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Integrated Halal Infrastructure for Strengthening Indonesia's Sharia Economic Ecosystem

Infrastruktur Halal Terintegrasi untuk Memperkuat Ekosistem Ekonomi Syariah Indonesia

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Abstract

Indonesia's growing role in the global halal economy highlights the necessity of a well-developed halal infrastructure that ensures product integrity, strengthens consumer trust, and enhances industry competitiveness. However, existing studies and national practices tend to focus on isolated elements such as certification or logistics, resulting in fragmented implementation and uneven institutional capacity across regions. This study aims to provide an integrated analysis of halal infrastructure covering certification governance, halal laboratory networks, halal logistics, and digital traceability systems and examine how these components collectively reinforce the Sharia economic ecosystem in Indonesia. Using a qualitative literature review supported by policy reports and empirical case documentation, the study synthesizes Institutional Theory, the Resource-Based View, and the maqāṣid al-sharīʿah framework to analyze structural, operational, and ethical dimensions. The findings show that coordinated institutional arrangements, capacity development of laboratories, and digital integration significantly enhance efficiency and credibility, although disparities remain in regional access and SME readiness. The study concludes that holistic infrastructure development is essential for sustainable and inclusive Sharia economic growth, contributing a conceptual framework to guide future policy and empirical research.

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Abstrak
Perkembangan Indonesia dalam ekonomi halal global menuntut keberadaan infrastruktur halal yang kuat untuk menjamin keutuhan produk, meningkatkan kepercayaan konsumen, serta mendorong daya saing industri. Namun, kajian dan praktik nasional selama ini cenderung menyoroti elemen-elemen infrastruktur secara terpisah, seperti sertifikasi atau logistik, sehingga menghasilkan implementasi yang terfragmentasi dan kapasitas kelembagaan yang tidak merata antarwilayah. Penelitian ini bertujuan memberikan analisis integratif terhadap infrastruktur halal meliputi tata kelola sertifikasi, jejaring laboratorium halal, logistik halal, dan sistem ketertelusuran digital serta menjelaskan bagaimana komponen-komponen tersebut secara kolektif memperkuat ekosistem ekonomi syariah Indonesia. Menggunakan pendekatan kajian literatur kualitatif yang didukung dokumen kebijakan dan data studi kasus, penelitian ini mengintegrasikan Kerangka Teori Kelembagaan, Resource-Based View, dan maqāṣid al-sharī'ah untuk menelaah aspek struktural, operasional, dan etika. Hasil penelitian menunjukkan bahwa harmonisasi kelembagaan, penguatan kapasitas laboratorium, dan integrasi digital mampu meningkatkan efisiensi dan kredibilitas, meskipun masih terdapat kesenjangan akses wilayah dan kesiapan UMKM. Studi ini menegaskan perlunya pembangunan infrastruktur halal secara holistik untuk pertumbuhan ekonomi syariah yang berkelanjutan dan inklusif.

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1. INTRODUCTION

The global halal industry has emerged as one of the fastest-growing sectors of the contemporary economy, evolving beyond its religious roots to represent a universal benchmark of quality, safety, and ethical assurance. According to the State of the Global Islamic Economy Report 2024 (DinarStandard), the market value of halal products and services has surpassed US $2.4 trillion, reflecting both increasing consumer consciousness and systematic international efforts to standardize halal governance. Leading countries such as Malaysia, the United Arab Emirates, and Saudi Arabia have successfully developed integrated halal ecosystems that harmonize certification, logistics, research institutions, and digital traceability under unified national strategies (Haleem et al., 2020; Kodirov, 2022).

Positioned as the world's largest Muslim-majority nation, Indonesia holds a strategic advantage in the halal economy. The government's Sharia Economic Masterplan 2019–2024 (KNEKS) explicitly emphasizes halal infrastructure as a critical enabler of national competitiveness and inclusive development. However, empirical records from the Halal Product Assurance Organizing Body (BPJPH) and the National Accreditation Committee (KAN) demonstrate persistent asymmetries: while certification coverage has expanded substantially, supporting infrastructures

particularly accredited laboratories, halal logistics systems, and digital traceability platforms remain unevenly distributed and insufficiently integrated across regions (Indonesia, 2024; Nasional, 2024) These institutional and infrastructural disparities hinder the realization of a coherent and efficient halal ecosystem.

Existing research tends to examine halal ecosystem components individually. For instance, scholars have analyzed certification governance (Fernando et al., 2022), halal logistics efficiency (Tieman et al., 2012), and laboratory accreditation challenges (Judijanto et al., 2024). However, such studies often overlook the systemic interdependence among certification systems, laboratory testing capabilities, logistical assurance, and digital transparency. The fragmented nature of these analyses limits the understanding of how these components collectively sustain halal integrity and economic performance. As highlighted in recent discussions on halal industrial ecosystems, there is a growing need for conceptual and empirical integration (Bahrudin et al., 2024; Trimulato et al., 2022)

To ensure that infrastructural development remains ethically grounded, this study situates halal infrastructure within the framework of maqāṣid al-sharīʿah. Enhancing certification reliability promotes ḥifẓ al-dīn (preservation of faith), strengthening laboratory safety systems aligns with ḥifẓ al-nafs (preservation of life), and improving logistics and digital transparency reflects ḥifẓ al-māl (preservation of wealth) (Dusuki & Abdullah, 2007); (Kamali, 2008). Thus, infrastructural modernization is positioned as both a technical and moral imperative.

While previous studies have examined individual pillars of halal infrastructure, few have analyzed how certification governance, laboratory networks, halal logistics, and digital traceability function as an integrated system, particularly in the Indonesian context. There has been limited research that bridges institutional theory, resource-based capabilities, and Islamic ethical objectives into a unified analytical framework. Therefore, this research focuses on constructing an integrative conceptual and empirical framework to explain how halal infrastructure collectively strengthens the resilience, inclusivity, and ethical sustainability of Indonesia's Sharia economy.

This study contributes by: (1) synthesizing fragmented halal infrastructure literature into a systemic analytical model; (2) linking Institutional Theory and the Resource-Based View with maqāṣid al-sharīʿah; and (3) offering a framework to guide national halal infrastructure planning and policy evaluation.

2. LITERATURE REVIEW

This section critically synthesizes theoretical and empirical literature on halal infrastructure to establish a conceptual foundation for this study. It integrates insights from Institutional Theory, the Resource-Based View (RBV), and the ethical framework of maqāṣid al-sharīʿah to explain how institutional legitimacy, infrastructural capability, and moral accountability collectively shape the halal economy. The review also identifies key findings from previous studies on certification, laboratory systems, logistics, and digital transformation to construct an integrative analytical model linking these dimensions.

A. Institutional Theory and Halal Governance

Institutional Theory provides a useful lens for understanding how legitimacy and governance shape halal infrastructure. (North, 1990) and (Scott, 2001) argue that institutions both formal (laws, regulations) and informal (norms, values) stabilize market transactions by establishing predictable structures. In the context of halal governance, institutions determine how certification, supervision, and standardization mechanisms are recognized and enforced. (Fernando et al., 2022) highlight that halal certification in Indonesia functions not merely as a regulatory formality but as a process of institutional legitimation that ensures both religious compliance and market trust.

Empirical studies have shown that institutional fragmentation remains a significant challenge. Overlaps between the roles of BPJPH, the Indonesian Ulema Council (MUI), and accreditation bodies (KAN) can produce inefficiencies and duplication of efforts (Bahrudin et al., 2024). This observation aligns with the argument by (Hidayat & Machmud, 2024) that institutional coherence clear coordination and accountability among agencies is a prerequisite for the success of halal certification systems. Institutional theory thus explains why policy harmonization and the enforcement of standardized halal governance are essential for systemic stability.

Internationally, countries such as Malaysia and the UAE have demonstrated the value of integrated governance structures. The Malaysian model, led by the Department of Islamic Development (JAKIM), exemplifies how centralized coordination enhances certification credibility, while the UAE's Emirates Authority for Standardization and Metrology (ESMA) showcases successful cross-border recognition of halal standards (Haleem et al., 2020; Kodirov, 2022). These models underscore that effective institutional governance provides the foundation upon which other pillars of halal infrastructure can operate efficiently.

B. Resource-Based View (RBV) and Infrastructure Capability

The Resource-Based View (RBV) complements institutional analysis by focusing on the internal assets and capabilities that create sustainable competitive advantage (Barney, 1991). In the halal economy, these resources include accredited laboratories, certified human capital, logistics facilities, and digital technologies. When effectively mobilized, these assets generate value that is difficult for competitors to replicate, particularly when they are embedded within strong institutional frameworks (Fernando et al., 2022; Tieman et al., 2012)

Empirical evidence supports this resource-centric argument. (Judijanto et al., 2024) found that Indonesia's limited distribution of accredited halal laboratories constrains verification processes, leading to delays in certification and inconsistent quality assurance. Conversely, studies on Halal Industrial Parks and logistics systems show that investment in infrastructure such as cold-chain networks and digital traceability can significantly reduce transaction costs and

enhance operational resilience (Bux et al., 2022; Destriyansah et al., 2023). Within the RBV perspective, these infrastructural investments represent strategic resources that transform institutional legitimacy into measurable performance outcomes.

The RBV framework also explains the strategic role of digital transformation. (Trimulato et al., 2022) and (Yap & Al-Mutairi, 2023) demonstrate that blockchain applications and halal information systems like SIHALAL create intangible assets trust, transparency, and reputation that reinforce consumer confidence. Thus, infrastructural and digital capabilities are not merely supportive tools but core resources that sustain competitive advantage in halal markets.

C. Maqāṣid al-Sharīʿah as Ethical Framework for Halal Infrastructure

The maqāṣid al-sharīʿah framework provides an ethical and teleological foundation that complements the economic and institutional analyses above. It ensures that halal infrastructure development aligns with Islamic objectives of human welfare (maṣlaḥah). Classical scholars such as al-Ghazālī and al-Shāḥibī, and contemporary thinkers like (Kamali, 2008), identify the protection of five essentials faith (ḥifẓ al-dīn), life (ḥifẓ al-nafs), intellect (ḥifẓ al-ʿaql), progeny (ḥifẓ al-nasl), and wealth (ḥifẓ al-māl) as the overarching goals of Sharia.

Applying these principles to the halal economy, (Dusuki & Abdullah, 2007) argue that institutional arrangements and market practices must promote both economic and moral integrity. Within halal infrastructure, ḥifẓ al-dīn is achieved through trustworthy certification; ḥifẓ al-nafs through scientifically verified product safety; and ḥifẓ al-māl through transparent logistics and fair trade. The maqāṣid framework therefore transforms halal infrastructure from a technical or bureaucratic exercise into a moral-economic system that preserves ethical accountability while promoting development.

Integrating maqāṣid with Institutional Theory and RBV creates a comprehensive analytical lens: institutional structures provide legitimacy, resources create capability, and maqāṣid ensures moral direction. Together, these frameworks justify the need for balanced progress efficiency must not come at the expense of ethics, and compliance must be substantiated by capability.

D. Previous Studies on Halal Infrastructure Components

Existing scholarship on halal infrastructure can be grouped into four thematic pillars: certification systems, laboratory accreditation, halal logistics, and digital transformation.

1. Certification Systems: Research emphasizes the importance of transparent and standardized certification in sustaining consumer trust and facilitating trade (Bahrudin et al., 2024; Fernando et al., 2022). However, overlapping jurisdictions between certification and regulatory bodies often generate inefficiencies (Hidayat & Machmud, 2024). Comparative evidence from Malaysia and the GCC shows that centralized systems under JAKIM or ESMA yield higher international recognition (Haleem et al., 2020; Kodirov, 2022).

2. Laboratory Accreditation: Halal laboratories ensure the scientific integrity of certification by testing raw materials and end products. Yet, their limited number and uneven geographic distribution in Indonesia hinder consistent quality assurance (Judijanto et al., 2024). Collaboration between universities and private laboratories, as demonstrated by Halal Valley in Bogor, represents an effective model for expanding capacity and innovation (Pratama & Deniesa, 2023; Titisari, 2024)
3. Halal Logistics: Logistics integrity is essential to prevent contamination and maintain halal status throughout the supply chain. Studies by (Tieman et al., 2012) and (Bux et al., 2022) highlight that integrated halal logistics frameworks not only safeguard religious compliance but also reduce costs and enhance global market access. Indonesia's emerging initiatives, such as the Makassar Halal Port, illustrate the feasibility of regionalized halal corridors (Hidayat & Machmud, 2024).
4. Digital Transformation: Digitalization underpins the transparency and efficiency of halal systems. The integration of platforms like SIHALAL and blockchain technologies facilitates real-time data exchange, certification traceability, and cross-institutional governance (Indonesia, 2024; Trimulato et al., 2022). However, digital readiness gaps among SMEs pose ongoing challenges that require targeted literacy and infrastructure programs (Destriyansah et al., 2023).

E. Conceptual Synthesis and Analytical Framework

Synthesizing these theoretical and empirical insights, this study conceptualizes halal infrastructure as an integrated ecosystem composed of interdependent institutional, material, and ethical components. Institutional Theory explains the regulatory and organizational foundations; RBV elucidates the strategic and resource dimensions; and maqāṣid al-sharīʿah ensures that all infrastructural developments adhere to moral and social objectives. Together, these perspectives inform the construction of an Integrative Analytical Framework that links certification, laboratory systems, logistics, and digital transformation as mutually reinforcing pillars of Indonesia's Sharia economy.

This synthesis provides the conceptual basis for the subsequent methodology and analysis. It supports the central proposition that the halal infrastructure ecosystem represents not an assemblage of discrete functions but a coordinated system whose effectiveness depends on institutional coherence, resource mobilization, and ethical governance (Bahrudin et al., 2024; Fernando et al., 2022; Trimulato et al., 2022)

3. METHOD

3.1. Research Design

This study adopts an Integrative Systematic Literature Review (SLR) design to examine the multidimensional structure of halal infrastructure and its contribution to Indonesia's Sharia economic ecosystem. The purpose of using an integrative SLR is to synthesize conceptual, empirical, and policy-based evidence

within a coherent analytical framework, rather than to generate primary field data. This approach is appropriate given the research objective of consolidating scattered scholarship across certification governance, laboratory systems, halal logistics, and digital transformation. Methodologically, this study is grounded in pragmatism, which emphasizes methodological flexibility and the generation of actionable knowledge applicable to real-world policy contexts. Pragmatism allows the integration of qualitative interpretations and quantitative secondary data to link theoretical constructs Institutional Theory, Resource-Based View (RBV), and maqāṣid al-sharīʿah with empirical realities of halal infrastructure development.

3.2. Participants / Sample Selection and Data Sources

The "participants" in this review are scholarly publications and institutional documents selected through systematic database searching. Data sources include Scopus, Web of Science, and ScienceDirect, complemented by Google Scholar for grey literature and institutional reports. The identification stage used Boolean keyword combinations such as "halal infrastructure," "halal certification," "halal logistics," "digital traceability," and "Sharia economy," yielding 1,247 initial records (2014–2025). Screening removed duplicates and non-relevant titles, leaving 386 studies. Eligibility assessment applied the following criteria: (1) relevance to at least one halal infrastructure pillar, (2) publication in peer-reviewed outlets or credible institutional agencies, and (3) conceptual or methodological clarity. The final dataset included 62 high-quality studies along with institutional reports from (Indonesia, 2024), (Nasional, 2024), and KNEKS.

3.3. Instrumentation/Data Collection

Data collection followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol, consisting of identification, screening, eligibility, and inclusion. A structured data extraction template recorded authorship, publication year, study objectives, methodological approach, geographic scope, and principal findings. The AMSTAR 2 instrument was used to appraise reliability and methodological rigor, while inter-coder validation enhanced classification consistency. Divergences in coding were resolved through discussion, ensuring transparency and reproducibility. Triangulation with policy documents and international models (e.g., JAKIM and ESMA) added contextual depth.

3.4. Data Analysis/Estimating Model/Variable Measurement

The analysis applied thematic synthesis to identify recurring concepts and classify them into four pillars of halal infrastructure: certification systems, accredited laboratory networks, halal logistics, and digital transformation. Coding procedures were guided by theoretical constructs from Institutional Theory (North, 1990; Scott, 2001) to interpret governance legitimacy, the Resource-Based View (Tieman et al., 2012) to examine resource-based capabilities, and maqāṣid al-sharīʿah (Dusuki & Abdullah, 2007; Kamali, 2008) to ensure ethical and value-oriented interpretation. Descriptive integration of secondary quantitative indicators (e.g., certification coverage, laboratory distribution, logistics efficiency,

digital readiness) provided empirical grounding. This synthesis resulted in the formulation of an Integrative Analytical Framework that positions halal infrastructure as a coordinated system whose effectiveness depends on institutional coherence, resource mobilization, and ethical governance.

4. RESULTS

This section presents the results of the Integrative Systematic Literature Review (SLR) and the empirical synthesis concerning halal infrastructure in Indonesia. The findings are organized into three major parts: (1) thematic findings from the literature review, (2) empirical findings and case illustrations, and (3) synthesis of thematic and empirical insights. Together, these results provide a comprehensive understanding of how the four pillars of halal infrastructure certification, laboratories, logistics, and digital transformation interact to shape Indonesia's Sharia economy.

A. Thematic Findings from the Systematic Literature Review (SLR)

The systematic review identified 62 qualified studies published between 2014 and 2025, covering conceptual, empirical, and policy-oriented research on halal infrastructure. Thematic synthesis of these studies reveals four interdependent pillars: certification systems, laboratory accreditation, halal logistics, and digital transformation.

1. Certification Systems

Halal certification emerges as the normative and institutional core of the halal ecosystem. Studies consistently highlight that effective certification frameworks ensure religious compliance, consumer confidence, and export readiness (Bahrudin et al., 2024; Fernando et al., 2022). Research by (Tieman et al., 2012) demonstrates that certification credibility directly influences international trade access and brand reputation.

However, several studies point to persistent institutional fragmentation in Indonesia's certification system, stemming from overlapping roles among BPJPH, MUI, and KAN (Hidayat & Machmud, 2024). These overlaps slow down the approval process and weaken regulatory coherence. Literature from Malaysia and the UAE, in contrast, shows that centralized coordination under JAKIM and ESMA, respectively enhances cross-border recognition (Haleem et al., 2020; Kodirov, 2022). This contrast underscores the importance of institutional harmonization for certification efficiency.

2. Laboratory Accreditation and Scientific Validation

Laboratory systems are critical in ensuring the scientific integrity of halal products. Findings from (Judijanto et al., 2024) and (Pratama & Deniesa, 2023) reveal that only 65 accredited halal laboratories operate in Indonesia, with concentration in Java and Sumatra. This geographic imbalance limits accessibility for eastern regions and delays the verification process.

Several studies advocate partnerships between universities, private laboratories, and the government to enhance capacity and innovation. For instance, the Halal Research Center at Universitas Djuanda collaborates with Halal Valley to advance bioinformatics-based testing, providing rapid DNA-based verification (Judijanto et al., 2024). This reflects how laboratory innovation contributes not only to compliance but also to global competitiveness.

3. Halal Logistics and Supply Chain Integrity

Halal logistics ensure that certified products maintain their integrity throughout the supply chain. Literature emphasizes that logistics systems are not merely supportive but essential for sustaining product trustworthiness and economic efficiency (Bux et al., 2022; Tieman et al., 2012). Studies by (Fernando et al., 2022) and (Haleem et al., 2020) indicate that adopting halal logistics standards reduces contamination risks and enhances export performance.

Indonesia's logistics infrastructure, however, remains uneven. The World Bank Logistics Performance Index (2023) ranks Indonesia at 61 globally, indicating systemic inefficiencies. The absence of integrated halal logistics certification further complicates supply chain traceability. Nonetheless, emerging projects such as the Makassar Halal Port Initiative demonstrate potential for regionalized halal corridors (Hidayat & Machmud, 2024).

4. Digital Transformation and Traceability Systems

Digitalization has become the most transformative pillar of halal infrastructure. The integration of digital platforms particularly SIHALAL has improved transparency and reduced certification processing time by approximately 30% (Indonesia, 2024; Trimulato et al., 2022). Blockchain applications in traceability systems enhance supply chain accountability and facilitate halal data interoperability (Yap & Al-Mutairi, 2023).

However, challenges persist in terms of digital literacy and connectivity, especially among micro and small enterprises (Destriyansah et al., 2023). Studies highlight the need for digital inclusion programs to prevent the marginalization of SMEs in the halal certification process. Despite these challenges, digital transformation remains a central enabler of integration across certification, laboratory, and logistics systems.

B. Empirical Findings and Case Illustrations

To validate and complement the literature review, empirical synthesis was conducted based on institutional data and case studies from leading halal industrial initiatives. These include the Indonesia Halal Industrial Park (IHIP) in Sidoarjo, Halal Valley in Bogor, and the Makassar Halal Port Initiative in Eastern Indonesia.

1. Indonesia Halal Industrial Park (IHIP), Sidoarjo

IHIP serves as a flagship model of integrated halal infrastructure. Managed by PT ANTAM Tbk and supported by KNEKS, IHIP hosts more

than 170 tenants across food, cosmetics, and pharmaceutical sectors (BPJPH, 2024). Tenants benefit from on-site certification services linked to the SIHALAL system, significantly reducing administrative bottlenecks. The park also implements a Halal Warehouse Management System (HWMS) based on blockchain technology, ensuring real-time traceability of storage and transport conditions (Yap & Al-Mutairi, 2023).

2. Halal Valley, Bogor

   Halal Valley operates as an innovation hub integrating laboratory testing, certification training, and SME incubation. Supported by LIPI and Universitas Djuanda, it has pioneered bioinformatics-based halal testing that shortens verification time and enhances analytical precision (Judijanto et al., 2024; Titisari, 2024). This initiative exemplifies the synergy between academic research and industrial application, demonstrating how technological innovation reinforces halal integrity.

3. Makassar Halal Port Initiative

   The Makassar Halal Port Initiative, developed by Pelindo IV in collaboration with KNEKS, aims to establish a dedicated halal logistics corridor for exports to the Middle East and Southeast Asia. Preliminary assessments show a 20% reduction in logistics costs for certified exporters through dedicated halal storage and cold-chain management (Hidayat & Machmud, 2024). This initiative highlights the strategic importance of decentralizing halal infrastructure to promote inclusive regional development.

C. Synthesis of Thematic and Empirical Findings

Synthesizing the thematic and empirical results reveals that Indonesia's halal infrastructure operates as a complex, interdependent system. Thematic findings demonstrate the structural and regulatory foundations of each pillar, while empirical cases illustrate their practical interactions.

1. Certification serves as the regulatory anchor, legitimizing halal products through standardized assurance.
2. Laboratories provide scientific validation, strengthening both compliance and consumer safety.
3. Logistics operationalize the flow of halal-certified goods, ensuring integrity and efficiency.
4. Digital transformation connects all pillars through data transparency and process integration.

Empirical evidence from IHIP, Halal Valley, and Makassar Halal Port confirms that coordinated institutional and technological efforts enhance efficiency, traceability, and market access. However, persistent challenges such as uneven laboratory distribution, limited digital literacy, and fragmented governance continue to constrain system-wide optimization.

These findings affirm the theoretical proposition that halal infrastructure effectiveness depends on institutional coherence (Institutional Theory), resource mobilization (RBV), and ethical alignment (maqāṣid al-sharīʿah). Collectively, they

establish the empirical foundation for the subsequent Discussion, which interprets these dynamics within broader theoretical and policy frameworks.

5. DISCUSSION

This section interprets the findings of the study by situating them within the broader theoretical domains of Institutional Theory, the Resource-Based View (RBV), and the normative framework of maqāṣid al-sharīʿah. The discussion advances beyond descriptive synthesis to provide critical and analytical insights into how halal infrastructure operates as an integrated system that balances regulatory legitimacy, capability development, and ethical sustainability in Indonesia.

1. Alignment with Research Objectives

   The findings directly address the research aim of understanding halal infrastructure as a multidimensional ecosystem composed of certification systems, laboratory networks, halal logistics, and digital governance. These elements do not function independently, but interactively reinforce one another in shaping the resilience of the Sharia economy. This confirms that effective halal infrastructure cannot be reduced to regulatory certification alone, a key research problem highlighted in the Introduction.

2. Institutional Interpretation: Legitimacy and Governance Coherence

   The persistent overlap of mandates among BPJPH, MUI, and KAN (Hidayat & Machmud, 2024) indicates ongoing institutional fragmentation which hinders operational efficiency. This supports Institutional Theory's argument that coherent regulatory structures are necessary for legitimacy and compliance (DiMaggio & Powell, 1983; North, 1990; Scott, 2001). In contrast, comparative governance models in Malaysia (JAKIM) and the UAE (ESMA) demonstrate that centralized coordination strengthens certification credibility and international recognition (Haleem et al., 2020; Kodirov, 2022). The emergence of the Indonesia Halal Industrial Park (IHIP), integrated with SIHALAL, shows promise for institutional streamlining (Indonesia, 2024), yet its replication remains uneven nationally. These contrasts highlight that Indonesia's institutional reforms are progressing, but require deeper structural harmonization to achieve global competitiveness.

3. Resource-Based Interpretation: Infrastructure as Strategic Capability

   From an RBV standpoint (Barney, 1991; Wernerfelt, 1984), the study demonstrates that halal laboratories, logistics corridors, and digital traceability platforms constitute strategic resources that shape competitive advantage. The Halal Valley model illustrates how laboratory based scientific validation can become a distinctive competency difficult for other regions to imitate (Judijanto et al., 2024). Similarly, the Makassar Halal Port Initiative shows how logistics investments reduce transaction costs and reinforce supply chain integrity. These cases contrast with regions where laboratory access and logistical capacity remain limited, revealing capability disparities that restrict ecosystem wide performance. Therefore, capability building not merely regulation is essential for sustainable halal economic development.

4. Maqāṣid al-Sharīʿah Interpretation: Ethical and Sustainable Anchoring

   The integration of maqāṣid al-sharīʿah provides a normative foundation that interprets halal infrastructure beyond technical efficiency. Certification aligns with ḥifẓ al-dīn, laboratory systems support ḥifẓ al-nafs, logistics efficiency sustains ḥifẓ al-māl, digital innovation contributes to ḥifẓ al-ʿaql, and long-term infrastructure planning supports ḥifẓ al-nasl (Dusuki & Abdullah, 2007; Kamali, 2008). This confirms that halal infrastructure must enable both material welfare and ethical accountability, distinguishing it from secular quality assurance frameworks. The findings show that initiatives like IHIP and Halal Valley succeed precisely because they embody these ethical orientations, while cases lacking ethical alignment show weaker sustainability outcomes.

5. Theoretical and Empirical Contrasts

   The discussion extends earlier scholarship (Bahrudin et al., 2024; Fernando et al., 2022; Trimulato et al., 2022) by arguing that institutional legitimacy is insufficient without reinforced infrastructural capabilities and ethical guidance. While previous studies examined these pillars separately, this study's integrative analysis demonstrates the necessity of systemic alignment across institutional, material, and moral dimensions.

6. Closing Statement

   In summary, the effectiveness of halal infrastructure is contingent upon the convergence of governance coherence, strategic resource capability, and ethical sustainability. This multi-theoretical synthesis underlines that Indonesia's halal economy will advance not merely through regulatory expansion, but through integrated institutional coordination, capability development, and value-based governance. These insights form the basis for the study's concluding recommendations and policy implications.

6. CONCLUSION

This study aimed to analyze the effectiveness of Indonesia's halal infrastructure by examining the interplay between institutional coherence, infrastructural capability, and ethical governance within the Sharia economic ecosystem. Employing an Integrative Systematic Literature Review (SLR) guided by the PRISMA protocol, the research synthesized conceptual frameworks, empirical findings, and policy-oriented evidence related to four key pillars of halal infrastructure: certification systems, accredited laboratory networks, halal logistics, and digital traceability platforms. The findings indicate that certification establishes regulatory legitimacy and consumer trust, laboratory networks ensure scientific validation and safety assurance, logistics systems maintain supply chain integrity and efficiency, and digital transformation facilitates transparency and governance integration. Collectively, these components function as an interconnected ecosystem that strengthens resilience, competitiveness, and sustainability in the halal economy. However, challenges persist, including regulatory overlap among

BPJPH, MUI, and KAN, uneven laboratory distribution across regions, and limited digital readiness among SMEs. These limitations suggest the need for strengthened institutional harmonization, capacity development, and inclusive digital adoption strategies. Future research is encouraged to empirically test infrastructure maturity frameworks, conduct comparative analyses with global halal hubs, and examine long-term impacts of digital and regulatory reforms on halal ecosystem sustainability.

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