturity.

HTMI Intervention: The Effects of Training and Certification
Table 4. HTMI Score Interventions

No	Assessed Aspect	Updated Score	Description
1	Halal Product Awareness	2.5	Post-training and certification subsidy
2	Supply Chain and Distribution	2.0	Halal supply chain management training
3	Customer Service and Interaction	3.0	Improved halal education and communication
4	Digital Technology Utilization	3.0	Business digitalization mentoring
5	Impact of Halal on Technology Usage	2.5	Halal-digital literacy training
6	Challenges	1.5	Improved infrastructure and funding availability
7	Opportunities	4.0	Increasing access to market opportunities

Source: output of observations and interviews based on rational score estimations, 2025

Based on Table 4, the updated HTMI score can be calculated as follows:

$$\text{Updated HTMI} = \frac{2.5 + 2.0 + 3.0 + 3.0 + 2.5 + 1.5 + 4.0}{7} = \frac{18.5}{7} = \mathbf{2.64}$$

The results indicate an improvement to the intermediate level, with an increase of +0.71 points or 36.7% compared to the initial index score. This improvement reflects the significant effectiveness of the implemented capacity-building programs and confirms that targeted and systematic interventions can meaningfully and measurably accelerate the halal-digital transformation of micro and small enterprises (MSEs).

The output of HTMI demonstrates that this index functions not only as a measurement tool but also as a strategic instrument for planning and evaluating halal-digital transformation among micro and small enterprises (MSEs). First, model validation confirms that HTMI can serve as a local Key Performance Indicator (KPI) to monitor annual progress in MSE transformation. Second, regional authorities may establish a national benchmark target of at least 2.8, particularly in areas implementing mass halal certification and community-based digitalization programs within traditional markets. Third, based on budget simulations, an increase of 0.1 points in the HTMI score is estimated to require approximately IDR 1.5 million per MSE for training and mentoring, which can be calculated using linear or logistic approaches. Fourth, HTMI can also be employed for risk segmentation, wherein regions scoring below 2.0 are identified as vulnerable to business stagnation and low levels of trust among Muslim consumers. Through this approach, the objective conditions of MSEs can be quantitatively assessed while enabling mathematical simulations of policy impacts. Thus, the HTMI model becomes a critical tool in designing a transformation roadmap for traditional market-based MSEs toward a digitally integrated and sustainable halal economic ecosystem.”

Discussion

The Halal-Tech Maturity Index (HTMI) model represents a quantitative, ordinal scale-based evaluative approach that is highly relevant for assessing the maturity of halal systems and digitalization in the micro and small enterprise (MSE) sector. This approach aligns with the findings Ag Majid et al. (2021) and Fathi et al. (2016), who emphasize the importance of index-based measurement tools in evaluating the readiness level of the halal industry, particularly in the dimension of halal supply chain management. Similarly, Abdul Mokti et al. (2024) developed the Halal Performance Index and demonstrated that scoring-based methods can effectively identify implementation gaps in the halal practices of small and medium-sized enterprises. In the context of HTMI, the application of a 0–4 scale not only provides an objective representation of field conditions but also serves as a practical tool for monitoring the sustainability of MSE development programs over time.

The seven-aspect structure of HTMI is indirectly informed by the principles of the Halal Value Chain proposed by Tieman (2015). Its development is further supported by studies such as Ab Talib et al. (2020), who emphasize that the integration of halal values into logistics and supply chains is significantly influenced by institutional frameworks, operational understanding, and technical training at the micro level. Similarly, Ali et al. (2022) highlight that the structured adoption of halal systems within MSEs requires the enhancement of literacy, enabling technologies, and standardized documentation—elements that are all reflected in the dimensions assessed by the HTMI. Thus, HTMI captures the multi-level challenges faced by the Entrepreneurs of Micro and Small Enterprises in balancing values, regulatory compliance, and market competitiveness.

In the context of digital technology adoption, HTMI aligns with the findings of Ali et al. (2022) and Ishii et al. (2022), who emphasize that trust, efficiency, and the integration of religious values are key determinants of successful technology implementation within the halal ecosystem. HTMI findings reveal that while MSEs have begun utilizing social media platforms and QRIS-based transactions, they remain largely disconnected from comprehensive halal digital ecosystems such as halal marketplaces—thus reinforcing these prior

insights. Furthermore, Mohd Shuhaimi et al. (2025) argue that digital adoption among Muslim MSEs can only be sustained if Islamic values and perceived technological benefits are harmonized. Consequently, HTMI dimensions such as “the influence of halal awareness on technology adoption” are not only theoretically relevant but are also empirically validated by global studies.

From an Islamic perspective, the HTMI approach is directly inspired by the teachings of the Qur'an and the Sunnah of Prophet Muhammad (PBUH). Surah al-Baqarah (2:168) emphasizes the importance of consuming what is halal and wholesome as an integral part of worship. The Prophet's hadith, narrated by Tirmidhi, regarding the honest and trustworthy merchant underscores the high spiritual value of conducting transparent and halal business practices. Within this framework, the low scores recorded in HTMI concerning consumer service and communication indicate that many business actors have yet to adopt halal communication as a core business strategy. This observation is further supported by the findings of Giyanti et al. (2021), who demonstrated that the transparency of halal-related information significantly influences Muslim consumer loyalty toward local brands. Therefore, developing halal communication capabilities is a crucial component of halal literacy—one that transcends legalistic dimensions and encompasses spiritual and ethical responsibilities (Baharun & Niswa, 2019).

The intervention simulation aspect within HTMI, which demonstrates score improvements following training and facilitation, is supported by numerous other quantitative studies. Maminirina Fenitra et al. (2024) found that halal training combined with enhanced digital literacy significantly improves the efficiency and sustainability of SMEs. In their experimental study, micro and small business actors who participated in halal certification training and digital adoption programs experienced notable increases in both revenue and consumer trust (Arrahman & Yanti, 2022). Similarly, Rahman & Ali Shah (2023), emphasized that the impact of digital training is amplified when integrated with religious value-based approaches, as this alignment enhances the perceived benefits and meaning of entrepreneurship. Therefore, the simulated increase in HTMI from 1.93 to 2.64 is not merely speculative; it reflects broader

empirical trends across countries that highlight the effectiveness of value- and technology-based interventions.

Finally, the HTMI can be positioned as a strategic instrument that bridges *maqāṣid al-sharī'ah* with contemporary public policy frameworks. Rooted in the Islamic imperative for knowledge, as emphasized in Surah al-Mujadilah (58:11), which promotes the pursuit of knowledge as a path to dignity, HTMI offers a measurable framework for evaluating how halal principles and digital literacy are internalized within business practices. It embodies key objectives of Islamic law—such as economic justice, transparency, and public benefit (*maṣlahah*)—by translating spiritual and ethical values into quantifiable performance indicators. As such, HTMI functions not merely as a diagnostic tool, but as a transformative mechanism that promotes professionalism, accountability, and sustainable growth among MSEs. This aligns with the perspective of Dusuki & Abdullah (2007), who assert that effective integration of *maqāṣid al-sharī'ah* into economic policy must be grounded in measurable, evidence-based frameworks that deliver tangible social outcomes. Moreover, the HTMI model is consistent with recent empirical findings showing that the adaptation of Islamic finance principles significantly enhances MSME performance in the halal food industry by fostering inclusive, ethical, and Sharia-compliant business environments. Ultimately, HTMI serves not only institutional and developmental functions but also as a pathway toward achieving spiritual accountability and divine approval (*riḍā* Allāh SWT) through ethical entrepreneurship (Gunarto & Yanti, 2024).

Conclusion

This study has introduced and operationalized the Halal-Tech Maturity Index (HTMI) as an integrated evaluative framework to systematically assess the level of halal awareness and digital transformation readiness among micro and small enterprises operating in traditional markets. By employing a structured ordinal scale and applying composite index modeling with weighted variables, the HTMI offers both diagnostic precision and strategic relevance. It translates qualitative field observations into quantifiable insights, enabling stakeholders to identify performance gaps and prioritize intervention areas. Furthermore, the HTMI's multidimensional structure—encompassing

product legitimacy, supply chain integrity, consumer interaction, technological adoption, and systemic enablers—makes it a practical instrument for policy design, institutional benchmarking, and longitudinal impact assessment across varying socio-economic and religious contexts.

The theoretical contributions of this study lie in its synthesis of existing behavioral and institutional models—such as the Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), and Capability Maturity Model (CMM)—with Islamic ethical constructs including the Halal Value Chain and *Maqāṣid al-Sharī'ah*. This convergence between modern management frameworks and Islamic jurisprudential principles provides a normative foundation for the development of an inclusive, faith-driven economic system that leverages digital technology to reinforce religious compliance, ethical entrepreneurship, and social trust. The HTMI further draws conceptual strength from the Qur'anic mandate for lawful (*ḥalāl*) and wholesome (*ṭayyib*) commerce and the Prophetic emphasis on transparency, honesty, and mutual responsibility in trade—thus presenting a values-based alternative to conventional maturity models that often overlook religious or ethical dimensions.

In practical terms, the HTMI has the potential to be institutionalized as a policy instrument for monitoring and evaluating the performance of halal-based economic programs at regional and national levels. Its structure is adaptable to diverse geographic and sectoral contexts, especially in Muslim-majority economies seeking to modernize traditional market sectors while preserving religious authenticity. Policymakers, halal certification bodies, academic institutions, and Islamic finance stakeholders are encouraged to adopt, refine, and scale this framework in collaboration. By embedding HTMI within regulatory systems, training programs, and digital governance platforms, governments and development agencies can systematically enhance the competitiveness and compliance of halal-oriented MSEs—thereby aligning economic modernization with the ethical imperatives of Islamic economics in the digital era.

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