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AI EPISTEMOLOGY IN ISLAMIC PERSPECTIVE: A BIBLIOMETRIC ANALYSIS

Lia Susanti
Universitas Pendidikan Indonesia, Bandung, Indonesia
liasusanti1988@upi.edu

Babang Robandi
Universitas Pendidikan Indonesia, Bandung, Indonesia
brobandi@upi.edu

Abdul Karim Suhadha
Universitas Pendidikan Indonesia, Bandung, Indonesia
abdulsuhadhaa@upi.edu

Dudun Najmudin
Institut KH. Ahmad Sanusi, Sukabumi, Indonesia
dudunnajmudin1989@gmail.com

Gunawan Anggia Rahman
Universitas Pendidikan Indonesia, Bandung, Indonesia
gunawan11@upi.edu

Abstract

This research explores the epistemology of artificial intelligence (AI) from an Islamic perspective to fill the gap in the literature that mostly only discusses the technical and ethical aspects of universal AI. Using bibliometric methods, this study analyzes trends, collaborations between researchers, and major themes in AI-Islamic studies, based on 200 documents from Google Scholar for the period 2015-2024. The analysis includes keyword co-occurrence, co-authorship, and citation density, with network map visualization through VOSviewer. The results show that AI is increasingly being applied in the fields of education, Islamic finance, and social management in Muslim societies, along with the increasing adoption of this technology globally. However, there are significant challenges related to the ethical, fair, and relevant application of AI to Islamic values,

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including the integration of Shariah principles in technology development. This research highlights opportunities to utilize AI to support the values of justice, welfare, and environmental stewardship grounded in Islamic spirituality. It contributes to the literature by integrating Islamic ontology, ethics, and epistemology in AI development, providing guidance that is not only conceptual but also applicable. It also highlights the need for cross-disciplinary collaboration to address emerging ethical and social challenges. As such, this research is not only relevant for Muslim societies but also offers a global perspective on how modern technology can be directed to support broader humanitarian goals based on Islamic values.

Keywords: *Artificial Intelligence, Epistemology, Islamic Perspective, Machine Learning, Knowledge.*

A. Introduction

Advances in artificial intelligence (AI) technology have had a significant impact on various aspects of human life, including education, economics, and social management (Pedro et al., 2019; Sheikh, 2020). However, this progress also raises new challenges, especially in terms of ethics, justice, and the relevance of the application of technology to cultural and religious values (Mufid, 2024; Achruh, 2024). In the context of Muslim society, there is a need to evaluate development and application of AI based on Islamic epistemology, which includes not only technical aspects, but also moral and spiritual values (Fouz Mohamed Zacky & Moniruzzaman, 2024, Nurhaeni et al., 2021; Popova, 2020).

Data shows that AI technology is increasingly becoming an integral part of human life, including in Muslim societies. A report from McKinsey & Company (2021) revealed that more than 50% of global companies are using AI to improve operational efficiency and decision-making (Chui, 2021). On the other hand, a Pew Research Center survey (2023) showed an increase in the adoption of AI-based technology in Muslim-majority countries, including in education, health, and economics (Faverio & Tyson, 2023). This is reinforced by Elsevier (2024) in a global study report of nearly 3,000 people working in research and health, noting that 54% of respondents had used AI, with 31% using it for work, and predictions of an increase in AI use of around 67% of those who have not used AI plan to start using it in the next 2-5 years (Mulligan et al., 2024).

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The use of artificial intelligence (AI) in the present and its projected development in the future is expected to increase significantly (Elsevier, 2024). Currently, approximately 54% of respondents have used AI, with 31% reporting its use for work-related purposes and 23% for non-work activities, while the remaining 46% have not used AI at all. These figures are further differentiated by country, showing that 39% of AI users for work purposes are from China, 22% from India, and 30% from the United States. Looking ahead, 67% of respondents anticipate using AI within the next two to five years, whereas 33% either do not expect to adopt the technology or remain uncertain. This projection also highlights substantial cross-country variation, with 84% of respondents in China, 76% in India, and 53% in the United States indicating a likelihood of adopting AI within this timeframe.

Research integrating AI with an Islamic perspective is still relatively limited (Ismail, 2024). Previous literature has mostly discussed AI from a technical and universal ethical perspective (Farooq et al., 2021; Gefen, 2021; Westerstrand, 2024), without paying sufficient attention to the concept of Islamic epistemology, such as how AI can be developed based on sharia principles, or how it can support the goals of human life in the Islamic perspective. Several studies have touched on the ethical aspects of AI and its application in the context of Islamic finance, including research on the challenges for Islamic finance and banking in the post-COVID era and the role of Fintech (Hassan et al., 2020); Interdisciplinary research in Islamic Banking and Finance Law (Kadi, 2022); AI and Islamic Finance (Sarea et al., 2021), and Adaptability of Islamic Finance Principles (Swastika, 2024). However, in-depth discussions on the relationship between AI, philosophy of science, and Islamic epistemology are still rare.

This study fills the gap by conducting a comprehensive analysis of the literature discussing the epistemology of AI from an Islamic perspective. The analysis was conducted using bibliometric methods to identify trends, researcher collaborations, and key themes in this study (Derviş, 2019). With this approach, the study not only explores conceptual dimensions, but also applications, including how Islamic values can be applied in the development of AI.

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The novelty of this study lies in its development of a conceptual integration framework that brings together key elements of Islamic epistemology—particularly the principles of *bayani*, *burhani*, and *maqasid al-shariah*—with contemporary approaches to artificial intelligence (AI) design and ethics. While previous research has discussed ethical concerns surrounding AI or explored general Islamic perspectives on technology, there remains a significant gap in scholarship regarding how specific epistemological constructs within Islamic intellectual tradition can systematically inform AI development, evaluation, and policy formulation. This study therefore introduces a structured model that links epistemic principles with concrete dimensions of AI practice, including value-sensitive design, accountability mechanisms, and normative evaluation. By articulating this integrative framework, the study provides a more precise and operational foundation for aligning technological innovation with Islamic ethical commitments and broader humanitarian objectives, moving beyond the descriptive or normative discussions that dominate earlier literature.

This study aims to deepen scholarly understanding of the interface between Islamic epistemology and AI by identifying conceptual compatibilities, mapping existing tensions, and analyzing opportunities for developing ethically grounded technological systems. In doing so, it establishes a clearer research pathway for bridging philosophical, ethical, and technological discourses that have previously remained fragmented. The study offers two main contributions: first, a theoretical contribution in the form of a new epistemologically informed model for AI ethics within a Muslim intellectual context; and second, a practical contribution that provides guiding principles for policymakers, technologists, and educational institutions seeking to implement AI systems that are culturally resonant, socially responsible, and ethically inclusive. Altogether, this research enriches the growing body of work at the intersection of Islamic studies, philosophy of technology, and AI ethics, while offering actionable insights for fostering AI development that is both contextually grounded and globally relevant.

B. Methods

This study uses a bibliometric approach to explore research trends related to "Epistemology of Artificial Intelligence (AI) in Islamic Perspective". The bibliometric

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method was chosen because of its ability to analyze patterns and relationships in scientific literature based on publication metadata, such as keywords, number of citations, and collaborations between authors (Derviş, 2019; Passas, 2024; Klarin, 2024). Research data were obtained through Publish or Perish software using the keywords "Artificial Intelligence", "Epistemology", and "Islam" or "Islamic". A search was conducted on the Google Scholar database with a time span of 2015 to 2024 to ensure the relevance of the data generated. From this search, 200 relevant documents were obtained, including metadata such as title, author name, abstract, keywords, number of citations, and year of publication.

The obtained data was exported in RIS format for analysis using VOSviewer software. The analysis was carried out in several stages, namely keyword co-occurrence analysis to identify key themes and research trends, co-authorship analysis to map the collaboration network between researchers, and citation density analysis to measure the influence and contribution of each document to this field of study (Klarin, 2024; Melyan & Yasir, 2024). The visualizations produced through VOSviewer are in the form of network maps and density maps that illustrate the relationships between elements in the related literature (Li et al., 2024). With this approach, this study aims to provide comprehensive insights into research developments at the intersection of AI, epistemology, and Islamic perspectives.

Conceptual Integration Framework

This study employs a structured conceptual framework that integrates three foundational principles of Islamic epistemology—*bayani*, *burhani*, and *maqasid al-shariah*—with contemporary approaches to artificial intelligence (AI) design, evaluation, and governance. The use of a conceptual integration framework is essential for bridging normative Islamic thought with empirical and technical dimensions of AI, particularly given the gaps in prior literature, where studies have focused either on general Islamic perspectives (Hassan et al., 2020; Haider et al., 2020; Khan et al., 2021) or secular-oriented critiques of algorithmic systems (Esposito, 2017; Campolo & Crawford, 2020) without establishing a systematic operational model. Accordingly, the present framework functions as an analytical lens to map epistemological constructs onto concrete AI

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practices—an approach consistent with integrative methodologies used in socio-technical and organizational AI research (Shrestha et al., 2019; Madan & Ashok, 2023).

The *bayani* principle, which emphasizes textual reasoning, normative clarity, and rule-based interpretation, was operationalized to guide the identification of ethical constraints and value-sensitive parameters relevant to AI design. This aligns with literature emphasizing the need for transparent and accountable AI decision structures (Shrestha et al., 2019). The *burhani* principle, grounded in rational-empirical reasoning, was incorporated to evaluate how evidence-based logic, data structures, and algorithmic inference systems can be assessed using methodological rigor (Saheb et al., 2022; Upadhyay et al., 2023). Meanwhile, the *maqasid al-shariah*, which focuses on the protection of welfare, justice, intellect, and human flourishing, provides a teleological anchor for assessing the societal and ethical impact of AI systems—particularly in applied domains such as education (Keshav et al., 2022; Romero-Rodríguez, 2023) and Islamic finance (Hassan et al., 2020; Haider et al., 2020).

This study constructs a matrix to systematically integrate epistemic modes that place each epistemological principle alongside corresponding contemporary AI practices in three areas: AI design, AI evaluation, and AI governance. This matrix (Table 1) serves as an analytical tool for mapping textual norms, rational-empirical logic, and higher ethical goals to operational technology components such as value-sensitive design protocols, accountability mechanisms, impact assessments, and governance standards. This structured framework enables a coherent and replicable method for analyzing how Islamic epistemology can provide insights into the ethical configuration and responsible implementation of AI systems, filling conceptual and methodological gaps identified in the existing literature (Shrestha et al., 2019; Campolo & Crawford, 2020; Hassan et al., 2020).

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Table 1. Structured Conceptual Framework Integrating Islamic Epistemology with AI Practices

Islamic Epistemological Principle	Core Concept	Relevance to AI	Application in AI Design	Application in AI Evaluation	Application in AI Governance
Bayani (Textual–normative reasoning)	Knowledge derived from authoritative texts (Qur'an, Hadith), emphasizing clarity, rules, and normative boundaries.	Provides ethical boundaries and ensures AI aligns with moral norms and established values.	Formulating value-sensitive design constraints consistent with ethical and religious norms (e.g., fairness, prohibited practices, user protection).	Evaluating whether AI outputs conform to normative expectations, such as avoidance of harm, misinformation, or unethical recommendations.	Drafting regulatory standards and compliance protocols grounded in clear ethical rules, transparency, and accountability.
Burhani (Empirical–rational reasoning)	Knowledge derived from logic, empirical observation, and systematic reasoning; compatibility of faith and rational inquiry.	Supports evidence-based AI processes, rational modeling, and transparent algorithmic logic.	Designing AI systems using explainable AI (XAI), robust datasets, and logical inference structures to ensure accuracy and traceability.	Rigorous performance assessment using empirical metrics (accuracy, bias testing, error analysis).	Formulating policies based on data-driven insights, risk analysis, and rational justification of AI deployment.
Maqasid al-Shariah (Higher objectives of the law)	Protection of religion, life, intellect, lineage, and property; emphasis on welfare, justice, and human flourishing.	Provides a teleological foundation ensuring AI serves the public good and avoids harm.	Embedding human-centered objectives, user well-being, equity, and sustainable impact into AI system goals and optimization criteria.	Evaluating AI systems based on societal impact, justice outcomes, inclusivity, and contribution to public welfare.	Establishing governance frameworks prioritizing ethical impact, protection of rights, and long-term societal benefit.

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C. Results and Discussion

Results

1. Researcher Quality and Productivity

The quality and productivity of researchers are seen from citation analysis, including the number of citations, h-index, g-index, and number of publications. From the results of the citation metric analysis of the keywords "Artificial Intelligence", "Epistemology", and "Islam" using Publish or Perish, in the period 2015–2024, there were 200 documents with a total of 4826 citations, an average of 24.13 citations per document, and 536.22 citations per year. The h-index reached 33, indicating 33 documents with a minimum of 33 citations. There are an average of 2.06 authors per document, with significant contributions to research related to this topic, indicating its relevance and academic appeal in the context of AI and the Islamic perspective.

The quality of researchers in this research topic can be assessed quite high based on citation metrics data. The h-index figure of 33 indicates that there are 33 documents, each of which has at least 33 citations, indicating that the researchers' contributions in this field are widely recognized by the scientific community. The average of 24.13 citations per document also reflects a fairly good level of relevance and quality of work. In addition, the collaboration seen from the average of 2.06 authors per document indicates synergy between researchers, which is often an indicator of quality research. Thus, it can be concluded that researchers in this field have made significant contributions and are recognized in academic literature.

Research on this topic is quite productive and influential, as reflected by an average of 24.13 citations per document and an h-index of 33. The average of 2.06 authors per document also reflects a fairly high level of collaboration among researchers. This suggests that studies at the intersection of AI, epistemology, and Islam have become an important concern in the scientific community, spanning a range of conceptual, philosophical, and applied dimensions.

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Researcher Quality Level

Table 2. Researchers with the Highest Number of Citations

Cites	Authors	Title	Year	Source
714	YR Shrestha, SM Ben-Menahem… (Shrestha et al., 2019)	Organizational decision-making structures in the age of artificial intelligence	2019	California …
284	And Esposito (Esposito, 2017)	Artificial communication? The production of contingencies by algorithms	2017	Timeline of Sociology
276	A Campolo, K Crawford (Campolo & Crawford, 2020)	Enchanted determinism: Power without responsibility in artificial intelligence	2020	Engaging Science, Technology…
250	MK Hassan, MR Rabbani, MAM Ali (Hassan et al., 2020)	Challenges for the Islamic Finance and banking in the post COVID era and the role of Fintech	2020	Journal of Economic …
226	R Madan, M Ashok (Madan & Ashok, 2023)	AI adoption and diffusion in public administration: A systematic literature review and future research agenda	2023	Government Information Quarterly
216	M Haider, S Khan, MR Rabbani… (Haider et al., 2020)	An artificial intelligence and NLP based Islamic FinTech model combining Zakat and Qardh-Al-Hasan for countering the adverse impact of COVID 19 on SMEs...	2020	International Journal of …
149	M Keshav, L Julien, J Miezel (Keshav et al., 2022)	The Role of Technology in Era 5.0 in the Development of Arabic Language in the World of Education.	2022	JILTECH: International Journal of …
122	JM Romero-Rodríguez, MS Ramírez-Montoya… (Romero-Rodríguez, 2023)	Use of ChatGPT at university as a tool for complex thinking: Students' perceived usefulness	2023	Journal of New …
107	T Saheb, M Dehghani, T Saheb (Saheb et al., 2022)	Artificial intelligence for sustainable energy: A contextual topic modeling and content analysis	2022	Sustainable Computing: Informatics and …
106	N Upadhyay, S Upadhyay, MM Al-Debei… (Upadhyay et al., 2023)	The influence of digital entrepreneurship and entrepreneurial orientation on intention of family businesses to adopt artificial intelligence: examining the mediating role …	2023	International Journal of …

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The table shows the list of authors with the five highest citations. The authors with the highest citations are Yash Raj Shrestha, Shiko M. Ben-Menahem, and Georg von Krogh (2019) with 714 citations. With the title of their research "Organizational decision-making structures in the age of artificial intelligence". The average citation for other authors is only around 100-300 citations. From the available data, it can be concluded that artificial intelligence (AI) is a highly relevant and impactful topic in various fields, such as organizational decision-making, algorithmic communication, ethics and social responsibility, Islamic finance, and public administration. Articles with the highest number of citations indicate a great interest in critical and strategic issues related to the application and implications of AI. This reflects that AI is not only seen as a technological innovation, but also as a transformational element that deeply influences social, economic, and organizational dynamics (Boyd & Hilton, 2018). In general, research in this field continues to grow, with significant contributions to the understanding and application of AI in various global contexts.

The Most Productive Researchers

Table 3. List of Most Productive Researchers

No.	Authors	Number of publications	Institutions and Country of Origin
1	Masudul Alam Choudhury (Kumar & Choudhury, 2023; Choudhury, 2021; Choudhury, 2024; Choudhury, 2024)	3	Trisakti University, Indonesia
2	Mustafa Raza Rabbani (Hassan et al., 2020; Haider, 2020; Khan et al., 2021)	3	University of Khorfakkan, Sharjah, United Arab Emirates
3	Shahnawaz Khan (Khan et al., 2021; Haider et al., 2020)	2	Indian Institute of Technology, India
4	Abolfazl Davodiroknabadi (Vahidimehr et al., 2024; Vahidimehr et al., 2024)	2	Department of Design and Clothing, Yazd Branch, Islamic Azad University, Yazd, Iran
5	Mahsa Khoie (Vahidimehr et al., 2024; Vahidimehr et al., 2024)	2	Islamic Azad University, Iran

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The data in the table shows that there are five principal researchers with significant contributions in related publications, where they come from different institutions and represent various countries. Masudul Alam Choudhury is a researcher from Trisakti University, Indonesia with the highest number of publications related to this research topic of three publications (Kumar & Choudhury, 2023; Choudhury, 2021; Choudhury, 2024; Choudhury, 2024). Similarly, Mustafa Raza Rabbani is a researcher from the University of Khorfakkan, United Arab Emirates with the second highest number of publications of three publications (Hassan et al., 2020; Haider, 2020; Khan et al., 2021). Both show significant contributions from the Southeast Asia and Middle East regions in this research.

Three other researchers, namely Shahnawaz Khan from the Indian Institute of Technology, India (Khan et al., 2021; Haider et al., 2020), and Abolfazl Davodiroknabadi and Mahsa Khoie from the Islamic Azad University, Iran (Vahidimehr et al., 2024; Vahidimehr et al., 2024), each have two publications. Research in this field is global in nature, with significant contributions from institutions and researchers in Southeast Asia, the Middle East, and South Asia. The dominance of publications from these countries shows their focus on developing science and technology based on local and Islamic values, which are relevant to regional and global needs. Cross-country collaboration also appears potential to expand the scope of future research.

2. Co-Authorship Analysis

In understanding collaboration patterns, identifying key authors, and evaluating the dynamics of the scientific community related to research topics, a Co-Authorship analysis was conducted (Klarin, 2024; Melyan & Yasir, 2024). This analysis is based on the number of publications co-authored by two or more authors.

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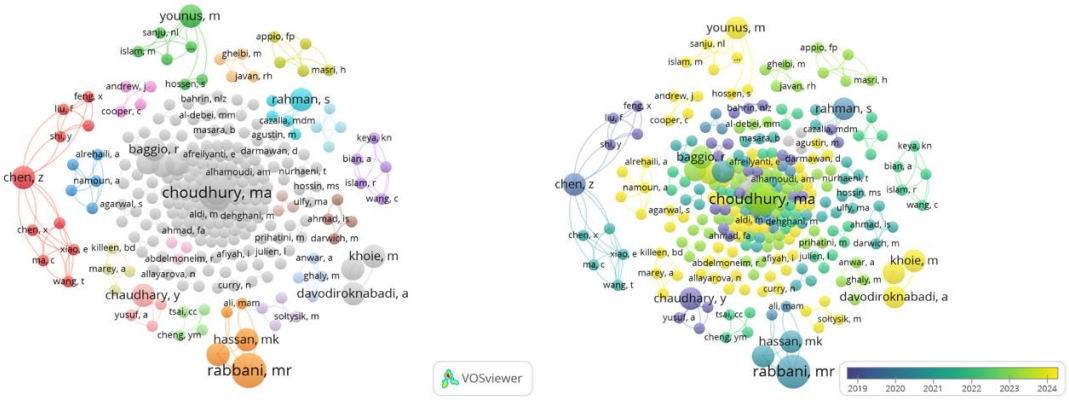

Figure 1. Co-Authorship Network and Overlay Visualization Analysis

Co-Authorship Network Visualization Analysis

The co-authorship network analysis reveals the structure of collaboration among scholars working on the epistemology of artificial intelligence (AI) from an Islamic perspective. The visualization shows several author clusters, each representing distinct research communities. The most prominent nodes, such as Choudhury, M.A. and Chen, Z., indicate researchers with substantial publication output and influence within the field. Choudhury appears as a large, independent node without collaborative ties, reflecting his extensive yet solitary contributions in areas such as Islamic ethics, AI in education, and Islamic economics. In contrast, the Chen, Z. cluster demonstrates a highly interconnected network composed of two major subgroups—one marked in green and another in red—each with dense internal collaboration patterns. Chen, Z. serves as a central bridging figure linking these two clusters, enabling the exchange of ideas between researchers who may address related but distinct thematic areas. Overall, the network highlights varying degrees of collaboration, identifies key contributors, and maps potential pathways for strengthening cross-disciplinary research on AI epistemology from an Islamic viewpoint.

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3. Co-occurrence analysis

This co-occurrence analysis shows a visualization that illustrates the relationship between keywords generated from the analysis of document titles and abstracts related to the topic of "Epistemology of Artificial Intelligence from an Islamic Perspective." This visualization shows how various terms are interrelated and grouped based on specific themes (Tomat, 2023).

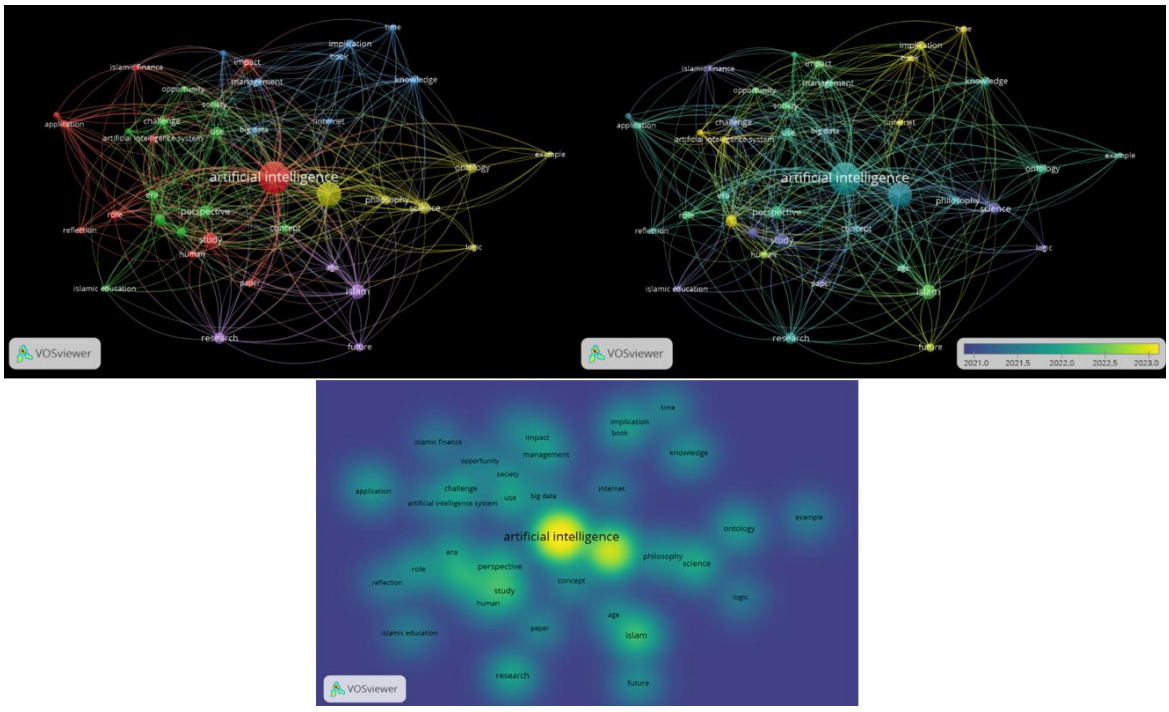

Figure 2. Co-occurence Network, Overlay, and Density Visualization Analysis

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Co-occurrence Network Visualization Analysis

The keyword co-occurrence map visualizes the thematic structure of literature on *AI Epistemology in Islamic Perspective* by showing how key terms cluster and interrelate. "Artificial intelligence" appears as the dominant central node, indicating its role as the primary conceptual anchor in the field. The visualization forms three major clusters: the first includes terms related to AI applications, educational contexts, societal roles, opportunities, and challenges; the second emphasizes epistemological and philosophical themes connected to Islam, such as ontology, logic, and scientific reflection; and the third highlights AI systems and their broader implications, including issues related to Islamic finance, management, and digital-era impacts. The color-coded clusters reflect distinct research orientations: the red cluster focuses on practical applications and challenges of AI; the green cluster centers on Islamic perspectives, especially within educational and ethical contexts; the yellow cluster examines philosophical and epistemological foundations integrating Islamic values; and the purple cluster points to future-oriented discussions and sectoral applications such as Islamic finance and Islamic education. Overall, the visualization demonstrates a multidimensional and interconnected research landscape, revealing how scholars engage AI through technical, ethical, philosophical, social, and Islamic epistemological lenses, while also identifying emerging opportunities and ongoing challenges in aligning AI with Islamic principles.

Co-occurrence Overlay Visualization Analysis

This visualization illustrates the temporal evolution of keywords in research on the "Epistemology of AI in the Islamic Perspective," with node colors indicating the average year of term emergence and reflecting a thematic shift over time. Core terms such as "artificial intelligence," "ontology," "philosophy," and "science" appear in blue to light green, signifying that discussions on epistemological foundations and the philosophy of science have been central since the earliest phase of study. In contrast, terms like "implication," "management," and "society," shown in yellowish green, indicate growing attention to the social impacts and governance of AI during 2022–2023. More blue-toned terms such as "Islamic education," "Islamic finance," and "reflection" suggest that the application of AI within Islamic contexts emerged earlier in the literature. Meanwhile,

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terms like "opportunity" and "challenge," colored green to yellow, highlight recent scholarly interest in examining the prospects and challenges of integrating AI into Muslim societies. Overall, the visualization reveals a shift from theoretical discussions toward increased focus on practical implementation and the societal implications of AI in Islamic contexts.

Co-occurrence Density Visualization Analysis

This visualization depicts the density and interrelations of keywords within research on "AI Epistemology in the Islamic Perspective," highlighting "artificial intelligence" as the central and most frequent term across analyzed titles and abstracts. Surrounding this core concept are clusters reflecting key thematic dimensions: philosophical and scientific foundations signaled by terms such as "ontology," "philosophy," and "science," as well as applications of AI within Islamic domains indicated by keywords like "Islam," "Islamic education," and "Islamic finance." Additional terms—"challenge," "impact," and "opportunity"—underscore growing scholarly attention to the societal implications of AI, including its benefits and potential risks from an Islamic viewpoint. Collectively, the visualization reveals a multidimensional discourse integrating scientific, philosophical, social, and religious perspectives, with AI positioned not only as a technological innovation but also as an entity carrying ethical and moral significance. Within this epistemological framework, AI is conceptualized as a tool aligned with Islamic values—promoting justice, welfare, and stewardship—while its development and application must remain consistent with sharia principles. This comprehensive perspective encompasses both the opportunities for AI's enhancement of education, Islamic finance, and social governance, and the ethical and societal challenges it poses within Muslim communities.

Discussion

1. The Relevance of Integrating Islamic Epistemology And AI

The integration of Islamic epistemology and artificial intelligence (AI) is increasingly relevant as contemporary technological development extends beyond technical innovation to encompass profound philosophical, ethical, and social implications that

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reshape human understandings of knowledge, action, and reality. Conventional epistemic approaches to AI are largely grounded in computational logic, statistical inference, and instrumental rationality. However, influential works such as Esposito (2017) and Campolo & Crawford (2020) demonstrate that AI also produces contingencies, biases, and forms of determinism that reconfigure the relationship between humans and knowledge production. These dynamics highlight the need for an alternative epistemological framework capable of addressing the moral dilemmas and civilizational directions shaped by AI. Islamic epistemology offers such a framework through its emphasis on the unity of knowledge (*tawhid*), ethical balance, and the purposive nature of human existence as articulated in the *maqasid al-shariah*. Within this tradition, knowledge is not merely data accumulation or predictive capability but an entrusted responsibility that must advance justice, welfare, and moral sustainability. The relevance of this integration becomes even more pronounced when considering the expansion of AI in Islamic education, Islamic finance, and public governance (Hassan et al., 2020; Madan & Ashok, 2023), all of which require a normative foundation ensuring that technology operates within the ethical and spiritual parameters of Islam.

Integrating Islamic epistemology with AI serves as a critical effort to construct a technological paradigm that avoids algorithmic reductionism and the dominance of secular, utilitarian, and efficiency-oriented Western value systems. Islamic epistemology provides conceptual tools for situating AI within a broader humanistic and moral framework—one that defines the relationship between humans, knowledge, and ethical responsibility. Within this perspective, AI is not understood as an autonomous entity but as an instrument subordinated to human agency and directed toward collective well-being. Normative principles such as *adl* (justice), *amanah* (responsibility), and *rahmatan lil-'alamin* (mercy for all creation) can serve as foundational ethical anchors for designing AI systems that are fair, inclusive, and socially sustainable. Therefore, the integration of Islamic epistemology not only offers theoretical legitimacy for the use of AI within Muslim contexts but also provides a philosophical alternative to global AI ethics discourse, which continues to grapple with issues of bias, inequity, and dehumanizing technological applications. In this sense, the relevance of integrating these two domains is both normative and strategic, contributing to the development of AI systems that align with

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universal human values while advancing justice, ethical integrity, and collective flourishing.

2. Research Gap and How the Study Addresses It

A review of the existing literature reveals a substantial research gap in the scholarly engagement between Islamic epistemology and artificial intelligence (AI). Current studies tend to fall into two primary categories: (1) technical or applied research on the use of AI within Islamic domains—most prominently Islamic finance (Hassan et al., 2020; Haider et al., 2020), digital Islamic education (Keshav et al., 2022), and public-sector innovation (Madan & Ashok, 2023); and (2) broad philosophical critiques of AI focused on algorithmic power, determinism, and socio-political implications (Esposito, 2017; Campolo & Crawford, 2020). While these bodies of research contribute valuable insights, they remain largely disconnected. Studies in Islamic finance and education rarely address the deeper ontological and epistemological assumptions embedded within AI technologies, while philosophical critiques seldom engage with Islamic intellectual traditions as a potential alternative knowledge framework. Moreover, there is a notable absence of integrated models that systematically articulate how AI's foundational concepts—such as algorithmic reasoning, machine learning, data ontology, and automated decision-making—can be situated within or evaluated through Islamic epistemological principles such as *tawhidic unity*, *maqasid al-shariah*, and ethical rationality (*'aql*). This fragmentation indicates a persistent gap where Islamic thought is either reduced to applied ethics or omitted entirely from theoretical discussions about AI's epistemic structure.

The research fills this gap by constructing a comprehensive, multidimensional framework that bridges modern AI theory with Islamic epistemological foundations. Rather than treating Islamic principles as merely normative add-ons, your study approaches them as an epistemic lens capable of reinterpreting and restructuring core AI concepts. Through the integration of ontological analysis, ethical reasoning, and epistemic validation processes rooted in Islamic scholarship, your work articulates how AI can be understood not only as a technological artifact but also as a knowledge-system that must align with moral intentionality and the teleological aims of human life as defined in Islam.

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By synthesizing bibliometric findings with theoretical exploration, the study demonstrates how Islamic epistemology can provide coherence across fragmented research areas—linking machine learning's logic with *tawhid*, AI governance with *maqasid*, and data ethics with Islamic principles of justice (*adl*) and verification (*tabayyun*). In doing so, your research not only addresses a critical theoretical void but also establishes a foundational platform for future interdisciplinary studies that seek to harmonize AI development with faith-informed epistemological frameworks in Muslim societies and beyond.

The integrative discussions presented in this study are grounded in the central novelty of the research—namely, the formulation of a conceptual framework that systematically links Islamic epistemological principles, particularly *bayani*, *burhani*, and *maqasid al-shariah*, with contemporary practices in AI design, evaluation, and governance. While prior scholarship has addressed ethical considerations in AI or offered general Islamic viewpoints on technological change, it has not developed an operational model that translates these epistemic constructs into actionable mechanisms such as value-sensitive design, accountability structures, and normative assessment criteria. The thematic analyses in the discussion—ranging from the relevance of Islamic epistemology to AI, the identification of research gaps, to the articulation of integration points and global ethical contributions—collectively demonstrate how this study fills that void. By explicitly connecting foundational Islamic modes of knowing with practical dimensions of AI development, the discussion illustrates the study's unique contribution in transforming abstract epistemological insights into a structured and applicable framework capable of guiding ethical, culturally grounded, and socially responsible AI innovation.

3. Integration Between Islamic Epistemology and AI Practices

The integration of Islamic epistemology with AI practices emerges from the convergence of underlying principles that govern how knowledge is produced, validated, and operationalized within technological systems. Islamic epistemology emphasizes the unity and coherence of knowledge (*tawhid*), the moral intentionality of human actions, and the centrality of ethical accountability—principles that intersect closely with contemporary concerns about algorithmic transparency and fairness highlighted in AI

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scholarship (Campolo & Crawford, 2020; Esposito, 2017). At the ontological level, Islamic thought situates all knowledge within a divinely ordered cosmos, where technological creations must align with justice, balance, and human dignity. This stands in contrast to the reductionist ontology present in many AI systems, which often treat data as neutral or self-contained entities. In this context, Islamic epistemology expands the evaluative lens through principles such as *adl* (justice), *amanah* (trustworthiness), and *ihsan* (excellence), offering alternative norms for mitigating algorithmic bias and ensuring the ethical governance of AI. Such an approach aligns with broader calls for value-driven AI governance found in studies on organizational decision-making and public-sector AI adoption (Shrestha et al., 2019; Madan & Ashok, 2023).

A second major point of integration lies in the alignment between AI's epistemic processes—learning, inference, validation—and the Islamic concepts of *'ilm* (knowledge), *aql* (reason), and *tabayyun* (verification). Machine learning's reliance on iterative validation and structured inference resonates with Islamic knowledge traditions that emphasize systematic verification and intellectual rigor. This creates opportunities for constructing AI models that are more transparent and accountable, thus responding to concerns raised in studies on AI's societal impact and technological contingencies (Esposito, 2017; Saheb et al., 2022). The *maqasid al-shariah* framework further provides a teleological orientation for AI implementation, ensuring that technologies contribute to essential human interests such as the protection of intellect, welfare, and social stability—an alignment that is especially relevant in ongoing AI applications in Islamic finance and digital Islamic education (Hassan et al., 2020; Haider et al., 2020; Keshav et al., 2022). When embedded into real-world practice—whether in Islamic financial algorithms, educational technologies, or public-service AI systems—the integration of Islamic epistemology offers not merely ethical constraints but a constructive epistemic paradigm. This paradigm supports the development of AI systems that are morally grounded, socially responsive, and aligned with the broader objectives of human flourishing, thereby contributing to the advancement of value-oriented and socially sustainable AI ecosystems within Muslim societies and beyond.

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4. Theoretical and Practical Implications

The theoretical implications of integrating Islamic epistemology with contemporary AI discourse lie in its ability to expand dominant epistemic paradigms that have historically shaped the development and critique of artificial intelligence. Much of the foundational literature—such as Esposito's (2017) analysis of algorithmic contingencies and Campolo & Crawford's (2020) critique of deterministic power structures—demonstrates that AI is often conceptualized through secular, empiricist, and techno-rational frameworks. By introducing Islamic epistemology, which emphasizes *tawhidic unity*, moral intentionality, and the teleological purpose of knowledge, this research offers an alternative theoretical lens that challenges reductionist assumptions about data, automation, and intelligence. This approach provides a holistic epistemic structure capable of reconciling the philosophical debates surrounding AI's ontological status with ethical imperatives anchored in Islamic tradition, resulting in richer conceptual clarity about the role of technology in shaping human life. Moreover, the integration of Islamic epistemology opens new avenues for theoretical modeling by positioning AI as a morally accountable tool rather than an autonomous epistemic agent—an insight that aligns with broader calls for responsible and value-driven AI design found in public governance and organizational decision-making literature (Shrestha et al., 2019; Madan & Ashok, 2023). Thus, the theoretical contribution of this study is not only to critique existing AI paradigms but also to introduce a normative framework that redefines the epistemic foundations upon which AI systems should be built.

In terms of practical implications, this integrative framework informs the design, deployment, and evaluation of AI systems across various sectors relevant to Muslim societies. The findings of this study hold particular significance for Islamic finance, where AI-driven automation continues to grow rapidly yet must remain consistent with principles of fairness, transparency, and social welfare (Hassan et al., 2020; Haider et al., 2020). By applying Islamic epistemological principles such as *adl* (justice), *amanah* (responsibility), and *maslahah* (public good), developers and policymakers can create AI systems that not only comply with sharia-based ethical norms but also address contemporary concerns about bias, inequality, and algorithmic opacity. The practical

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relevance extends to education as well, where AI tools have been shown to support learning innovation (Keshav et al., 2022; Romero-Rodríguez, 2023), and to sectors such as sustainable energy and entrepreneurship where AI adoption is accelerating (Saheb et al., 2022; Upadhyay et al., 2023). By embedding Islamic ethical reasoning into these technological applications, this research enables more socially aligned forms of AI governance, encourages stakeholder trust, and promotes culturally grounded adoption strategies. Overall, the practical implications highlight how Islamic epistemology can play a transformative role in shaping AI ecosystems that are not only technologically efficient but also ethically resilient, socially equitable, and responsive to the moral fabric of Muslim communities.

5. Challenges and Opportunities

The integration of Islamic epistemology with artificial intelligence presents a range of conceptual and operational challenges that must be acknowledged to develop a coherent interdisciplinary framework. One of the primary challenges lies in the epistemic mismatch between classical Islamic knowledge structures—which emphasize revelation, moral intentionality, and metaphysical grounding—and contemporary AI paradigms that prioritize statistical inference, automation, and data-driven objectivity. This tension mirrors broader debates on algorithmic governance and ethical uncertainties highlighted by Esposito (2017) and Campolo & Crawford (2020), who note that AI systems often operate within value-neutral assumptions that obscure underlying biases and power asymmetries. Within Muslim-majority contexts, additional difficulties emerge due to the limited availability of culturally aligned datasets, the lack of standardized frameworks for evaluating sharia-compliant AI, and the uneven digital readiness of educational and financial institutions (Hassan et al., 2020; Haider et al., 2020). These challenges collectively illustrate the need for methodological innovation, institutional support, and sustained dialogue between technologists and Islamic scholars to bridge epistemic, ethical, and practical gaps in the development of AI systems.

Despite these challenges, the integration of Islamic epistemology and AI also presents significant opportunities for advancing both technological innovation and culturally grounded ethical frameworks. In the domain of education, AI has demonstrated

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considerable potential to support formative assessment, personalized learning, and student engagement (Keshav et al., 2022; Romero-Rodríguez, 2023), creating opportunities to embed Islamic values such as *amanah* and *adab al-'ilm* into AI-powered learning environments. Likewise, in Islamic finance and the broader Muslim economy, AI can strengthen decision-making, risk assessment, and compliance monitoring while maintaining alignment with principles of justice and transparency (Hassan et al., 2020; Sarea et al., 2021). Beyond sector-specific applications, the incorporation of Islamic ethical reasoning into AI governance responds to global demands for culturally inclusive and socially responsive AI policies, echoing calls for responsible AI in public administration and organizational contexts (Shrestha et al., 2019; Madan & Ashok, 2023). These opportunities highlight the potential for Muslim societies not only to adopt AI technologies but also to contribute substantively to global AI ethics discourse by offering an alternative value-driven paradigm grounded in Islamic intellectual tradition.

6. Contributions to Global Artificial Intelligence Ethics

The integration of Islamic epistemology into artificial intelligence offers a distinctive contribution to global AI ethics, particularly through its emphasis on moral intentionality, justice, and the safeguarding of human dignity—principles that align with but also expand upon mainstream ethical frameworks. While global AI ethics discourse often centers on issues such as transparency, fairness, and accountability, it tends to be grounded in secular-humanist paradigms that may overlook the spiritual and metaphysical dimensions of ethical reasoning (Campolo & Crawford, 2020; Esposito, 2017). Islamic epistemology, with its interconnected principles of *tawhid* (unity), *adl* (justice), and *maslahah* (public good), introduces a holistic ethical perspective that positions technology as part of a larger moral and cosmological order. This perspective offers a corrective to the value-neutral stance often embedded in algorithmic systems, providing an ethical lens that emphasizes responsibility, stewardship, and the moral consequences of technological actions—concerns echoed in broader critiques of AI in organizational and public governance domains (Shrestha et al., 2019; Madan & Ashok, 2023). As such, Islamic epistemology enriches global conversations by foregrounding values that ensure AI serves not merely efficiency or profit but the cultivation of human and societal well-being.

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Islamic contributions to AI ethics provide practical frameworks that can inform global regulatory and technological standards, especially in sectors where ethical ambiguity is prevalent. For instance, Islamic finance—an industry deeply rooted in ethical compliance—has already begun demonstrating how AI can be guided by value-based constraints, ensuring that technological interventions uphold fairness, transparency, and social responsibility (Hassan et al., 2020; Haider et al., 2020). These models present transferable insights for global financial technologies seeking alternatives to risk-intensive or exploitative algorithmic practices. Similarly, AI applications in education within Muslim contexts have revealed the importance of embedding cultural and moral values into adaptive learning systems, thereby contributing to international debates on culturally responsive AI design (Keshav et al., 2022; Romero-Rodríguez, 2023). The growing scholarly engagement in sustainability-oriented AI (Saheb et al., 2022) and ethical entrepreneurship (Upadhyay et al., 2023) further illustrates how Islamic ethical paradigms align with—and at times advance—global priorities related to social justice, ecological responsibility, and equitable technological diffusion. By bringing these value-rich frameworks into the global arena, Islamic epistemology not only diversifies the ethical foundations of AI but also offers actionable, culturally grounded models that can strengthen international efforts toward inclusive and humane AI governance.

D. Conclusion

This study demonstrates that Islamic epistemology—particularly *bayani*, *burhani*, and *maqasid al-shariah*—provides a coherent foundation for evaluating and guiding the development of artificial intelligence (AI) in Muslim and global contexts. Through bibliometric analysis of 200 publications (2015–2024), the research identifies a growing application of AI in education, Islamic finance, and social governance, while also revealing persistent gaps in aligning AI with Islamic ethical values and Shariah-oriented objectives. To address this gap, the study proposes a structured conceptual framework that systematically integrates Islamic epistemological principles with contemporary approaches to AI design, evaluation, and governance. This framework offers both theoretical and practical contributions by linking normative reasoning with empirical assessment and teleological moral aims, enabling more equitable, accountable, and

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welfare-oriented AI systems. Ultimately, this research enriches global AI ethics discourse by showing how Islamic intellectual traditions can inform responsible technological innovation and support broader humanitarian goals.

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