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Research Paper

Halal Integrity in Heavy Industry: A Conceptual Governance–Leadership–Sustainability Framework for Ethical Industrial Operations

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Abstract

While Halal governance is well-established in food and pharmaceuticals, its application to heavy industry remains largely unexplored, presenting distinctive challenges related to supply chain transparency, material integrity, and technical Shariah compliance. This gap is particularly significant for petrochemical operations where high-volume production must reconcile religious principles with global industrial standards. This conceptual study develops a novel integrative framework—the Governance–Leadership–Sustainability (GLS) Model—to operationalise Halal integrity in heavy industry contexts. Using the Hengyi Petrochemical Complex as an illustrative case, the research proposes a benchmark framework for ethical industrial governance within ASEAN. The research employs a conceptual methodology, synthesising insights from Brunei's national Halal standards, peer-reviewed literature on Islamic ethics and sustainable operations, and global petrochemical industry reports. The resulting framework merges governance structures, leadership dynamics, and sustainability principles through a Halal-Tayyiban lens, emphasising amanah (trust), tayyib (wholesomeness), and maslahah (public good). The analysis suggests that robust Halal integrity in heavy industry depends upon a dual foundation of rigorous legal compliance and proactive, values-driven leadership. Practices observed at Hengyi—including supplier audits, Shariah-based contractual provisions, and ethics-oriented workforce development—illustrate this convergence. Furthermore, embedding sustainability principles may enhance corporate legitimacy and market positioning, aligning industrial outputs with both Islamic values and universal sustainability targets. This paper's primary contribution is a first-of-its-kind hybrid framework that systematically extends Halal governance into the non-consumer heavy industry sector. It provides a pioneering blueprint for policymakers and corporate leaders, positioning Brunei as a normative architect of ethical industrialisation in ASEAN. As a conceptual study, findings are derived from secondary data. Future research should empirically validate the framework through qualitative case studies and quantitative surveys to assess its practical efficacy across diverse industrial contexts

Keywords: *Halal Governance, Heavy Industry, Sustainable Leadership, Petrochemical Ethics, GLS Model, Brunei Darussalam*

INTRODUCTION

The conceptualisation of Halal has undergone significant transformation, evolving from dietary regulations to a comprehensive ethical paradigm encompassing business operations and consumption patterns (Tieman, 2011). While Halal governance has traditionally been associated with consumer-facing sectors—food, pharmaceuticals, and cosmetics—its extension into heavy industry introduces distinctive complexities. Petrochemical operations, characterised by high-volume production, intricate supply chains, and globally sourced raw materials, present unique challenges that transcend product-level certification. These challenges encompass material integrity, process purity, and the embedding of Islamic ethical values within corporate governance and leadership structures.

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Brunei Darussalam, as a nation committed to Islamic principles and sustainable development, has positioned Halal integrity as a cornerstone of its economic diversification strategy under Wawasan Brunei 2035. This vision aligns closely with the United Nations Sustainable Development Goals (SDGs), particularly those related to responsible consumption and production, industry innovation, and partnerships for sustainability (United Nations, 2015). Within this context, the Hengyi Petrochemical Complex—a strategic joint venture between Brunei and China—represents a critical test case for exploring Halal governance in a sector traditionally governed by technical standards and environmental regulations rather than religious ethics (Hengyi Industries, 2023).

Recent scholarship by Idris and colleagues has advanced the discourse on Halal governance beyond traditional sectors, emphasising intersections with sustainability and leadership ethics. Idris et al. (2022) explored the alignment of Halal-Tayyiban principles with SDGs, highlighting the strategic roles of *amanah* (trust), *tayyib* (wholesomeness), and *maslahah* (public good) in shaping organisational behaviour. Idris (2024) examined certification challenges in non-traditional contexts, underscoring the need for leadership-driven compliance strategies. Her edited volume, *The Halal Industry in Asia* (Idris et al., 2025), provides comparative insights into Halal governance frameworks across ASEAN, reinforcing the argument for integrated models that combine legal, ethical, and sustainability dimensions.

Despite these advances, scholarly attention to Halal governance in heavy industry remains limited (Tieman, 2011). Existing frameworks predominantly address certification processes and consumer trust, offering little guidance on how large-scale industrial entities can embed Halal values into leadership practices and sustainability strategies. This gap is significant, given the increasing global emphasis on ethical production and the convergence of Halal principles with Environmental, Social, and Governance (ESG) frameworks.

Research Questions

This conceptual study addresses the following research questions:

1. How can Halal governance principles be systematically conceptualised for application in heavy industry contexts?
2. What are the key governance, leadership, and sustainability dimensions required to operationalise Halal integrity in petrochemical operations?
3. How might the proposed GLS Model be conceptually applied within an ASEAN petrochemical context, using Hengyi as an illustrative example?

Objective and Contribution

The objective of this paper is to propose a novel hybrid framework—the Governance–Leadership–Sustainability (GLS) Model—that integrates three critical dimensions: legal governance, values-based leadership, and sustainability principles, all viewed through a Halal-Tayyiban lens. By focusing conceptually on the Hengyi Petrochemical Complex as an illustrative context, the study aims to establish a benchmark for ethical industrial governance in ASEAN, demonstrating how Halal integrity might coexist with global competitiveness and environmental stewardship.

LITERATURE REVIEW

This section synthesises scholarly contributions and regulatory frameworks relevant to Halal integrity in heavy industry. It is organised into four thematic areas: Halal Governance Beyond Food, Leadership and Islamic Ethics, Sustainability and Triple Bottom Line, and Research Gap and Theoretical Positioning.

Halal Governance Beyond Food

The conceptualisation of Halal has evolved from a set of dietary laws into a comprehensive ethical paradigm for business and consumption. Initially confined to food and pharmaceuticals, the Halal industry has systematically expanded into logistics, finance, and cosmetics, driven by global Muslim market demands and standardisation efforts (Tieman, 2011). However, its foray into heavy industry, particularly the petrochemical sector, represents the most complex and underexplored frontier. This sector introduces unique challenges that transcend product-level certification, demanding a systemic approach to Shariah-compliance across the entire value chain.

The complexity lies in ensuring integrity from raw material extraction—where the permissibility of catalysts and solvents must be assessed—through complex chemical transformations, to final products and by-products. This requires moving beyond tangible product attributes to address process purity (*istihalah*), cross-contamination risks, and supply chain transparency in highly technical environments. Brunei's regulatory framework, particularly the Brunei Halal Standard (2017) and the PBD 24: 2007 Brunei Darussalam Standard Halal Food, provides a foundational regulatory scaffold for such applications.

Ethical Leadership and Maqasid al-Shariah in Industrial Governance

While robust governance systems are necessary, they are insufficient without the animating force of ethical leadership. The internalisation of Halal integrity within an organisation's culture is fundamentally a leadership challenge. The principles of *Maqasid al-Shariah*—the higher objectives of Islamic law—particularly the preservation of faith, life, intellect, lineage, and wealth—provide a timeless framework for ethical decision-making (Dusuki & Abdullah, 2007). In an industrial context, this translates to upholding *amanah* (trust) in managing resources, ensuring *tayyib* (wholesomeness) in operational impacts on communities and the environment, and prioritising *maslahah* (public good) over narrow corporate interests.

Idris (2021) demonstrates that leadership enacted through cultural and ethical values is pivotal in shaping organisational behaviour, a finding that resonates profoundly in the context of Halal governance. Leadership-driven compliance strategies are essential for overcoming certification challenges inherent in complex, non-traditional sectors (Idris, 2024). This perspective moves Halal integrity from a peripheral compliance function to a core strategic imperative, fostering stakeholder trust and organisational resilience. Consequently, Islamic ethical leadership is increasingly recognised as a powerful driver for sustainable industrial transformation, demonstrating significant convergence with global ESG frameworks that prioritise long-term value creation and ethical stewardship (World Economic Forum, 2020). Brown and Treviño's (2006) work on ethical leadership further reinforces this, highlighting how leaders influence organisational culture through values-based stewardship—a concept that aligns closely with Islamic principles of *amanah* and *adl* (justice).

Sustainability and the Triple Bottom Line

The integration of sustainability into the Halal discourse is both a logical extension of its principles and a strategic imperative for its relevance in the 21st century. The Halal-Tayyiban paradigm, which emphasises not only permissibility but also quality, safety, and wholesomeness, provides a robust lens through which to interpret the Triple Bottom Line (TBL) of People, Planet, and Profit (Idris et al., 2022).

Within this framework:

- People aligns with *maslahah* and social equity, demanding fair labour practices, community engagement, and positive social impact.
- Planet resonates with the Islamic duty of *khalifah* (stewardship), mandating environmental protection, resource conservation, and the adoption of cleaner production technologies.
- Profit is reconceptualised within the boundaries of Halal and Tayyib, promoting ethical wealth generation that does not harm society or the environment.

For a petrochemical entity like Hengyi, this synthesis can be operationalised through tangible commitments. The company's investments in effluent treatment, carbon emission reduction technologies, and public sustainability targets (Hengyi Industries, 2023) represent potential manifestations of Tayyib's operational principles. This alignment with the United Nations Sustainable Development Goals (SDGs), particularly SDG 9 (Industry, Innovation and Infrastructure), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action), positions Halal industrial governance as a significant contributor to global sustainability agendas (United Nations, 2015). The ASEAN Guidelines for Sustainable CSR further reinforce this integrated approach, encouraging member states to blend cultural and ethical values with business operations (ASEAN Secretariat, 2020).

Research Gap and Theoretical Positioning

A critical analysis of the literature reveals a significant and persistent gap. While scholarly work has effectively expanded the *scope* of Halal governance (Tieman, 2011) and elaborated on its ethical *foundations* (Dusuki & Abdullah, 2007; Idris, 2021) and sustainability *linkages* (Idris et al., 2022), a disconnect remains. The existing body of knowledge offers scant guidance on how large-scale petrochemical operations can holistically embed Halal integrity.

The research is characterised by a siloed approach, with studies focusing either on technical certification, leadership ethics, or sustainability in isolation. There is a conspicuous lack of integrated conceptual models that combine the structural assurance of governance, the catalytic influence of leadership, and the strategic direction of sustainability into a coherent framework for heavy industry. This gap is particularly acute in the ASEAN context, where economic ambitions for industrial growth must be harmonised with strong religious and cultural identities.

Theoretical Framework Development

This study draws upon three interconnected theoretical streams to construct the GLS Model:

1. Institutional Theory: Provides insights into how formal rules, regulatory frameworks, and normative pressures shape organisational behaviour (DiMaggio & Powell, 1983). This informs the governance pillar, addressing how Brunei's Halal regulations and global industrial standards create institutional imperatives for compliance.
2. Stakeholder Theory: Emphasises the importance of managing relationships with diverse stakeholders—including regulators, communities, investors, and employees (Freeman, 1984). This underpins the sustainability pillar, highlighting how Halal-Tayyiban principles align with stakeholder expectations for ethical and environmentally responsible operations.
3. Ethical Leadership Theory: Focuses on how leaders influence organisational culture and ethical decision-making through values-based stewardship (Brown & Treviño, 2006). This grounds the leadership pillar, explaining how *Maqasid al-Shariah* principles can be enacted through transformative leadership practices.

These theoretical foundations provide a coherent framework for conceptualising how governance structures, leadership practices, and sustainability commitments interact to produce Halal integrity as a system-level outcome. Halal integrity is operationally defined in this study as the systematic alignment of organisational governance, leadership practices, and operational processes with Shariah principles, ensuring that all activities—from raw material sourcing to final product delivery—are conducted in a manner that upholds amanah (trust), tayyib (wholesomeness), and maslahah (public good).

RESEARCH METHODOLOGY

This study adopts a **conceptual research design**, which is appropriate for emerging topics where empirical evidence is limited and theoretical development is required (Jaakkola, 2020). The primary aim is to construct a hybrid framework that integrates legal governance, values-based leadership, and sustainability principles within the context of Halal integrity in heavy industry. Given the novelty of applying Halal governance to petrochemical operations, a conceptual approach allows for synthesising diverse theoretical perspectives and regulatory insights without the constraints of field-based data collection. Conceptual research is particularly appropriate for nascent research domains where empirical evidence is limited and theoretical foundations require development (Gilson & Goldberg, 2015).

Research Design and Philosophical Underpinnings

The research is philosophically grounded in a social constructivist paradigm, which acknowledges that realities—such as the perception and implementation of Halal integrity—are constructed through social and institutional practices (Idris, 2021). This paradigm is well-suited to understanding how Halal principles are interpreted, negotiated, and enacted within the complex socio-technical system of a petrochemical complex. The constructionist perspective acknowledges that Halal integrity is not a fixed, objective property but emerges from the interplay of regulatory frameworks, organisational practices, and stakeholder interpretations.

Data Sourcing and Selection Criteria

The research synthesises insights from a rigorously selected corpus of secondary data sources. To ensure comprehensiveness and credibility, the data collection followed a systematic approach, drawing from four distinct source categories:

1. Regulatory and Policy Documents: Includes Brunei's primary Halal governance instruments, specifically the *Halal Certificate and Halal Label (Amendment) Order 2017* and the *Brunei Darussalam Standard Halal Food (PBD 24:2007)*, which provide the foundational legal and procedural framework. Additional documents include ASEAN-level policy frameworks and international guidance on industrial governance.
2. Scholarly Literature: A systematic review of peer-reviewed literature was conducted, with priority given to Scopus-indexed publications from 2010-2024. The review focused on three intersecting domains: (a) Islamic ethics and *Maqasid al-Shariah* (e.g., Dusuki & Abdullah, 2007; Kamali, 2008); (b) ethical and sustainable leadership (e.g., Idris, 2021; Brown & Treviño, 2006); and (c) Halal governance and its intersection with sustainability (e.g., Idris et al., 2022; Tieman, 2011).
3. Industry and Corporate Reports: To ground the model in practical industrial contexts, we analysed Hengyi Industries' Sustainability Reports (2021-2023) and operational disclosures. These documents provide critical insights into the company's environmental management systems, supply chain practices, and corporate governance structure, offering

a real-world context for model application. It is important to note that these reports are treated as documentary evidence of the company's stated commitments and practices, not as independent empirical validation of the GLS Model's implementation.

4. Comparative Policy Analysis: To situate the Brunei case within a regional context, reports from the ASEAN Secretariat and comparative studies on Halal governance frameworks in Malaysia, Indonesia, and Japan (Idris et al., 2025) were incorporated.

The selection criteria for all sources emphasised authority, relevance, and timeliness. Only documents from official government bodies, reputable international organisations, and peer-reviewed academic journals were included.

Analytical Procedure: Thematic Synthesis and Conceptual Modelling

The analytical process involved a two-stage thematic synthesis, following the approach delineated by Thomas and Harden (2008) for synthesising qualitative and conceptual data.

Stage 1: Inductive Coding and Theme Development

The source materials were systematically reviewed to identify recurring concepts and patterns. Through an iterative process of open coding, initial concepts were grouped into three primary thematic domains:

1. Governance Mechanisms: Encompassing Shariah-compliant contractual obligations, Halal certification pathways for industrial inputs, and rigorous supplier audit protocols. Key codes included: *regulatory compliance*, *supplier certification*, *contractual provisions*, *audit procedures*, and *material integrity verification*.
2. Leadership Imperatives: Focusing on the role of values-based stewardship in embedding *amanah* and *maslahah* into corporate culture and strategic decision-making. Key codes included: *ethical culture*, *leadership accountability*, *values-driven decision-making*, *training and development*, and *organisational commitment*.
3. Sustainability Integration: Concerning the alignment of Triple Bottom Line objectives (People, Planet, Profit) with the Halal-Tayyiban paradigm. Key codes included: *environmental stewardship*, *social responsibility*, *economic viability*, *community engagement*, and *sustainable operations*.

Evidence Trail

To ensure transparency and reproducibility, the following analytical documentation was maintained:

- Document Inventory: A comprehensive list of all source documents including regulatory texts (n=8), academic articles (n=45), corporate reports (n=6), and policy documents (n=12), with metadata on publication date, author/institution, and relevance.
- Coding Results: A detailed coding framework showing how each concept was identified, categorised, and linked to its source material. For example, the code "supplier audit protocols" was derived from the *Halal Certificate and Halal Label (Amendment) Order 2017*, *Brunei Darussalam Standard Halal Food (PBD 24:2007)*, and Tieman (2011).
- Evidence Matrix: A cross-referenced matrix linking each thematic finding to specific source documents, demonstrating how themes were triangulated across multiple source types.
- Thematic Mapping: Visual representations showing the relationships between codes and themes, and how these informed the development of the GLS Model structure.

Stage 2: Model Construction and Integration

In the second stage, the relationships and interdependencies between these themes were

analysed. This involved synthesising the discrete themes into a coherent, higher-order conceptual structure—the GLS Model. This model visually and theoretically represents how the three pillars interact synergistically to produce robust Halal integrity, moving beyond a siloed understanding to an integrated systems view.

Ensuring Analytical Rigour

To ensure the conceptual rigour and validity of the synthesis, several strategies were employed (Gilson & Goldberg, 2015):

- Triangulation: Insights were cross-verified across multiple source types (e.g., regulatory documents, academic literature, and corporate reports) to mitigate bias from any single source. This included verifying Halal governance concepts against both Brunei-specific regulatory texts and international academic literature.
- Iterative Refinement: The emerging model was continually refined and tested against the source data to ensure it provided a comprehensive and logical representation of the phenomenon. Multiple iterations of the GLS Model structure were developed and assessed against the thematic synthesis findings.
- Theoretical Grounding: The conceptualisation is deeply anchored in established theoretical frameworks, including *Maqasid al-Shariah*, Institutional Theory, Stakeholder Theory, and the Triple Bottom Line, and builds directly upon prior work in Halal studies (Idris et al., 2022; Dusuki & Abdullah, 2007).

Researcher Reflexivity and Positionality

The authors acknowledge that their positions influence the research process and interpretation. One author is affiliated with the case organisation (Hengyi Industries), providing valuable insider knowledge but also potential for bias. To mitigate this, the research maintains a clear conceptual focus, uses documentary evidence rather than personal experience as primary data, and explicitly distinguishes between conceptual propositions and illustrative examples. The analysis emphasises public, verifiable sources and maintains transparency about the role of the case organisation as an illustrative context rather than an empirical validation site.

Limitations and Pathway for Empirical Validation

The principal limitation of this conceptual study is its reliance on secondary data, which precludes direct empirical validation within the scope of this paper. However, this foundational work is designed explicitly to enable and guide subsequent empirical research. The proposed GLS Model provides a testable framework for future studies, which could employ qualitative case studies (e.g., in-depth interviews with Hengyi's management and Shariah auditors) or quantitative surveys to measure the model's impact on operational, ethical, and financial performance indicators.

Conflict of Interest Statement

The authors declare the following: One author is employed by Hengyi Industries Sdn. Bhd., the organisation used as an illustrative case in this study. This affiliation provides access to corporate documents and operational insights but does not compromise the scholarly integrity of the conceptual analysis. The study employs publicly available documentary evidence and does not involve privileged internal information. All interpretations are the authors' own and do not necessarily reflect the views of the affiliated organisation. There are no other competing interests to declare.

FINDINGS AND DISCUSSION

This section presents the conceptual findings derived from the thematic synthesis and introduces the Governance–Leadership–Sustainability (GLS) Model. The analysis reveals three interconnected pillars that collectively conceptualise Halal integrity in heavy industry.

Thematic Synthesis Results

The systematic analysis of secondary sources yielded three primary themes, each with associated sub-themes and propositions:

Theme 1: Governance Mechanisms

Sub-themes identified:

1. Regulatory compliance frameworks
2. Supplier certification and audit protocols
3. Shariah-compliant contractual provisions
4. Material integrity verification systems
5. Documentation and traceability requirements

Key propositions (P):

- P1: Comprehensive legal governance structures provide the essential foundation for Halal integrity in heavy industry, ensuring that material purity and process integrity are systematically maintained across complex supply chains.
- P2: Shariah-compliant supply chain engineering, including critical control point (CCP) analysis for impurity (*najs*) risks, is necessary to mitigate contamination risks in petrochemical operations.
- P3: Legally enforceable Halal clauses in supplier contracts serve as accountability mechanisms that extend compliance obligations throughout the value chain.

Theme 2: Leadership Imperatives

Sub-themes identified:

1. Ethical culture and organisational values
2. Leadership accountability structures
3. Values-driven decision-making processes
4. Employee training and development
5. Integration of *Maqasid al-Shariah* principles

Key propositions (P):

- P4: Transformative ethical stewardship is necessary to embed Halal values beyond procedural compliance and into organisational culture.
- P5: Leadership that champions ethics as a strategic differentiator—rather than a compliance cost—fosters internal commitment to Halal integrity.
- P6: Cultivation of an organisational culture where *Maqasid al-Shariah* principles become heuristics for strategic decision-making enhances the authenticity of Halal governance.

Theme 3: Sustainability Integration

Sub-themes identified:

1. Environmental stewardship (*khalifah*)
2. Social equity and community engagement (*maslahah*)
3. Ethical economic viability (*Halal rizq*)

4. Alignment with SDGs and ESG frameworks
5. Circular economy and cleaner production

Key propositions (P):

- P7: The Halal-Tayyiban paradigm provides a robust lens through which to interpret Triple Bottom Line objectives, positioning sustainability as a core component of wholesomeness.
- P8: Investments in environmental management systems, emission reduction, and resource conservation represent tangible manifestations of *Tayyib* operational principles.
- P9: Alignment with global sustainability frameworks (SDGs, ESG) enhances the legitimacy and market positioning of Halal-compliant industrial operations.

The following table summarises how each theme was triangulated across source types.

Table 1. Evidence Matrix Summary

Theme	Regulatory Sources	Academic Literature	Corporate Reports	Comparative Policy
Governance Mechanisms	Halal Certificate and Halal Label (Amendment) Order 2017; PBD 24:2007	Tieman (2011);	Hengyi Sustainability Reports (2021-2023)	ASEAN CSR Guidelines (2020)
Leadership Imperatives	Halal Certificate and Halal Label (Amendment) Order 2017	Dusuki & Abdullah (2007); Idris (2021; 2024)	Hengyi Sustainability Reports (2021-2023)	-
Sustainability Integration	PBD 24:2007	Idris et al. (2022)	Hengyi Sustainability Reports (2021-2023)	UN SDGs (2015); WEF (2020)

The Governance–Leadership–Sustainability (GLS) Model

The research culminates in the development of the Governance–Leadership–Sustainability (GLS) Model, a conceptual framework that re-conceptualises Halal integrity in heavy industry as a dynamic, emergent property of three synergistically interacting pillars. The analysis suggests that for capital-intensive, high-risk sectors like petrochemicals, a holistic paradigm that integrates structural governance, catalytic leadership, and strategic sustainability is imperative for the authentic operationalisation of Islamic ethics.

Model Structure and Components

FIGURE 1 TITLE: Governance–Leadership–Sustainability (GLS) Model for Halal Integrity in Heavy Industry



Figure 1. The Governance–Leadership–Sustainability (GLS) Model for Halal Integrity in Heavy Industry

[A professional diagram featuring three interconnected pillars supporting a central dome labelled "Halal Integrity as a Competitive Advantage." Bi-directional arrows show continuous reinforcement between pillars. The model is situated within an outer ring labelled "External Enablers: Global ESG Frameworks, UN SDGs, ASEAN Policy, Wawasan 2035."]

Explanation of Symbolism

- Central Dome: Represents the ultimate goal—Halal integrity as a competitive advantage and strategic differentiator.
- Three Pillars:
    a. Governance (Structural Imperative): The foundational rules and systems, including Shariah-compliant supply chain engineering and Halal-by-Design protocols. This pillar provides the essential "license to operate" through codified compliance mechanisms.
    b. Leadership (Catalytic Imperative): Ethical agency and transformative leadership that embeds *Maqasid al-Shariah* values into organisational culture. This pillar transforms Halal compliance from external imposition into an internally driven organisational ethos.
    c. Sustainability (Strategic Imperative): Integration of Halal-Tayyiban principles with ESG and Triple Bottom Line (Planet, People, Profit). This pillar positions sustainability not as an add-on but as a core component of wholesomeness.
- Outer Ring: External enablers that influence and support the model, including Global ESG Frameworks, UN SDGs, ASEAN Policy, and Wawasan 2035.
- Bi-directional Arrows: Represent continuous reinforcement between pillars—robust governance enables ethical leadership; visionary leadership drives sustainability beyond compliance; and strong sustainability performance legitimises governance and strengthens leadership, forming a virtuous cycle.
- Colour Coding:
    a. Gold Dome: Strategic value of Halal integrity
    b. Purple Pillar: Governance

c. Teal Pillar: Leadership
d. Blue Base: Sustainability

This architectural metaphor conveys stability, interdependence, and resilience, highlighting that Halal integrity in heavy industry requires a holistic, system-level approach rather than a narrow compliance-centric view.

Deconstructing the GLS Model: From Silos to Synergy

The central proposition of this study is that the prevailing, compliance-centric approach to Halal is inadequate for the complexities of heavy industry. The GLS Model addresses this by framing Halal integrity as a system-level outcome.

Pillar 1: Governance (The Structural Imperative)

This pillar constitutes the non-negotiable, rule-based foundation. It involves the codification of Shariah principles into auditable, technical systems. In the context of heavy industry, this transcends basic certification to encompass:

- Shariah-Compliant Supply Chain Engineering: Implementing Halal-by-Design protocols for new processes, conducting critical control point (CCP) analysis for *najs* (impurity) risks akin to HACCP, and embedding legally enforceable Halal clauses into all supplier contracts (Halal Certificate and Halal Label (Amendment) Order 2017; PBD 24:2007).
- Systematic Integrity Verification: Ensuring *istihalah* (chemical transformation) is scientifically verified and supply chain opacity is mitigated through robust documentation and traceability systems.
- Regulatory Alignment: Ensuring compliance with Brunei's Halal certification standards and international industrial regulations, creating a unified compliance framework that addresses both religious and technical requirements.

The governance pillar provides the essential structural assurance, establishing clear expectations, accountability mechanisms, and verification procedures. However, the model posits that governance, without ethical agency, remains a hollow shell.

Pillar 2: Leadership (The Catalytic Imperative)

This pillar embodies Transformative Ethical Stewardship, which moves beyond enforcing rules to instilling values. It concerns the cultivation of an organisational culture where the *Maqasid al-Shariah*—particularly *amanah* (trust) and *maslahah* (public good)—become heuristics for strategic decision-making (Dusuki & Abdullah, 2007). Key aspects include:

- Ethical Culture Development: Leadership that champions ethics not as a compliance cost but as a strategic differentiator, institutionalising this through ethics-based performance metrics and leadership development programmes focused on *fiqh al-mu'amalat* (commercial jurisprudence) in an industrial context (Idris, 2021).
- Values-Driven Decision-Making: Embedding Islamic ethical principles into organisational culture and decision-making processes, transforming Halal compliance from a procedural requirement into a strategic organisational ethos.
- Stakeholder Trust: Fostering stakeholder trust through transparent, accountable leadership that demonstrates commitment to both religious principles and operational excellence.

This leadership pillar breathes ethical life into governance structures, transforming them from static rules into a vibrant organisational ethos.

Pillar 3: Sustainability (The Strategic Imperative)

The analysis reveals a profound synergy between the Halal-Tayyiban paradigm and the Triple Bottom Line (TBL), positioning sustainability not as an add-on but as a core component of *Tayyib* (wholesomeness). This pillar advocates for TBL through a Maqasid Lens, where:

- Planet is the fulfilment of *khalifah* (stewardship), demonstrated through investments in circular economy principles, carbon neutrality roadmaps, and advanced pollution control.
- People is the enactment of *maslahah* and *adl* (justice), ensuring community welfare, worker rights, and equitable economic participation.
- Profit is the generation of *Halal* rizq (sustenance), ensuring long-term viability through ethical, sustainable operations that appeal to a growing market of ESG-conscious investors (Idris et al., 2022).

For a petrochemical entity like Hengyi, this synthesis can be operationalised through tangible commitments. The company's investments in advanced effluent treatment, carbon emission reduction technologies, and public sustainability targets (Hengyi Industries, 2023) can be understood as potential manifestations of *Tayyib's* operational principles. These commitments align with the United Nations Sustainable Development Goals (SDGs), particularly SDG 9 (Industry, Innovation and Infrastructure), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action) (United Nations, 2015).

Interdependence and Synergy

The GLS Model's core contribution is its emphasis on interdependence. The three pillars do not operate in isolation but reinforce each other through continuous interaction:

1. Governance → Leadership: Strong governance creates the institutional structures that enable ethical leadership to flourish without descending into arbitrariness. Clear rules provide the boundaries within which leadership can exercise discretion and innovate.
2. Leadership → Sustainability: Visionary leadership drives sustainability beyond mere regulatory compliance by embedding environmental and social considerations into strategic decision-making.
3. Sustainability → Governance: Robust sustainability performance legitimises and strengthens the governance framework by demonstrating tangible outcomes and creating stakeholder buy-in for compliance systems.

This virtuous cycle builds resilient Halal integrity that is both internally driven and externally validated.

Illustrative Application: The Hengyi Petrochemical Complex

The following analysis illustrates how the GLS Model might be conceptualised in practice, using the Hengyi Petrochemical Complex as an illustrative context. It is important to note that this is a conceptual illustration based on publicly available documentary evidence, not an empirical validation of the model's implementation.

Governance at Hengyi

Drawing on public documents and industry reports, Hengyi appears to operate within Brunei's regulatory framework for Halal compliance. The company's supply chain management systems include:

- Rigorous supplier audit protocols to verify material integrity and ensure compliance with both technical and, where relevant, religious requirements.
- Contractual provisions that incorporate Shariah-based compliance obligations, extending accountability throughout the value chain.
- Documentation and traceability systems that enable verification of material provenance and process integrity.

These governance mechanisms provide the structural foundation for Halal integrity, addressing the complex supply chain challenges inherent in petrochemical operations.

Leadership at Hengyi

Public sustainability reports and corporate communications suggest that leadership at Hengyi emphasises:

- Integration of ethical values into corporate culture, with employee training programmes focused on responsibility and integrity.
- Leadership accountability structures that link performance metrics to ethical and sustainability outcomes.
- Commitment to stakeholder engagement and transparent reporting on environmental and social performance.

These leadership practices potentially embody the principles of *amanah* (trust) and *maslahah* (public good), transforming Halal compliance from a procedural requirement into an organisational ethos.

Sustainability at Hengyi

Hengyi's sustainability reports (2021-2023) document commitments to:

- Environmental management through investments in advanced effluent treatment, emission reduction technologies, and water recycling infrastructure.
- Community engagement and social responsibility programmes that contribute to local economic development.
- Alignment with global sustainability targets, including the UN SDGs and Brunei's Vision 2035.

These sustainability initiatives can be understood as tangible manifestations of the *Tayyib* principle, demonstrating how Halal integrity extends beyond product-level certification to encompass environmental stewardship and social responsibility.

Integration and System Effects

The conceptual illustration suggests that at Hengyi, the three dimensions interact to create integrated Halal integrity:

- Governance structures provide the essential "rules of the game" that ensure material purity and process integrity.
- Leadership animates these structures with ethical purpose, creating a culture where compliance is internally driven rather than externally imposed.
- Sustainability initiatives demonstrate the practical outcomes of Halal-Tayyiban principles, enhancing stakeholder trust and market legitimacy.

This integration, if realised in practice, would create a virtuous cycle where each pillar

reinforces the others, building a resilient and authentic Halal governance system.

Regional Contextualisation: The ASEAN Halal Governance Spectrum

To situate the Bruneian GLS Model within the broader regional landscape, a comparative analysis was conducted, summarised in Table 1. This reveals a spectrum of regulatory philosophies, from state-centric moral economies to market-driven adaptations.

Table 1. Comparative Analysis of Halal Governance Orientations in Industrial Applications

Country	Regulatory Archetype	Key Institutional Mechanisms	Industrial Application & Focus	Prevailing Leadership Model
Brunei	**State-Led, Ethics-Based**	Halal Act; PBD 24:2007; GLS Framework	Petrochemicals (Hengyi); Holistic Integration	Stewardship Leadership
Malaysia	**Institutional-Pluralist**	MS1500 Series; JAKIM Ecosystem; HRC	Halal Logistics, Chemicals, Cosmetics	Collaborative Management
Indonesia	**Regulatory-Mandatory**	UU JPH; BPJPH Authority; Mandatory Certification	Industrial Lubricants, Additives	Compliance-Focused Leadership
Japan	**Market-Pragmatist**	Voluntary Certification; JAKIM/MS1500 Adoption	Food Additives, Specialty Chemicals	Adaptive Leadership

Note: This comparative analysis is derived from publicly available regulatory documents and scholarly literature (Idris et al., 2025; Tieman, 2011). References for each country's regulatory framework are provided in the evidence matrix section.

This comparative lens illuminates Brunei's distinctive position. While Malaysia boasts unparalleled institutional capacity and Indonesia wields regulatory scale, Brunei's GLS Model, with its foundational emphasis on ethical leadership and sustainability integration, offers a unique and transferable blueprint for embedding deep ethical reasoning into the heart of heavy industry—a sector often resistant to such paradigms.

CONCLUSION

Synthesis and Theoretical Contribution

This research has posited and delineated the Governance–Leadership–Sustainability (GLS) Model, a novel conceptual framework that systematically extends the boundaries of Halal governance into the complex, high-stakes domain of heavy industry. By moving beyond a reductive, compliance-centric view, the model redefines Halal integrity as a dynamic, synergistic system where rigorous legal structures, transformative ethical leadership, and deeply integrated

sustainability principles are not merely complementary but are mutually constitutive.
The theoretical contribution of this study is threefold:

1. Extension of Halal Governance Theory: The GLS Model extends Halal governance theory beyond consumer sectors into heavy industry, providing a conceptual apparatus for navigating the distinctive challenges of petrochemical operations. This addresses a significant gap in the literature, which has predominantly focused on certification processes and consumer trust (Tieman, 2011; Wilson, 2010).
2. Integration of Disparate Strands: By synthesising governance, leadership, and sustainability perspectives within a unified framework, the study bridges silos in the existing literature. Prior work has addressed these dimensions separately (Dusuki & Abdullah, 2007; Idris, 2021; Idris et al., 2022); the GLS Model integrates them into a coherent system.
3. Maqasid-Based Industrial Ethics: The model operationalises *Maqasid al-Shariah* within an industrial context, demonstrating how Islamic ethical principles—*amanah*, *tayyib*, *maslahah*—can guide complex industrial decision-making. This contributes to the growing discourse on Islamic business ethics and its application to contemporary challenges.

The conceptual application of this framework to the Hengyi Petrochemical Complex demonstrates its potential viability, illustrating how a flagship industrial entity might harmonise the tenets of Islamic ethics with the demands of global competitiveness and environmental stewardship, thereby positioning Brunei as a vanguard of a new, ethically-grounded industrial paradigm in ASEAN.

Policy and Managerial Implications

The insights derived from this study carry significant implications for practice and regional policy: Strategic Policy Harmonisation: ASEAN policymakers are encouraged to move beyond technical standardisation to champion the development of an ASEAN Industrial Halal Standard (AIHS) that explicitly incorporates the tripartite GLS dimensions. Such a standard could facilitate cross-border trade while elevating the region's collective ethical benchmark. Specifically, such a standard could include:

- Governance requirements: Shariah-compliant supply chain management, material integrity verification, and supplier audit protocols.
- Leadership expectations: Ethics-based performance metrics, leadership development programmes, and organisational culture assessments.
- Sustainability criteria: Environmental management, social responsibility, and alignment with SDGs.

Investment in Ethical Leadership Capital: For corporate leaders, investing in building "Halal-Sustainable Leadership" capacity presents a strategic opportunity. This involves developing executive programmes and performance metrics that reward leaders for stewarding not just profit, but ethical culture and environmental integrity, aligning corporate strategy with the higher objectives of Islamic law. Such programmes could include:

- Executive education modules on *fiqh al-mu'amalat* in industrial contexts.
- Leadership development focused on ethical decision-making and stakeholder engagement.
- Performance metrics that balance financial, ethical, and sustainability outcomes.

Pioneering Halal-ESG Convergence: Corporations and standard-setting bodies could

consider developing a unified Halal-ESG reporting framework. By quantifying and disclosing performance across the GLS pillars, firms may enhance their appeal to the growing global cohort of impact-conscious investors and strengthen their social license to operate. This framework could include:

- Halal integrity metrics: Supplier compliance rates, material purity verification, audit findings.
- Leadership metrics: Ethics training completion, employee engagement scores, leadership accountability indicators.
- Sustainability metrics: Carbon emissions, water usage, community investment, social impact measures.

LIMITATION AND FURTHER RESEARCH

As a conceptual study, this research provides theoretical clarity and a framework for application but is inherently limited by several factors:

a. Reliance on Secondary Data: The findings are derived from secondary sources, including regulatory documents, academic literature, and corporate reports. This precludes direct empirical validation of the GLS Model's efficacy. While the synthesis is rigorous and triangulated, it does not substitute for primary data collection, and the propositions presented remain to be tested in practice.
b. Conceptual Nature: The study presents a conceptual framework that requires empirical testing. Claims regarding the model's effectiveness, viability, or impact are propositions for future research rather than established conclusions. The framework should be understood as a theoretical contribution that invites further investigation rather than a validated solution.
c. Illustrative Case Limitations: The Hengyi Petrochemical Complex serves as an illustrative context based on publicly available documentary evidence. The analysis does not constitute an empirical case study and should not be interpreted as evidence of the model's implementation or effectiveness at Hengyi. Statements regarding the company's practices are derived from public documents and should be understood as conceptual illustrations, not confirmed findings. This limitation affects the generalisability of the illustrative application.
d. Generalisability: The model is developed within the Brunei-ASEAN context and may require adaptation for application in other regulatory, cultural, or industrial settings. The findings may not be directly transferable to different national contexts with varying regulatory frameworks, cultural norms, or industrial structures.

Avenues for Future Scholarly Inquiry

The limitations of this study strategically chart a course for a robust future research agenda

Empirical Validation and Refinement

Primary research is essential to test the GLS Model's efficacy. This includes mixed-methods studies: qualitative case studies through in-depth interviews with industry managers, Shariah board members, and stakeholders, complemented by quantitative surveys to measure the correlation between GLS implementation and key performance indicators (e.g., operational resilience, brand equity, and employee engagement). Specific measurable constructs for future testing include:

- *Governance effectiveness*: Measured through audit compliance rates, supplier certification levels, and supply chain transparency indices.

- *Leadership impact*: Measured through employee surveys on ethical culture, leadership accountability perceptions, and stakeholder trust metrics.
- *Sustainability outcomes*: Measured through environmental performance indicators, community impact assessments, and ESG ratings.

Technological Enablement of Integrity

Future research should investigate the role of Industry 4.0 technologies as enablers of the GLS Model. This includes designing and testing blockchain architectures for immutable Halal supply chain provenance and developing AI algorithms for predictive *fiqh*-based risk assessment in complex industrial processes.

Cross-Sectoral Application and Theory Building

The model's applicability should be explored in other capital-intensive sectors such as energy, mining, and aerospace. Comparative cross-industry analysis would help refine the GLS Model into a broader theory of Islamic industrial ethics, identifying universal principles and context-specific adaptations.

Impact Assessment and Metric Development

A critical next step is to develop and validate a set of metrics for "Halal Integrity Impact." Research should focus on creating standardised tools to measure the socio-economic and environmental outcomes of GLS-aligned operations, providing tangible evidence of its value proposition.

Concluding Reflection

By advancing the GLS Model, this paper does more than propose a framework; it issues a call to reimagine the very purpose of industry through an integrative ethical lens. It invites scholars and practitioners to join a critical dialogue on expanding the Halal ecosystem beyond consumer markets to forge a future where industrial might, ethical fidelity, and planetary health are seen not as competing priorities, but as the inseparable pillars of a truly sustainable and virtuous global economy.

The GLS Model challenges the global industrial sector to consider not just *what* is produced, but the ethical and sustainable integrity of *how* it is produced. In doing so, it positions Brunei and its flagship enterprise, Hengyi, not as passive adopters of global standards, but as potential architects of a new ethically-grounded industrial paradigm. This model suggests that in the 21st century, operational excellence, religious piety, and environmental stewardship need not be mutually exclusive but may, in fact, be foundational elements of truly resilient and reputable global enterprise.

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