Synergy of AI and Islamic Human Capacity for Strengthening the Halal Hub and Empowering MSMEs in the Era of Society 5.0

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Abstract

The global halal ecosystem requires MSMEs to integrate advanced technologies with Islamic values and competencies. This conceptual article proposes a theoretical model that synergizes Artificial Intelligence (AI) and Islamic Human Capacity (IHC) which encompasses Islamic work ethics, halal literacy, and digital ethics/competence within the context of a halal hub as a supporting ecosystem. Grounded in the Resource-Based View and Dynamic Capabilities frameworks, as well as an ecosystem perspective, we position IHC and AI as complementary capabilities that influence MSME empowerment and performance, with the strength of the halal hub serving as a cross-level mediator and/or moderator. This article formulates conceptual propositions, defines key constructs, and proposes a research agenda along with empirical validation designs (PLS-SEM/CB-SEM and/or field studies). The main contributions are: (1) integrating technology human capabilities rooted in Islamic values, (2) operationalizing the "strength of the halal hub" as an ecosystem mechanism, and (3) mapping MSME empowerment pathways aligned with the human-centric vision of Society 5.0.

Keywords: AI Adoption; Islamic Human Capacity; Halal Hub; Msmes; Society 5.0; Ecosystem; Conceptual Model.

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Introduction

The global halal economy continues to grow, demanding higher standards of quality, safety, and traceability along the supply chain including for MSMEs, which serve as the backbone of suppliers. The *State of the Global Islamic Economy (SGIE) Report 2023/24* notes that Muslim consumer spending reached approximately US$2.29 trillion in 2022 across sectors such as food, pharmaceuticals, cosmetics, fashion, travel, and media. This highlights both a vast market opportunity and the increasing demands for halal compliance and traceability (DinarStandard, 2023).

From a regulatory and standardization standpoint, OIC countries are pursuing harmonization through the OIC/SMIIC scheme to strengthen quality infrastructure and market trust. In Indonesia, Law No. 33/2014 on Halal Product Assurance and Government Regulation No. 39/2021 emphasize mandatory certification and the governance of halal assurance systems. These require process separation, monitoring, and labeling all of which imply the need for end-to-end traceability (Ministry of Religious Affairs of Indonesia, 2021).

At the ecosystem level, various countries are developing halal hubs or halal industrial parks to accelerate certification, supplier distributor integration, and market access. For instance, Malaysia's HALMAS industrial parks have become a reference point for building regional halal ecosystems (Halal Development Corporation, 2022).

On the other hand, Artificial Intelligence (AI) offers MSMEs opportunities to enhance productivity, quality, service, and data-driven decision-making. However, policy literature and cross-country studies indicate that AI adoption among small enterprises is often hindered by capability gaps, limited talent and data literacy, and process integration challenges creating a gap between potential and realized benefits (OECD, 2021). Inclusive digital transformation for MSMEs still requires organizational readiness, ecosystem support, as well as adequate regulatory and quality infrastructure frameworks to ensure that the benefits of technology are widely distributed (World Bank, 2022).

In the halal context, traceability is not only a matter of compliance but also a source of consumer trust. Recent studies highlight that implementing halal traceability systems contributes to better performance and transparency, and serves as a key element in certification processes and strengthening the competitiveness of halal industries (Emerald, 2022; AIP Publishing, 2023). Various digital solutions including AI and blockchain are being tested to strengthen traceability and supply chain data integrity, with initial findings showing potential improvements in supply chain performance and competitive advantage (Emerald, 2023).

Beyond technological readiness, Islamic Human Capacity (IHC) which encompasses Islamic work ethics, halal literacy, and digital competence & ethics remains a crucial prerequisite for ensuring that technology is value-driven and human-centric, in line with the vision of Society 5.0 (Cabinet Office of Japan, 2019; Springer, 2022). Empirical evidence confirms the positive relationship between Islamic work ethics and performance, commitment, and work behavior, making it a relevant foundation for human capabilities within AI-adopting organizations. However, most AI MSME studies emphasize technical and infrastructural aspects, while halal studies focus on compliance. The intersection of AI × IHC × halal hub strength explaining how impacts are formed at the MSME level through cross-level mediation/moderation mechanisms remains underexplored systematically.

This article contributes a conceptual model that positions IHC and AI capabilities as complementary resources (under the RBV/DC framework) within the halal hub ecosystem. The

model emphasizes the role of halal hubs including certification and mentoring services, standardization and traceability, supplier distributor networks, and policy support as mediators and/or moderators that strengthen the translation of human technology capabilities into MSME empowerment and performance. In line with this, the article formulates research propositions and an empirical validation agenda that can be tested in the context of halal MSMEs in the Era of Society 5.0 (Islamic Development Bank, 2022).

Theoretical Foundation and Construct Definitions

2.1 Resource-Based View (RBV) & Dynamic Capabilities (DCV)

The RBV emphasizes that sustainable competitive advantage arises from resources/capabilities that are valuable, rare, inimitable, and non-substitutable (VRIN) (Barney, 1991). In this context, AI capabilities such as data readiness, algorithms, and process integration and Islamic Human Capacity (IHC) which encompasses Islamic work ethics, halal literacy, digital competence & ethics, and learning orientation are positioned as complementary strategic assets that are difficult to replicate. The DCV framework adds the dimensions of sensing seizing transforming, that is, an organization's ability to sense opportunities, seize them, and dynamically transform processes relevant for orchestrating AI and halal practices within MSMEs (Teece, Pisano, & Shuen, 1997). Model implication: IHC enhances absorptive capacity and the quality of AI implementation; conversely, AI expands learning loops and productivity. This combination forms a hard-to-imitate capability in the long run (Mahoney, 2021).

2.2 Ecosystem/Innovation Theory

Innovation ecosystems view value as emerging from the co-evolution of actors (regulators, certification bodies, associations, universities/incubators, digital platforms/marketplaces) through standardization, knowledge flows, and incentives (Granstrand & Holgersson, 2019). This framework is well-suited for analyzing halal hubs as arenas of coordination in halal standards, traceability, certification, supplier distributor networks, as well as market and financing access. Recent reviews distinguish between business, innovation, and platform ecosystems, emphasizing the role of platforms in expanding digital entrepreneurship and generating network effects (Autio, Nambisan, Thomas, & Wright, 2018; de Reuver, Sørensen, & Basole, 2018). An example of institutionalization is Malaysia's HALMAS industrial parks, which provide governance, certification services, and incentives as a proof-of-concept for regional halal hubs (Halal Development Corporation, 2022).

2.3 Society 5.0 (Human-Centric)

The concept of **Society 5.0** emphasizes the integration of cyber physical spaces for human well-being. Technology is only valuable when aligned with human values, ethics, and capabilities (Cabinet Office of Japan, 2019). This aligns with the idea of IHC and provides a normative foundation for human-centered AI adoption in halal MSMEs.

2.4 Construct Definitions & Theoretical Rationale

1. **Islamic Human Capacity (IHC)**
   a. Definition. Human capacity rooted in Islamic values, encompassing:

- *Islamic Work Ethics (IWE):* trustworthiness (*amanah*), diligence (*itqan*), justice, and excellence (*ihsan*).
- Halal literacy & compliance mindset (understanding halal critical points, internal audit, compliance intention).
- Digital/AI competence & ethics (privacy, fairness, transparency, data security).
- Learning orientation & leadership grounded in *maqāṣid al-sharī'ah*.

b. Literature basis. Studies show IWE positively influences attitudes, commitment, and performance (Ali & Al-Owaihan, 2008). The IWE scale has also been validated across contexts (Youcef & Baharuddin, 2015). Integrating IWE with digital competence extends the concept of Islamic human capital toward ethical AI readiness (Emerald Publishing, 2022).

c. Operationalization (summary). Indicators: trustworthy/diligent behavior, understanding halal critical points & traceability, applying AI ethics, continuous digital learning.

2. AI Adoption/Utilization

a. Definition. The intensity and depth of AI use (demand/sales analytics, recommendation systems, service chatbots, computer vision for quality control, automation), as well as its integration into core processes (marketing, operations, finance).

b. Literature basis. Recent AI MSME studies link adoption to the Technology Organization Environment (TOE) framework and internal capabilities (RBV), showing performance impacts but also highlighting barriers in talent, cost, data readiness, and governance (Maroufkhani, Wagner, & Wan Ismail, 2020; Trocin, Mikalef, & Mossberger, 2021).

c. Operationalization (summary). Measure AI use by function (marketing/operations/finance), data readiness & system integration, and AI governance/ethics.

3. Strength of the Halal Hub

a. Definition. The degree of support provided by the halal ecosystem as experienced by MSMEs: quality & accessibility of certification/mentoring services, standardization & traceability, supply chain networks, policy incentives, and market platform access.

b. Literature basis. Halal hubs are effective when they provide standardization and traceability that enhance integrity and market trust; halal industrial parks such as HALMAS serve as references for governance and incentive practices (Ahmad & Ghozali, 2021; Halal Development Corporation, 2022).

c. Operationalization (summary). Indicators: perceived access to certification services, presence of digital traceability systems, supplier distributor networks, ease of market access, and incentives.

4. MSME Empowerment & Performance

a. Definition.

- *Empowerment* = enhancement of digital capabilities, decision-making autonomy, market/finance access, and customer trust.
- *Performance* = sales, productivity, quality/defect rate, delivery timeliness, and sustainability.

b. Literature basis. Digitalization (including AI) has the potential to improve MSME competitiveness, but capability and literacy gaps often hinder benefit realization emphasizing the role of ecosystems and targeted upskilling (OECD, 2021).

2.5 Conceptual Connector: Halal Traceability as a Trust Mechanism

Within the halal ecosystem, traceability connects human technology capabilities with trust and market performance. Recent studies show that digitally supported traceability (IoT, blockchain, AI) improves data integrity, transparency, and audit speed leading to stronger trust and supply chain performance (Ab Talib, Hamid, & Chin, 2016; Kamalahmadi & Parast, 2021).

Summary of Theoretical Fit → Construct Model

1) RBV/DCV explain why IHC and AI capabilities serve as sources of advantage (VRIN; sensing seizing transforming) (Barney, 1991; Teece et al., 1997).
2) Ecosystem/Platform theory explains how halal hubs provide standardization, networks, and incentives (Granstrand & Holgersson, 2019).
3) Society 5.0 provides a normative rationale: technology must be human-centric and aligned with values/ethics (Cabinet Office of Japan, 2019).

Research Methodology

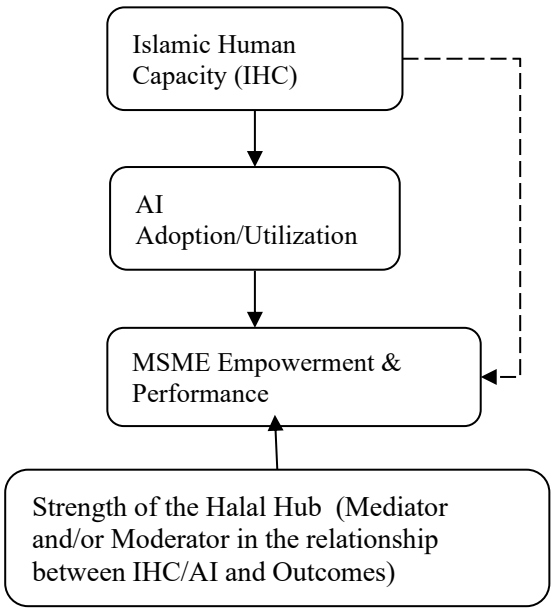

Figure 1. Conceptual Framework of Islamic Human Capacity, AI Adoption and MSME Empowerment Under the Influence of Halal Hub Strength

Model Intuition:

Islamic Human Capacity (IHC) strengthens the readiness and quality of AI implementation; AI then translates these capabilities into business value and halal trust. The halal hub provides the rules of the game, services, and networks that not only mediate the flow of capabilities but also moderate the effectiveness of AI in practice.

Discussion of Propositions

Islamic Human Capacity (IHC) occupies a central position in the model because it represents a unique human resource that not only reflects Islamic work ethics (*amanah*, *itqan*, justice, *ihsan*), but also encompasses halal literacy, digital competence, and learning orientation. In line with the RBV perspective, IHC can be positioned as a strategic asset that is difficult to imitate and serves as the foundation of competitive advantage for halal MSMEs. With this capacity, MSME actors have higher absorptive capacity to understand, adopt, and integrate AI technology. Therefore, Proposition 1 (P1) asserts that IHC positively influences AI adoption; while Proposition 2 (P2) states that IHC, directly, also drives MSME empowerment and performance through increased commitment, productivity, and consumer trust.

Furthermore, the technology adoption literature in MSMEs shows that AI acts as a catalyst for productivity and competitiveness, whether through demand analytics, automation, or recommendation systems that expand market access. This underlies Proposition 3 (P3): AI utilization positively affects empowerment and performance. However, AI's benefits cannot be separated from the human readiness to manage and operate the technology. Hence, Proposition 4 (P4) emphasizes AI's role as a mediator that bridges the influence of IHC on performance. In other words, IHC provides the ethical foundation and digital capabilities, while AI serves as the vehicle that translates them into performance gains.

In an ecosystem context, the halal hub is a determining institutional factor. By providing certification services, standardization, traceability, supplier distributor networks, and policy incentives, the halal hub functions as an institutional enabler that reduces barriers to technology adoption while enhancing the legitimacy of halal products in the market. Accordingly, Proposition 5 (P5) states that the strength of the halal hub increases AI adoption, while Proposition 6 (P6) highlights its direct contribution to MSME empowerment and performance. Beyond this, the halal hub also acts as a moderator (P7) that strengthens the effect of AI on performance: the stronger the hub support, the greater the positive impact of AI on outcomes. This aligns with the DCV framework, which emphasizes the importance of ecosystem orchestration in converting capabilities into tangible results.

Finally, it is important to note that these effects are not homogeneous. MSMEs that are already halal-certified enjoy greater market legitimacy, stronger consumer trust, and easier access to halal hub infrastructure. Thus, Proposition 8 (P8) asserts that the effects of IHC and AI on performance are stronger for certified MSMEs compared to non-certified ones. This differentiation is practically important, as it highlights the need for a two-pronged strategy: accelerating certification while supporting digital technology adoption.

Overall, this set of propositions forms an integrative conceptual framework: IHC and AI as complementary capabilities; the halal hub as enabler, mediator, and moderator; and traceability as a trust mechanism linking humans, technology, and ecosystems to strengthen halal MSME performance in the Society 5.0 era.

Operationalization

For empirical testing purposes, each construct will be operationalized using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). This scale is chosen because it is more sensitive in capturing variations in respondents' attitudes/assessments. All items will be locally adapted to the context of Indonesian halal MSMEs, and tested for reliability (Cronbach's alpha/Composite Reliability) and validity (CFA/AVE) in subsequent studies.

1) Islamic Human Capacity (IHC). Measured through a combination of ethics, halal literacy, and digital competence. Indicators include:
    a. trustworthiness and *itqan* in daily work,
    b. understanding of halal critical points and traceability practices,
    c. application of AI ethics, including privacy, fairness, and transparency,
    d. basic and advanced digital skills,
    e. learning orientation and self-development.

    Items can be adapted from the Islamic Work Ethics scale (Ali & Al-Owaihan, 2008), enriched with halal literacy and digital ethics indicators.

2) AI Adoption/Utilization. Focused on the intensity and depth of AI use in halal MSMEs. Indicators include:
    a. use of sales and demand analytics,
    b. chatbots or digital assistants for customer service,
    c. computer vision for product quality control,
    d. cross-functional data integration (marketing, operations, finance),
    e. business process automation.

    Instruments can be derived from TOE/RBV-based technology adoption literature with halal sector adjustments.

3) Strength of the Halal Hub. Measures MSMEs' perceptions of ecosystem support. Indicators include:
    a. accessibility and quality of mentoring and certification services,
    b. availability of standards and digital traceability systems,
    c. breadth and depth of halal supplier distributor networks,
    d. policy incentives and regulatory support from government/agencies,
    e. access to halal market platforms.

    Items may be drawn from studies on innovation ecosystems and halal hub governance such as HALMAS.

4) MSME Empowerment & Performance. Combines empowerment and performance dimensions.
    a. Empowerment indicators: (a) enhanced digital capacity, (b) decision-making autonomy, (c) access to markets and financing, (d) customer trust.
    b. Performance indicators: (a) sales growth and productivity, (b) product quality/defect rate, (c) delivery timeliness and operational sustainability. Adaptations can be based on validated digitalization-oriented MSME performance scales from OECD and World Bank literature.

Research Implications

Theoretical contributions. This article formalizes the synergy between Islamic human capabilities (IHC) and technology (AI) within the RBV and DCV frameworks. IHC is positioned as a VRIN intangible asset which, when combined with AI, forms a rare, inimitable, and sustainable capability. The integration of the halal ecosystem through halal hubs adds a contextual dimension as a mediator and moderator, extending RBV/DCV applications into the halal MSME domain with Islamic value and institutional ecosystem nuances.

Practical contributions. This article offers guidelines for entrepreneurs, regulators, and support institutions:

1) Designing training curricula and capacity building rooted in Islamic values that integrate halal literacy, digital ethics, and AI skills.
2) Developing halal traceability systems enhanced by analytics and blockchain to improve transparency and consumer trust.
3) Formulating policy directions in the form of incentives, mentoring, and strengthening halal hubs as strategic infrastructure to lower AI adoption barriers.

Thus, this article provides both a theoretical and practical roadmap for the development of halal MSMEs in the Society 5.0 era.

Conclusion

This conceptual article maps the pathways through which Islamic Human Capacity (IHC) and the utilization of Artificial Intelligence (AI) reinforced by the role of halal hubs can promote empowerment and improve the performance of halal MSMEs in line with the vision of Society 5.0. By combining RBV, DCV, ecosystem theory, and the normative rationale of Society 5.0, the article underscores that Islamic human capabilities and technological capabilities are complementary and derive maximum value when embedded in a strong halal ecosystem.

The proposed research propositions covering direct effects, mediation, moderation, and heterogeneity among MSMEs provide a foundation for future empirical research agendas. Empirical findings may test the model's validity, compare contexts across OIC countries, or develop new measurement instruments reflecting the integration of Islamic ethics and digital technologies. On the practical side, this article serves as a reference for policymakers and halal ecosystem practitioners. By emphasizing the importance of Islamic-value-driven AI literacy, technology-enabled traceability systems, and institutional support via halal hubs, this study highlights the need for targeted intervention strategies so that halal MSMEs not only survive but also remain competitive in global markets. Accordingly, this article contributes to building a bridge between strategic management theory, Islamic values, and digital transformation practices, advancing the development of an inclusive and sustainable halal economy.

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