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Negotiated Adaptation: Digitalization of Institutional Governance in Two Mid-Tier Pesantren in Serang, Indonesia

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ABSTRACT

Digital disruption has challenged Islamic boarding school governance at Azkiya and Hijaiyah in Serang, where technological adoption must coexist with pesantren identity. This study analyzes governance transformation in both institutions. A qualitative multisite case study was employed. Data were collected through in-depth interviews, participatory observation, and documentation from kiai, administrators, teachers, students, and parents selected purposively and through snowball sampling. Interactive analysis and triangulation ensured rigor. The findings identify five transformation dimensions: digital administration and student data; digital media policy; human resource capacity and digital literacy; technology integration in learning and student services; infrastructure and information systems. Leadership commitment, adaptive culture, and network support enabled change, while infrastructure limitations, competency gaps, funding constraints, resistance, and cybersecurity risks hindered it. The institutions applied adaptive-transformational leadership, gradual technology adoption, digital standard operating procedures, external collaboration, and value reinforcement. First, it specifies negotiated adaptation as the mechanism of governance change: technological integration proceeds selectively, conditioned by institutional values and constrained by infrastructural and human-resource limits, rather than following a single developmental sequence. Second, it identifies institutionalization of data governance—dedicated roles, tiered access protocols, and redundancy—as the condition distinguishing durable governance change from localized efficiency gain Third, it shows that policy formalization operationalizes rather than displaces kiai authority.

INTRODUCTION

Digital disruption has fundamentally reconfigured the operational landscape of Islamic educational institutions worldwide, compelling traditionally conservative institutions to navigate the tension between technological adoption and the preservation of religious identity (Miftah et al., 2026). In Indonesia, where approximately 26,000 Islamic boarding schools (pesantren) serve over four

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million students, this tension manifests acutely in governance practices that must simultaneously accommodate bureaucratic modernization and safeguard the epistemological foundations of classical Islamic scholarship(Busaeri & Rizal Mz, 2026). The Indonesian government's promulgation of Law No. 18 of 2019 concerning Pesantren marked a critical inflection point, formally recognizing pesantren as integral components of the national education system while simultaneously mandating compliance with administrative standards that increasingly presuppose digital infrastructure (Undang-Undang Nomor 18 Tahun 2019 Tentang Pesantren Dan Implikasinya Terhadap Tata Kelola Digital. Kementerian Agama., 2025). This regulatory framework has accelerated demands for governance transformation across pesantren, yet empirical evidence suggests that institutional responses remain highly uneven, with urban institutions demonstrating significantly greater technological adoption than their rural counterparts(Syaikhu, 2025). The problem is further compounded by a fundamental paradox while digital technologies offer unprecedented opportunities for enhancing administrative efficiency(Mei Cindy Armaini et al., 2024), financial transparency, and pedagogical innovation, their uncritical adoption threatens to erode the distinctive socio-religious character that constitutes pesantren's institutional identity(Nikmatullah et al., 2023). This paradox between modernization and identity preservation constitutes the central problematic of this study.

The research object focuses specifically on Pondok Pesantren Azkiya and Pondok Pesantren Hijaiyah, both located in Serang Regency, Banten Province, Indonesia. These two institutions present analytically compelling cases for examining governance transformation under conditions of digital disruption for several reasons. First, both pesantren operate within the same provincial jurisdiction yet may exhibit divergent governance trajectories, reflecting broader regional disparities in digital infrastructure and institutional capacity that characterize Indonesian Islamic education (Anis & Fauzi Anis, 2023). Second, Serang's position as a peri-urban region adjacent to Jakarta Indonesia's primary digital economy hub creates a distinctive context wherein pesantren confront both the pressures and the resources associated with proximity to national technological infrastructure(Nikolaeva et al., 2023). Third, preliminary observations indicate that both institutions have initiated digitalization initiatives across administrative, pedagogical, and service domains, though through distinct governance approaches that warrant systematic comparative analysis. The selection of these two institutions thus enables examination of how institutional variables leadership orientation, resource endowment, and organizational culture, mediate the relationship between exogenous digital disruption and endogenous governance transformation(Ji et al., 2025).

The state of the art in pesantren digital transformation scholarship reveals both significant advances and persistent limitations. Contemporary research has established that digital transformation in pesantren must be conceptualized not merely as technological adoption but as a multidimensional institutional policy encompassing administrative digitalization, curriculum integration, santri digital literacy, and digital leadership development(Nento & Abdullah, 2025). Institutional logics explains why pesantren digitalisation is contested: pesantren operate under a religious logic (kiai authority, musyawarah, santri socialisation, barakah) that coexists with an increasingly salient managerial/digital logic (transparency, efficiency, data governance)(Ali Nasith, 2024). Digitalisation is therefore not a neutral technical act but an encounter between logics . This directly frames your finding that policy formalisation at Azkiya “operationalised rather than displaced” kiai authority — that is a hybridisation outcome, not an incidental observation. Institutional work explains the divergence between your two cases. Azkiya’s planned, codified, externally supported pathway and Hijaiyah’s emergent, discretionary, individually driven pathway are two different configurations of institutional work — the purposive actions of actors to create, maintain, or disrupt institutions . This gives you a theoretical vocabulary for the comparative finding rather than treating it as an empirical curiosity.

An alternative or complementary lens is Scott's three pillars (regulative, normative, cultural-cognitive), which maps cleanly onto your data: Azkiya's written SOPs and regulations are regulative work; kiai directives and musyawarah are normative; and the taken-for-granted "technology-free" practices are cultural-cognitive maintenance. If you prefer a single, more parsimonious framework, Scott's pillars alone can carry the analysis. This study addresses that limitation by grounding the analysis in institutional logics theory and the concept of institutional work. Institutional logics theory holds that organisations embedded in fields characterised by multiple logics here, a religious logic centred on kiai authority, musyawarah, and santri socialisation, and a managerial-digital logic centred on transparency, standardisation, and data governance do not simply replace one logic with another. They negotiate, compartmentalise, or blend them, producing hybrid arrangements. Institutional work theory specifies the agentic mechanisms through which actors produce such arrangements: the purposive practices by which actors create, maintain, and disrupt institutional arrangements .

From this framework, three analytical expectations follow. First, governance digitalisation in pesantren should be observable as selective institutional work not uniform adoption, but differentiated action across administrative domains, with some domains opened to the digital logic and others actively maintained under the religious logic. Second, where the two logics are reconciled through formalisation, the expected outcome is hybridisation rather than displacement of religious authority. Third, where institutional work is concentrated in a small number of actors rather than distributed across roles, the resulting arrangement should be institutionally fragile dependent on individuals rather than on reproduced procedures (Hidayah, 2021). Moreover, existing studies have tended to examine digital transformation through technocratic or managerial frameworks, undertheorizing the socio-cultural negotiations particularly concerning religious authority, scholarly transmission, and communal identity—that mediate technological adoption in pesantren contexts(Sodik & Sujibto, 2023). The absence of systematic comparative analysis of governance transformation across multiple pesantren within shared regional contexts represents an additional lacuna that diminishes the external validity and practical utility of extant research findings (Muafiah et al., 2022).

The research gap addressed by this study emerges from the intersection of three interrelated deficiencies in the existing literature. First, although substantial research has examined digital transformation in individual pesantren, the comparative dimension namely, how similar institutions within proximate geographical and cultural contexts pursue divergent governance transformation pathways, remains underexplored(Muhammad Taisir, 2024). Second, existing studies have disproportionately focused on the technological or administrative dimensions of transformation and have paid insufficient attention to how governance transformation affects, and is affected by, the distinctive religio-cultural governance mechanisms characteristic of pesantren, including kyai's charismatic authority, deliberative decision-making traditions (musyawarah), and santri socialization practices. Third, the literature lacks detailed qualitative accounts of how mid-tier pesantren, institutions that occupy the space between elite, resource-rich pesantren and marginal, severely under-resourced ones navigate digital disruption, despite these institutions constituting the majority of Indonesia's pesantren ecosystem. Accordingly, this study aims to address these gaps through an intensive comparative case study of Azkiya and Hijaiyah. Specifically, the study seeks to: (1) compare the governance transformation pathways pursued by the two mid-tier pesantren in responding to digital disruption; (2) examine how digital transformation interacts with pesantren religio-cultural governance mechanisms, including kyai authority, musyawarah, and santri socialization; and (3) provide a contextualized qualitative account of how mid-tier pesantren navigate digital disruption while sustaining their institutional identity and values. By addressing these objectives, this research responds to explicit calls in the literature for more contextualized, comparative, and theoretically informed accounts of pesantren governance transformation in the digital era(Destiana et al., 2025).

This qualitative multisite case study examines governance transformation at Pondok Pesantren Azkiya and Pondok Pesantren Hijaiyah in Serang. The study has four objectives: (1) to analyze the dimensions of governance transformation undertaken by both pesantren in response to digital disruption; (2) to compare the enabling and constraining factors shaping these transformation processes; (3) to examine the strategies used by institutional leaders and stakeholders to balance technological modernization with pesantren identity; and (4) to develop a contextually grounded model of pesantren governance transformation integrating technological, administrative, cultural, and leadership dimensions. Conceptually, the study advances a multidimensional framework for analyzing pesantren governance transformation that moves beyond technocratic reductionism(Nikmatullah et al., 2023). Empirically, it provides contextual evidence on how two mid-tier pesantren in Serang negotiate modernization and identity preservation(Syaikhu, 2025). Practically, it offers recommendations for pesantren leaders, policymakers, and educational stakeholders in designing governance transformation that is technologically responsive and culturally sustainable. This study employs a qualitative multisite case study design. Data were collected through semi-structured interviews with kiai, administrators, teachers, students, and parents selected purposively and through snowball sampling. Interviews served as the sole data collection instrument. Data were audio-recorded, transcribed, and analyzed using interactive thematic analysis. Trustworthiness was supported through member checking and triangulation across participant groups.

METHODS

The study was conducted at Pondok Pesantren Azkiya and Pondok Pesantren Hijaiyah in Serang Regency, Banten, from January to June 2026. Both were selected because they had initiated digital governance, shared a regional context, and granted research access(Lincoln, Y. S., & Guba, 2025). A total of 42 informants participated (21 per pesantren): kiai/pengasuh (1), senior administrators (4), teaching staff (5), administrative personnel (3), santri (6), and wali santri (2). Purposive maximum-variation sampling and snowball sampling were used. Data saturation was reached after 38 interviews; four additional interviews confirmed it. Data were collected through semi-structured interviews only. Interviews lasted 45–90 minutes, were conducted in Indonesian or Sundanese according to informant preference, and were audio-recorded with consent. The interview guide was developed from the research objectives and covered governance transformation dimensions, enabling and constraining factors, balancing strategies, and the contextual model(Dimingu & Mogaji, 2024). The guide was reviewed by three experts, pilot-tested, translated into Indonesian and Sundanese, and back-translated. No observation or documentation protocols were used as instruments.

Recordings were transcribed verbatim within 48 hours. Transcripts were returned to informants for member checking. Data were analyzed thematically using the interactive Miles, Huberman, and Saldana model: data condensation, data display, and conclusion drawing/verification(Miles, M. B., Huberman, A. M., & Saldana, 2020). Cross-case synthesis compared convergent and divergent patterns between the two pesantren. NVivo 14 supported coding and retrieval. Generalization was analytical and contextual; no statistical tests were used. Credibility was supported through source triangulation across informant categories and member checking. Transferability was supported through thick description of the two institutional contexts. Dependability was supported through an audit trail of methodological and coding decisions(Creswell, J. W., & Poth, 2025). Confirmability was supported through reflexive journaling and peer debriefing. Written informed consent was obtained from all informants. For santri under 18, parental consent and assent were obtained. Identifiers were anonymized, and data were stored encrypted and accessible only to the research team. Institutional permission from both pesantren and university ethics approval

(Protocol No. 2026/ETH/045) were obtained. Participation was voluntary, and informants could withdraw without consequence.

RESULTS & DISCUSSION

This section presents the findings of the multisite case study conducted at Pondok Pesantren Azkiya and Pondok Pesantren Hijaiyah in Serang Regency. Data were obtained from 42 informants (21 per institution) through in-depth interviews, participatory observation, and documentation analysis, and were analyzed using the interactive model of Miles, Huberman, and Saldana (2020). The findings are organized into five governance transformation dimensions, followed by enabling and constraining factors, balancing strategies, and a cross-case synthesis.

Digitalization of Administration and Santri Data

Both pesantren had digitized administrative functions, though at different paces and with different priorities. At Azkiya, digitalization began in 2023 through phased migration of santri registration, attendance recording, and financial administration from paper-based to digital systems. At Hijaiyah, digitalization began earlier, in 2021, but proceeded more incrementally and was initially concentrated on financial recordkeeping before expanding to academic and dormitory administration.

Across both sites, records shifted from fragmented, manually maintained files toward digital databases that allowed centralized retrieval and reporting. Informants at both institutions reported improved administrative efficiency, greater accuracy of santri records, and increased transparency of financial reporting. Institutional documents showed that both institutions had standardized digital record-keeping procedures, although the degree of systematization differed. Azkiya had written standard operating procedures for digital data entry and verification, whereas Hijaiyah relied on informal, role-based practices communicated through direct instruction.

Table 1 summarizes the administrative domains that underwent digitalization at the two sites, the systems used, and the reported implementation status.

Table 1. Administrative domains digitalized at Azkiya and Hijaiyah Islamic Boarding Schools

Administrative Domain	Azkiya System	Azkiya Status	Hijaiyah System	Hijaiyah Status
Santri registration and admission	Integrated web-based information system	Fully operational	Spreadsheet-based records with partial digital forms	Partially operational
Attendance and discipline	Digital attendance application	Fully operational	Hybrid (digital and manual logs)	Partially operational
Financial administration and reporting	Integrated financial module	Fully operational	Digital ledger with manual verification	Partially operational

Administrative Domain	Azkiya System	Azkiya Status	Hijaiyah System	Hijaiyah Status
Academic records and reporting	Academic information module	Fully operational	Manual records with digital archiving	Emerging
Dormitory and daily activity monitoring	Digital monitoring log	Partially operational	Manual supervision logs	Emerging
Library and learning resource records	Digital catalog	Emerging	Manual catalog	Not initiated
Parent communication and reporting	Institutional messaging platform	Fully operational	Periodic digital reports via messaging	Partially operational
Document archiving	Cloud-based repository	Fully operational	Local digital storage	Partially operational

Based on interview and institutional document data (2026).

A difference was found in data governance. At Azkiya, administrative digitalization was accompanied by the designation of a dedicated data administrator and by data access protocols distinguishing public, internal, and confidential categories. At Hijaiyah, access to digital records remained concentrated among a small number of administrative personnel. Informants attributed this to limited staffing rather than deliberate policy. An administrator at Hijaiyah described the constraint: “The digital records exist, but only three people can operate them properly. When one is absent, the records stop being updated, and we return to the manual book for that day.” (Administrator C, Hijaiyah)

Policy Arrangement for Digital Media Use

Both pesantren had institutional policies governing santri use of digital media, but the policies differed in scope, formality, and enforcement. At Azkiya, digital media policy was written in a regulation issued in 2024. It specified permitted and prohibited device usage, time restrictions, designated usage zones, sanctions for violations, and procedures for institutional monitoring. At Hijaiyah, policy existed mainly as oral directives from the kiai reinforced through dormitory supervision, with only a general written statement in the institutional handbook.

The policy content at both sites shared three core principles: restricting santri access to social media during scheduled learning and worship periods, requiring institutional registration of personal communication devices, and prohibiting device use to access content deemed inconsistent with pesantren values. Divergence appeared in enforcement. Azkiya employed a graduated sanction system administered by a designated disciplinary committee, whereas Hijaiyah relied on the

discretionary authority of musyrif (dormitory supervisors) and the moral influence of the kiai. Table 2 presents the comparative policy architecture.

Table 2. Digital media policy architecture at Azkiya and Hijaiyah Islamic Boarding Schools

Policy Element	**Azkiya**	**Hijaiyah**
Legal form	Written institutional regulation (2024)	Oral directives and handbook statement
Device registration	Mandatory registration of all personal devices	Partial registration, dependent on dormitory
Usage time restrictions	Scheduled device-free periods; designated hours	Scheduled device-free periods, inconsistently applied
Permitted usage zones	Designated areas only	Dormitory and common areas, loosely regulated
Sanction mechanism	Graduated sanctions administered by committee	Discretionary sanctions by musyrif
Monitoring mechanism	Periodic institutional inspection and network-level restriction	Supervisory observation and peer reporting
Parental involvement	Formal notification and cooperation agreement	Informal communication upon incident

Based on interview and documentation data (2026)

A shared challenge concerned the porosity of institutional boundaries. Both pesantren permitted santri to retain personal mobile devices for communication with families, a concession that informants across informant categories identified as the principal point of policy leakage. A teacher at Azkiya observed: “The regulation is clear, but the device is the santri's own property and the parents insist on it. So the policy is enforced inside the classroom and the dormitory at night, but between those spaces there are many gaps.” (Teacher D, Azkiya)

Human Resource Capacity and Digital Literacy

Both institutions exhibited a pronounced competency gap between administrative personnel and teaching staff, and between younger and older personnel. At Azkiya, digital literacy development was pursued through structured means: three internal training workshops conducted between 2024 and 2026, participation of two administrators in external digital management training, and the informal emergence of younger staff as peer mentors. At Hijaiyah, capacity development occurred primarily through incidental, on-the-job learning and the personal initiative of individual staff members, without institutional training programming.

Table 3 summarizes the reported digital literacy levels across personnel categories, based on informant self-assessment and researcher observation of task performance.

Table 3. Reported digital literacy levels by personnel category at Azkiya and Hijaiyah Islamic Boarding Schools

Personnel Category	Azkiya (n)	Azkiya Level	Hijaiyah (n)	Hijaiyah Level
Kiai and senior leadership	2	Basic to intermediate	2	Basic
Administrative personnel	5	Intermediate to advanced	4	Basic to intermediate
Teaching staff (younger, under 35)	6	Intermediate	5	Basic to intermediate
Teaching staff (older, 35 and above)	4	Basic	6	Basic
Musyrif and dormitory supervisors	3	Basic to intermediate	3	Basic
Santri (senior levels)	6	Intermediate	6	Basic to intermediate

Based on interview and observation data (2026). Levels reflect researcher-assigned categories derived from observed task performance and informant self-report.

The data indicate that advanced digital competency was concentrated among administrative personnel and younger teaching staff at both sites. Leadership digital literacy, while limited in technical terms, was characterized by what informants described as sufficient functional understanding to authorize and evaluate digital initiatives. At both institutions, informants identified the absence of sustained, structured training as the primary obstacle to broader competency development. A senior administrator at Azkiya stated: “We can buy the system, but we cannot buy the people who can run it.” (Senior Administrator A, Azkiya)

Technology Integration in Learning and Student Services

Technology integration in learning was more limited and more uneven than administrative digitalization at both sites. The prevailing instructional application of technology was presentational rather than transformative: projection of digital materials, distribution of readings through messaging platforms, and use of video content for religious instruction. Neither institution had implemented a formal blended or hybrid learning model, although both reported experimentation during periods of external constraint. At Azkiya, three teachers had independently developed structured digital learning materials and maintained class-level digital repositories; at Hijaiyah, adoption of learning technology remained dependent on individual teacher initiative without institutional coordination.

Student services exhibited a more substantial transformation, particularly in communication with families. Both institutions had established regular digital reporting to parents regarding attendance, academic progress, and disciplinary matters, replacing prior reliance on periodic written reports and face-to-face meetings. Azkiya had additionally implemented a parent-facing communication channel enabling direct queries to administrative staff, while Hijaiyah maintained a broadcast-only reporting model. A parent informant described the change: "Before, I would only know about my child's progress at the end of the semester. Now I receive updates every month, and if there is a problem with attendance I am informed within days." (Parent B, Azkiya)

Table 4 presents the observed integration of technology across learning and service functions.

Table 4. Technology integration in learning and student services at Azkiya and Hijaiyah Islamic Boarding Schools

Function	Azkiya	Hijaiyah
Instructional delivery	Presentational use of digital media	Presentational use, teacher-dependent
Learning materials distribution	Digital repository at class level	Messaging-based distribution
Assessment	Partially digital (quiz and reporting)	Predominantly manual
Attendance reporting to parents	Monthly automated reporting	Monthly manual compilation
Academic progress reporting	Semester-based digital reports	Semester-based digital reports
Disciplinary notification	Immediate digital notification	Notification upon incident escalation
Parent inquiry channel	Interactive query channel	Broadcast only
Religious guidance services	Occasional digital content distribution	Predominantly face-to-face

Based on interview and observation data (2026)

Infrastructure and Information Systems

Infrastructure constituted the most significant and most consistently reported constraint at both institutions. While both sites had secured internet connectivity, the reliability and bandwidth of provision were described as insufficient for institutional-scale operations. At Azkiya, connectivity had been upgraded in 2025 with external support, and the institution maintained a limited number of shared computing devices for administrative use. At Hijaiyah, connectivity remained dependent on a single provider arrangement, with intermittent outages reported as a routine operational disruption. Neither institution possessed dedicated server infrastructure; both relied on cloud-based services and

locally stored data. A second infrastructural constraint concerned device availability. At both institutions, administrative digitalization exceeded the available hardware, requiring personnel to share devices and to perform data entry outside scheduled working hours. This condition was identified by informants as a significant source of inefficiency and a disincentive to full digital adoption. A staff member at Hijaiyah explained: "There is one computer for four people. When it is my turn, I have already spent the morning doing other work, and I must enter the data at night." (Administrative Staff B, Hijaiyah)

A third constraint concerned data security. Neither institution had implemented formal cybersecurity protocols, and informants at both sites acknowledged vulnerability arising from weak password practices, shared accounts, and the absence of systematic data backup procedures. Documentation analysis revealed that neither institution had conducted a data security audit or formulated a data protection policy, a condition that researchers identified as a latent institutional risk requiring attention independent of the transformation process.

Enabling Factors

Analysis of the interview and observation data identified five factors that consistently facilitated governance transformation across both sites. Table 5 summarizes these factors, their manifestation at each institution, and the informant categories that identified them.

Table 5. Enabling factors of governance transformation at Azkiya and Hijaiyah Islamic Boarding Schools

Enabling Factor	Manifestation at Azkiya	Manifestation at Hijaiyah	Identifying Informant Categories
Leadership commitment	Kiai issued formal digitalization mandate and allocated budget	Kiai endorsed digitalization and authorized staff participation in training	All categories
Adaptive organizational culture	Staff permitted to experiment with digital tools without punitive consequence	Innovation tolerated at individual level, though not institutionally coordinated	Kiai, administrators, teachers
External network support	Collaboration with university and regional education office for training and infrastructure	Collaboration with alumni network for device provision	Kiai, administrators
Presence of internal digital champions	Younger staff voluntarily assumed mentoring and troubleshooting roles	One administrative staff member served as informal technical resource	Administrators, teachers, staff

Enabling Factor	Manifestation at Azkiya	Manifestation at Hijaiyah	Identifying Informant Categories
Perceived institutional benefit	Efficiency gains and improved parent satisfaction reinforced continued adoption	Improved financial record accuracy reinforced continued adoption	All categories

Based on interview and observation data (2026)

Leadership commitment emerged as the most frequently cited enabling factor. Informants across categories at both institutions attributed the initiation and continuation of digitalization to explicit endorsement by the kiai, whose authority in the pesantren's normative structure conferred legitimacy on technological change that might otherwise have been resisted as inconsistent with tradition. An administrator at Azkiya articulated this relationship: “Nothing moves here without the kiai's word. When he said the administrative work must be digital, no one argued. The question became how, not whether.” (Administrator B, Azkiya)

Constraining Factors

Five constraining factors were identified with comparable consistency across both sites, presented in Table 6.

Table 6. Constraining factors of governance transformation at Azkiya and Hijaiyah Islamic Boarding Schools

Constraining Factor	Manifestation at Azkiya	Manifestation at Hijaiyah	Identifying Informant Categories
Infrastructure limitation	Insufficient bandwidth and shared devices	Unreliable connectivity and acute device shortage	All categories
Competency gap	Concentration of skills among few personnel	Concentration of skills among one to two personnel	Kiai, administrators, staff
Funding constraint	Capital investment dependent on external support	Absence of dedicated digitalization budget line	Kiai, administrators
Resistance and scepticism	Concern that digitalization displaces established practice	Concern that technology undermines santri discipline	Teachers, musyrif, parents

Constraining Factor	Manifestation at Azkiya	Manifestation at Hijaiyah	Identifying Informant Categories
Cybersecurity risk	Absence of formal data protection protocol	Absence of formal data protection protocol	Administrators, staff

Based on interview and observation data (2026)

Resistance manifested in two distinguishable forms. The first was normative resistance, rooted in concern that digital technology would erode the pesantren's distinctive socio-religious character, particularly the tradition of direct scholarly transmission (talaqqi) and communal discipline. The second was practical resistance, grounded in personnel's apprehension that digital systems would expose incompetence or impose additional workload without commensurate support. Normative resistance was more frequently expressed by older teaching staff and some parent informants; practical resistance was more frequently expressed by administrative personnel. Notably, resistance at both institutions was expressed as qualification rather than refusal: no informant advocated abandoning digitalization, but several advocated caution, sequencing, and the explicit protection of practices regarded as non-negotiable.

Balancing Strategies

Both institutions had developed strategies to manage the tension between modernization and identity preservation, though the strategies were more explicit and more systematized at Azkiya. Five strategies were identified, summarized in Table 7.

Balancing Strategies

Both pesantren developed strategies to balance technological modernization with identity preservation, though they differed in emphasis and formality. Five strategies were identified across the two sites: adaptive-transformational leadership, value reinforcement, gradual and sequenced adoption, protection of non-negotiable practices, and external collaboration. Adaptive-transformational leadership was evident in how each kiai framed digitalization. At Azkiya, the kiai presented digitalization as service to the pesantren’s mission, whereas at Hijaiyah the kiai framed it as a practical necessity. Value reinforcement also differed: Azkiya formally linked digital initiatives to institutional religious objectives, while Hijaiyah asserted value preservation through supervisory guidance. Both institutions adopted gradual and sequenced adoption—Azkiya phased implementation by administrative domain, and Hijaiyah proceeded incrementally driven by immediate need. External collaboration took different forms: Azkiya pursued partnerships for training, infrastructure, and expertise, while Hijaiyah relied on its alumni network and informal partnerships.

The strategy of protecting non-negotiable practices warrants particular attention because it represents the most direct institutional response to the normative tension. At Azkiya, specific practices were formally designated as technology-free. At Hijaiyah, similar protections were maintained through supervisory discretion rather than written policy. In both cases, these protections marked the boundary between what could be digitized and what had to remain grounded in pesantren tradition. Based on interview data (2026).

This revision eliminates and integrates its content into prose. To further reduce tables, consider converting the remaining tables into either a single consolidated table (e.g., summarizing the five transformation dimensions and their implementation at each site) or into descriptive text if the

table is not essential for comparison. Keep only those tables that are truly necessary for the reader to see side-by-side comparisons at a glance. At Azkiya, this strategy was formalized: the institutional regulation identified specific practices including designated sessions of Qur'anic recitation, face-to-face scholarly transmission, and communal congregational prayer as explicitly excluded from technological mediation. At Hijaiyah, protection was exercised through supervisory discretion rather than formal designation. The formalization at Azkiya appeared to reduce ambiguity for staff and reduced the frequency with which digitalization was framed as a threat to tradition. A teacher at Azkiya commented: "Because the boundary is written, we know what must not change. That makes it easier to accept the parts that do change." (Teacher A, Azkiya)

Cross-Case Synthesis

Comparative analysis of the two cases revealed convergence on the dimensions of transformation, on the enabling and constraining factors, and on the normative tension between modernization and identity preservation. Divergence appeared in the degree of formalization, the sequencing of adoption, and the institutionalization of support mechanisms. Table 8 presents the comparative synthesis.

Table 7. Cross-case synthesis of governance transformation at Azkiya and Hijaiyah Islamic Boarding Schools

Analytical Dimension	Azkiya	Hijaiyah	Pattern
Initiation of digitalization	2023	2021	Divergent timing
Driving rationale	Institutional strategic mandate	Administrative necessity	Divergent framing
Policy formalization	High (written regulations and SOPs)	Low (oral and discretionary)	Divergent formalization
Administrative digitalization	Comprehensive and integrated	Partial and domain-specific	Divergent scope
Learning technology integration	Moderate, teacher-initiated	Limited, teacher-dependent	Convergent limitation
Service digitalization	Substantial, interactive	Moderate, broadcast-oriented	Divergent depth
Digital literacy development	Structured and programmatic	Incidental and individual	Divergent institutionalization
Infrastructure adequacy	Partially adequate	Inadequate	Convergent constraint

Analytical Dimension	Azkiya	Hijaiyah	Pattern
Cybersecurity preparedness	Absent	Absent	Convergent vulnerability
Balancing strategy	Explicit and codified	Implicit and discretionary	Divergent formalization
Transformation trajectory	Planned and phased	Emergent and incremental	Divergent approach

Based on cross-case analysis of interview, observation, and documentation data (2026)

The synthesis indicates that the difference between the two cases is best characterized as a difference in the degree to which governance transformation was institutionalized rather than a difference in the direction of transformation. Both institutions moved toward digitalized governance; both confronted the same constraining factors; both developed strategies to reconcile technological adoption with identity preservation. Azkiya's transformation was characterized by planned sequencing, codified policy, and structured capacity development, whereas Hijaiyah's transformation was characterized by emergent adoption, discretionary policy, and individualized capacity development. Notably, neither trajectory demonstrated superiority in outcome: Azkiya achieved greater administrative integration but at higher resource cost and with greater dependence on external support, whereas Hijaiyah achieved lower cost and greater flexibility but with persistent operational fragility and dependence on a small number of key personnel. The findings further indicate that the two convergent vulnerabilities inadequate infrastructure and absent cybersecurity protocol constitute conditions that neither institution's internal governance capacity can resolve independently, and that both require attention from external policy actors if transformation is to be sustained.

DISCUSSION

The findings of this study indicate that governance transformation at Pondok Pesantren Azkiya and Pondok Pesantren Hijaiyah is neither a uniform process nor a simple matter of technological adoption. Rather, it is a differentiated institutional trajectory shaped by the interaction of leadership orientation, resource endowment, organizational culture. the digital literacy study at Pesantren Al-Muttaqin, which emphasized the critical, ethical, and purposeful use of technology grounded in Islamic values (Garuda, 2026), but extends it by foregrounding the organizational distribution of competence as a determinant of institutional resilience.

The observation that leadership digital literacy, while technically limited, was functionally sufficient to authorize and evaluate digital initiatives is also noteworthy. This finding supports Sudarmanto et al.'s (2025) account of the kiai's dual role as spiritual guide and manager, which fosters an adaptive organizational climate without requiring the kiai to possess advanced technical expertise. The kiai's authority conferred legitimacy on technological change, while administrative and younger staff supplied the operational competence. This division of labor appears to be a viable model for pesantren governance transformation, provided that mechanisms exist to retain and distribute operational competence beyond individual incumbents.

Technology Integration in Learning and Student Services

The finding that technology integration in learning remained predominantly presentational projection of materials, distribution of readings, use of video content while student services underwent more substantial transformation is consistent with the "adaptive-conservative" model proposed by Mahmudi and Aimah, in which technology is adopted when it aligns with institutional values, provides practical benefits, and presents manageable risks. Learning practices that touch the core of pesantren pedagogy face-to-face Qur'anic transmission, bandongan, sorogan, and character formation remained central and largely unmediated by technology at both institutions(Mahmudi & Aimah, 2025). This selective pattern supports the proposition that pesantren digital transformation is not a linear progression toward greater technological intensity but a differentiated adoption process in which the pedagogical core is protected while peripheral functions are digitalized.

The more substantial transformation of student services, particularly parent communication, warrants separate discussion. Both institutions replaced periodic written reports and face-to-face meetings with regular digital reporting on attendance, academic progress, and disciplinary matters. This change aligns with Fauzi et al.'s (2025) finding that digitalization enhances stakeholder communication and trust, and with Samsudin et al.'s (2026) observation that digitalization improves communication with parents and public trust. The present study adds a dimension that has been undertheorized: the shift from broadcast to interactive communication. Azkiya's parent-facing query channel enabled direct engagement with administrative staff, whereas Hijaiyah maintained a broadcast-only reporting model. This difference suggests that service digitalization can proceed along a continuum from information dissemination to interactive co-governance, with implications for the depth of institutional accountability. The finding supports the view that governance transformation is not solely an internal administrative matter but also reconfigures the relationship between pesantren and its constituent communities.

Infrastructure, Cybersecurity, and the Limits of Institutional Agency

The infrastructural constraints documented at both institutions insufficient bandwidth, shared computing devices, unreliable connectivity, confirm the persistent digital divide in Indonesian pesantren documented. However, the finding that both Azkiya and Hijaiyah, despite their peri-urban location, experienced acute infrastructural limitations qualifies the assumption that geographical proximity to national digital infrastructure ensures adequate institutional connectivity. The constraint is not merely one of location but of institutional resource endowment and the absence of dedicated investment in educational technology infrastructur(Aat Royhatudin; Agus Hidayatullah dan Siti Inayatulloh;, 2026)e. This finding supports the argument advanced in the policy literature that resolving the digital divide in pesantren cannot be achieved through partial or single-approach interventions and that sustainable infrastructure subsidies and shared-device models under controlled standard operating procedures are necessary conditions for equitable digitalization(Ahmad Fahmi Fahruddin.et.al, 2026)

The absence of formal cybersecurity protocols at both institutions represents a finding that extends the existing literature in a direction that has received insufficient empirical attention. While Sutopo (2026) identified limited human resource capacity and cultural resistance as barriers to digital governance, and Isomuddin and Putra (2026) included risk mitigation as a dimension of their proposed Smart Pesantren Governance Framework, empirical accounts of actual cybersecurity preparedness in pesantren remain scarce. The present study found that neither institution had conducted a data security audit, formulated a data protection policy, or implemented systematic backup procedures(Royhatudin et al., 2020). Informants acknowledged vulnerabilities arising from

weak password practices, shared accounts, and the absence of formal access controls(Rahim, 2019). This condition constitutes a latent institutional risk that is independent of the transformation trajectory: whether digitalization is planned or emergent, the accumulation of digital data without corresponding protection creates exposure for santri, families, and the institution. The finding suggests that cybersecurity preparedness should be treated not as a downstream technical concern but as a constitutive element of governance transformation, requiring attention from pesantren leaders and external policy actors alike.

Leadership, Balancing Strategies, and the Institutionalization of Value Preservation

The centrality of leadership commitment in initiating and sustaining governance transformation at both institutions supports the growing body of scholarship on kiai leadership in the digital era. Sudarmanto et al. (2025) found that the kiai's integration of spiritual leadership with strategic management including selective adoption of digital innovations, enhances efficiency while preserving cultural authenticity. The present study corroborates this finding and specifies the mechanisms through which leadership commitment operates. At both institutions, the kiai's explicit endorsement of digitalization conferred legitimacy on technological change, transforming what might otherwise have been framed as a threat to tradition into an institutional mandate. As an administrator at Azkiya observed, "Nothing moves here without the kiai's word. When he said the administrative work must be digital, no one argued. The question became how, not whether" (Administrator B, Azkiya). This observation aligns with Miftah et al.'s (2026) argument that pesantren digital transformation is a process of negotiating religious authority, in which the kiai remains the guardian of scholarly authority while selectively permitting technological integration.

The most analytically significant leadership finding concerns the formalization of non-negotiable practices at Azkiya. By designating specific practices Qur'anic recitation sessions, face-to-face scholarly transmission, and communal congregational prayer as explicitly excluded from technological mediation, Azkiya's written regulation operationalized the boundary between permissible and impermissible change(Hanisch et al., 2023). This formalization appeared to reduce normative ambiguity and to diminish the frequency with which digitalization was framed as a threat to tradition. A teacher at Azkiya articulated this effect: "Because the boundary is written, we know what must not change. That makes it easier to accept the parts that do change" (Teacher A, Azkiya). This finding extends the existing literature on value preservation in pesantren digital transformation. Whereas the Darul Qur'an study identified an ideological filter that guided selective adoption (Garuda, 2027), and Miftah et al. (2026) characterized transformation as a socio-cultural negotiation, the Azkiya case demonstrates that codifying the non-negotiable domain is a concrete governance mechanism through which value preservation is institutionalized rather than left to discretionary interpretation. The absence of such codification at Hijaiyah did not produce greater traditionalism but rather greater ambiguity, with the consequence that resistance was expressed more frequently and with less resolution.

The comparative evidence thus supports a qualified version of the adaptive-transformational leadership model. Leadership commitment is necessary but insufficient; it must be accompanied by governance mechanisms that translate normative commitments into operational rules, distribute competence across roles, and formalize the boundaries of permissible change(Warisno et al., 2025). The Hijaiyah case demonstrates that charismatic authorization without institutionalization can initiate transformation but cannot sustain it independently of key individuals. The Azkiya case demonstrates that institutionalization without charismatic legitimacy would likely have encountered resistance, but

that the combination of the two produced a more durable and less ambiguous transformation trajectory.

Cross-Case Synthesis and Theoretical Implications

Taken together, the findings support three theoretical propositions. First, pesantren governance transformation in the digital era is best characterized as a continuum of institutionalization rather than a binary distinction between transformed and untransformed institutions. Azkiya and Hijaiyah both moved in the same direction toward digitalized administration, codified or discretionary digital media policy, structured or incidental capacity development, and explicit or implicit value preservation but they occupied different positions on a continuum defined by the degree to which transformation was formalized, systematized, and embedded in institutional roles and procedures. This proposition qualifies stage-model approaches to digital transformation that assume a universal sequence of developmental phases.

Second, the preservation of pesantren identity is not antithetical to governance transformation but is actively produced through governance mechanisms. The codification of non-negotiable practices, the framing of digitalization as service to the pesantren's mission, and the retention of face-to-face pedagogical transmission as central institutional practices are not residual traditions that survive despite transformation; they are deliberate governance choices that shape the direction and limits of transformation(Fauzi et al., 2025). This proposition supports Miftah et al.'s (2026) characterization of transformation as value negotiation and extends it by identifying formalization as a mechanism through which negotiation is stabilized.

Third, the sustainability of governance transformation is constrained by factors that exceed institutional agency. Infrastructure limitations and cybersecurity vulnerabilities were convergent across both cases and were not resolvable through internal governance reforms alone. This proposition aligns with the policy literature's emphasis on infrastructure subsidies and external support (Nikmatullah et al., 2023)and suggests that the analytical framework for pesantren governance transformation must incorporate the external resource environment as a constitutive dimension rather than a background condition.

Relation to Prior Research and Theoretical Expectations

The claims advanced in this discussion are supported by the results presented in the preceding section and are consistent with the expectations established by prior research. The findings confirm the governance benefits of administrative digitalization reported by Fauzi et al. (2025) and Samsudin et al. (2026); the centrality of kiai leadership in authorizing and framing transformation reported by Sudarmanto et al. (2025) and Miftah et al. (2026); the persistence of infrastructural and competency barriers documented by Garuda (2026); and the selective, value-conditioned pattern of technology adoption characterized as adaptive-conservative or guided innovation (Garuda, 2027; Samsudin et al., 2026). The study also contradicts two assumptions that persist in parts of the literature. It contradicts the assumption that peri-urban location ensures adequate digital infrastructure, and it contradicts the assumption that policy formalization necessarily erodes pesantren's distinctive relational governance. In both instances, the evidence suggests that the relationship between formalization, location, and transformation outcomes is more contingent than the existing literature has generally acknowledged.

CONCLUSION

This study set out to analyze how Pondok Pesantren Azkiya and Pondok Pesantren Hijaiyah in Serang Regency transform their governance in response to digital disruption, to identify the factors that enable and constrain that transformation, to examine the strategies through which institutional actors negotiate the tension between modernization and identity preservation, and to develop a contextually grounded model of pesantren governance transformation. The comparative evidence supports four principal conclusions. First, governance transformation at both institutions is a differentiated and selective process rather than a uniform or linear progression toward technological intensity. Both pesantren digitalized administrative functions, developed policy arrangements governing santri digital media use, undertook capacity development for personnel, and extended digital reporting to families. Yet both protected the pedagogical and devotional core of pesantren practice Qur'anic transmission, face-to-face scholarly instruction, and communal worship from technological mediation. This pattern indicates that transformation proceeds along differentiated domains in which functional and peripheral activities are digitalized while identity-constitutive practices are retained, and it qualifies stage-model accounts that assume a universal developmental sequence.

Second, the decisive variable distinguishing the two cases is the degree of institutionalization rather than the direction of transformation. Azkiya's pathway was characterized by planned sequencing, codified policy, structured capacity development, and formalized data governance; Hijaiyah's pathway was characterized by emergent adoption, discretionary policy, individualized capacity development, and concentrated operational competence. Both trajectories produced demonstrable governance benefits, and neither demonstrated unambiguous superiority: Azkiya achieved greater administrative integration at higher resource cost and with greater dependence on external support, while Hijaiyah achieved lower cost and greater flexibility but with persistent operational fragility and dependence on a small number of key personnel. The study therefore concludes that institutionalization the embedding of transformation in roles, procedures, and accountability mechanisms is the condition that determines the durability of governance transformation, not the mere adoption of digital tools.

For policymakers and external stakeholders, the findings indicate that infrastructure subsidies and shared-device models under controlled standard operating procedures remain necessary conditions for equitable digitalization, and that these cannot be substituted by institutional initiative alone. The convergent infrastructural and cybersecurity vulnerabilities documented across two peri-urban institutions suggest that support programs should be designed on the assumption that geographical proximity to national digital infrastructure does not ensure institutional adequacy. Policy instruments should also extend beyond hardware provision to include sustained capacity development, since one-off training was identified at both sites as insufficient to produce durable competence. For future research, four directions follow from this study. First, longitudinal designs employing repeated observation would strengthen causal inference regarding the sequencing and durability of governance transformation, addressing a limitation that cross-sectional case study cannot resolve. Second, research incorporating santri-level outcome measures would establish whether governance transformation produces measurable effects on educational achievement and character formation, a question the present design could not address. Third, comparative research encompassing elite, well-resourced pesantren alongside severely under-resourced rural institutions would test the transferability of the institutionalization continuum proposed here and clarify whether the relationship between formalization and identity preservation holds across resource environments. Fourth, research examining the perspectives of families as co-governors of santri digital conduct would address the boundary porosity identified in both cases, since the retention of personal devices for family

communication emerged as the principal point of policy leakage and cannot be resolved through institutional action alone. Finally, the development and empirical validation of a contextually grounded governance model integrating technological, administrative, cultural, and leadership dimensions remains an outstanding task, and the four mechanisms identified in this study—codified value boundaries, distributed competence, integrated data governance, and cybersecurity preparedness offer a preliminary foundation for that endeavor.

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