



Effect of Electronic Tax System on Performance of Revenue Collection: A Case of Rwanda Revenue Authority Head Office

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Abstract: The study assessed the effect of the electronic tax system on revenue collection performance at Rwanda Revenue Authority Head Office. The specific objectives were to assess the effect of electronic tax filing, analyse the effect of electronic tax billing, and determine the effect of electronic tax payment on performance of revenue collection of Rwanda Revenue Authority. A descriptive and explanatory research design was adopted. The target population consisted of 341 Rwanda Revenue Authority employees working in departments directly interacting with electronic tax systems, and a sample of 184 respondents was determined using the Yamane formula. Data were collected through structured questionnaires and analysed using descriptive statistics, Pearson correlation, and multiple regression analysis in SPSS. The response rate was 92.93%, with 171 valid responses. Findings showed that electronic tax filing had a positive and significant effect on revenue collection performance ($B = 0.218$, $t = 3.460$, $p = 0.001$), electronic tax billing had a positive and significant effect ($B = 0.198$, $t = 4.950$, $p = 0.000$), and electronic tax payment had the strongest positive and significant effect ($B = 0.486$, $t = 7.147$, $p = 0.000$). The model explained 80.5% of the variance in revenue collection performance ($R^2 = 0.805$, $F = 228.481$, $p = 0.000$). The study concluded that electronic tax filing, electronic tax billing, and electronic tax payment significantly improve revenue collection performance. It recommended deeper integration of electronic payment systems with mobile money platforms, stronger taxpayer education, advanced cybersecurity, and continuous technical support.

Keywords: electronic tax system, electronic tax filing, electronic tax billing, electronic tax payment, revenue collection performance, Rwanda Revenue Authority

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1. Introduction

Taxation has evolved from traditional systems such as corvée and tithe taxes in ancient societies to modern systems that rely on digital platforms for filing, billing, payment, monitoring, and enforcement. Historical tax administration shows that governments have always depended on organized fiscal systems to mobilize public resources, finance public services, and maintain state functions (Wilkinson, 2021; Thorndike, 2021). In the current era, public revenue administration is increasingly

shaped by digital transformation because governments seek to reduce revenue losses, improve compliance, and lower the cost of tax collection (OECD, 2023).

Global evidence indicates that tax evasion, illicit financial flows, and profit shifting continue to generate large public revenue losses, especially in developing economies (Tax Justice Network, 2024; UNCTAD, 2023). These losses reduce government capacity to invest in infrastructure, health, education, and social services. Electronic tax systems therefore provide a

practical route for strengthening transparency, limiting discretion, improving taxpayer records, and broadening the tax base. In Asia, Dabla-Norris et al. (2021) documented that electronic payment systems and electronic tax administration platforms increased revenue collection, while the OECD (2023) noted that digital transformation has been integrated into the operating models of many tax administrations.

In Africa, digital tax administration is expanding but remains affected by weak ICT infrastructure, institutional resistance, limited digital literacy, and uneven political support. Nigeria's TaxPro-Max platform has demonstrated potential for improving revenue and collection efficiency (Peter, 2023). Ghana has also recorded improvements in transparency and accountability through digitized local revenue systems, although digitalization does not fully eliminate bribery and corruption risks in revenue processes (Dzansi et al., 2022; World Bank, 2023). Kenya continues to use mobile and digital platforms for taxpayer registration, mobile payments, and real-time revenue tracking (IMF, 2025).

In Rwanda, Rwanda Revenue Authority has embraced e-filing, e-billing, online taxpayer accounts, electronic billing machines, and digital payment channels as mechanisms for improving tax services, compliance, and revenue mobilization (ICTD & RRA, 2024). Despite these reforms, Rwanda still faces revenue collection challenges. Revenue collection reached Rwf 2,332.6 billion in FY 2022/2023 and exceeded the target by 3.6 percent, but the tax-to-GDP ratio declined from 15.8 percent to 15.0 percent (Rwanda Revenue Authority, 2023). Revenue increased to Rwf 2,619.2 billion in FY 2023/2024, yet the tax-to-GDP ratio remained low at 15.1 percent, and tax exemptions reached approximately Rwf 643 billion, equivalent to 3.6 percent of GDP (TaxDev, 2024).

Evidence further shows that rapid adoption of EBM2 did not automatically translate into strong revenue gains, implying that technology adoption alone is insufficient without effective usage, monitoring, taxpayer capacity, and system integration (Mascagni et al., 2022). SMEs continue to experience difficulties related to limited ICT infrastructure and technical capacity, leading to delayed or incorrect tax filings (Mpakaniye, 2024). Although previous studies have explored electronic tax administration, many treat electronic taxation as a broad concept and do not separately examine electronic tax filing, electronic tax billing, and electronic tax payment as explanatory variables. This study addressed that gap by examining how these components affect revenue collection performance at Rwanda Revenue Authority Head Office.

The general objective of the study was to assess the effect of electronic tax system on performance of revenue collection of Rwanda Revenue Authority. Specifically,

the study assessed the effect of electronic tax filing, analysed the effect of electronic tax billing, and determined the effect of electronic tax payment on performance of revenue collection of Rwanda Revenue Authority.

2. Literature Review

2.1 Conceptual Review

An electronic tax system is a coordinated digital arrangement that organizes taxpayer registration, validation routines, assessment activities, billing, payment, and administrative interactions through integrated technological components that streamline tax information flows (CIAT, 2025). It also supports taxpayer account management, enforcement procedures, verification activities, and timely administrative decisions through automated processes that enhance responsiveness and clarity (Tax Justice Network, 2024). Electronic tax filing refers to online declaration submission through organized digital inputs, validation routines, and secure transmission mechanisms that support accurate movement of information from taxpayers to administrators (IMF, 2025). It enables declarants to complete required forms electronically, integrate supporting information, confirm correctness through embedded verification tools, and submit final declarations through authorized portals (Peter, 2023).

Electronic tax billing refers to a digital arrangement that generates authenticated transaction records, structures invoice data, organizes fiscal identifiers, and stores commercial evidence within secure systems (OECD, 2023). It promotes traceability, reduces irregularities, and strengthens accountability. Electronic tax payment is a technologically supported approach for fulfilling fiscal duties through secure portals that authenticate taxpayer identity, process transfers, confirm completion, and update payment histories (UNCTAD, 2023).

Revenue collection performance reflects the effectiveness of administrative procedures in gathering statutory obligations through accurate assessments, organized compliance activities, structured recordkeeping, and well-directed enforcement processes (World Bank, 2023). It also involves institutional capacity to sustain revenue inflows, improve taxpayer compliance, reduce tax evasion, maintain system reliability, and strengthen fiscal stability (Peter, 2023).

2.2 Theoretical Review

2.2.1 Technology Acceptance Model

The Technology Acceptance Model originated from Fred Davis's work on technology adoption and explains how perceived usefulness and perceived ease of use shape adoption behaviour. Recent scholarship maintains that perceived usefulness remains central in explaining the adoption of electronic systems across different economic

environments (Al-Momani & Ramayah, 2025). The model is relevant to electronic taxation because taxpayers and employees are more likely to use e-filing systems when they perceive them as useful, reliable, and easy to operate.

The model also supports analysis of the Rwanda Revenue Authority electronic tax system because electronic tax filing depends on user willingness, accessibility of the platform, simplicity of procedures, system reliability, and availability of user support. Yang et al. (2025) show that acceptance of technology is shaped by cognitive, social, and experiential conditions, while Alshammari and Alkhwaldi (2025) emphasize that sustained digital use is influenced by user expectations and support conditions. Therefore, TAM explains how improved acceptance of electronic tax filing strengthens compliance, accuracy, and revenue collection performance.

2.2.2 Deterrence Theory

Deterrence Theory emerged from Cesare Beccaria's reasoning that misconduct can be reduced when consequences are certain, proportionate, and predictable. Contemporary applications show that coordinated sanctions and predictable accountability mechanisms discourage fraudulent behaviour (Zhang, 2025). In tax administration, deterrence is reflected in the certainty that non-compliance can be detected through reliable records, billing data, electronic audits, and transaction traceability.

This theory applies to electronic tax billing because electronic invoices and electronic billing machines increase the visibility of transactions, reduce manipulation of taxable records, and support enforcement. Modern deterrence applications in digital environments indicate that individuals and institutions are less likely to engage in harmful or non-compliant conduct when credible sanctions and monitoring mechanisms are expected (Li et al., 2025; Meraj, 2024). Therefore, Deterrence Theory explains how electronic tax billing improves accountability and discourages noncompliance.

2.2.3 Systems Theory

Systems Theory was introduced through Ludwig von Bertalanffy's General Systems Theory and emphasizes interactions among components operating within a larger arrangement. The theory encourages holistic analysis rather than isolated interpretation of individual parts. Recent scholarship applies systems reasoning to explain how institutional, technological, and societal conditions interact to shape outcomes in digital environments (Watson & Romic, 2025).

Systems Theory is relevant because revenue collection performance depends on the coordination of electronic tax filing, billing, payment, taxpayer support, system

maintenance, verification, and reporting. Flynn and Mathias (2025) describe outcomes as products of layered interactions, while Chin et al. (2025) present organizational knowledge as a product of complementary forces within a system. In the Rwanda Revenue Authority context, electronic tax payment functions as one component of a wider revenue collection structure, where coordination with filing and billing enhances efficiency, verification accuracy, and performance.

2.3 Empirical Review

2.3.1 Electronic Tax Filing and Performance of Revenue Collection

Nose et al. (2025) examined how digitalization in the corporate sector can boost tax revenue collection. Their cross-country analysis illustrated that stronger firm digitalization is associated with significantly higher tax revenues, and their firm-level analysis showed that digitalization, including the use of e-filing systems, improves tax compliance among high-risk taxpayers such as small and informal enterprises.

Ikidi and Ikhara (2025) investigated the impact of digital transformation on tax administration in Africa across Rwanda, Kenya, and South Africa. Their findings showed that integrating advanced technologies, especially e-filing systems, improved revenue collection and compliance by simplifying procedures and expanding taxpayer engagement, although infrastructure and digital literacy gaps remained challenges.

Hakorimana and Twesige (2021) examined the effect of electronic tax filing on tax collection performance in Musanze District, Rwanda. Using a correlational design with 100 registered taxpayers, the study reported a strong positive correlation between electronic tax filing and tax collection performance ($r = 0.618$, $p = 0.039$), confirming that e-filing improves convenience, efficiency, accuracy, and voluntary compliance.

2.3.2 Electronic Tax Billing and Performance of Revenue Collection

Manani (2021) assessed the performance of Electronic Fiscal Devices on tax revenue collection in Tanzania, focusing on TRA Mbeya Region. The study used descriptive design and found that EFDs significantly improved tax revenue collection by enhancing efficiency and increasing amounts collected, while recommending taxpayer education and adaptation to technological changes.

Kibuuka et al. (2023) investigated electronic billing machines and revenue collection performance at Uganda Revenue Authority. Using a descriptive cross-sectional survey, the study found that electronic billing machines were significantly associated with improved revenue collection performance because e-billing enhanced

accuracy, reduced fraud, and accelerated generation of tax bills.

Habimana and Gashema (2025) examined electronic tax administration systems and revenue collection performance in Rwanda, focusing on electronic billing machines and tax portals. Their mixed-methods findings showed that EBMs improved transparency, operational efficiency, and reduction of tax evasion, although poor connectivity, limited training, and technical failures affected optimal use.

2.3.3 Electronic Tax Payment and Performance of Revenue Collection

Kebede et al. (2025) explored practices, opportunities, and challenges of Ethiopia's electronic tax system from taxpayers' perspectives. The study found that e-tax reduced paperwork, transportation costs, calculation errors, and waiting times, thereby improving compliance and efficiency, although poor internet connectivity and server congestion remained barriers.

Mbugua (2024) evaluated the effect of online tax payments on tax compliance among large taxpayers in Kenya's North-Rift Region. The study established a significant and positive effect of online payment methods on tax compliance, with a coefficient of 0.108 and a significance value of 0.032, showing that online tax payments improve settlement behaviour.

Kabasinga (2025) assessed the effect of electronic tax payment systems on tax collection in Rwanda Revenue Authority. Using a descriptive design and SPSS analysis, the study found a statistically significant relationship between electronic tax payment systems and revenue collection and recommended strengthening policies that promote electronic platforms.

3. Methodology

3.1 Research Design

The study adopted a descriptive and explanatory research design to examine the effect of electronic tax system on revenue collection performance of Rwanda Revenue Authority. Research design guides evaluation of digital systems' impact on government revenue mobilisation and ensures clarity, validity, and alignment with technological reforms in tax administration practices (Getahun & Meleseb, 2024). The descriptive component presented the characteristics of electronic tax systems, while the explanatory component determined the strength, nature, and direction of the relationship between electronic tax components and revenue collection performance.

3.2 Population, Sample Size and Sampling

The study population consisted of 341 employees working in Rwanda Revenue Authority departments that directly interact with the electronic tax system. These departments included the Domestic Tax Department, Customs Services Department, Finance Department, IT and Digital Transformation Unit, and Taxpayer Services and Communications Unit (Creswell & Creswell, 2023). The sample size was determined using the Yamane (1967) formula at a 5% margin of error, resulting in 184 respondents. Stratified sampling and simple random sampling were used to ensure representation from all key departments involved in electronic tax administration. The formula is expressed as:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = required sample size

N = population size (341)

e = margin of error (0.05)

$$n = \frac{341}{1 + 341(0.05)^2} = \frac{341}{1 + 0.8525} = \frac{341}{1.8525} = 184$$

Stratified sampling is appropriate in electronic taxation studies because it captures diverse administrative roles and supports comprehensive evaluation of electronic tax administration outcomes (CIAT, 2025).

3.3 Data Collection Instruments

The study used structured questionnaires to collect primary data from respondents. Data collection instruments are systematic tools designed to gather accurate and relevant information from respondents and support credible, valid findings (Kumar, 2022). The questionnaire contained closed-ended and Likert-scale questions measuring system usability, perceived efficiency, reliability, transaction accuracy, compliance outcomes, and revenue performance indicators (Dabla-Norris et al., 2021).

3.4 Pilot Test, Validity and Reliability

A pilot test involving 18 respondents, representing about 10 percent of the total sample, was conducted to evaluate clarity, validity, reliability, logical sequencing, and completion time of the questionnaire. Content validity was assessed using expert review. The questionnaire contained 28 items under the main study variables and 24 were considered relevant after review, producing a CVI of 0.857, which was above the acceptable threshold of 0.70 (Lee et al., 2025).

Table 1: Reliability Statistics Based on SPSS Data

Variable	Number of Items	Cronbach's Alpha
Electronic Tax Filing	6	0.781
Electronic Tax Billing	6	0.832
Electronic Tax Payment	6	0.890
Revenue Collection Performance	6	0.813
Overall Scale	24	0.829

Source: Field data, 2026

The reliability results showed that all Cronbach's Alpha values were above the acceptable threshold of 0.70. Electronic tax filing recorded 0.781, electronic tax billing recorded 0.832, electronic tax payment recorded 0.890, revenue collection performance recorded 0.813, and the overall scale recorded 0.829. These results confirmed that the instrument was internally consistent and suitable for data collection.

3.5 Data Processing and Analysis

Data processing involved editing, coding, and tabulation to ensure completeness, consistency, and organization of responses (Nair, 2023; Kumar, 2022; Creswell & Creswell, 2023). Data analysis included descriptive statistics and inferential statistics. Means and standard deviations were used to describe respondents' perceptions, while Pearson correlation and multiple regression analysis were used to test relationships between electronic tax filing, electronic tax billing, electronic tax payment, and revenue collection performance (Mascagni et al., 2022; Pallant, 2023). The adopted regression model was $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \varepsilon$, where Y represented revenue collection

performance, X_1 electronic tax filing, X_2 electronic tax billing, and X_3 electronic tax payment.

3.6 Ethical Considerations

Respondents were informed about the purpose of the study before data collection, participated voluntarily, and were allowed to withdraw without penalty. Personal identifiers were avoided, and the collected data were used strictly for academic purposes.

4. Results and Discussion

Out of 184 questionnaires distributed to Rwanda Revenue Authority employees, 171 were completed and returned, representing a response rate of 92.93%. Only 13 questionnaires, equivalent to 7.07%, were not returned or were unusable. The high response rate provided adequate data for descriptive and inferential analysis of the effect of electronic tax system on revenue collection performance at Rwanda Revenue Authority.

4.1 Descriptive Findings

4.1.1 Electronic Tax Filing

Table 2: Descriptive Statistics on Electronic Tax Filing

Statement	N	Mean	Std. Deviation
Rwanda Revenue Authority electronic tax filing platform provides accessibility that enables taxpayers to complete filing activities without difficulty.	171	4.18	.386
Rwanda Revenue Authority electronic tax filing process maintains simplicity that allows taxpayers to perform filing tasks comfortably.	171	4.10	.300
Rwanda Revenue Authority electronic tax filing system demonstrates reliability that ensures filing operations continue without unnecessary interruptions.	171	4.07	.318
Rwanda Revenue Authority electronic tax filing environment offers user support that assists taxpayers in resolving filing challenges effectively.	171	4.13	.342
Rwanda Revenue Authority electronic tax filing platform enhances filing accuracy through automated validation and error-checking features.	171	4.10	.300
Rwanda Revenue Authority electronic tax filing system supports timely tax submission by issuing reminders and deadline alerts to taxpayers.	171	4.18	.386
Overall	171	4.13	.339

Source: Field data, 2026

The results show that electronic tax filing recorded an overall mean of 4.13 and standard deviation of 0.339. This high mean indicates strong agreement that Rwanda Revenue Authority electronic tax filing supports

platform accessibility, process simplicity, system reliability, user support, filing accuracy, and timely submission. The standard deviation below 0.5 indicates homogeneous responses, confirming consistency among

respondents. These findings agree with Hakorimana and Twesige (2021), who found that electronic tax filing

improves convenience, accuracy, and tax collection performance.

4.1.2 Electronic Tax Billing

Table 3: Descriptive Statistics on Electronic Tax Billing

Statement	N	Mean	Std. Deviation
Rwanda Revenue Authority electronic tax billing platform enables invoice generation that ensures clear and consistent billing information.	171	4.15	.509
Rwanda Revenue Authority electronic tax billing operations enhance awareness of EBM regulations that guide compliant taxpayer billing behavior.	171	4.20	.538
Rwanda Revenue Authority electronic tax billing procedures strengthen monitoring and enforcement that maintain adherence to required billing standards.	171	4.13	.385
Rwanda Revenue Authority electronic tax billing system provides integration with business systems that supports smooth transmission of billing data.	171	4.20	.400
Rwanda Revenue Authority electronic tax billing system improves transparency in transactions by ensuring traceable and verifiable billing records.	171	4.30	.486
Rwanda Revenue Authority electronic tax billing platform promotes timely submission of billing information through automated reporting features	171	4.25	.498
Overall	171	4.21	.469

Source: Field data, 2026

Electronic tax billing recorded an overall mean of 4.21 and standard deviation of 0.469. The very high mean indicates that respondents strongly confirmed the role of electronic tax billing in invoice generation, awareness of EBM regulations, monitoring and enforcement, system integration, transaction transparency, and timely reporting. The homogeneous responses show that

electronic billing is widely perceived as a key mechanism for improving revenue collection performance. This supports Kibuuka et al. (2023) and Habimana and Gashema (2025), who found that electronic billing machines improve accuracy, transparency, fraud reduction, and revenue mobilization.

4.1.3 Electronic Tax Payment

Table 4: Descriptive Statistics on Electronic Tax Payment

Statement	N	Mean	Std. Deviation
Rwanda Revenue Authority electronic tax payment system offers multiple payment options that support flexible tax settlement processes.	171	4.09	.364
Rwanda Revenue Authority electronic tax payment framework ensures security of transactions that protects sensitive financial information during payments.	171	4.08	.266
Rwanda Revenue Authority electronic tax payment service maintains cost-effectiveness that reduces unnecessary expenses during payment activities.	171	4.13	.400
Rwanda Revenue Authority electronic tax payment interface provides confirmation and tracking features that allow taxpayers to follow processed transactions.	171	4.07	.400
Rwanda Revenue Authority electronic tax payment platform facilitates timely tax payments by reducing delays associated with manual procedures.	171	4.15	.360
Rwanda Revenue Authority electronic tax payment system enhances user convenience through integration with mobile banking and other digital channels.	171	4.21	.409
Overall	171	4.12	.366

Source: Field data, 2026

Electronic tax payment recorded an overall mean of 4.12 and standard deviation of 0.366. This high mean indicates that Rwanda Revenue Authority electronic tax

payment systems provide multiple payment options, transaction security, cost-effectiveness, confirmation and tracking, timely payments, and integration with

mobile banking and other digital channels. The results are consistent with Mbugua (2024), who found that online tax payments significantly improve tax compliance, and Kabasinga (2025), who confirmed a strong relationship between electronic tax payment

systems and tax collection in Rwanda Revenue Authority.

4.1.4 Revenue Collection Performance

Table 5: Descriptive Statistics on Revenue Collection Performance

Statement	N	Mean	Std. Deviation
Rwanda Revenue Authority revenue collection performance demonstrates achievement of set revenue targets supported through improved digital processes.	171	4.30	.486
Rwanda Revenue Authority revenue collection operations contribute to expansion of registered taxpayers through strengthened digital engagement.	171	4.20	.400
Rwanda Revenue Authority revenue collection framework enhances reduction of tax evasion or fraud through improved digital controls.	171	4.19	.396
Rwanda Revenue Authority revenue collection activities improve administrative efficiency through coordinated and streamlined electronic tax procedures.	171	4.11	.308
Rwanda Revenue Authority revenue collection systems enhance compliance levels among taxpayers through improved digital monitoring and reporting mechanisms.	171	4.06	.310
Rwanda Revenue Authority revenue collection processes support timely and accurate tax assessment through the use of integrated digital platforms.	171	4.13	.359
Overall	171	4.17	.376

Source: Field data, 2026

Revenue collection performance recorded an overall mean of 4.17 and standard deviation of 0.376. This high mean indicates that digital tax processes supported achievement of revenue targets, expansion of registered taxpayers, reduction of evasion or fraud, administrative efficiency, improved compliance levels, and timely tax

assessment. The homogeneous standard deviation confirms that respondents consistently perceived electronic tax systems as valuable contributors to performance. This aligns with Nose et al. (2025), who showed that digitalization supports higher tax revenues and stronger compliance.

4.2 Inferential Findings

Table 6: Correlations Analysis

		Electronic Tax Filing	Electronic Tax Billing	Electronic Tax Payment	Revenue Collection Performance
Electronic Tax Filing	Pearson Correlation	1	.594**	.838**	.794**
	Sig. (2-tailed)		.000	.000	.000
	N	171	171	171	171
Electronic Tax Billing	Pearson Correlation	.594**	1	.718**	.744**
	Sig. (2-tailed)	.000		.000	.000
	N	171	171	171	171
Electronic Tax Payment	Pearson Correlation	.838**	.718**	1	.873**
	Sig. (2-tailed)	.000	.000		.000
	N	171	171	171	171
Revenue Collection Performance	Pearson Correlation	.794**	.744**	.873**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	171	171	171	171

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Field data, 2026

Correlation results show that electronic tax filing had a strong positive relationship with revenue collection performance ($r = 0.794$, $p = 0.000$), electronic tax billing also had a strong positive relationship ($r = 0.744$, $p = 0.000$), and electronic tax payment had the strongest positive relationship ($r = 0.873$, $p = 0.000$). These results

confirm that improvements in electronic filing, billing, and payment were significantly associated with better revenue collection performance. The findings reflect Nose et al. (2025) and Hakorimana and Twesige (2021), who demonstrated positive relationships between digital taxation and revenue performance.

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.897 ^a	.805	.802	.164	1.665

a. Predictors: (Constant), Electronic Tax Payment, Electronic Tax Billing, Electronic Tax Filing

b. Dependent Variable: Revenue Collection Performance

Source: Field data, 2026

The model summary shows a multiple correlation coefficient of $R = 0.897$, indicating a very strong positive relationship between the combined electronic tax system components and revenue collection performance. The R Square value of 0.805 shows that electronic tax filing, electronic tax billing, and electronic tax payment explained 80.5% of the variation in revenue collection

performance. The Durbin-Watson value of 1.665 indicated acceptable independence of residuals. This high explanatory power confirms that electronic tax systems are major drivers of revenue collection performance, consistent with Habimana and Gashema (2025).

Table 8: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.507	3	6.169	228.481	.000 ^b
	Residual	4.482	167	.027		
	Total	22.989	170			

a. Dependent Variable: Revenue Collection Performance

b. Predictors: (Constant), Electronic Tax Payment, Electronic Tax Billing, Electronic Tax Filing

Source: Field data, 2026

The ANOVA results show that the regression model was statistically significant ($F = 228.481$, $p = 0.000$). Since the significance value is below 0.05, the combined predictors reliably explained revenue collection

performance. This confirms that electronic tax filing, electronic tax billing, and electronic tax payment jointly provide a valid model for predicting revenue collection performance at Rwanda Revenue Authority.

Table 9: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.402	.156	2.577	.011		
	Electronic Tax Filing	.218	.063	.216	3.460	.298	3.355
	Electronic Tax Billing	.198	.040	.246	4.950	.485	2.063
	Electronic Tax Payment	.486	.068	.516	7.147	.223	4.478

a. Dependent Variable: Revenue Collection Performance

Source: Field data, 2026

The coefficient results show that electronic tax filing positively and significantly influenced revenue collection performance ($B = 0.218$, $t = 3.460$, $p = 0.001$). Therefore, the null hypothesis stating that electronic tax filing has no significant effect on revenue collection performance was rejected. Electronic tax billing also had a positive and significant effect ($B = 0.198$, $t = 4.950$, $p = 0.000$), leading to rejection of the second null hypothesis. Electronic tax payment had the strongest positive and significant effect ($B = 0.486$, $t = 7.147$, $p =$

0.000), leading to rejection of the third null hypothesis. The VIF values of 3.355, 2.063, and 4.478 were below 10, indicating no harmful multicollinearity. These findings reinforce the Technology Acceptance Model because improved digital conditions and user expectations contribute to adoption and performance (Yang et al., 2025).

5. Conclusion and Recommendations

The findings showed that electronic tax filing, electronic tax billing, and electronic tax payment were positively perceived and statistically significant predictors of revenue collection performance at Rwanda Revenue Authority. Electronic tax filing improved accessibility, accuracy, and timely submission. Electronic tax billing enhanced transparency, traceability, and compliance monitoring. Electronic tax payment improved convenience, transaction security, cost-effectiveness, and timely settlement of tax obligations.

5.1 Conclusion

The study concluded that electronic tax filing has a positive and significant effect on revenue collection performance of Rwanda Revenue Authority because a reliable and accessible filing platform encourages timely submission and reduces administrative burdens. The study also concluded that electronic tax billing significantly improves revenue collection performance by strengthening invoice generation, transaction transparency, and compliance enforcement. Finally, electronic tax payment was concluded to be the strongest predictor of revenue collection performance because secure, flexible, and integrated payment channels increase taxpayer convenience, accelerate settlement, and reduce manual delays. Overall, the electronic tax system functions as an integrated framework that supports transparency, compliance, administrative efficiency, and sustainable revenue mobilization.

5.2 Recommendations

From the findings, the following recommendations were:

1. Rwanda Revenue Authority should expand taxpayer education campaigns on electronic tax filing and electronic billing to improve user understanding, reduce filing errors, and strengthen voluntary compliance.
2. Rwanda Revenue Authority should deepen integration between electronic payment systems and mobile money platforms to increase convenience for taxpayers, especially those operating in informal and semi-formal economic sectors.
3. Rwanda Revenue Authority should strengthen cybersecurity protocols across electronic filing, billing, and payment platforms to protect sensitive taxpayer data and sustain confidence in digital tax services.
4. Rwanda Revenue Authority management should establish continuous technical support for users of electronic filing and billing platforms so that digital errors are resolved quickly and revenue collection delays are reduced.

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