
SIGAF: A SHARIA-INFORMED GOVERNANCE FRAMEWORK FOR ARTIFICIAL INTELLIGENCE IN ISLAMIC DA'WAH APPLICATIONS

Dimas Yudha Prawira

International Open University

ABSTRACT

The increasing adoption of Artificial Intelligence (AI), particularly Large Language Models (LLMs), has significantly transformed the delivery of Islamic knowledge through digital da'wah applications. AI-powered systems offer substantial opportunities to improve accessibility, personalization, multilingual communication, and continuous religious assistance. However, these advancements also introduce critical challenges related to Sharia compliance, content authenticity, hallucinated responses, algorithmic bias, transparency, accountability, human oversight, and data privacy. Although previous studies have explored the opportunities and ethical implications of AI in Islamic da'wah, existing research remains largely conceptual and lacks a comprehensive governance framework that systematically integrates internationally recognized AI governance standards with Sharia principles. This study addresses this gap by developing SIGAF (Sharia-Informed Governance Framework), a governance framework specifically designed for AI-powered Islamic da'wah applications. The proposed framework adopts the Design Science Research (DSR) methodology and integrates ISO/IEC 42001, the NIST AI Risk Management Framework, OECD AI Principles, and Maqasid al-Shariah into a unified governance model. SIGAF consists of nine governance domains covering organizational governance, Sharia governance,

data governance, AI model governance, ethical governance, risk and compliance, human oversight, operational governance, and continuous monitoring. The framework provides governance principles, governance controls, and implementation guidelines to ensure trustworthy, transparent, accountable, and Sharia-compliant AI systems throughout the AI lifecycle. SIGAF is expected to serve as a practical reference for researchers, AI developers, Islamic institutions, and policymakers in developing responsible AI applications within Islamic digital ecosystems.

Keywords: Artificial Intelligence Governance, Islamic Da'wah, Sharia-Informed AI, Design Science Research, AI Governance Framework, ISO/IEC 42001, NIST AI Risk Management Framework.

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1. INTRODUCTION

The rapid advancement of Generative Artificial Intelligence (GenAI), particularly Large Language Models (LLMs), has fundamentally transformed how knowledge is created, accessed, and disseminated. Unlike conventional information systems, LLMs are capable of generating context-aware responses, interpreting natural language, and providing conversational assistance across diverse knowledge domains.

As a result, AI-powered applications have been increasingly adopted in education, healthcare, finance, public administration, and religious services to improve accessibility, efficiency, and user engagement.

Within the Islamic digital ecosystem, Artificial Intelligence has emerged as an enabling technology for modern da'wah by supporting interactive learning, multilingual communication, intelligent information retrieval, and personalized religious education. AI-powered chatbots and virtual assistants are increasingly utilized to answer religious inquiries, recommend learning resources, explain Islamic concepts, and facilitate access to the Qur'an, Hadith, and other authoritative references. These innovations have expanded the reach of Islamic knowledge beyond geographical and temporal limitations, allowing individuals to obtain religious guidance anytime and anywhere.

Despite these opportunities, the application of AI in Islamic da'wah presents governance challenges that differ fundamentally from those encountered in general AI applications. AI systems generate probabilistic outputs rather than deterministic answers, making them susceptible to hallucinations, factual inaccuracies, algorithmic bias, and inconsistent reasoning. In the context of Islamic teachings, these limitations may lead to the dissemination of incorrect religious information, unsupported legal opinions, misleading interpretations of Islamic texts, or recommendations that conflict with established Sharia principles. Consequently, ensuring the trustworthiness and integrity of AI-generated

religious content becomes not merely a technical concern but also a theological, ethical, and societal responsibility.

In response to the growing adoption of AI, numerous international organizations have introduced governance standards and responsible AI frameworks to promote trustworthy AI systems. ISO/IEC 42001 establishes requirements for Artificial Intelligence Management Systems (AIMS), while the NIST AI Risk Management Framework (AI RMF) provides guidance for identifying, assessing, mitigating, and monitoring AI-related risks throughout the AI lifecycle. Likewise, the OECD AI Principles emphasize transparency, accountability, robustness, fairness, and human-centered values as essential characteristics of responsible AI. Collectively, these frameworks provide comprehensive governance mechanisms for AI deployment across multiple sectors.

However, existing AI governance frameworks are intentionally domain-neutral. They are designed to be applicable across industries and jurisdictions and therefore do not explicitly address governance requirements for religious AI applications. Critical elements required in Islamic digital environments—including Sharia compliance, scholarly validation, religious authority, verification of Islamic sources, adherence to Maqasid al-Shariah, and continuous oversight by qualified scholars—are beyond the scope of current international AI governance standards. Consequently, applying existing frameworks without contextual adaptation may be insufficient for AI systems intended to support Islamic da'wah.

Existing studies on Artificial Intelligence in Islamic da'wah similarly reveal an important research limitation. Previous research has primarily examined the potential benefits of AI for expanding access to Islamic knowledge, improving educational experiences, and supporting religious communication. Other studies have discussed ethical implications, misinformation risks, and the necessity of human supervision in AI-assisted religious services. Nevertheless, these studies remain predominantly conceptual and descriptive. They generally recommend compliance with Islamic ethical principles without proposing an operational governance framework that defines governance structures, governance controls, implementation mechanisms, or assessment procedures for AI-powered Islamic da'wah applications.

This limitation reveals a significant research gap. While international AI governance standards provide organizational and technical governance mechanisms, they lack explicit integration with Sharia principles. Conversely, existing studies in Islamic AI emphasize ethical compliance but do not translate these principles into implementable governance practices that can guide AI developers, Islamic organizations, or regulatory bodies. Therefore, there remains no comprehensive governance framework that systematically integrates internationally recognized AI governance standards with Sharia principles throughout the complete AI lifecycle, from data acquisition and model development to deployment, monitoring, auditing, and continuous improvement.

To address this gap, this study proposes SIGAF (Sharia-Informed Governance Framework), a governance framework

specifically designed for Artificial Intelligence in Islamic da'wah applications. SIGAF integrates internationally recognized AI governance standards—including ISO/IEC 42001, the NIST AI Risk Management Framework, and the OECD AI Principles—with Islamic governance concepts derived from the Qur'an, Sunnah, and Maqasid al-Shariah. Rather than introducing an alternative governance model, SIGAF extends existing AI governance practices by incorporating Sharia-oriented governance domains, governance controls, implementation guidelines, and compliance mechanisms that address the unique characteristics of AI-enabled religious services.

This research adopts the Design Science Research (DSR) methodology because the primary objective is to design and evaluate a governance artifact capable of addressing an identified organizational and societal problem. Through iterative design, refinement, and expert validation, the proposed framework aims to provide practical governance guidance for AI developers, Islamic institutions, policymakers, and researchers seeking to implement trustworthy, transparent, accountable, and Sharia-compliant AI systems.

Accordingly, this study addresses the following research question:

How can internationally recognized AI governance standards be systematically integrated with Sharia principles to develop a comprehensive governance framework for Artificial Intelligence in Islamic da'wah applications?

The principal contribution of this research is the development of SIGAF, a Sharia-informed AI governance framework that

bridges the gap between contemporary AI governance standards and Islamic governance principles. The framework is expected to contribute to both AI governance literature and Islamic digital transformation by providing a structured governance model that supports the responsible, ethical, and trustworthy implementation of Artificial Intelligence in Islamic da'wah applications.

2. REVIEW OF LITERATURE

2.1 Artificial Intelligence Governance

Artificial Intelligence (AI) governance has become an essential discipline in ensuring that AI systems are designed, developed, deployed, and monitored in a trustworthy, ethical, and accountable manner. As AI systems increasingly influence organizational decision-making and public services, governance extends beyond technical implementation to encompass organizational policies, regulatory compliance, risk management, ethical oversight, and continuous monitoring throughout the AI lifecycle.

Recent international initiatives have established comprehensive governance guidance for responsible AI implementation. ISO/IEC 42001 introduces the Artificial Intelligence Management System (AIMS), providing organizations with a structured management framework for AI governance. Similarly, the NIST Artificial Intelligence Risk Management Framework (AI RMF) focuses on identifying, measuring, mitigating, and continuously managing AI-related risks. In parallel, the OECD AI Principles promote transparency, accountability, fairness, robustness, and human-centered values as the foundation for trustworthy AI. Collectively, these

frameworks provide a comprehensive governance foundation that supports responsible AI implementation across various industrial sectors.

Although these frameworks are comprehensive, they are intentionally designed to be domain-neutral. Consequently, they do not explicitly address governance requirements for AI applications operating within religious environments where theological correctness, religious authority, Sharia compliance, and scholarly validation are fundamental governance objectives. This limitation creates an opportunity to investigate how existing AI governance standards may be extended to accommodate governance requirements specific to Islamic digital ecosystems.

2.2 Artificial Intelligence Governance

Digital transformation has significantly influenced the evolution of Islamic da'wah. Conventional methods of religious dissemination are increasingly complemented by digital platforms, including mobile applications, intelligent search engines, virtual assistants, and AI-powered conversational systems. The emergence of Generative AI has accelerated this transformation by enabling AI systems to provide contextual responses, multilingual interaction, automated content generation, and personalized learning experiences.

Recent studies indicate that AI offers considerable opportunities to expand access to Islamic knowledge, improve educational effectiveness, and strengthen engagement between Islamic institutions and the public. AI-powered systems can assist users in retrieving Qur'anic verses, Hadith

references, Islamic jurisprudence, and educational materials through natural language interaction. These capabilities have positioned AI as an important technological enabler for contemporary digital da'wah.

Nevertheless, researchers consistently identify several challenges associated with AI adoption in religious contexts. These include hallucinated responses, misinformation, algorithmic bias, inadequate explainability, privacy concerns, declining reliance on qualified scholars, and uncertainty regarding the religious validity of AI-generated content. Such concerns demonstrate that successful AI adoption in Islamic da'wah requires not only technological capability but also an effective governance structure capable of ensuring the accuracy, trustworthiness, and accountability of religious information.

2.3 Sharia Principles for AI Governance

Islamic ethics provide a comprehensive normative foundation for evaluating technological innovation. Within Islamic jurisprudence, technology should contribute to public benefit (*maslahah*) while preventing harm (*mafsadah*). Consequently, AI systems deployed in Islamic contexts should not merely satisfy technical performance indicators but also preserve religious integrity and ethical responsibility.

Among the most influential concepts is Maqasid al-Shariah, which emphasizes the protection of religion, life, intellect, lineage, and property. These objectives offer ethical guidance for evaluating AI systems from an Islamic perspective. Additional principles—including *amanah* (trustworthiness), *adl*

(justice), *ihsan* (excellence), *tabayyun* (verification), and *shura* (consultation)—can further strengthen AI governance by promoting transparency, accountability, verification of information, and human oversight throughout the AI lifecycle.

Emerging literature increasingly argues that Sharia principles should not only function as ethical recommendations but also be translated into governance mechanisms capable of guiding organizational policies, AI development processes, and operational decision-making. However, practical implementation guidance remains limited, particularly outside domains such as Islamic finance.

2.4 Design Science Research for Governance Framework Development

Design Science Research (DSR) is widely recognized within Information Systems research as an appropriate methodology for developing innovative artifacts intended to solve practical organizational problems. Unlike explanatory research, which seeks to understand existing phenomena, DSR focuses on creating and evaluating artifacts such as models, architectures, methods, and governance frameworks.

The DSR process generally consists of problem identification, objective definition, artifact design, demonstration, evaluation, and communication. Through iterative refinement and expert validation, DSR enables researchers to integrate theoretical knowledge with practical implementation requirements. Previous studies have successfully applied DSR to develop enterprise architecture frameworks, cybersecurity governance

models, digital transformation frameworks, and AI governance solutions.

Considering that the primary objective of this research is to develop a governance framework rather than evaluate an existing information system, DSR provides an appropriate methodological foundation for designing and validating SIGAF.

2.5 Research Gap

The literature demonstrates two significant streams of research. The first focuses on international AI governance standards, emphasizing responsible AI, risk management, transparency, accountability, and organizational governance. The second investigates AI adoption within Islamic contexts, highlighting ethical considerations, opportunities for digital da'wah, and the importance of Sharia compliance.

Despite their complementary objectives, this research streams remain largely disconnected. Existing AI governance frameworks provide comprehensive governance mechanisms but do not explicitly integrate Sharia principles into governance processes. Conversely, studies concerning AI in Islamic da'wah emphasize ethical values without translating them into implementable governance domains, governance controls, assessment mechanisms, or lifecycle management practices.

Therefore, a significant research gap exists in the absence of a comprehensive governance framework capable of integrating internationally recognized AI governance standards with Sharia principles throughout the AI lifecycle. Addressing this gap, the present study proposes SIGAF (Sharia-Informed Governance Framework) as a structured governance framework designed to

support trustworthy, transparent, accountable, and Sharia-compliant Artificial Intelligence in Islamic da'wah applications.

Table 1. Research gap comparison

No.	Study / Framework	Research Focus	Method	Main Contribution	Identified Limitation
1	ISO/IEC 42001:2023	Artificial Intelligence Management System (AIMS)	International Standard	Provides a comprehensive management system for AI governance, including policies, risk management, continual improvement, and organizational governance.	Designed as a domain-neutral standard and does not include religious governance or Sharia compliance.
2	NIST AI Risk Management Framework (AI RMF 1.0)	AI Risk Governance	Risk Management Framework	Defines four governance functions (Govern, Map, Measure, and Manage) to support trustworthy AI across the AI lifecycle.	Focuses on AI risk management without addressing religious authority or theological validation.
3	OECD AI Principles	Responsible AI	International Policy Framework	Establishes principles including transparency, accountability, fairness, robustness, and human-centered values for responsible AI.	Provides high-level principles but limited implementation guidance for domain-specific governance.
4	Religious Ethics in the Age of AI (2026)	Religious Ethics and AI Governance	Comparative Qualitative Study	Demonstrates that Islamic, Christian, and Buddhist ethical traditions can	Does not develop an operational governance framework or implementation

				enrich modern AI governance by contributing long-standing moral values.	on controls specific to Islamic AI applications.
5	Ethical Pluralism in AI Policy (2025)	Integration of <i>Maqāṣid al-Sharīah</i> with Global AI Governance	Conceptual Mapping	Shows conceptual alignment between Islamic ethical principles and global AI governance frameworks.	Stops at conceptual mapping and does not propose a governance lifecycle or implementation model.
6	Studies on AI in Islamic Da'wah	AI Adoption for Islamic Education and Da'wah	Literature Review / Qualitative	Discuss opportunities and ethical concerns of AI for Islamic learning, religious communication, and digital da'wah.	Focus primarily on ethics and adoption; lack structured governance domains, governance controls, and assessment mechanisms.
7	This Study (SIGAF)	AI Governance for Islamic Da'wah Applications	Design Science Research (DSR)	Develops SIGAF, integrating ISO/IEC 42001, NIST AI RMF, OECD AI Principles, and Sharia principles into a comprehensive governance framework for AI-powered Islamic da'wah applications.	Not applicable (proposed framework).

Source: The author(s) own work.

3. RESEARCH METHODOLOGY

3.1 Research Design

This study employs the Design Science Research (DSR) methodology proposed by Peffers et al. (2007) to develop a novel governance framework for Artificial Intelligence in Islamic da'wah applications. Design Science Research is widely recognized in Information Systems research for creating innovative artifacts that address real-world organizational problems through systematic design, development, and evaluation.

Unlike explanatory or descriptive research, which focuses on understanding existing phenomena, DSR aims to produce practical artifacts such as models, frameworks, architectures, methods, and systems that solve identified problems while contributing to scientific knowledge. In this study, the artifact is SIGAF (Sharia-Informed Governance Framework), which integrates internationally recognized AI governance standards with Sharia principles to support responsible AI implementation within Islamic digital ecosystems.

The overall research process consists of six iterative stages: (1) Problem Identification, (2) Definition of Objectives, (3) Design and Development, (4) Demonstration, (5) Evaluation, and (6) Communication.

3.2 Research Framework

The research framework is illustrated through the Design Science Research process shown in Figure 1.

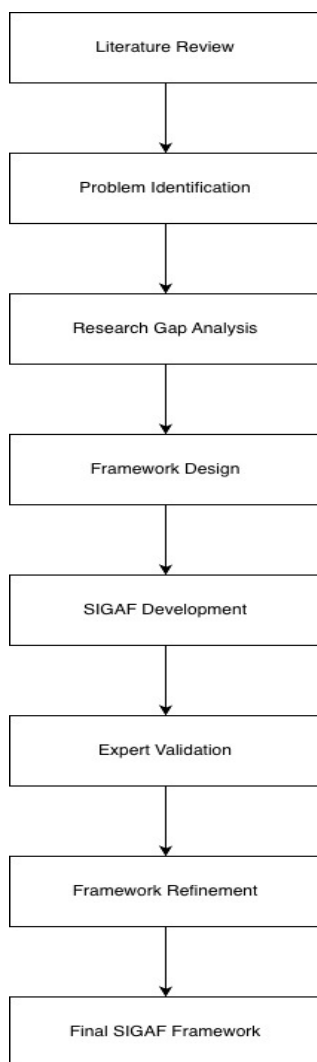


Figure 1. Design research process

The framework begins with an extensive literature review to identify governance challenges associated with Artificial Intelligence in Islamic da'wah applications. The identified research gap becomes the foundation for designing SIGAF, which is subsequently validated through expert evaluation before producing the final governance framework.

3.3 Design Science Research Process

Stage 1 – Problem Identification

The first stage focuses on identifying governance challenges associated with AI adoption in Islamic da'wah applications. A comprehensive review of scientific literature, international AI governance standards, responsible AI guidelines, and Islamic governance principles was conducted.

The review revealed that although numerous governance standards have been developed—including ISO/IEC 42001, the NIST AI Risk Management Framework, and the OECD AI Principles—none explicitly addresses governance requirements related to Sharia compliance, religious authority, verification of Islamic sources, or theological accountability.

Similarly, existing studies concerning AI in Islamic da'wah emphasize ethical considerations and opportunities for digital transformation but generally do not propose structured governance mechanisms for AI lifecycle management.

Stage 2 – Definition of Research Objectives

Based on the identified research gap, this study defines the following research objective:

To develop SIGAF, a Sharia-Informed Governance Framework capable of integrating internationally recognized AI governance standards with Sharia principles in order to support trustworthy, transparent, accountable, secure, and Sharia-compliant Artificial Intelligence throughout the AI lifecycle.

The framework is expected to serve as practical guidance for AI developers, Islamic organizations, policymakers, and researchers.

Stage 3 – Design and Development

The third stage involves designing SIGAF by synthesizing governance concepts derived from multiple authoritative sources.

The primary knowledge sources include:

- ISO/IEC 42001 Artificial Intelligence Management System (AIMS)
- NIST AI Risk Management Framework
- OECD AI Principles
- UNESCO Recommendation on the Ethics of AI
- Maqasid al-Shariah
- Qur'an
- Sunnah
- Islamic governance literature

These references are analyzed and mapped to identify governance principles applicable to AI-powered Islamic da'wah applications.

The resulting framework consists of five structural components:

- Governance Principles
- Governance Domains
- Governance Controls
- Implementation Guidelines
- Assessment Criteria

Stage 4 – Demonstration

The proposed framework is demonstrated conceptually by mapping governance controls across the complete lifecycle of AI-enabled Islamic da'wah applications.

The lifecycle consists of:

- Data Collection
- Data Preparation
- Model Development
- Model Evaluation
- Deployment
- Monitoring
- Continuous Improvement

Each lifecycle stage is associated with relevant governance controls to ensure organizational accountability, transparency, human oversight, and compliance with Sharia principles.

Stage 5 – Evaluation

The proposed framework is evaluated through expert judgment.

Experts are selected based on their expertise in one or more of the following areas:

- Artificial Intelligence
- Enterprise Architecture
- AI Governance
- Information Systems
- Islamic Studies
- Digital Transformation

The evaluation assesses SIGAF using five criteria:

Table 2. Evaluation assessment of SIGAF

Evaluation Criteria	Description
Completeness	Coverage of governance domains
Consistency	Internal consistency among governance components
Applicability	Practical implementation in Islamic and Sharia principles
Compliance	Alignment with AI governance standards and Sharia principles
Usability	Ease of adoption by organizations

Source: The author(s) own work.

Suggestions obtained during expert evaluation are incorporated into the refinement process.

Stage 6 – Communication

The final stage communicates the research outputs through scholarly publication.

The final artifact includes:

- SIGAF Architecture
- Governance Domains
- Governance Controls
- Governance Mapping Matrix
- Implementation Guidelines
- Framework Validation Results

The framework is intended to contribute both theoretically and practically to AI governance within Islamic digital ecosystems.

3.4 Knowledge Sources

The development of SIGAF relies on two complementary categories of knowledge sources.

The first consists of internationally recognized AI governance standards, including ISO/IEC 42001, NIST AI RMF, OECD AI Principles, and UNESCO Recommendation on the Ethics of Artificial Intelligence.

The second consists of Islamic governance principles derived from the Qur'an, Sunnah, Maqasid al-Shariah, and contemporary Islamic ethics literature.

The integration of these two knowledge domains enables SIGAF to address both technical governance requirements and Sharia compliance.

3.5 Framework Development

Framework development follows a synthesis-based approach. Each governance requirement identified from international standards is analyzed and mapped against relevant Sharia principles. For example:

- Transparency → *Tabayyun*
- Accountability → *Amanah*
- Human Oversight → *Shura*
- Fairness → *Adl*
- Risk Management → *Maslahah*
- Continuous Improvement → *Ihsan*

The mapping process forms the conceptual foundation of SIGAF.

3.6 Framework Validation

To ensure the credibility of the proposed framework, validation is performed through expert review. Experts evaluate:

- relevance,

- completeness,
- clarity,
- consistency,
- feasibility,
- and Sharia compliance.

Qualitative feedback is analyzed and incorporated into framework refinement. Future empirical studies may extend the validation through case studies or pilot implementation within Islamic organizations.

4. Data Analysis

This research adopts qualitative thematic analysis. Data obtained from the literature review and expert evaluation are systematically coded into governance themes. The coding process categorizes findings into:

- Governance Principles
- Governance Domains
- Governance Controls
- AI Lifecycle Activities
- Sharia Compliance Requirements

The categorized findings are subsequently synthesized into the final SIGAF architecture.

4.1 Research Output

The primary research output is SIGAF (Sharia-Informed Governance Framework), consisting of:

- Governance Principles
- Governance Domains
- Governance Controls
- Governance Mapping Matrix
- AI Lifecycle Governance
- Implementation Guidelines
- Assessment Checklist

These components collectively provide a structured governance model to support trustworthy, transparent, accountable, and Sharia-compliant Artificial Intelligence in Islamic da'wah applications.

4.2 Analysis

4.2.1 Comparative Analysis of Existing AI Governance Frameworks

The rapid adoption of Artificial Intelligence has encouraged governments, international organizations, and industry stakeholders to establish governance frameworks that promote responsible, trustworthy, and accountable AI systems. Among the most influential governance references are ISO/IEC 42001, the NIST Artificial Intelligence Risk Management Framework (AI RMF), and the OECD AI Principles. These frameworks

collectively provide guidance on organizational governance, AI lifecycle management, transparency, accountability, human oversight, and risk management.

Despite their comprehensive coverage, these frameworks are intentionally designed to be domain-neutral. Their governance controls are applicable across various industries, including healthcare, finance, manufacturing, and public administration. However, they do not explicitly address governance requirements specific to religious applications where theological correctness, religious authority, verification of sacred texts, and compliance with religious doctrines are essential governance objectives.

Table 3. Summarizes the comparative analysis of internationally recognized AI governance frameworks

Framework	Primary Focus	Strengths	Limitation for Islamic Da'wah Applications
ISO/IEC 42001	AI Management System	Comprehensive organizational governance and lifecycle management	No Sharia governance, religious validation, or theological oversight
NIST AI RMF	AI Risk Management	Risk Identification, measurement, and mitigation	Focuses primarily on technical and organizational risks
OECD AI Principles	Responsible AI	Transparency, fairness, accountability, and human-centered values	High-level principles without regulatory governance mechanisms

UNESCO Recommendation on the Ethics of AI	Ethical AI	Human rights, inclusiveness, sustainability, and ethical responsibility	Generic ethical guidance without domain- specific implementation for Islamic applications
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Source: The author(s) own work.

The comparison demonstrates that existing frameworks provide strong governance foundations but remain insufficient for AI applications operating within Islamic religious environments.

4.2.2 Analysis of Governance Requirements for Islamic Da'wah Applications

Artificial Intelligence applications supporting Islamic da'wah differ significantly from conventional AI applications because their outputs influence religious understanding, ethical decision-making, and public trust. Unlike commercial AI systems, AI-generated religious information may affect worship practices, legal interpretations, and personal religious obligations. Consequently, governance requirements extend beyond technical performance to include theological accountability and religious legitimacy.

Based on the literature review, several governance requirements emerge as essential for AI-powered Islamic da'wah applications.

- **Sharia compliance** must be embedded throughout the AI lifecycle. AI systems should ensure that generated responses remain consistent with the Qur'an, authentic Hadith, and accepted scholarly interpretations.

- **Verification of Islamic knowledge sources** is essential. AI-generated content should be traceable to authoritative references to reduce the risk of misinformation or fabricated religious statements.
- **Human oversight** remains indispensable. AI should function as a decision-support tool rather than a replacement for qualified Islamic scholars, particularly when addressing complex jurisprudential issues.
- **Ethical governance** must ensure fairness, transparency, accountability, privacy protection, and responsible use of AI technologies while respecting Islamic moral values.
- **Continuous monitoring and governance improvement** are necessary because AI models evolve over time and may experience performance degradation, bias, or unintended behavioural changes.

These governance requirements extend beyond those addressed by existing international AI governance frameworks and therefore require additional governance mechanisms grounded in Sharia principles.

4.2.3 Gap Analysis

The comparative analysis reveals two parallel but disconnected streams of research. The first stream focuses on AI governance from technological, organizational, and regulatory perspectives. Existing frameworks provide comprehensive guidance on governance structures, AI risk management, organizational accountability, transparency, and lifecycle management.

Nevertheless, they do not incorporate governance mechanisms related to Islamic jurisprudence, religious authority, or Sharia compliance.

The second stream consists of studies concerning Artificial Intelligence in Islamic contexts. These studies primarily discuss ethical considerations, opportunities for digital da'wah, Islamic AI ethics, and the importance of preserving religious values. However, they generally stop at conceptual recommendations and rarely translate Islamic ethical principles into operational governance domains, governance controls, implementation procedures, or assessment mechanisms.

This analysis indicates that no existing framework simultaneously satisfies both categories of requirements. As a result, organizations intending to implement AI-powered Islamic da'wah applications lack practical governance guidance capable of integrating internationally recognized AI governance standards with Sharia principles.

4.3 Design Requirements

Based on the comparative analysis and requirement analysis, eight design requirements were formulated to guide the development of SIGAF.

Table 4. Design requirement for SIGAF development

Design Requirement	Description
DR1 - Sharia Compliance	AI governance shall ensure compliance with the Qur'an, Sunnah, and Maqasid al-Shariah.
DR2 - Organizational Governance	Governance structures, policies, roles, and responsibilities shall be clearly defined.

DR3 – Data Governance	Islamic knowledge sources shall be validated, traceable, and continuously maintained.
DR4 – AI Model Governance	AI models shall be governed throughout development, validation, deployment, and monitoring.
DR5 – Ethical Governance	AI shall comply with transparency, fairness, accountability, and privacy principles.
DR6 – Risk and Compliance	Governance shall identify and mitigate hallucination, misinformation, bias, privacy, and cybersecurity risks.
DR7 – Human Oversight	Qualified scholars and domain experts shall supervise AI-generated religious content.
DR8 – Continuous Improvement	Governance shall support monitoring, auditing, evaluation, and continual improvement.

Source: The author(s) own work.

4.4 Governance Mapping Matrix

To ensure that the proposed framework is theoretically grounded, each design requirement was systematically mapped to internationally recognized AI governance standards and relevant Sharia principles.

Table 5. Governance Mapping Matrix

Design Requirement	ISO/IEC 42001	NIST AI RMF	OECD AI Principles	Sharia Principles
DR1	Organizational Context	Govern	Human-Centered Values	Maqasid al-Shariah, Amanah
DR2	Leadership & Policy	Govern	Accountability	Amanah, Adl
DR3	Data Management	Map	Transparency	Tabayyun
DR4	AI Lifecycle	Measure	Robustness	Ihsan
DR5	Ethics Management	Govern	Fairness	Adl

DR6	Risk Management	Manage	Accountability	Maslahah
DR7	Human Supervision	Govern	Human-Centered Values	Shura
DR8	Continual Improvement	Manage	Sustainability	Islah, Ihsan

Source: The author(s) own work.

The mapping demonstrates that every component of SIGAF is derived from both internationally recognized AI governance standards and Islamic governance principles. Rather than replacing existing governance frameworks, SIGAF extends them by incorporating governance mechanisms specifically required for AI-enabled Islamic da'wah applications.

5. RESULTS AND DISCUSSION

5.1 Overview of SIGAF

Based on the findings obtained from the literature review, comparative analysis, requirement elicitation, and governance mapping process, this study proposes the Sharia-Informed Governance Framework for Artificial Intelligence (SIGAF) as a governance framework specifically designed for Artificial Intelligence in Islamic da'wah applications.

Unlike existing AI governance frameworks that primarily address organizational and technical governance, SIGAF extends these frameworks by incorporating Sharia principles into every stage of the AI governance lifecycle. The framework aims to ensure that AI systems are not only technically reliable and organizationally accountable but also compliant with Islamic principles and religious governance requirements.

SIGAF adopts a layered governance architecture consisting of four interconnected layers:

- Governance Principles
- Governance Domains
- Governance Controls
- Implementation Layer

This layered architecture enables governance requirements to be translated systematically into operational controls applicable throughout the AI lifecycle.

5.2 SIGAF Architecture

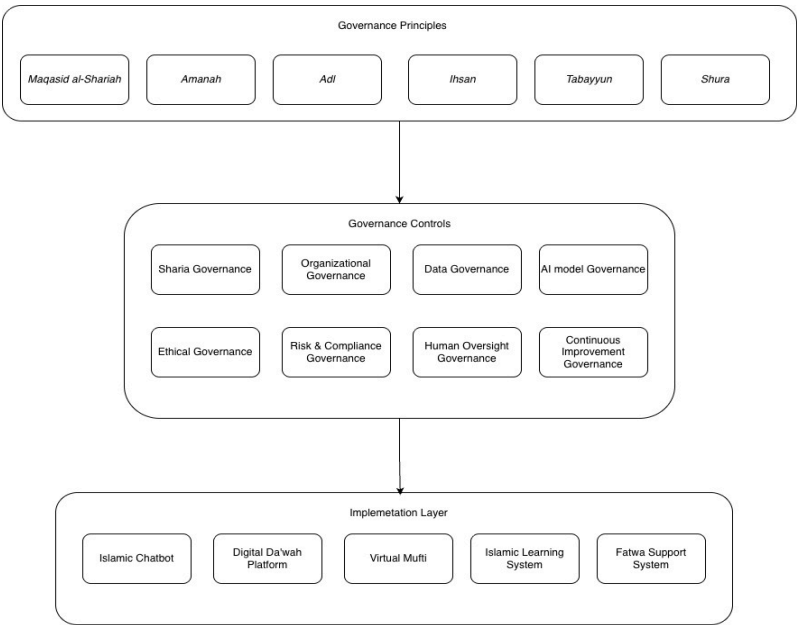


Figure 2. illustrates the overall architecture of SIGAF

The architecture demonstrates that governance principles serve as the foundational layer from which governance domains are derived. These domains are operationalized through governance controls and ultimately implemented within AI-powered Islamic da'wah applications.

5.3 Governance Domains of SIGAF

The Governance Mapping Matrix developed during the analysis phase resulted in eight governance domains that collectively constitute the core architecture of SIGAF.

Table 6. SIGAF Governance Domains

Domain	Purpose	Primary Governance Controls
Sharia Governance	Ensure compliance with Islamic principles	Sharia Board, Fatwa Review, Religious Validation
Organizational Governance	Establish governance structures and accountability	AI Policy, Governance Committee, Roles and Responsibilities
Data Governance	Govern Islamic knowledge sources	Dataset Validation, Source Verification, Data Lineage
AI Model Governance	Govern AI development and deployment	Model Validation, Explainability, Prompt Governance
Ethical Governance	Promote responsible AI	Transparency, Fairness Assessment, Privacy Protection
Risk & Compliance Governance	Manage AI risks	Risk Register, Incident Response, Compliance Monitoring
Human Oversight Governance	Maintain human supervision	Scholar Approval, Human-in-the-Loop Review
Continuous Improvement Governance	Support governance maturity	KPI Monitoring, Governance Audit, Continuous Improvement

Source: The author(s) own work.

These governance domains provide comprehensive coverage across organizational, technical, ethical, and religious dimensions of AI governance.

5.4 Governance Lifecycle

SIGAF supports governance throughout the complete AI lifecycle.

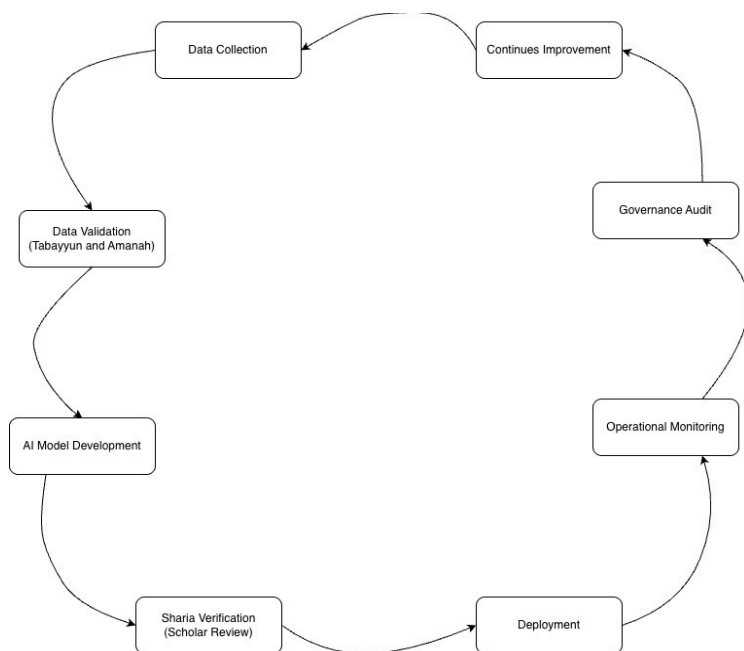


Figure 3. SIGAF Lifecycle

At each lifecycle stage, governance controls are applied to ensure AI systems remain trustworthy, transparent, secure, and Sharia-compliant.

5.5 Discussion

The proposed SIGAF framework extends existing AI governance standards by integrating organizational governance with Islamic ethical and theological principles. While ISO/IEC 42001 provides a comprehensive management system for Artificial Intelligence and the NIST AI RMF emphasizes AI risk management, neither framework explicitly incorporates mechanisms for religious governance, Sharia compliance, or scholarly validation.

Similarly, studies on Artificial Intelligence in Islamic contexts primarily focus on ethical guidance and conceptual discussions without providing operational governance structures capable of supporting AI implementation throughout its lifecycle.

SIGAF addresses these limitations through the introduction of Sharia Governance as a dedicated governance domain and by embedding Islamic principles within governance controls, AI lifecycle activities, and organizational governance processes.

Another significant contribution of SIGAF is the introduction of a layered governance architecture. Unlike conventional governance models that primarily organize governance into domains or principles, SIGAF establishes explicit relationships between governance principles, governance domains, governance controls, and implementation contexts. This layered structure improves traceability between theoretical foundations and practical implementation.

The proposed framework also supports adaptability. Although designed for Islamic da'wah applications, its governance structure may be extended to other AI-enabled Islamic services,

including Islamic education, digital fatwa systems, Islamic financial technologies, and Islamic knowledge management platforms.

Overall, SIGAF contributes both theoretically and practically by bridging the gap between international AI governance standards and Islamic governance principles, thereby enabling trustworthy and Sharia-compliant AI implementation within Islamic digital ecosystems.

6. CONCLUSION

This study addressed the growing need for a governance framework that integrates internationally recognized Artificial Intelligence (AI) governance standards with Sharia principles for AI-powered Islamic da'wah applications. Through the Design Science Research (DSR) methodology, the study systematically identified governance challenges, analyzed existing AI governance frameworks, elicited governance requirements, and developed the Sharia-Informed Governance Framework (SIGAF) as a novel governance artifact.

The findings demonstrate that existing AI governance frameworks, including ISO/IEC 42001, the NIST AI Risk Management Framework, the OECD AI Principles, and the UNESCO Recommendation on the Ethics of Artificial Intelligence, provide comprehensive guidance for organizational governance, AI lifecycle management, transparency, accountability, and risk management. However, these frameworks remain domain-neutral and do not explicitly address governance requirements unique to Islamic digital ecosystems, such as Sharia compliance, verification of Islamic

knowledge, scholarly oversight, and theological accountability. Conversely, studies on Artificial Intelligence in Islamic contexts predominantly focus on ethical considerations and digital da'wah opportunities without providing structured governance mechanisms for AI implementation.

To address this gap, this study proposed SIGAF, a layered governance framework that integrates international AI governance standards with Islamic governance principles. The framework consists of four governance layers: Governance Principles, Governance Domains, Governance Controls, and Implementation Layer. Within these layers, SIGAF defines eight governance domains: Sharia Governance, Organizational Governance, Data Governance, AI Model Governance, Ethical Governance, Risk and Compliance Governance, Human Oversight Governance, and Continuous Improvement Governance. These domains collectively support trustworthy, transparent, accountable, and Sharia-compliant AI throughout the AI lifecycle.

From a theoretical perspective, this research contributes to the AI governance literature by extending existing governance frameworks with governance mechanisms derived from Islamic principles, particularly *Maqasid al-Shariah*, *Amanah*, *Adl*, *Tabayyun*, *Shura*, and *Ihsan*. Rather than proposing an alternative to existing standards, SIGAF complements internationally recognized AI governance frameworks by providing governance components specifically required for Islamic AI applications. The introduction of a layered governance architecture and a governance mapping matrix also

offers a systematic approach for integrating religious values into AI governance.

From a practical perspective, SIGAF provides implementation guidance for organizations developing or adopting AI technologies within Islamic digital ecosystems. The framework can assist Islamic educational institutions, da'wah organizations, Islamic technology companies, mosque information systems, digital fatwa services, and policymakers in establishing governance structures that ensure responsible AI adoption while maintaining compliance with Islamic principles.

Despite these contributions, this study has several limitations. First, SIGAF is proposed as a conceptual governance framework and has not yet been empirically implemented or evaluated in operational AI systems. Second, the framework was developed primarily through literature synthesis and expert-oriented design, without large-scale organizational case studies. Third, the current framework focuses on AI applications for Islamic da'wah and may require contextual adaptation before being applied to other domains such as Islamic finance, healthcare, or public administration.

Future research should focus on validating SIGAF through expert consensus methods such as the Delphi technique, implementing pilot projects within Islamic organizations, and conducting comparative evaluations against existing AI governance frameworks. Further studies may also develop governance maturity models, quantitative assessment instruments, and automated compliance mechanisms to support continuous governance monitoring. These future developments will strengthen the applicability of SIGAF and

contribute to the broader advancement of trustworthy and Sharia-informed AI governance.

Overall, this study demonstrates that integrating international AI governance standards with Sharia principles is both feasible and necessary to address the unique governance challenges of AI-powered Islamic da'wah applications. By bridging the gap between global AI governance practices and Islamic ethical values, SIGAF provides a foundation for developing AI systems that are not only technically reliable and ethically responsible but also aligned with the principles of Islamic governance.

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