



Digital Archive Transformation for Smart Governance: A Four- Pillar Framework for Trustworthy, AI-Ready Digital Government

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Abstract

Digital transformation in government often prioritizes visible service channels while neglecting the records infrastructure that establishes evidential integrity, auditability, and institutional memory. This study synthesizes 24 Scopus-indexed journal articles published between 2010 and 2026 to examine how digital archive transformation enables smart governance and to identify its implementation conditions. A qualitative descriptive-analytical review used a reproducible search, screening, thematic coding, and cross-study synthesis. The findings identify four recurrent mechanisms: policy and records governance, interoperable systems and secure technologies, workforce capability, and a data-driven organizational culture. Fragmented applications, inconsistent metadata, uneven competency, governance discontinuity, and change resistance constrain the conversion of service data into trustworthy public records. The study proposes a four-pillar framework that positions electronic records management as the governance layer connecting operational systems with transparency, accountability, and evidence-based decision-making. The framework extends smart-governance research by treating digital archives as active, trustworthy information infrastructure that can be made AI-ready and, where institutionally justified, reinforced through distributed-ledger audit mechanisms.

Keywords: Digital Inclusion Digital Archive Transformation; Electronic Records Management; Smart Governance; Trustworthy AI; Blockchain-Enabled Auditability; Digital Government.

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INTRODUCTION

Digital transformation has moved from an optional modernization initiative to a structural condition of contemporary public administration. Rather than simply digitizing existing procedures, it changes how public institutions create information, coordinate work, preserve evidence, and demonstrate accountability. Haug et al. [1] characterize digitally induced public-sector change as a multidimensional transformation involving technology, organization, and institutional arrangements. Artificial intelligence (AI) expands the capacity of government to classify information, automate repetitive processes, and support decisions, but Wirtz et al. [2] caution that public value depends on governance, legitimacy, and capability rather than technological availability alone. In parallel, cloud-enabled public services create new security and accountability dependencies, as shown in the local-government risk analysis of Ali et al. [3]. Janowski [4] further explains that digital government has evolved from isolated service transformation toward context-sensitive, networked governance.

The smart-governance paradigm provides a useful lens for understanding this transition. Smart governance is not synonymous with online public services; it concerns the institutional capacity to combine technology, people, and rules in ways that improve coordination, transparency, participation, and evidence-based decisions. Nam and Pardo [5] emphasize the technology, people, and institution dimensions of smart-city development, while Gil-Garcia et al. [6] identify integration across organizational, technological, and governance components as essential. Recent work on smart-governance models also stresses that digital maturity depends on adaptive institutional arrangements, not only on infrastructure investment [7].

A recurring weakness in practice is that governments frequently invest in visible front-office applications while underinvesting in the back-office records infrastructure that gives public action evidential value. Digital records establish what was decided, by whom, when, under which authority, and with what subsequent amendments. Duranti and Rogers [8] show that trust in digital records depends on maintaining their authenticity, reliability, and legal defensibility. Digital government also restructures the citizen-state relationship, making the quality and traceability of institutional information increasingly consequential for legitimacy [9]. Mergel et al. [10] therefore argue that digital transformation must be understood as organizational change rather than as a standalone technology project.

Emerging digital technologies heighten both the promise and the risk. Blockchain can provide tamper-evident, distributed verification for selected public-sector processes, but its use should be governed by a clear value case rather than by technological enthusiasm [11]. Broader transformation research similarly shows that organizational capabilities and contextual adaptation determine whether digital tools produce durable benefits [12]. For archives, AI-assisted metadata extraction, semantic search, anomaly detection, and retention recommendations may improve information access; however, these functions require controlled data provenance, human oversight, and explainable accountability before they can be trusted in public administration.

The literature contains rich but fragmented insights. Reviews of electronic records management identify persistent problems in governance, interoperability, preservation, and professional capability [13]. The notion of a digital record as a structured evidential object, rather than merely a stored file, has been sharpened by work on Record DNA and the future evidence base [14]. At the same time, data-governance research demonstrates that organizational roles, standards, and decision rights are necessary to make information assets usable and accountable [15]. Recent

digital-government research further identifies data collaboration as a central, yet difficult, institutional requirement [16].

Implementation evidence points to the importance of organizational readiness, public-sector information-system adoption, and coordination across administrative boundaries [17]. Evidence from blockchain adoption in regulated supply chains indicates that transparency tools also face governance, interoperability, and capability barriers [18]. Research on big-data-supported urban governance [19], public-sector accountability [20], local-government interoperability [21], and the organizational consequences of e-government [22] reinforces the same conclusion: digital outputs become governance assets only when they are systematically connected to standards, accountability mechanisms, and institutional work practices. Against this background, this study asks how digital archive transformation can strengthen smart governance, which structural barriers repeatedly inhibit this role, and what strategic configuration can translate the literature into an actionable, trustworthy, and AI-ready framework.

LITERATURE REVIEW

Digital Records as Governance Infrastructure

Records management is not an auxiliary administrative function. It is a governance capability because it preserves the evidence needed to explain, audit, challenge, and improve public action. Casadesus de Mingo and Cerrillo-i-Martinez [23] demonstrate that records-management improvement can advance transparency and corruption prevention when records are managed throughout their lifecycle. Ambira et al. [24] develop an electronic-records framework for e-government that places policy, system design, and stakeholder roles at the center of implementation. In local government, Shepherd et al. [25] show that access-to-information obligations are inseparable from information governance and reliable records-management practice.

International evidence also highlights the operational consequences of weak records governance. Osebe et al. [26] link records-management practice to governance in Kenyan county governments, while Lemieux [27] identifies the potential and limitations of blockchain as a mechanism for enhancing trust in records. Meijer [28] argues that electronic records management must balance accountability values with organizational realities, rather than be treated as a purely instrumental system. Earlier work by Sprehe [29] and Moloj and Mutula [30] similarly shows that integrating records management with information-resource management and e-government architecture is a foundational, not optional, requirement.

Toward Trustworthy and AI-Ready Smart Governance

AI, analytics, and distributed-ledger technologies expand the possibilities of digital archive transformation but also raise governance requirements. Kankanhalli et al. [31] identify opportunities for AI and the Internet of Things in the public sector alongside risks involving data quality, responsibility, and institutional capacity. Platform-based governance can reduce fragmentation when information infrastructures are designed for reuse and coordination [32]. Smart-city governance research also emphasizes that technology is only one dimension of a broader political and institutional arrangement [33]. Transparency-enhancing information and communication technologies can improve openness, but their contribution depends on the surrounding governance and anti-corruption ecosystem [34].

A trustworthy approach should therefore begin with public values rather than with tools. Bannister and Connolly [35] caution that information and communication technology can generate value conflicts among efficiency, privacy, equity, transparency, and accountability. E-government success depends on aligning practical tools with institutional foundations [36], while service digitalization requires deliberate attention to organizational interfaces, professional practice, and citizen-facing consequences [37]. In the Indonesian context, legal and policy alignment remains central to the viability of electronic archive management [38]. Research on records management and good governance [39], digital recordkeeping [40], public-sector records models [41], and the evolving orthodoxy of records management [42] supports a lifecycle-based view in which trustworthy digital records are preserved, contextualized, and governed as long-term public assets.

METHODS

This study employed a qualitative descriptive-analytical design using a structured integrative literature review. The design was selected because the objective was to synthesize dispersed conceptual and empirical evidence on digital archive transformation, records governance, smart governance, transparency, accountability, and technology-enabled public administration. The review did not seek to estimate a common intervention effect; instead, it examined the mechanisms, barriers, and strategic responses reported across the selected literature.

The Scopus database was used as the principal retrieval source because it provides broad coverage of peer-reviewed international journals relevant to digital government, records management, information governance, and emerging digital technologies. The search was conducted in the TITLE-ABS-KEY field using the following string: TITLE-ABS-KEY(("digital transformation" OR "digital government" OR "e-government" OR "smart governance") AND ("digital archives" OR "electronic records management" OR "records management") AND ("transparency" OR "accountability" OR "public governance")). The search was limited to English-language journal articles published between 2010 and 2026.

The original search retrieved 68 records. Screening by document type, language, publication period, and substantive relevance resulted in 24 articles for full-text synthesis. The unit of analysis was an article, and the data-extraction matrix recorded the study context, research orientation, records-management problem, governance mechanism, technology implication, barrier, and reported strategic response. The 24 selected studies comprise the core analytical corpus. Additional peer-reviewed sources are cited in the Introduction and Discussion to contextualize the corpus and sharpen the theoretical interpretation; they were not counted as part of the 24-study synthesis.

Table 1. Search, Screening, and Selection Protocol

Stage	Operational criterion	Records (n)
Identification	Scopus TITLE-ABS-KEY search using the predefined Boolean string	68
Screening	Journal articles in English published between 2010 and 2026; duplicate and non-relevant records removed	24
Eligibility	Titles, abstracts, and full texts assessed for substantive relevance to digital archives, records management, smart governance, transparency, or accountability	24
Inclusion	Studies retained for thematic extraction and conceptual synthesis	24

The analysis proceeded in four iterative stages. First, each article was read to identify its central argument and evidence base. Second, relevant material was coded into a structured matrix. Third, codes were compared across studies to identify recurrent mechanisms and cross-cutting constraints. Fourth, the resulting themes were integrated into a strategic framework. To enhance analytical transparency, the codes were kept close to the review questions and checked against the original article context before synthesis.

Table 2. Analytical Coding Framework

Analytical Dimension	Coding Focus	Interpretive Purpose
Records governance	Policies, ownership, classification, retention, metadata, access rules	Assess whether records are governed as evidence across the lifecycle
System architecture	Interoperability, integration, security, audit trails, preservation, platform dependencies	Identify conditions for reliable and traceable records exchange
Human capability	Digital literacy, records expertise, leadership, training, role clarity	Examine institutional ability to operate and sustain digital records systems
Organizational culture	Compliance, documentation discipline, change readiness, accountability orientation	Identify non-technical conditions supporting sustainable adoption
Emerging technology	AI assistance, analytics, blockchain, automation, human oversight	Determine where innovation adds value without weakening accountability

RESULTS AND DISCUSSION

Results

Dataset Profile and Synthesis Logic

The 24-study corpus was heterogeneous in setting, method, and level of analysis. It included conceptual studies, systematic reviews, public-sector cases, governance analyses, and technology-oriented discussions. Consequently, the evidence does not support a pooled statistical effect size. Instead, the results are presented as a thematic evidence synthesis that identifies recurring conditions under which digital archive transformation contributes to smart-governance outcomes. The synthesis produced four dominant domains: records governance, integrated and secure system architecture, human capability, and a data-driven organizational culture. Emerging technologies were treated as cross-cutting enablers rather than as a separate substitute for the four domains.

The core pattern is that digital records create public value only when they remain authentic, contextualized, accessible to authorized users, and traceable across their lifecycle. Digitalization alone can increase the volume of documents without improving their evidential quality. The transformation problem is therefore not merely one of digitizing paper or deploying document-management software; it is a governance problem concerning what counts as an authoritative record, who owns it, how it is classified, how long it is retained, how it is protected, and how its history can be reconstructed.

Table 3. Results of Thematic Evidence Synthesis

Synthesis Domain	Recurring Evidence Pattern	Governance Risk When Weak	Implication For Smart Governance
Records governance	Records require lifecycle rules, ownership, metadata, retention schedules, and access controls.	Loss of context, inconsistent classification, and weak legal or audit evidence.	Establish an authoritative, governed record as the basic unit of transparent administration.
Integrated architecture	Operational applications must connect with electronic records systems through interoperable standards and secure audit trails.	Information silos, duplication, unverifiable versions, and limited cross-agency coordination.	Link front-office transactions to back-office evidence and reusable information services.
Human capability	Staff require digital, archival, privacy, and information-security competencies, supported by leadership.	Underused systems, unreliable data entry, uneven compliance, and dependence on informal workarounds.	Treat capability development as a continuing governance investment, not a one-time training event.
Data-driven culture	Sustainable transformation depends on documentation discipline, stewardship, and accountability-oriented work practices.	Technology adoption remains symbolic, fragmented, or vulnerable to organizational resistance.	Institutionalize data stewardship, evidence use, and internal accountability routines.
Emerging technology enablement	AI and blockchain are beneficial only when deployed within governed data, clear accountability, and proportionate risk controls.	Opaque automation, inappropriate data sharing, vendor lock-in, and technology-first reforms.	Use AI for assistive tasks and blockchain for justified multi-party verification, with human and legal oversight.

From Front-Office Digitization to Back-Office Evidence

The first result concerns a structural mismatch between the visibility of digital services and the invisibility of the records infrastructure that makes those services accountable. Online portals, mobile applications, and automated workflows may improve access and speed; however, each transaction also generates records that must be captured, contextualized, and preserved. Where front-office systems are not connected to an electronic records-management environment, governments can deliver digital services while still lacking a complete, reliable, and auditable record of the underlying administrative action.

This mismatch produces what can be termed an evidence gap. An evidence gap occurs when transaction data, messages, attachments, approvals, and amendments are dispersed across applications without stable metadata, record identifiers, retention rules, or version control. The data may exist, yet the institution cannot confidently demonstrate completeness or reconstruct a decision trail. For smart governance, this is consequential because the quality of analytics, transparency

reporting, public-information disclosure, and performance evaluation depends on the trustworthiness of the underlying records.

Structural Barriers and Actionable Responses

The second result is that the major barriers are mutually reinforcing. System fragmentation makes metadata practices inconsistent; inconsistent metadata limits interoperability; limited staff capability weakens compliance; and weak governance makes it difficult to sustain investment and coordinate roles. None of these barriers can be resolved by purchasing a single application. The evidence instead indicates that public agencies need a coordinated transformation architecture in which policy, technology, people, and culture advance together.

The third result concerns the role of emerging technologies. AI can support document classification, entity extraction, duplicate detection, semantic retrieval, and triage of high-volume information. Blockchain or other distributed-ledger approaches can provide tamper-evident verification where multiple organizations need shared confidence in a record trail. Neither technology, however, replaces records governance. AI assistance should preserve human validation, provenance, and contestability; distributed ledgers should be adopted only when their immutability, shared verification, and cost profile solve an actual governance problem. These technologies are enablers of the framework, not its foundation.

Table 4. Structural Barriers and Actionable Responses in Digital Archive Transformation

Barrier	Operational manifestation	Actionable response
Fragmented systems	Records are distributed across portals, e-mail, collaboration tools, and line-of-business applications.	Implement interoperable capture rules, unique identifiers, shared metadata, and automated transfer to the electronic records environment.
Weak policy alignment	Units apply inconsistent classification, retention, access, and accountability practices.	Assign clear records ownership; approve enterprise policies, schedules, and minimum metadata requirements.
Uneven capability	Staff depend on informal storage practices and cannot consistently apply security or lifecycle rules.	Develop role-based competency pathways combining digital literacy, records governance, privacy, security, and AI awareness.
Resistance and low stewardship	Digital systems are perceived as extra administrative work rather than as evidence infrastructure.	Use leadership communication, workflow redesign, performance measures, and feedback loops to normalize documentation discipline.
Technology-first adoption	AI or blockchain pilots are launched without use-case clarity, legal assessment, or audit design.	Apply proportionate use-case assessment, human oversight, data-protection controls, and measurable governance outcomes.

Four-Pillar Framework for Trustworthy Digital Archive Transformation

The fourth result is the proposed four-pillar framework. Digital records management infrastructure forms the base layer because it supplies the lifecycle controls, metadata, access rules, preservation processes, and auditability needed to turn digital documents into trustworthy evidence. Four interdependent pillars build on this layer. First, policy and governance establish authority, standards, roles, and accountability. Second, system and technology integration connects operational applications, records systems, security controls, and information-exchange mechanisms. Third, human resource capacity ensures that staff and leaders can implement and supervise the system. Fourth, a data-driven organizational culture sustains stewardship, compliance, learning, and evidence use.

The framework is intentionally non-linear. Policy without technology cannot operationalize standards; technology without competent people cannot ensure reliable capture; capability without leadership and culture often produces short-lived compliance; and a data-driven culture requires a dependable records base. As shown in Figure 1, the pillars operate as an integrated governance system whose outcomes are transparency, accountability, and evidence-based decision-making. AI-ready functionality and blockchain-enabled auditability are located within the system-and-technology pillar because they should be introduced only after the foundational records infrastructure and governance controls are in place.

Table 5. Implementation Roadmap for the Four-Pillar Framework

Pillar	Initial Priority	Near-Term Deliverable	Outcome Indicator
Policy and governance	Define record ownership, legal responsibilities, metadata, classification, retention, and access rules.	Enterprise records-governance charter and implementation standards.	Percentage of business units operating under approved records policies.
System and technology integration	Map systems of record and connect transaction platforms to electronic records capture, audit, and preservation processes.	Interoperability architecture, audit-log design, and integration roadmap.	Proportion of priority workflows with automated and verifiable records capture.
Human resource capacity	Assess role-specific skills and train staff, records officers, IT teams, and leaders.	Competency matrix and continuing professional-development plan.	Training completion, compliance quality, and reduction in informal storage practices.
Data-driven organizational culture	Embed stewardship, accountability, and evidence use into workflow design, performance management, and leadership routines.	Data-stewardship roles, monitoring dashboard, and improvement cycle.	Use of verified records in audits, transparency reporting, and decision processes.

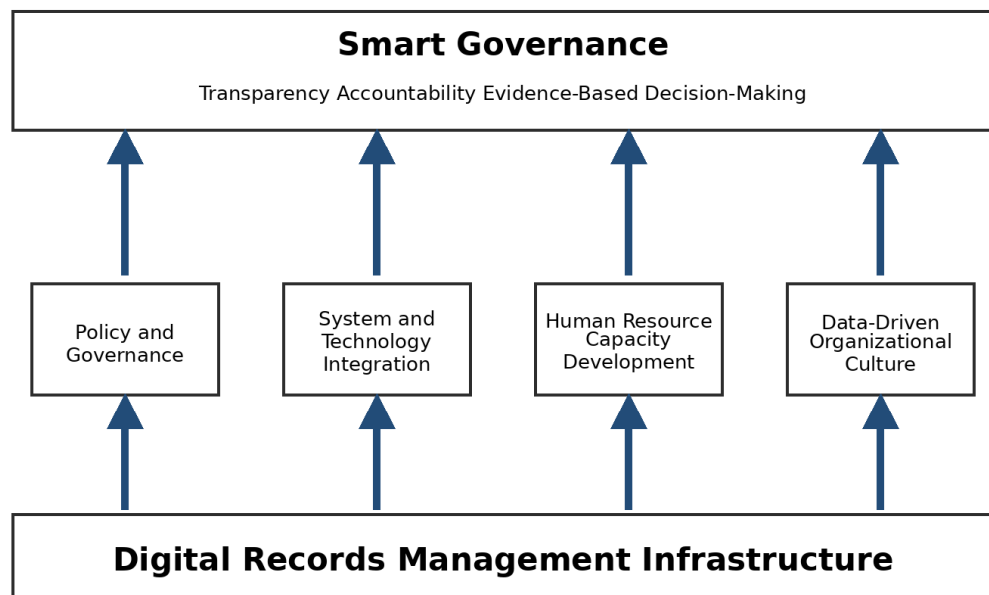


Figure 1. Four-Pillar Framework for Trustworthy Digital Archive Transformation and Smart Governance

Discussion

The findings reposition digital archive transformation from a back-office technical function to a central element of smart governance. The review shows that the public value of digital government is not established at the point where a service is placed online; it is established when the resulting information can be trusted as institutional evidence. This interpretation extends the public-sector transformation perspective of Haug et al. [1] and the digital-government evolution described by Janowski [4]. In both traditions, technology becomes transformative only when it is embedded in organizational and institutional change. The present synthesis specifies a largely overlooked mechanism in that transformation: the records layer that preserves provenance, context, and accountability across digital workflows.

This finding is consistent with records-management scholarship that views records as evidence, not merely as containers of content. Duranti and Rogers [8] emphasize the legal and evidential implications of trust in digital records, while McLeod and Lomas [14] describe the need to retain structural and contextual features that make records intelligible over time. The synthesis also aligns with Casadesus de Mingo and Cerrillo-i-Martinez [23], who link effective records management to transparency and corruption prevention. The novel contribution of this study is to integrate these insights with smart-governance research: it treats electronic records management as the connective governance layer that binds front-office service delivery, back-office administration, data sharing, auditability, and future digital innovation into a single institutional architecture.

The four-pillar framework also clarifies why partial digitalization repeatedly fails to produce sustainable accountability. Policy and governance are required to define what must be captured, how it is classified, who is responsible, and which retention and access rules apply. System integration is required to ensure that a transaction does not lose its record identity as it moves across platforms. Human capacity is required because electronic systems cannot correct unreliable or incomplete capture practices on their own. Finally, organizational culture determines whether

documentation is understood as a bureaucratic burden or as a shared commitment to institutional memory and public accountability. This systems view corroborates evidence from Ambira et al. [24], Osebe et al. [26], and Moloji and Mutula [30], which shows that e-records implementation depends on the alignment of policy, process, technology, and professional capability.

The results have practical implications for public-sector leaders. First, agencies should audit the full record pathway for a set of high-risk or high-volume services, from data creation to disposition or preservation. The immediate objective is not to digitize more material, but to identify where accountability can be lost through fragmented capture, inconsistent metadata, disconnected approval flows, or uncontrolled versions. Second, agencies should establish enterprise records-governance roles that include records professionals, legal and compliance units, information-security teams, service owners, data stewards, and technology architects. This multi-disciplinary approach responds directly to the information-governance and freedom-of-information concerns documented by Shepherd et al. [25] and to the public-accountability challenges identified by Meijer [28].

Third, the framework supports a disciplined, rather than technology-first, use of AI and blockchain. AI should be introduced as an assistive capability for tasks such as optical character recognition, metadata suggestion, semantic discovery, duplicate detection, and exception triage. Decisions that determine legal status, retention, disclosure, or individual rights should remain contestable, auditable, and subject to human responsibility. This is consistent with the opportunity-risk balance identified by Wirtz et al. [2] and Kankanhalli et al. [31]. Blockchain should likewise be treated as a selective trust mechanism. Lemieux [27] and Olnes et al. [11] show why tamper-evident distributed ledgers can be valuable in multi-party environments, but the present synthesis indicates that they cannot substitute for authoritative metadata, retention governance, legal rules, or accountable stewardship. The appropriate question is not whether blockchain can store a record, but whether its characteristics solve a clearly defined evidential or inter-organizational trust problem more effectively than a well-governed conventional architecture.

The framework also contributes to the emerging discourse on trustworthy AI in government. AI-ready records are not simply digitized records available to an algorithm. They are records whose provenance, context, permissions, quality, and retention status can be interpreted and governed. Without these properties, AI may amplify the errors, gaps, bias, and opacity already present in fragmented information environments. In this respect, the study links data governance [15], public values in technology design [35], and the organizational consequences of digital public services [37]. It suggests that trustworthy AI requires a prior investment in trustworthy information infrastructure. This proposition moves beyond the common assumption that AI adoption begins with model selection; in public administration, it should begin with record reliability, lawful data governance, and accountability design.

For scholarship, the novelty lies in combining archival, digital-government, and emerging-technology perspectives into one explanatory model. Existing smart-governance work explains integration, participation, and institutional capacity [5], [6], [33], while records-management scholarship explains evidence, authenticity, lifecycle control, and accountability [13], [39], [40]. The four-pillar framework makes the relationship explicit. It proposes that smart governance is weakened whenever the digital record is treated as a residual by-product of service automation rather than as the authoritative information asset through which the government can demonstrate, learn from, and improve its actions. This conceptual bridge is relevant to research on AI, blockchain, and

future digital innovation because it identifies the governance conditions under which these technologies can responsibly augment, rather than destabilize, public-sector recordkeeping.

The study should also be interpreted with appropriate restraint. It does not claim that all government agencies need the same platform, that blockchain is universally beneficial, or that AI can resolve institutional fragmentation. Its contribution is a strategic configuration: records governance and organizational readiness must precede, accompany, and constrain technological innovation. Future empirical research should test the framework through comparative case studies, maturity assessments, and design-science interventions in agencies with different levels of digital maturity. Such work could examine how each pillar influences measurable outcomes such as audit completion, response quality to information requests, service traceability, record-capture completeness, and the quality of evidence used in managerial or policy decisions.

CONCLUSION

This study highlights the readiness of creative professionals in photography and filmmaking to adopt GenAI technologies, revealing both opportunities and concerns. While younger professionals and those in more technologically advanced regions show greater openness to AI adoption, resistance is more pronounced among older professionals and those worried about job displacement, creative control, and ethical issues. By employing the Rasch Model, the study provides a nuanced understanding of readiness, identifying significant differences across job roles and demographics. The research also underscores the importance of organizational support and reskilling initiatives in mitigating resistance and fostering successful AI integration. This study contributes to the theoretical understanding of AI adoption in creative industries and offers practical recommendations for industry leaders, policymakers, and future research, emphasizing the need for a balanced approach that maximizes the benefits of AI while addressing its ethical challenges.

LIMITATIONS

Digital archive transformation is a strategic prerequisite for smart governance because transparency, accountability, and evidence-based decision-making depend on the availability of trustworthy institutional records. The review of 24 Scopus-indexed studies shows that governments cannot rely on front-office digitization alone. They must establish a governed records layer that maintains authenticity, context, access, lifecycle control, security, and auditability across digital workflows. The proposed four-pillar framework integrates policy and records governance, interoperable and secure system architecture, human resource capability, and a data-driven organizational culture. Its main contribution is to show how these pillars jointly convert digital information from a dispersed operational by-product into a reliable public asset.

The framework has direct implications for AI- and blockchain-enabled public administration. AI can improve classification, discovery, and monitoring only when it draws on reliable, governed records; blockchain can strengthen shared verification only when it serves a justified multi-party trust requirement. Therefore, agencies should first establish authoritative records rules, interoperable capture and audit mechanisms, competency pathways, and stewardship practices before scaling advanced technologies. Digital archive transformation should be treated as a continuous governance reform, not a one-time technology procurement exercise. Empirical validation of the framework across national, regional, and local government settings remains

necessary to assess its performance under varying legal, technological, and organizational conditions.

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CONFLICT OF INTEREST

“The Authors Declare No Conflict Of Interest.”

DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

The author used generative AI only for language refinement, grammar support, and editorial improvement. The author reviewed and revised all content, verified the cited sources, and accepts full responsibility for the manuscript.

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