RESEARCH PAPER

Challenges of Implementing Digital Revenue Systems in Local Government: A Case Study of Kanye District Municipal Council, Botswana

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ABSTRACT
This study examines the barriers impeding digital transformation in municipal revenue collection systems within the Kanye District Municipal Council, Botswana, and their consequent effects on financial performance indicators. Despite global momentum toward digital governance, African local authorities continue to face substantial obstacles in adopting revenue digitization technologies, resulting in persistent revenue leakage, low collection efficiency ratios, billing inaccuracies, and delayed payment turnaround times. Employing a qualitative research design grounded in the Technology Organization Environment (TOE) framework, this investigation utilizes semi-structured interviews with revenue officers, IT personnel, finance managers, and municipal leadership to identify and analyze multifaceted adoption barriers. Thematic analysis reveals six primary barrier categories: technical infrastructure deficiencies, human capacity constraints, organizational culture and leadership resistance, system integration challenges, policy and regulatory inadequacies, and financial resource limitations. Findings indicate that these barriers collectively undermine digital transformation efforts and directly impair municipal financial performance through increased revenue leakage (averaging 23-35% of potential collections), reduced billing accuracy (65-72% efficiency), and extended payment cycles (45-90 days). The study contributes to the digital governance literature by providing empirical evidence from a Southern African context and offers practical recommendations for organizational reform, infrastructure modernization, capacity-building interventions, and policy realignment to enhance revenue system digitization in resource-constrained municipal settings.

Keywords: Digital transformation, municipal revenue collection, TOE framework, financial performance, technology adoption barriers, local government, Botswana, e-payment systems, revenue leakage, collection efficiency

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1. INTRODUCTION

Municipal revenue collection systems across Africa face unprecedented challenges as local governments struggle to meet escalating service delivery demands amid constrained fiscal resources. The imperative for digital transformation in public finance has intensified, driven by technological advancement, citizen expectations for transparent governance, and the urgent need to optimize revenue mobilization (Ngcaweni, 2025; Lafioune et al., 2024). Digital revenue ecosystems encompassing e-payment platforms, automated billing systems, real-time monitoring dashboards, and integrated financial management information systems (FMIS) promise substantial improvements in collection efficiency, revenue assurance, and financial accountability (Bob & Bob, 2025). However, despite these demonstrable benefits and global acceleration of e-governance initiatives, African municipal councils persistently lag in technology adoption, perpetuating manual processes that generate significant revenue leakages, billing discrepancies, and compliance deficits.

The digital divide between advanced and developing economies manifests acutely in local government financial management systems. While South Africa's revenue service achieved remarkable success through e-filing implementation in 2006 streamlining tax processes, reducing inefficiencies, and elevating compliance rates (Ngcaweni, 2025) most district and local municipalities across Southern Africa remain tethered to paper-based workflows, fragmented data systems, and manual reconciliation processes. This technological inertia results in substantial fiscal consequences: South African municipalities collectively owed over R100 billion to water boards and R110 billion to Eskom as of 2024, with aggregate consumer debts reaching R306.7 billion (National Treasury, 2023). These arrears stem partially from weak billing systems, inadequate credit control mechanisms, and deficient revenue collection infrastructure that digital transformation could potentially remedy.

Botswana's local government sector exemplifies these challenges. Despite national commitments to digital

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transformation through the SmartBots strategy and ambitious targets to provide over 500 online government services (Porogo & Kalusopa, 2021), district councils encounter persistent obstacles in implementing digital revenue systems. The Kanye District Municipal Council, serving as a representative case within Botswana's municipal landscape, grapples with endemic revenue collection deficiencies manifested in high leakage rates, billing inefficiencies, delayed remittances, and suboptimal financial performance indicators. While the Botswana Unified Revenue Service (BURS) successfully digitized national tax administration between 2014-2020, reducing tax filing to five minutes and substantially narrowing the tax gap (Nortal, 2023), these innovations have not cascaded to local government revenue systems.

The consequences of delayed digital adoption extend beyond operational inefficiencies to fundamentally compromise municipal financial sustainability (David et al., 2023). Financial performance indicators including revenue leakage percentages, collection efficiency ratios, billing accuracy rates, payment turnaround times, and compliance levels remain suboptimal across Botswana's district councils (Porogo & Kalusopa, 2021). These performance deficits constrain municipalities' capacity to fund essential services, maintain infrastructure, settle creditor obligations, and execute developmental mandates. As Botswana's 2025/26 budget allocates P3.48 billion to local government infrastructure and P1.47 billion specifically for digital transformation initiatives (Ministry of Finance, 2025), understanding the barriers preventing effective technology adoption becomes critically important for policy formulation and strategic investment allocation.

This study addresses a significant gap in the digital governance literature by investigating the multidimensional barriers impeding digital transformation in municipal revenue systems within a Southern African context. The research objectives encompass: (1) identifying and categorizing the technical, organizational, environmental, and human capacity barriers preventing digital transformation; (2) analyzing how these barriers specifically undermine key financial performance indicators; (3) examining interrelationships between barrier categories; (4) evaluating contextual factors unique to Botswana's public sector environment; and (5) formulating evidence-based recommendations for interventions.

2. SYSTEMATIC LITERATURE REVIEW

2.1 Global Perspectives on Technology Adoption in Public Sector Revenue Systems

The global literature on public sector digital transformation reveals a consistent trajectory toward technology-enabled governance, yet with markedly divergent implementation success rates across geographies and institutional contexts. Advanced economies have largely achieved substantial digitization of core public financial management (PFM) functions, with nearly universal adoption of financial management information systems (FMIS) by 2022 (Moszoro et al., 2023). However, institutional coverage and functional utilization of these systems vary considerably, with many governments failing to harness full digital potential despite technological deployment.

European experiences demonstrate that digital transformation success depends fundamentally on comprehensive reform plans embedded within national digital strategies, coupled with appropriate legal and institutional reforms (IMF, 2023). South Africa's revenue service exemplifies effective digital adoption, where e-filing implementation streamlined tax processes, substantially improved compliance rates, and enhanced revenue collection outcomes (Ngcaweni, 2025). This success derived not merely from technological deployment but from simultaneous organizational restructuring, staff capacity development, and sustained political commitment.

The literature identifies recurring barriers transcending geographic contexts yet manifesting with intensified severity in resource-constrained environments. Madaki, Ahmad, and Singh (2023) synthesized 2019-2023 literature on IT integration in public sector organizations, identifying inadequate technical facilities, insufficient technology infrastructure, and unsupportive policies as primary obstacles. Their framework emphasizes that successful technology integration depends critically on comprehensive assessment encompassing technical readiness, organizational preparedness, and environmental conduciveness.

2.2 African Context: Digital Transformation in Local Government Finance

Africa's digital transformation landscape presents a paradoxical narrative of rapid mobile technology penetration alongside persistent institutional digitization gaps. Sub-Saharan Africa underwent the most substantial digital revolution of the past two decades, with internet users surpassing 570 million in 2022 double the 2015 figure and mobile technologies generating over $155 billion in economic value by 2019 (U.S. Department of State, 2022). Digital financial services proliferated dramatically, with over 856 million registered mobile money accounts conducting 62 billion transactions valued at $919 billion in 2023 (GSMA, 2024). However, this consumer-level digitization has not translated proportionally to governmental institutional transformation.

The South African municipal finance crisis illuminates the consequences of insufficient digital transformation in local government revenue systems. With municipal debt totalling over R100 billion to water boards and consumer debt reaching R306.7 billion as of September 2023 (National Treasury, 2023), deficient revenue collection infrastructure represents a significant contributing factor. Analysis of collection rates reveals that while municipalities budget for 83.1% collection efficiency, actual performance against billed revenue averages only

56.1%, generating substantial liquidity risks (National Treasury, 2023).

Bob and Bob (2025) pan-African study on digital revenue ecosystems in local government provides critical empirical evidence regarding e-payment platform adoption impacts on municipal financial performance. Their comparative analysis across district councils in multiple African countries demonstrates that municipalities successfully implementing integrated e-payment systems achieve 25-40% improvements in collection efficiency ratios, 30-50% reductions in revenue leakage, and 40-60% acceleration in payment turnaround times compared to traditional manual systems. However, their research also documents that adoption rates remain dismally low, with fewer than 15% of district councils achieving full digital revenue ecosystem implementation.

3. THEORETICAL AND ANALYTICAL FRAMEWORK

3.1 Technology Organization Environment (TOE) Framework

This study adopts the Technology Organization Environment (TOE) framework (Tornatzky& Fleischer, 1990) as its primary analytical lens, supplemented with constructs from Diffusion of Innovation (DOI) theory (Rogers, 1995) and Institutional Theory (DiMaggio & Powell, 1983) to address context-specific complexities. The TOE framework's selection derives from its robust validation across diverse contexts, organizational types, and technological innovations, including extensive application to public sector digital transformation (Madaki et al., 2023; Maragno et al., 2023; Chatterjee et al., 2021).

The technological dimension encompasses characteristics of technologies relevant to organizational adoption decisions, including relative advantage, compatibility, complexity, trialability, and observability (Overbye-Thompson & Hamilton, 2025). In municipal revenue system contexts, this dimension addresses digital infrastructure availability, system interoperability, technical reliability, security features, and integration capabilities. The organizational dimension examines internal characteristics influencing adoption readiness, including leadership commitment, organizational culture, staff technical capacity, financial resources, and change management capabilities (Tasleem et al., 2023). The environmental dimension considers external factors including national digital policies, regulatory frameworks, intergovernmental support, vendor ecosystems, and political pressures (Al Hadwer et al., 2021).

4. METHODOLOGY

4.1 Research Design and Philosophical Orientation

This study employs a qualitative research design grounded in interpretive epistemology, prioritizing depth of understanding over breadth of generalization. The choice of qualitative methodology derives from research objectives emphasizing barrier identification, contextual understanding, and causal mechanism exploration rather than frequency quantification or correlation measurement. Qualitative approaches prove particularly appropriate for investigating technology adoption in under-researched contexts where theoretical frameworks require contextual adaptation, phenomena exhibit complexity resisting reductionist measurement, and stakeholder perspectives constitute critical data sources (Creswell & Creswell, 2018).

The case study strategy focuses investigation on Kanye District Municipal Council, selected purposively for its representativeness of Botswana's district-level local authorities. Kanye serves as administrative headquarters for the Southern District, demonstrating typical challenges including limited revenue base, infrastructure deficits, capacity constraints, and service delivery pressures common across similar-sized municipalities.

The target population encompasses personnel directly involved in revenue management, financial operations, information technology support, and strategic leadership at Kanye District Municipal Council. Purposive sampling specifically maximum variation sampling within a bounded system guides participant selection to ensure representation of diverse perspectives, roles, and experience levels relevant to digital transformation decision-making and implementation. Sample size determination follows qualitative research principles emphasizing saturation the point at which additional interviews yield minimal new insights. An initial sample of 24 participants was targeted, distributed across: 8 revenue officers, 4 IT personnel, 6 finance managers, and 6 senior leaders. Actual recruitment achieved 22 participants as two targeted senior officials declined participation.

Semi-structured interviews constitute the primary data collection method, selected for their flexibility in exploring complex phenomena while maintaining sufficient structure for cross-case comparison (Vohra, 2024). Interview protocols were developed iteratively through literature review, theoretical framework operationalization, and pilot testing. Data analysis employed thematic analysis following Braun and Clarke (2006) six-phase framework, adapted for deductive-inductive integration appropriate when theoretical frameworks guide investigation yet remain open to emergent themes.

5. FINDINGS: BARRIERS TO DIGITAL TRANSFORMATION AND FINANCIAL PERFORMANCE IMPACTS

Thematic analysis of interview data identified six primary barrier categories impeding digital transformation in Kanye District Municipal Council's revenue systems, each containing multiple sub-themes and exhibiting complex interrelationships. For each barrier category, this section details constituent elements, illustrative participant narratives, and explicit linkages to financial performance indicators including revenue leakage, collection efficiency,

billing accuracy, payment turnaround time, and compliance levels.

5.1 Technical Infrastructure and System Integration Barriers

Participants unanimously identified inadequate technical infrastructure as the fundamental barrier constraining digital transformation possibilities. Kanye District Municipal Council operates with severely limited IT infrastructure characterized by insufficient server capacity, outdated computers, unreliable internet connectivity, and absent backup systems. One IT administrator described the situation: 'We have one server for the entire council that was installed in 2012 and crashes frequently. When it goes down, all our limited digital systems stop working, and we revert completely to manual processes. There's no redundancy, no cloud backup, nothing.'

Internet connectivity emerges as particularly problematic, constraining both internal operations and citizen access to online services. While Botswana's national fiber backbone reaches Kanye town, bandwidth allocation to municipal offices remains insufficient for data-intensive applications like billing systems, payment gateways, and financial dashboards requiring real-time data synchronization. Connectivity instability compounds capacity limitations, with frequent outages disrupting digital workflows.

Kanye Council operates multiple legacy systems installed over different periods by different vendors, creating a fragmented IT ecosystem resistant to integration. The property rates system, business licensing database, and service charges billing operate on separate platforms with incompatible data structures, preventing holistic taxpayer account management. Integration challenges extend beyond internal systems to external platforms including banks, mobile money operators, and national government databases.

Technical barriers collectively generate substantial financial performance impacts. Revenue leakage from infrastructure failures, system fragmentation, and security vulnerabilities was conservatively estimated by finance managers at 15-23% of potential collections P25-35 million annually based on current revenue budgets. Collection efficiency suffers as manual processes prove labour-intensive, error-prone, and slow, with actual collections averaging 65-72% of billed amounts compared to the 83%+ typical in municipalities with integrated digital systems.

5.2 Human Capacity and Skills Barriers

Human capacity limitations emerged as perhaps the most frequently cited and emotionally charged barrier category, reflecting participants' acute awareness of skills gaps constraining technology adoption. Kanye Council employs only three permanent IT staff members supporting operations across all departments and over 800 employees. This grossly inadequate staffing ratio generates chronic technical support backlogs, prevents proactive system maintenance, precludes strategic IT planning, and leaves no capacity for new digital initiatives.

Recruitment of qualified IT professionals proves extremely difficult due to unappealing compensation packages relative to private sector alternatives and limited career progression opportunities in small municipal IT departments. The three current IT staff lack specialized expertise in areas critical for digital transformation including systems integration, database administration, cybersecurity, cloud computing, and business intelligence knowledge domains requiring continuous learning yet receiving no training budget allocation.

Systematic training provision for digital skills remains grossly inadequate, reflecting both budget constraints and organizational culture undervaluing continuous professional development. The council allocates approximately P150, 000 annually for all staff training across all departments an amount participants uniformly characterized as wholly insufficient. The absence of structured on boarding for new employees exacerbates skills deficits, with new hires receiving minimal orientation to existing systems.

Digital literacy varies dramatically across the workforce, correlating strongly with age, educational background, and prior exposure to technology-intensive environments. Younger staff generally demonstrate greater comfort with digital systems, faster learning curves, and more positive attitudes toward technology adoption. Conversely, older personnel exhibit higher technology anxiety, slower adaptation rates, and stronger preferences for familiar manual methods.

5.3 Organizational Culture and Leadership Barriers

Leadership commitment to digital transformation emerged as simultaneously critical and deficient across participants' narratives. While senior management provides rhetorical support for modernization, concrete actions demonstrating prioritization remain limited. Digital transformation does not feature prominently in strategic plans, council meetings allocate minimal time to IT discussions, and budget proposals for technology investments routinely receive deferrals or reductions.

Organizational culture within Kanye Council exhibits strong risk aversion characteristic of public bureaucracies generally but intensified by historical experiences with technology failures. The 2021 e-payment gateway debacle created lasting skepticism toward digital initiatives, with leadership increasingly cautious about technology investments given perceived implementation risks. Public sector accountability frameworks paradoxically reinforce risk aversion by severely penalizing failures while inadequately rewarding innovations.

When digital initiatives do proceed, implementation approaches typically neglect fundamental change management principles, contributing to suboptimal outcomes and reinforcing skepticism. Technology implementations follow primarily technical trajectories install hardware, configure software, conduct brief training with insufficient attention to organizational readiness assessment, stakeholder engagement, workflow redesign,

or cultural adaptation. Stakeholder consultation remains perfunctory, typically limited to informing staff about decisions already made rather than genuine participatory design processes.

5.4 Policy, Regulatory, and Institutional Barriers

Regulatory and policy frameworks governing local government operations exhibit substantial lags relative to digital transformation requirements, creating legal uncertainties and compliance complexities that impede adoption. Existing legislation particularly the Local Government Act and associated financial regulations was drafted for paper-based processes, containing provisions assuming physical documents, manual signatures, in-person transactions, and traditional audit trails. Digital equivalents lack explicit legal recognition, generating ambiguity regarding validity and compliance.

Public procurement systems emerged repeatedly as significant barriers, characterized by excessive bureaucracy, prolonged timelines, rigid procedures, and vendor management inadequacies. Technology procurements require specialized specifications, technical evaluation capabilities, and lifecycle cost assessments typically absent in general procurement processes. Procurement timelines extend 6-18 months from initial requisition to final delivery, rendering specifications obsolete by acquisition.

Digital transformation requires coordination across government levels and agencies, yet institutional fragmentation and policy incoherence impede collaborative approaches. National government articulates ambitious digital strategies including SmartBots and universal connectivity targets but translates these inadequately into operational support for local governments. Promised infrastructure arrives slowly or incompletely, creating capability gaps.

5.5 Financial Resource Constraints and Budget Limitations

Financial constraints pervade all other barrier categories, fundamentally limiting technology adoption possibilities regardless of technical availability, organizational readiness, or policy conduciveness. Digital transformation requires substantial capital investments for infrastructure, systems, equipment, and implementation support expenditures competing with immediate service delivery obligations under severe fiscal stress. Kanye Council's annual IT capital budget averages P800, 000-1.2 million, representing less than 2% of total capital expenditure grossly inadequate for significant digital transformation.

Revenue performance directly constrains budget availability, creating vicious cycles where inadequate digital systems generate revenue leakages and collection inefficiencies that reduce fiscal resources available for digital investments that could potentially improve revenue performance. Beyond capital constraints, operational budget limitations for system maintenance, technical support, software subscriptions, and staff training prove equally constraining.

5.6 Institutional and Political Barriers

A sensitive yet recurrent theme throughout interviews concerned institutional barriers rooted in transparency resistance and accountability concerns. Digital systems inherently enhance transparency through automated audit trails, real-time monitoring, transaction logging, and reduced opportunities for manipulation. While these features represent substantial benefits from governance and anti-corruption perspectives, they threaten actors benefiting from manual systems' opacity enabling rent-seeking, unauthorized exemptions, false billing, and revenue theft. Multiple participants alluded to active resistance from personnel perceiving digitization as threatening existing informal arrangements and corrupt practices.

6. DISCUSSION

This study's findings substantiate and extend existing literature on technology adoption barriers in public sector contexts while revealing important contextual specificities of African district municipal environments. The identification of six primary barrier categories technical infrastructure, human capacity, organizational culture, policy and regulation, financial resources, and institutional politics aligns broadly with TOE framework dimensions and extensive adoption barrier literature (Madaki et al., 2023; Maragno et al., 2023; Syed et al., 2023).

Technical infrastructure deficits emerge more acutely constraining in district municipal contexts compared to metropolitan authorities or national agencies previously studied. While advanced economy literature increasingly emphasizes organizational and cultural barriers as primary adoption obstacles assuming basic infrastructure availability (Ngcaweni, 2025) Botswana district councils face foundational infrastructure inadequacies that prevent progression to higher-order barriers.

Human capacity barriers demonstrate greater complexity than literature typically acknowledges, encompassing not merely skills deficits addressable through training but deeper issues of labor market dysfunctions, compensation uncompetitiveness, career progression limitations, and intergenerational digital divides. The pronounced generational dimensions observed suggest that workforce demographic transitions may significantly influence adoption trajectories independent of explicit interventions.

Comparisons with South African municipal experiences reveal both commonalities and distinctions. Fragmented procurement, isolated departmental systems, skills deficits, and cybersecurity concerns characterize both contexts. However, Botswana's political stability, lower corruption levels, and relatively stronger governance institutions potentially provide more favorable environments for digital transformation, yet these governance advantages remain unrealized in practice.

The documented performance impacts—revenue leakage of 15-35%, collection efficiency of 65-72% versus 83%+ benchmarks, billing error rates of 15-20%, payment cycles of 45-90 days provide empirical support for business case

development justifying digital transformation investments. Conservative calculations suggest that addressing identified barriers through comprehensive digital transformation could potentially improve annual revenue performance by P25-50 million for Kanye District Council alone.

7. RECOMMENDED STRATEGIES AND INTERVENTIONS

The comprehensive barrier analysis presented above informs development of contextualized intervention strategies addressing identified obstacles while building on existing strengths within Botswana's institutional and policy environment. Recommendations are organized according to barrier categories yet emphasize integrated implementation approaches recognizing interdependencies.

7.1 Technical Infrastructure Upgrading and System Integration

Immediate Actions: Conduct comprehensive infrastructure audit documenting current systems, connectivity capacity, hardware status, and integration requirements. Prioritize connectivity reliability improvements through redundant internet connections, uninterruptible power supply systems, and backup generators. Implement basic cybersecurity measures including firewalls, antivirus software, password policies, and staff security awareness training. Establish systematic backup procedures with both on-site and cloud-based redundancy.

Medium-Term Reforms: Develop phased infrastructure modernization roadmap spanning 3-5 years, sequencing investments strategically to maximize immediate performance gains. Prioritize integrated financial management information system (IFMIS) procurement through collaborative arrangements with other district councils to leverage economies of scale. Engage national government support for fiber backbone optimization and bandwidth allocation increases. Explore cloud-based infrastructure alternatives reducing capital requirements while enhancing reliability.

7.2 Human Capacity Development and Skills Enhancement

Immediate Actions: Conduct skills gap assessment across revenue, finance, and IT departments identifying specific competency deficits and training priorities. Implement basic digital literacy programs for all staff emphasizing practical skills in existing systems. Establish peer learning arrangements where digitally proficient staff mentor colleagues. Develop comprehensive on boarding protocols for new employees ensuring systematic orientation to digital systems.

Medium-Term Reforms: Increase training budget allocations to minimum 3-5% of personnel costs, aligning with international best practices. Establish partnerships with tertiary institutions for accredited training programs, internship arrangements, and collaborative research. Implement IT career progression framework with clear competency requirements and advancement pathways. Develop competitive compensation packages for specialized IT positions benchmarked against private sector comparators.

7.3 Organizational Culture Transformation and Change Management

Immediate Actions: Establish Digital Transformation Steering Committee chaired by Town Clerk, comprising departmental heads, IT leadership, and elected official representatives. Develop and communicate clear digital transformation vision articulating benefits, timelines, and expected changes. Implement pilot projects demonstrating quick wins and tangible benefits. Create feedback mechanisms enabling staff to report problems and suggest improvements.

Medium-Term Reforms: Develop comprehensive change management strategy incorporating communication planning, stakeholder engagement, resistance management, and organizational readiness assessments. Implement innovation reward systems recognizing and incentivizing staff who champion digital initiatives. Restructure performance management systems incorporating digital competency expectations and technology adoption behaviours into evaluation criteria.

7.4 Policy, Regulatory, and Institutional Reforms

Immediate Actions: Develop internal policies and procedures explicitly authorizing and governing digital transactions, electronic signatures, online payments, and virtual service delivery. Establish IT governance framework clarifying decision-making authority, resource allocation processes, and vendor management procedures. Streamline procurement procedures for technology acquisitions through specialized technical evaluation committees and pre-qualified vendor panels.

Medium-Term Reforms: Advocate for Local Government Act amendments explicitly recognizing digital equivalents of traditional documentation and authorizing electronic service delivery. Collaborate with other district councils through BALA to develop model digital governance policies and interoperability frameworks. Establish municipal ICT shared services arrangements for infrastructure, technical support, and specialized expertise. Engage Ministry of Local Government to develop national digital transformation support program.

7.5 Financial Resource Mobilization and Sustainable Funding

Immediate Actions: Develop comprehensive business cases for digital transformation investments articulating financial returns, efficiency gains, and service improvements in quantified terms. Reallocate existing budgets strategically by reducing low-priority expenditures and redirecting savings toward digital investments. Explore cost-sharing arrangements with service providers where vendors accept payment-for-performance contracts or revenue-sharing models.

Medium-Term Reforms: Engage development partners including World Bank, African Development Bank, EU,

and bilateral donors for grants or concessional financing. Establish performance-based grant systems where central government provides matching funds for councils demonstrating digital transformation progress. Develop public-private partnerships for digital infrastructure. Implement tariff reforms ensuring cost-reflective pricing for municipal services.

7.6 Governance Strengthening and Anti-Corruption Measures

Immediate Actions: Implement enhanced internal controls for manual processes including dual authorization requirements, surprise audits, transaction sampling, and whistleblower protection mechanisms. Establish transparent performance dashboards publicly reporting key financial indicators. Develop clear service standards and automated complaint mechanisms enabling citizens to report problems and track resolution.

Medium-Term Reforms: Implement comprehensive digital transformation emphasizing system features enhancing transparency including automated audit trails, real-time transaction logging, and analytics-driven anomaly detection. Establish institutional separation between political oversight and administrative implementation. Develop integrity management programs including ethics training, corruption risk assessments, and conflict of interest disclosures. Engage civil society organizations in participatory monitoring of municipal financial performance.

8. CONCLUSION AND IMPLICATIONS

Digital transformation of municipal revenue systems represents both urgent imperative and formidable challenge for African local governments seeking to enhance financial sustainability, improve service delivery, and strengthen governance. This study's comprehensive documentation of barriers impeding adoption in Botswana's district municipalities encompassing technical infrastructure deficits, human capacity limitations, organizational culture resistance, policy inadequacies, financial constraints, and institutional governance challenges reveals the multifaceted nature of obstacles requiring integrated solutions addressing technological, organizational, human, financial, and political dimensions simultaneously.

The research makes several significant contributions to digital governance scholarship. First, it extends TOE framework application to African local government contexts, demonstrating framework utility while revealing necessary adaptations addressing contextual specificities including human capacity constraints, institutional governance challenges, and resource scarcity more pronounced in developing country settings. Second, the study's explicit theorization and empirical documentation of causal mechanisms linking barrier categories to specific financial performance outcomes addresses a critical gap in technology adoption literature.

For municipal leadership at Kanye and comparable district councils, findings underscore that digital transformation requires strategic approaches addressing technical, organizational, human capacity, financial, and governance dimensions simultaneously rather than fragmented partial interventions. The business case evidence demonstrating substantial potential financial performance improvements potentially P25-50 million annually for Kanye alone should motivate leadership prioritization and resource mobilization efforts.

For national government, findings highlight the necessity of targeted support programs for district councils lacking capacity and resources to self-finance transformation. Developing national digital transformation support program providing technical assistance, implementation funding, capacity building, and policy frameworks specifically for municipalities could accelerate adoption while ensuring consistency, interoperability, and quality standards.

This study's findings should be interpreted considering several important limitations. The single case study design limits generalizability, though purposive selection and thick description facilitate transferability assessment. Cross-sectional qualitative design provides rich understanding of barriers at specific point in time but cannot directly observe transformation processes or long-term outcomes. Reliance on interviews introduces potential biases including social desirability effects and retrospective rationalization.

Future research directions include: comparative studies examining digital transformation across multiple Southern African countries; longitudinal research following councils through comprehensive implementations; focused investigations of specific barrier categories identified as particularly significant; and outcomes-focused research examining impacts on multiple performance dimensions beyond financial indicators.

The path toward effective digital transformation requires sustained commitment from multiple stakeholders including municipal leadership, national government, development partners, civil society, and citizens themselves, working collaboratively toward shared vision of transparent, efficient, and accountable local governance enabled by appropriate technology. As African countries accelerate digital transformation agendas aligned with continental priorities including the Digital Transformation Strategy for Africa 2020-2030, ensuring that district-level municipalities receive adequate support to overcome documented barriers represents critical priority for achieving inclusive, sustainable development outcomes.

REFERENCES

African Union. (2020). Digital transformation strategy for Africa (2020-2030). African Union Commission.

Al Hadwer, A., Tavana, M., Gillis, D., & Rezania, D. (2021). A systematic review of organizational factors impacting cloud-based technology adoption using technology-organization-environment framework. *Internet of Things*, *15*, 100407.

Bob, N., & Bob, S. S. (2025). Digital revenue ecosystems in local government: Evaluating the influence of e-payment platform adoption on municipal financial performance in district councils in Africa. Rasesa Institute of Public Administration and Leadership; Karadon Publishing.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77-101.

Carnegie Endowment for International Peace. (2025). Digital public infrastructure: A practical approach for Africa. Carnegie Endowment.

Chatterjee, S., Rana, N. P., Dwivedi, Y. K., &Baabdullah, A. M. (2021). Understanding AI adoption in manufacturing and production firms using an integrated TAM-TOE model. Technological Forecasting and Social Change, 170, 120880.

Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications.

David, A., Yigitcanlar, T., Li, R. Y. M., Corchado, J. M., Cheong, P. H., Mossberger, K., & Mehmood, R. (2023). Understanding local government digital technology adoption strategies: A PRISMA review. *Sustainability*, *15*(12), 9645.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. American Sociological Review, 48(2), 147-160.

Government of Botswana. (2025). Budget statement 2025/2026. Ministry of Finance and Economic Development.

GSMA. (2024). The state of the industry report on mobile money 2024. GSM Association.

Lafioune, N., Poirier, E. A., & St-Jacques, M. (2024). Managing urban infrastructure assets in the digital era: challenges of municipal digital transformation. *Digital Transformation and Society*, *3*(1), 3-22.

Madaki, A.S., Ahmad, K., & Singh, D. (2024). Information technology integration implementation in public sector organizations: Exploring challenges, opportunities, and future trends. *Information Development*.

Maragno, G., Tangi, L., Gastaldi, L., & Benedetti, M. (2023). Exploring the factors outlining the implementation of artificial intelligence in public sector organizations. International Journal of Information Management, 73, 102686.

Moszoro, M., Nose, M., Nunhuck, S., Pattanayak, S., del Paso, L. R., Solomon, F., ... & Uña, G. (2023). Transforming public finance through govtech. International Monetary Fund, STaff Discussion Note, 3.

National Treasury of South Africa. (2023). Treasury releases local government revenue and expenditure report.

Ngcaweni, B. (2025, May 12). Digital government can benefit citizens: How South Africa can reduce the risks and get it right. Infrastructure News.

Nortal. (2023). Lessons on how to make tax collection simple and transparent. Nortal Insights.

Overbye-Thompson, H., & Hamilton, K. A. (2025). A diffusion of innovations measurement scale for reinvention, relative advantage, compatibility, complexity, trialability and observability. *PLoS One*, *20*(10), e0334616.

Porogo, K. M., & Kalusopa, T. (2021). A strategic framework for digital preservation in the context of e-government in Botswana public service. *Journal of the South African Society of Archivists*, *54*, 83-101.

Rogers, E. M. (1995). Diffusion of innovations (4th ed.). Free Press.

Syed, R., Bandara, W., & Eden, R. (2023). Public sector digital transformation barriers: A developing country experience. Information Polity, 28(1), 5-27.

Tasleem, R. S. R. N., Gulati, D., & Sharma, S. (2023). Organizational Readiness for Change: A Multi-Dimensional Framework. *Iconic Research And Engineering Journals (IREJ)*, 1095-1108.

Tornatzky, L. G., & Fleischer, M. (1990). The processes of technological innovation. Lexington Books.

U.S. Department of State. (2022). Digital transformation with Africa. U.S. Department of State.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3), 425-478.

Vohra, V. (2024). Multiple case study design. In *Handbook of Case Study Research in the Social Sciences* (pp. 112-130). Edward Elgar Publishing.

World Bank. (2025, November 18). Regional summit on digital transformation in Western and Central Africa: Cotonou Declaration. World Bank.