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IMPACT OF ELECTRONIC BILLING MACHINE ON TAX REVENUE
COLLECTION
CASE STUDY OF RRA (2020-2023)

A Dissertation, submitted to the School of Economics and Business Studies in Partial Fulfilment of the Academic Requirements for the Award of a Bachelor's Degree in Accounting

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DECLARATION

I, **MUKAMUSONI Noella declare** to the best of my knowledge hereby declare that this dissertation entitled ‘Impact of Electronic Billing Machine of Tax Revenue Collection, a case study of RRA 2020-2024 my original work and has never been either partially or wholly presented anywhere else for any other academic qualification at any university or institution of higher learning.

Date:...../...../2024

Signature

MUKAMUSONI Noella

APPROVAL

I, certify that the dissertation titled impact of electronic billing machine of tax revenue collection, a case study of RRA 2020-2023'have been written by **MUKAMUSONI Noella** under my guidance as a university supervisor and I have approved its submission.

Supervisor NSENGIYUMVA Joseph

Date

Signature

DEDICATION

To my families

To my friends

ACKNOWLEDGEMENTS

I thank the Almighty God who led and answered our prayers day in day out and who enabled me to produce and present this work very well.

I would like to take this opportunity to extend my gratitude to the **Prof. Dr RWIGAMBA BALINDA**, The Founder and President of the Kigali Independent University ULK for having initiated the private institution on university level so I could get my bachelor degrees for people who didn't get bursary from public university that is now success.

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LIST OF ABBREVIATION, ACRONYMS AND SYMBOLS

%	: Percentage
AEO	: Authorized Economic Operator
Bn	: Billion
CIS	: Certified Invoicing System
Dr	: Doctor
EFDs	: Electronic Fraud Detection System
ESW	: Electronic Single for domestic taxpayers Window
GSM	: Global System for Mobile
ICT	: Information and communication Technology
IDA	: International Development Agency
IT	: Information Technology
LG	: Local Government
LGA	: Local Government Authority
PAYE	: Pay As You Earn
PC	: Personal Computer
Prof	: Professor
RBV	: Resource Based View
RRA	: Rwanda Revenue Authority
Rwf	: Rwandan francs
SDC	: Sales Data Controller
Std	: Standard deviation
TAM	: Technology Acceptance Model
UI	: User interface
VAT	: Value Added Tax
WWW	: World Wide Web

ABSTRACT

This study set out the contribution of electronic billing machine to tax collection in Rwanda. Case study of Rwanda Revenue Authority (RRA) from 2020-2023. The general objective of the study is to find out the contribution of electronic billing machine to tax collection in Rwanda while specific objectives were to verify if Electronic billing machine is effectively used by Taxpayers and to examine the contribution of Electronic billing machine. to examine the contribution of Electronic billing machine and tax collection in Rwanda and To give some suggestions to RRA on how to improve electronic billing machine in order to increase tax collected in Rwanda, research methodology which contains research design; Data Collection Methods; Validity and reliability tests, Data processing; Data analysis; Limitation of the study and Ethical considerations.

The research results The first hypothesis was to assess the effectiveness of effectiveness of EBM used by RRA where 27(57.4%) agreed that RRA train the Tax payers on how to use EBMs, 15(31.9%) agreed and remaining 5(10.6%) strongly disagree with this statement that EBM provides the data on time to the RRA employees. 30(63.8%) strongly agreed that EBM provides accurate without manipulation by Tax payers; 31.9% of respondents agreed that EBM provides accurate without manipulation by taxpayers while the remaining 2(4.3%) disagreed with this statement that EBM provides accurate without manipulation by Tax payers. 21(44.6%) strongly agreed that EBM contribute to the reduction of TAX REVENUE processing cost, 16(34.0%) agreed and 10(21.2%) disagreed with the statement. 24(51.0%) strongly agreed that EBM facilitate to make a follow up of Tax payers, 17(36.2%) agreed with the statement and 6(12.8%) of respondents disagreed that EBM facilitate to make a follow up of taxpayers. A tax audit is an examination of organization's or individual's tax return. Each year when tax season rolls around, the internal Revenue services, as well as state departments of taxation, kicks into overdrive to meet with the onslaught of tax filings.

Key concepts: EBM and Tax Collection

CHAPTER ONE: GENERAL INTRODUCTION

1.0. Introduction

This part include the background of the study, the problem statement, research objectives, research question, research hypothesis, scope of the study, significant of the study and the organization of the study.

1.1. Background of the study

Globally, Taxation is a mark of civilization. Taxation occurred as ancient empires developed. One notes that taxation was implemented by different empires in different places and times; perhaps like temple and monument construction, taxation is a common phenomenon of human society. Tax evolved and developed independently in the great ancient empires.

During the last decade, the main challenge in the administration of Value Added Tax (VAT) in many countries, including Rwanda has mainly been tax evasion by non-issuance of tax invoice especially by small to medium taxpayers (<http://allafrica.com/stories/201401070103.html>). Taxation is one of the best instruments to boost the potential for public sector performance, to finance the social insurance program and for the repayment of public debt. A country's revenue generation primarily depends upon its sufficient capacity to tax more in both economic and administrative term(Okoye&Ezejiolor, 2019). To curb this problem, in 2013 the government of Rwanda passed a legislation requiring all businesses registered for VAT to provide customers at each sale with a certified

VAT receipt generated by an Electronic Billing Machine (EBM), in the Finance Act of 2013, through Rwanda Revenue Authority (RRA) to replace manual methods of tax management with the main aim of enhancing VAT collection (http://www.rra.gov.rw/rra_article1035.html).

The responsibility of tax administrator's is to ensure that the right amount of tax is paid by the right taxpayer at the right time. A tax administration becomes effective when the government is provided with the needed revenue to finance its activities as planned. An administration that achieves this task at a reasonable, minimal cost to the government, as well as taxpayers, is therefore said to be efficient (Dečman&Klun, 2015). While ICTs have proven to be instrumental to achieve the obligations for prompt tax payment, to curb deliberate practice of tax evasion by

taxpayers is more challenging (Sankay, Olufemi, & Filibus, 2013). The EBMs use mobile phone network to directly send any Transaction data in real time. As such, EBMs can achieve improved monitoring of firms' VAT obligations (Steenberg, 2020).

However, EBMs by themselves cannot ensure accurate VAT reporting because a firm still has an option to report false VAT declaration when issuing fake EBM receipts.

1.2. Statement of the Problem

Tax Management has been a major change in most developing countries where Rwanda is inclusive. In Rwanda before 1994, tax collection was carried out by department of customs and excises responsibility, in land tax and income tax in the ministry of finance. However, despite the RRA employed strategies, the failure to collect all the potential tax revenue is persisting, and the tax-to-GDP ratio is lower than their target, EAC average ratio. The low tax to GDP ratio implies that a lot of tax remains uncollected and so tax revenues collected are inadequate to finance government budget. Tax collection was low in tax administration weak and this was believed to be due to manual system of tax administration characterized by low tax collection delays and poor record keeping, this made the Rwanda failed to meet their targeted budget. Even when Rwanda Revenue Authority was established in 1997 the problem persisted Tax revenue remain a sustainable source of financing for Rwanda development, Electronic billing machine system/technology comes to reduce tax the cost of processing and paying taxes by taxpayers and reducing cost and time of collecting revenue by collectors (RRA)

Introduction of EBM in 2013 help to improve tax revenue and bridge the gap of the budget but still there challenges like unreliable network and inadequate computer skills associated with EBM system making it is a problem to achieve their targeted budget. It is upon the above problem that is the researchers are prompted to analyze the effect of Electronic Billing Machine on tax collection by Rwanda Revenue Authority.

1.3 Objectives of the study

The objective of the study is sub-divided into general and specific objectives

1.3.1 General objective

The general objective of the study will to investigate the contribution of Electronic billing Machine to tax collection in Rwanda.

1.3.2 Specific Objectives

- i. To verify if Electronic billing machine is effectively used by Taxpayers
- ii. To examine the contribution of Electronic billing machine and tax collection in Rwanda
- iii. To give some suggestions to RRA on how to improve electronic billing machine in order to increase tax collected in Rwanda.

1.4. Research Questions

1. Are electronic billing machine effectively used by Taxpayers?
2. Does extent electronic billing machines contribute to tax collection in Rwanda?

1.5. Research Hypothesis

Hypothesis is an anticipated answer to the research question. This provisional answer is confirmed or rejected through observations or experimentations (GRAWITZ, 2018). Answering to the above questions two hypothesis was formulated and was proved during this research process.

The answers of research questions are the following:

1. Electronic billing machines are effectively used by Taxpayers,
2. Electronics billings machine increased the volume of tax in Rwanda.

1.6. Scope of the Study

As far as the scope of the study is concerned, this study is limited in space, time and domain.

1.6.1. Scope in time

The researchers will examine online Tax declaration and Revenue collection in RRA for a period of four (4) years (2020-2023)

1.6.2. Scope in domain

The study's topic is basically on Taxation

1.6.3. Geographical scope

Geographically, this research will carry out in Rwanda Revenue Authority/ Headquarter located in Kigali City - Kimihurura.

The researcher divides scope of the study into three parts in order to get accurate and update information concerning research objectives. Conceptually

1.7. Significance of the Study

The study is significant to the researcher; focus on the personal interest, scientific and academic interest, and social interest and to the RRA

1.7.1. Personal Interest

The researcher the study was enable them obtain the bachelor degree and acquire deep knowledge about EBM and its Impact on tax collection, It will provide researcher with knowledge of e filing and e payment and their effects on revenue collection and would act as an important requirement for award of Bachelor's Degree in Accounting.

1.7.2. Scientific and Academic Interest

This study was served as tool of reference to future research and advanced studies and to the community by taking into account the findings and the results and recommendations that contributes to the thinking of the community. This research report would be available in ULK University library which can be used by other researchers who will interest in this area of research.

1.7.3. To Rwanda Revenue authority

To Rwanda Revenue authority if they adopt the recommendation it will improve on the revenue collection hence effective and efficient service delivery in the country. To the Policy makers, they were able to make law which favors the use of e filing and e payment was hence promoting tax administration efficiency and effectiveness.

1.7.4. Social Interest

This research related to the impact of electronic billing machine on the tax collection will provide information to Rwanda revenue can rely in order to improve its activities for the welfare of the society.

1.8. Organization of the Study

The study consisted chapter one as general introduction, The general introduction is about the background, significance of the study, the scope of the study, objectives of the research, problem statement and hypothesis.

Chapter two is the literature review, it contains the definition of key terms related to our topic, conceptual and theoretical on the EBM and tax collection.

The third chapter examines the research methodology.

The Fourth chapter consist of presentation of findings, finally this research ended with the general conclusion and recommendation.

CHAPTER TWO: LITERATURE REVIEW

2. Introduction

This chapter focused on explaining and illustrates the issue related to the topic of the research and related to the findings for the interpretation later on. In this regard the chapter focuses on the definitions of the key term used in topic. These are tax collection, tax compliance, Electronic Billing Machine System (EBMs), Value Added Tax (VAT), and others which will considered important and necessary on impact of electronic billing machine system on tax collection.

2.1 Concept review

Defining key concepts is important because a research can provide a direction of understanding some of technical terms related to the study area since a field has proper key concepts corresponding to it.

2.1.1. TAX

Tax are involuntary fees levied on individual or corporation and enforced by government entity whether local, regional or national in order to finance government entities , tax fall on whomever pays the burden of the tax whether this is the entity being taxed such as a business or the final consumer of the business goods (Lymer and Oats, 2009).

Tax has been defined by various authorities and professionals in various ways. Conceptually, tax can be defined or seen as a compulsory transfer of resources from the private to the public sector (Uremadu, 2000). According to Adesola (1998), tax is a compulsory levy which a government imposes on its citizens to enable it to obtain the required revenue to finance its activities. And the other scholars Lymer and Oats (2009) tax is imposed by government or other tax raising body, on income, expenditure, or capital assets, for which the taxpayer receives nothing specific in return.

2.1.2 Value Added Tax

Value Added Tax is a tax the supply of goods and services which is eventually born by the final consumer but all collected at each stage of production and distribution chain with VAT government reasoned it was virtually impossible to evade (Ocoye Olarungi, 2009).

Value Added tax is the difference between business sales and purchase of goods and businesses service from other businesses. It represents the sum of wages, other labor compensation (such as health insurance), interest payments and the profits businesses earn. The VAT is popular because it raises significant revenue, is relatively easy to administer and unlike an income tax does not impinge on household saving and business investment choices (Aaron and J. Slemrod, 2003).

Also Value Added Tax is a tax on consumption. Poorer households spend a larger proportion of their income. A VAT is therefore regressive if it is measured relative to current income and it is introduced without other policy adjustments. A VAT is regressive if measured relative to lifetime income (Gupta M, 2012).

2.1.3. Electronic billing machine

Electronic billing machine means that a system comprising of CIS and SDC connected together as one system. Electronic billing machine consists of the electric types writer, a calculator (in modern accounting machine, minicomputer) 'some programmed control devices, and unit for recording the information on an auxiliary (Jahansson (2008).

Electronic billing machines are used, for example at computer consoles .in bookkeeping departments of commercial and industrial enterprise, in bank, in large warehouse, and in construction and assembly installation directorate. The use of such machine substantially expedites the processing of accounting and financial documentation. With the development of automated control systems, billing machines have been employed as input terminal for such systems (Moore, 2008).

2.1.4 Tax collection

Tax collection explained as the process of the government collecting or getting money from people and business required to pay tax and the amount of tax the government gets from this activity is used in government infrastructures (Lymer and Oats, 2009).

Revenue is defined as all amounts of money received by a government from external sources for example those originating from "outside the government" net of refunds and other correcting

transactions, proceeds from issuance of debt, the sale of investments, agency or private trust transactions, and intergovernmental transfers (Ahmed, 2010).

Stated in terms of the accounting procedures from which these data originate, revenue covers receipts from all accounting funds of a government, other than intra-governmental service (revolving), agency, and private trust funds (Chaudhry and Munir, 2010).

2.2. Theoretical Framework

2.2.1. Theories related to Electronic Billing Machine

In the ancient times the Abacus was composed of a row of grooves in sand into which pebbles were placed. Later, the use of slate or board made it a portable device, widely used throughout Asia.

Today it is composed of beads strung on parallel wires in rectangular frame, and is still in use where electricity and battery are scarce or expensive. For example, a Russian version was still in widespread use within the last decade. The abacus works on principle of places-value notation; the location of the bead determines its values. In this way, relatively few beads are required to depict large numbers. Since the e-commerce revolution began in the 1990's tax policy discussions in developed economies have enlisted "e-solutions" to streamline consumption tax administration as well as to resolve technical problems. These well-considered discussions are now producing systemic, multi-jurisdictional changes in Europe and United States consumption tax regimes (Ainsworth R. 2006).

E-solution frequently targeted single-issues, and were often jurisdiction-specific, thus, it only made good sense for policy professionals to coordinate the advances, to harmonize e-solutions across multiple jurisdictions, and to make them more comprehensive within the jurisdictions that embraced them. There are two aspects to these developments: horizontal; the availability of a single e-solution to the same consumption tax issues within a single jurisdiction. The introduction of tax automation minimizes direct contacts between tax collection officers and traders or their agents, and hence leads to a reduction of corruption. Further benefits achieved through customers automation includes improved reporting, control of file transfers, automatic reconciliation of tax returns declarations, and compliance testing of bank files, Paperless declarations and customers (Thacker, 2008).

2.2.1.2. Necessity of using Electronic Billing Machine

It is about one the most important measures for legalization of gray economy. Citizens will, thanks to these secure devices, know exactly how much they paid for goods or services and tax burden was clearly justified. Introduction of this invoicing system will eventually lead to modernization of Rwanda towards new consumer protection program and creation of fair competition among all taxpayers. An official in the compliance department of RRA says that they are aware that many businesses are not paying their full taxes and to prove that fact auditors spend countless hours going over massive documentation which causes disruption in operation of both honest taxpayers and those who evade tax on purpose (Ainsworth R. 2006).

That thanks to this affordable technology, VAT paid by the citizens and businesses was instantly recorded and the audit itself was much simpler (Thacker 2008).

RRA adds that the EBMs also provided a market balance and make equal business opportunities for every entrepreneur in a sense that it promotes transparency in book-keeping.

This is because, when taxpayer A withholds taxes he's supposed remit to RRA, he unfairly makes more profits than taxpayer B who chooses to operate honestly. In practice, VAT doesn't belong to the business, for it has already been added into the product for sales and is paid by the consumers. To calculate the final price of a commodity, several factors are considered including VAT and therefore, RRA is simply helping the tax to separate what belongs to him and what to the treasury. "Our ambition to increase the budget benefits all citizens who eventually enjoyed better social program and the money that was coming from your VAT (Thacker 2008).

2.2.1.3 Introduction of EBM in Rwanda

On August 26, 2013 the ministerial order on modalities of use of certified Electronic Billing Machine, No.002/23/10TC of 31/07/2013, was published in the official gazette of Rwanda. This order has set loose a technology revolution in VAT compliance that promise business efficiencies, and revenue enhancements that are only imagined in more developed countries

The RRA was one of the few tax administrations in the world to have the ability to identify corrupted devices within 24 hours, remotely abolish the certification, and terminate the ability to issue valid receipts. Effectively, Rwanda was able to stop VAT frauds as they happen, or at least

as soon as the RRA become aware of them. Rwandan legislation requires all VAT registered taxpayers to have certified Electronic Billing Machine (Aaron and Slemrod, 2003).

What makes Rwanda so interesting from a tax compliance perspective is that is very clear that the government has moved beyond focusing on the device and has instead begun thinking about security in terms of programming functionality and operation of the device. Because any device that passes certification review is acceptable to RRA, the Rwanda system is one step away from virtual system. In principal it should not matter to the RRA the name, shape or size of the SDC The device is just the container for collecting the data RRA wants (RRA, 2013).

Nevertheless, we should recall that there is the big number of businessman who have low education level which cannot unable the Electronic Billing Machine system, hence affecting tax compliance (Abdul, A. & Idris, 2012).

2.2.1.4. TYPES OF ELECTRONIC BILLING MACHINE (EBMS)

A BILLER DIRECT

This refers to an approach in which consumers are make payment to one biller that issues bill they receive at the website of the firm of the issued the bills.

An example should be of public utility enterprise offering this payment services to its consumers a market has emerged for out sourced billing provides same one who specialized in electronic billing processed and technology for company that need to send bills directly to their consumers (Andrew Zeitlitz, 2002).

A. BANK – AGGREGATOR

The approach under is to make payment at an aggregator. This made allow the consumer to make a payment to multiple billers that are the pre-registered to receive payments (Andrew Zeitlitz, 2012).

2.2.1.5. Benefits of Electronic Billing Machine

There are numerous benefits of EBM to compliant taxpayers and tax administration these benefits to the taxpayers to RRA and to Rwanda include:

EBM sales data can be copied and passed into sales tab when completing the VAT annexure making its quicker and easier for taxpayers to declare and pay VAT. Improving bookkeeping and stock taking for taxpayers through using EBMs to record the exact items and price being sold Simplifying the audit process reducing the time and interruption of taxpayer daily operation Reducing the potential for the tax evasion ensuring that taxpayers can complete fairly and increase the tax collection for public spending It enables traders to produce daily, Monthly and Annual report, easily ,hence reduce the cost bookkeeping and paperwork since with EBM a taxpayer could just keep soft copies and the VAT refunds process will also be easier and faster since RRA can now smoothly get related business transaction information on time (Krnets, 2000).

2.2.1.6. Effect of Electronic Billing Machine on Tax collection

A billing machine consists of an electric typewriter, a calculator (in a modern accounting machine, a mini computer), a programmed control device, and a on an auxiliary carrier. Billing machines are used, for example ,at computer consoles ,in bookkeeping departments of commercial and industrial enterprises ,in banks ,in large warehouses, and in construction and assembly .installation directorates the use of such machines substantially expedites the processing of accounting of financial documentation .with the development of automated control systems, billing machines have been employed as input terminals for such systems (Ainsworth R. 2006).

The various billing machine models differ in the width of the typewriter carriage (32, 45, 62 centimeter) the set of computational operations performed, and the degree of automation. The machines are widely used in the Soviet Union (Jahirul, 2011). A device for the processing of alphanumeric documents for example ,accounts ,invoice –payment demands, payrolls ,and construction estimates that require simple calculation such as addition, subtraction ,multiplication, division and the computation of percentages .

The machine also automatically prints the result of a processing operation on paper by means of a typewriter and simultaneously records the results on an auxiliary information carrier, such as magnetic tape, a punch tape or punch cards. Monetary transactions at banks retails stores, grocery stores, healthcare institutes and other places have been made easier with the use of

variety of machine. Billing and money counting are two important functions involved in this transaction (Geetha and Sekar, 2012). These functions should be done fast and with accuracy to add value to the business operations.

Something like billing and currency counting machine can be easily spotted at the aforementioned places. There are portable models of this machine that can be used in a variety of applications. If you have business or services provide store that require money related transactions to be done efficiently, learn about the working and benefits of machines in this regard before the advent of modern day billing machine models and cash counters, the machine used for these purposes were purely mechanical. Today, there are electronically machines with improved functionality due to better working mechanism. In a cash counting machine, the lot containing coins or currency notes is placed in hopper. The machine contains electronic components like rollers and sensors that count each and every coin or note in the process. Many machines are pre-programmed to perform the designated sets of functions (Mukasa, J. 2011).

One of the most important advantages of a billing and currency counting machine is that it saves a lot of time and manual efforts. Productivity can be easily increased with these machines .a billing machine proves to be advantages in producing the sum totals for various money transactions and to generate the bills faster and accurately. However, their advantages are not limited to those already mentioned (Geetha and Sekar, 2012). Depending up on the types of features integrated with them .these machines can detect fake and counterfeit currency notes.

In addition, many models are designed to find old and damaged currency notes note so that they can be separated or replaced according to the user requirements. Going further, some billing and cash counting machines can be used to count note with different denomination separately. Electronic billing machine as an independent variable it can affect the taxation in different ways even if taxes depending to different thing let us take those thing as the constants ,we will see how EBM aims at improving tax collection and tax compliance ,this machines are helping the government increase its tax base (Jahirul, 2011). The tolls have helped cut down time spent screening books of accounts and auditors used to spend hours investigating and going over massive documentation ,easing conducted and by using of electronic billing machines RRA's now able to catch tax evaders with less effort. The same technology is used in countries such as

Sweden ,Germany ,Greece, Ethiopia ,Kenya to combat tax evasion because every registered machine records all transactions and indicates value added taxes expected to be remitted to government coffers ,the use of Electronic Billing Machines discourage some taxpayers who were found of keeping two receipt books or non-issuing tax receipts to clients, irrespective of the quantities bought, which encouraged tax evasion.

2.2.1.7 A model for improved tax collection through EBMs

The best way to use EBMs to improve tax collection is to introduce them alongside two complementary interventions, firstly, there is need for intervention that reinforce the issuing of EBM receipts where non-compliance is identified. These also provide data to establish true patterns of sales, which is used by the second intervention type. This second intervention uses targeted data analytics that automatically identifies when a firm is engaged in irregular or suspicious behavior. The most powerful way in which EBMs can increase voluntary tax payables and increase tax revenue is by taking both approaches jointly a data –driven approach to spot irregular patterns and automatically remind EBM user of non-complying behavior. EBMs thus open up potential for a large number of new, complementary interventions (Muwonge, H. 2011).

2.2.2. Theories related to tax collection

2.2.2.1. Overview of VAT

VAT (Value Added Tax) is a tax on consumption while people are consuming services or goods from VAT registered organization. It is not a tax on business. It is charged on the value of imports and on the value added (mark-up) on goods and services supplied by one business to another or the final consumer. VAT is a general consumption tax assessed on the value added to goods and services. It is a general tax that applies, in principle, to all commercial activities involving the production and distribution of goods and provision of services. It is borne ultimately by the final consumer (Agrawal, M. 2006).

It is not a charge on companies. It is charged as a percentage of prices, which means the actual tax burden is visible at each stage in the production and distribution chain (Herouy, 2004).

According to Tax Notes International, 2010, VAT is an indirect tax that is broad based (levied at multiple stages of the distribution chain) with the provision for businesses to offset the tax paid on their own purchases of goods and services against the tax charged on sales of goods and

services. The tax is levied on: Imports, transactions between businesses, transactions between businesses and the final consumer and transactions with the government (Aguti J. 2011).

2.2.2.2. Registration for VAT

In the exercise of the powers conferred by Article 79 (2) of the VAT Law, the Commissioner General hereby makes rules for the taxpayers' registration and de-registration for VAT purposes. Enterprises are required to register for VAT if their turnover is above 20 Million Rwf for any period of 12 month or 5 Million Rwf in three consecutive months in the last quarter of the year. Voluntary registration also allowed. The registered person/entity collects and accounts for VAT, the final consumer pays the tax and not the person registered for purposes of collecting and accounting for and paying VAT to RRA (Matsushima R. and Shiomi, K., 2003).

2.2.2.3. VAT Declaration Form

Article 37 as modified and completed by article one of the Law n°25/2010 of 28/05/2010 modifying and complementing law n°06/2001 of 20/01/2001 on the code of Value Added Tax specifies the following:

1. Declaration is immediately done and submitted to tax offices, from the 1st day of the month till the 15th day of the month which follow the one during which the VAT was collected.
2. When the deadline falls within a public holiday or vacation day, declaration is done on the following workday.
3. A declaration is accompanied by annexes that are required before checking and signing for it and keyboarding it in machines.
4. The taxpayer correctly fills his declarations and pays the VAT due in the bank indicated to him or other electronic payment (Ayres, 2006).

2.2.2.4. VAT Violations and Penalties

Based on Law n°40/2016 of 15/10/2016 modifying and complementing law n°37/2012 of 9/11/2012 establishing the value added tax as modified and complemented to date, the following administrative fines are imposed to persons who do not comply with provisions of Value Added tax:

Article 24 bis of Law n° 37/2012 of 9/11/2012 establishing the value added tax as modified and complemented to date is modified and complemented as follows:“ Any person required to use electronic billing machine who sells goods or services without issuing an electronic invoice is

liable to an administrative fine of ten (10) times the value of the evaded value added tax. In case a person repeats the fault specified in Paragraph One of this Article, he/she is liable to an administrative fine of twenty (20) times the value of the evaded value added tax.” (Geetha R. and Sekar M. 2012).

Article 4: Non-compliance with other obligations of the user of electronic billing machine

Article 24 ter of Law n° 37/2012 of 9/11/2012 establishing the value added tax as modified and complemented to date is modified and complemented as follows: “Any person required to use an electronic billing machine complies with other obligation of the user of such a machine provided for by the Ministerial Order on modalities of use of certified electronic billing machine. Subject to provisions of Article 24 bis of this Law, any person who fails to comply with the obligations specified in Paragraph one of this Article is liable to an administrative fine of two hundred thousand Rwandan francs (FRW 200,000). In case a person repeats the fault provided under Paragraph 2 of this Article, he/she is liable to an administrative fine of four hundred thousand Rwandan francs (FRW 400,000) (Jayakumar, A. and Nagalakshmi, 2006).

Any person who makes a taxable transaction and delivers an electronic invoice with under-valued price or quantity of goods or services is liable to an administrative fine of ten (10) times the value of the evaded value added tax. In case the person repeats the fault provided under Paragraph 4 of this Article, the fine is increased to twenty (20) times of the value of the value added tax evaded.” (Gupta M, 2012).

2.2.2.5. Obligations of a VAT registered Taxpayer

Articles 57-63 specify the obligations of a VAT registered taxpayer and include the following: display the VAT registration; issue a VAT invoice; file a monthly VAT return (taxpayers whose turnover is less than or equal to Rwf200, 000,000 can file on a quarterly basis); make available to the officers books of accounts ascertaining to the business; and use electronic billing machine (EBM) (Hales and Steenkamp, 2014).

2.2.2.6. Improving tax by using data with complementary measures

The most powerful way to improve tax collection through EBM is to use the same data driven approaches to automatically reinforce EBM usage for non-complying firms. This could possibly

be pursued by offering firms their prefilled VAT return or by sending out automated taxpayer feedback based on suspected non-usage of EBM machines (Nakiwala, 2010).

Automated Taxpayer Feedback

Providing taxpayer feedback is the most powerful tool to improve tax collection level. This combines a true facilitative component with an increased awareness that the revenue authority is monitoring the specific taxpayer's behavior and so raising the probability of audit and sanctions for non-compliance (Sekar, 2012).

Prefilling VAT Returns

EBMs are introduced in Rwanda as a tax facilitation program by creating an automatic, digital copy of all receipts. However firms are still required to keep their own records and issue their own tax returns, resulting in cases where there is a large deviation between their EBM receipts and their VAT declaration, possibly due to record-keeping challenges. This could also further reduce the likelihood of firms issuing fake receipts, by pre-populating a firm's permissible deductions. For this work, it is the key that receipts provide a comprehensive and reliable account of VAT duties (Sherif, 2015).

2.2.3. Relationship between EBM and Tax collection

Electronic billing machine impacts tax collection through meeting the various governmental needs (Illyas and Siddiqi, 2010). Perhaps the most important mechanism through which government expenditure impacts on economic performance are the costs of raising taxes to finance that expenditure because taxes affect the decisions of households to save, supply labor and invest in human capital and of firms to produce, create jobs, invest and innovate, as well as the choice of savings channels and assets by investors (Johansson, 2008).

Billing machines are used, for example, at computer consoles, in bookkeeping departments of commercial and industrial enterprises, in banks, in large warehouses, and in construction and assembly-installation directorates. Today, there are electronically machines with improved functionality due to better working mechanism.

In a cash counting machine, the lot containing coins or currency notes is placed in a hopper. Electronic Billing Machine as an independent variable it can affect the Taxation in different ways even if Taxes depending to different thing lets us take those thing as the constants, we will see how Electronic Billing Machine aims at improving tax collection and compliance, this machines are helping the government increase its tax base (Jahirul, 2011). The use of Electronic Billing Machines discourage some taxpayers who were fond of keeping two receipt books or non-issuing tax receipts to clients, irrespective of the quantities bought, which encouraged tax evasion.

2.3. Review of related literature

2.3.1. Empirical Review

A billing machine consists of an electric typewriter, a calculator (in a modern accounting machine, a minicomputer), a programmed control device, and a unit for recording the information on an auxiliary carrier. Billing machines are used, for example, at computer consoles, in bookkeeping departments of commercial and industrial enterprises, in banks, in large warehouses, and in construction and assembly-installation directorates. The use of such machines substantially expedites the processing of accounting and financial documentation. With the development of automated control systems, billing machines have been employed as input terminals for such systems. The various billing machine models differ in the width of the typewriter carriage (32, 45, or 62 centimeters), the set of computational operations performed, and the degree of automation. The machines are widely used in the Soviet Union (Jahirul, 2011).

Many machines are pre-programmed to perform the designated sets of functions. One of the most important advantages of a billing and currency counting machine is that it saves a lot of time and manual efforts. Productivity can be easily increased with these machines. A billing machine proves to be advantageous in producing the sum totals for various money transactions and to generate the bills faster and accurately. However, their advantages are not limited to those already mentioned (Geetha and Sekar, 2012). Depending upon the types of features integrated with them, these machines can detect fake and counterfeit currency notes. In addition, many models are designed to find old and damaged currency notes so that they can be separated or replaced according to the users' requirements. Going further, some billing and cash counting machines can be used to count notes with different denominations separately.

Electronic Billing Machine as an independent variable it can affect the Taxation in different ways even if Taxes depending to different thing lets us take those thing as the constants, we will see how Electronic Billing Machine aims at improving tax collection and compliance, this machines are helping the government increase its tax base (Jahirul, 2011). The tools have helped cut down time spent screening books of accounts and Auditors used to spend hours investigating and going over massive documentation, but with the EBM, audits are easily conducted and by using of Electronic Billing Machines RRA is now able to catch tax evaders with less effort. The same technology is used in countries such as Sweden, Germany, Greece, Ethiopia and Kenya to combat tax evasion because every registered machine records all transactions and indicates Value Added Taxes expected to be remitted to government coffers. The use of Electronic Billing Machines discourage some taxpayers who were fond of keeping two receipt books or non-issuing tax receipts to clients, irrespective of the quantities bought, which encouraged tax evasion.

2.3.2. Research Gap

In contrast to traditional government processes, e-Government is characterized by (1) extensive use of communication technology (2) the impersonal nature of the online environment (3) the ease of information can be collected (data-mining), processed and used by multiple parties (Warkentin, Gefen, Pavlou & Rose, 2002).

However, e-Government has the implicit uncertainty of using an open technological infrastructure for transaction via the newness of the communication medium – interact with a government website. This would indirectly increase the spatial and temporal separation between citizens and government; more uncertainty and concern about the reliability of the underlying Internet and related government infrastructure interfaces. As overall these unique differences increase uncertainty and reduce perception of citizen control, imposing a barrier to e-Government adoption (Geetha and Sekar, 2012).

The goal of any tax authority is to establish a system of tax administration that allows for the collection of required taxes at minimum cost. A tax authority engages in many activities, such as processing returns and related information from taxpayers, entering tax return data into a

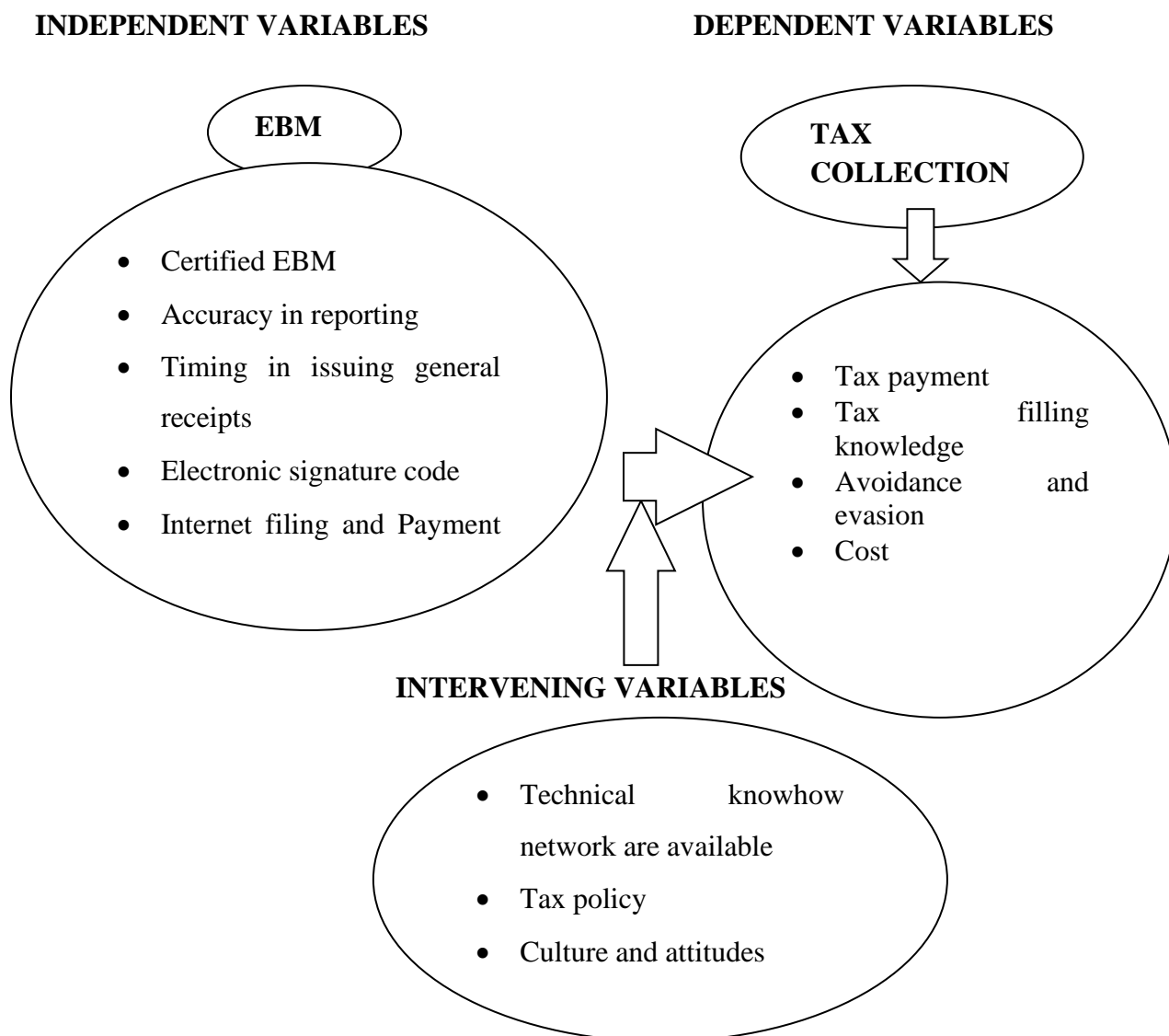
database, matching returns against filing requirements, processing tax payments and matching them against assessments, and issuing assessments and refunds.

From the above literature review ,the researchers tries to gap from the above literature based on the review ,the researchers has never come across similar study in Rwanda i.e. taxpayers on the Electronic Billing Machine (EBMs),however , he has come across with comparable studies were carried out in other African counties. Thus, the research gap was that, those study were carried out in countries other than Rwanda. This was the motive behind the study. therefore ,the researchers noticed by many works on EBM are available but relied on IT solution but also the available EBM work are still few and more are needed so that there is need to include information on the theoretical, methodological, and historical by establishing more complex model to increase the accuracy EBM ,an analysis critique has been presented detailing the weaknesses of the EBM usage where after the establishment of a comprehensive recommendation with IT solution that it was able to apply EBM with maximum accuracy.

2.4 Conceptual framework

A conceptual framework refers to the working model for the study. The model outlines the study variables, their positions and directions of effect. A good model is a useful model that is one providing with a clear direction of research.

Figure 1: Conceptual Framework



Source Researcher adoption,2024

The researcher believe that electronic billing machine system which comprises of certified EBM, Accuracy in Reporting ,Timing in issuing general Receipts and electronic signature code the electronic billing machine improves efficiency in tax collection through timely payment and cost effectiveness .this depends on tax policy network availability and people’s attitude to words the system.

CHAPTER III: RESEARCH METHODOLOGY

3.0.Introduction.

In purpose of achieving the main research objectives, this section is mainly focused on the Discussion of various research designs and methodologies which are used in this study work.

This study used inductive approach where began by collecting data, once considerable amount of data has been collected, the researcher will take time out from the data collected and stepping back to get a bird's eye view of the data. The last step, the researcher looked for patterns in the data and working to develop a theory that will explain the patterns.

3.1 Research Design.

As discussed by Ghoshi, (2002) that a research design is a plan of the proposed research work. A research designs as the structure of any scientific work. He also pointed out that, it gives direction and systemizes the research and each design has its own advantages and disadvantages (Blakstad, 2008). This will a cross-sectional study where the quantitative study involved the use of numbers to assess information, which information will later analyzed using statistical analysis.

3.2. Study Population

Target population in statistics is the specific population about which information is desired. A population is a well-defined or set of people, services, elements and events, group of things or households that are being investigated.

This definition ensures that population of interest is homogeneous. And by population the researcher means complete census of the sampling frames the researcher choose this population because they realized that employees will involve in the day-to-day relationship with Rwanda Revenue Authority (RRA). In this study the population will comprised by employees of Rwanda Revenue Authority (RRA) involve.

3.2.1 Purposive Sampling

Purposive sampling will use by the researcher as the basic sampling technique where she selects a group of RRA jects (a sample) for study from a larger group (population). Each variable is chosen by the researcher entirely by aim economic reason and each variable of the population has an equal chance of being included in the sample. Every possible sample of a given size has the same chance of selection; i.e. each member of the population is equally likely to be chosen at any stage in the sampling process. Population is a group of individuals, objects or items from

which samples are taken (Kombo and Tromp, 2006). The sample size of this research is 30 EBM Staffs of RRA who will help me in this research have.

3.2.2. Sampling Techniques

Purposive sampling will use by the researcher as the basic sampling technique where i select a group of subjects (a sample) for study from a larger group (population). Each variable is chosen by the researcher entirely by aim economic reason and each variable of the population has an equal chance of being included in the sample. Every possible sample of a given size has the same chance of selection; i.e. each member of the population is equally likely to be chosen at any stage in the sampling process.

3.3. Data collections Techniques

3.3.1. Questionnaire

According to Williams, (2017), A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents; the questionnaires technique will be used to collect information about the effect of EBM on tax revenue Collection in Rwanda, 69 respondents was selected by giving them the questionnaires to respond.

The questionnaire will addressed to 30 staff of RRA in order to arise in them a free expression on EBM and Tax collection of RRA. This technique will give a clear understanding on how the Electronic Billing Machine will apply.

3.3.2 Interview

The method assumes that respondents to be interviewed have information required. They can understand the questions put forward to them and can be used to give honest answers face to face with researcher. The researcher asks questions to the selected individuals in relation to the pre-determined objectives. Questions are asked in relation to the objectives that would help to get direct information from the respondents in field of research. The interview permits clarification of questions as having higher response rate than written questionnaires.

In this research, the primary data is composed of information gathered from the interviewees. The researcher will use primary data in which interview technique will used to get some information that has not been studied on; the researchers was design interview questions which

enabled the researcher to assess the electronic billing machine and tax revenue collection of organization. Face to face interview will used by using the questionnaire where the researcher will ask questions to employees of RRA.

3.3.3. Documentary Review

Secondary data will mainly collected through review of various documents for the purpose of attaining sufficient and reliable information where the researcher was analyses the audit reports, Williams, (2017), RRA annual reports, laws and regulations, procedures manuals in order to get real information on EBM and Tax revenues collection of RRA.

3.3.4. Validity and reliability tests

Validity is the extent to which a test measures what it is supposed to measure. The question of validity is raised in the context of the three points made above, the form of the test, the purpose of the test and the population for whom it is intended; (Cronbach, 2016). The validity of instruments will be used to test validity of the instruments to be used. This included the item analysis that is carried out with the aid of the supervisor, research experts knowledgeable about the themes of the study. The process involved in examining and assessing each item in each of the instruments to establish whether the item brings out what it is expected to do.

2.4. Data processing and analysis

2.4.1. Data analysis instruments

The process of data analysis as will use by the researcher after data collection in order to make deep interpretation and understanding by using analysis methods as follow:

3.4.2 Analytical method

Consists to analyze data harvest from ground and to interpret them (Tandon &Subramanian, 2017).

3.4.3 Statistical method

It consists to present data, harvested on the ground under from tables and graphics. It is also about to make some calculations (Ranyon, 2015).

3.4.4. Comparative method

It helped the researcher to compare data that has been gathered during the period of study in RRA(Ranyon, 2015).

3.4.5. Synthetic method

According to Grawitz (2017), it is synthesized, that is to say globalized information and data into a coherent whole. This method will allowing the researchers to synthesize the information gathered from RRA It help to summarize the result of own research as a conclusion; it also allowed us to synthesize data collected for interview technique

3.4.6 Historical method

It is about to describe the history of a phenomenon in order to show its evolution, (GRAWITZ, N., 2000:13). This method help *in* getting and interpreting the past events such as: RRA services, RRA performance and other results found during the period of study.

3.5. Data processing analysis

As said by Roth (2015); processing data is concerned with classifying responses into meaning categories called codes. Data processing refers to the transformation of the respondents' views into meaning form. Data was process and relevant data to the objectives of the study that is considered and transformed into meaningful information for interpretation and understanding. This process consists of editing, coding and tabulation.

3.5.1. Editing

According to Cochran (2017); editing is the process whereby the completed questionnaires and interview scheduled was analyze in the hope of amending/ recording errors, or at least deleting data that are obviously erroneous. Editing was used in order to check completeness, accuracy, uniformity, eligibility and comprehensibility. Editing will be used as a routine task after every response.

3.5.2. Coding

According to Kalton (2015); defined coding as classifying answers into meaning categories so as to come out with their responses, in this study coding was applied for classify the data aimed at easy manipulation, interview and receiving questions.

3.5.3. Tabulation

According to Nachmias (2016); tabulation is putting the data into some kind of statistical tables such as percentage and frequency occurrence of responses to particular questions. According to Baily (2014); not all data can be presented in their entirety. The variables to be presented are those central to the goals of the sturdy. She defines data analysis variables records in order to

obtain quantitative data about the past. The edited and coded data will be transferred into tables constructed basing mainly on the variables considered under the study.

3.6. Ethical considerations

Research ethics is about the responsibility of researcher for being honest and respectful to all individuals who may be affected by the research study results.

The primary data was collected from field and only was used for academic purpose. Besides, as effective book keeping is considered as a competitive edge by various institutions, the secondary information gathered was sensitive. The researchers were ensuring that all the information gathered was solely use for the intended purpose and that it was treated with confidentiality. In data processing and analysis, there was no data manipulation and the interpretation was impartially in order to reflect to the reality. The information provided in this research was kept confidential and results of research will use for the objective of this research study as mentioned in introduction

3.7. Limitation

During this research, the researcher was faced the following constraints; Time: the time allowed to do this research was not being enough to allow exhaustive study and obtain all the essential information for much more suitable conclusions. The problem minimized by putting much effort on this research so as to meet the deadline. Financial Constraints: The Research was limited by financial resources such as the transport costs and stationery to carry out his research effectively. In an effort to mitigate this shortcoming, he sourced for funds from a few sponsors.

CHAPTER IV: PRESENTATION OF FINDINGS

This chapter will be concerned on impact of electronic billing machine on tax collection in Rwanda. The chapter starts with the historical background of Rwanda revenue authority, its vision, mission, values.

4.1.RRA Background

The history of taxes in Rwanda indicates that the first tax legislation was inherited from colonial regimes. This tax legislation included the Ordinance of August 1912, which established graduated tax and tax on real property. There was another Ordinance on 15th November 1925 adopting and putting into application the Order issued in Belgian Congo on 1st June 1925, establishing a profits tax.

This law was amended from time to time in order to comply with the changing economic environment. Such other legislative instruments include the 1973 law governing property tax, the tax on licence to carry out trade and professional activities, the Law No. 29/91 of 28th June 1991 on sales tax /turnover tax (now repealed and replaced by the Law No. 06//2001 of 20/01/2001 on the Code of Value Added Tax (VAT).

A substantive Law governing Customs was enacted on 17th July 1968 accompanying the Ministerial Order of 27th July 1968, putting into application the Customs Law.

The administration and accountability of taxes and duties in Rwanda was initially under the Ministry of Finance and Economic Planning. This was later vested into an independent body - the Rwanda Revenue Authority - that was established by law no 15/97 of 8th November 1997.

In 2005, the parliament adopted law number No25/2005 of 04/12/2005 on tax procedures, amending Decree-Law of December 28, 1973 relating to Personal Tax, Law No 06/2001 of January 20, 2001 on the Code of Value Added Tax and Law No 9/97 of June 26, 1997 on the Code of Fiscal Procedures.

Similarly, Law No 16/2005 OF 18/08/2005 2005 on direct taxes on income was adopted replacing Law No 8/97 of 26/6/1997 on Code of Direct Taxes on Different Profits and

Professional Income, and Law No 14/98 of December 18, 1998 establishing the Rwanda Investment Promotion Agency, especially in its Articles 30, 31 and 34. Con

The parliament also adopted Law No. 21 of 18/04/2006 establishing the customs law, replacing the Law of July 17th 1968 concerning the Customs law as amended and completed to date.

However, on July 1, 2009, Rwanda adopted the EAC Customs Management Act 2004, An Act of the Community to make provisions for the management and administration of Customs and for related matters.

4.2 Identification of Respondent

Identification of respondents is a section which presented the characteristics. Our sample size age, sex, and Qualifications. Those variables are very necessary to be determined, before making a research because they influence more quality of our research. The following tables show the distributions of respondents according to different criteria.

Table 4.1: Distribution of respondents by gender

Gender	Frequency	Percentage
Female	13	43.3%
Male	17	56.7%
Total	30	100%

Source: Primary data, June 2024

The table 4.1 above shows that the right proportion of respondents is women with 43.3% of all respondents, whereas men are 56.7% of respondents. This shows that among the sample taken the female are more than men.

The following tables show the distributions of respondents according to their group age

Table 4. 2: Distribution of respondents according to their group age

Age (Years)	Frequency	Percentage
Below 25	3	10%
26-45	21	70%
Above 46	6	20%
Total	30	100%

Source: Primary data, June 2024

The table 4.2 above reveals that out of 30 respondents selected, the highest proportion is between 26-45 corresponding to 70% and the second age group above 26years old with 20%. The lowest proportion is below25 with 10%.

The following tables show the distributions of respondents according to their qualification.

Table 4.3: Distribution of respondents according to their qualification

Level of education	Frequency	Percentage
University	21	70%
Master's degree	9	30%
Total	30	100%

Source: Primary data, June, 2024

The table 4.3 shows that majority of respondents with 70% have bachelor degree other proportion with 30% completed the masters level.. This shows that this Company employs mostly qualified people and knowledgeable in this area under investigation, this will help to gather the truth information. And it shows that they have ability to fulfill their tasks effectively.

4.2. Evaluating the effectiveness of Electronic Billing Machine on Tax Collection in Rwanda

The following tables shows the results obtained through the survey conducted on tax rra

4.2.1. Perceptions on mandatory usage of EBM on VAT compliance

This part is composed of results obtained on mandatory usage of EBM on VAT compliance indicators namely timely filing of VAT returns, timely payment of VAT liabilities, accurate reporting in VAT declaration and voluntary VAT registration .

Table4.4: The respondent's perceptions on EBM on timely filing of VAT declaration after the adoption of EBM

EBM on timely filing of VAT declaration after the adoption of EBM	Frequency	Percent
strongly agree	18	60
Agree	9	30
Disagree	3	10
Total	30	100

Source: Primary data, June, 2024

According to the results in table above, which shows the impact of EBM on timely filing of VAT declaration after the adoption of EBM, 60% of all respondents strongly agree with the positive impact of EBM on timely filing of VAT after the adoption of EBM, 30% agree and that means 10% of all respondents disagree with the positive impact of EBM on timely filing of VAT declaration after the adoption of EBM. There is positive impact of EBM on timely filing of VAT declaration after the adoption of EBM.

Table4.5 The respondent's perceptions on timely payment of VAT liabilities after the adoption of EBM

EBM on timely payment of VAT liabilities after the adoption of EBM	Frequency	Percent
strongly agree	15	50
Agree	12	40
Disagree	3	10
strongly disagree	0	0
Total	30	100

Source: Primary data, June, 2024

According to the results in table above, which shows the impact of EBM on timely payment of VAT declaration after the adoption of EBM, 50% of all respondents strongly agree with the positive impact of EBM on timely payment of VAT liabilities after the adoption of EBM, 40% agree and other 10% strongly disagree the last one means 0% of all respondents disagree with the positive impact of EBM on timely payment of VAT liabilities after the adoption of EBM. Means that the adoptions of EBM have a strong positive impact on VAT liabilities.

Table4.6: The respondent's perceptions on reporting of VAT sales after the adoption of EBM

EBM on reporting of VAT sales after the adoption of EBM	Frequency	Percent
strongly agree	21	70
Agree	6	20
Disagree	3	10
Total	30	100

Source: Primary data, June, 2024

Through the results obtained in the table, 70% of all respondents strongly agree that there is a positive impact of EBM on reporting of VAT sales after the adoption of EBM, 20% agree, and other 10% of all respondents disagree. These results explain that there positive impact of EBM on reporting VAT sales after the adoption of EBM.

Table4. 7: The respondent’s perceptions on VAT collected by RRA after the adoption of EBM

EBM on VAT collected by RRA after the adoption of EBM	Frequency	Percent
strongly disagree	12	40
Agree	15	50
strongly disagree	1	3.3
Disagree	2	6.7
Total	30	100

Source: Primary data, June, 2024

Table 4.7 shows that 40% of all respondents strongly agree with positive impact of E BM on VAT paid after the adoption of EBM, 50% agree with that, 3.3% strongly disagree and only 6.7% disagree with the positive impact of EBM on VAT paid after the adoption of EBM. This result confirmed that there is positive impact of EMB on VAT paid after the adoption of EBM.

4.2.2.Data integrity

Taxpayers are concerned with the use of the data they provide during transactions. There are cases when internet is trucked and therefore many taxpayers are scared about such information being risk to the taxpayers. Researchers asked the respondents to give their views on the integrity of using EBM in tax revenue collection and the results are summarized in the tables below.

Table 4.8. The data provided by EBM are collect

	Respondents	Percent
Strongly agree	27	90
Agree	3	10
Disagree	0	0
Total	30	100.0

Source: Field data, June, 2024

The table 4.8 Show that, out of 30respondents 27(90%) strongly agreed that The data provided by EBM are collect, 3 (10%) agreed and 0% disagreed with this statement. From the figures above, it is clear that the big number of respondents agreed that the data provided by EBM are collect.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 in order to improve on tax collection and meet the targeted budget accordingly, and this was done to enable that 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 by make the EBMs available in any location (Gupta, 2012).

Table 4:9. EBM provides the data on time to the RRA employees

	Respondents	Percent
Strongly agreed	18	60
Agree	9	30
Disagreed	3	10
Total	30	100.0

Source: Field data, June, 2024

The Table 4.9 show that out of 30 respondents 18(60%) agreed that RRA train the Tax payers on how to use EBMs, 9(30%) agreed and remaining 3(10%) strongly disagree with this statement that EBM provides the data on time to the RRA employees. From the figures above it is clear that the big numbers of the respondents that EBM provides the data on time to the RRA employees.

Table 4.10. EBM provides accurate without manipulation by Tax payers

	Respondents	Percent
Strongly agreed	18	60
Agree	9	30
Disagreed	3	10
Total	30	100.0

Source: Field data, June, 2024

The Table 4.10 show that out of 30 respondents, 18(60%) strongly agreed that EBM provides accurate without manipulation by Tax payers; 30% of respondents agreed that EBM provides accurate without manipulation by taxpayers while the remaining 3(10%) disagreed with this statement that EBM provides accurate without manipulation by Tax payers. From the figures above it is clear that the big number of respondents agreed with the statement that EBM provides accurate without manipulation by Tax payers.

4.2.3. Confidentiality

A nonnegotiable commercial instrument issued by a seller to a buyer. It identifies both the trading parties and lists, describes, and quantifies the items sold, shows the date of shipment and mode of transport, prices and discounts (if any), and delivery and payment terms. Researchers asked the respondents to give their views on sales controller by EBM and the results are summarized in the tables below.

Table 4.11. Data provided by EBM can't be accessed by everybody

	Respondents	Percent
Strongly agree	18	60
Agree	12	40
Disagree	0	0
Total	69	100.0

Source: Field data, January, 2024

The Table 4.11 show that out of 30 respondents, 60% strongly agreed that Data provided by EBM can't be accessed by everybody, 40% agreed while 0% remained Disagreed. From the result above the big number of respondents agreed that Data provided by EBM can't be accessed by everybody.

Table 4.12 The data provided by EBM are only viewed by authorized viewers

	Respondents	Percent
Strongly agree	18	60
Agree	9	30
Disagree	3	10
Total	30	100.0

Source: Field data, June, 2024

The Table 4.12 show that out of 30 respondents 60% strongly agreed that the data provided by EBM are only viewed by authorized viewers and 30% agreed and 10% of respondents disagreed with this statement that the data provided by EBM are only viewed by authorized viewers. From the figures above it is clear that all respondents agree with statements that the data provided by EBM are only viewed by authorized viewers which indicate how the data provided by EBM can't be accessed by everyone and can't be manipulated.

4.2.4. Receipt specification

A Certified Invoicing System generate receipts, which must show, among others, the following data: Taxpayer's name; Tax Identification Number; the address at which the sale takes place; tax Identification number of the client; phone number of the client; receipt type and transaction type. Researchers asked the respondents to give their views on receipts specification by EBM and the results are summarized in the tables below.

Table 4.13 EBM identifies and provides proof of the legality of each receipt for all types of transactions

	Respondents	Percent
Strongly agree	21	70
Agree	6	20
Disagree	3	10
Total	30	100.0

Source: Field data, June, 2024

The Table 4.13 show that, out of 30 respondents 70% strongly agreed that EBM identifies and provides proof of the legality of each receipt for all types of transactions, 25(36.2%) agreed and 1.5% disagreed that EBM identifies and provides proof of the legality of each receipt for all types of transactions. E-filing and e-payment provides many aspects of convenience to tax payers for example tax filing can be conducted at any time, filing can be done in any location, easy use of the system, information search and other online transactions that is not available in the traditional channels.

4.3 Effects of Internet Payment System on Tax Collection in Rwanda

This section analyses EBM and its effects on Tax Collection in Rwanda

Table4.14: Details of revenue collections by broad categories, in Rwf billions:

	Actual 2019/20	Target 2019/20	Variance	Achievement Rate	Actual 2018/19	Growth 2018/19
Total Revenue	1,516.3	1,598.0	-72.8	95.4%	1,422.9	93.4%
Non-Tax Revenue	21.4	20.0	1.4	107.2%	23.4	-2.0%
Tax Revenue	1,494.8	1,569.0	-74.2	95.3%	1,399.5	95.3%
Direct Taxes	656.3	670.5	-14.2	97.9%	597.7	58.6%
Taxes on G&S	720.1	776.3	-56.2	92.8%	690.0	30.0%
Taxes on Int'l Trade	118.4	122.2	-3.7	96.9%	11.7	6.7%
<i>LG Taxes and Fees</i>	68.2	68.2	-6.3	90.8%	60.6	1.4%

RRA REPORT, 2020-2023

Total revenue collections (including tax and non-tax, but excluding local government collection) summarizes the revenue performance of RRA against its targets for the FY 2022/23. The key figures are: Total central revenue collection for FY 2022/23 amounted to Rwf 2,332.6 billion against a target of Rwf 2,250.8 billion. This is an achievement of 103.6%, and an excess of Rwf 81.8 billion above the target. Total revenue collection refers to both tax and non-tax revenues, excluding local government collections. Total central tax revenue collection for FY 2022/23 amounted to Rwf 2,250.4 billion against a target of 2,181.3 billion. This is an achievement of 103.2% and an excess of Rwf 69.1 billion above the target and a growth of 21.2. Local Government (LG) taxes and fees collections totalled Rwf 86.5 billion against a target of Rwf

90.3 billion. This is an achievement of 95.8%, and a shortfall of Rwf 3.8 billion. However, this represents year-on-year growth of 15.5% and a nominal increase of Rwf 11.6 billion.

Table4.15 :RRA’ spending on tax collection

Expenses	Revised budget FY 2020/21	Actual FY 2020/21	Variance	Performance (%)
Compensation of Employees	27,398,968,856	27,368,578,316	30,390,540	99.9%
Use of Goods and Services	20,704,724,365	17,264,186,266	3,440,538,099	83.4%
Social Assistance	690,720,365	455,544,688	235,175,677	66.0%
Other Expenses	22,199,313,099	21,901,215,596	298,097,503	98.7%
<i>Total Operating Expenses</i>	<i>70,993,726,685</i>	<i>66,989,524,866</i>	<i>4,004,201,819</i>	<i>94.4%</i>
<i>Capital Expenditure</i>	<i>6,754,129,380</i>	<i>3,102,981,701</i>	<i>3,651,147,679</i>	<i>45.9%</i>
Total Expenses	77,747,856,065	70,092,506,567	7,655,349,498	90.2%

Source: Research data, 2024 extracted from RRA annual activity report

The table above present the expense that were RRA spend on the process of tax collection, The total RRA revised budget for the 2020/21 fiscal year was Frw 77.7 billion and RRA’s expenditure was Frw 70.1 billion, which is 90.2% of the annual budget, resulting in an under spending of Frw 7.6 billion. The main reasons for this under spending were: delays in procurement process for the acquisition of staff uniforms whose budget was Frw 240 million, repair and maintenance (628 million), purchase of computers, scanners and other ICT equipment (1.5 billion), acquisition of office equipment (650 million) and supplying EBM point of sales (POS) devices (1.4 billion). Procurement process was mainly affected by lack of responsive and qualified bidders leading to the re-advertisement of the tenders or extension of delivery period. In addition, there was delay in the rehabilitation of RRA, NEC and OAG complex which is behind the initial schedule due to measures associated to COVID-19 pandemic causing delays in spending Frw 320 million.

4.4.RRA'S EXPENDITURES FOR 2022/23 FISCAL YEAR

RRA approved budget for the 2022/23 fiscal year was Rwf 64.3 billion with expenditure totalling Rwf 63.8 billion, representing 99.2% utilisation. The overspending on other expenses was due to approved extra spending of Rwf 0.5 billion to cater for other refunds.

Table4.16: Total RRA budget and expenditure in billions Rwf

Expenses	Revised budget	Actual FY	Variance	Performance
Compensation of Employees	36.0	35.7	0.3	99.2%
Use of Goods and Service	22.6	22.1	0.5	98.0%
Social Assistance	0.5	0.4	0.005	98.9%
Other Expenses	1.3	1.8	(0.5)	138.5%
Total Operating Expenses	60.3	60.1	0.3	99.6%
Capital Expenditure	4.0	3.8	0.2	94.1%
Total Expenses	64.4	63.9	0.5	99.2%

The provided table shows the budget and expenditure of the Rwanda Revenue Authority (RRA) for the period 2020-2023. The table is broken down into different categories of expenses, including compensation of employees, use of goods and services, social assistance, other expenses, capital expenditure, and total expenses.

The RRA's total expenses have remained relatively stable over the period 2020-2023, with a slight increase in 2022.

The largest category of expenditure is compensation of employees, which accounts for approximately 56% of the total budget.

The second largest category of expenditure is the use of goods and services, which accounts for approximately 35% of the total budget.

Social assistance is a relatively small category of expenditure, accounting for less than 1% of the total budget. Other expenses and capital expenditure have also remained relatively small.

The RRA has generally been able to stay within its budget, with a few exceptions. For example, in 2022, the RRA overspent on other expenses by 38.5%.

Overall, the RRA's performance in terms of budget execution has been relatively good.

It is important to note that this table does not provide any information on the impact of electronic billing machines on tax revenue collection. In order to assess the impact of electronic billing machines, it would be necessary to compare the tax revenue collected before and after the introduction of these machines.

Additionally, it would be helpful to have information on the number of electronic billing machines installed, the types of businesses that are required to use these machines, and the penalties for non-compliance

4.5. EBM ACQUISITION RATION

This is obtained by dividing the number of VAT registered taxpayers having EBMs at a given period by the number of VAT registered taxpayers expected to have EBM at the same period.

Table 4.17. EBM acquisition ratio

Period	Total # of VAT registered taxpayers	# of non-filers for VAT within the past 12 months	# of VAT registered taxpayers exempted from having EBM	# of VAT registered taxpayers that should have EBM (Expected)	# of taxpayers having EBM	EBM acquisition ratio
2020	27,987	2,895	14	25,078	23,910	95.3
2021	33,535	-	12	33,523	32,848	98.0%
2022	39,879	-	-	-	-	97.4%
2023	38,261	-	-	45,202	91,334	84.6%.

As indicated in Table 4.17. above, RRA had a total of 24,046 VAT registered taxpayers as of end June 2020, of which 21,521 were expected to have EBM, out of which 17,665 taxpayers had acquired EBM, making an acquisition ratio of 82.1%. Average growth rate in VAT registered taxpayers is not proportional to average growth rate of taxpayers having EBM. This means that some VAT registered taxpayers (17.9%) operate without having EBMs while they are supposed to have them. the EBM acquisition ratio is 95.3% meaning that there are still some VAT

registered taxpayers (1,168; equivalent to 4.7%) who are VAT registered without EBMs yet they are supposed to have them. This category includes taxpayers in banking sector that RRA is working on to find a suitable solution to integrate with their systems. There are also taxpayers who registered business but have not yet started operations; they are nil-filers.

Table 4.18: RRA revenue performance against targets for 2021/2023 fiscal year (billion Frw)

Categories of tax	Target FY 2022/23	Actual FY 2022/23	Variance	Performance rate	Actual FY 2021/22	Growth in FY 2022/23	Nominal increase	Proj. Growth
Total central revenue	2,250.8	2,332.6	81.8	103.6%	1,910.2	22.1%	422.4	17.8%
Other Revenue	69.5	82.2	12.7	118.3%	53.0	55.2%	29.2	31.2%
Total tax revenue	2,181.3	2,250.4	69.1	103.2%	1,857.2	21.2%	393.2	17.5%
* Direct taxes	979.5	1051.3	71.7	107.3%	857.4	22.6%	193.9	14.2%
* Taxes on G & S	1046.5	1029.5	-16.9	w98.4%	867.0	18.7%	162.5	20.7%
* Taxes on Int'l Trade	155.3	169.6	14.3	109.2%	132.8	27.8%	36.9	17.0%
L.G tax and fees	90.3	86.5	-3.8	95.8%	74.9	15.5%	11.6	20.6%
LG Tax	43.1	41.5	-1.6	96.4%	35.4	17.4%	6.1	21.8%
LG Fees	47.2	45.0	-2.3	95.2%	39.5	13.8%	5.4	19.5%
Central & L.G tax revenue	2,224.4	2,291.9	67.5	103.0%	1,892.6	21.1%	399.3	17.5%

Rwanda Revenue Authority Report (2020 – 2023)

Table above summarizes the revenue performance of RRA against its targets for the FY 2022/23.

The key figures are:

1.Total central revenue collection for FY 2022/23 amounted to Rwf 2,332.6 billion against a target of Rwf 2,250.8 billion. This is an achievement of 103.6%, and an excess of Rwf 81.8 billion above the target. Total revenue collection refers to both tax and non-tax revenues, excluding local government collections.

2.Total central tax revenue collection for FY 2022/23 amounted to Rwf 2,250.4 billion against a target of 2,181.3 billion. This is an achievement of 103.2% and an excess of Rwf 69.1 billion above the target and a growth of 21.2.

3.Local Government (LG) taxes and fees collections totalled Rwf 86.5 billion against a target of Rwf 90.3 billion. This is an achievement of 95.8%, and a shortfall of Rwf 3.8 billion. However, this represents year-on-year growth of 15.5% and a nominal increase of Rwf11.6 billion.

During FY 2022/23, RRA continued to strengthen electronic invoicing system by extending various electronic invoicing facilities suitable to our taxpayers' specific needs. The following EBM platforms are available for usage in issuing EBM receipts;

EBM Software: This system is installed on a taxpayer's computer (desktop, laptop, tablet or POS) for large and medium taxpayers as well as others who may apply for it. This system was used by 49,110 taxpayers in 2022/23 compared to 41,190 taxpayers from FY 2021/22, an increase of 7,920 taxpayers with percentage of 19.2%.

EBM Mobile System: This system is installed on taxpayer's smart phones. Issuance of EBM receipts is done through an SMS. Eligible taxpayers to this solution are those whose annual turnover does not exceed Rwf 20.0 million. This system has been used by 29,261 taxpayers in 2022/23 compared to 22,019 taxpayers from FY 2021/22, an increase of 7,242 taxpayers with percentage of 32.8%.

3. Online EBM. This internet-based EBM solution enables taxpayers to issue EBM receipts whenever and wherever they are. Eligible taxpayers for this solution are those in the service sector whose annual turnover does not exceed Rwf 20.0 million, and do not issue receipts frequently. This system was used by 6,758 taxpayers in 2022/23 compared to 3,235 taxpayers from FY 2021/22, an increase of 3,523 taxpayers with percentage of 108.9%.

4. Online Sales Data Controller: This solution is particularly designed for large, medium and small taxpayers who have their own invoicing systems to issue receipts over the internet. Online

SDC is integrated to taxpayers' own system that interact with EBM system while issuing receipts online. This system was not used by taxpayers in FY 2022/23.

5.Virtual Sales Data Controller: This system works like Online Sales Data Controller except that it can continue operating while offline. Owners of such systems also express their integration request to RRA using the above-mentioned email address. In 2022/23, 1400 taxpayers used this system compared to 960 taxpayers in FY 2021/22.

Migration from e-invoicing system V.1 to V.2: RRA phased out the use of EBM V.1 and continued to sensitize and facilitating taxpayers to acquire EBM V.2 EIS. Installation of e-invoicing software was done to taxpayers' machines and training provided to end users. As of end June 2023 the total number of taxpayers who had EBM V.2 totaled to 84,448 compared to 52,862 taxpayers who had e-invoicing system EBM V.2 by end June 2022. The number of taxpayers having e-invoicing system EBM V.2 as of 30th June 2023 accounted for 92.6 % of total number (91,182) of taxpayers having e-invoicing system at the same period.

Extension of EBM usage to non-VAT registered taxpayers (NVRTs) continued throughout fiscal year 2022/23, As a result 46,132 non-VAT taxpayers had EBM V.2 compared to 33,624 taxpayers as end June 2022.

Table4.19: relationship between EBM and Tax

	<i>EBM</i>	<i>NPL</i>
EBM	1	
NPL	0.99101559	1

Source: research findings: 2024

The table above establishes the relationship between EBM and Tax volume. by using the simple correlation analysis between EBM and Tax collection the research results shows that there a strong high positive correlation between the EBM and tax volume . this implies that the more taxpayers subscribe on EBM the tax volume increases.

GENERAL CONCLUSION AND RECOMMENDATIONS

Conclusion

The general objective of the study is to find out the contribution of electronic billing machine to tax collection in Rwanda. For achieving the above objective, the researchers have tried to answer the following questions which helped researchers to test the hypothesis:

The specific objectives of the study are the following:

- i. To verify if Electronic billing machine is effectively used by Taxpayers

- ii. To examine the contribution of Electronic billing machine and tax collection in Rwanda
- iii. To give some suggestions to RRA on how to improve electronic billing machine in order to increase tax collected in Rwanda.

The research questions are the following:

1. Are electronic billing machine effectively used by Taxpayers?
2. Do electronic billing machines contribute to tax collection in Rwanda?

In order to respond to those statement problems, the researchers will formulate the following hypothesis:

1. Electronic billing machines are effectively used by Taxpayers,
2. Electronic billing machines contribute to tax collection in Rwanda.

The reach was classified into following three chapters:

The second chapter is literature review which presents a full description the research topic related terms and concepts.

The third chapter presents research methodology which contains research design; Data Collection Methods; Validity and reliability tests, Data processing; Data analysis; Limitation of the study and Ethical considerations.

The forth chapter presents the presentation of the findings with verification of objectives of the study:

The first hypothesis was to assess the effectiveness of effectiveness of EBM used by RRA where 27(57.4%) agreed that RRA train the Tax payers on how to use EBMs, 15(31.9%) agreed and remaining 5(10.6%) strongly disagree with this statement that EBM provides the data on time to the RRA employees. 30(63.8%) strongly agreed that EBM provides accurate without manipulation by Tax payers; 31.9% of respondents agreed that EBM provides accurate without manipulation by taxpayers while the remaining 2(4.3%) disagreed with this statement that EBM provides accurate without manipulation by Tax payers. 21(44.6%) strongly agreed that EBM contribute to the reduction of TAX REVENUE processing cost, 16(34.0%) agreed and 10(21.2%) disagreed with the statement. 24(51.0%) strongly agreed that EBM facilitate to make

a follow up of Tax payers, 17(36.2%) agreed with the statement and 6(12.8%) of respondents disagreed that EBM facilitate to make a follow up of taxpayers. A tax audit is an examination of organization's or individual's tax return. Each year when tax season rolls around, the internal Revenue services, as well as state departments of taxation, kicks into overdrive to meet with the onslaught of tax filings.

While the second hypothesis was to analyse the contribution of EBM on tax collection where the total revenue collection (both tax and non-tax, excluding local government collections) for 2018/19 fiscal year amounted to Frw 1,422.9 billion against the target of Frw 1,392.1 billion which is an achievement of 102.2%, and an excess of Frw 30.8 billion above the target. Tax revenue collection for 2018/19 fiscal year was Frw 1,399.5 billion while the target was Frw 1,373.1 billion; this is an achievement of 101.9%, and Frw 26.2 billion above the target. Compared to Frw 1,234.1 billion collected in 2017/18 fiscal year, additional revenue of Frw 165.4 billion was collected (or a growth of 13.4%). In summary, direct taxes for the 2018/19 fiscal year performed at 103.3%, which represented a surplus of Frw 18.9 billion, a nominal increase of Frw 77.9 billion and growth rate of 15.0% when compared with 2017/2018 fiscal year. Generally, the both research hypothesis of the study has been confirmed.

Suggestions

Given the advantages of EBM system method, when compared to paper invoicing system method for taxpayers, we would like to recommend the following:

To facilitate taxpayers in their e-taxation activities, the Rwanda revenue authority should provide enough training on how to use EBM particularly to those with low education level because they present a big number of taxpayers in business of goods.

RRA should employ skilled personnel and subscribe to reliable internet providers to avoid network problem for effective and efficient service delivery to taxpayers.

RRA should think about other technology for getting invoice electronically to avoid loss or erasure of information's on the paper invoice.

Areas of further studies

Researchers have observed the following areas for further studies because they are some of the challenges facing electronic billing machine in Rwanda:

Effects of network and system reliability on Electronic billing machine Management.

Effect of technical knowhow on electronic billing system.

Effect of low education level and mind set on electronic billing machine system.

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APPENDICE

QUESTIONNAIRES

QUESTIONNAIRE IMPACT OF ELECTRONIC BILLING MACHINE ON TAX REVENUE COLLECTION CASE STUDY OF RRA (2020-2023)

Dear respondent,

I, MUKAMUSONI Noella student at Kigali Independent University ULK in Economics and Business Studies, Accounting department. As a requirement in partial fulfilment for the award of the above mentioned course, I am required to carry out a field research study on “Impact of Electronic Billing Machine on tax revenue collection”. therefore I request you to take a few

minutes of your precious time and answer the questions below. Your responses will be used for academic purposes only and will be treated with utmost confidentiality. Thank you.

Section A: Demographic Characteristics of Respondents

1. Marital status: single Married widow

3. Level of education:

Diploma

Bachelor's degree

Master's degree:

PhD degree:

Other (please specify): _____

5. Working experience

From 0-1 year

Between 2-4 years

Between 5-7 years

7 years and above

Part B: Questions related to the use of Electronic Billing Machine

What is your level of agreement on the statements related to the use of Electronic Billing Machine, in relation to your own experience, fill the following table using strongly agree = 1, agree = 2 and Disagree = 3 ?

Data integrity	3	2	1
6. The data provided by EBM are correct			
7. EBM provides the data on time to the RRA employees			

8. EBM provides accurate without manipulation by TAX payers			
Data confidentiality			
9. Data provided by EBM can't be accessed by everybody			
10. The data provided by EBM are only viewed by authorized viewers			
11. EBM contribute to the reduction of tax processing cost			
Audit ability			
12. With EBM, it is easy to calculate the tax to be paid by TAX payers			
13. EBM facilitate to make a follow up of tax payers			
14. EBM facilitates to detect the evasion and avoidance of tax			
Receipt specification			
15. EBM identifies and provides proof of the legality of each receipt for all types of transactions			
16. All receipts signed by EBM are instantly verifiable by revenue administrators			
17. Each receipt is verified for its authenticity			

Part C: Questions related to the importance of EBM on tax revenue collection

What is your level of agreement on the statements relate to the affect Electronic Billing Machine on TAX administration, in relation to your own experience, fill the following Table using strongly agree = 1, agree = 2 and Disagree = 3.

Cost reduction	3	2	1
18. EBM reduces expenses spent on the tax collectors			
19. EBM improved fairness of tax collection			
20. EBM help transparency of between RRA and tax payers			
Tax compliance			
21. EBM allows the fiscal authority to compare reported sales of each intermediate product with reported purchases of producers to know the tax to be paid			

22. EBM help accountancy to do good financial report which facilitate the calculation of tax to be paid			
Increase of Tax			
23. EBM facilitate transparency in tax revenue collection			
24. EBM has reduced the fraudulent activities between tax payers and RRA employees which reduced the revenue of tax collected			

Thank you for your cooperation