

From Manuscript to Modernity: The Digital Revolution of Kitab Kuning and Its Impact on Islamic Studies

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Abstract

The transition from handwritten manuscripts to digital formats has significantly transformed Islamic studies in Indonesia. This article analyzes the impact of digitalization on access, pedagogical practices, and the interpretation of Kitab Kuning within the framework of contemporary education policies. Employing a qualitative methodology, the study identifies a shift from reliance on physical texts to digital validation processes. The results indicate that digitalization not only alters information storage but also affects scholarly authority, learning practices in pesantren, and the implementation of policies such as the Kurikulum Merdeka. Nevertheless, digitalization introduces challenges, including disparities in digital literacy, fragmentation of religious authority, and the potential loss of contextual nuances present in original manuscripts. The article proposes a policy framework that balances the preservation of tradition with technological adoption, and recommends enhancing students' digital competencies and standardizing academic repositories. This research advances the discourse on digital humanities in Islamic studies and offers practical recommendations for policymakers, educators, and researchers.

Keywords: *Kitab Kuning, Manuscript Digitization, Islamic Studies*

1. INTRODUCTION

Indonesian Islamic a santri has long relied on the *Kitab Kuning*, a collection of classical texts central to pesantren, madrasah, and Islamic universities. Traditionally, these texts were manually transcribed and served as both knowledge sources and symbols of religious authority and cultural identity (Wahid, 2024). (Wahid, 2024) Teaching methods emphasized close teacher-student relationships, memorization, and specialized reading techniques such as *sorogan* and *bandongan* to preserve sanad, ensure accurate interpretation, and maintain historical context. Since the 2010s, digitalization has transformed access to Islamic heritage through digital libraries, interactive applications, and cloud platforms (Nasution, 2021). These developments support national education policies that encourage curriculum decentralization, digital literacy, and technological integration. Programs like Merdeka Belajar and Kurikulum Merdeka, along with digital initiatives in pesantren, offer both opportunities and challenges for the *Kitab Kuning* tradition (Siregar, 2022). While access to classical works has broadened, rapid and unregulated adoption of technology risks compromising authenticity and commodifying knowledge. (Badan Standar dan Asesmen Pendidikan, 2022) Authority may shift from kyais and ulamas to digital systems. Therefore, comprehensive research is needed to evaluate the impact of digitalization on

knowledge, pedagogy, and policy in contemporary *Kitab Kuning* studies in Indonesia (Hirzulloh & Annadhif, 2024; Mulyadi, 2023).

Research on digitizing Islamic manuscripts has increased in the last five years, but important gaps remain. Earlier studies mostly focused on technical aspects like scanning, metadata standards, and developing Arabic text apps such as Al-Maktabah Syamilah, LIRIS, and *Kitab Kuning* Digital. These works are mainly descriptive and rarely examine changes in scholarly authority, student impact, or the tension between national education policies and pesantren independence (Hirzulloh, 2023; Mahmud, 2022). There is also little research that combines digital humanities, education policy theory, and critical analysis of the Islamic knowledge system (Jamil, 2023). The effects of digital platforms on text validation, scholarly hierarchies, and meaning within the Kurikulum Merdeka are also rarely discussed in depth. This article addresses these gaps by providing a multidimensional analysis of the digital transformation of the *Kitab Kuning* and its implications for Islamic studies and education policy in Indonesia (Hakim, 2022). The discussion draws on media theories from (McLuhan, 1964; Postman, 1992), who argue that the medium shapes how people think, interact, and view authority. This is especially relevant in Islamic studies, where digitalization changes access, verification, teaching, and the legitimacy of knowledge. The article also applies (Shulman, 1986) concept of Pedagogical Content Knowledge (PCK), adapted for Islamic education, to explore how teachers and kyais adjust their teaching of the *Kitab Kuning* to meet new curriculum and digital literacy needs. Finally, policy-implementation theories from (Hill & Hupe, 2014), are used to examine the gap between digital education policy design and its actual implementation in pesantren and madrasah. This combined approach enables a critical analysis of power dynamics, teaching changes, and policy effects in the digital era of the *Kitab Kuning*.

Previous research conducted between 2019 and 2025 reveals a consistent yet fragmented pattern. (Rahman & Fauzi, 2020) reported that the adoption of digital platforms in pesantren boosted accessibility to classical texts by roughly 65%, but concurrently reduced the depth of contextual comprehension. (Hidayat & Sari, 2021) noted that students who rely on digital applications tend to use instant translation services without mastering the rules of nahwu-sharaf, potentially weakening their hermeneutical competence. At the policy level, the (Badan Standar dan Asesmen Pendidikan, 2022) indicated that digitalisation programmes have reached 40 % of pesantren in Java and Sumatra, yet they are hampered by infrastructure shortcomings, teacher competency gaps, and cultural resistance from some traditional ulama (Direktorat Pendidikan Diniyah dan Pondok Pesantren, 2023). International studies, such as those by (Al-Masri & Hassan, 2023) on the Middle East, show that digitising Islamic manuscripts facilitates cross-national academic collaboration while sparking debates over textual-criticism standards and digital copyright. In Indonesia, the works of (Nurul, 2024; Pratama, 2025) begin to address curriculum issues, but they have yet to integrate national education-policy

analysis with the epistemological transformation of Kitab Kuning studies. (Nurul, 2024) This gap suggests a need for a critical synthesis that links technology, pedagogy, scholarly authority, and educational policy within a coherent analytical framework. In light of this background and the identified research gap, the present study aims to: (1) examine the material and access changes of *Kitab Kuning*.

The objectives of this study are to: (1) examine the transition of Kitab Kuning from physical to digital formats; (2) explore shifts in authority and epistemological frameworks within modern Islamic studies; (3) assess the impact of digitalization on learning processes in pesantren and madrasahs under the Merdeka Curriculum; (4) analyze the tensions and synergies between national education policy and the autonomy of religious institutions; and (5) provide practical recommendations for policy and pedagogy. In application, this article serves as a resource for policymakers, pesantren leaders, digital platform developers, and digital humanities researchers seeking to design learning systems that honor tradition while adapting to contemporary needs. Theoretically, the primary contribution is an analytical framework that integrates media studies, Islamic pedagogy, and education policy analysis in the context of digitizing Indonesia's scholarly heritage (El-Ghali, 2020).

2. METHODS

The research employs critical discourse analysis and systematic literature review, methodologies that elucidate the complex power dynamics, meanings, and policy challenges inherent in the digitalization of *Kitab Kuning insights that quantitative data* alone cannot capture (Boell & Cecez-Kecmanovic, 2020; Thomas & Harden, 2020). Critical discourse analysis investigates how language, textual presentation, and policy narratives influence public perceptions of authenticity, authority, and educational value in the digital era. The literature review establishes a factual foundation for mapping recent research, identifying consensus and debate, and constructing arguments grounded in robust evidence. Literature searches focused on journals indexed in Scopus, SINTA, DOAJ, and ERIC published between 2019 and 2025, using combined keywords such as “digitalization of Islamic manuscripts,” “digital pedagogy for *Kitab Kuning*,” “pesantren curriculum transformation,” “digital humanities Islamic studies,” and “Indonesia digital education policy.” Filters ensured inclusion of only peer-reviewed articles, official reports, or relevant empirical studies (Page et al., 2021; Thomas & Harden, 2020). Additionally, public policy documents including ministerial regulations, implementation guidelines for the Merdeka Curriculum, digital transformation documents for pesantren from the Ministry of Religious Affairs, and evaluation reports of the Merdeka Belajar program were analyzed to identify alignment, gaps, and ambiguities between central policy directives and institutional practices (Kementerian Pendidikan Riset, dan Teknologi, 2021). Finally, secondary data from prominent Indonesian *Kitab Kuning* digital platforms, encompassing interface features, metadata structures, text-validation mechanisms, and user reviews, were examined to trace interaction patterns among technology, texts, and readers.

The data analysis proceeded through several systematic steps. Initially, all academic and policy documents were coded to identify recurring patterns, contradictions, and central themes. Subsequently, critical discourse analysis was applied to interrogate assumptions underlying digital claims such as “democratic access,” “authentic preservation,” and “modernization of tradition.” This approach revealed that digital platforms are not neutral; they embed technical biases, commercial interests, and authority structures that influence the dissemination of Islamic knowledge. In the third phase, findings from academic literature, policy documents, and digital platform practices were triangulated to ensure robust argumentation. Throughout the process, technical claims, such as scanning accuracy, were distinguished from interpretive claims, such as students’ comprehension of classical texts. To ensure academic rigor, several validation methods were employed: a documentary audit trail documented every research decision, data source, and interpretation; peer debriefing compared preliminary findings with the theoretical framework to minimize bias; and reflexivity was maintained to balance the preservation of tradition with pedagogical innovation, ensuring that each claim was considered from multiple perspectives. The primary limitations of this study are its reliance on secondary data and public documents, without in depth interviews with pesantren leaders, application developers, or policymakers. These limitations were mitigated through comprehensive discourse analysis, an extensive literature review, and careful conceptual comparison, resulting in a thorough and responsible synthesis. The research deliberately avoids overgeneralization regarding religious traditions or portraying digitalization as either an unequivocal solution or a fundamental problem. All claims are substantiated by clear references, and critical interpretations are presented as academic reflections rather than definitive conclusions. This approach seeks to provide meaningful analysis and foster a balanced discourse on the future of Islamic studies in Indonesia.

3. FINDINGS AND DISCUSSION

3.1 Material Transformation and Accessibility: From Paper Sheets to Cloud Repositories

The digitization of *Kitab Kuning* has reshaped how Indonesians access Islamic intellectual heritage. Previously, classical manuscripts were kept on daluwang paper, lontar, or 19th-century European paper, all of which are prone to damage from age, humidity, and frequent handling. Access to these texts was limited to certain regions and institutions, typically only found in large pesantren libraries, museums, or private scholars’ collections. This created a knowledge hierarchy in which deep understanding relied heavily on physical proximity to the manuscript and on direct guidance from a teacher. (Hosen, 2021) Digitization using high-resolution scanning, Arabic OCR, and cloud storage has removed spatial and temporal constraints. Now, texts that once could be read only in specific study rooms are accessible to students in Aceh, university learners in Makassar, or researchers abroad via digital devices.

This shift carries undeniable positive ramifications. Empirical studies indicate that digital repositories such as LIRIS (Islamic Information and Reference Laboratory) and the Digital Kitab Kuning platform have boosted the availability of classical texts by up to threefold over the past five years (Hidayat & Sari, 2021; Rahman & Fauzi, 2020). Semantic search, thematic indexes, and cross-linking between books enable readers to explore interdisciplinary connections at a speed unattainable with manual methods. Moreover, digital backup technologies reduce the risk of manuscript loss from natural disasters or neglect, thereby strengthening the preservation of Islamic intellectual history. From a policy standpoint, this aligns with the educational digital transformation agenda that prioritizes equitable access to high-quality learning resources, as outlined in the Ministry of Religious Affairs' strategic document (Badan Standar dan Asesmen Pendidikan, 2022; Nasional, 2021) and the implementation guidelines of the Merdeka Curriculum, which promote the use of open resources.

Nevertheless, easier access does not automatically translate into deeper comprehension. Digitization often overlooks the physical attributes of manuscripts that, within pesantren tradition, carry pedagogical and spiritual significance (Wahyudi, 2022). Marginal notes, ink variations, handwritten punctuation, or irregular page arrangements constitute historical traces documenting cross-generational scholarly processes. When a manuscript is converted into a uniform PDF or HTML format, these subtleties are frequently lost in favor of a cleaner screen presentation. Consequently, digital readers engage with a technically "cleaned" text that lacks the creation context and the evolution of meaning (Zuhri, 2023). This raises the question: Does screen-oriented digitization sacrifice the rich meaning embedded in the manuscript's materiality? Some digital humanities scholars have begun advocating a "digital materiality" approach that not only digitizes the textual content but also records physical structure, marginalia, and edition variations as metadata (Al-Masri & Hassan, 2023; Drucker, 2021). In Indonesia, this method remains rare, causing most digital platforms to present *Kitab Kuning* as a static final product rather than a living text whose meaning continuously evolves.

Wider accessibility also reshapes how knowledge is consumed. Students and scholars now frequently rely on machine translation, algorithmic summaries, or short videos on social media. While these tools aid beginners in grasping basic concepts, an overreliance on digital simplification can erode the ability to read original texts critically. (Nurul, 2024) study found that students who spent more than 60 % of their study time on digital platforms showed a decline in their capacity to understand classical Arabic grammatical structures and trace citation sources. This evidence suggests that convenience does not always correspond with depth of comprehension. Therefore, the transition from physical manuscripts to digital repositories should be viewed as an expansion of the learning ecosystem rather than a replacement, and it must be balanced with pedagogical strategies that continue to stress direct reading, cross-verification, and interpretive discussion.

3.2 Epistemological Shift: Textual Authority, Scholarly Validation, and the Fragmentation of Tradition

The digital turn has not only altered the ways texts are accessed but also reshaped the structures that legitimize knowledge in Islamic studies. Within the pesantren tradition, scholarly authority is established through a chain of isnād that links a student to a teacher, that teacher to his predecessors, and ultimately back to the classical ulama. A text's credibility, therefore, depends not merely on its content but also on its transmission context, pedagogical methods, and the recognition of the scholarly community (Suryadi, 2021). This system creates a clear hierarchy of authority, though not always democratic, it preserves a controlled, time-tested continuity of interpretation. Digital platforms, by contrast, decentralize that authority, placing every internet-connected user on an ostensibly equal footing (Safitri, 2023). Anyone can download, read, quote, or even publish alternative exegeses of the "*Kitab Kuning*" without undergoing traditional scholarly verification. This gives rise to what can be termed an "epistemic authority fragmentation." When platform algorithms decide a text's visibility based on download counts, reading duration, or social-media engagement, the criteria for validation shift from the depth of isnād to digital-engagement metrics. Texts that are easier to read, shorter, or align with popular narratives tend to achieve higher visibility, regardless of methodological soundness or fidelity to classical scholarly traditions.

The problem is amplified by a flood of religious content produced rapidly by digital creators who lack adequate pesantren training. (Pratama, 2025) reports that 43 % of the "*Kitab Kuning*" learning materials circulating on free education platforms omit isnād references, fail to provide historical context, and ignore relevant fiqh or kalam debates. Consequently, lay readers or novice santri may develop fragmented, partial, or even contradictory understandings without realizing the diversity of interpretations that exist within classical Islamic tradition. Critiquing this fragmentation does not amount to rejecting the democratization of knowledge. Islamic intellectual history itself demonstrates a tradition of critical scholarship; questioning fragmented authority is compatible with an openness to dialogue and innovation, provided core principles are respected. Digitalization can actually reinforce Islamic epistemology if it incorporates transparent validation mechanisms and involves multiple stakeholders. Some platforms are already experimenting with open peer review, digital isnād tagging, and collaborations with accredited pesantren to verify texts. These initiatives show that technology need not clash with tradition but can serve to enhance scholarly accountability in the information age. The real challenge lies in balancing algorithmic logic, which prioritizes speed and reach, with scholarly logic, which emphasizes depth, verification, and continuity. While the Ministry of Religious Affairs and the Indonesian Ulema Council (MUI) stress the importance of preserving doctrinal authenticity and preventing distorted teachings, policy documents often remain vague, advocating "responsible technology use" without offering concrete standards for digital text validation, teacher competencies for platform-based

instruction, or mechanisms for reporting misleading content. This leaves Islamic educational institutions uncertain about how to integrate digital tools into formal curricula without compromising religious prudence. A promising solution may be the development of a “collaborative authority” framework that brings together ulama, academics, technology developers, and policymakers to draft digital-ethics standards for the study of the “*Kitab Kuning*.” Such a framework could ensure that broader access does not undermine scholarly integrity.

3.3 Pedagogical Impacts: Teaching the (Kitab Kuning) in the Era of Independent Curriculum and Independent Learning

Digital transformation extends beyond textual content; it permeates classrooms and pesantren environments. The government’s Independent Curriculum and Independent Learning initiatives emphasize competency-based instruction, curricular flexibility, and the use of technology as a learning medium. In this setting, the traditional teaching of the *Kitab Kuning*, once highly structured, hierarchical, and reliant on intensive memorization, must adjust to a more collaborative, project-oriented, and digitally literate paradigm. This shift creates both opportunities and significant pedagogical challenges for teachers, kiai, and students.

One notable positive effect is the rise in interactivity during lessons. Digital platforms allow the integration of explanatory videos, adaptive quizzes, asynchronous discussion forums, and text-translation simulations that enrich students’ learning experiences. Educators can leverage learning analytics to pinpoint individual difficulties, tailor pacing, and provide more personalized feedback. This aligns with the differentiation principle highlighted in the Independent Curriculum, which acknowledges diverse learning speeds and styles among students. Field research by (Hidayat & Sari, 2021) found that pesantrens that incorporated digital platforms alongside conventional sorogan methods saw a 38 % boost in student motivation, especially among those previously struggling with large-group instruction.

Nonetheless, this adaptation is not without friction. Many veteran instructors, accustomed to face-to-face teaching traditions, find it hard to adjust. The lack of targeted training on how to embed digital *Kitab Kuning* into competency-based teaching leads some teachers to merely transplant old methods onto screens without altering core pedagogy. Consequently, digitalization becomes an extra administrative burden rather than a catalyst for instructional change. Moreover, the pressure to meet “digital literacy” indicators in school assessments often shifts the focus from mastering subject matter to mastering tools, leaving students more proficient with applications than with the scholarly context of the texts. This underscores the need to redefine teacher competencies in Islamic education to encompass not only technological proficiency but also the ability to balance scholarly tradition with pedagogical innovation (Hirzulloh & Annadhif, 2024). Learning outside formal class hours can foster curiosity and intellectual initiative, yet it may also create an illusion of competence when students equate reading a digital translation with truly

mastering the book. In pesantren tradition, mastery of the *Kitab Kuning* is measured not merely by literal comprehension but also by tracing inter-madhab debates, recognizing historical contexts, and applying principles of *usul al-fiqh* or *balaghah*. Digitalization, lacking methodological support, may produce learners with a broad but shallow understanding. Therefore, integrating the Independent Curriculum with Yellow Book instruction requires an explicit pedagogical design that teaches critical reading strategies rather than just content consumption. This can be achieved through modules that blend digital exploration with cross-verification tasks, in-depth discussions, and contextual interpretation projects guided directly by teachers.

3.4 Context of Indonesian Education Policy: Regulations, Implementation, and the Tension between Standardization and Traditional Autonomy

Over the past five years, Indonesia's education policy has demonstrated a strong commitment to digitalization, yet its implementation in Islamic education faces distinctive challenges. The Ministry of Religious Affairs' digital transformation program for pesantren aims to upgrade infrastructure, boost learning quality, and broaden inter-institutional collaboration. At the same time, the nationally adopted Merdeka Curriculum emphasizes school autonomy, project-based learning, and technology integration. While these two initiatives are theoretically complementary, in practice they often clash, pitting standardized national criteria against the locally rooted, autonomous traditions of pesantren.

A primary source of friction concerns graduate competency standards and assessment methods. The Merdeka Curriculum promotes portfolio, project, and reflective assessments, whereas the traditional *Kitab Kuning* pedagogy relies on memorization exams, textual structure tests, and teacher-graded evaluations based on the depth of *sanad* comprehension. When Islamic educational institutions are compelled to align their assessment systems with national indicators, the spiritual and methodological dimensions that characterize *Kitab Kuning* instruction are often diminished. According to the Ministry of Religious Affairs' (Badan Standar dan Asesmen Pendidikan, 2022) evaluation report, 27% of pesantren reported difficulties translating digital learning outcomes into assessment formats compatible with their scholarly traditions, leading many to operate parallel assessment systems and increasing administrative load.

Another source of tension relates to digital content regulation. The government promotes open learning resources and vetted educational platforms, yet no definitive standards exist defining what is "valid" or "authentic" for digital *Kitab Kuning* materials. In the absence of clear regulatory guidelines, pesantren confront a dilemma: adopt convenient commercial platforms that lack scholarly validation, or create independent, authentic systems that are limited in scale. This predicament is exacerbated by a lack of incentives for digital content creators collaborating with accredited scholars or pesantren, resulting in a market dominated by products that prioritize technical efficiency over scholarly depth. A more effective policy should recognize that standardization need not

entail homogenization. Rather than imposing a single digital model, the government could establish a “minimum standards” framework guaranteeing accessibility, data security, and transparent validation, while still allowing pesantren to design learning models aligned with their own traditions.

Policy synchronization also demands a multi-stakeholder approach that includes not only bureaucrats and academics but also pesantren representatives, technology developers, and ulama. Regular dialogue forums, collaborative pilot projects, and evidence-based feedback mechanisms can help bridge the gap between policy and on-the-ground practice. Moreover, adequate budgeting for teacher training, infrastructure development in remote areas, and research on the impacts of digitalization is essential to ensure that the transformation yields tangible improvements in learning and scholarship.

3.5 Science and the Future of Religious Authority

Behind the narrative of progress and modernization, the digital revolution of the *Kitab Kuning* still faces inequality issues that deserve attention. The digital divide remains a challenge, especially for pesantren located in remote regions or with limited resources. Access to devices, reliable internet, and technical training is often uneven, giving rise to a new “digital class” in which students from larger or urban pesantren enjoy greater digital literacy and academic networking. (Rahman & Fauzi, 2020) found that only 31 % of pesantren outside Java have adequate access to verified digital Kitab Kuning platforms, while the remainder rely on unofficial sources or manual learning. This disparity may widen regional differences in the quality of Islamic education, contradicting the principle of equity in national education. Commercialization of religious knowledge raises concerns. Many digital platforms operate on subscription, advertising, or premium-feature models, turning access to classical texts from a scholarly right into a commodity (Zamzami, 2023). When religious knowledge is packaged as a product to be purchased, the paradigm shifts from “knowledge as a trust” to “knowledge as an asset.” This conflicts with Islamic values that emphasize unrestricted dissemination of learning and risks marginalizing students from low-income families. Conversely, some platform developers argue that a commercial model is needed for operational sustainability, server maintenance, and feature development. While technically valid, such arguments should be balanced with subsidy mechanisms, partnerships with non-profit organizations, or open-source models that still ensure content quality and security (Yusuf, 2022).

The future of religious authority in the algorithmic age is also a crucial issue. As search engines and content-recommendation systems dictate which texts receive the most attention, and religious influencers reach wider audiences than traditional scholars, authority shifts from chain-of-transmission legitimacy to popularity. This shift is not inherently negative, but it demands strong critical literacy so users avoid digital echo chambers or fragmented understandings. Contemporary Islamic education must teach students not only how to use technology but also how to think critically about it understanding algorithmic bias, recognizing unverified content, and habitually

cross-checking information. Without these skills, digitization may produce a tech-savvy generation that lacks methodological insight. In sum, the digital revolution of the *Kitab Kuning* s is more than a media shift. It represents a transformation of the scholarly ecosystem, encompassing material aspects, ways of thinking, learning processes, and policy.

The success of digitization should not be measured merely by the number of scanned manuscripts but by how effectively the Muslim community leverages technology to deepen understanding, broaden dialogue, and preserve traditional integrity. Existing challenges are not grounds to reject digitization; rather, they call for a more reflective, inclusive design that prioritizes sustainable scholarly values. The *Kitab Kuning* has reshaped the landscape of Islamic studies in Indonesia in a multidimensional way, going beyond a simple transition from physical to digital media. Material transformation has improved accessibility and preservation of classical manuscripts, yet it often overlooks the hermeneutic richness embedded in the physicality and traditional annotations. An epistemological shift reveals a fragmentation of scholarly authority, where text validation no longer depends solely on chains of transmission and community verification but also on digital metrics and platform popularity. Pedagogically, integrating digital tools into the Merdeka Curriculum and Merdeka Learning offers interactive and differentiated opportunities, but it also confronts challenges such as teachers' adaptation, inflated perceptions of student competence, and evaluative pressures that can diminish the methodological dimensions of traditional pesantren education. At the policy level, the tension between national standardization and the traditional autonomy of pesantren creates implementation challenges that require a more flexible, collaborative regulatory approach.

4. CONCLUSION

This article emphasizes the importance of media ecology and policy implementation theory within Islamic digital humanities, showing that technology reconfigures power relations, knowledge-validation practices, and learning patterns. Practically, the findings point to the need for a framework that balances technological innovation with the preservation of scholarly methods, and for critical digital literacy that teaches not only tool use but also an understanding of bias, validation, and the ethics of knowledge in the algorithmic era. Based on this analysis, several recommendations are made for stakeholders. First, education policymakers should develop minimum standards for validating digital texts that involve scholars, academics, and technology developers, and allocate proportionate budgets for teacher training and infrastructure in remote regions. Second, administrators of pesantren and madrasas are urged to adopt hybrid learning models that blend digital exploration with direct reading, cross-verification, and methodological support, while building teachers' competence in digital pedagogy that still honors the sanad tradition. Third, platform developers should implement open peer-review systems, ensure metadata transparency, and provide inclusive access models

(such as open-source or cross-subsidy schemes) to prevent the commercialization of knowledge that would undermine justice in education. Fourth, researchers and academics need longitudinal studies on the long-term impact of digitization on santri's depth of understanding, as well as the development of a "digital materiality" framework that records not only text content but also historical traces and marginalia as integral parts of scholarly heritage. The digital revolution of the *Kitab Kuning* is not the end of tradition but a new phase in the continuity of Islamic scholarship, demanding critical vigilance, pedagogical creativity, and multidisciplinary collaboration. By designing a digital ecosystem rooted in scholarly values, methodologically transparent, and inclusive in access, Islamic studies in Indonesia can move toward modernity without losing the spirit of its tradition.

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