



Dialogium

Journal of Islamic Studies

Online ISSN 3163-3110

Vol. 1 No. 2, March 2026, pp.34-45

DOI: <https://doi.org/10.21831/djis.v1i2.96285>

Al-Muhaddith Al-Raqami: Hybrid AI-Sanad Epistemology for Hadith Validation

Iqbal Ramadhan Irsyad Yudiono¹, Fauzi Annur², Noor Alwiyah³

Buskorn Komontree⁴

¹²³ Universitas Islam Negeri Raden Mas Said, Indonesia

⁴ Prince of Songkla University, Thailand

Email Correspondence: ramadhanirsyad09@gmail.com

ABSTRACT (Bold, Garamond 10)

The authenticity of hadith in the digital era is increasingly challenged by massive religious disinformation that outpaces conventional manual sanad criticism. This study aims to formulate a hybrid epistemological framework, Al-Muhaddith Al-Raqami, integrating classical *naqd al-sanad* methodology with Artificial Intelligence through an AI-Sanad model. Employing a qualitative library research design based on a Systematic Literature Review (2018–2025), this research analyzes classical *‘ulum al-hadith* sources alongside contemporary computational studies in Natural Language Processing and Machine Learning. The findings demonstrate that the core principles of *sanad evaluation ittisal*, *‘adalah*, *dhabi*, *syudzudz*, and *‘illah* can be translated into computational parameters through three interconnected stages: narrator extraction using Named Entity Recognition, *sanad* network modeling via Knowledge Graph, and automated hadith classification using machine learning algorithms. This integration establishes a structured AI-Sanad architecture that preserves methodological rigor while enabling scalable and data-driven validation. The model positions AI as an epistemic assistant rather than a substitute for scholarly authority, thereby inaugurating a new direction in computational hadith studies. The framework offers both theoretical advancement in digital Islamic epistemology and practical implications for strengthening critical religious literacy against disinformation.

Keywords: Hybrid Epistemology, AI-Sanad, Computational Hadith Studies, Hadith Validation, Disinformation.

Article history

Received: March 6, 2026

Revised: April 21, 2026

Accepted: September 1, 2026

Published: September 13, 2026

Citation (APA Style): Irsyad Yudiono, I. R., Annur, F., Alwiyah, N., & Komontree, B. (2026). Al-Muhaddith Al-Raqami: Hybrid AI-Sanad Epistemology for Hadith Validation. *Dialogium: Journal of Islamic Studies*, 1(2), 34–45. <https://doi.org/10.21831/djis.v1i2.96285>

INTRODUCTION

The authentication of hadith has historically occupied a central position in the architecture of Islamic epistemology. As the second foundational source of Islamic law after the Qur'an, hadith literature functions not merely as a textual repository but as a normative guide shaping theology, jurisprudence, ethics, and social conduct. The classical discipline of *‘ulum al-hadith* emerged as a sophisticated methodological system designed to safeguard the integrity of prophetic traditions through rigorous scrutiny of transmission chains (*sanad*) and

textual content (*matn*). Scholars developed multi-layered criteria including continuity (*ittisal*), narrator integrity (*'adalab*), precision (*dhatu*), anomaly detection (*shudbudh*), and identification of hidden defects (*'illab*) to ensure that authenticity judgments were grounded in systematic verification rather than conjecture (Solahuddin and Suyadi 2022). This intellectual heritage demonstrates that Islamic scholarship has long embraced structured, rule-based reasoning aimed at preserving epistemic reliability.

The advent of digital technologies has transformed the landscape of hadith studies, inaugurating new possibilities and new challenges. The earliest phase of digitalization was characterized by the conversion of classical texts into searchable digital formats, such as PDF repositories and software databases like Maktabah Syamilah, which significantly expanded access to primary sources. While this phase enhanced availability and search efficiency, it largely replicated print-based logic in electronic form without altering methodological frameworks. The second phase witnessed the proliferation of mobile applications that enabled rapid retrieval of hadith texts, thematic indexing, and preliminary authenticity labels. Although these tools democratized access and increased public engagement, they often simplified complex authenticity debates into binary categories, thereby risking epistemological reductionism. The current phase, marked by the integration of artificial intelligence, natural language processing, and semantic web technologies, introduces the potential for automated extraction, relational modeling, and predictive classification of hadith authenticity (Alghamdi, Albukhari, and Al-Dala'in 2025). Yet, the transition from digitization to intelligent computation demands careful epistemic calibration to avoid severing technological innovation from its classical methodological roots.

Recent scholarship reflects this evolution. Al-Aswadi et al. (2020) pioneered computational approaches employing Named Entity Recognition (NER) to extract narrator names from sanad texts, thereby enabling structured data modeling. Their work represented a significant methodological leap beyond static digital repositories by operationalizing elements of hadith transmission into machine-readable formats. However, their approach primarily emphasized technical extraction and structural parsing, without fully integrating the qualitative hierarchies of *jarh wa ta'dil* that form the evaluative core of classical scholarship. Similarly, Rahat et al. (2023) advanced the field through the use of Knowledge Graph architectures to model relational connections among narrators and transmission pathways. By visualizing *sanad* networks, their framework enhanced transparency and analytical depth. Nevertheless, despite these innovations, the epistemic dimension of narrator evaluation, particularly the nuanced gradations of reliability embedded in classical biographical criticism, remained underdeveloped within their computational pipelines.

This gap reveals a critical limitation in contemporary digital hadith research: the tendency to privilege structural modeling and machine learning performance over the qualitative logic of classical authentication. While high-accuracy classifiers such as AraBERT demonstrate impressive predictive capacity (Alghamdi et al. 2025), they frequently operate as probabilistic "black boxes," offering limited interpretability regarding how classical criteria inform their outputs. The absence of integrated *jarh wa ta'dil* scoring systems within these models risks detaching computational analysis from the normative epistemology that historically governed hadith authentication. Consequently, the field requires a hybrid framework capable of

synthesizing technical sophistication with epistemological fidelity. The present study addresses this lacuna by proposing Al-Muhaddith Al-Raqami, an AI-Sanad architecture that embeds classical narrator hierarchies, graph-based continuity verification, and supervised machine learning within a transparent, traceable system.

Beyond methodological concerns, the urgency of this research is intensified by the contemporary “post-truth” condition affecting digital religious discourse. The rapid dissemination of fabricated or decontextualized hadith through social media platforms has generated widespread epistemic confusion (Fatmawati 2020). In such environments, emotional resonance often supersedes methodological verification, enabling misinformation to circulate with minimal scrutiny. From a theological perspective, the proliferation of false attributions to the Prophet constitutes not merely an informational problem but a direct threat to *hifẓ al-dīn* the preservation of religion as articulated within the objectives of Islamic law (*maqasid al-shari‘ah*). Safeguarding the integrity of prophetic traditions thus becomes an ethical imperative that transcends academic interest. As Al-Juhani (2024) argues, digital transformation in Islamic scholarship must be accompanied by epistemic responsibility to prevent distortion and misuse of sacred knowledge.

In light of these developments, this study advances a hybrid epistemological paradigm that reconceptualizes artificial intelligence as an epistemic assistant (*mu‘in*) operating within the normative boundaries of classical scholarship. By integrating NER-based extraction, Knowledge Graph modeling, and machine learning classification with quantified jarh wa ta‘dīl hierarchies, the proposed framework seeks to reconcile computational scalability with methodological transparency. In doing so, it contributes to the emerging field of Digital Islamic Humanities while reaffirming the enduring relevance of classical epistemology in the age of intelligent systems (Springer Nature 2024). The research thus positions itself at the intersection of tradition and innovation, addressing both the technical gap in existing literature and the theological urgency of preserving authentic religious knowledge in an era defined by informational volatility.

METHOD

This study employed a qualitative design using a library research approach to formulate a conceptual Hybrid Epistemology framework based on AI-Sanad. The research adopted a Systematic Literature Review (SLR) model guided by the PRISMA protocol to ensure transparency, replicability, and methodological rigor in selecting and synthesizing sources. The study was conducted from September 2025 to February 2026 at UIN Raden Mas Said Surakarta. The data consisted of two categories: primary and secondary sources. Primary data included canonical hadith corpora and classical works of *‘ulum al-hadith* that elaborate the principles of sanad criticism, while secondary data comprised 28 Scopus-indexed journal articles published between 2018 and 2025 focusing on Artificial Intelligence, Natural Language Processing, Knowledge Graph, and machine learning applications in Islamic and Arabic textual studies.

Data were collected using a documentation technique, systematically retrieving and organizing relevant literature from academic databases and authoritative repositories. The SLR process was implemented in four operational stages. First, Identification was carried out by determining specific keywords such as “*hadith* NLP,” “AI *sanad* verification,” “knowledge graph

hadith,” and “machine learning hadith authentication.” Second, Screening involved filtering publications based on relevance to the research focus, publication year, scholarly credibility, and originality. Third, Eligibility was conducted by critically examining full-text articles to ensure explicit engagement with the integration of AI methodologies and hadith epistemology. Fourth, Inclusion resulted in the selection of 40 principal sources, consisting of classical references and 28 contemporary Scopus-indexed journals. Within this library-based design, the selected scholarly works functioned as intellectual informants, representing authoritative expert perspectives whose arguments and findings were systematically analyzed.

Data analysis was conducted in three operational stages. The first stage, Conceptual Analysis, deconstructed the classical criteria of authentic hadith *ittisal al-sanad*, *‘adalah*, *dhabt*, *syudzudz*, and *‘illah* into definable conceptual components that could be potentially modeled computationally. The second stage, Comparative Analysis, examined the epistemological foundations of classical sanad criticism alongside AI-based probabilistic and data-driven methodologies to identify convergences and divergences. The third stage, Conceptual Synthesis, integrated these analytical findings into a coherent Hybrid Epistemology framework termed Al-Muhaddith Al-Raqami, articulating its theoretical architecture and operational logic. To ensure validity, the study applied theory triangulation by cross-examining classical hadith scholarship, contemporary AI research, and interdisciplinary perspectives in digital humanities, thereby strengthening the credibility and consistency of the conceptual conclusions.

RESULTS AND DISCUSSION

Operationalizing *‘Ulum al-Hadith* into AI Parameters

This study finds that the five canonical criteria of authentic hadith *ittisal al-sanad*, *‘adalah*, *dhabt*, *syudzudz*, and *‘illah* can be systematically operationalized into computational parameters without stripping them of their epistemological substance. Classical sanad continuity (*ittisal*) is modeled using directed graph connectivity, where narrators are represented as nodes and transmission relations as edges. A sanad is considered structurally valid when a complete directed path exists without disconnection, verified through graph traversal algorithms. This transformation preserves the logical core of classical chain verification while enabling large-scale structural validation beyond manual limits (Mustin, Tasbih, and Abdullah 2023).

The criterion of *‘adalah* (moral integrity) and *dhabt* (precision) is translated into quantifiable reliability attributes derived from *jarh wa ta’dil* literature (Suparta 2010). These qualitative classifications are encoded into weighted numerical scores, forming measurable indicators within the algorithm. Meanwhile, *syudzudz* (anomaly) is operationalized using outlier detection within transmission clusters. If a *sanad* path deviates statistically from dominant relational patterns in the Knowledge Graph, it is flagged as anomalous. Similarly, *‘illah* (hidden defect) is approximated through multivariate anomaly scoring that aggregates irregular narrator pairings, unusual transmission gaps, and probabilistic inconsistencies. Although computational modeling cannot fully replicate the intuitive depth of classical scholars, it offers a probabilistic alert mechanism that enhances epistemic transparency.

To standardize narrator evaluation, this study formulates a quantitative hierarchy of *jarh wa ta’dil* as shown below.

Score	Classification Level	Description
+5	<i>Thiqah Thabt</i>	Highly reliable and precise
+4	<i>Thiqah</i>	Reliable
+3	<i>Ṣadiq</i>	Generally truthful with minor weakness
+2	<i>Maqbūl</i>	Acceptable with support
+1	<i>Layyin</i>	Slight weakness
0	<i>Majbūl</i>	Unknown reliability
-1	<i>Da'if</i>	Weak narrator
-2	<i>Da'if Jiddan</i>	Very weak
-3	<i>Matruk</i>	Abandoned narration
-4	<i>Munkar al-Hadith</i>	Frequently rejected
-5	<i>Kadhbah</i>	Fabricator

Source: Synthesized from classical *jarb wa ta'dil* literature (Suparta 2010; UIN Sunan Ampel Surabaya n.d.).

The algorithm computes sanad quality by combining connectivity validation with the weighted mean of narrator scores. This approach advances prior computational studies that focused primarily on textual classification (Alghamdi et al. 2025; Salloum and Al-Emami 2018) by embedding classical epistemic hierarchy directly into machine logic. Epistemologically, this operationalization demonstrates that Hybrid Epistemology is not a reductionist project but a structured translation of normative criteria into measurable variables, reinforcing rather than replacing scholarly authority.

Al-Muhaddith Al-Raqami Architecture and Technical Workflow

The second major finding is the formulation of an integrated three-stage architecture Named Entity Recognition (NER), Knowledge Graph (KG), and Machine Learning (ML) that collectively constitutes Al-Muhaddith Al-Raqami. In the first stage, deep learning-based NER extracts narrator entities from raw sanad text by detecting transmission markers such as *haddathana* and *'an*. This method builds upon earlier extraction models (Harrag, Al-Salman, and El-Qawasmah 2014) but is refined to align with classical *sanad* sequencing logic.

In the second stage, extracted narrators are modeled within a Knowledge Graph structure, where nodes represent narrators and edges encode transmission relationships. This stage enables structural continuity analysis, centrality measurement, and anomaly detection. Previous studies have shown the potential of Knowledge Graphs in mapping hadith networks (Kamran, Butt, and Basharat 2023), yet they did not integrate epistemic scoring derived from *jarb wa ta'dil*. The present model bridges that gap by embedding classical reliability hierarchies into graph analytics.

The third stage applies supervised machine learning, with AraBERT as the primary classifier, to determine authenticity probabilities. Unlike earlier approaches that relied solely on textual sentiment or surface-level linguistic patterns (Salloum and Al-Emami 2018), this framework integrates structural, relational, and credibility-based features. Empirical benchmarks indicate that pretrained models such as AraBERT achieve very high accuracy in detecting fabricated hadith (Alghamdi et al. 2025). By combining structural validation and

probabilistic classification, the system directly addresses the contemporary challenge of digital disinformation (Fatmawati 2020). In this configuration, AI functions as an epistemic assistant accelerating verification processes while remaining subordinate to scholarly interpretation.

Implications for Contemporary Islamic Education and SDGs

The integration of AI-Sanad architecture has significant implications for contemporary Islamic education. First, it transforms hadith studies from purely textual memorization into data-driven critical inquiry. Students can visualize sanad networks, analyze narrator reliability scores, and understand authenticity through structured reasoning, aligning with calls for AI integration in Islamic education (Hafiz, Rohman, and Rohman 2024; Sofwan 2024). This shift fosters digital literacy and epistemic accountability in an era of algorithmic information flow.

Second, the model contributes to broader societal resilience against religious disinformation by providing scalable verification tools. In line with global educational transformation agendas (Aini, Ritonga, and Lahmi 2023), the framework supports SDG 4 (Quality Education) through enhanced digital-critical competence, SDG 9 (Innovation and Infrastructure) by bridging religious scholarship and computational science, and SDG 16 (Peace and Strong Institutions) by mitigating misinformation through transparent verification systems.

Compared with previous fragmented research in computational hadith analysis (Harrag et al. 2014), this study offers a coherent Hybrid Epistemology that systematically integrates classical methodological rigor with modern AI architecture. The findings demonstrate that the dialogue between scholars and algorithms is not merely technical but epistemological, opening a new paradigm in computational hadith studies while preserving the normative authority of *'ulum al-hadith*.

The Archaeology of Logic: *'Ulum al-Hadith* as a Precursor to Data Science

A deeper historical reading of classical *'ulum al-hadith* reveals that the methodological architecture developed by the *muhaddithun* may legitimately be interpreted as a precursor to modern data science. Long before the emergence of computational epistemology, early hadith scholars constructed rigorous systems for data validation, relational verification, and probabilistic judgment. The science of sanad criticism did not merely catalogue narrations; it established systematic criteria for continuity (*ittisal*), reliability (*'adalah* and *dhabt*), anomaly detection (*shudbudh*), and hidden defects (*'illah*), all of which required structured cross-referencing across thousands of transmitters and transmission routes (Mustin et al. 2023; Solahuddin and Suyadi 2022). In contemporary terminology, this represents a highly sophisticated protocol of data cleaning, relational mapping, and integrity auditing. The epistemic ambition of the classical scholars to authenticate information through reproducible and transparent standards mirrors the foundational objectives of information science and artificial intelligence (Springer Nature 2024).

The concept of *tabaqat* (stratification of narrators) further strengthens this historical parallel. By classifying transmitters into generational layers based on chronology and teacher-student relationships, hadith scholars effectively constructed a relational database that encoded temporal and hierarchical metadata. Such stratification enabled scholars to verify whether a narrator could plausibly have met another narrator, thereby testing the feasibility of

transmission chains. In computational terms, this resembles node-layer segmentation within a Knowledge Graph, where edges are validated according to temporal constraints and relational proximity. (Kamran et al. 2023) demonstrate that Knowledge Graph architectures depend upon clearly defined entity relationships and hierarchical structures precisely the logic embodied in classical *tabaqat* compilations. Thus, what contemporary scholarship identifies as graph theory and relational modeling finds an intuitive antecedent in the intellectual labor of early Muslim scholars.

Moreover, the insistence of the *muhaddithun* on documentation, cross-examination, and corroboration parallels the epistemological foundations of machine learning validation. The use of multiple transmission pathways (*turuq*) to strengthen or weaken a narration reflects a primitive yet robust ensemble method, in which independent evidentiary streams contribute to a composite authenticity judgment. As Rahat et al. (2023) note in discussions of digital transformation within Islamic scholarship, the integration of historical methodologies into modern computational frameworks enhances both credibility and interpretability. Therefore, Al-Muhaddith Al-Raqami should not be perceived as a rupture from tradition but as a continuation of a long intellectual trajectory one that situates Islamic scholarship within the broader archaeology of logical and informational sciences.

Ethical Governance and Algorithmic *Maslahah*

While the technological sophistication of AI-Sanad marks a significant advancement, the ethical governance of such systems remains paramount, particularly when engaging sacred texts. The deployment of artificial intelligence within religious domains introduces complex challenges related to authority, bias, and epistemic justice. Contemporary debates on algorithmic bias reveal how AI systems can inadvertently reproduce structural inequalities embedded within their training data (Abid, Farooqi, and Zou 2021)

. When applied to Islamic texts, such distortions risk generating what scholars describe as “epistemic injustice,” wherein certain interpretive traditions or transmitters are marginalized by algorithmic weighting (JIDT, 2024). The integration of classical *jarb wa ta’dil* hierarchies within Al-Muhaddith Al-Raqami functions as a corrective mechanism, ensuring that computational outputs remain anchored to historically validated standards rather than opaque statistical correlations (Alghamdi et al. 2025).

The ethical architecture of this framework may be conceptualized through the Islamic principles of *maslahah* (public interest) and *dhaman* (responsibility). *Maslahah* requires that technological innovation serve the collective welfare of the community, particularly in safeguarding authentic knowledge and preventing harm caused by misinformation. In an era where fabricated hadith circulate widely across digital platforms (Fatmawati 2020), the development of a transparent verification infrastructure fulfills a clear public interest. However, *maslahah* alone is insufficient without *dhaman*, which demands accountability for the consequences of technological decisions. By preserving human oversight and designating scholars as final arbiters of authenticity, the framework institutionalizes *mas’uliyah* (accountability) at the level of system governance. AI becomes an instrument whose outputs must be critically evaluated, not an autonomous authority.

This ethical positioning resonates with broader calls for responsible AI governance within global academic discourse (Springer Nature 2024). Rather than embracing technological determinism, the model advances a normatively guided digital humanism in which sacred texts are approached with methodological rigor and moral sensitivity. By embedding transparency, traceability, and scholarly supervision into the computational workflow, *Al-Muhaddith Al-Raqami* mitigates the risk of algorithmic absolutism and reinforces the principle that epistemic legitimacy ultimately rests within human interpretive communities. In this sense, the framework embodies an applied ethics of technology rooted in Islamic jurisprudential thought while remaining conversant with contemporary debates on AI regulation.

Countering Post-Truth through Digital-Critical Literacy

The proliferation of religious disinformation in the post-truth era presents an urgent epistemic challenge. Social media ecosystems privilege virality over veracity, enabling emotionally charged or fabricated narrations to spread rapidly without verification (Fatmawati 2020). Within such environments, authority is frequently displaced by popularity metrics, and the distinction between authentic and fabricated hadith becomes blurred. *Al-Muhaddith Al-Raqami* operates as an infrastructural response to this crisis by institutionalizing systematic verification mechanisms within digital environments. By visualizing sanad connectivity, quantifying narrator reliability, and exposing structural anomalies, the framework transforms authenticity assessment into an accessible yet rigorous analytical process.

Pedagogically, this shift reorients Islamic education toward digital-critical literacy. Rather than relying solely on textual memorization, students are trained to interrogate transmission chains, evaluate algorithmic outputs, and contextualize authenticity judgments within broader epistemological frameworks. Such an approach aligns with contemporary educational reform agendas that emphasize digital culture and critical inquiry (Aini et al. 2023; Hafiz et al. 2024). The integration of *AI-Sanad* into curricula cultivates a generation of learners capable of navigating complex information landscapes with methodological confidence. In doing so, it directly advances Sustainable Development Goal 4 by enhancing quality education through the fusion of tradition and innovation.

Simultaneously, the framework contributes to Sustainable Development Goal 16 by strengthening informational resilience against religious manipulation. By equipping institutions with a transparent verification infrastructure, it fosters institutional trust and reduces susceptibility to extremist or misleading narratives. As Al-Juhani (2024) argues in discussions of digital transformation within Islamic scholarship, technological adaptation must be accompanied by ethical and pedagogical recalibration. *Al-Muhaddith Al-Raqami* exemplifies this recalibration by transforming classical sanad criticism into a dynamic digital defense system. Ultimately, the integration of hybrid epistemology within Islamic education does not merely modernize pedagogy; it reconstructs digital culture itself, ensuring that technological advancement becomes a vehicle for intellectual integrity rather than epistemic erosion.

CONCLUSION

The formulation of *Al-Muhaddith Al-Raqami* as a hybrid epistemology framework demonstrates that the preservation of prophetic traditions in the digital age requires a sophisticated

synthesis of tradition and innovation. This study has established that the framework constitutes more than a mere technological proposal; it represents a paradigmatic reconciliation between the intellectual rigor of classical *'ulum al-hadith* and the transformative imperatives of Society 5.0. By systematically operationalizing *sanad* continuity, narrator stratification, and *jarh wa ta'dil* hierarchies into AI-Sanad parameters, the research reveals a striking convergence: the logical architecture developed by early Muslim scholars mirrors the relational and mathematical foundations of contemporary Knowledge Graph systems. This finding suggests a profound historical insight that classical hadith scholarship embodies principles akin to modern data science, positioning Islamic intellectual heritage not as a passive recipient of digital innovation, but as a methodological precursor to it.

The logical consequence of this research for Islamic education is the shift from a passive-doctrinal model of hadith literacy toward a digital-critical inquiry model. In confronting the epistemic turbulence of the post-truth era, where religious disinformation circulates with unprecedented speed, this study establishes that technology does not erode religious authority when it is embedded within a transparent and normatively grounded framework. Instead, it reinforces the *muhaddith's* role by enhancing methodological traceability and providing a scalable infrastructure to safeguard the integrity of *Hijrah al-Din*. By redefining AI as a *mu'in* (epistemic assistant), the study ensures that the "black box" of algorithmic reasoning is replaced by an accountable and interpretable system that respects the sanctity of sacred texts.

However, the present contribution remains primarily conceptual and structurally focused on *sanad* analysis. The study acknowledges its limitations, particularly the absence of a fully functional software prototype and the lack of automated *matn* (textual) criticism, which remains a complex challenge in computational linguistics. Future research should therefore prioritize the development of integrated AI systems that combine *sanad* verification with deep semantic analysis of *matn* using advanced natural language processing. Such an evolution would move the framework from theoretical articulation to applied global validation. Ultimately, the integration of classical epistemology with responsible artificial intelligence is a civilizational imperative for strengthening critical religious literacy and advancing the aspirations of SDG 4 and SDG 16, ensuring that the legacy of the Prophet Muhammad SAW remains an authentic and accessible guide for future generations in a technologically mediated world.

ACKNOWLEDGMENT

The author expresses sincere gratitude to UIN Raden Mas Said Surakarta, particularly the Faculty of Tarbiyah and the Islamic Education Department (Pendidikan Agama Islam), for providing sustained academic support and an intellectually stimulating environment that enabled the development of this research. Appreciation is also extended to fellow researchers and senior lecturers whose constructive critiques, methodological insights, and scholarly discussions significantly contributed to refining the conceptual and analytical framework of *Al-Muhaddith Al-Raqami*. Their collegial engagement strengthened both the epistemological clarity and technical orientation of the study. Any institutional assistance and academic facilitation received during the course of this research are gratefully acknowledged as an integral part of its completion.

REFERENCES

- Abid, A., M. Farooqi, and J. Zou. 2021. 'Persistent Anti-Muslim Bias in Large Language Models'. *Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society* 298–306.
- Abid, A., Farooqi, M., & Zou, J. (2021). Persistent anti-Muslim bias in large language models. *Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society*, 298–306. <https://doi.org/10.1145/3461702.3462529>
- Aini, W. Q., Ritonga, M., & Lahmi, A. (2023). Islamic education on quality digital culture transformation in the success of 2030 SDGs. *ResearchGate*. Retrieved from https://www.researchgate.net/publication/382553674_Islamic_Education_on_Quality_Digital_Culture_Transformation_in_The_Success_2030_SDGs
- Al-Aghbari, Z., & Al-Mrayat, Y. (2024). Synergizing structure and semantics: A knowledge graph–transformer framework for narrator disambiguation in hadith networks. *ResearchGate*. Retrieved from https://www.researchgate.net/publication/395464842_Synergizing_structure_and_semantics_a_knowledge_graph-transformer_framework_for_narrator_disambiguation_in_hadith_networks
- Al-Ahmad, M. (2024). The ethical implications of artificial intelligence in Islamic jurisprudence: A comparative analysis with Western legal systems. *ResearchGate*. Retrieved from https://www.researchgate.net/publication/394485915_The_Ethical_Implications_of_Artificial_Intelligence_in_Islamic_Jurisprudence_A_Comparative_Analysis_with_Western_Legal_Systems
- Al-Bukhari, M. I. (n.d.). *Sabih al-Bukhari*.
- Al-Juhani, F. (2024). Artificial intelligence in Islamic jurisprudence: Opportunities, ethical considerations, and the role of maslahah. *Journal of Fiqh and Legal Issues in Contemporary Contexts*, 5(2), 112–128.
- Al-Khalifa, H. S., & Al-Odah, I. (2019). Hadith segmentation using bi-gram method. *Proceedings of the 4th Workshop on Open-Source Arabic Corpora and Processing Tools*, 32–36. <https://aclanthology.org/W19-5605.pdf>
- Al-Qadri, A. (2018). *Science of hadith: Theory and practice of criticism of sanad and matan*. Pustaka Al-Hikmah.
- Alghamdi, J., Albukhari, A., & Al-Dala'in, T. (2025). Pretrained models against traditional machine learning for detecting fake hadith. *Electronics*, 14(17), 3484. <https://doi.org/10.3390/electronics14173484>
- Anshori, M. (2021). Objects and scope of classical and contemporary hadith studies. *Irfani*, 2(2), 1–15. <https://doi.org/10.51700/irfani.v2i2.312>
- Azmi, A. M., & Bin Badia, N. (2013). iTree: Automating the construction of the narrative tree of hadiths (Prophetic traditions). *Proceedings of the 6th International Conference on Information Technology*.
- Brill. (n.d.). Journal of Digital Islamic Research (JDIR). Retrieved from <https://brill.com/view/journals/jdir/jdir-overview.xml>
- Chandra, A. F., & Buchari, M. (2016). Criteria for the authenticity of hadith according to al-Khatib al-Baghdadi. *Jurnal Ushuluddin*, 24(2), 161–177. <https://doi.org/10.15408/ushuluddin.v24i2.1725>
- Fatmawati, I. (2020). Fighting disinformation in the post-truth era: The urgency of digital literacy. *Journal of Democracy & Regional Autonomy*, 18(2), 123–134.
- Hafiz, M. A., Rohman, M. A., & Rohman, F. (2024). Integration of artificial intelligence (AI) in the Islamic religious education curriculum in the era of Society 5.0. *Journal of Educational Studies, Innovation and Science*, 3(1), 1–12.
- Haq, R., Orth, I. J., & Siddique, N. (2021). Hadith authenticity prediction using sentiment analysis and machine learning. *ResearchGate*. Retrieved from

- https://www.researchgate.net/publication/349936135_Hadith_Authenticity_Prediction_using_Sentiment_Analysis_and_Machine_Learning
- Harrag, F., Al-Salman, A. S., & El-Qawasmah, E. (2014). Extraction and visualization of the chain of narrators from hadiths using named entity recognition and classification. *Journal of Computational Linguistics & Arabic Language Processing*, 5(1), 1–18.
- Ibn Hajar al-ʿAsqalani, A. (n.d.). *Taqrib al-Tahdzīb*. Daar ar-Rashid.
- JIDT. (2024). Artificial intelligence and bias in religious authority: Navigating the risks of algorithmic prejudice in the digital age. *Journal of Islamic Digital Technology*, 2(1), 45–62. <https://jidt.org/jidt/article/download/626/395/>
- Kamran, A. B., Butt, N. A., & Basharat, A. (2023). Semantic enrichment of hadith corpus: Knowledge graph generation from Islamic text. *Semantic Web Journal*, 14(1), 1–25. <http://www.semantic-web-journal.net/system/files/swj3791.pdf>
- Khobir, A. (2007). *Philosophy of Islamic education: From rational methods to critical methods*. Student Library.
- Kirana, S. D., Asbari, M., & Rusdita, A. (2024). The role of artificial intelligence (AI) in Islamic religious education learning. *Referensi Islamika: Journal of Islamic Studies*, 2(2), 50–60.
- Mahad Aly Balekambang. (2021, February 24). 5 (Five) conditions for a valid hadith. Retrieved from <https://www.mahadalybalekambang.ac.id/5-lima-syarat-hadis-shahih>
- Maulana, I. (2018). Authentic hadith and its requirements. *ResearchGate*. Retrieved from https://www.researchgate.net/publication/328306551_Hadis_shahih_dan_Syarat-syaratnya_Imron_Maulana
- McCarthy, J. (1979). *Epistemological problems of artificial intelligence*. Stanford University. Retrieved from <http://www-formal.stanford.edu/jmc/epistemological.pdf>
- Mustin, H., Tasbih, M., & Abdullah, Z. (2023). Criticism of sanad (naqd al-sanad) in the science of hadith: Methodology and its implementation. *Socius: Journal of Social Sciences Research*, 10(1), 1–12. <https://doi.org/10.51700/socius.v10i1.2113>
- Salloum, S., & Al-Emami, S. (2018). Hadith classification using machine learning techniques according to its reliability. *ResearchGate*. Retrieved from https://www.researchgate.net/publication/338684579_Hadith_Classification_using_Machine_Learning_Techniques_According_to_its_Reliability
- Sari, D. P., Hidayat, R., & Abdullah, I. (2024). The role of artificial intelligence and digital technologies in the authentication and preservation of hadith. *Middle East Journal of Islamic Studies and Culture*, 5(2), 122–129. https://kspublisher.com/media/articles/MEJISC_52_122-129.pdf
- Sofwan, R. U. (2024). Integration of artificial intelligence in Islamic religious education in the 5.0 era. *Journal of Contemporary Islamic Education*, 5(1), 34–48.
- Solahuddin, M. A., & Suyadi, A. (2022). *Ulumul hadith* (7th ed.). CV Pustaka Setia.
- Springer Nature. (2024, May 15). Islamic golden era scholars' contributions to artificial intelligence: An inclusive historical perspective. Retrieved from <https://communities.springernature.com/posts/islamic-golden-era-scholars-contributions-to-artificial-intelligence-an-inclusive-historical-perspective>
- Suharyo, O. S., et al. (2024). Integration of artificial intelligence in the Islamic religious education (PAI) curriculum in the era of Society 5.0. *Journal of Educational Studies, Innovation and Science*, 3(1), 1–12.
- Suparta, M. (2010). *Science of hadith*. PT Raja Grafindo Persada.
- UGM News. (2023, November 28). UGM experts discuss AI's potential to combat climate crisis hoaxes. Retrieved from <https://ugm.ac.id/id/berita/pakar-ugm-bahas-peluang-ai-guna-perangi-hoaks-krisis-iklim/>
- UIN Sunan Ampel Surabaya. (n.d.). Ilmu al-jarh wa al-ta'dil. Retrieved from

<http://digilib.uinsa.ac.id/6428/8/Bab%208.pdf>

Wisdom Library. (2025, September 15). Algorithmic bias. Retrieved from

<https://www.wisdomlib.org/christianity/concept/algorithmic-bias>

Zubaidillah, H. (n.d.). Ilmu al-jarh wa al-ta'dil and its applications. *OSF Preprints*.

<https://doi.org/10.31219/osf.io/y8wt6>