TAXPAYERS PERCEPTION ON ELECTRONIC BILLING MACHINE (EBMs) USAGE,

Case study of Rwanda Revenue Authority.

GASANI MPATSWE

COLLEGE OF SCIENCES AND TECHNOLOGY

SCHOOL OF ICT

MASTER OF SCIENCE IN INFORMATION SYSTEM

WITH

SPECIALIZATION IN E-GOVERNMENT

March, 2018.
TAXPAYERS PERCEPTION ON ELECTRONIC BILLING MACHINE

(EBMs) USAGE,

Case study of Rwanda Revenue Authority.

By

GASANI MPATSWE

Registration number: 217300812

A dissertation submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN E-GOVERNMENT

in the

COLLEGE OF SCIENCES AND TECHNOLOGY

Supervisor: Assistant Professor Islam Sirajul

Co-Supervisor: Dr. HANYURWIMFURA Damien

Kigali March 2018.
DECLARATION

“I do hereby declare that this research dissertation submitted in partial fulfillment of the requirements for the degree of Master of Science in E-government, at College of Sciences and Technology, University of Rwanda, is my original work and has not previously been submitted elsewhere. Also, I do declare that a complete list of references is provided indicating all the sources of information quoted or cited.

GASANI MPATSWE

Registration number: ..................

Signature: ..................................

Date: ................................./................../..................
AUTHORIZATION

Assistant Professor Islam Sirajul

In my capacity as a Supervisor, I do hereby authorize the student to submit his dissertation.

Signature: ........................................

Date: ........../........../.....................
DEDICATION

To my God who is the almighty;
My wife MUKUNDE KARANGWA Rosine;
My two children ISUGI GASANI Vanella and IMANZI GASANI Alvin;
My classmates, especially Mr. KAREBA Patrick and ISARO M. Lisa;
My cousin Mr. Roger KAMANA,
All people who have contributed to the success of this work.
ACKNOWLEDGEMENT

I am greatly thankful to my wife MUKUNDE KARANGWA Rosine for her moral support. I am grateful to the almighty God who gives me life. I sincerely acknowledge the commitment of the Administration and teaching Staff of the Orebro University and University of Rwanda to their respective duties and more especially untiring academic assistance. I extend my thanks to my Supervisor Assistant Professor Islam Sirajul and Co- Supervisor Dr. Damien HANYURWIMFURA who guided me to fulfill this research. My sincerest thanks go to Mr. Rogers KAMANA for his invaluable assistance throughout this research process. I thank all those who helped me all requirements to complete this research.

May Almighty God bless you all!
ABSTRACT

This study has to examine the various way EBM can be used to facilitate voluntary compliance and direct compliance enforcement resources to sectors with greater risk to revenues and find out the effectiveness of implementing e-taxation in Rwanda. The aim was to explore to which extent the use of EBM can improve tax declaration and recovery in the context of RRA by focusing on three aspects: the quality of service delivery, the cost and time involved in use. The study was done by using quantitative research methodology approach and the structured questionnaire were distributed to the taxpayers. The research shown that the big number of respondents used EBM (Table 4.2). The reason addressed why didn’t used EBM machine (Machine damaged and didn’t registered to VAT, Table 4.3). Also, the findings shown that the technical problems persisted for low education level (table 4.3, Graph 4.2) and take long to be resolved (Table 4.6) which create to not deliver invoice and feck invoice. The taxpayers had willing to have another technology for getting invoices because the printed invoice present some problem to keep it for long term. The use of EBM still present challenges due to lack of awareness among the taxpayers about VAT management system in place, technical problems and lack of skills.

Keywords: Paper invoice method, Electronic Billing Machine, E-taxation, Value-Added Tax, Rwanda Revenue Authority.
LIST OF SYMBOLS AND ABBREVIATIONS

**VAT**: Value-Added Tax

**EBM**: Electronic Billing Machine

**ICT**: Information and Communication Technology

**IT**: Information Technology

**CST**: College of Science and Technology

**UR**: University of Rwanda

**RRA**: Rwanda Revenue Authority

**CIS**: Certified Invoicing System

**SDC**: Sales Data Controller

**EFD**: Electronic Fiscal Devices

**GPRS**: General Packet Radio Services
# TABLE OF CONTENTS

DECLARATION .......................................................................................................................... ii
AUTHORIZATION ..................................................................................................................... ii
DEDICATION ............................................................................................................................ i
ACKNOWLEDGEMENT ........................................................................................................... i
ABSTRACT ................................................................................................................................. ii
LIST OF SYMBOLS AND ABBREVIATIONS .......................................................................... iii
TABLE OF CONTENTS .............................................................................................................. iv
LIST OF FIGURES .................................................................................................................... v
CHAPTER 1: INTRODUCTION ..................................................................................................... 1
  1.1. The background and problem ............................................................................................... 1
  1.2. Overall aim ........................................................................................................................... 2
  1.3. Specified Objectives ............................................................................................................ 2
  1.4. Research questions ............................................................................................................. 2
  1.5. Significance of the Study .................................................................................................... 2
  1.6. Scope, limitation ................................................................................................................... 3
  1.7. Subdivision of the Project .................................................................................................. 3
CHAPTER 2: LITERATURE STUDY ............................................................................................. 4
  2.1. Introduction ....................................................................................................................... 4
  2.2. Tax ..................................................................................................................................... 4
  2.3. Value-Added Tax ................................................................................................................ 4
  2.4. Electronic Billing Machine ................................................................................................ 4
  2.5. What is the purpose of EBM? ............................................................................................. 5
  2.6. Electronic Billing Machine on Revenue Collection ............................................................. 5
  2.8. Conceptual Framework ....................................................................................................... 7
  2.9. Improving VAT Compliance through Targeted EBM Data Analytics ................................. 8
  2.10. The impact of EBM on Tax Revenue ............................................................................... 8
  2.11. Tax Administration .......................................................................................................... 9
  2.12. Research Gap. .................................................................................................................. 10
CHAPTER 3: RESEARCH METHODOLOGY ............................................................................... 11
  3.1 Introduction ....................................................................................................................... 11
  3.2 Research Design .................................................................................................................. 11
  3.3 Target population ............................................................................................................... 11
  3.4 Sample size ....................................................................................................................... 11
  3.5 Data collection instruments ............................................................................................... 12
  3.6 Data .................................................................................................................................... 12
  3.6.1 Primary Data ..................................................................................................................... 12
  3.6.2 Secondary Data ............................................................................................................... 13
  3.7 Data Analysis Procedure .................................................................................................... 13
CHAPTER 4: RESULTS ................................................................................................................ 14
  4.1. Introduction ....................................................................................................................... 14
  4.2. Social demographics ......................................................................................................... 14
  4.3. Taxation Method and VAT experience EBM use ............................................................... 16
LIST OF FIGURE

Figure 1 Sample of EBM receipt .............................................................................................................7
Figure 2 Conceptual framework Model for VAT Compliance through EBMs. .......................................8
Figure 3 Reason for not using EBM. .......................................................................................................18
Figure 4 Does your EBM faced any problem due to the network or EBM system. .............................20
Figure 5 When your EBM machine is not working, how you deliver the invoice to your customers? 22
Figure 6 The technology preferred .......................................................................................................25
Figure 7 Next chosen taxation system method. .................................................................................26
LIST OF TABLES

Table 1 Social demographics. .................................................................16
Table 2 Have you ever been used EBM. ..................................................17
Table 3 Have you faced any technical problem. ......................................18
Table 4 Solution given to the problem. ..................................................19
Table 5 Taxation experience using EBM (year). ......................................20
Table 6 If yes, how long it was taken to be resolved ................................21
Table 7 Have you faced a typing error when using EBM machine. ..........23
Table 8 If yes, how it has been resolved. ..............................................23
Table 9 The quality of service delivery and cost comparison of Type of invoice. ..............................24
Table 10 The two taxation system methods which one is faster than another in VAT declaration and recovery? .................................................................25
CHAPTER 1: INTRODUCTION

1.1. The background and problem

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 invoices 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 & Ezejiofor, 2014). 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 compliance (http://www.rra.gov.rw/rra_article1035.html).

The responsibility of tax administrators 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 uses mobile phone network to directly send any transaction data in real time.
As such, EBMs can achieve improved monitoring of firms’ VAT obligations (Steenbergn, 2007). 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. Overall aim
The aim of this study is to explore to which extent the use of EBM can improve tax recovery procedures in the context of Rwanda Revenue Authority. More specifically, the study will examine the various way EBM can be used to facilitate voluntary compliance and direct compliance enforcement resources to sectors with greater risk to revenues.

1.3. Specified Objectives
The specific objectives are the following:
To analyze the effectiveness of using EBM.
To assess the usage of EBM by category of businesses (Good and services).
Identify challenges of EBM usage.
To suggest IT solutions that can overcome those challenges.

1.4. Research questions
What is the real taxpayers’ perception on EBM Machine? The study was conducted to provide an answer to this general question.
Specifically, the following questions are addressed by the study.
Does EBM usage more effective than paper invoice in VAT recovery and declaration?
In which category of business EBM is more effectively used?
Which problems are faced by taxpayers in using EBM machine?
Could think that IT services can overcome challenges faced by taxpayers in usage of EBM?

1.5. Significance of the Study
The study is significant to the researchers, Rwanda Revenue Authorities, taxpayers and policy maker. The study will provide to the researchers the deep knowledge or understand on how the electronic billing machine influences revenue collection when it’s well implemented. To Rwanda Revenue authorities it will improve on the revenue collection hence effective and efficient service delivery in the country when it will adopt IT solutions provided by the study. To the taxpayers it will help them to pay taxes in convenient and appropriate mood even with their customers. To the Policy makers, they will be able to make law which will favor the use of EBM hence encouraging tax administration efficiency and effectiveness.
1.6. Scope, limitation

The scope was subdivided into subject scope, geographical and time scope. The study surveyed the efficient of usage of electronic billing machine in the implementation of e-taxation system on VAT collection on Rwanda Revenue Authority. This research will be conducted to examine the efficient of the EBM in terms of providing IT solutions to satisfy taxpayer’s service delivery since Electronic Billing Machine has been introduced in revenue collection in Rwanda. It focuses on Rwanda revenue authorities’ and two district Gasabo, Ngoma tax payer’s perspective.

1.7. Subdivision of the Project

This study is subdivided in 6 main chapters and each chapter has also its sub-chapters.

The following are those main parts:

Chapter one (Introduction): This part contains background and problem of the study, aim and objectives, research question, scope and limitation of the study, and subdivision of the project.

Chapter two (Literature review): This part relates different researches previously done on the current study, theoretical reviews and research gaps.

Chapter three (Methodology): This part shows a short introduction to this chapter and shows in detail the way the study will be conducted. It is comprised of study area, study design, study population, study sample, sampling strategy, questionnaire and data collection methods, data Analysis procedures, problems and limitations of the study and ethical considerations.

Chapter four Results: This part shows the results obtained after the analysis Chapter five Discussions: This part shows the discussions in relation with the study relevant literature and objectives.

Chapter six (Conclusion and Recommendations): This part summarizes the key findings of the study and describes recommendations from the study for the future researches.
CHAPTER 2: LITERATURE STUDY

2.1. Introduction
This Chapter review of literature that has been arranged according to the themes derived from the specific objectives and research questions. This Chapter looks at some works and thoughts of some scholars and writers about Electronic Billing Machine (EBM). This chapter discusses literature related to the study variables and focuses on the use of Electronic Billing Machine (EBM) in different countries that had adopted this method with their success and failure stories. It will analyze empirical studies on the Electronic Billing Machine (EBM) as a tool for efficient way of implementing e-taxation system in Rwanda. Lastly it will also provide research gap and conclusion of the Chapter Clients produce invoice easily by use of EBM easily by use of EBM and EBM become user-friendly with the clients.

2.2. Tax
There are numerous definitions of tax. They emphasize on its characteristics and functions. According to (CARLOS A. AGUIRRE and PARTHASARATHI SHOME) defined (SHOME, n.d.) Tax as a compulsory contribution imposed on persons, corporate bodies as well as goods and services. Taxes therefore generate revenue to government to enable her meet its traditional responsibilities of maintaining law and other, general administration and other obligations of providing social and infrastructural facilities to aid economic welfare and development of a country (SHOME, n.d.). But our research will be focused on value-added tax using electronic billing machine.

2.3. Value-Added Tax
Value-added tax is a tax on the supply of good 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 will be virtually impossible to evade (Olaoye Clement Olatunji, 2009).

2.4. Electronic Billing Machine
An Electronic Billing Machine comprises of two components, a Certified Invoicing System (CIS) and a Sales Data Controller (SDC). If business doesn’t have Electronic Billing Machine in
place by the announced deadline, it could face a substantial fine. Upon the public announcement, every business registered for VAT will have to provide a customer with a special receipt issued through Electronic Billing Machine for every sold good or service. The groups of taxpayers which must have a special device installed on its premises to record every sale will be announced by Public Notice, as installation will be carried out in phases. By end of each phase, the law will apply to every newly business registered for VAT in Rwanda. (Zaburi, 2014).

2.5. What is the purpose of EBM?
Besides combating tax evasion and corruption, Electronic Billing Machine will provide a market balance and make equal business opportunities for every entrepreneur. Rwanda Revenue Authority knows that most businesses are not paying its full taxes and to prove that fact auditors often spend countless hours investigating and going over massive documentation which causes disruption in operations of both honest taxpayers and those who evade tax on purpose. Thanks to this affordable technology VAT paid by the citizens and businesses will be instantly recorded and the audit itself will become much simpler. Our ambition to increase budget goes to the benefit of all citizens who will eventually enjoy better social programs, and the money for that will be coming from your VAT. (Zaburi, 2014).

2.6. Electronic Billing Machine on Revenue Collection
Generally, 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 (KAMANA, 2016)
Rwanda has decided to introduce legislation which will help businesses to keep their books properly and protect honest taxpayers from unfair competition where EBM have used as a tool 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 (Eissa, Zeitlin, Karpe, & Murray, 2014). And the new law is specifically designed to help to combat tax evasion because every registered machine records all transactions and indicates Value Added Taxes expected to be remitted to government coffers as it has been succeeded in different countries such as Sweden, Germany, Greece, Ethiopia and Kenya even in other richest countries around the world. (http://www.rra.gov.rw/rra_article1035.html).

2.7. How does Electronic Billing Machine work?
A sales Data Controller (SDC) record every transaction received from Certified Invoicing System (CIS), and then ensures that electronic signature on the receipt is printed. The signature is verifiable by Rwanda Revenue Authority officers using a special decryption tool which is unique for every installed SDC device; therefore, any falsification of the signature can be immediately detected.

The SDC itself was carefully designed to be secure and tamper-proof. Rwanda Revenue Authority auditors can access any SDC and quickly detect missing taxes. Electronic Billing Machine are designed to suite every business environment. If taxpayer already own invoices processing equipment, they must make sure if their system is compatible with requirements, as soon as possible. Asking a vendor about the compatibility is the first step. The requirements and the testing method are provided by RRA. (Zaburi, 2014). The figure below, shows the identification of a valid receipt.
**Figure 1** Sample of EBM receipt

Source: Rwanda Revenue Authority, “Electronic Billing Machines; Presentation for Foreign Visitors” (Eissa et al., 2014).

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Most authors argued that the best way to use EBMs to improve VAT compliance is to introduce them alongside two complementary interventions (Figure 2.2).

The researcher believes that electronic billing machine system which comprises of EBM problem audits (technical knowhow and network availability, Educational and culture or attitude problems) and targeted data analytics that identify irregular of EBM patterns improves efficiency in Reinforce EBM usage for high- risk, non-complying firms through service delivery, time and cost effectiveness in tax recovery and declaration. This depends on network availability and taxpayer’s attitude towards the system.
2.9. Improving VAT Compliance through Targeted EBM Data Analytics.
It has been noted that, receipts audits are often difficult to target, and their effects tend to be temporary, so that noncompliant firms will quickly move back to their old ways when they feel the revenue authorities have stopped monitoring. For this reason, it is key to use targeted data analytics to automatically identify ‘irregular’ EBM patterns (e.g. in terms of receipt issuing, discrepancies between buyers and sellers, and suspicious item pricing). This could help flag out all three forms of VAT non-compliance. To initiate EBM data analytics, it may be important to start small and gradually seek to expand the number of functionalities.

2.10. The impact of EBMs on Tax Revenue
Researcher reported that it is helpful to consider the case of introducing EBMs in Rwanda. Eissa et al (2014) provide one 8 the first rigorous evaluations of EFDs on tax revenue, and the only to our knowledge that tries to identify the way in which such EFDs influence tax compliance. In
August 2013, Rwanda adopted a new law that stated that all businesses registered for VAT must provide customers, at each sale, a certified VAT receipt generated by a third-generation EFD: the Electronic Billing Machine, which contains a Sales Data Controller (SDC) with GPRS and a Certified Invoicing System (CIS) all working together. This must be purchased from a Rwanda Revenue Authority (RRA)-approved vendor and activated by the RRA.

More researchers like Steenbergen, (2017) as his work conducted that was aimed to address what it considers a critical tax policy question for developing countries: how best to improve compliance for Value Added Taxes (VAT) using Electronic Billing Machines (EBMs). In his context, there was a notice that a question is critical because improving VAT compliance is arguably the core priority of tax authorities in developing countries due to its immediate promising tax yields, and because EBMs are often the primary tool identified for achieving such VAT compliance. Also (Steenbergen, 2017) mentioned that “The case of Rwanda further shows that EBMs alone do not have a large impact on VAT compliance because they do not form a true third-party reporting system: firms can still choose not to comply by not issuing EBM receipts”. In his view, as remarks coined that to date, the overall effect of EBMs on tax yields has been disappointing. And, he argued that this is primarily because EBMs do not offer a true third-party tax reporting mechanism (such as is often the case for employer-reported wage income), because firms can choose not to use EBMs to issue receipts or choose to issue false receipts. Again, argued that EBMs still offer an important mechanism for compliance by producing the necessary data to ‘spot’ EBM non-compliance. To ensure that taxes are collected efficiently and reduce opportunities for corruption, a generally accepted principle is that tax authorities should not handle money directly. Ideally, tax officials should have little direct contact with taxpayers and so less discretion in deciding how to treat them E-filing is also easy, flexible and convenient for taxpayers. E-filing makes it possible to file returns from a taxpayer’s home, library, financial institution, work place, tax professional’s business or even stores and shopping malls. (Geetha and Sekar, 2012).

2.11. Tax Administration

Most authors have reported that the paramount objective of any tax administration is to encourage, facilitate, attain, and maintain a high degree of self-assessment and voluntary compliance by taxpayers with their tax obligations. A high degree of voluntary compliance in
any country allows the tax administration to concentrate its resources on identifying and dealing effectively with those taxpayers who fail to fully comply with their tax obligations. Without a doubt, the most successful tax administrations around the world continuously encourage, attain, and maintain a high degree of voluntary compliance (Jacobs, 2013)

As commented by (Emmanuel Ndayisenga, 2016) that RRA and clients should subscribe to reliable internet providers for effective and efficient service delivery. And also, RRA should employ skilled personnel with more experience on network management in order to ensure the reliability of network. But researcher has noted forgotten to note that RRA management should ensure that there is country wide training to clients on usage of various e tax applications for efficient revenue collection. Also, the same remarks that RRA management should keep on upgrading their e tax technology in order to have an up to date system for effective service delivery due to researcher conducted saying that EBM should be provided to different business enterprises across the country for easily accessible by customers, so that quick service and convenience is maintained hence improving revenue collection. At the same time constantly serviced should be ensured to provide reliability of the services. Notably that Constant power back up should be ensured on order to solve the problems of power interruptions and fluctuations.


From the above literature review, the researcher tries to gap from the above literature based on the review, the researcher has never come across similar study in Rwanda i.e. Taxpayers’ on The Electronic Business Machine (EBMs), however, he has come across with comparable studies in other African countries. Thus, the research gap was that, those studies were carried out in countries other than Rwanda. This was the motive behind the study. Therefore, the researcher noticed that many works on EBM are available but relied on IT solutions 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 of 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 will be able to apply EBM with a maximum accuracy.
CHAPTER 3. RESEARCH METHODOLOGY

3.1 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.

3.2 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 was a cross-sectional study where the quantitative study involved the use of numbers to assess information, which information was later analyzed using statistical analysis.

3.3 Target population.
The target population is including both services and goods business category taxpayers in NGOMA and GASABO districts using electronic billing machine. They total up to 106 respondents.

3.4 Sample size
When it is not possible to study an entire population, but the population is known, a smaller sample is taken from strata by purposive and stratified sampling technique. Richard, William& R. Lyman 011 formula allows a researcher to sample the population with a desired degree of accuracy. Richard, William & Lyman’s 011 formula was used to calculate the sample size. The Richard, William& Lyman’s 011 formula is calculated as follows:

\[
 n = \frac{z^2 r(1-r)k}{e^2}
\]

Where:

(1)
n = Sample size in terms of number of domestic taxes to be selected.

z = z-statistics corresponding to the level of confidence desired. The commonly used level of confidence is 95% for which z is 1.96.

k = Factor accounting for non-response. Domestic taxes payers using electronic billing machine are not selected using replacement. Thus, the final number of domestic taxes payers using electronic billing machine interviewed will be slightly less than the original sample size eligible for interviewing. For most developing countries, the non-response rate is typically 10% or less. So, a value of 1.1 (= 1 + 10%) for k would be conservative.

e = Margin of error, sampling errors or level of precision. It depends very much on the size of the sample, and very little on the size of the population (10%).

Using the information describe above the minimum sample size needed for this study is:

\[ n = \frac{1.96 \times 0.5(1 - 0.5) \times 1.1}{0.10^2} = 106 \], domestic taxes payers using electronic billing machine.

3.5 Data collection instruments

In this study, the researcher there are various methods used to collect data which includes interviews, questionnaires or participant observation. Each method has its own advantages and disadvantages. According to Judd (1991) said that a questionnaire is reasonable in data collection mainly because; it enables the researcher to collect large amount of data within a short time period, it also provides opportunity for respondents to give forthright, anonymous answers. The questionnaires were designed for the RRA taxpayers; it included both open and closed ended set of questions that to be answered. The questionnaire was written in a simple and clear language for the respondent to feel free while answering.

3.6 Data

There are two types of data, that is, primary and secondary which can be used by researchers while the study. In this study, the researcher used both data, i.e. primary and secondary.

3.6.1 Primary Data

Primary data is expensive to collect but it is important as it is possible to formulate structured
and unstructured questionnaires that focus on the study topic. This study relied mainly on the data collected through questions as its source of primary information. The information is crucial to the research project as it specifically addresses issues of interest to the study area.

3.6.2 Secondary Data
Secondary data is data gathered and recorded by someone else prior to the current project. It is not primarily intended for the study under review. In this study, the researcher used some reports published especially on EBM usage.

3.7 Data Analysis Procedure
Quantitative data were verified, compiled, coded and summarized before carrying out quantitative analysis based on objectives stated. SPSS and MS Excel were employed as a tool for data coding and analysis. Value judgments were used to analyze qualitative data collected whereas conclusion was driven out of logical analysis of the data.
CHAPTER 4: RESULTS

4.1. Introduction
In this Chapter, the results and discussions of findings of the study were analyzed using SPSS version 21 Data Analysis and Statistical Software. This study was done with the aim of exploring in which extent the use of EBM can improve tax recovery procedures in the context of Rwanda Revenue Authority, with the target of examining the various way EBM can be used to facilitate voluntary compliance and direct compliance enforcement resources to sectors with greater risk to revenues by comparing two taxation system methods, EBM and paper Invoicing method, in terms of quality of service delivery, cost involved in two taxation systems, time involved for in use of both systems and technical problems faced by EBM system. The data were presented and described by means of tables and charts. The data presentation is also based on the questionnaire used for information gathering. Demographic data for Sex, Age, education qualification and business categories were based upon the total sample size of 106 respondents who provided complete data. These descriptive statistics are presented in frequency distribution tables for each demographic variable.

4.2. Social demographics

Sex
Respondents were asked to indicate their gender. In this study, 66% of the respondents were male and 34% were Female. No respondent did not complete this question (See Table 4.1).

Age in Years
Respondents were asked to indicate their age, according to 10-years ranges. They could indicate 20 -30, 31-40, 41-50, 51-60. In this study, the majority of respondents (41 individuals) was reported being in the 31-40 age group. This represented 38.7 percent of 106 total respondents. The 20-30 age group and the 41-50 age group represented 37.7% and 18.9% of the respondents respectively. Three individuals identified themselves with the 51 and above age group which represented 4.7% of all respondents. No participant fell within the 56 and above age group. (See Table 4.1)
**Education qualification**

Respondents were asked to indicate their education level. In this study, 19.8% of the respondents were alphabet (No education level), 23.6% were Primary level, 28.3% were secondary level and 28.3% were university level. No respondent did not complete this question. (See Table 1).

**Business categories**

According to the category of business the respondents were doing. In this study, 106 of the respondents, 69.8 were doing business of goods and 30.2% were doing business in services. No respondent did not complete this question. (See Table 1).
Table 1 *Social demographics.*

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
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</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Age of respondents</strong></td>
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</tr>
<tr>
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<tr>
<td>31-40 years old</td>
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<td>5</td>
<td>4.7</td>
<td>4.7</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>education qualification</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>21</td>
<td>19.8</td>
<td>19.8</td>
<td>19.8</td>
</tr>
<tr>
<td>Primary</td>
<td>25</td>
<td>23.6</td>
<td>23.6</td>
<td>43.4</td>
</tr>
<tr>
<td>Secondary</td>
<td>30</td>
<td>28.3</td>
<td>28.3</td>
<td>71.7</td>
</tr>
<tr>
<td>University</td>
<td>30</td>
<td>28.3</td>
<td>28.3</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Business category</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goods</td>
<td>74</td>
<td>69.8</td>
<td>69.8</td>
<td>69.8</td>
</tr>
<tr>
<td>Services</td>
<td>32</td>
<td>30.2</td>
<td>30.2</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

4.3. Taxation Method and VAT experience EBM use

Respondents were asked to indicate whether they have ever participated in use of EBM or not. Of 106 respondents in this study, 95.3% of the respondents had participated in use of EBM and 4.7% did not participate (See Table 2). When we compared with level of education, the EBM are more frequently used by those with high education.
Table 2 Have you ever been used EBM.

<table>
<thead>
<tr>
<th>Education</th>
<th>Used EBM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>None</td>
<td>15.1</td>
</tr>
<tr>
<td>Primary</td>
<td>23.6</td>
</tr>
<tr>
<td>Secondary</td>
<td>28.3</td>
</tr>
<tr>
<td>University</td>
<td>28.3</td>
</tr>
<tr>
<td>Total</td>
<td>95.3</td>
</tr>
</tbody>
</table>

Reason of not using EBM

Respondents who had not used EBM were asked to indicate the reason why they did not used EBM. Of 5 participants who have not used EBM system method in taxation in this study, 40% respondents have indicated that the EBM has been damaged, 60% respondents have indicated that their businesses was not registered in TVA to get EBM. (See figure 3).
**Technical problem.**

Respondents were asked to indicate whether they have ever faced technical problem in use of EBM or not. Of 103 respondents in this study, 68.9% of the respondents had faced technical problem in use of EBM and 31.1% did not faced any problem. The respondents with high education level faced less technical problem than those with low education level as well.

(See Table 3).

**Table 3 Have you faced any technical problem.**

<table>
<thead>
<tr>
<th>Education</th>
<th>Faced any technical problem</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Count</td>
<td>21</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>100</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Primary</td>
<td>Count</td>
<td>25</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>100</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Secondary</td>
<td>Count</td>
<td>20</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>66.7</td>
<td>33.3</td>
<td>100</td>
</tr>
<tr>
<td>University</td>
<td>Count</td>
<td>7</td>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>23.3</td>
<td>76.7</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>73</td>
<td>33</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>68.9</td>
<td>31.1</td>
<td>100</td>
</tr>
</tbody>
</table>
Solution given to the problem.
Respondents who had faced technical problem in use of EBM were asked to indicate how the solution has been provided. Of participants who faced technical problem in use of EBM in this study, 57.5% respondents have indicated that the EBM have been replaced, 42.5% respondents have indicated that they got support from RRA staff. And regarding their level of education, the respondents with high education level are easily getting support from RRA staff and their option of replacing are very low than others with low education level (See Table 4).

Table 4 Solution given to the problem.

<table>
<thead>
<tr>
<th>Education</th>
<th>Solution given to the problem</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Replaced</td>
<td>Support from RRA</td>
</tr>
<tr>
<td>None</td>
<td>76.2</td>
<td>23.8</td>
</tr>
<tr>
<td>Primary</td>
<td>88.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Secondary</td>
<td>20.0</td>
<td>80.0</td>
</tr>
<tr>
<td>University</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>57.5</td>
<td>42.5</td>
</tr>
</tbody>
</table>

Taxation experience using EBM.
Respondents were asked to indicate the number of years they had participated in use of EBM e-taxation system. Responses ranged from 1 to 4 years of experience. The highest percentage of respondents fell within the 1 year of experience and 56.3% percent of total respondents. Respondents who had participated in EBM taxation system for 2 years made 22.3 percent of total respondents. Respondents who had participated in the use of EBM taxation system for 3 years were 16.5 percent of total respondents. Respondents who had participated in the EBM taxation system for 4 years or less made up 4.9 percent of total respondents. The business category that represent the big numbers of taxation experience in using EBM are business of goods. (See Table 4.5).
Table 5 Taxation experience using EBM (year).

<table>
<thead>
<tr>
<th>Business Category</th>
<th>Taxation Experience using EBM (year)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Goods</td>
<td>38.8</td>
<td>14.6</td>
</tr>
<tr>
<td>Services</td>
<td>17.5</td>
<td>7.8</td>
</tr>
<tr>
<td>Total</td>
<td>56.3</td>
<td>22.3</td>
</tr>
</tbody>
</table>

Respondents faced network or EBM system.
Respondents were asked to indicate whether they have ever faced network or system problem in use of EBM or not. Of respondents in this study, 89% of the respondents had faced problem in use of EBM and 11% did not faced any problem. (See Figure 4).

Figure 4 Does your EBM faced any problem due to the network or EBM system.

The time taken to resolve problem.
Respondents were asked to indicate the time taken to resolve EBM network or system problem. Responses ranged from 1 to 5 hours. Of respondents got problem, the highest percentage of respondents fell within the 2 hours of time and 37% percent of total respondents. Respondents who had got EBM network or system for 1 hour made 26.1 percent of total respondents. Respondents who got EBM network or system for 3 hours were 21.7 percent of total respondents. Respondents who had got EBM network or system for 4 were 12 percent of total
respondents. Respondents who got support from RRA staff in 5 hours with percentage of 3.3% with less frequencies comparing with other respondents (See Table 6).

**Table 6 If yes, how long it was taken to be resolved**

<table>
<thead>
<tr>
<th>Time (hours)</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24</td>
<td>26.1</td>
</tr>
<tr>
<td>2</td>
<td>34</td>
<td>37.0</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>21.7</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>12.0</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>3.3</td>
</tr>
</tbody>
</table>

**The replacement of EBM when not working.**

Respondents who had faced problem when EBM not working were asked to indicate how the invoices are delivered to customers. Respondents who deliver invoice when EBM not working in this study, 76.09% respondents have indicated that no invoice were delivered to customers when EBM not working. 23.91% respondents have indicated that they were delivered paper invoice. (See Figure 5).
**Figure 5** When your EBM machine is not working, how you deliver the invoice to your customers?

<table>
<thead>
<tr>
<th>No invoice delivery to customers</th>
<th>Paper Invoice</th>
</tr>
</thead>
<tbody>
<tr>
<td>76.09</td>
<td>23.91</td>
</tr>
</tbody>
</table>

**Typing error.**

Respondents were asked to indicate whether they have ever faced a typing error in use of EBM or not. Respondents in this study, 36.3% of the respondents had faced a typing error in use of EBM and 63.7% did not faced any typing error. By regarding to the level of education, the high level of education presents small number of errors in typing (See Table 7).
Table 7 Have you faced a typing error when using EBM machine.

<table>
<thead>
<tr>
<th>Education</th>
<th>Have you faced a typing error when using EBM machine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>None</td>
<td>88.9</td>
</tr>
<tr>
<td>Primary</td>
<td>61.5</td>
</tr>
<tr>
<td>Secondary</td>
<td>13.3</td>
</tr>
<tr>
<td>University</td>
<td>16.7</td>
</tr>
<tr>
<td>Total</td>
<td>36.3</td>
</tr>
</tbody>
</table>

The solution due to the typing error.

Respondents who had faced typing error in use of EBM were asked to indicate how the solution has been provided. Respondents who faced typing error in use of EBM in this study, 60% respondents have indicated that they got support from RRA technical support, 33.3% respondents have indicated that they negotiated with customers and 6.7% of respondents they didn’t get any support it means they didn’t care about it. (See Table 8).

Table 8 If yes, how it has been resolved.

<table>
<thead>
<tr>
<th>Education</th>
<th>RRA technical Support</th>
<th>Negotiation with customer</th>
<th>Live it</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>68.8</td>
<td>25.0</td>
<td>6.3</td>
<td>100</td>
</tr>
<tr>
<td>Primary</td>
<td>50.0</td>
<td>40.0</td>
<td>10.0</td>
<td>100</td>
</tr>
<tr>
<td>Secondary</td>
<td>75.0</td>
<td>25.0</td>
<td>0.0</td>
<td>100</td>
</tr>
<tr>
<td>University</td>
<td>60.0</td>
<td>40.0</td>
<td>0.0</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>60.0</td>
<td>33.3</td>
<td>6.7</td>
<td>100</td>
</tr>
</tbody>
</table>

4.4. Taxation methods comparison.
Cost Comparison and quality of service delivery
Respondents were asked to compare the quality of service delivery using each of the taxation system methods EBM and paper invoice. Respondents who responded to those questions, 90.29% and 33.01% indicated that taxation system method using EBM in quality service delivery and cost respectively. Conversely, 9.71% and 58.25 indicated that paper invoice method in quality service delivery and cost respectively. 0% and 8.74% didn’t know. (See Table 9).

<table>
<thead>
<tr>
<th>Type of Invoice</th>
<th>The quality of service delivery</th>
<th>Cost comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBM system method</td>
<td>90.29</td>
<td>33.01</td>
</tr>
<tr>
<td>Paper invoice system method</td>
<td>9.71</td>
<td>58.25</td>
</tr>
<tr>
<td>Don't know</td>
<td>0</td>
<td>8.74</td>
</tr>
</tbody>
</table>

Table 9 The quality of service delivery and cost comparison of Type of invoice.

Time used in VAT recovery and declaration.
Respondents were asked to compare the time taken in using each of the taxation system methods in VAT recovery and declaration. Respondents who responded to this question, 50.4% indicated that EBM method used very short time, 46.1% short time, 1.2% long time, 2.3% very long time in VAT declaration and recovery. While respondents indicated that in VAT declaration and recovery paper invoice used 0.5% very short, 23.2% short time, 20% long time and 56.3% very long time. It means that EBM system method is faster than paper invoice in VAT declaration and recovery (See Table 10).
Table 10 The two taxation system methods which one is faster than another in VAT declaration and recovery?

<table>
<thead>
<tr>
<th>VAT declaration methods</th>
<th>Time used in VAT recovery and declaration</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>very short</td>
<td>short</td>
</tr>
<tr>
<td>EBM system method</td>
<td>50.4</td>
<td>46.1</td>
</tr>
<tr>
<td>Paper invoice declaration</td>
<td>0.5</td>
<td>23.2</td>
</tr>
</tbody>
</table>

4.5. Overcome technologies

Next invoice option

Respondents were asked to indicate whether they can prefer another technology of getting invoice when using EBM or not. All respondents preferred another technology for getting invoice. 47.47% responded that they can prefer getting invoice through telephone. 2.91% prefer getting it through e-mail and 49.51% prefer both technology (telephone and e-mail) (See Figure 6).

![The technology preferred](image)

Figure 6 The technology preferred

Next choice comparison

Respondents were asked to make a choice of the next Taxation system became one of the decision makers participating in taxation system method. Respondents who responded to this
question, 82% have chosen EBM; conversely, 18% have chosen Paper invoice. (See Figure 7).

**Figure 7 Next chosen taxation system method.**

![Pie chart showing chosen taxation system method]
CHAPTER 5: DISCUSSIONS

5.1. Introduction.
This chapter discusses the findings of this study which involved 106 respondents from Ngoma and Gasabo districts taxpayers. The order of the discussion is as follows based on the study objectives: Firstly, analyze the effectiveness of using EBM. Secondly, assess the usage of EBM by category of businesses. Thirdly, identify challenges of EBM usage. Fourthly, Suggest IT solution that can overcome challenges.

5.2. Analyze the effectiveness of using EBM
In this study almost, all participants (95.3% from Table 2) have participated in EBM taxation activities. This is because those who did not use EBM in their businesses because theirs machine has been damaged and others are not registered in VAT (From Figure 3).

5.3. The usage of EBM by category of businesses (Good and services).
In this study, a big number (69.8% from Table 1) of respondents are practicing the business of Goods and 30.2% there are doing business of services. This has a relationship with the fact that taxpayers are employing a big number (38.7% from table 1) of taxpayers ranging from 31 to 40 years old and the big number of taxpayers are male (66% from table 1).

5.4 Identify challenges of EBM usage.
Technical problem: In this study, 68.9% (From Table 3) of respondents who answered this question faced technical problem and 31.1% didn’t faced problem. when faced technical problem 57.5% replacing the machine and 42.5 getting support from RRA (from Table 4).
Network and EBM system problem: In this study, 89% (From Figure 4) of respondents who answered this question faced network and system problem and 11% didn’t faced problem. when faced network and system problem, the time taken to be resolved is still long (from Table 4) and when the EBM is not working cause to deliver paper invoices (23.91%) and not deliver EBM invoices 76.09% (from Figure 5).
5.5. IT solutions that can overcome those challenges.

Technology preferred: In this study, (From Figure 6) respondents who answered this question preferred another technology for delivering invoices as well as electronic invoice. 47.57% preferred delivering invoice through telephone, 2.91% through email and 49.51% through both options (Telephone and email).

Next choice comparison: In this study, respondents were asked to make a choice among the two-taxation method for the next taxation activities if they were given an opportunity to became one of decision makers. 82% of participants (From Table 3) have chosen to use EBM against 18% who have chosen to use paper invoice or traditional method.
CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

This study has to explore to which extent the use of EBM can improve tax recovery procedures in the context of Rwanda Revenue Authority and to examine the various way EBM can be used to facilitate voluntary compliance and direct compliance enforcement resources to sectors with greater risk to revenues, based on three factors, the quality of service delivery to taxpayers, the cost involved for taxpayers in use and the time consumed while VAT declaration and recovery. The results of this study show that EBM method is the best one when it is compared to paper invoicing method, since it presents good service delivery quality (see Table 4.9), it is cheaper when used in long term (see Table 4.9) and it is faster than paper invoicing system in VAT declaration and recovery (see Table 4.10). Even if the EBM system is faster than paper invoice but still present some challenges due to lack of awareness among the tax payers with low education level about VAT management system in place (see Graph 4.2), technical problems (see Table 4.3) and lack of skills especially among the tax payers on how to use the system. Which accelerate provision of the feedback to the RRA staff (see Table 4.6). The taxpayers had willing to have another technology for getting invoices because the printed invoice present some problem to keep it for long term.

6.2. Recommendations.
Given the advantages of EBM system method, when compared to paper invoicing system method for taxpayers, I 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.
This study was conducted at two districts (Ngoma and Gasabo) only and may not be indicative of responses from other districts of Rwanda. I would suggest future study to collect data from
different districts of Rwanda and make the same study for the whole the country. This study was conducted during a limited time. It would be more advantageous if it was given enough time for gathering more ideas from different informants.

### 6.3 Areas of further studies
Researcher has 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 taxation Management.
- Effect of technical knowhow on Electronic Taxation system.
- Effect of low education level and mindset on Electronic Taxation system.
REFERENCES


APPENDICES
QUESTIONNAIRE

Directions: The questionnaire is divided two: social demographics data of respondents and specific objectives. Please tick the response that you think is most appropriate to each question and indicates your response in the space provided. Tick whichever is applicable to you:

SOCIAL DEMOGRAPHICS DATA

1. Are you Male or Female?
   1. Male
   2. Female

2. What is your age? (Tick appropriately)

3. Educational qualification:
   1. None
   2. Primary
   3. Secondary
   4. University
   5. Others specify

4. Business categories
   Goods
   Services

GOODS [ ]
SERVICES [ ]
12, 20

SPECIFIC OBJECTIVE 1: THE GREATEST RISK TO REVENUES BY PRESENTING THE FACTORS THAT LEAD TO TAX NON-COMPLIANCE RISK

5. Have you ever been used EBM?
1. Yes
2. No

6. If no, why not used it?
   1. Damaged
   2. My business is not currently registered in EBM

7. Have you faced any technical problem?
1. Yes
2. No

8. If yes, how have you resolve it?
   1. Replaced
   2. Support from RRA

9. Taxation experience using EBM

10. Does your EBM faced any problem due to the network or EBM system?
    1. Yes
    2. No

11. If yes, how long it was taken to be resolved?

12. When your EBM machine are not working, how you deliver the invoice to your customers?
    1. No invoice delivery to customers
    2. Paper invoice
13. Have you faced a typing error when using EBM machine?
   1. Yes
   2. No

14. If yes, how it has been resolved?
   1. RRA technical Support
   2. Negotiation with customer
   3. Live it

SPECIFIC OBJECTIVE 2&3: THE USAGE OF EBM EFFECT AND CHALLENGES IN THOSE IDENTIFIED AREAS

15. Can you rate the quality of service delivery using paper invoice system method?
   1. Very good
   2. Good
   3. Uncertain
   4. Bad
   5. Very bad
   6. Don’t know

16. Can you rate the quality of service delivery using EBM system method?
   1. Very good
   2. Good
   3. Uncertain
   4. Bad
   5. Very bad
6. Don’t know

17. Among the two Taxation system methods which one has a good service delivery quality?
1. EBM system method
2. Paper Invoice system method
3. Don’t know

18. Among the two Taxation system methods which one is cheaper than another?
1. EBM system method
2. Paper invoice system method
3. Don’t know

19. Can you rate the time used when service delivery or VAT declaration using Paper invoice system method?
   Very short
   Short
   Moderate
   Long
   Very long
   Don’t know

20. Can you rate the time used when service delivery or VAT recovery using EBM system method?
   1. Very short
   2. Short
   3. Moderate
   4. Long
   5. Very long
   6. Don’t know

21. Among the two taxation system methods which one is faster than another in VAT declaration?
1. EBM system method
2. Paper invoice declaration system method
3. Don’t know

SPECIFIC OBJECTIVE 4: IT SOLUTIONS THAT CAN OVERCOME THE CHALLENGES

22. Can you prefer another option of getting invoice?
   1. Yes
   2. No

23. Which one can be chosen?
   1. through Telephone
   2. through E-mail
   3. Both options

24. If you were given an opportunity to become one of the decision makers, involving in taxation system, which method would you recommend using?
   1. EBM system method
   2. Paper invoice declaration system method
   3. Other (specify) ……………………