

An Assessment of The Effect of Electronic Tax Management Systems on Tax Collection in Zambia: The Case of The Zambia Revenue Authority (ZRA)

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ABSTRACT

The policy discourse on electronic tax collection in developing countries has gained momentum as governments seek efficient systems for assessment and collection through internet-based solutions. In Zambia, the Zambia Revenue Authority (ZRA) introduced the Electronic Tax Management System (ETMS), rooted in reforms dating back to 1994, which has since evolved into a widely utilized platform with high taxpayer engagement. This study focused on evaluating the relationship between ETMS and tax collection efficiency, particularly in Lusaka, using a quantitative descriptive design and analyzing data from 100 randomly selected ZRA employees. Findings revealed that ETMS positively impacts compliance, transparency, and efficiency, leading to increased tax revenue. Integration of ETMS into ZRA processes provided benefits such as risk assessment, real-time monitoring, and improved data accuracy. However, challenges remain, including informal sector dominance, a narrow tax base, complex policies, outdated technology, and enforcement difficulties. The study concluded that addressing these issues is essential for sustainable revenue collection and recommended continuous staff training, interdepartmental collaboration, and comprehensive tax reform strategies.

Keywords: Electronic Tax Management Systems (ETMS), Tax Efficiency, Compliance, Zambia.

INTRODUCTION

The efficient collection of taxes plays a central role in ensuring a nation's economic stability and growth. In recent years, revenue authorities worldwide have increasingly turned to Electronic Tax Management Systems (ETMS) as a transformative tool to enhance compliance, improve revenue generation, and streamline tax collection processes. In Zambia, the Zambia Revenue Authority (ZRA) has embraced ETMS as part of broader fiscal reforms, recognizing its potential to strengthen economic capacity and reduce dependency on foreign aid. This study examined the implementation of ETMS within ZRA to assess its impact on revenue collection, taxpayer compliance, and overall efficiency, highlighting the importance of adopting technology in tax administration within developing economies.

The adoption of ETMS in Zambia can be traced back to pilot initiatives introduced in 1994, which gradually expanded into a comprehensive system. Governments in developing countries, including Zambia, face persistent challenges in mobilizing sufficient domestic resources due to inefficiencies in tax collection, enforcement difficulties, and the dominance of the informal sector. As noted by scholars such as Nisar (2013) and Chirwa (2021), electronic systems offer innovative approaches to minimize wastage, improve compliance, and bridge the gap between potential and actual tax revenues. The ZRA introduced a formal ETMS in 2012 as part of its Business Process Improvement (BPI) strategy, expanding the scope of taxpayer services such as online registration, filing, and compliance certification. Since then, the system has been progressively integrated into ZRA's operations, enabling real-time monitoring, improved accuracy, and better interaction with taxpayers.

The introduction of ETMS has significantly improved Zambia’s revenue collection performance. Before ICT-driven systems, ZRA collected around ZMW 20 billion annually but often fell short of national budget targets by 10–15%. With the full rollout of ETMS in 2017, annual collections steadily increased, reaching ZMW 57.1 billion in 2022, representing 19.1% of GDP and exceeding government revenue targets by 5% (ZRA, 2022; World Bank, 2022). While these outcomes reflect substantial progress, experts caution that technology alone does not account for revenue growth, as external economic factors also play a role. Moreover, the effectiveness of ETMS depends on proper staff training, integration within organizational processes, and addressing challenges such as corruption, outdated infrastructure, and limited coverage of the informal sector.

LITERATURE REVIEW

The Electronic Tax Management System (ETMS) is a secure, web-enabled platform designed to modernize domestic tax administration by replacing traditional manual systems. It provides an integrated solution that allows taxpayers to register for Personal Identification Numbers (PINs), file returns, make payments, and monitor accounts online in real time (Waweru, 2018). Traditionally, government services were linked to bureaucracy as described by Weberian principles of hierarchy and standardized procedures. However, the rise of ICT has enabled governments to offer services that are more efficient, accessible, and cost-effective, reducing transaction costs and improving accountability (Kun et al., 2018).

Globally, the adoption of e-government systems such as e-filing has shown the potential of technology to transform public service delivery. For instance, in the United States, e-filing reduced refund processing time from 12 weeks to just 3 weeks and allowed direct bank deposits, improving both efficiency and taxpayer satisfaction (Harold, 2019, 2021). Beyond efficiency, ICT supports innovation and economic growth by creating new organizational structures, markets, products, and services, ultimately boosting productivity and revenue generation (Mugisha, 2021; Crede, 2018; Suluo, 2022). These benefits highlight the role of ICT as both a service enhancer and a driver of compliance.

In Zambia, however, challenges such as incomplete computerization, outdated systems, and lack of access to third-party financial data continue to affect tax collection. To address this, reforms have been recommended, including the use of a uniform Taxpayer Identification Number (TPIN), simplification of tax codes, and stronger enforcement mechanisms (Moyi, 2006). The Zambia Revenue Authority (ZRA) has also introduced digital controls such as internal audits, segregation of duties, and strict authorization processes to reduce fraud and revenue leakages (Obat, 2018). Through ETMS, ZRA seeks to balance effective enforcement with quality service delivery, thereby enhancing voluntary compliance, strengthening trust with taxpayers, and positioning itself to meet and surpass revenue targets.

Summary of Literature Review.

This table synthesizes eight empirical and review studies relevant to the effect of Electronic Tax Management Systems (ETMS) and broader e-government integration on tax revenue collection, compliance, and governance. It highlights each study’s focus, key findings, and direct relevance to the current study on ZRA’s ETMS.

Author / Year	Focus / Topic	Key Findings	Relevance to Current Study
Chibanda & Hussein (2019)	Implementation and effectiveness of ETMS in Zambia	ETMS enhances transparency, accountability, and efficiency; combats fraud and evasion; limited analysis of staff capacity and digital literacy.	Supports examining ETMS’s role in revenue gains while highlighting the need to measure ZRA staff competence.
Mwansa & Bwalya (2017)	Use of Electronic Tax Registers (ETRs) among	ETR adoption reduces underreporting; sector-specific insights; limited	Informs SME-focused compliance strategies within ETMS;

	SMEs in Zambia	consideration of SMEs' technical/financial adoption challenges.	underscores support needs for smaller taxpayers.
Chileshe & Munsaka (2018)	Impact of Electronic Fiscal Devices (EFDs) on compliance and revenue	Real-time invoicing improves compliance and curbs evasion; generalizes results without considering taxpayer profiles or regions.	Evidence for digitized invoicing inside ETMS; signals need for differentiated enforcement and support.
Sichone & Mwale (2020)	Electronic payments (e-wallets) and tax modernization	Digital payments increase convenience and compliance; taxpayer-centric view with limited analysis of ZRA's internal capacity.	Validates payment-side integration with ETMS; highlights importance of back-office capability and monitoring.
Abeyratne (2015)	E-government systems and governance in Sri Lanka	Empirical support that e-government improves transparency and reduces corruption; lacks detail on causal mechanisms.	Justifies ETMS as a governance tool; encourages mechanism-focused evaluation (e.g., audit trails, role-based access).
Al-Marashdeh et al. (2018)	E-government effectiveness in Jordan	Effective systems reduce corruption and improve transparency with strategic, user-friendly design; limited attention to usage rates and digital literacy.	Reinforces UX and adoption metrics for ETMS; suggests measuring taxpayer/staff digital readiness.
Emerald Park & Kim (2020)	Global panel (214 countries) on e-government and corruption	E-government significantly reduces corruption, especially with strong legal systems; may overlook qualitative/context factors.	Positions ETMS benefits as conditional on legal/institutional strength; motivates complementary legal reforms.
Ibrahimy, Virkus & Norta (2023)	E-government and corruption reduction in Afghanistan	Mixed-method evidence that decentralization via e-government enhances transparency and accountability; context-specific limits.	Encourages ETMS designs that decentralize controls and improve auditability; cautions on context transferability.

Research Theories

The Technology Acceptance Model (TAM) provides a structured framework for analyzing the adoption of the Electronic Tax Management System (ETMS) within the Zambia Revenue Authority (ZRA) and its impact on tax compliance.

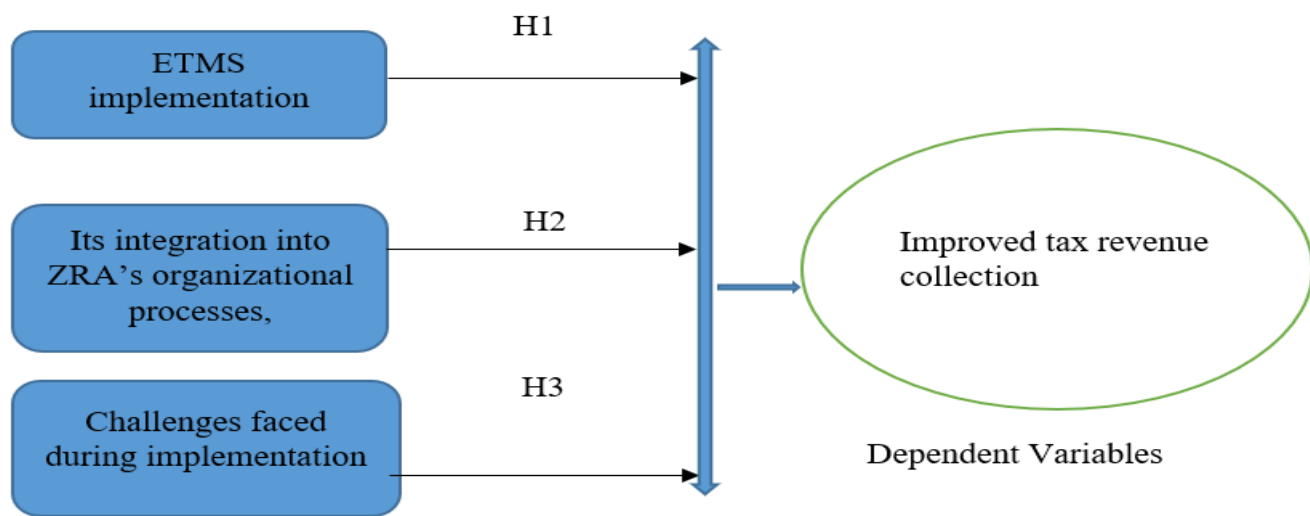
The Innovation Diffusion Theory, developed by Everett Rogers in 1972, is a valuable theoretical framework for understanding how innovations, such as the Electronic Tax Management System, are adopted and spread within a social system. The theory categorizes individuals into adopter categories, including innovators, early

adopters, early majority, late majority, and laggards, based on their willingness and readiness to adopt innovations.

Institutional Theory is a prominent theoretical framework that delves into how organizations and individuals conform to established norms, rules, and practices within a given institutional environment. This theory provides a lens through which we can examine how the adoption of the Electronic Tax Management System aligns with or challenges the existing institutional practices and norms within the Zambia Revenue Authority (ZRA). Institutional Theory focuses on three key pressures organizations face: coercive, normative, and mimetic.

CONCEPTUAL FRAMEWORK

Figure 3.1: This conceptual framework is diagrammatically represented as follows:



Independent Variables

The framework was adapted to assess how the Electronic Tax Management System (ETMS) affects tax revenue collection by the Zambia Revenue Authority (ZRA). The independent variables ETMS implementation, its integration into ZRA's organizational processes, and challenges faced during implementation were examined in relation to their impact on the dependent variable: improved tax revenue collection. This framework illustrates how these variables interact to enhance or hinder ZRA's performance in revenue mobilization (Chikalipah, 2017; Mwenda & Muuka, 2020).

RESEARCH METHODOLOGY

Research Design

The study used a quantitative approach to evaluate the relationship between the Electronic Tax Management System (ETMS) and tax collection efficiency within the Zambia Revenue Authority (ZRA). Both qualitative and quantitative designs were applied to provide a broader understanding, aiming to capture measurable outcomes and depict features of individuals, groups, and occurrences in the tax system.

Study Area or Site

The research was conducted in Lusaka, Zambia's capital and economic hub, where most formal and informal economic activities take place. Lusaka was chosen due to its concentration of taxpayers, diverse economic sectors, and proximity to ZRA headquarters, which facilitated data access. Its relatively better infrastructure also supports effective implementation of electronic systems, making it an ideal site for assessing ETMS impact.

Study Population

The study population consisted of ZRA employees directly involved in ETMS implementation and operations. This included tax collectors, IT specialists, administrators, and other staff supporting revenue collection processes. These participants were considered appropriate since they hold practical knowledge and direct experience with ETMS functions.

Study Sample

ZRA Lusaka offices have about 1,250 employees. Using Yamane's formula, a sample size of 100 employees was selected. The sample was drawn randomly to ensure representativeness and reduce bias, with questionnaires used as the main instrument for data collection.

size was determined as follows.

Where $n = ?$

$N = 1250$, $e = 1.52\%$

$$n = \frac{1250}{1 + 1250(0.052)^2}, \quad n = \frac{1250}{1 + 11.5}, \quad n = \frac{1250}{12.5}, \quad n = 100$$

$n = 100$ ZRA employees

Sampling Techniques

Simple random sampling, specifically the rotary method, was used to select 100 respondents. This method ensured each employee had an equal chance of being chosen. The sample size was statistically justified based on Yamane's formula, providing accuracy while balancing resource constraints.

Instruments for Data Collection

A structured interview schedule was used, requesting demographic information and perceptions on ETMS. Questions focused on ETMS's role in increasing revenue, integration into ZRA processes, and challenges faced in achieving potential revenue targets.

Procedure for Data Collection

Face-to-face interviews were conducted at ZRA offices, each lasting 10–15 minutes. Between 10–15 interviews were done daily, with interpreters assisting respondents who faced language barriers. Respondents were thanked after participation to maintain rapport and encourage future cooperation.

Data Analysis

Data was analyzed using both quantitative and qualitative methods. Tools such as frequency tables, charts, and regression analysis were applied. SPSS version 20.0 and Excel were used for processing, while questionnaires were carefully edited to identify missing responses.

Reliability and Validity

Reliability was ensured through pre-testing of questionnaires and use of Cronbach's alpha, with values above 0.7 accepted. Validity was achieved by aligning questions with objectives, expert reviews, and triangulating primary and secondary data. These measures enhanced accuracy and credibility of findings.

Ethical Considerations

Ethical practices included obtaining informed consent, assuring participants of voluntary involvement, and protecting confidentiality by anonymizing responses. A letter from the University of Zambia confirmed the academic purpose. Oversight from the University and ZRA ensured compliance with ethical standards, while proper citation safeguarded academic integrity.

Findings

The effect of the ETMS in increasing tax revenue collection in Zambia.

The study revealed that 87 percent of respondents agreed that the Electronic Tax Management System (ETMS) has significantly increased tax revenue collection in Zambia by enhancing compliance, transparency, and efficiency in tax administration. Respondents highlighted that ETMS promotes real-time monitoring of financial transactions, reduces opportunities for tax evasion, and strengthens ZRA's enforcement and audit capabilities through accurate and timely taxpayer data. Its advanced data management and analytics enable the identification of non-compliance patterns, targeted enforcement, and improved forecasting of tax trends, leading to more predictable revenue streams. Additionally, automation of processes such as registration and filing has reduced errors and delays, while the system's user-friendly interface has improved communication between taxpayers and ZRA, encouraging voluntary compliance. Overall, the findings underscore that ETMS has streamlined tax processes, curbed revenue leakages, and fostered a positive taxpayer–authority relationship, thereby contributing to Zambia's enhanced fiscal performance.

The integration of the ETMS into ZRA's organizational processes in improving revenue collection in Zambia.

The study found that the integration of the Electronic Tax Management System (ETMS) into the Zambia Revenue Authority's (ZRA) processes has significantly improved efficiency by reducing turnaround times for tax activities, enhancing taxpayer satisfaction, and ensuring timely and complete revenue collection. Respondents highlighted that ETMS strengthens risk assessment and non-compliance detection, allowing ZRA to allocate resources more effectively and curb tax evasion. Its real-time monitoring features enable rapid responses to taxpayer behavior and economic changes, ensuring adaptability in revenue strategies. The system has also enhanced data accuracy and reliability, reducing errors, disputes, and discrepancies in tax assessments, while automation has streamlined operations and freed tax officers to focus on strategic tasks. Additionally, ETMS has improved internal communication and collaboration across ZRA departments, fostering greater coordination toward revenue targets. High mean scores (4.98, 4.92, 4.87, 4.86, and 4.67) reflect strong agreement on its positive impact on efficiency, accuracy, and collaboration.

The challenges faced by ZRA in achieving potential tax revenue collection in Zambia.

The study revealed that 90 percent of respondents agreed the Zambia Revenue Authority (ZRA) faces significant challenges in maximizing tax revenue collection, primarily due to the dominance of the informal economy, which operates largely outside regulation and contributes to substantial revenue leakage. A narrow tax base reliant on a few sectors further undermines stability, while weak enforcement of tax laws and widespread non-compliance exacerbate the problem. Corruption within ZRA, including bribery and collusion, was also identified as a major obstacle, alongside taxpayer practices such as underreporting income and fraud. Additional challenges include the complexity and frequent changes in tax policies, which create confusion and unintentional non-compliance, and outdated technology and infrastructure that limit ZRA's capacity for efficient data management and monitoring. Respondents emphasized that expanding the tax base, simplifying regulations, strengthening enforcement, combating corruption, and investing in modern technology are essential to improving ZRA's performance and ensuring sustainable revenue collection.

CONCLUSION AND IMPLICATIONS

The study concludes that the Electronic Tax Management System (ETMS) has played a transformative role in enhancing tax revenue collection in Zambia. Findings show that the system has improved transparency, compliance, and efficiency in tax administration through real-time monitoring, automation, and data analytics. These features have reduced opportunities for tax evasion, strengthened enforcement and audit capacity, and streamlined processes such as registration and filing. The strong agreement among respondents demonstrates that ETMS has not only boosted revenue collection but also fostered a more positive relationship between taxpayers and the Zambia Revenue Authority (ZRA), encouraging voluntary compliance and supporting fiscal stability.

The integration of ETMS into ZRA's operations has further optimized revenue collection by reducing turnaround times for tax-related activities, enhancing risk assessment, and enabling timely responses to changes in taxpayer behavior and economic conditions. Automation has minimized errors, improved accuracy in tax assessments, and allowed tax officers to focus on higher-level tasks, while the system's data integrity has reduced disputes and discrepancies. Additionally, ETMS has strengthened internal communication and collaboration within ZRA, ensuring cohesive efforts toward revenue targets. These improvements highlight the system's broader institutional benefits in modernizing tax administration and improving taxpayer satisfaction, ultimately contributing to more predictable and sustainable revenue flows.

Despite these achievements, the study reveals that ZRA still faces substantial challenges in realizing its full tax revenue potential. The dominance of the informal economy, a narrow tax base, weak enforcement mechanisms, corruption, complex tax policies, and outdated infrastructure continue to undermine efficiency and compliance. These findings imply that while ETMS has significantly strengthened ZRA's operational capacity, broader reforms are required to address systemic challenges. Expanding the tax base, simplifying tax policies, investing in modern infrastructure, and promoting transparency and accountability within ZRA are critical steps needed to fully optimize revenue collection. Thus, the combined use of ETMS and comprehensive policy reforms can position Zambia toward achieving a more robust, fair, and sustainable tax system.

RECOMMENDATION

The Effect of ETMS in Increasing Tax Revenue Collection

To maximize the benefits of the Electronic Tax Management System (ETMS), the Zambia Revenue Authority (ZRA) should strengthen support systems by regularly reviewing and enhancing training programs. These should include hands-on training both locally and internationally, with staff exchange programs or benchmarking visits to countries such as South Africa, Botswana, and Namibia where ETMS is already operational. Such initiatives would expose ZRA personnel to best practices, promote knowledge transfer, and strengthen institutional capacity, thereby ensuring that ETMS achieves its intended outcomes in boosting tax revenue collection.

Integration of ETMS into ZRA's Organizational Processes

For effective ETMS integration and improved interdepartmental collaboration, ZRA should regularly refine its training programs to align with evolving ETMS functionalities. Feedback mechanisms and performance metrics should be used to improve workshops and training sessions. Practical learning through regional exchange programs and study visits to neighbouring countries where ETMS is effectively applied would enable ZRA to adopt proven strategies and best practices. This approach will enhance collaboration, streamline internal processes, and ensure the system's full potential is realized within Zambia's operational environment.

Challenges Faced by ZRA in Achieving Potential Tax Revenue Collection

To overcome persistent challenges, ZRA should implement a comprehensive tax reform strategy. This should focus on formalizing the informal sector through incentives and simplified registration, broadening the tax

base, and simplifying complex tax policies. Investments in modern technologies such as advanced data analytics and automated enforcement systems are necessary to strengthen compliance monitoring and enforcement. Anti-corruption measures, including regular audits and transparent reporting, should be prioritized to enhance accountability. Furthermore, upgrading digital platforms and infrastructure will improve efficiency in data processing and overall revenue collection effectiveness.

Recommendation for Future Research

Future research should examine employee perceptions and adaptation to continuous training programs under ETMS implementation. This includes evaluating how staff engagement with training influences their proficiency in using ETMS features, analytical capacity, and responsiveness to evolving tax trends. Exploring the relationship between training effectiveness, departmental performance, and overall system integration will provide insights for refining workforce development strategies. Such research will help optimize staff capabilities, strengthen compliance and transparency, and ensure sustainable improvements in Zambia's tax administration system.

Conflict of interest

The Authors declare that they have no conflicting interests

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Data Availability Statement

The data used to support the findings of the study are available from the corresponding Author upon request.

Ethical Considerations

The article followed all ethical standards appropriate for this kind of research.

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