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Mr. Oscar Odhiambo Wasonga & Dr. Osiemo Athanas Kengere² (PhD)

¹ School of Business and Economics, Master of Business Administration (Finance Option) Mount Kenya University, Kigali, Rwanda

² Mount Kenya University, Kigali, Rwanda

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Abstract

Rwanda Revenue Authority had in the recent past experienced low revenue collections and a weak and ineffective tax administration and collection system. This was believed to be due to manual administration system characterized by low tax collections and poor record keeping that made the Rwanda Revenue Authority not to meet its budgets. This research was conducted to ascertain the impact of electronic tax system implementation and efficient revenue collection in Rwanda. This research had three specific objectives namely, to analyze the effect of internet payment/filing on tax collection in Rwanda, to examine the effect of mobile payments on tax collection in Rwanda and to establish the effect of electronic billing machines on tax collection in Rwanda. The study was designed in a way that provided insight to the tax administrators and policymakers in the government on the way forward as far as making the system acceptable and friendly to the taxpayers. The research was undertaken in Rwanda Revenue Authority head offices in Kigali; with a time, frame of two months. The study used a descriptive research design with a survey population of 75 staff of the RRA. The population of the study included all the 75 staff sampled in Rwanda Revenue Authority hence a census approach was applied. The researcher used secondary data from the Rwanda Revenue Authority. Descriptive statistics, such as frequencies and percentages, were used to summarize and present the survey responses. Inferential statistical tests, such as regression analysis tests, were conducted to examine relationships and associations between variables. Qualitative data from interviews were transcribed and analyzed using thematic analysis. The themes and factors leading to the impact of electronic tax system on revenue collected were identified, summarized, and reported. This study was relevant because it embraced technological advancement tools that transform businesses. The government being a service provider is obligated to embrace technology in order to reduce operational costs in terms of stationery, and transaction costs and to enable taxpayers to be compliant anywhere in the world and at any time. The e-tax system was introduced at a time when the government was championing the digitization of its ministerial processes as a way of enhancing service delivery to the citizens hence the need to research in this area.

Keywords: *Electronic Tax System Implementation, Efficient Revenue Collection, Rwanda Revenue Authority, Gasabo District, Rwanda*

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1. Introduction

Rwanda Revenue Authority had been experiencing low revenue collection and its tax administration system was weak and this is believed was due to the manual system that was in place. The manual tax system, where tax processes were predominantly paper-based and relied on manual record-keeping and verification had serious significant impacts on revenue collection. They were inefficient, increased error rates and tax evasion due to lack of the necessary checks, compliance challenges, high administration costs, limited transparency and its inability to meet its budgetary obligations. E-filing and e-taxation payment was introduced by RRA in 2012 with functioning e-filing system in place such as Mobile declaration, Electronic Single for domestic taxpayers Window (ESW) and Authorized Economic Operator (AEO) for importers and exporters (Gupta, 2012) in order to improve on tax collection and meet the targeted budget accordingly, and this was done to enable the taxpayers to deal with RRA electronically anywhere and anytime as well as to enhance tax administration to collect tax revenue in short term and as a measure to improve on tax compliance and efficiency but unfortunately, the country was not able to meet its obligations due to the inefficiency in the tax management system. There has been little research done on the impact of e-tax on revenue collection. An empirical study by Wen-ping (2018) on the factors affecting taxpayer's intention to adopt e-tax filing method was inconclusive and raised a gap that needs to be filled. It is due to the above problems that has prompted the researcher to conduct this research to determine the impact of electronic tax system implementation and efficient revenue collection in Rwanda.

1.1 Objectives of the study

1.1.1 General objective

The general objective of the study was to analyze the impact of electronic tax system implementation and efficient revenue collection in Rwanda.

1.1.2 Specific objectives

The specific objectives were:

- i. To assess the effect of Internet payment/filing system on efficient revenue collection in Rwanda
- ii. To examine the effect of mobile payment/filing system on efficient revenue collection in Rwanda
- iii. To assess the effect of electronic billing machines on efficient revenue collection in Rwanda

1.2 Research hypotheses

H₀₁: Internet payment has no statistically significant effect on efficient revenue collection in Rwanda.

H₀₂: Mobile payments have no statistically significant effect on efficient revenue collection in Rwanda

H₀₃: Electronic Billing Machines have no statistically significant effect on efficient revenue collection in Rwanda.

2.1 Empirical Review

A number of studies both locally and internationally have been done on the role Information Technology plays in Tax compliance and systems.

2.1.1 Paperless Income Tax Filing

Amitabh (2018) did a study on the antecedents of paperless income tax filing by young professionals in India. The objective of the study was to analyze how young Indian professionals behaved towards paperless or online filing of tax returns with the aim of enhancing compliance. The regression analysis carried out found that the antecedents of young Indian professionals depended on the perceived ease of the tax system, personal innovativeness in information technology, relative advantage, the performance of filing services, and compatibility. The implication of the findings to the current study is that for any online system to succeed whether for small, medium or large taxpayers' category there must be the ease of use, innovativeness and accessibility.

Ching-Wen Cheng (2017), Impact of quality antecedents on taxpayer satisfaction with online tax filing systems in Taiwan discussed taxpayer satisfaction with an online system for filing individual income tax returns. Online tax-filing system quality encompasses information, system, and service qualities, which are the antecedents of user satisfaction with any system. To measure online tax filing system quality, a second-order measurement model was tested using higher-order confirmatory factor analysis. Hierarchical factor analysis supported the measurement model of Information System quality in the research setting. Path analysis using structural equation modeling confirmed that the quality antecedents strongly influenced taxpayer satisfaction with the online tax-filing system. Furthermore, the factors of information and system quality were more important than service quality in measuring taxpayer satisfaction, demonstrating the importance to taxpayers of system outputs and processing ability.

2.1.2 Integrating ICT skills and tax

In Malaysia, Ling and Nawawi (2017) carried out a survey on Integrating ICT Skills and tax software in tax education. The respondents were the tax practitioners and the study aimed at establishing the necessary skills required by taxpayers to fully utilize a tax online system. The study found that three skills are needed by a taxpayer to interact well with technology-based tax system, namely, spread sheet software, word-processing software and e-mail. The findings of this study have got implications on the current study in that in analyzing the effectiveness of electronic filing system, one must not ignore the mandatory skills that would be users of the system need to have. Failure to consider such skills may make the intention of the system not to be realized as confirmed by Maede (2019), that despite the heavy investment that the Malaysian tax authority put in new online system, only 20% of the targeted taxpayers were able to use it after three years of implementation. This was mainly attributed to lack of necessary user skills like computer literacy; however, taxpayer's behavior also played a role.

Duncan (2021) looked at the factors that facilitate the successful adoption of technology as a tax compliance enhancement tool. In his study, Conclusion was that three factors must be in place to realize this objective, namely: flexible Information Technology structure, competent IT skill base and strong customer orientation.

Kamau (2018), sought to determine the impact of the adoption of technology as a strategic tool in enhancing tax compliance in Rwanda. The study focused on the large taxpayers of Rwanda Revenue Authority. The study concludes that indeed the adoption of technology does impact on the tax compliance levels of large taxpayers. Additionally, it was concluded

that the Rwanda Revenue Authority has effectively implemented its Internet and Communication Technology strategy.

2.2 Research Gap

The presented literature review highlights the significance of leveraging information and communication technology (ICT) in tax administration, emphasizing its potential to enhance efficiency and service delivery. However, the specific focus on e-tax systems and their impact, particularly in the context of Rwanda, appears to be a research gap. While scholars like Geetha & Sekar (2018) underscore the importance of ICT in tax administration, the text lacks a dedicated exploration of the challenges and impact of e-tax implementation.

Additionally, the discussion on leadership and its role in organizational success touches upon the vulnerability of management and the need for effective leadership practices. Yet, there's a gap in connecting these leadership insights to the specific challenges and opportunities associated with implementing e-tax systems, which can be a critical factor in the success of such initiatives.

This study aims to fill these gaps by delving into the unique context of Rwanda and evaluating the impact of e-tax systems on tax administration and organizational performance. Through an empirical approach, the research seeks to contribute valuable insights into the challenges and benefits of e-tax implementation, providing a nuanced understanding that extends beyond the general discussions presented by the existing authors.

2.3 Conceptual Framework

The electronic taxation conceptual framework components comprise dependent, independent and intervening variables. Electronic Tax Payment is measured in terms of the revenue collection efficiency, accuracy, and timeliness of Rwanda revenue authority and is dependent on the payments made by registered and active taxpayers. This is achieved by the presence and proper functioning of electronic tax payments such as the electronic cash registers and the e-tax portal system that are used by taxpayers to make payments of their tax obligations through the internet.

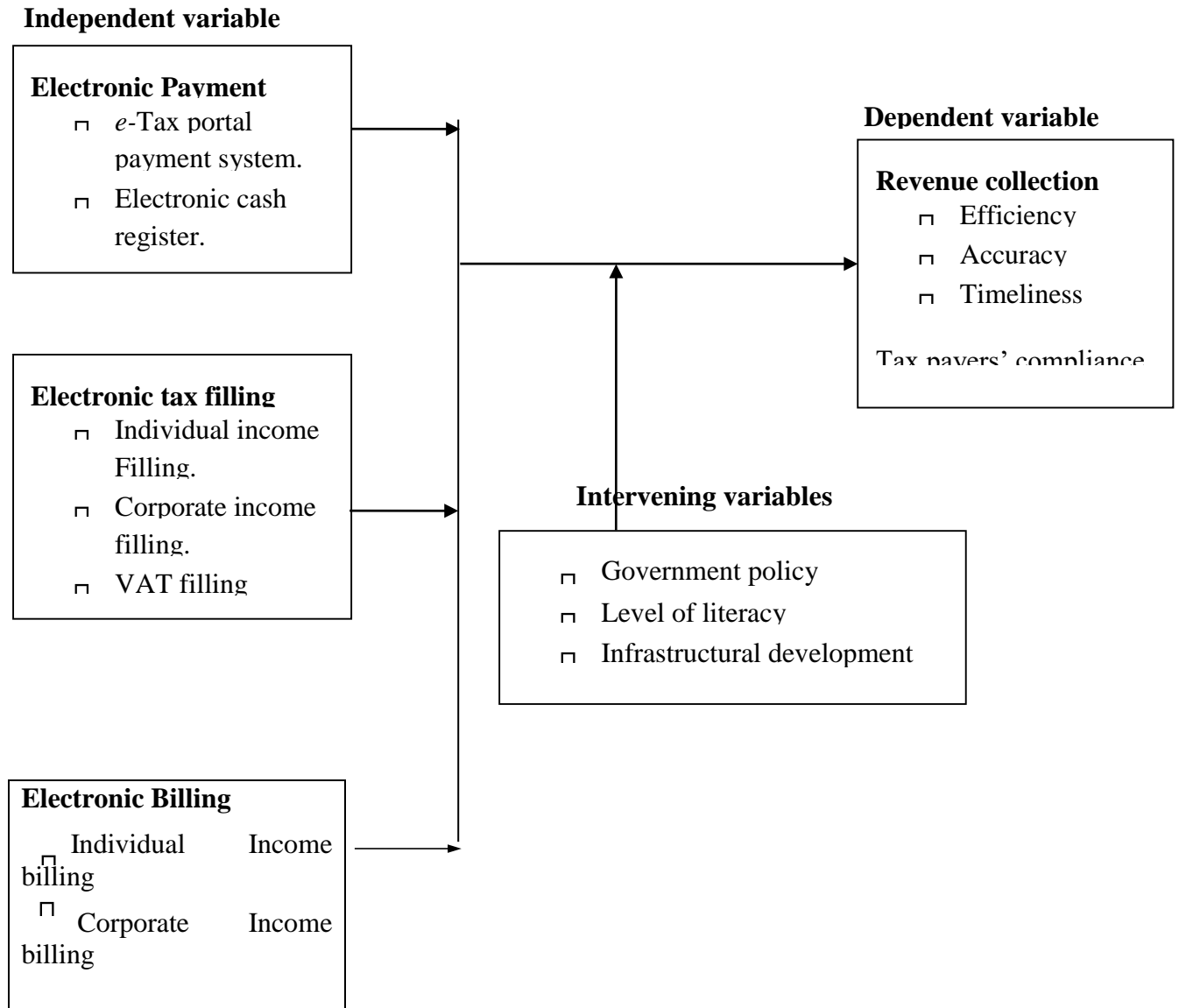
The organization realizes preset objectives of efficient and effective operations, and collection of accurate, reliable, and informative financial reports that comply with relevant legal and regulatory requirements. Electronic Tax Filing is measured in terms of electronic filing potential on the revenue collection efficiency of RRA for cost savings on the public sector side of the tax system, reducing tax administration costs. This applies to both individual and non-individual taxpayers. In particular, computerization of all tax records may reduce errors and decrease the effort of tax authorities in sorting and analyzing the tax files, and administrating the system, besides the potential reduction in corruption and the informal interactions between tax payers and tax officials and directly helping firms reduce compliance costs.

Challenges of Electronic Tax Systems are measured in terms of the good that comes with electronic tax system, there are challenges in its implementation, use and maintenance. From the literature review, a good system will need; a reliable and accessible internet service, cooperative financial institutions, an IT oriented public, and adequate financing to set up the appropriate infrastructure in tax offices.

Ideally, the setting of an e-filing and e-payment system should form part of a comprehensive IT design, development and implementation strategy. Training is essential because it provides

clients with the skills necessary in raising their attitude of voluntarily complying with taxation systems, the designers must ensure that it is user friendly and reduces its difficulty to access.

Figure 1: Conceptual Framework



3. Materials and Methods

The research design adopted for this study was descriptive, with a focus on gaining a profound understanding of the behavioral characteristics of the participants. Utilizing qualitative methods, the study aimed to explore the 'why' and 'how' of decision-making, emphasizing the need for smaller but focused samples. The entire population of 75 employees from the Rwanda Revenue Authority (RRA) Head Office was included due to the study's small size. The interpretive framework associated with the design aimed to provide descriptive and narrative findings.

Conducted at the Department of Tax Administration and Management of the RRA office in Kigali, the target population comprised all employees in the tax administration section,

totalling 75 out of the overall 500 staff. A stratified random sampling technique was employed to ensure representation from various departments, and the sample size was determined with a confidence level of 96% and a margin of error of 4%.

Data collection instruments, as per Nillaor (2019), involved a data capture sheet created by the researcher for secondary data. The study adhered to ethical principles and standards, obtaining appropriate approvals before data collection. Reliability and validity of instruments were ensured through a preliminary study involving 57 respondents. The Content Validity Index (CVI) was used to assess validity, and reliability was pre-tested, aligning with the methodologies recommended by Ahmed & Ishtiaq (2021), Mugenda et al. (2022), Yusoff (2019), and Eyisi (2016).

The research employed multiple regression analysis, following Santoso's (2007) approach, to test the hypothesis. The regression model included independent variables (Electronic Billing, Electronic Filing, Electronic Tax) predicting the dependent variable (Efficient Revenue Collection), represented by the equation $Y = a + b_1x_1 + b_2x_2 + b_3x_3 + e$.

Ethical considerations were paramount, ensuring confidentiality and seeking consent from respondents. Letters from the university and the institution were presented before initiating any questions. The ethical approach aligned with the guidelines proposed by scholars such as Ahmed & Ishtiaq (2021).

4.1 Presentation of findings

4.1.1 Assessment of Internet Payment System on Tax Collection in Rwanda

Table 1 describes respondent's views on Internet Payment on Tax Collection in Rwanda.

Table 1: Assessment of Internet Payment System on Tax Collection

Internet Payment/Filing System	Mean	Std. Deviation	Observations
Taxpayers pay tax easily by use of laptops from office or home	4.2266	0.55928	Strong Heterogeneity
Taxpayers file tax from home or office by use of desktops of laptops	4.1867	0.51184	Strong Heterogeneity
Taxpayers get alert on mail and sms by use of internet	4.2000	0.46499	Strong Heterogeneity
Taxpayers ability to check statements by use of desk top or laptop	3.9333	0.60030	Strong Heterogeneity
Taxpayers' ability to get tax knowledge by use of internet without physical appearance	3.9733	0.59214	Strong Heterogeneity
Total	4.1040	0.54571	

Source: Primary Data 2023

Taxpayers could pay tax easily by use of laptops or desktops from the comfort of their homes or offices and this was indicated by a strong mean of 4.2266 and a heterogeneity standard deviation of 0.55928. It implies that taxpayers can easily pay their taxes from any location through the use of their gadgets, laptops and desktops. Taxpayers could file tax returns from any location, home or office and this was indicated by a strong mean of 4.1867 with a heterogeneity standard deviation of 5.1184. This showed that, through the use of internet,

taxpayers were able to do their filing from any location with the availability on internet and computers.

Checking of tax statements by use of electronic gadgets like computers and laptops by the taxpayers was possible from any location and this was indicated by a mean of 3.9333 and a heterogeneity standard deviation of 0.60030. The taxpayers also could get tax knowledge by use of internet without having to physically move to the revenue offices. This was indicated by a strong mean of 3.9733 and a heterogeneity standard deviation of 0.59214. Taxpayers were also found to be getting alerts on their emails and short message services.

The overall assessment shows that the internet payment/filing system in Rwanda is strong with a mean of 4.1040 and a heterogeneity standard deviation of 0.54571 and this implies that internet payment system is a tool used for tax payment in Rwanda.

4.1.2 Effects of Internet Payment/Filing System on Tax Collection in Rwanda

Table 2 shows the effects of internet payment system on tax collection in Rwanda

Table 2: Effects of Internet Payment/filing system on Tax Collection in Rwanda

Internet Payment/filing System	Mean	Std. Deviation	Comments
Internet payment/filing system has made taxpayers pay taxes in time	4.2400	.61160	Strong Heterogeneity
Internet payment/filing system has reduced on RRA/Taxpayers operational cost	4.2267	.55928	Strong Heterogeneity
Internet payment/filing system has made taxpayers pay tax from any location	4.2800	.45202	Strong Heterogeneity
Internet payment/filing system has made communication collaboration between taxpayer easier	4.4267	.49792	Strong Heterogeneity
Internet payment/filing system has made tax auditing/accountability easier	4.2533	.49575	Strong Heterogeneity
Internet payment/filing has increased revenue collection	4.2933	.45836	Strong Heterogeneity
Overall Summary	4.2866	.51248	Strong Homogeneity

Source: Primary Data 2023

Table 2 indicates the effects of internet payment/filing system on tax collection in Rwanda and the responses were analyzed as follows;

Internet payment /filing system has made taxpayers pay tax on time; this was indicated by a strong mean of 4.2400 and a heterogeneity standard deviation of 0.61160. This implies that internet payment/filing system has made it easy for taxpayers to pay tax on time without any delays. Internet payment/filing system has led to the reduction of RRA operational cost on taxpayers and this is indicated by a strong mean of 4.2267 and a heterogeneity standard deviation of 0.55928. This shows that internet payment/filing has led to a reduction on the operational cost of RRA.

Internet payment/filing has made taxpayers make payments from any location. This was indicated by a strong mean of 4.2800 and a heterogeneity of standard deviation of 0.45202. This shows that internet payment/filing has made taxpayers pay tax from any location of their choice. Internet payment/filing has made communication collaboration between taxpayers easier and this can be indicated by a strong mean of 4.4267 and a heterogeneity standard deviation of 0.49792. This implies that Internet payment/filing system has made communication easier between the taxpayer and RRA.

Internet payment/filing system has made tax audit/accountability easier. This can be indicated by a strong mean of 4.2533 and a homogeneity standard deviation of 0.49575 and this implies that internet payment/filing system has led to easy tax audit/ accountability. Internet payment/filing system has led to an increase in revenue collection; this can be indicated by a mean of 4.2933 and homogeneity standard deviation of 0.45836. This implies that through the use of internet payment/filing system has led to improvement in revenue collection.

In general, assessment shows that internet payment/filing system has improved tax collection by RRA as indicated by a strong mean of 4.2866 and a heterogeneity standard deviation of 0.51248 and this implies that internet payment/filing system has led to improved revenue collection by RRA.

4.1.3 Relationship between Internet Payment and Tax Collection in Rwanda.

The Table 3 represents the relationship between Internet payment System and tax collection in Rwanda.

			Internet Payment System	Tax Collection in Rwanda
		Correlation Coefficient	1.000	0.887**
	Internet Payment System	Significant (2-tailed)	-	0.000
		N	75	75
Spearman's rho		Correlation Coefficient	0.887**	1.000
	Tax Collection in Rwanda	Significant (2-tailed)	.000	-
		N	75	75
**Correlation is significant at the 0.01 level (2-tailed)				

The above table give the relationship between internet payment system and tax collection in Rwanda whereby the respondents N is 75 and the significant level is 0.01, the results indicate that independent variable has positive high correlation to dependent variable equal to 0.887** and a p-value is 0.000 which is less than 0.01. When p-value is less than significant level, hence, researcher conclude that variables are correlated. This means that there is a significant relationship between internet payment/filing system and tax collection in Rwanda. We therefore conclude that internet tax payment system contributes to tax collection in Rwanda.

4.1.4 Assessment of Mobile Payment on Tax Collection in Rwanda

Table 4: Mobile Payment /filing System in Rwanda

Mobile payment System	Mean	Std. Deviation	Comments
Taxpayer pay tax easily from any location by use of their mobile phones	4.0667	.41373	Strong Homogeneity
Taxpayer file tax easily from any location by use of their mobile phones	4.0933	.49792	Strong Homogeneity
Taxpayers check tax statements easily from any location by use of their mobile phones	4.0400	.57984	Strong Heterogeneity
Taxpayers get tax knowledge easily from anywhere by use of their mobile phones	4.0667	.57735	Strong Heterogeneity
Taxpayers get alert messages easily on their mobile phones	4.2533	.43785	Strong Homogeneity
Overall Summary	4.104	.50133	Strong Heterogeneity

Source: Primary Data 2023

The table 4 above describes the mobile payment/filing system in Rwanda and their responses were analyzed as follows;

Taxpayers pay tax easily from anywhere by the use of their mobile phones. This was indicated by a strong mean of 4.0667 and a homogeneity standard deviation of 0.41373. This implies that taxpayers can pay tax easily from any location by the use of their mobile phones if they have the applications and internet connectivity. Taxpayers file taxes easily from any location by the use of mobile phones. This was indicated by a strong mean of 4.0933 and a homogeneity standard deviation of 0.49792. This implies that taxpayers easily file taxes from anywhere by the use of their mobile phones.

Taxpayers could check their tax statements easily from any location by use of mobile phones. This was indicated by a strong mean of 4.0400 and a heterogeneity standard deviation of .57984. This implies that taxpayers could check their tax statements by use of mobile phones. Clients get tax knowledge easily from any location by the use of their mobile phones. This was indicated by a strong mean of 4.0667 and a heterogeneity standard deviation of 0.57735. This implies that taxpayers get tax knowledge easily from any location through the use of mobile phone. Taxpayers also get messages easily on their mobile phones. This was indicated by a strong mean of 4.2533 and a homogeneity standard deviation of 0.43785. This implies that taxpayers get alerts easily on their mobile phones.

The overall assessment shows that the mobile payment/filing system in Rwanda is highly used by taxpayers for tax collection. This was indicated by a mean of 4.104 and a heterogeneity standard deviation of 0.50133. This implies that Mobile Payment/filing System is used for tax collection by RRA.

4.1.5: Effects of Mobile Payment/filing System on Tax Collection in Rwanda**Table 5: Effects of Mobile Payment/filing system on Tax collection in Rwanda**

Mobile payment System	Mean	Std. Deviation	Comments
Mobile payment system has made taxpayers pay tax on time	4.1333	.50225	Strong Heterogeneity
Mobile payment system has reduced on RRA/Taxpayers operational cost	4.0800	.42744	Strong Homogeneity
Mobile payment system has made communication collaboration between taxpayers easier	4.0267	.54459	Very strong Heterogeneity
Mobile payment system has made tax auditing/accountability easier	4.2800	.60538	Strong Heterogeneity
Mobile payment has increased revenue collection	4.1600	.43620	Strong Homogeneity
Overall Summary	4.2177	.50924	Strong Heterogeneity

Source: Primary Data 2023

Table 5 describes the effects of mobile money payment/filing system on tax collection in Rwanda was analyzed as below;

Mobile payment system has made taxpayers pay tax on time. This was indicated by a strong mean of 4.1333 and a heterogeneity standard deviation of .50225. This implies that mobile money payment has made taxpayers pay their taxes on time. Mobile money payment system has led to a reduction in RRA/taxpayers' cost. This was indicated by a strong mean of 4.0800 and a homogeneity standard deviation of 0.42744. This implies that mobile payment/filing has reduced on cost of RRA/Taxpayers. Mobile payment system has made taxpayers pay tax from any location. This was indicated by a strong mean of 4.0267 and a heterogeneity standard deviation of 0.54459. This implies that mobile payment/filing has made taxpayers pay tax from any location. Mobile payment/filing has made communication collaboration between taxpayers easier. This was indicated by a strong mean of 4.6267 and a heterogeneity standard deviation of .53960. This implies that mobile payment has made communication collaboration between RRA and taxpayers easier. Mobile money payment/filing has made tax auditing/accountability easier. This was indicated by a strong mean of 4.2800 and a heterogeneity standard deviation of 0,60538. This implies that mobile payment system has made tax auditing/accountability easier. Mobile payment has increased revenue collection. This was indicated by a strong mean of 4.16000 and a homogeneity standard deviation of 0.43620. This implies that mobile money payment has increased revenue collection.

The overall assessment shows that mobile payment/filing system in Rwanda has improved on tax collection in Rwanda. This was indicated by a mean of 4.2177 and a heterogeneity standard deviation of .50924. This implies that mobile money payment/filing system has improved on tax collection by RRA.

4.1.6: Relationship between Mobile Payment/filing System and Tax Collection in Rwanda

			Mobile Payment/Filing system	Tax Collection in Rwanda
		Correlation Coefficient	1.000	.884**
	Electronic Billing Machine	Significant (2-tailed)	-	0.000
		N	75	75
Spearman's rho		Correlation Coefficient	.884**	1.000
	Tax Collection	Significant (2-tailed)	.000	-
		N	75	75
		**Correlation is significant at the 0.01 level (2-tailed)		

Table 6 shows the relationship between mobile payment/filing system on revenue collection in Rwanda whereby the respondents N is 75 and the significant level is 0.01, the results indicate that independent variable has positive high correlation to dependent variables equal to .884** and the p-value is 0.000 which is less than 0.01. When the p-value is less than significant level, the researcher concludes that the variables are correlated. This means that there is a significant relationship between mobile payment/filing system and tax collection in Rwanda. I can therefore conclude that mobile payment/filing system contributes positively to tax collection in Rwanda.

4.1.7 Assessing Electronic Billing Machine in Rwanda

Table 7: Electronic Billing Machine on Tax Collection in Rwanda

Electronic Billing Machines on tax collection in Rwanda	Mean	Std. Deviation	Observations
Taxpayers easily pay tax any location by use of EBM	3.9333	.50225	Strong Heterogeneity
Taxpayers file tax easily from any location by use of EBM	3.9467	.56696	Strong Homogeneity
Taxpayers check tax statements from any location by use of EBM	3.8933	.58294	Strong Homogeneity
Taxpayers get alerts on mail and SMS by use of EBM	3.8800	.56854	Strong Homogeneity
Overall Assessment	3.9133	.55517	

Source: Primary Data 2023

Table 7 describes the Electronic Billing Machines on Tax Collection in Rwanda responses were as analyzed in detail as below;

Taxpayers pay tax easily from any business location by use of EBM. This was indicated by a strong mean of 3.9333 and a heterogeneity standard deviation of 0.50225. This implies that taxpayer' pay taxes easily from any business location by use of EBM. Taxpayers file tax

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easily from any location by use of EBM. This was indicated by a strong mean of 3.9467 and a heterogeneity standard deviation of 0.56696. This implies that taxpayers file tax easily from any location by use of EBM. Taxpayers check tax statements easily from any location by use of EBM. This was indicated by a strong mean of 3.8933 and a heterogeneity standard deviation of 0.58294. This implies that clients check their tax statements easily from any location by use of EBM. Taxpayers get alert message and emails easily from any location by use of EBM. This was indicated by a strong mean of 3.8800 and a heterogeneity standard deviation of 0.56854. This implies that taxpayers' get message alerts easily from any location by use of EBM.

Overall assessment shows that EBM in Rwanda is used for tax collection and this was indicated by a strong man of 3.9133 and a strong heterogeneity standard deviation of 0.55517. This implies that EBM is used for tax collection by RRA in Rwanda.

4.1.8 Effects on Electronic Billing Machine on Tax Collection in Rwanda

Table 8: Effects of Electronic Billing Machine on Tax Collection in Rwanda.

EBM effect on tax Collection	Mean	Standard Deviation	Comments
EBM system has made taxpayers pay tax on time	3.8800	.51883	Strong Heterogeneity
EBM payment system has reduced on RRA/Client operational cost	4.2267	.53457	Strong Heterogeneity
EBM payment system has made taxpayers pay tax from any location	3.8400	.52091	Strong Heterogeneity
EBM payment system has made communication collaboration between taxpayers easier	4.2000	.51988	Strong Heterogeneity
EBM payment system has made tax auditing/accountability easier	4.1200	.43371	Strong Heterogeneity
EBM payment has increased Revenue Collection	4.2667	.50502	Strong Heterogeneity
Overall Assessment	4.0889	.50502	Strong Heterogeneity

Source: Primary Data 2023

Table 8 describes the effect of Electronic Billing Machine on tax Collection in Rwanda and their responses were analyzed as below;

EBM system has made taxpayers pay tax in time. This was indicated by a strong mean of 3.8800 and a heterogeneity standard deviation of .51883. This implies that EBM system has made client pay tax in time. EBM payment has reduced on RRA/taxpayers operational cost. This was indicated by a strong mean of 4.2267 and a heterogeneity standard deviation of .53457. This implies that EBM system has reduced on RRA/taxpayers' operational cost. EBM payment system has made taxpayers pay tax from any location. This was indicated by a strong mean of 3.8400 and a heterogeneity standard deviation of .52091. This implies that EBM has made taxpayers pay tax from any location. EBM payment system has made communication and collaboration between tax payers easier. This was indicated by a strong mean of 4.2000 and a heterogeneity standard deviation of .51988. This implies that EBM payment system has made communication and collaboration easier. EBM system has made tax auditing/accountability easier. This was indicated by a strong mean of 4.1200 and a strong homogeneity of .43371. This implies that EBM system has made tax auditing/accountability easier. EBM payment system has increased revenue collection. This was indicated by a

strong mean of 4.2667 and a heterogeneity standard deviation of .50225. This implies that EBM payment system has led to increased revenue collection.

The overall assessment shows that EBM system in Rwanda has improved in revenue collection , this was indicated by a strong mean of 4.0889 and a strong heterogeneity standard deviation of .50502 which implies that EBM payment system has improved revenue collection in Rwanda.

4.1.9 Relationship between Electronic Billing Machine and Tax Collection in Rwanda.

Table 9 shows the relationship between Electronic Billing Machine and Tax Collection in Rwanda.

			EBM Payment System	Tax Colleection in Rwanda
		Correlation Coefficient	1.000	.781**
	Electronic Billing Machine	Significant (2-tailed)	-	0.000
		N	75	75
Spearmans's rho		Correlation Coefficient	.781**	1.000
	Tax Collection	Significant (2-tailed)	.000	-
		N	75	75
**Correlation is significant at the 0.01 level (2-tailed)				

The above table gives the relationship between Electronic Billing Machine and Tax Collection in Rwanda whereby the respondents N is 75 and the significant level is 0.01. The results indicate that independent variable has positive high correlation to dependent variable equal to .781** and the p-value is .000 which is less than 0.01. When p-value is less than significant level, therefore researcher conclude that variables are correlated. This therefore means there is a significant relationship between Electronic Billing Machine and Tax Collection in Rwanda. We can therefore conclude that Electronic Billing Machine contribute positively to Tax Collection in Rwanda.

4.1.10 Relationship between Electronic Tax Management System and Revenue Collection in Rwanda.

Table 10 indicates the relationship between Electronic Tax Management System and effective revenue collection in Rwanda.

			Electronic Tax Management System	Tax Colleection in Rwanda
		Correlation Coefficient	1.000	.850**
	Electronic Billing Machine	Significant (2-tailed)	-	0.000
		N	75	75
Spearmans's rho		Correlation Coefficient	.850**	1.000
	Tax Collection	Significant (2-tailed)	.000	-
		N	75	75
**Correlation is significant at the 0.01 level (2-tailed)				

The Table gives the relationship between Electronic Tax Management System and effectiveness of revenue collection in Rwanda whereby the response is 75 and the significant level is 0.01. The results indicate that independent variable has positive high correlation to dependent variable equal to .850** and the p-value is .000 which is less than 0.01. When p-value is less than significant level, therefore researcher concludes that variables are correlated. This means that there is a significant relationship between Electronic Tax Management System and Effectiveness of Revenue collection in Rwanda.

5.1 Conclusion

In the findings it was established that both electronic tax management system which consist of Tax Payment System, Mobile Tax Payment System and electronic Billing Machine System contributes to timely tax payment and reduced operational cost for both RRA staffs and clients. The system has also made clients pay tax from any business location, has made communication collaboration between tax payers easier, has made tax auditing/accountability easier and lastly has increased Revenue collection. Analysis gave the relationship between Electronic Tax Management System and Effectiveness of Revenue collection in Rwanda whereby the respondents N is 75 and the significant level is 0.01, the results indicate that independent variable has positive high correlation to dependent variable equal to .850** and the p-value is .000 which is less than 0.01. When p-value is less than significant level, therefore researchers conclude that variables are correlated. This means that there is a significant relationship between Electronic Tax Management System and Effectiveness of Revenue collection in Rwanda. We can therefore conclude that Electronic Tax Management System contribute positively to Revenue collection in Rwanda.

5.3 Recommendations

The Rwanda Revenue Authority (RRA) should prioritize the enhancement of its e-tax infrastructure and services through strategic measures. This includes subscribing to reliable internet providers to ensure seamless service delivery and employing skilled personnel with expertise in network management for improved reliability. Countrywide training programs for clients on diverse e-tax applications, such as mobile applications and Electronic Billing Machines (EBM), are essential to enhance efficiency in revenue collection. Regular technology upgrades, widespread distribution of EBMs to businesses, and ensuring constant power backup are crucial steps to maintain a cutting-edge and reliable e-tax system, ultimately contributing to effective service delivery and revenue improvement.

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