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Effect of Innovative Technology on Revenue Collection in South Nyanza County Governments, Kenya

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ABSTRACT: *After the enactment of Kenya's new constitution in the year 2010, a lot of public services were delegated to the County governments. Ideally, the county governments should finance their operations. However, almost all Counties suffer from inadequate financial resources to carry out their functions. This has been attributed to poor revenue collections. The main objective of this study, therefore, was to establish the effects of innovative technology on revenue collection in the South Nyanza region counties of Kisii, Migori, Homabay, and Nyamira County Governments. Specifically, the study aimed at answering; what is the effect of mobile money, electronic billing, online banking, and electronic receipting on revenue collections in County Governments of the South Nyanza region? Anchoring on the technology acceptance model, the study used a descriptive research design with a sample of 352 from a target population of 720 respondents. Data was collected using questionnaires. The study used random sampling to select revenue collection officers, and tax and revenue managers at the selected county governments as respondents. Before data collection, the study did a pilot study in Narok County to test the reliability of the questionnaires using the Cronbach Alpha test. The data collected was analyzed descriptively followed by multiple regression analysis. The study found that there was a positive and significant ($\beta = .415$, p-value = .0001<.05) relationship between mobile money and revenue collection. Secondly, the study found a positive and significant ($\beta = .172$, p-value = .0001<.05) relationship between e-billing and revenue collection. Further the study established a positive and significant ($\beta = .092$, p-value = .0044<.05) relationship between online banking and revenue collection. Lastly, the study reported a positive and significant ($\beta = .360$, p-value = .0001<.05) relationship between e-receipting and revenue collection. The study concluded that innovative technology (mobile banking, e-billing, online banking and e-receipting) positively influence collection of revenue collection in South Nyanza Counties. The study recommended that from the findings and conclusions, the study recommends that the revenue management or administration of South Nyanza Counties of Kisii, Nyamira, Homabay and Migori should formulate policies to help ensure costs of revenue collections remains low. They should do cost benefit analysis of innovative technologies in revenue collection like mobile money in revenue collections to ensure that they don't cost too much and eat into* *their revenue collections. The counties should also make policies aimed at using innovative technologies like e-billing to aid in revenue planning. Thirdly, the revenue administration team should ensure that there are adequate policies that guides use of innovative technologies like online banking, mobile money, e-billing and e-receipting can aid them in better audit of their revenues.*

KEYWORDS*:* innovative technology; mobile money; electronic billing; online banking; electronic receipting; revenue collection.

INTRODUCTION

Collection of revenue is one of the mandates the government must ensure that the various financial obligations are met timely. This is done through collection from the public by the revenue department of the government or its agencies. Revenue comes in the form of fees, tax, fines, and use of the government's facilities among other sources. Various government agencies are mandated to collect revenues that they are constitutionally mandated to have. Since the enactment of the new constitution in Kenya in 2010, the county governments are entitled to collect cess, fees from permits, and license fees among other revenues to meet their financial obligation and provide services to the public (Constitution of Kenya,2010; Waikenda, Lewa & Muchara, 2019). The County governments often find themselves falling behind target in revenue collections. This puts them in a tight position in terms of service delivery as finances to do so are limited. They thus depend on the national government to finance their operations and provide service to the public. This however is not sustainable given that the national government does not have infinite resources and continued reliance on the national government will drag the national economy downwards (Muriithi, 2015).

In Africa, individuals are also motivated to pay their dues as technology makes it easier to do as opposed to physically visiting revenue offices to do the same. Maintenance of electronic records also makes it easier for the revenue collectors to reach out to the taxpayers given that their contact details are maintained for future reference. The costs involved in automating revenue systems are therefore a cost worth paying for as the advantages outweigh the costs. Audit of revenue collections is made possible if all transactions done are well stored in the systems detailing time, and information relating to the payers, service, or levies paid for and where the transaction took place. Such information makes it hard for revenue collectors and payers of government levies, taxes, and fees to be unaccountable (Sani, 2016).

In Ghana, Noronaa (2016) who evaluated the automation of revenue collections in West Africa postulated that the administration of tax and revenue collections is also improved as the efficiency in collections and costs are optimum. It was established that automation of revenue collection significantly raises revenues collected.

In Uganda, Balunywa et al in 2014 reported that fiscal decentralization as a strategy for aiding revenue collections in Uganda can only work if all the taxpayers are brought on board. To optimally collect revenue due, getting all possible taxpayers on board is essential as it lessens the burden of tax to the existing payers as targets are met timely. When it comes to tracking noncompliance to payment of taxes, the use of ICT methods that uses electronic formats comes in handy.

Around the world, the World Bank report (2015) pointed out that automation of revenue collection is one of how public sector finances can be improved. Giving taxpayers a simple payment option removes barriers associated with tax payments and improves compliance. This includes the use of mobile cash, online payment portals, and online access to revenue payment information

In Kenya, many people wanting to comply with tax payments find it convenient to pay their dues when payment methods include easier options like the use of mobile money. As a result of technology, it has now been adopted as a means through which you can pay for your license, parking fees, tax and any other due. This has been an enabler given that you will save time and use a simple process while paying for taxes (Karimi, Maina, and Kinyua, 2017).

Electronic tax systems have enabled Kenya Revenue Authority to collect more revenues Nyaega (2018) posited that the tax system influence on tax returns and compliance in Kenya is both positive and significant. Electronic tax filing systems stores information regarding the taxpayers' individual account and utilizes the same for revenue collection purposes. It is therefore postulated that these systems have changed the way tax administration is carried out and makes it possible for the revenue authority to use technology like e-billing, self-assessments, tax accounting, audit and reporting.

In Kenya, administration of electronic billing and payment of revenue has not been efficient as intended. This has been linked with low technological adoption and slow implementation of system roll outs that will phase out manual revenue collections. However, the low levels of implementation have shown improvements over manual systems in terms of reducing pilferage and increasing tax compliance levels (Ngotho & Kerongo, 2014).

Globally, revenue collection has been found to improve when use of innovative methods are incorporated into revenue collection efforts. In the United Kingdom, use of technology improves efficiency; reduces time it takes to collect taxes and saves cost of revenue collection. For economies to grow, revenue mobilization is a key factor. The revenue generated is used to provide essential services to the public, reduces poverty levels and provides social safety nets for the poor. Holniker reported that there is efficiency in computerizing the tax systems in the United Kingdom (Holniker, 2015)

United Nations in 2016 evaluated electronic governance globally. One of the methods advocated for is use of information and communication technologies as it brings accountable and transparent transactions that can be audited. This audit ability aspect of the ICT systems used like online banking reduces misuse of public finances like revenues. The United Nations postulates that ranking of nations based on their financial reporting and lending risk through a score is a way to encourage superior public finance management. It was reported that the international development partners have for a long time being advocating for better and modern public finance management methods in the developing countries so as to curb misuse of revenue aimed for development purposes. Countries seen to have low risk can get international loans at low interest rates than the high-risk countries (United Nation, 2016).

In the East African region, the World Bank reports that a number of initiatives have been mooted and operationalized in an effort to automate and improve revenue collections. The introduction of online government services popularly known as e-government was aimed at improving service delivery and reduction of costs involved in delivering these services. Automation is important in improving public sector financial management through increased efficiencies. (World Bank, 2015).

In most developed nations like in the Europe and America, it has been postulated that automating systems that are used to collect revenue helps to increase revenue collections. Automation of revenue collection also makes it possible to reduce theft of public resources and this increases the amount of revenues going to the development of the economy Use of electronic systems (e-receipting) for instance provides digital footprints that can be used to audit transactions and thus helps improve accountability. (Gil-García & Pardo, 2015).

In West African region, technology enables governments and the public access information. This information is vital in revenue collection as the portals used are centralized and enables fast and easy way of collecting and paying fees, taxes and levies. This information access improves transparency and accountability from the revenue collection point of view as opposed to use of manual systems that are opaque in terms of transparency and accountability. This information is in terms of platforms used to apply for licenses, levies or information filled in during self-assessments of individuals and business (Nkeobuna & Ugoani, 2017)

The National Treasury (2017) in Kenya posits that automating tax collection and administration will aid address past inefficiencies in revenue collections. This includes making payment of taxes easy in online platforms. This move will counties modernize their manual revenue collection systems include electronic means of billing taxpayers and electronic payments. E-receipts will definitely seal loopholes inherent in the manual methods of revenue collection and payments.

The use of electronic payment systems in Kenya was meant to enhance revenue collection. Theft by staff and taxpayers' collusion will also addressed by use of electronic systems leaves digital footprints that the auditor can use and this sort of deter corrupt practices. Electronic billing and payment thus improve revenue collection to a great extent (Njanja, 2014)

According to Ndunda, Ngahu and Wanyoike (2015) who studied revenue collections in Nakuru County, there are many information and communication technology applications that have been developed today for use to make life much easier. Electronic receipts are one of them and when used in tax collection and administration, it improves the efficiency of revenue collections and reduces instances of pilferage. Therefore, electronic receipts are much more than payment acknowledgements when paying fees, rates and other taxes as it is used as an information source and form part of digital footprint that can be referred to during audit and reporting. The study nonetheless focused on just Nakuru County and did not cover the current study's area.

Various government agencies are mandated to collect revenues that they are constitutionally mandated to have. Since the enactment of the new constitution in Kenya in 2010, the county governments are entitled to collect cess, fees from permits, license fees among other revenues to meet their financial obligation and provide services to the public (Muriithi, 2015).

The County governments often find themselves falling behind target in revenue collections. These puts them in a tight position in terms of service delivery as finances to do so are limited. They thus depend on the national government to finance their operations and provide service to the public. This however is not sustainable given that the national government does not have infinite resources and continued reliance on the national government will drag the national economy downwards (Muriithi, 2015).

According to Karimi, Maina and Kinyua (2017) who studied the effect of information technology and revenue collection and covered the County government of Embu. It was established that when information and communication technology is used in revenue collection the whole process becomes efficient and streamlined as transactions are captured digitally and more revenues are collected. However, the study generally covered use of information technology but did not go down to the specifics of innovations used in revenue collection.

Statement of the Problem

The South Nyanza region County governments of Kisii, Migori, Nyamira and Homa Bay like many other counties are expected to find other sources of revenue to supplement the allocations (Kshs 384B of national government revenue collections, National Government (2022) given to them by the National government of Kenya. They are expected to expand their revenue base through improving their collection efficiency. This will in turn increase the amounts of revenue they collect to help finance their recurrent and development expenditures Wang'ombe, (2018). However, in most instances, the Counties inherited outdated revenue collection platforms from the former municipal councils where inefficiencies, pilferage, collusion with residents not to pay taxes are the orders of the day Kiema (2017). These inefficiencies can only be addressed through use of innovative methods like through use of ICT. These innovative solutions include mobile money, electronic billing (e-billing), online banking and electronic receipting (e-receipting).

A number of studies have been conducted regarding this study phenomenon. Several studies have shown that revenue improves as a result of using innovative methods of revenue collection Karimi, Maina and Kinyua, (2017). Maisiba & Atambo (2016) investigated use of ICT and revenue collection and found out a positive impact between use of ICT and revenue collections. However, the study did not focus on e-billing, mpesa and online banking as ICT aspects used in revenue collection. Kiema (2017) investigated effects of ICT on revenue collection by the Kenya Revenue authority. These studies however, are different in terms of context and methodology used from the current study. Therefore, this study sought to fill in this knowledge gap by establishing the effects of technology on revenue collection in South Nyanza region, Kenya. The study specifically evaluated how mobile money, e-billing, e-receipting and online banking have affected revenue collection in South Nyanza.

Research Questions

The following research questions guided the study;

i) What is the effect of mobile money on collection of revenue in South Nyanza region in Kenya?

ii) What is the effect of electronic billing on collections of revenue in South Nyanza region in Kenya?

iii) How does online banking affect collections of revenue in South Nyanza region in Kenya?

iv) What is the effect of electronic receipting on revenue collection in South Nyanza region in Kenya?

Study's Research Hypotheses

H_{01}; There exist significant influence of mobile money on collection of revenue in South Nyanza in Kenya

$H_{02;}$ There exists significant effect of electronic billing on collection of revenue in South Nyanza region in Kenya

$H_{03;}$ There exist significant effect of online banking on collection of revenue in South Nyanza region in Kenya

$H_{04;}$ There exists significant effect of electronic receipting on collection of collection in South Nyanza region in Kenya

Significance of this Study

First and foremost, the county governments of South Nyanza region will benefit in terms of knowing where and how they can improve on their revenue collections. The County will also get ideas on how to plug the budget deficits internally through use of technology in revenue collection and savings that comes with reduced low costs of revenue collection as a result of using technology. Secondly, this study will greatly aid Counties in Kenya know how technology can be used to enhance their revenue collections. Also, the results from this study will help shed light on the extent to which County governments in Kenya conduct their revenue collections in order to meet their financial obligations. Thirdly, to the revenue collection team in Counties, the results of this study will inform them on the best technology practices that can help them increase efficiency in terms of increased revenue collections. Also, the policy makers in the public sector, this study will shed light on the use and adoption of technology to enhance revenue collections, minimize costs and reduce pilferage. Lastly, the study will contribute immensely to the body of literature available on technology methods used in the collection of revenue in counties. The study will give base to future scholars and academicians who would use such a study as reference.

Study scope and Delimitations

The study aimed at evaluating the influence of innovative technology on collection revenue in South Nyanza County governments in Kenya between July 2023 and October 2023. The study was limited to innovative technology which comprises the use of mobile money, e-billing, e-receipting and online banking in revenue collection. The study's choice is justified given that most people in Kenya are now privy to these technologies and are using them daily. Nyanza region is located in the Western part of Kenya and borders Rift Valley and Western regions.

LITERATURE REVIEW

Effect of Mobile Money on Revenue Collection

Globally, revenue collection has been found to improve when use of innovative methods are incorporated into revenue collection efforts. Use of technology improves efficiency; reduces time it takes to collect taxes and saves cost of revenue collection. For economies to grow, revenue mobilization is a key factor. The revenue generated is used to provide essential services to the public, reduces poverty levels and provides social safety nets for the poor. Holniker reviewed the efficiency and macroeconomic aspects of computerizing the tax systems in the United Kingdom Holniker (2015). The study was carried out in the United Kingdom. However, the methodology used was not adequately explained. The current study seeks to establish the effect of innovative technology on revenue collection by the county governments.

According to the World Bank report (2015), automating collections of revenue is one of the ways in which public sector finances can be improved. This includes use of mobile cash, online payment portals and online access to revenue payment information. Giving taxpayers a simple payment option removes barriers associated with tax payment and improves compliance. The study's context was different from the current study that seeks to evaluate revenue collection at the county level.

Noronaa (2016) evaluated automation of revenue collections by the Ghana Revenue Authority (GRA). The main objective of the study was to examine the automation of tax collection by the GRA with reference to Asokwa office. The study used simple randomly selected revenue collection officials to collect data and it was found out that automation of revenue collection significantly raises revenues collected. One of the methods found to improve collection of revenue was automation of payment where you can pay for tax using online and mobile money.

In the East African region, mobile money has completely changed the way people transact financially given that with just a simple mobile phone, you can send money, receive money and pay your bills at the comfort of your home. Nowadays, people use mobile money as much as they use cash including in their businesses. This has made it possible for people to access financial services even in the rural parts of the country. Aron (2018) provides a review of the empirical evidence on mobile money and finds support for its role in improving risk-sharing. In addition to evidence from Jack and Suri (2014), notable other studies such as Mbiti and Weil (2015) and Wieser and others (2019) find that the increased use of mobile increases remittance transactions. Therefore, mobile phones help in doing communication as well as processing financial transactions (Aron, 2015). The study only evaluated general effects of mobile money and not use of mobile money on revenue collection. The study however used cross section research design in its evaluation of mobile money.

Beattie (2015) evaluated online banking and lowering costs. Many businesses both small and large have adopted use of mobile money to enhance their operations. Incorporating such an innovative technology into the revenue collection in Kenya was thus bound to happen sooner than later. It is possible today to find people entirely doing their daily transactions using mobile money including payment of parking fees, tickets, license fees, payment for permits etc. (Beattie, 2015). The context of this study was on lowering costs through innovative ways of financial transactions and not in revenue collection as in the present study.

Ngaruiya et al. (2014) studied the effects of mobile money transactions on performance of small and medium enterprises in Nakuru. The objective of the study was to determine, the effects of mobile money transaction on sale revenue, debt collection, and cash management. The study employed use of descriptive research design and used stratified sampling. The study found a positive relationship between small and medium business's financial performance and use of mobile money in their financial transactions. Mobile money does help streamline sales as accountability is easier to do. Mobile money also makes it possible to reduce cash handling risks given that you can pay and get paid using mobile money. The study was however in different context from the current one.

A lot of people who might want to comply with tax payments find it easier to pay their dues when payment methods include easier options like use of mobile money. This has been an enabler given that you will save time and use a simple process while paying for taxes. Initially, revenue collection agencies used to have cash and bank options when remitting payment to them.

Karimi, H., Kimani, E. M. & Kinyua, J. M. (2017) studied the effect of technology and information systems on revenue collection by the Embu County government. The study employed a descriptive survey research design. Data was collected using self-administered semi-structured questionnaires. Their findings disclosed that technology and information systems had the effect on revenue collection. Due to advancement of technology and wide use of mobile money, it has now been adopted as a means through which you can pay for your license, parking fees, tax and any other due Karimi, Maina and Kinyua (2017). The study however focused primarily with general effect of technology in Embu. Nevertheless, the research findings never revealed whether use of mobile money increased revenue collection.

Effect of Electronic Billing on Revenue Collection

Wang and Liao (2016) study evaluated electronic government systems and used the Delone and Mclean model of information validation. The study used cross sectional research design. E-billing involves online assessments and filling of taxes which makes it possible to make payments and information sharing. Electronic payment of taxes has been found to reduce time and costs of tax administration in the public finance management. There exist various portals that enable taxpayers and revenue collection agencies access information and use the same towards settling of taxes due. Wang and Liao study found out that there exist several advantages of using electronic billing like automation of tax collection process, enables compliance, aids in tax collection, gives access to vital information and its use (Wang & Liao, 2016). The study however, did not expound on collection of revenue by county governments but rather was generalized to use of electronic billing in government.

Soneka and Phiri (2019) did a study on effect of e-tax billing and revenue collection. The study was aimed at examining the net effect of having an electronic tax system on tax compliance using a cross sectional study design. It was found out that electronic tax systems have the capacity to improve tax compliance given that electronic data records will help nub tax cheats and thus improve compliance. The study's research methodology was cross sectional while that in the current study is descriptive.

In the East African region including Kenya, a number of initiatives have been mooted and operationalized in an effort to automate and improve revenue collections. Automation is essential in improving public sector financial management through increased efficiencies. The introduction of online government services popularly known as e-government was aimed at improving service delivery and reduction of costs involved in delivering these services. This leaves enough finances for use in provision of social and economic services to the citizens (World Bank, 2015). The study is different from the current one in that it focused on general automation of revenue collection.

In Many developing countries, use of Information communication technologies in public finance management helps governments improve service delivery and improves the working conditions as it makes work a lot organized and methodical. Use of innovations is advocated for as it improves service delivery at manageable costs. Innovations also replace manual systems that are expensive to run and maintain. ICT use in revenue collection improves accountability and reduces pilferage of levies that ought to go to the national coffers (Abdul and Wan'gombe, 2018). The study was conducted in Kenya and focused on taxation costs and compliance behaviors. A cross sectional research design was adopted in the study.

A key pillar to development is increased finances to the government and among many options, raising debt free finances through revenue collections is a top agenda. Kenya has established a good and wide tax base when compared to the rest of the nations in Africa. Raising of finances and use of the same is captured in the Public Audit Act of 2015 among other laws that regulate the same. Musoke study evaluated the relationship between budgeting and performance of financial institutions in Uganda (Musoke, 2017). However, the study methodology was not provided and as such the findings cannot be generalized.

In Kenya, there is room for improvement in revenue collections and financial management in general and this has been cited as a possible way in making the nation leapfrog many other nations in Sub Saharan Africa in terms of development. Kenya and Government of Denmark, (2014). The study context was national government revenue collection and financial management while the current study is focused on use of innovative financial innovations and revenue collection at county level.

Nyaega (2018) studied i-tax influence on tax returns and compliance in Kenya. Electronic tax filing systems like i-Tax in Kenya does is a platform that stores information regarding the taxpayers' individual account and utilizes the same for revenue collection purposes. The study established that these systems have changed the way tax administration is carried out and makes it possible for the revenue authority to reach out to a wider tax base using e-billing, self-assessments, tax accounting, audit and reporting. Electronic tax systems for example have enabled Kenya Revenue Authority to cast their tax net wider (Nyaega, 2018).

According to the Kenya revenue authority (2016) I-Tax and electronic billing have integrated the revenue authority tax administration and domestic tax process in a much secure way. This has enabled safe taxpayer registration, e-billing, e-payment and streamlines the operational functions to the collecting agency. The study report however did not elucidate the methodology used to arrive at the conclusions given.

A study was carried out by the National Treasury (2017) in Kenya and recommended that County governments 'tax administration should be automated, and the services be available online. This move will see more and more counties modernize their manual systems of revenue collections to include electronic means of billing taxpayers and electronic payments. E-receipts will definitely seal loopholes inherent in the manual methods of revenue collection and payments.

Njanja (2014) studied E-Systems and taxation in Kenya. It was established that use of electronic payment systems was meant to enhance revenue collection. Corruption in terms of staff and taxpayers' collusion will also be checked as the electronic systems leaves digital footprints that the auditor can use and this sort of deter corrupt practices. This type of corruption used to cost the county government and national governments a lot of revenue which drags the economy backwards. Electronic billing and payment thus improve revenue collection to a great extent Njanja (2014). The context and methodology used were nonetheless different from the current study.

Mueke (2015) evaluated revenue collections in Nairobi. This study used s descriptive research design and used random sampling to collect to data. The study established that in Nairobi County, e-billing and payment of parking fees, rates, and permits have been implemented with a lot of success. The cost of revenue administration has been greatly reduced and there is reported significant increase in collections. This has enabled the county to increase its revenue and can thus improve its service delivery provision as finances are significantly more than they used to be when manual methods of billing and payments were used (Mueke, 2015).

Ngotho & Kerongo studied the determinants of tax collections in Kenya in 2014. The study used a descriptive research design and employed random sampling. They established administration of e-billing and revenue collection has not been efficient as should be. This has been attributed to low technological adoption in Sub Saharan Africa as well as slow implementation of system roll outs that will phase out manual revenue collections. However, the low levels of implementation have shown improvements over manual systems in terms of reducing theft and increasing compliance levels (Ngotho & Kerongo, 2014)

A study by Wekesa in 2015 evaluated revenue collection and development in Kenya. The study used cross sectional research methodology. It was established that for the county governments in Kenya to improve their service delivery and facilitate economic developments there should be adoption of electronic billing and payment systems. This will see them increase revenue collections and use the same to roll out development projects. The revenue base needs to be expanded to capture more tax-payers and electronic systems of billing and revenue collection provide these advantages (Wekesa, 2015).

Effect of Online Banking on Revenue Collection

Globally, a study on the risks and benefits of online banking found out that online banking as an easy way to access banking services from the comfort of your home. The study analysis used secondary data. The online banking system is available all the time and involves use of phones and computers over the internet to access banking services. Taxpayers can therefore use online banking to settle their tax payments as it is cheaper and involves less time when compared to payment of levies, taxes and permit fess physically Root III (2017). The current study however seeks to use primary data and well as secondary data.

United Nations in 2016 evaluated electronic governance globally. It was established that the international development partners have for a long time being advocating for better and modern public finance management methods in the developing countries so as to curb misuse of revenue aimed for development purposes. One of the methods advocated for is use of information and communication technologies as it brings accountable and transparent transactions that can be audited. This audit ability aspect of the ICT systems used like online banking reduces misuse of public finances like revenues. The United Nations postulates that ranking of nations based on their financial reporting and lending risk through a score is a way to encourage superior public finance management. Countries seen to have low risk can get international loans at low interest rates than the high-risk countries (United Nation, 2016).

When taxpayers are offered a way of settling their tax dues using online banking, it saves time for them and this encourages them to comply with the revenue collection agencies. The manual tax payment systems have inherent defects like failures, slow pace in finishing transactions and often involve movement from one office to the other. These defects discourage compliance in tax payments (Wang & Liao, 2016). This study was however done in developed countries and the current study is focused on Kenya and specifically in County revenue collection.

A study by Wang and Liao (2016) on electronic governance systems established that the tax system is enhanced by innovative technologies in terms of making it efficient, easier, accuracy in transactions, easier reporting, and fast way of completing transactions. When the tax administration incorporates technology, the efficiency improves significantly. This has led many nations into investing in updating their tax systems to include online billing and payments. This will increase their revenue collections that can be used to meet their development demands (Wang & Liao, 2016). This study was however done in developed countries and the current study is focused on Kenya and specifically in County revenue collection.

In the African region, audit of revenue collections is made possible if all transactions done are well stored in the systems detailing time, and information relating to the payers, service or levies paid for and where the transaction took place. Such information makes it hard for revenue collectors and payers of government levies, taxes and fees to be unaccountable. People are also motivated to pay their dues as technology makes it easier to do as opposed to physically visiting revenue offices to do the same. Maintenance of electronic records also makes it easier for the revenue collectors to reach out to the taxpayers given that their contact details are maintained for future reference. The costs involved in automating revenue systems are therefore a cost worth paying for as the advantages outweighs the costs. The study used a descriptive research design and focused on thorny issues in taxation in West Africa (Sani, 2016).

A descriptive study done in Nigeria regarding the influence of ICT on administration of taxes found out that use of innovative technology like online banking, online assessments, online payments lessen the costs involved in tax administration. It was also established that compliance and payment of taxes is improved as these methods are user friendly and do not waste resources unnecessarily in trying to comply. There was therefore a positive relationship between tax payment and compliance and use of ICT in tax administration Olaoye and Kehinde (2017)

According to Nkeobuna & Ugoani (2017), ICT enables governments and the public access information. This information is in terms of platforms used to apply for licenses, levies or information filled in during self-assessments of individuals and business. This information is vital in revenue collection as the portals used are centralized and enables fast and easy way of collecting and paying fees, taxes and levies. This information access improves transparency and accountability from the revenue collection point of view as opposed to use of manual systems that are opaque in terms of transparency and accountability. This study was however not focused on revenue collection but use of ICT in information access.

A study was carried out by Abel and Wang'ombe (2018) regarding tax and compliance in Kenya. Cross sectional research methodology was used. The study established that innovative tax settlements like use of online banking in payment of taxes makes it a lot easier for taxpayers to ensure compliance and widens the tax base for the collection agencies. The hustle involved in using traditional tax payment methods encouraged people not to comply. This was attributed to having to incur costs and time to pay taxes (Abelson *et al*., 2015).

Effect of Electronic Receipting and Revenue Collection

Globally, it has been postulated that automating systems helps to increase tax collections. Use of electronic systems provides digital footprints that can be used to audit transactions and thus helps improve accountability. Automation of revenue collection also makes it possible to reduce theft of public resources and this increases the amount of revenues going to the development of the economy (Gil-García&Pardo, 2015). The authors reviewed electronic government and factors that make it a success. However, the methodology of the study was not elucidated in the report.

Noronaa (2016) evaluated automation of revenue collections in West Africa. The study involved revenue collection officials and it was found out that automation of revenue collection significantly raises revenues collected. The administration of tax and revenue collections is also improved as the efficiency in collections and costs are optimum. This study however, was carried out in West Africa and covered Ghana only.

Wang and Liao (2016) study further found out that the tax collections agencies have advocated for changes in taxation laws to allow them administer tax electronically. This has been justified by the increased tax base and compliance which means more revenues are collected. This can be attributed to use of simpler and efficient electronic systems like e-receipting (Wang & Liao, 2016).

A study conducted by Moore (2015) in Turkey involved examination of the information and communication technology effect on revenue administration. The study methodology consisted of a descriptive research design. The study established that there exists significant positive impact on revenue collection when ICT methods are incorporated in revenue administration. Issuance of e-receipts for example has been found to make available digital audit trail and reduces cost of tax administration. The efficiency of systems used to collect revenue is thus dependent on how good ICT processes make it possible for people to file and pay taxes electronically. The study however focused on revenue administration and not revenue collection as a result of automation.

Research done by Lee (2016) involved electronic tax invoicing and tax compliance. The study was conducted in Korea and used a cross sectional study design. It was done to establish how making electronic tax invoices mandatory affected compliance. The study established that electronic invoices improve compliance through accountability and transparent tax payment systems. It was also found out that electronic invoicing is convenient to users and provides better information for tax administration purposes. The study's methodology was different from the current study. A study by Daka (2019) on electronic taxation established that electronic receipting significantly improves the revenue collections and deters tax cheats. The study employed a descriptive methodology. The study also established that electronic receipts in tax collection gives taxpayers the perception that there is accountability on the part of the tax administrators as there exists limited instances where the systems can be misused. The perception that taxes paid will go towards the greater good improves taxpayer's compliance.

In the East African region, a study was conducted by Balunywa et al. (2014). The study analyzed the fiscal decentralization as a strategy in aiding revenue collections in Uganda. The study used a cross sectional research methodology. It established that when it comes to tracking of those who have not complied to payment of taxes, use of ICT methods that uses electronic formats comes in handy. To optimally collect revenue due, getting all possible taxpayers on board is essential as it lessens the burden of tax to the existing payers as targets are met timely Balunywa *et al.* (2014).

A study conducted by Karimi, Maina and Kinyua (2017) on the effect of information technology and revenue collection and covered the County government of Embu. The study employed use of purposeful sampling methods in data collection among staff in the county government. It was established that when information and communication technology is used in revenue collection the whole process becomes efficient and streamlined as transactions are captured digitally and more revenues are collected. However, the study generally covered use of information technology but did not go down to the specifics of innovations used in revenue collection.

Owigar and Omwenga (2016) carried out a study on user evaluation of online services in Kenya. The study used a descriptive research design and used both primary and secondary data. The study established that electronic tax systems the world over is being driven by information and communication technologies. Electronic systems are being adopted in all sectors and industries as they have been proven to be efficient that manual systems. The population has also enabled adoption of such technologies given that most people can comfortably use one or more aspects of technology in their day-to-day living. Having a tech savvy population also calls for adoption of electronic methods of tax administration given that most people are comfortable when doing their tax electronically. Availability of digital data also encourages the taxman to use electronic means to administer tax since information is made available electronically and e-billing and e-payments match this perspective (Owigar & Omwenga, 2016). The study was however focused on online services in Kenya and not revenue collection.

Kiema (2017) conducted a study that found out that when there is high revenue collection by relevant agencies, use of efficient systems has been adopted through changed policies that encourage modern electronic forms of information access, e-payments, e-receipts and e-reporting. The study found out that wastage of revenue through corrupt practices can be cut into half if electronic receipts are used as opposed to manual receipts. According to Ndunda, Ngahu and Wanyoike (2015) study in Nakuru on revenue collections, many information and communication technology applications have been developed today for use to make life much easier. Electronic receipts are one of them and when used in tax collection and administration, it improves the efficiency of revenue collections and reduces instances of pilferage. Therefore, electronic receipts are much more than payment acknowledgments when paying fees, rates, and other taxes as it is used as an information source and form part of the digital footprint that can be referred to during audit and reporting. The study nonetheless focused on just Nakuru County and did not cover the current study's area.

RESEARCH METHODOLOGY

Data Processing and Analysis

According to Denscombe (2014), the process of data analysis includes generating summaries, visualizing data, interpreting as well as making sense of the data collected. In this study the process of data analysis was presided by editing of research instruments to eliminate errors. Data entry were entered using version 23 of Statistic Packages for Social Sciences (SPSS) followed by cleaning of the study data to ensure no errors were made during data collection or data entry. A clean data file was made available for data analysis. This study then did a descriptive analysis using means and standard deviations. The results were presented in the study using pie charts and frequency tables. After running correlation analysis, the study then used multiple regressions to test the association of the studies' independent variables and dependent variable. To test the significance of the effect of technology (independent variables) on revenue collection (dependent variable) in South Nyanza County governments, the following multiple linear regression model was adopted to analyze the relationship between revenue collection and use of mobile money, e-billing, online banking and e-receipting:

$RC= \beta_0+\beta_1MM+\beta_2EB+\beta_3OB+\beta_4ER+ e$

Whereby:

RC; Revenue Collection

MM ; Mobile Money

EB ; Electronic billing

OB ; Online banking

ER ; Electronic receipting

e ;randomerrorterm

β_0; the constant

$\beta_1$to β_4; Beta Coefficients

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RESULTS AND DISCUSSION

Effect of Mobile Money on Revenue Collection

This study sought to determine the effect of mobile money on revenue collection in South Nyanza region County governments, Kenya. The relationship between revenue collection by South Nyanza Counties and use of mobile money was positive. There was a meaningful relationship amongst mobile money and revenue collection. These results mimic findings by Ira (2019) who reported that use of mobile money in revenue payment makes it easy to comply with tax payment, and results to accountability on part of the management since there is digital trail. Karimi et al (2017) similarly posited that in Embu County, use of Mpesa in revenue collection brings efficiency. Daka and Phiri (2019) also reported that mobile money use in revenue payment makes it easier to pay taxes.

Effect of Electronic Billing on Revenue Collection

This study sought to determine the effect of e-billing on revenue collection by South Nyanza region County governments, Kenya. The relationship between revenue collection by South Nyanza Counties and e-billing was positive. There exist meaningful relationship between e-billing and revenue collection. These findings are similar to what Abul and Wang'ombe (2018) reported that use of innovative technologies in revenue collections like electronic bills leads to improved accountability, improves collections and makes it possible to monitor revenue collections. Ira (2019) also reported that electronic means of billing in revenue collections leads to accountability on revenue collection. Olaoye and Kehinde (2017) who investigated technology effect on revenue collection reported that use of electronic means brings efficiency and accountability in revenue collections.

Effect of Online Banking on Revenue Collection

This study sought to determine the effect of online on revenue collection by South Nyanza region County governments, Kenya. The relationship between revenue collection by South Nyanza Counties and use of online banking was positive. Since the null hypothesis was rejected, it implied a meaningful relationship between online banking and revenue collection. These results on use of online banking and revenue collections are similar to what Nyaega (2018) reported. The study reported that in Nakuru County, online banking has led to improvements in revenue collection. Noronaa (2016) also reported that online banking brings efficiency in revenue collections and reduces theft of revenue.

Effect of Electronic Receipting and collections of Revenue

This aimed at determining the influence of e-receipt on revenue collections by South Nyanza region County governments, Kenya. The findings pointed to a positive and significant relationship between e-receipts and revenue collection in South Rift Counties of Kisii, Nyamira, Migori and Homa Bay. Null hypothesis was rejected implying that there was a meaningful relationship between mobile money and revenue collection. These results are similar to what National treasury (2017) reported that use of electronic methods in billing, collecting and recording taxes leads to improved monitoring, aids revenue accountability and increases efficiency in revenue collections. Olaoye and Kehinde (2017) also posited that electronic receipts make it easy to deter fraud in revenue collections. Owigar and Omwega (2016) whose study evaluated user friendliness of tax collection modes in Kenya reported similarly views that e-receipts improves efficiency in revenue collection.

Interpretation of Findings

From the hypothesis testing, the study established that use of innovative technology like; mobile money, e-billing, online banking and e-receipting can positively be linked to improvement in revenue collections by South Nyanza Counties of Kisii, Migori, Nyamira and Homabay. This innovative technology use was found to increase efficiency, reduce pilferage, increase accountability, improve collections and makes it easier to monitor collections. In addition, use of these innovative technologies have resulted in reduced revenue collection costs, leads to better auditing, makes revenue payment easy and gives an audit trail of transactions.

CONCLUSION

Based on the findings of the study, several conclusions were drive. To begin with, the study concluded that use of innovative technologies like mobile money in revenue collections leads to easier payment of revenue, its efficient and bring about accountability in revenue collections in South Nyanza Counties. Secondly, the study concluded that use of innovative technologies like electronic billing leads to leads to transparency in revenue collections, it's easy to use and administer, there is accountability and trail of transactions and has led to increase in revenue collections in South Nyanza Counties. Thirdly, the study concluded that use of innovative technologies like online banking in revenue payment leads to eased revenue administration, reduced costs of revenue payment, efficient and improved collections, is preferred than traditional banking when paying for taxes and reduces theft in revenue collections in South Nyanza Counties. Lastly, the study concluded that use of innovative technologies like electronic receipting leads to eased monitoring and evaluations; it's hard to do fraud, there is accountability and efficiency in revenue collections in South Nyanza Counties.

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