

Digital accounting and financial audit as the foundation of smart governance

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Abstract

In the era of rapid digital transformation, the integration of accounting and auditing functions into smart governance frameworks has become a key determinant of transparency, efficiency, and public trust. This paper examines the conceptual and practical foundations of digital accounting and financial audit as essential components of smart governance. The research argues that financial information systems and auditing tools powered by digital technologies — including artificial intelligence, blockchain, and data analytics — redefine the mechanisms of accountability in both public and private sectors. Drawing on recent developments in digital finance and international public sector accounting standards (IPSAS), the study explores how the adoption of automated reporting and digital audit trails enhances decision-making processes and mitigates systemic financial risks in smart cities. The paper also highlights the evolving role of auditors as data analysts and strategic partners in governance, emphasizing the shift from compliance-oriented control to predictive, risk-based auditing. Through a theoretical and empirical lens, the research proposes a multidimensional framework where digital accounting and audit functions serve as the backbone of financial governance in intelligent urban systems. By aligning fiscal transparency with technological innovation, smart governance models can promote citizen engagement, reinforce institutional credibility, and ensure the sustainability of public finances. The study concludes that the future of accountable governance fundamentally depends on the synergy between digital technologies and financial integrity mechanisms.

Keywords: benefits, challenges, limitations.

1. Introduction

Smart governance represents the intersection of technology, public administration, and societal participation. Modern cities and states are increasingly relying on digital solutions to enhance transparency, streamline financial operations, and engage citizens in governance processes. The integration of digital accounting and auditing systems within these frameworks is essential to ensure effective fiscal management, reduce opportunities for corruption, and promote evidence-based decision-making [1].

Recent developments in information and communication technologies (ICTs) allow governments to automate financial reporting, monitor expenditures in real-time, and integrate large-scale data analytics into daily administrative processes. As a result, accountability mechanisms no longer remain reactive, instead, they become predictive, proactive, and continuous [2]. The adoption of e-government and digital public sector platforms can reduce financial irregularities by up to 30%, emphasizing the transformative potential of these tools.

2. Research aim and objectives

The primary aim of this study is to investigate how digital accounting and financial auditing can strengthen smart governance in Georgia and comparable contexts. Objectives include:

- To analyze the role of digital accounting and auditing in enhancing governance transparency.
- To explore the impact of advanced technologies such as blockchain, AI, and open data on public sector accountability.
- To examine historical lessons, particularly the case of Niko Nikoladze in Poti, Georgia, as a practical model of transparent management.
- To propose an integrated framework for implementing smart governance practices in contemporary contexts, including Georgia.

3. Previous research

This study builds on previous research in public sector accounting, digital governance, and smart city initiatives, integrating both theoretical frameworks and empirical findings. Key references include works published in SCRD.eu, addressing cybersecurity, AI in auditing, and municipal digital transformation [3, 4, 5, 6] Prior historical analyses, such as Bakradze on Niko Nikoladze, provide comparative insights on transparent governance [7, 8].

4. Methodology

The study uses a mixed-methods approach combining qualitative and quantitative analyses. Methods include:

- Case study of Poti municipality and historical examination of Niko Nikoladze's governance practices.
- Analysis of empirical data from SCRD.eu and government digital platforms.
- Comparative literature review of international digital audit and smart governance frameworks.

5. Results

Empirical findings show that digital accounting reduces errors and unreported expenditures by 20–35% [3, 6] AI-based auditing increases efficiency and predictive capacity by 40–60% [4, 5] Open data initiatives enhance citizen trust and engagement by 18–30% [6, 7]. Historical evidence demonstrates that transparent budgeting and public participation, as in Poti (1895–1904), substantially improved municipal financial outcomes [7].

6. Discussion

6.1. Digital accounting in smart governance

Digital accounting is the backbone of modern financial governance. It provides automated, real-time monitoring of municipal and national budgets, reduces human error, and supports data-driven decision-making. Key components include:

- Automated Financial Recording: Transactions are logged instantaneously into a centralized system, eliminating delays inherent in manual accounting.
- Real-Time Budget Monitoring: Government bodies can immediately identify discrepancies in expenditure and allocate resources more effectively.

- **Data-Driven Reporting:** Reports are generated automatically, enabling policymakers to make timely decisions based on reliable financial data.
- **Transparency and Public Access:** Digital platforms allow citizens to access financial data, creating a feedback loop between government and society [3].

Benefits include increased operational efficiency, reduced opportunities for corruption, enhanced public trust, and improved compliance with international standards [3]. Challenges include high initial investment costs, need for skilled personnel, and data security concerns. Research from SCRD.eu shows a 20–35% reduction in unreported expenditures [6].

6.2. Blockchain, artificial intelligence, and open data in smart governance

1. Blockchain technology

Blockchain technology provides immutable, transparent, and auditable financial records, making it ideal for smart governance. Every transaction is cryptographically secured and can be verified independently, ensuring that no funds are misallocated or manipulated. Key applications in governance include:

- **Public Sector Accounting:** Municipalities can track revenues and expenditures in real-time, creating a digital trail accessible to auditors and citizens.
- **Procurement and Contract Monitoring:** Smart contracts enforce compliance automatically, reducing manual oversight needs.
- **Anti-Fraud Measures:** Unauthorized changes to financial records are immediately detectable%.

Recent studies indicate that blockchain adoption in municipal budgets can reduce irregularities by 25–40% [5, 9]. For example, cities like Tallinn, Estonia, and Dubai, UAE, have implemented blockchain-based procurement systems to enhance transparency and trust.

2. Artificial intelligence in auditing

AI tools transform auditing from a retroactive check to a predictive, proactive management instrument. Key functionalities include:

- **Anomaly Detection:** AI algorithms analyze transaction patterns to detect irregularities, overspending, or fraudulent activity.
- **Predictive Analytics:** Forecast potential budget shortfalls or resource misallocation.
- **Automated Risk Assessment:** Evaluate high-risk transactions and flag them for human review.

AI-based auditing can increase efficiency and accuracy by 40–60% compared to traditional methods [6, 10]. AI also allows auditors to shift from routine compliance tasks to strategic advisory roles, providing insights to decision-makers in real time.

3. Open data initiatives

Open Data platforms empower citizens to engage directly with governance processes. Through open access to municipal budgets, procurement data, and audit reports, citizens can:

- Conduct independent analyses;
- Develop data-driven advocacy and policy suggestions;
- Monitor government performance and detect irregularities.

Open data initiatives have proven to increase citizen trust and engagement significantly. Studies show that when cities release 100% of their budgetary and procurement data publicly, corruption complaints decrease by 18–30% [6].

6.4. Historical case: Niko Nikoladze and the development of Poti

Niko Nikoladze (1843–1928), one of Georgia’s foremost economists and reformers, serves as a historical example of transparent, accountable governance [7, 8] As mayor of Poti from 1894 to 1905, Nikoladze implemented practices that today resemble smart governance principles.

Key Reforms:

- Open Budget Systems: Detailed accounting of revenues and expenditures, accessible to citizens [7, 8].
- Public Reporting: Citizens were informed of municipal financial decisions, reinforcing transparency [7, 8].
- Oversight Commissions: Involvement of local communities in monitoring public finances [7, 8].

These reforms had tangible results. Poti’s municipal budget expanded from 75,000 manat in 1895 to 723,327 manat in 1904, demonstrating the economic impact of transparent and accountable governance [7, 8].

Comparative analysis with modern smart governance:

- Blockchain \approx Open Ledger: Just as blockchain ensures immutable transactions today, Nikoladze’s meticulous accounting created a transparent financial trail.
- AI Auditing \approx Analytical Oversight: Nikoladze analyzed revenue patterns and expenditures systematically, enabling evidence-based decisions.
- Open Data \approx Public Access to Reports: Publishing budgets and engaging citizens mirrored modern open data principles.

Lessons for contemporary governance:

- Transparent accounting drives economic growth and public trust.
- Citizen participation strengthens oversight and accountability.
- Systematic financial control enables proactive, strategic decision-making.

This historical precedent demonstrates that technological innovations like blockchain, AI, and open data are extensions of principles that have proven effective for over a century [7].

6.5. Digital auditing and financial transparency

Digital auditing represents a paradigm shift from traditional compliance-based review to predictive, data-driven governance. Modern audit systems combine automated data collection, AI-powered analytics, and continuous monitoring to ensure accountability in real time.

Key features of digital auditing:

- Continuous Monitoring: Auditors can track transactions and budget allocations in real time, identifying irregularities immediately [5]
- Data Analytics: Large datasets are analyzed to detect trends, inefficiencies, and potential fraud [9]
- Predictive Auditing: AI models forecast future risks, allowing proactive interventions rather than reactive corrections [10]
- Strategic Advisory Role: Auditors transition from compliance enforcers to strategic partners, offering insights into policy effectiveness [6]

Benefits:

- Enhances fiscal transparency and accountability;
- Reduces opportunities for corruption and mismanagement;
- Provides policymakers with actionable, timely insights;
- Supports sustainable budgeting and resource allocation.

Challenges:

- Integration with existing legacy systems can be complex;
- Requires skilled personnel in both auditing and ICT;
- Cybersecurity risks need robust mitigation strategies.

A study conducted by PwC (2022) found that organizations adopting AI-driven audit tools improved fraud detection rates by up to 50% while reducing manual workload by 40%. Similarly, municipalities with real-time audit dashboards reported improved budget compliance and citizen satisfaction [10].

6.6. Technological integration in Georgia

Georgia has been gradually adopting digital solutions in public finance and auditing. Key initiatives include:

- E-Government Platforms: Integration of digital accounting and reporting tools across ministries and municipalities [1].
- Open Data Portals: Public access to budget, procurement, and audit data through centralized online platforms [1].
- Capacity Building: Training programs for public officials on digital accounting, blockchain applications, and AI-based auditing [10].

Examples:

- Poti Municipality: Inspired by Niko Nikoladze's historical practices, the city has implemented digital budget tracking, providing citizens with real-time access to expenditures and revenues.
- Tbilisi City Hall: Adoption of blockchain-based procurement platforms to reduce fraud and increase transparency.
- National Initiatives: The Ministry of Finance has begun piloting AI-assisted audits for tax compliance and fiscal risk assessment.

Impact:

- Citizen trust in local governance has increased (SCRD.eu, 2023).
- Budget efficiency and resource allocation improved by 18–30%.
- Encourages participatory governance and informed decision-making.

Despite progress, challenges remain: technical infrastructure limitations, skills gaps, and legal frameworks for digital auditing must be strengthened to achieve full-scale smart governance implementation [6, 10].

As it turns out from research:

The integration of digital accounting, AI, blockchain, and open data creates a multi-layered framework for transparent and accountable governance. By combining historical lessons with modern technology, governments can achieve:

- Enhanced Fiscal Integrity: Continuous monitoring and predictive analytics prevent misallocation of resources.
- Citizen Engagement: Open access to data encourages participatory oversight and strengthens democracy.
- Strategic Decision-Making: Data-driven insights allow policymakers to allocate resources effectively, anticipate risks, and plan sustainable development initiatives.
- Ethical Governance: As Niko Nikoladze demonstrated, transparent accounting and citizen oversight are moral imperatives that align governance with societal trust.

Challenges and considerations:

- Cybersecurity and Data Privacy: Protecting sensitive financial data remains critical.
- Technological Literacy: Both public officials and citizens must understand digital tools.
- Cultural and Institutional Adaptation: Historical governance traditions may resist rapid technological adoption.

In sum, smart governance is not merely about technology; it is about creating systems that combine transparency, accountability, and citizen participation. Historical examples, like Poti under Niko Nikoladze, provide evidence that these principles have long-term economic and social benefits, even before the advent of modern technology.

7. Conclusion

This study demonstrates that digital accounting and auditing are foundational to modern smart governance. Key insights include:

- Digital tools such as AI, blockchain, and open data transform auditing and financial transparency from reactive to predictive [4, 5, 10, 11].
- Historical examples, such as Niko Nikoladze's reforms in Poti, illustrate the enduring value of transparent accounting and citizen engagement [7, 8].
- Successful implementation in Georgia requires investment in technology, skills, and legal frameworks [2, 5, 9, 10].

Smart governance models strengthen public trust, reduce corruption, and improve resource allocation, ensuring sustainable economic development [1, 7].

The synergy between technology, ethical governance, and historical lessons provides a robust framework for advancing transparency, efficiency, and public accountability in Georgia and beyond [1, 2, 3, 4, 5, 6, 10, 12].

8. Original contribution

This paper's original contribution lies in linking historical governance lessons with modern digital tools to form a comprehensive framework for smart governance. It demonstrates the synergy between digital technology, historical precedent, and fiscal integrity, offering actionable insights for academics, policymakers, and practitioners.

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