
Digital Transformation of Accounting Information Systems and Organizational Efficiency in Nigeria: An Integrative Review and Research Agenda

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Abstract

Digital transformation is reshaping accounting information systems (AIS) from transaction-recording applications into integrated socio-technical infrastructures for real-time reporting, analytics, control, and decision support. This article critically examines how such transformation may influence organizational efficiency in Nigeria. Using a theory-informed integrative review, the study synthesizes peer-reviewed research on digital transformation, AIS, management control, information-system success, and digital public financial management, together with institutional evidence on Nigeria's Treasury Single Account, Government Integrated Financial Management Information System, and Integrated Personnel and Payroll Information System. The synthesis integrates the Technology-Organization-Environment framework, Institutional Theory, and the DeLone-McLean information-systems success model. The evidence indicates that digital AIS can improve transaction speed, information quality, internal control, auditability, decision support, and cross-functional coordination. However, these benefits are contingent rather than automatic. Infrastructure reliability, interoperability, data governance, cybersecurity, managerial commitment, digital competence, process redesign, and institutional enforcement determine whether technological investment is converted into measurable efficiency. Nigeria-specific evidence remains fragmented and is dominated by cross-sectional surveys, conceptual studies, and public-sector reform assessments; consequently, strong causal claims are not yet warranted. The article contributes an integrated mechanism-based framework, identifies boundary conditions particular to developing economies, and proposes a research agenda emphasizing longitudinal designs, objective performance measures, sectoral comparisons, and ethical and cybersecurity risks. For practitioners and policymakers, the central implication is that AIS digitalization should be managed as organizational and institutional transformation, not merely as software acquisition.

Keywords: accounting information systems; digital transformation; organizational efficiency; Nigeria; public financial management; technology adoption

1. Introduction

Digital transformation has become a central concern in contemporary management and information-systems research because digital technologies increasingly alter organizational structures, decision rights, work practices, and value-creation processes. It is conceptually broader than the conversion of analogue records into digital data (digitization) or the incremental use of

digital tools to improve existing routines (digitalization). Digital transformation denotes an organization-wide process through which combinations of information, computing, communication, and connectivity technologies generate substantial changes in organizational properties and value-creation pathways (Gong & Ribiere, 2021; Vial, 2019). Accordingly, its effects cannot be evaluated only by counting software installations or automated transactions; the relevant question is whether technology is integrated with strategy, people, processes, controls, and institutional arrangements (Hanelt et al., 2021; Verhoef et al., 2021).

Accounting information systems occupy a strategic position within this transformation. An AIS captures, validates, processes, stores, and communicates financial and non-financial information for operational control, statutory reporting, planning, performance evaluation, and managerial decision-making. Historically, many organizations treated AIS as a back-office transaction-processing function. Contemporary systems increasingly combine enterprise resource planning, cloud computing, business intelligence, advanced analytics, artificial intelligence, application programming interfaces, and continuous-control technologies. This shift can reduce repetitive work, accelerate reporting cycles, improve traceability, and support more timely decisions, but it also creates dependencies on data quality, system integration, cybersecurity, user competence, and governance (Appelbaum et al., 2017; Knudsen, 2020; Moll & Yigitbasioglu, 2019; Yoshikuni et al., 2023).

Nigeria provides an analytically important setting. The country combines a large and diverse private sector with extensive public-sector digital financial reforms. At the federal level, the Treasury Single Account (TSA), Government Integrated Financial Management Information System (GIFMIS), and Integrated Personnel and Payroll Information System (IPPIS) were introduced to improve cash consolidation, budget execution, payroll integrity, accounting, and reporting. Institutional assessments nevertheless show uneven module use, incomplete integration, infrastructure constraints, capacity gaps, and continuing governance challenges (International Monetary Fund [IMF], 2018; Office of the Accountant-General of the Federation [OAGF], n.d.; PEFA Secretariat, 2020; World Bank, 2017). In the private sector, adoption ranges from basic computerized bookkeeping to integrated platforms and analytics-intensive financial systems, with pronounced variation by size, industry, managerial capability, and access to reliable infrastructure.

The existing literature frequently presents digitalization as inherently efficiency enhancing. That assumption is analytically weak. Technology can automate an inefficient process, accelerate the production of poor-quality information, or centralize control without improving accountability. Moreover, benefits observed in highly resourced organizations cannot be transferred uncritically to firms and public institutions operating under infrastructure volatility, fragmented legacy systems, cybersecurity exposure, and weak enforcement. A mechanism-based explanation is therefore required: which digital capabilities alter which accounting processes, through what intermediate mechanisms, under which organizational and institutional conditions, and with what measurable outcomes?

Nigeria-specific studies provide useful signals but remain fragmented. Some report positive associations between accounting digitalization and financial performance or system effectiveness, while others document implementation obstacles and uneven reform outcomes (Adurayemi & Olalekan, 2024; Meraghni et al., 2021). Much of this evidence relies on cross-sectional perceptions, small or non-probability samples, conceptual synthesis, or institutional case material. These designs are suitable for identifying relationships and implementation themes, but they do not establish that digital AIS independently causes superior efficiency. The literature also tends to separate private-sector AIS, management accounting, audit technology, and public financial-

management systems, although all involve related questions of information quality, process integration, control, and organizational capability.

This article addresses these limitations through a theory-informed integrative review. It has four objectives: (1) to clarify the meaning and scope of digital transformation in AIS; (2) to identify the mechanisms through which digital AIS may influence organizational efficiency; (3) to explain the technological, organizational, environmental, and institutional conditions that enable or constrain these mechanisms in Nigeria; and (4) to develop a research agenda capable of producing stronger causal and context-sensitive evidence. The article asks the following research questions:

- RQ1. What capabilities distinguish a digitally transformed AIS from basic accounting computerization?
- RQ2. Through which mechanisms can digital AIS affect organizational efficiency?
- RQ3. Which technological, organizational, environmental, and institutional conditions explain variation in outcomes within Nigeria?
- RQ4. What methodological and substantive gaps should guide future research?

The article makes three contributions. First, it integrates the Technology-Organization-Environment (TOE) framework, Institutional Theory, and the DeLone-McLean information-systems success model into a single explanatory structure. Second, it reframes organizational efficiency as a multidimensional outcome produced through specific information, process, control, and coordination mechanisms rather than as a direct consequence of technology adoption. Third, it connects firm-level AIS transformation with Nigeria's public financial-management reforms, thereby identifying shared implementation conditions and context-specific boundary factors.

2. Conceptual and Theoretical Foundations

2.1 Digitization, Digitalization, and Digital Transformation

Conceptual precision is essential because the terms digitization, digitalization, and digital transformation are often used interchangeably. Digitization refers to converting analogue information into digital form, such as scanning invoices or replacing paper ledgers with electronic records. Digitalization refers to using digital technologies to improve or reconfigure existing activities, for example automating bank reconciliation, electronic invoicing, or approval workflows. Digital transformation is broader: it changes how accounting information is produced, governed, interpreted, and embedded in organizational decision-making. It may alter roles, authority, control practices, relationships with external stakeholders, and the architecture of organizational information (Gong & Ribiere, 2021; Plekhanov et al., 2023; Vial, 2019).

For this review, digital AIS transformation is defined as the coordinated redesign of accounting data, processes, technologies, controls, competencies, and governance arrangements to enable integrated, timely, reliable, and analytically useful financial information. This definition excludes purely cosmetic computerization. A stand-alone spreadsheet that reproduces a manual ledger is digitized, but it is not necessarily transformed. Transformation requires integration across processes, improved information flows, redesigned controls, and changes in how users act on information.

2.2 Accounting Information Systems as Socio-Technical Systems

An AIS is not only software. It comprises people, procedures, data, infrastructure, internal controls, interfaces, and governance arrangements. Its quality depends on the interaction of these components. A technically sophisticated platform can fail when master data are inconsistent, users bypass controls, processes are poorly designed, or management does not use system outputs. Conversely, modest technologies can produce substantial benefits when they are aligned with organizational needs, supported by competent users, and embedded in disciplined processes.

Digital technologies expand the functional scope of AIS. Cloud platforms can improve accessibility and scalability; enterprise systems can integrate purchasing, inventory, payroll, revenue, and general-ledger data; analytics can identify patterns and exceptions; artificial intelligence can support classification, forecasting, and anomaly detection; and digital audit trails can increase traceability. Yet these capabilities also increase complexity, vendor dependence, attack surfaces, and the risk that opaque algorithms or poor-quality data produce misleading outputs (Appelbaum et al., 2017; Mikalef & Gupta, 2021; Sutton et al., 2016). Digital AIS should therefore be evaluated as a socio-technical control and decision infrastructure.

2.3 Organizational Efficiency as a Multidimensional Construct

Organizational efficiency is often reduced to cost savings, but AIS-related efficiency is multidimensional. At the operational level, it includes transaction-processing speed, reporting cycle time, staff productivity, error rates, and cost per transaction. At the informational level, it includes accuracy, completeness, timeliness, relevance, consistency, and accessibility. At the control level, it includes fraud prevention, exception detection, compliance, auditability, and reduction of leakages. At the managerial level, it includes decision quality, forecasting capability, resource allocation, and strategic responsiveness. In the public sector, transparency, budget credibility, cash visibility, and accountability are also central outcomes.

This distinction matters because a system may improve one dimension while weakening another. For example, centralized automation can reduce processing time but create a single point of failure; extensive controls can improve compliance but slow approvals; and real-time dashboards can increase information availability without improving decisions if metrics are poorly designed. Efficiency should therefore be assessed through balanced outcome measures rather than a single self-reported performance score (Cosa & Torelli, 2024; DeLone & McLean, 2003; Fährndrich, 2023).

2.4 Integrated Theoretical Framework

The TOE framework explains organizational adoption and implementation through three contexts. The technological context concerns the characteristics of available and existing technologies, including compatibility, complexity, reliability, cybersecurity, scalability, and data quality. The organizational context includes size, resources, leadership, structure, digital skills, process maturity, culture, and governance. The environmental context includes regulation, competitive pressure, professional norms, vendor ecosystems, national infrastructure, and relationships with external stakeholders (Tornatzky & Fleischer, 1990). TOE is useful because it prevents technological determinism: the same system may generate different outcomes in organizations with different capabilities and environments.

Institutional Theory adds an explanation of why organizations adopt similar technologies even when economic benefits are uncertain. Coercive pressures arise from laws, government directives, regulators, donors, or parent organizations. Mimetic pressures arise when organizations imitate perceived leaders under uncertainty. Normative pressures arise from professional standards, audit expectations, and educational or industry norms (DiMaggio & Powell, 1983). In Nigeria, public-sector systems such as TSA, GIFMIS, and IPPIS illustrate coercive adoption, while private organizations may respond to regulatory reporting, banking requirements, auditor expectations, and competitive imitation. Institutional pressure can accelerate adoption, but ceremonial compliance may result when systems are installed without substantive process integration or use.

The DeLone-McLean model links system quality, information quality, and service quality to use, user satisfaction, and net benefits (DeLone & McLean, 2003). It complements TOE and Institutional Theory by clarifying the pathway from adoption to outcomes. Adoption does not itself

produce efficiency. Organizations must achieve reliable system performance, useful information, competent support, meaningful use, and user acceptance. The integrated framework used in this article therefore distinguishes (1) adoption drivers and contextual conditions, (2) system and information quality, (3) value-creation mechanisms, and (4) organizational efficiency outcomes.

Table 1. Core constructs and analytical interpretation

Construct	Working definition	Illustrative indicators	Primary theoretical lens
Digital AIS capability	Integrated technological and organizational capacity to capture, process, control, analyse, and communicate accounting information digitally.	ERP/cloud integration; automation; analytics; real-time reporting; digital audit trails; API connectivity.	TOE; socio-technical systems
System and information quality	Technical reliability and the usefulness, accuracy, completeness, timeliness, and accessibility of outputs.	Uptime; response time; data accuracy; reconciliation differences; report latency; user satisfaction.	DeLone-McLean model
Organizational efficiency	Resource and process outcomes achieved with lower waste, delay, error, and control failure while preserving decision quality.	Cost per transaction; closing cycle; error rate; productivity; leakage reduction; budget credibility.	Information-systems success; performance measurement
Institutional pressure	Coercive, mimetic, and normative forces that shape adoption and use.	Regulatory mandates; audit requirements; professional standards; peer imitation; donor conditions.	Institutional Theory
Implementation readiness	The organizational and environmental capacity to convert adoption into sustained use and benefits.	Leadership; digital skills; process maturity; infrastructure; vendor support; cybersecurity governance.	TOE

3. Method

3.1 Review Design

The study adopts an integrative literature-review design. An integrative review is appropriate when a phenomenon spans multiple research traditions and includes empirical, conceptual, and institutional evidence. The purpose is not to estimate a pooled effect size, but to reconcile concepts, identify mechanisms, compare contexts, and build a theoretically coherent explanation. The review is therefore distinct from a meta-analysis and from a fully exhaustive systematic review.

The source manuscript was used as the initial evidence pool. Its references were screened for relevance, bibliographic completeness, methodological transparency, and verifiability. The pool was then supplemented with seminal and recent peer-reviewed research on digital transformation, AIS, management control, artificial intelligence, information-systems success, and organizational change, as well as institutional reports concerning Nigerian public financial-management reforms. Priority was given to sources with resolvable digital object identifiers, established publishers, clear methods, or direct institutional responsibility for the systems discussed.

3.2 Source Identification and Eligibility

Candidate sources were identified through targeted searches of academic publisher platforms and institutional repositories using combinations of the terms digital transformation, accounting information systems, digital accounting, organizational efficiency, management control, artificial intelligence, financial management information systems, GIFMIS, IPPIS, Treasury Single

Account, Nigeria, and developing economies. The main substantive coverage was 2015-2026, while older seminal works were retained when necessary for theoretical foundations.

Sources were included when they met at least one of four criteria: (1) they developed or reviewed the concept of digital transformation; (2) they examined AIS, accounting digitalization, management control, audit analytics, or information-system performance; (3) they investigated organizational conditions affecting digital implementation; or (4) they provided direct evidence on Nigeria's digital financial-management reforms. Sources were excluded when their bibliographic identity could not be verified, when claims were unsupported by a discernible method, when they duplicated stronger evidence, or when they addressed digitalization without a meaningful connection to accounting, control, decision-making, or organizational performance.

3.3 Analytical Procedure

The analysis combined deductive and inductive coding. Deductive codes were derived from TOE (technology, organization, environment), Institutional Theory (coercive, mimetic, and normative pressures), and the DeLone-McLean model (system quality, information quality, use, satisfaction, and net benefits). Inductive codes captured recurring mechanisms and outcomes, including automation, transaction speed, data quality, decision support, internal control, fraud detection, compliance, integration, transparency, and resource allocation. Contradictory or conditional findings were retained rather than forced into a uniformly positive narrative.

The synthesis followed a causal-chain logic in which digital capability influences system and information quality, which in turn affects process and control mechanisms and, ultimately, efficiency outcomes; each link remains subject to contextual conditions. This structure was used to distinguish plausible benefits from unsupported causal assertions. Evidence was treated as stronger when it used objective measures, longitudinal data, multiple organizations, validated constructs, or triangulated institutional records; it was treated as more tentative when it relied solely on cross-sectional perceptions, conceptual argument, or single-case descriptions.

3.4 Methodological Boundaries

Because the evidence base is heterogeneous and the search was integrative rather than exhaustive, the review does not claim complete coverage of every Nigerian organization or technology. It also does not calculate a meta-analytic effect. The synthesis should be interpreted as a critical conceptual consolidation and research agenda. A future systematic review should document database-specific search strings, duplicate removal, full-text screening decisions, quality appraisal scores, and a PRISMA flow diagram.

4. Results Digital AIS Landscape in Nigeria

4.1 Private-Sector Transformation

Private-sector AIS transformation in Nigeria is heterogeneous. Large banks, telecommunications companies, manufacturing firms, and multinational subsidiaries are more likely to use integrated enterprise systems, automated controls, digital payment interfaces, analytics, and continuous reporting. Small and medium-sized enterprises often rely on packaged accounting software, spreadsheets, mobile applications, or outsourced cloud services. This variation affects both the meaning of adoption and the probability of realizing efficiency gains.

Firm-level evidence generally reports positive associations between digital accounting, AIS effectiveness, and financial or operational performance. However, the evidence should be interpreted cautiously. Cross-sectional studies cannot rule out reverse causality: better-performing firms may have more resources to invest in digital systems. Self-reported measures may also inflate relationships because respondents evaluate both adoption and performance. International evidence

nevertheless supports a plausible mechanism: information-systems infrastructure integration enables strategic enterprise-management practices and improves decision-making performance, which can strengthen innovation and strategic flexibility (Huy & Phuc, 2025; Meraghni et al., 2021; Yoshikuni et al., 2023).

4.2 Public Financial-Management Transformation

Nigeria's public financial-management architecture provides a prominent example of digital AIS at scale. The TSA consolidates government cash balances and supports centralized cash visibility. GIFMIS provides modules for budget execution, accounting, treasury functions, and reporting. IPPIS digitizes personnel and payroll information to improve payroll control. Together, these systems are intended to reduce fragmented bank accounts, manual processing, unauthorized expenditure, payroll fraud, and delays in financial reporting.

Institutional evidence confirms meaningful progress but also demonstrates the limits of technology-only interpretations. The World Bank reported that Nigeria had implemented a harmonized chart of accounts through GIFMIS and that TSA arrangements improved cash aggregation; the same assessment noted suboptimal and inconsistent use of GIFMIS modules and incomplete IPPIS coverage (World Bank, 2017). IMF analysis similarly associated TSA expansion with greater transparency in cash management (IMF, 2018). The OAGF describes the reform objective as efficient, effective, and transparent cash management supported by a general-ledger system and timely reporting (OAGF, n.d.). These sources support the proposition that digital platforms can improve financial visibility and control, but they also show that system coverage, integration, and actual use remain decisive.

4.3 Contextual Characteristics

Several contextual characteristics shape digital AIS outcomes in Nigeria. Electricity and connectivity reliability affect system availability, especially outside major urban centres. Fragmented legacy applications complicate integration and reconciliation. Shortages of specialized skills increase reliance on vendors and consultants. Cybercrime and data-protection risks raise the cost of secure implementation. Organizational hierarchies and resistance to process transparency may encourage workarounds. In the public sector, political incentives, administrative fragmentation, and enforcement quality influence whether digital audit trails lead to sanctions or merely document irregularities.

These conditions do not imply that digital transformation is infeasible. They imply that efficiency gains are conditional. Cloud and mobile solutions may reduce some infrastructure barriers, while shared services and standardized data architectures may improve scalability. Yet such solutions also require robust identity management, access controls, backup, vendor governance, and incident response. The Nigerian case therefore illustrates why digital AIS should be treated as a capability-building programme rather than a one-time procurement project.

5. Mechanisms Linking Digital AIS to Organizational Efficiency

5.1 Process Automation and Cycle-Time Reduction

Automation is the most visible mechanism. Rules-based workflows can post recurring transactions, match documents, reconcile accounts, calculate payroll, route approvals, and generate standard reports. When processes are standardized and exceptions are well defined, automation reduces manual touchpoints, transcription errors, and processing time. It can also release accounting personnel from routine tasks for analysis and advisory work. The efficiency effect is strongest when automation is preceded by process simplification; automating redundant approvals or inconsistent data entry can reproduce inefficiency at greater speed.

5.2 Information Quality and Decision Support

Integrated systems can create a more consistent data environment by reducing duplicate records and enabling common master data. Real-time or near-real-time reporting shortens the delay between economic events and managerial awareness. Analytics can support cash forecasting, cost analysis, budget monitoring, variance investigation, customer profitability, and risk assessment. Yoshikuni et al. (2023) show that infrastructure integration contributes to strategic flexibility through information-system-enabled management practices and decision-making performance. The mechanism is not information volume alone; it is the production of relevant, interpretable, and trusted information at the point of decision.

Poor data governance can reverse this benefit. Inconsistent definitions, uncontrolled spreadsheets, weak interfaces, and incomplete source data create multiple versions of the truth. Dashboards can make inaccurate information appear authoritative. Data ownership, validation rules, metadata, reconciliation, and change control are therefore efficiency mechanisms in their own right.

5.3 Internal Control, Auditability, and Fraud Risk

Digital AIS can strengthen internal control by enforcing authorization rules, segregating duties, maintaining audit trails, performing automated validations, and flagging unusual transactions. Analytics and artificial intelligence can extend testing from small samples to larger populations and support anomaly detection (Appelbaum et al., 2017; Sutton et al., 2016). In public finance, centralized payment and payroll records can make duplicate accounts, unauthorized employees, or irregular expenditure more visible.

Nevertheless, digital control is not equivalent to effective governance. Users may share credentials, override controls, manipulate source data, or collude. Algorithms may produce false positives or embed unexamined assumptions. Weak incident response may allow detected anomalies to persist. Digital controls are effective only when access management, independent review, investigation, and sanctions are operational. Thus, AIS transformation changes the control environment but does not eliminate human agency or institutional weakness.

5.4 Integration, Coordination, and Organizational Agility

Integrated AIS can reduce information silos between accounting, procurement, inventory, operations, human resources, and treasury. A transaction entered once can update multiple records, reducing re-entry and reconciliation. Shared data can improve coordination among managers and enable faster responses to cash shortages, cost overruns, demand changes, or compliance requirements. Digital transformation also shifts organizational boundaries by connecting firms with banks, tax authorities, suppliers, customers, auditors, and platform partners (Plekhanov et al., 2023).

Integration may also centralize power and reduce local discretion. Whether this improves efficiency depends on governance design. Excessive centralization can create bottlenecks, while uncontrolled decentralization can weaken standardization and security. Effective architectures combine common standards and central controls with appropriate local decision rights.

5.5 Transparency and Accountability

Digital records can increase transparency by making transactions more traceable, reports more timely, and performance deviations more visible. In public financial management, consolidated cash information can improve fiscal planning and reduce idle balances. Electronic reporting can facilitate oversight by treasury authorities, auditors, legislatures, and citizens. These are important efficiency effects because opaque systems create opportunities for duplication, leakage, delayed correction, and low-quality resource allocation.

Transparency, however, requires more than data generation. Information must be accessible, comprehensible, complete, and linked to accountability processes. Publishing reports without clear classification, explanation, or follow-up may create formal transparency without substantive accountability. Institutional design therefore moderates the relationship between digital visibility and organizational performance.

Table 2. Mechanisms, expected outcomes, and recommended indicators

Mechanism	Expected efficiency effect	Recommended objective indicators	Main failure risks
Automation	Lower manual workload, shorter processing cycles, fewer transcription errors.	Cost per transaction; number of manual interventions; closing days; error rate.	Automating poor processes; hidden exceptions; overdependence on vendors.
Information quality	More timely, consistent, and decision-relevant reporting.	Report latency; reconciliation differences; data-completeness rate; forecast accuracy.	Poor master data; fragmented interfaces; uncontrolled spreadsheets.
Digital control	Stronger authorization, traceability, compliance, and anomaly detection.	Control exceptions; audit findings; duplicate payments; fraud losses; resolution time.	Credential sharing; override abuse; false positives; weak sanctions.
Integration	Reduced duplicate entry and improved cross-functional coordination.	Interface failure rate; duplicate records; reconciliation time; process hand-offs.	Legacy incompatibility; centralized bottlenecks; unclear data ownership.
Transparency	Improved visibility of cash, budgets, payroll, and performance.	Timeliness of statements; budget variance; idle balances; public disclosure completeness.	Formal disclosure without usability or accountability follow-up.

6. Enablers and Barriers

6.1 Technological Conditions

Technological readiness includes system reliability, interoperability, scalability, data architecture, cybersecurity, and technical support. Reliability is especially important because accounting processes are deadline sensitive. Frequent outages encourage parallel manual systems and weaken confidence in digital records. Interoperability determines whether organizations obtain integrated information or merely operate multiple electronic silos. Scalability matters for transaction growth and geographic expansion. Cybersecurity determines whether gains in accessibility are offset by fraud, disruption, or data compromise.

Data quality deserves separate emphasis. Artificial intelligence and analytics cannot compensate for inaccurate, incomplete, or inconsistently classified transactions. Organizations should establish master-data governance, interface controls, reconciliation routines, data-quality metrics, and clear ownership. Technology selection should be based on business requirements and total lifecycle cost, including implementation, integration, training, security, maintenance, and exit arrangements.

6.2 Organizational Conditions

Leadership is required to align digital investment with strategy and to resolve cross-functional conflicts. AIS projects often fail because they are delegated entirely to information-technology or accounting units, even though implementation changes procurement, operations, human resources, treasury, audit, and managerial reporting. A governance structure with executive sponsorship, process owners, data owners, control functions, and user representation is therefore essential.

Digital competence is another core condition. Users need more than software navigation; they require understanding of data, controls, analytics, cybersecurity, and the implications of automated

decisions. Accountants increasingly need hybrid competencies in accounting, information systems, process analysis, and data interpretation (Knudsen, 2020; Moll & Yigitbasioglu, 2019). Training should be role based, continuous, and linked to actual processes. Organizations should also redesign roles so that efficiency gains do not simply increase workload or create unrecognized control responsibilities.

Change management affects adoption and sustained use. Resistance may arise from fear of job loss, loss of discretionary authority, exposure of previously opaque practices, or low confidence in system reliability. Effective change management includes early stakeholder participation, communication of process rationale, pilot testing, support mechanisms, and visible response to user problems. User satisfaction is not merely a convenience; it affects actual use and therefore net benefits (DeLone & McLean, 2003).

6.3 Environmental and Institutional Conditions

The national and sectoral environment affects digital AIS through telecommunications, power supply, regulation, professional education, vendor capacity, and access to finance. Large organizations can often invest in redundancy and specialist staff, while smaller firms face higher relative costs. Shared digital infrastructure, cloud services, professional training, and interoperable regulatory platforms may reduce these disparities.

Institutional pressures can promote standardization and accountability, but they can also produce formal compliance without substantive use. A mandated system may be technically installed while users maintain parallel spreadsheets or bypass controls. Regulators and public authorities should therefore evaluate usage quality, data integrity, integration, and performance outcomes rather than adoption status alone. Professional bodies can strengthen normative pressures by incorporating digital assurance, data governance, and analytics into competency standards.

6.4 Cybersecurity, Privacy, and Ethical Risks

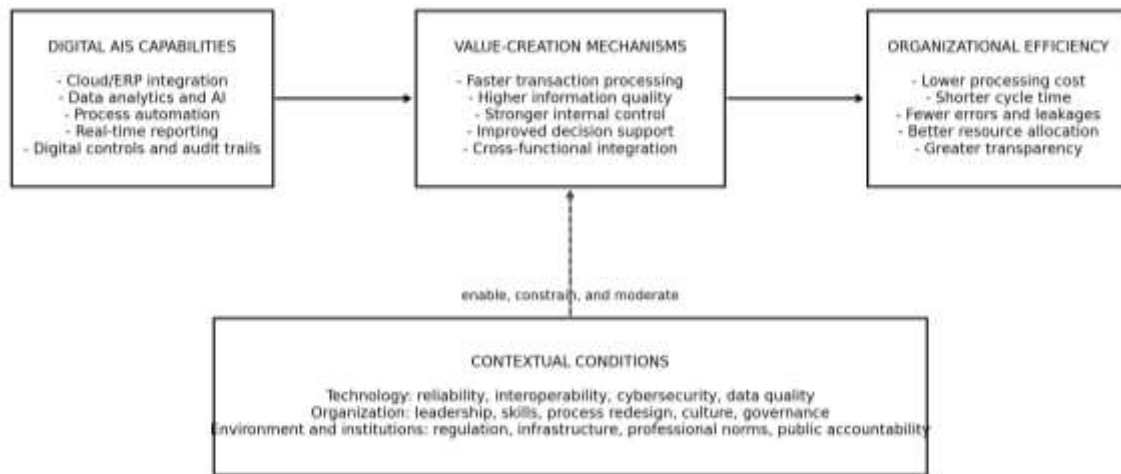
Digital AIS concentrates sensitive financial, payroll, vendor, customer, and employee data. This concentration increases the consequences of unauthorized access, ransomware, identity theft, insider abuse, and service disruption. Security controls should include least-privilege access, multi-factor authentication, segregation of duties, encryption, secure backups, logging, vulnerability management, vendor-risk assessment, business continuity, and incident response. These controls should be tested rather than assumed.

Artificial intelligence introduces additional ethical and governance issues. Models may be difficult to explain, may reproduce bias in historical data, and may shift responsibility for decisions. Organizations should document model purpose, training data, validation, performance thresholds, override procedures, and human accountability. In high-stakes accounting and audit contexts, explainability and contestability are necessary components of system quality, not optional ethical additions.

7. Integrated Synthesis and Propositions

The literature supports a conditional, mechanism-based model. Digital AIS capability does not directly and uniformly produce organizational efficiency. It first affects system quality, information quality, process integration, and control capability. These intermediate changes then influence transaction cost, cycle time, error, decision quality, resource allocation, and accountability. The strength and direction of the relationship depend on technological readiness, organizational capability, environmental infrastructure, and institutional enforcement.

Figure 1. Integrated framework for digital AIS transformation and organizational efficiency



Source: Author synthesis based on TOE, Institutional Theory, and the DeLone-McLean information-systems success model.

Proposition 1. Digital AIS capability is positively associated with organizational efficiency only to the extent that it improves system quality, information quality, and actual use.

Proposition 2. Process standardization and redesign mediate the effect of automation on transaction cost, cycle time, and error reduction.

Proposition 3. Information integration and analytical capability improve decision-making performance when data governance and managerial interpretation capability are sufficiently developed.

Proposition 4. Digital controls reduce leakage and compliance failure when access governance, independent review, investigation, and sanctions are effective.

Proposition 5. Leadership commitment, digital competence, and change-management capability positively moderate the relationship between digital AIS investment and organizational efficiency.

Proposition 6. Infrastructure volatility, weak interoperability, cybersecurity exposure, and ceremonial institutional compliance negatively moderate the realization and sustainability of efficiency gains.

8. Discussion

8.1 Interpretation of the Evidence

The evidence is broadly consistent with the claim that digital AIS can enhance organizational efficiency, but the wording matters. The strongest conclusion is not that digitalization automatically improves performance; it is that digital technologies create capabilities that can improve performance when organizations redesign processes, govern data, develop skills, and enforce controls. This interpretation reconciles positive empirical associations with persistent implementation failures.

The Nigerian public-sector experience is particularly instructive. TSA and GIFMIS can improve cash visibility and reporting, while IPPIS can strengthen payroll control. Yet incomplete coverage, inconsistent module use, and parallel processes reduce benefits. These are not peripheral implementation details; they are part of the causal explanation. A system that is not consistently used cannot generate reliable integrated data, and unreliable data cannot support efficient decisions or credible accountability.

Private-sector organizations face the same logic at different scales. Cloud accounting or enterprise systems may reduce cost and improve information access, but benefits depend on process discipline, integration, and user capability. Smaller firms may realize rapid gains from

basic automation, while larger organizations may require complex integration and governance to avoid fragmentation. Consequently, digital maturity should be assessed relative to organizational needs rather than by the sophistication of individual technologies.

8.2 Theoretical Contributions

The first theoretical contribution is integration. TOE explains contextual readiness and constraints; Institutional Theory explains adoption pressures and ceremonial compliance; and the DeLone-McLean model explains how system and information quality translate into use and net benefits. Combining these perspectives produces a more complete account than any one framework alone.

The second contribution is the identification of mechanisms. Much of the literature models digital transformation as a broad independent variable and performance as a broad dependent variable. This review decomposes the relationship into automation, information quality, control, integration, and transparency. This decomposition supports more precise measurement and reduces the risk of attributing all organizational change to technology.

The third contribution is the treatment of institutional enforcement as a boundary condition. Digital records increase observability, but observability becomes accountability only when review and sanction mechanisms function. This distinction is especially relevant in public-sector settings and in organizations where informal workarounds coexist with formal systems.

8.3 Managerial Implications

Managers should begin with process and information problems rather than technology brands. A digital AIS roadmap should identify critical processes, decision requirements, data owners, control objectives, integration dependencies, and measurable outcomes. Benefits should be expressed in operational terms such as reduced closing time, fewer reconciliation differences, lower duplicate-payment rates, improved forecast accuracy, or faster exception resolution.

Implementation should be staged. High-volume, rules-based processes with reliable data are suitable early targets for automation. More complex analytics and artificial intelligence should follow the establishment of data governance and basic control maturity. Each phase should include baseline measures, post-implementation evaluation, and user feedback. Governance should include finance, information technology, operations, internal audit, risk, and senior management.

Organizations should avoid eliminating manual controls before digital controls have been validated. Parallel operation may be necessary during transition, but it should have a planned end date because indefinite duplication increases cost and creates inconsistent records. Vendor contracts should address data ownership, security obligations, interoperability, service levels, backup, incident notification, audit rights, and exit procedures.

8.4 Policy Implications

Policy should focus on enabling conditions and outcome accountability. Investment in reliable connectivity and power remains important, but digital public finance also requires standardized data, interoperable architecture, professional skills, cybersecurity, and independent oversight. Government should evaluate the extent to which GIFMIS, IPPIS, and related platforms are used across their intended process scope, not merely whether agencies are connected.

For smaller firms, policymakers and professional bodies can support adoption through digital-accounting training, model control frameworks, cybersecurity guidance, interoperable tax and payment interfaces, and incentives for verified digital records. Regulatory requirements should be proportionate and should avoid forcing small organizations into complex systems without support. Professional curricula should combine accounting expertise with information-systems governance, data analytics, and digital assurance.

9. Research Agenda

The principal research need is stronger design. Cross-sectional perception studies should be complemented by longitudinal and quasi-experimental approaches. Researchers can compare performance before and after implementation, exploit staggered rollouts, use matched organizations, or examine policy-induced adoption. Objective measures should be collected from system logs, financial statements, audit reports, processing records, and incident data.

Research should also distinguish technologies and mechanisms. Cloud adoption, ERP integration, robotic process automation, business intelligence, artificial intelligence, blockchain, and digital public-finance platforms are not interchangeable. Studies should specify the capability being examined and test mediators such as information quality, cycle time, control effectiveness, decision quality, or user competence.

Sectoral and organizational heterogeneity requires attention. Banks, manufacturers, public agencies, universities, hospitals, and small enterprises have different processes, risks, and regulatory environments. Multi-group analysis can examine whether firm size, ownership, region, industry, or infrastructure reliability changes the effect of digital AIS. Public-sector research should distinguish cash management, payroll, procurement, budget execution, and financial reporting rather than treating reform as a single construct.

Finally, research should investigate negative and unintended outcomes: cybersecurity incidents, algorithmic bias, surveillance, loss of professional judgment, vendor lock-in, system exclusion, and excessive centralization. Efficiency should not be studied in isolation from resilience, ethics, privacy, and accountability.

Table 3. Priority research questions and recommended designs

Research question	Recommended design and data	Expected contribution
Does digital AIS cause measurable efficiency improvement?	Longitudinal panel, difference-in-differences, staggered implementation; system logs and audited performance data.	Stronger causal inference and effect-size estimates.
Which mechanisms transmit the effect?	Mediation models using information quality, cycle time, control exceptions, and decision quality.	Mechanism-specific theory and implementation guidance.
How do Nigerian contextual conditions moderate outcomes?	Multi-sector and multi-region comparisons; infrastructure, skills, regulation, and governance measures.	Context-sensitive boundary conditions.
Do public financial systems improve accountability?	Administrative data on coverage, usage, payment exceptions, audit findings, budget credibility, and sanction follow-up.	Distinguishes formal adoption from substantive accountability.
What risks accompany AI-enabled AIS?	Model audits, incident analysis, qualitative case studies, and governance experiments.	Ethical, cybersecurity, and professional-judgment safeguards.

10. Limitations

This review has four limitations. First, it is integrative rather than exhaustive; it does not provide a database-by-database PRISMA accounting of all potentially relevant studies. Second, Nigeria-specific firm-level evidence remains limited and methodologically heterogeneous. Third, rapid technological change may alter the relevance of particular applications even when the underlying organizational mechanisms remain stable. Fourth, institutional documents are valuable for understanding system design and reform progress but may not provide independent causal evaluation. These limitations reinforce the need for transparent, longitudinal, and multi-method research.

11. Conclusion

Digital transformation can reposition accounting information systems from administrative record-keeping tools to integrated infrastructures for processing, control, analytics, and organizational coordination. In Nigeria, this potential is visible in both private-sector adoption and large-scale public financial-management reforms. The most plausible benefits are faster processing, improved information quality, stronger auditability, better decision support, and enhanced financial visibility.

These benefits are not automatic. They depend on reliable infrastructure, interoperable systems, disciplined data governance, cybersecurity, capable users, process redesign, leadership, and institutional enforcement. Technology may increase the visibility of transactions without increasing accountability, or automate processes without improving their logic. The appropriate managerial and policy stance is therefore neither technological optimism nor rejection, but governed capability development supported by measurable outcomes.

The central conclusion is that digital AIS transformation is an organizational and institutional change programme. Software acquisition is only one component. Organizations that align technology with information needs, controls, skills, and accountability mechanisms are more likely to convert digital investment into sustainable efficiency. Future research should test this conditional mechanism-based model with objective and longitudinal evidence across Nigerian sectors.

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