Urwatul Wutsqo: Jurnal Studi Kependidikan dan Keislaman
Vol. 15 No. 2, July 2026
P-ISSN: **2252-6099**; E-ISSN: **2721-2483**
DOI: https://doi.org/10.54437/juw
Journal Page: https://pondokjurnal.uwj.ac.id/index.php/UrwatulWutsqo

Integrative Study between Data Analysis and Shura Principles in Islamic Education Institutions

Nurhana Fakhriyah Imtinan[1], Abdurrozaq[2], Muhammad Thohir[3], Sahudi[4]
Universitas Islam Negeri Sunan Ampel, Surabaya, Indonesia [1234]
imtinan.fakhri@gmail.com[1], rozaqaziz0@gmail.com[2],
muhammadthohir@uinsa.ac.id[3],sahudiuinsa@gmail.com[4]

Abstract: This study aims to examine the integration of data-driven approaches with the principle of shura in Islamic education management using a Systematic Literature Review (SLR) based on the PRISMA 2020 protocol. A total of 27 selected articles from reputable databases such as Scopus, Web of Science, and SINTA (2020–2025) were analyzed. The findings indicate a significant shift from administrative digitalization toward advanced data analytics and intelligent algorithms in decision-making processes. However, the dominance of technological approaches risks neglecting ethical, spiritual, and value-based dimensions inherent in Islamic education. Therefore, this study emphasizes the integration of Islamic epistemology, including bayani, burhani, and irfani, in decision-making. The concept of shura acts as a collective validation mechanism for data analysis results, ensuring that decisions are not purely algorithmic. This study proposes the Data-Driven Shura (DDS) model as an integrative framework combining data analytics with Islamic values to support holistic decision-making. The contribution lies in bridging modern technology with Islamic ethical principles in educational management.
Keywords: Big Data, Shura, Islamic Education Management, Data Analytics, Islamic Ethics

Abstract: *Penelitian ini bertujuan mengkaji integrasi pendekatan data-driven dengan prinsip shura dalam manajemen pendidikan Islam melalui pendekatan Systematic Literature Review (SLR) berbasis protokol PRISMA 2020. Studi ini menganalisis 27 artikel terpilih dari database bereputasi seperti Scopus, Web of Science, dan SINTA dalam rentang tahun 2020–2025. Hasil penelitian menunjukkan adanya pergeseran signifikan dari digitalisasi administratif menuju pemanfaatan data analitik dan algoritma cerdas dalam pengambilan keputusan pendidikan Islam. Namun, dominasi pendekatan teknologis berpotensi mengabaikan dimensi etis, spiritual, dan nilai-nilai keislaman. Oleh karena itu, penelitian ini menekankan pentingnya integrasi epistemologi Islam yang meliputi bayani, burhani, dan irfani dalam proses pengambilan keputusan. Konsep shura berfungsi sebagai mekanisme validasi kolektif terhadap hasil analisis data, sehingga keputusan tidak bersifat deterministik. Penelitian ini menawarkan model konseptual Data-Driven Shura (DDS) yang memadukan analisis data dengan nilai-nilai Islam sebagai kerangka pengambilan keputusan yang holistik. Kontribusi penelitian ini terletak pada penguatan integrasi antara teknologi modern dan nilai-nilai etika Islam dalam manajemen pendidikan.*
Kata Kunci: Big Data, Shura, Manajemen Pendidikan Islam, Data Analytics, Etika Islam

Corresponding Author:
Nurhana Fakhriyah Imtinan
Universitas Islam Negeri Sunan Ampel, Surabaya; imtinan.fakhri@gmail.com

Introduction

In the era of rapidly advancing digital transformation, the education sector can no longer be separated from the influence of technological developments. Over the past decade, the global education landscape has undergone significant changes driven by the Industrial Revolution 4.0 and the transition toward Society 5.0 (Dhameria, Muazeib, Blhaj, Sugiyarsih, & Rosadah, 2025). This transformation is characterized by the increasing production of digital data generated from various educational activities, such as student attendance, the use of Learning Management Systems (LMS), and administrative processes. The emergence of Big Data and Learning Analytics enables educational institutions to improve the quality of decision-making, enhance managerial efficiency, and support personalized learning (Akour & Alenezi, 2022).

In the general educational context, data-driven approaches have become a standard practice in institutional management. However, in Islamic Educational Institutions (IEIs), such as pesantren, madrasah, and Islamic higher education institutions, the implementation of Big Data introduces unique epistemological and ethical challenges. These institutions are deeply rooted in the tradition of turats (classical Islamic scholarly heritage) and rely on value-based leadership, particularly the authority of religious scholars (kiai), which emphasizes moral, spiritual, and communal dimensions (Elihami dkk., 2024).

The increasing demands for accountability, accreditation standards, and global competitiveness have encouraged Islamic Educational Institutions to shift from intuition-based decision-making toward evidence-based management. While this transformation offers opportunities to enhance efficiency and transparency, it also raises concerns regarding the dominance of algorithmic logic, which may overlook the holistic nature and value-oriented principles of Islamic education, particularly in character and moral development (Ulum, Patria, & Alatas, t.t.).

Previous studies (Giandari Maulani, Rito Cipta Sigitta Hariyono, Ken Ditha Tania, Muhammad Eka Purbaya, & Ahmad Jurnaidi Wahidin, 2024) have extensively discussed the implementation of Big Data, Educational Data Mining, and Decision Support Systems in the field of education. However, most of these studies primarily focus on technical and operational aspects, with limited attention given to the integration of data-driven approaches with Islamic epistemological principles, particularly the concept of shura (consultative decision-making). This indicates a significant research gap in understanding how modern data analytics can

be aligned with Islamic values without neglecting their ethical and spiritual dimensions.

Therefore, this study aims to develop an integrative framework that harmonizes data-driven decision-making with the principles of shura in Islamic education management. Specifically, this research seeks to examine how data analytics can function as an epistemic tool (burhani), while still maintaining the role of spiritual intuition (irfani) and textual guidance (bayani) within a collective decision-making process.

This study contributes in three main aspects. First, it offers a conceptual integration between modern data analytics and Islamic epistemology. Second, it proposes a novel model, namely Data-Driven Shura (DDS), as a framework for decision-making in Islamic educational institutions. Third, it provides practical implications for policymakers and educational leaders in implementing data-driven approaches without neglecting Islamic ethical values.

Methods

This study employs a Systematic Literature Review (SLR) approach by following the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency, replicability, and rigor in the article selection process. The SLR method is used to systematically identify, evaluate, and synthesize relevant studies related to the integration of Big Data and Shura principles in Islamic education management (Page dkk., 2021).

The data were collected from several reputable academic databases to ensure the quality and credibility of the selected studies. These databases include Scopus, Web of Science, Google Scholar, and SINTA-indexed journals (Rahayu, Muhyidin, & Jamaludin, 2025).

The search process employed Boolean operators with structured keyword combinations, including:

1. Main Keywords: "Big Data", "Educational Data Mining", "Learning Analytics", "Decision Support System", "Artificial Intelligence".
2. Context Keywords: "Islamic Education", "Islamic Education Management", "Pesantren", "Madrasah".
3. Islamic Concepts: "Shura", "Tabayyun", "Maqashid Shariah", "Maslahah".

The search string used in this study was: ("Big Data" OR "Data Mining" OR "Learning Analytics") AND ("Islamic Education" OR "Islamic Education Management") AND ("Decision Making" OR "Shura"). The publication period was limited to 2020–2025 to capture recent developments in post-pandemic educational transformation.

To maintain relevance and quality, the following selection criteria are applied:

Table 1
Selection Criteria

Criterion	Inclusions (Accepted)	Exclusion (Denied)
Publication Type	Peer-reviewed journal articles (research or review articles) and indexed conference proceedings	Non-academic sources such as opinion articles, news, blogs, theses, or unpublished manuscripts
Journal Quality	Articles indexed in Scopus, Web of Science (WoS), or SINTA (levels 1–3)	Predatory journals, non-accredited journals, or SINTA level 4 and below
Language	Articles published in English or Indonesian	Articles published in languages other than English or Indonesian
Topic	Studies discussing Big Data, data analytics, or decision-making in the context of Islamic education management	Studies focusing only on technical informatics without an educational context, or purely theological studies without management relevance
Year of Publication	2020 – 2025.	Publications before 2020

Source: author data processing

Based on the inclusion and exclusion criteria, the initial search identified more than 1,200 articles. After removing duplicate records, 850 articles remained. A title and abstract screening process further reduced the number to 200 articles. Subsequently, a full-text assessment was conducted, resulting in 60 eligible articles. Finally, 27 core articles were selected as the primary basis for analysis, supported by additional methodological references (Mateen, Oh, Tergas, Bhayani, & Kamdar, 2013). This screening process was conducted systematically following the PRISMA framework to ensure transparency and replicability.

The collected data was analyzed using two approaches (1) Descriptive Literature Analysis: This approach was used to identify research trends, dominant themes, and methodological patterns within the selected studies. (2) Qualitative Content Analysis (*Content Analysis*): To extract key themes, conceptual models, and synthesis of findings related to the integration of data analysis with the *Shura* (Hakami et al., 2025; Nurhasan, Rizal, Rokhman, Surbakti, & Karlina, 2025).

Result And Discussion

Result

Research Trends in Islamic Education Management (2020–2025)

Based on the analysis of the 27 selected articles, the findings indicate a significant shift in research trends in Islamic Education Management (MPI) over the last five years. Earlier studies primarily focused on the digitalization of basic administrative processes, such as the use of office applications and institutional websites. However, recent studies demonstrate a transition toward the use of advanced data analytics and intelligent algorithms to support decision-making processes.

Distribution of Research Topics

The analysis reveals the following distribution of research topics:

1. **Decision Support Systems (DSS) (40%)**, Focused on scholarship selection, teacher performance evaluation, and academic decision-making using methods such as AHP, TOPSIS, SAW, SMART, and Profile Matching.
2. **Prediction and Classification (Educational Data Mining) (30%)**, Focused on predicting student graduation, early detection of dropouts, and classification of memorization abilities using algorithms such as Random Forest, Naïve Bayes, C4.5, and Decision Trees.
3. **Strategic Management and Leadership (20%)**, Addressing digital leadership, organizational transformation, and data-driven policy development using qualitative approaches such as case studies and systematic reviews.
4. **Ethics, Information Validation, and Philosophy (10%)**, Focused on data ethics, the concept of tabayyun, and the integration of Islamic values in information management.

Table 2
Distribution of Research Topics

Category: Topik	Focus on the Main Problem	Technology/Methods	Percentage Distribution
Decision Support System (SPK)	Selection of scholarship recipients, selection of the best teachers, and determination of majors.	AHP, TOPSIS, SAW, SMART, Profile Matching.	40%

Prediction & Classification (EDM)	Prediction of student graduation, early detection of *dropouts*, and classification of memorization skills.	Random Forest, Naive Bayes, C4.5, Decision Tree.	30%
Strategic Management & Leadership	*Digital Leadership*, organizational culture transformation, and data-driven policies.	Qualitative Case Study, Bibliometrik, SLR.	20%
Ethics, Fiqh Information & Philosophy	Information validation (*Tabayyun*), data privacy, and integration of Islamic values.	Library Research, Tafsir Tematik.	10%

Source: author data processing

These percentages represent the frequency distribution of topics identified within the 27 selected articles.

The dominance of Decision Support Systems and predictive analytics (70% combined) indicates that Islamic educational institutions are currently in a phase of technological pragmatism, focusing on solving operational problems using computational tools

Application of Data Analytics in Islamic Educational Institutions

Several studies highlight the implementation of data analytics in Islamic boarding schools, particularly in managing tahfidz programs. Research by Sobari et al. and Siregar & Putri demonstrates the effectiveness of Random Forest and C4.5 algorithms in predicting student graduation outcomes. An important finding is the identification of determinant variables influencing student success. Non-academic factors, such as discipline in congregational prayers and participation in extracurricular activities, were found to have a significant impact on memorization performance, sometimes exceeding academic indicators.

These findings support the development of early warning systems, enabling educators to identify at-risk students and provide targeted interventions, such as counseling and mentoring. In addition, several studies examine the use of Decision Support Systems (DSS) in the distribution of zakat, infaq, and alms (ZIS) scholarships. Methods such as SMART and TOPSIS are used to ensure objective and fair selection of scholarship recipients based on criteria such as parental income, number of dependents, and memorization achievement.

Discussion

Based on the findings from the 27 reviewed studies, the discussion section interprets and synthesizes the results by linking data-driven approaches with Islamic epistemological principles, particularly in the context of decision-making in Islamic educational institutions.

Integration of Data Analytics and Islamic Epistemology

The integration of Big Data into Islamic Education Management requires a strong epistemological foundation. In the context of Islamic thought, knowledge is traditionally categorized into three approaches: bayani (text-based), burhani (rational-empirical), and irfani (intuitive-spiritual)(Aulia Rizki & Syamsul Rijal, 2026).

Data analytics and algorithms can be understood as manifestations of the burhani approach, providing empirical evidence to support decision-making. However, Islamic education also emphasizes the importance of irfani (intuition) and bayani (scriptural guidance), particularly in contexts that require ethical and moral considerations.

Technology as a "Smart Assistant" in Decision-Making

Although data analytics provides accurate and objective insights, it should not function as the sole decision-maker. Instead, technology should be positioned as a supporting tool or "smart assistant." (Elrawy & Wagdy, 2025)

The findings indicate that reliance on algorithmic predictions alone may overlook contextual factors. For instance, a student predicted to fail based on attendance data may actually be facing personal or family challenges, which cannot be captured by quantitative metrics. Therefore, human judgment remains essential to ensure fairness and contextual sensitivity in decision-making processes (Boujmiraz, Darhmaoui, & Drissi El Maliani, 2026).

Integration of Shura Principles in the Digital Era

The concept of shura (consultative decision-making) plays a central role in Islamic education management. In the context of data-driven decision-making, shura functions as a mechanism to validate and interpret analytical results. The findings suggest that data should be treated as burhani evidence, which is then deliberated through shura, incorporating both rational analysis and spiritual intuition (Sucilawati, 2020).

This study proposes a redefinition of shura in the digital era as a process of collaborative sense-making, where data is critically examined rather than accepted as absolute truth.

Islamic Data Ethics

The use of Big Data carries ethical risks, such as the spread of misinformation (*Hoax*) due to an error in analysis, or the violation of the privacy of students. In

Islamic teachings, the concept of Tabayyun serves as a verification mechanism and *Hifz al-'Ird* (Preserving Honor). Afghani on related studies, *Fiqh Information* Muhammadiyah emphasizes that verifying the truth of information before making decisions is a religious obligation (QS. Al-Hujurat: 6) (Surwandono & Kaukab, 2021). In the context of *Big Data*, *Tabayyun* means (1) Source Validity: Ensures input data (*Raw Data*) is accurate and clean from manipulation (*data cleaning*); (2) Method Validity: Ensures the algorithm used is appropriate and unbiased; (3) Interpretive Validity: Ensure the reading of graphs/statistics is not misleading.

Islamic education managers who use incorrect data to punish teachers or students are considered to have committed tyranny (Bakar et al., 2024; Putra & Ayyaisy, 2025). Student data, including records of bad behavior or family economic conditions, are *Trust.* Leaking this data or allowing a weak cybersecurity system to be stolen is a form of betrayal of trust. (Huda & Suwahyu, 2024) Highlight the need to integrate data privacy ethics into the curriculum and learning process. Concept *Hifz al-Sirr* (keeping confidential) should be translated into data encryption protocols and restriction of access rights (*access control*) in the pesantren information system.

Development of the Data-Driven Shura (DDS) Model

Based on the synthesis of findings from the 27 reviewed articles, this study proposes an integrative model called **Data-Driven Shura (DDS).** This model illustrates the ideal decision-making flow for Islamic educational institutions in the 5.0 era.

Table 3
Components of the Shura Data-Driven Model (DDS)

Stages	**Technology Activities (Data Analytics)**	**Human Activity (Islamic Values)**	**Output**
1. Input & Collection	*Data Mining*, IoT, and LMS record student activities in *real-time*.	Setting Lillah's *intentions* and privacy boundaries (*Amanah*).	*Valid and secure* raw data.
2. Processing & Analysis	Algorithms (Random Forest / AHP) process data into patterns/predictions.	Ensure that the algorithm is fair, not discriminatory.	*Structured Insight* / Information (*Bayan*).
3. Verification (Tabayyun)	The system detects anomalies or *outliers*.	Leaders *cross-check* data with field realities.	Verified facts (*Haqq*).

4. Deliberation (Shura)	Data visualization (*Dashboard*) is presented on the meeting screen.	The Kiai Council discussed, weighing the aspects *of Maslahah*, *Hikmah*, and *Turats*.	Strategic Decisions (*Qarar*).
5. Execution & Tawakal	The system monitors the implementation of decisions.	Prayer and submission of results to Allah (*Tawakal*).	A Charity of Business.

Source: author data processing

The DDS model places the technology as a Dialogue Partners, not a decision-maker. In ushul fiqh terminology, data serves as Qarinah (indicator) that strengthens the Ijtihad of Institutional Leaders (Abdullah, Shaharuddin, Wahid, & Harun, 2022).

Conclusion

This study indicates that the integration of Big Data technology into Islamic education management has the potential to improve managerial efficiency and support decision-making processes. The use of advanced algorithms, such as Random Forest and Decision Support System (DSS) methods, including AHP and TOPSIS, can enhance the accuracy of predicting student performance and improve fairness in scholarship distribution. However, these findings are derived from a systematic literature review of 27 selected studies and should therefore be interpreted within this scope.

Despite the advantages of data-driven approaches, this study emphasizes that technological sophistication should not replace the ethical, spiritual, and contextual dimensions inherent in Islamic education. The principle of *shura* (deliberation) remains a central pillar in decision-making, functioning as an ethical validation mechanism to balance empirical reasoning (*burhani*), spiritual intuition (*irfani*), and textual guidance (*bayani*). Without this balance, there is a risk of excessive reliance on algorithmic determinism, which may overlook the humanistic and moral aspects of education.

As a synthesis of the findings, this study proposes the Data-Driven Shura **(DDS)** model as a conceptual framework for decision-making in Islamic educational institutions. The model positions data and algorithms as supporting evidence rather than final determinants, while maintaining the authority of collective deliberation guided by Islamic values. This approach enables institutions to integrate modern data analytics with the ethical foundations of Islamic educational traditions. This study has several limitations, including the limited number of reviewed articles (27 studies), the restricted publication period (2020–2025), and the focus on English and Indonesian sources. Additionally, the proposed DDS model has not yet been empirically tested in real institutional contexts. Therefore, future research is

recommended to conduct empirical and case-based studies to validate and refine the implementation of the DDS model across diverse Islamic educational settings.

REFERENCE

Abdullah, O., Shaharuddin, A., Wahid, M. A., & Harun, M. S. (2022). The Potentials and Challenges of Decision Support System for Islamic Banking and Finance. *European Journal of Islamic Finance*, *9*(3), 21–29. https://doi.org/10.13135/2421-2172/6901

Akour, M., & Alenezi, M. (2022). Higher Education Future in the Era of Digital Transformation. *Education Sciences*, *12*(11), 784. https://doi.org/10.3390/educsci12110784

Aulia Rizki & Syamsul Rijal. (2026). Epistemological Foundations of Islamic Education: Bayani, Burhani, and Irfani. *Al-Mudarris (Jurnal Ilmiah Pendidikan Islam)*, *9*(1), 1–14. https://doi.org/10.23971/mdr.v9i1.11002

Bakar, A. Y. A., Fazial, F., Abdullah, S. R., Taher, N. H. M., Kasim, N. H., & Hamid, M. S. A. (2024). The Concept of Tabayyun in Dissemination of Information Through Mass Media. *International Journal of Academic Research in Business and Social Sciences*, *14*(1), 2630–2642. https://doi.org/10.6007/IJARBSS/v14-i1/20693

Boujmiraz, S., Darhmaoui, H., & Drissi El Maliani, A. (2026). Predicting student performance: A comprehensive review of machine learning, deep learning, and explainable AI approaches. *Computers and Education: Artificial Intelligence*, *10*, 100548. https://doi.org/10.1016/j.caeai.2026.100548

Dhameria, V., Muazeib, A. I. M., Blhaj, K. M. S., Sugiyarsih, S., & Rosadah, R. A. (2025). The Impact of Digital Transformation in Higher Education Management: Integrating Online Learning and Educational Applications for Efficiency and Accessibility. *R. A.*., *4*(1).

Elihami, E., Masuwd, M. A., Sheerly, S., Ismail, I., Sitonda, S., & Sudirman, M. Y. (2024). Data-Driven Approaches in Islamic Quality Management and Education Technology for Advancing Sustainable Development Goals. *Jurnal Pendidikan Progresif*, *14*(3), 1599–1616. https://doi.org/10.23960/jpp.v14.i3.2024109

Elrawy, S., & Wagdy, B. (2025). Perceptions of generative AI in the architectural profession in Egypt: Opportunities, threats, concerns for the future, and steps to improve. *AI & SOCIETY*, *40*(6), 4235–4263. https://doi.org/10.1007/s00146-025-02193-1

Giandari Maulani, Rito Cipta Sigitta Hariyono, Ken Ditha Tania, Muhammad Eka Purbaya, & Ahmad Jurnaidi Wahidin. (2024). *Penerapan Data Mining di Berbagai Bidang*. Padang: CV HEI Publishing Indonesia.

Hakami, T. A., Alginahi, Y. M., & Sabri, O. (2025). Exploring the Evolution of Big Data Technologies: A Systematic Literature Review of Trends, Challenges, and Future Directions. *Future Internet*, *17*(9), 427. https://doi.org/10.3390/fi17090427

Huda, M., & Suwahyu, I. (2024). Peran Artificial Intelligence (Ai) Dalam Pembelajaran Pendidikan Agama Islam. *Referensi Islamika: Jurnal Studi Islam*, *2*(2), 53–61. https://doi.org/10.61220/ri.v2i2.005

Mateen, F., Oh, Tergas, Bhayani, & Kamdar. (2013). Titles versus titles and abstracts for initial screening of articles for systematic reviews. *Clinical Epidemiology*, 89. https://doi.org/10.2147/CLEP.S43118

Nurhasan, A. K., Rizal, M., Rokhman, S., Surbakti, A. H., & Karlina, L. (2025). Agility in Islamic Education: Adapting to Social and Technological Changes in the VUCA Era. *Managere: Indonesian Journal of Educational Management*, *7*(1), 1–13. https://doi.org/10.52627/managere.v7i1.744

Page, M. J., Moher, D., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., … McKenzie, J. E. (2021). PRISMA 2020 explanation and elaboration: Updated guidance and exemplars for reporting systematic reviews. *BMJ*, n160. https://doi.org/10.1136/bmj.n160

Putra, D. H. A., & Ayyaisy, H. I. (2025). Optimizing Digital Technology in Progressive Islamic Education to Enhance Public Literacy and Combat Hoaxes. *Multicultural Islamic Education Review*, 63–74. https://doi.org/10.23917/mier.v3i1.9915

Rahayu, B. M., Muhyidin, A., & Jamaludin, U. (2025). Cultural Intelligence Meets EdTech: A Systematic Review on Integrating Local Wisdom into Digital Teaching to Foster Learning Engagement. *Jurnal Pendidikan Progresif*, *15*(3), 1764–1784. https://doi.org/10.23960/jpp.v15i3.pp1764-1784

Sucilawati. (2020). The Concept of Shura in Islamic Governance Practice of Shura during the Caliph Umar Bin Khattab. *IJOBSOR*.

Surwandono, S., & Kaukab, M. E. (2021). Relevansi Fiqh Informasi Muhammadiyah Dalam Pengelolaan Hoax Dalam Era Disrupsi Informasi. *Jurnal Penelitian Dan Pengabdian Kepada Masyarakat UNSIQ*, *8*(3), 283–290. https://doi.org/10.32699/ppkm.v8i3.1842

Ulum, B., Patria, N. N., & Alatas, A. (t.t.). *Analysis Of Islamic Education Management Models In The Digital Era Analisis Model Manajemen Pendidikan Islam Di Era Digital*.