# SYSTEM AUTOMATION AND REVENUE COLLECTION IN SIAYA COUNTY GOVERNMENT, KENYA

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# DECLARATION

This research project is my original work and has not been presented for a degree qualification in any other University.

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# DEDICATION

This project is dedicated to my family members, AgnessAnyango, Fabian Camillus, Felicity Sylvia, my mum Syprosa and beloved daughter Fedria Anne.

# ACKNOWLEDGEMENT

It is God's favour that made this project to reach its final stage, may his name be glorified. Special appreciation to my supervisor Dr.Wanjare for his guidance and dedication which enabled me to finalize this research project.

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# ABSTRACT

The objective of the revenue collection department is to employ the resources at their disposal to achieve the targeted revenue collection. This is possible when the right strategies are used and both the collectors and payers are well sensitized. Several studies have shown that the use of technology can help improve effectiveness and efficiency in the collection of revenue. In the collection of own source revenue a county government must improve the tax base to net as many payers as possible while using minimal resources for the process to be cost effective. In this research a longitudinal study is done to cover the six years that the county governments have been in place. Secondary data showing the annual revenue targets and collections is used for analysis while taking into consideration the level of system automation in the particular financial year. A relationship between the level of automation and revenue collected is thenstudied. The study establishes that 21.74% of the revenue streams are fully automated with 30.43% being non- automated. Revenue streams which are fully automated show stability in collection by being non-volatile to external factors unlike the semi-automated and non-automated revenue streams. The average collection by the fully automated revenue streams post higher averages than the other streams. The analyzed linear regression model indicate a positive relationship between system automation and revenue collection with beta coefficients being 0.394 for ECR and 0.328 for POS. The study further recommends the introduction and usage of mobile money transfers to create even more impact on revenue collection.

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| | |
|---|---|
| **ECR** | Electronic Cash Register |
| **FY** | Financial Year |
| **ICS** | Internal Control Systems |
| **ICT** | Information and Communications Technology |
| **IFMIS** | Integrated Financial Management Information Systems |
| **IRMIS** | Integrated Revenue Management Information Systems |
| **KRA** | Kenya Revenue Authority |
| **MBA** | Master of Business Administration |
| **OSR** | Own Source Revenue |
| **POS** | Point of Sale |
| **SME** | Small and Medium Enterprises |
| **SMS** | Short Message Services |
| **SPSS** | Statistical Package for Social Sciences |
| **TAM** | Technology Acceptance Model |
| **VIF** | Variance Inflation Factor |

# CHAPTER ONE

# INTRODUCTION

## 1.1Background of the Study

The idea of system automation in revenue collection is born of the need to improve the process of collecting revenue with the help of technology. As more innovations are made and new technological advances are achieved, the ease and convenience of financial transactions is enabled. Effective revenue collection should be cheap and involve as many taxpayers as possible. Such inclusion and involvement of the players is made easier with the application of system automation. The existing gaps which allow some individuals to corrupt the system of revenue collection are adequately sealed through system automation since it is effective in tracking transactions and reporting is real-time coupled with reduced handling of hard cash. Even though it requires a lot of initial capitation to install, there is possible gain as more revenue would be collected and the number of employees needed to effect its operations minimized hence reducing operation costs.

Technology and innovations based theories and those that involve revenue collection are taken into account. Technology acceptance model theory looks at the most effective way of making the taxpayers to embrace the new concept of collecting revenue through automation. The expediency theory of taxation views the practicability of collecting the proposed taxes while revenue diversification theory considers the steps to take in ensuring a non-volatile environment of revenue collection through creation of multiple revenue sources. The modelling of system automation can be founded on the application of these three theories in order to be successful.

The formation of devolvedgovernment units created another level at which collection of revenue is done. The county governments should not greatly depend on the allocation of revenue from the national treasury but must initiate effective means of collecting own revenue in order to take care of their needs adequately. The county government of Siaya in its effort to improve in terms of revenue collection has embraced system automation.

Since system automation is a recent phenomenon, very little study has been done to evaluate the extent of its effect in relation to revenue collection. While high revenue collection may be attributed to the improved processes, the high volatility evident in revenue collection may be due to changes in the market microstructure through the system ( Ngaruiya, 2014). This study therefore wishes to establish the available levels of automation and the trend so created in terms of revenue collection in the county government of Siaya.

### 1.1.1 System Automation

System automation is the use of electronics and computer controlled devices to assume control of processes. In finance it involves the use of software to automate key finance related tasks like accounts reconciliation, journal entries and preparation of financial statements with minimal human interventions. System automation ensures smooth running of processes and increases rate of productivity by improving efficiency and effectiveness. The task of monitoring activities and creation of effective controls in production is also made easy by the introduction of system automation.

Usage of computer programs, programmed gadgets such as electronic cash registers and mobile phone applications are the common fronts of system automation in financial activities. System automation in financial transactions was also introduced to reduce the use of hard cash and hence limit the risks of cash transactions. Further introduction and integration of mobile money transfers into financial transactions ensures that many individuals are brought into the financial system and are able to transact at lower costs as postulated byKendall, Maurer, Machoka&Veniard (2011). The inception of payments using technology to a greater extent sealedthe loophole of non-collection and non-remittance of funds collected. One of the other benefits of system automation is the accurate recordings which makes tracking of transactions very easy. Automated processes are also easy to use with minimal training needs for the users.

The major challenge with the use of ECR is the collaboration between the tax payer and the collector to defraud the system. According to Biwott, Mulongo&Omboto (2014), adoption of system automation helps to improve efficiency and effectiveness in revenue

mobilization as the tax collection agency will be able to meet its targets due to less tax avoidance and evasions hence enhances productivity and viability.A study by Kirui&Onyuma (2015) on the role of mobile money transactions on revenue of microbusinesses in Kenya reveals that there is improvement of sales turnover due to use of mobile money services. System automation limits the options of collaboration between the taxpayers and the revenue clerks to defeat the revenue collection system and it does not require the physical presence of revenue clerks or restricted office hours for a transaction to take place,Ngaruiya (2014). Paybill tills are used to make payments electronically by using mobile phones and proof of payment exists in electronic form. All the money paid is securely transferred to the treasury and the taxpayer also has proof of the transaction. Tracking and auditing of transactions done is therefore very easy with the inception and proper use of system automation.

### 1.1.2 Revenue Collection

Revenue collection is the generation of income by an entity in order to acquire assets and to enable it meet its financial obligations.Revenue sources for governments are licensing fees, taxes, fines for breaking by-laws, rents, rates and sale of property among others. Collection of revenue from these sources require sound strategies and effective methods in order to be successful. Creation of several revenue streams,effective revenue collection officers and cooperative taxpayers are needed for a proper revenue collection system.

Kerogo&Ngotho (2014) on a study of the determinants of revenue collection in developing countries found thatthe effectiveness of revenue collection depends on the laid down payment methods and sensitization of the tax payers as well as the training given to the revenue collectors. With efficient and effective methods of collection, a great increase in revenue volume is posted.Revenue collection can be improved through clarity in policies coupled with realistic penalties and enforcement programs. This view is supportedby Moyi&Muriithi (2003) who also proposed that the confidence of the taxpayers on the revenue system must be built in order to succeed in improving revenue collection and policies must intend to improve individual positive responses to taxation.

### 1.1.3 System Automation and Revenue Collection.

System automation can be used strategically to create an effective revenue collection system where issues such as non-collection, non-remittance and collaboration between the payer and the collector to defeat the system are to be limited (Githinji, Mwaniki, Kirwa&Mutongwa 2014). This is due to the creation of an easy to follow audit trail with the use of Electronic Cash Registers (ECR) and Point of Sale (POS) gadgets. The proper controls and effective tracking of financial transactions by the system limits improper practices therefore yielding higher returns and the real time reports obtained ensures action is taken early enough.

Kinyanjui&Kahonge (2013) in their study of mobile based parking system relates the use of mobile phones and collection of parking fees in Singapore and Germany to show the efficiency brought about by the concept of system automation on revenue collection. Correct and updated tax records help to boost the confidence of the tax payers, a concern which is well taken care of by system automation. System automation builds confidence of the taxpayers as it improves internal control systems hence enhancing revenue collection. Otiso,Simiyu&Odhiambo(2013) established that In Bungoma County 86% of SMEs preferred use of mobile phones to transfer money while 14% used traditional banking hall and other transfer services which explained the improvement in revenue collection by the SMEs.Mutisya (2014) proposes that automation of revenue collection is the way to bridge the wide gap between the government allocated revenue and own source revenue in the counties. He further suggests that more investment be done in modern technologies to enhance compatibility and sharing of information for efficiency and effectiveness.

### 1.1.4 Siaya County Government

As indicated in the County Integrated Development Plan 2013-2017,the county of Siaya has six sub-counties which act as its sub-units during revenue collection and there are several markets, beaches, transport and communication network stations where traders pay taxes.In the financial year 2017/18 the own source revenue budget was Kshs 270 million but only Kshs 127 million was actually realized according to the financial report for the year. The county has established the use of ICT in its operations and in collection of revenue it has equally integrated system automation. At the end of 2017/2018 financial year the county government of Siaya installed Integrated Revenue Management Information System (IRMIS) whose objective was to seal leakages in the revenue collection system.

Odhiambo (2013) in the business daily africa reported a deal between the Siaya county government and the Equity bank where automation was to be introduced to fight the failures brought about by manual revenue collection. Odhiambo(2019) in a report in the standardmedia indicates an increase of 42% in revenue collection by the Siaya County Government which is such a big positive change and the underlying reasons need to be commended.This study wishes to use Siaya County as a case to determine the effect of automation on revenue collection. This research will study the ways in which revenue collection methods have applied system automation and the eventual effect on revenue collection. Based on the above this research finds Siaya County quite interesting to study under the topic of system automation and revenue collection

## 1.2 Research Problem

System automation in revenue collection has been embraced as it seals several loopholes which exist when manual means of collection is used (Githinji et al., 2014). Other sectors have utilized technology to capture more individuals into their systems and improve on compliance as indicated by Muturi&Kiarie (2015). Manual collection of revenue is open to corruption and manipulations and even risk of security of the cash collected. These challenges are better countered when technology is employed as a means of collecting revenue. The use of mobile money transfer further makes accountability and reliability of

the revenue clerks to improve as it makes their work easy and strengthens the internal control system according to Odoyo,Oginda,John,Aila&Ojera(2013)

Having automated 97 of its 136 streams of revenue collection the County of Nairobi reported a great increase in its revenue collection as reported by Omulo(2018). NakuruCounty attributes automation to ease of doing business and resulting in higher revenue collection,Jananga(2018). In Siaya County there has been lower level of revenue collection in the past and the 2017/18 financial report indicated that the actual collection was just 47% of the targeted collection.

A lot of emphasis has been put on embracing the use of technology and the establishment of ICT integration in the running and management of SiayaCounty. The use of system automation to collect revenue is not new to the counties and in SiayaCounty no research has ever been carried out to establish the relationship between system automation and collected revenue. This research is to establish if system automation has made an impact on the collection of revenue hence the question which this study hopes to answer; Does system automation affect revenue collection in Siaya County?

## 1.3 Research Objectives

To determine the effect of systemautomation on revenue collection in Siaya County government.

## 1.4 Value of the Study

Policy formulation by the policy makers and the regulators such as the county assemblies will find this study very useful to them during their operations as the relationship between system automation and revenue collection process will be highlighted. Possible gaps which require proper legislation to be highlighted so that the necessary legislation can then be done for improvement in revenue collection by the county governments.

Finance managers and revenue officers as practitioners will find this study quite significant as it will establish the link between systems automation and revenue collection. This could prove to be useful during decision making particularly on the best methods to apply during revenue collection and planning on revenue operations.

The study will also act as a guide for further studies by scholars in the field of finance and system automation. Besides referencing the academicians can also build on the knowledge of embracing technology and innovations to automate finance management with the findings of this research as a basis. It will therefore be very useful in building of theories by the scholars.

# CHAPTER TWO
# LITERATURE REVIEW

## 2.1 Introduction

In this chapter a thorough and critical review of the research studies previously conducted on the use of system automation in revenue collection and related topics is done.
Theories on adoption of technology and innovations as well as theories relevant to revenue collection are highlighted in order to create a basis and give a clear perspective of this research topic. Previous studies done by other researchers in similar topics are also highlighted under the empirical literature review to ensure there is a good foundation for the study and to help in the identification of existing gaps. Finally the conceptual framework is given and the existing research gap upon which this study is anchored.

## 2.2Theoretical Literature Review

Several theories and models have been used in adoption of innovations and particularly where technology is at play and in revenue collection. This chapter has identified three theories of which one isapplicable tosystem automation while two are revenue collection oriented. These theories provide a framework which guides in the designing and implementation of the systems successfully. They help in exploring the underlying facts and factors which are instrumental in the research process. The theory which applies to system automation is Technology Acceptance Model Theory. The theories which apply to revenue collection are; Expediency Theory of Taxation and Revenue Diversification Theory. Each of these theories are briefly discussed in relation to their relevance to this study.

### 2.2.1 Technology Acceptance Model Theory (TAM)

Technological acceptance model focusses on how the consumer adopts and accepts to use a new idea or innovation in information systems, Davis (1989). There are two factors involved in this theory; the perceived usefulness and perceived ease of use of the technology. The likelihood of the system enhancing the life or operations of the user entails the perceived usefulness while ease of use is the measure of the level of effort the system requires from the user to utilize it. These two factors are the most important determinants of the actual use of a system. External factors which may be social,cultural or political also influence the perceived usefulness and ease of use of the new system.

The behavioral intention which precedes the actual use of the system is what determines the attitude created by the user. The level of effort required on mobile phone users to pay to revenue accounts is actually low and the likelihood of it being embraced is highly recognized by this theory.

### 2.2.2The Expediency Theory of Taxation

It asserts that every tax proposal must pass the test of practicability, meaning that only tax which can be paid should be levied. The administration must device means of collecting tax efficiently and at a reasonable cost, Musgrave & Musgrave (2004). It treats the socio-economic objectives as irrelevant because they are valid if and only if tax is collected.

The expediency theory seeks to justify the influence of administrative setup on tax collection which is prime in the institution of system automation to collect revenue by the county government. Only the relevant streams of revenue should be taxed and appropriately for instance collection of parking fees in small market centres could be an exercise in futility.

### 2.2.3 Revenue Diversification Theory

The effects of diversification on volatility and expected revenue depend on the compositional change in the portfolio according to revenue diversification theory. Financial stability can be created in the organization if multiple sources of income are developed,Morgan (1988). Diversification therefore helps to reduce volatility on revenue collection a phenomenon which can be applied by the county governments through the use of technology. Automating the revenue collection system would widen the netting of taxpayers, and therefore enhanced diversification. Multiple streams of revenue can then be accessed without much increase in the cost of management.

The above theories provide a common framework on how to setup a system which can introduce and maintain technological innovations in order to create order and enhance adequate collection of revenue. They further help the management to understand and evaluate change in a system and its possible effects. As long as the application of the theories bring positive change they should be adhered to. The concepts and ideas in the theories above help in making predictions on how the underlying variables will be related which in this case are system automation and the total revenue collected.

## 2.3 Empirical Literature Review

Some studies have been done by different researchers on system automation and revenue collection. A study done by Kiamba (2008) on the effect of corporate governance on financial performance of local authorities in Kenya identified lack of proficiency with ICT and failure to embrace ICT in operations as some of the factors which negatively affect revenue productivity and hence financial performance. The study looked at managerial practices and the role of internal audit. Having taken a sample of 30 local authorities it was realized that some managers due to their personal inadequacies do not embrace the use of technology in making payments.This is supported by the view that with the use of ICT the number of supervisors and supervision time is greatly reduced resulting into efficiency,Momanyi(2009).

Kimanthi(2018) indicated that the counties collected only Shs 4.82 billion in the period between July and September 2017. The own source revenue collection by the counties in the 2016/2017 financial year was only Shs 32.52 billion which was far below the annual target of Sh57.6 billion. This was even a reduction of seven percent compared to the preceding financial year. The counties need not to come up with other revenue streams before fully making the available ones moreeffective. It was proposed that automation of revenue collection should be embraced to help in improving the process. It is further noted that the few counties which had higher revenue collections had started to embrace partial automation in collection of revenue.

A strong positive relationship exists between Internal Control System (ICS) and revenue collection in Kenyan local authorities. The ICS is enhanced through integration of ICT which as a result improves the revenue collection by the local authorities(Odoyo et al., 2013). This was concluded during their study on the effect of information systems on revenue collection in Homabay County. The study was to establish a relation between internal controls, use of ICT and its effectiveness and efficiency in revenue collection. The study collected data from 1842 local traders and 162 staff members of the Homabay County.Challenges are met when system automation is introduced as a method of

collecting revenue. Kimani (2008) statesthat fear and concern of security is the main reason why there was minimal use of paying utility bills by mobile money transfer system. The challenges in the implementation of mobile banking information systems in commercial banks in Kenya are technological,managerial,user related,employee, security and legislative based,Otieno (2008).

Systems automation offers a cheap means of financial transactions such as deposits and withdrawals of cash for instance using mobile money transfers. It further puts more individuals into the formal financial system where they can transact with the financial service providers at lower costs (Kendall et al., 2011). In the study they stipulated that the poor receive money unpredictably and hence their need to transact is better taken care of through mobile banking.Kirui, Okello, Nyikal&Njiraini (2013) studying the impact of mobile phone based money transfer in agriculture, randomly selected households in Kenya andfound that the use of mobile money services increased the level of annual household income by $224. It was also observed that it helped to resolve market failures especially in the rural areas hence improved financial inclusion.

Maisiba&Atambo (2016) studied the effect of electronic tax system on revenue collection efficiency by Kenya Revenue Authority in UasinGishu County. They used questionnaires on a population of 102 respondents who included KRA staff and the tax payers and it was evident that despite reported difficulties in handling data electronically by some respondents,there exists a positive influence in revenue collection following the use of electronic tax system. The Kenya Revenue Authority officials reported reduced queues, less workload and reduction of input in the cumbersome processes as well as timely filing of returns and reduction in the audit period. The level of corruption also reduced as the payments are done through mobile phones and returns submitted online.The study therefore recommended comprehensive civic sensitization on the processes to create public awareness and empowerment.According to Muturi&Kiarie (2015), small tax-payers in Meru County found the use of online tax system better than the manual tax system in tax registration, tax filing of returns and remittances. The online system

therefore affected and improved the tax compliance among the small tax-payers giving more reason as to why the use of system automation should be embraced.

An improved governance translates into efficient delivery of services which is possible with the use of ICT. Mobilization of domestic resources can therefore be effectively done by utilizing ICT (Githinji et al., 2014).In their study on ICT and revenue collection by Kenyan counties, they established that domestically driven sources of income could create more financial stability as opposed to external funding. According to Nyanumba (2010), decentralization of revenue collection in the county of Nairobi greatly improved the revenue collection but the positive result would be negatively affected by corruption hence a suggestion of system automation initiative to control the leakages in management of revenue collection.Electronic payment system as used by the County of Nairobi improved the level of compliance in revenue payment as indicated by Okiro(2015).In the study 18 departments were used to collect secondary data whose analysis found that 92% variation in revenue collection could be attributed to adoption of e-payment. The use of automation also adversely affects the revenue collection system as it improves flexibility and convenience in Nairobi County,Kibaara, Kimwele&Were (2017).

## 2.4 Summary and Identification of Gap

Integrated Financial Management Information System (IFMIS) and Quality of Budgetary Control practices by the County government of Siaya needs a holistic consideration to effectively post the benefits from system automation (Owiti, 2016). Much emphasis is put on management of revenue allocated from the national government but very little tracking is done in consideration of own source revenue and its collection methods have never been evaluated. In the Siaya County Integrated Development Plan 2013/2017 it is documented that 90% of the adult population own mobile phones and most of the residents are self-employed with 86% and 92% in urban and rural respectively in terms of employment. The county government of Siaya furtherreports increased constraints in mobilizing financial and technical resources.

A good proportion of revenue collected is wasted due to lack of proper databanks, recovery systems or sheer poor ways of revenue collections by the use of manual methods (Githinji et al., 2014). They further propose that strengthening domestic resource mobilization offers many benefits as it reduces overdependence on external flows and hence reduces volatility on resource availability. Kibaara et al (2017) established that the use of ICT highly enhanced effectiveness on revenue collection process in the county of Nairobi. There exists studies done on the usage of system automation to collect revenue by some county governments such as Nairobi, Meru, UasinGishu, Nakuru and Homabay. Most of the studies done front system automation as the better way of handling transactions rather than the manual means. In terms of revenue collection and management, most county governments are notably trying to embrace system automation even though the impact created by the use of system automation is still blurred. From the above observations, most organizations and institutions are embracing system automation in collection of revenue as well as in managing their finances. However, no study has been done to investigate system automation inSiayaCountyin relation to its revenue collection, the gap which this study hopes to fill.

## 2.5 Conceptual Framework

This conceptual framework seeks to expressdiagrammatically the perceived relationship between the variables.

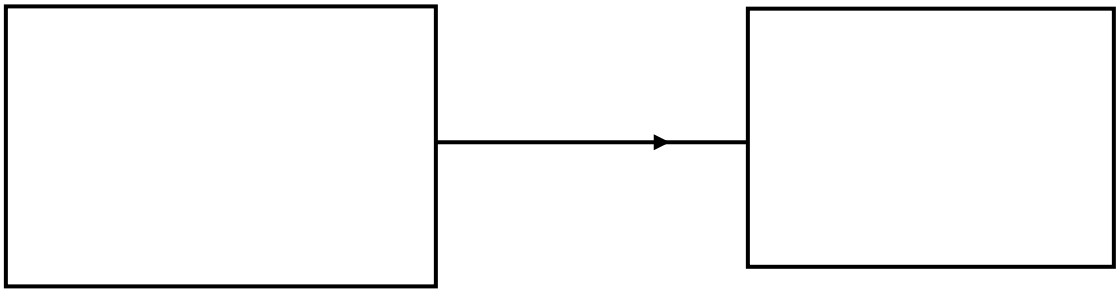
There independent variable is system automation.

The dependent variable is the revenue collected.

The figure 2.1 is the conceptual model which links the independent variable and the dependent variable.

## Figure 2.1: The Conceptual Model

**Independent Variable** **Dependent Variable**



Source Author (2019)

# CHAPTER THREE
# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter briefly explains the methodology used to undertake the study and the details concerning the approach and tools used to obtain relevant information expressed (Cooper &Emory, 1995).It entails; the research design, population, sampling techniques, data collection methods, data presentation and analysis (O'Leary, 2014).

## 3.2 Research Design

A longitudinal study which takes into consideration the years that the county governments have been in existence shall be done. It will involve the periods before and after the adoption of system automation while also noting the levels of automation. The study will purpose to establish if there is a relationship between the existing variables.

## 3.3 Population and Sample Design

The research is a case study where only one specific county is involved.The research will only study the revenue collection system of the county and its total collections over the past six financial years. All the eightdepartments and all the revenue streams being used to collect revenue will be considered.

## 3.4 Data Collection

**S**econdary data was collected usingsecondary data capture form in this study. The secondary data which would be more accurate and reliable was obtained from the financial reports over the past years from 2013 to 2019 as given by the Finance department and the Revenue collection section. Aspects of change in level of automation noted as would be documented by the finance department reports are taken into consideration to ensure sufficient and accurate data is collected.

## 3.5 Data Analysis

Data analysis would involve screening of the data collected and transforming it into information which can easily assist in drawing guided conclusions,(Andre, 2004). Statistical Package for Social Sciences (SPSS) is the analytical tool to be employed during the data analysis owing to the quantitative nature of the data collected and the appropriateness in usage of the software in statistical analysis. It is also accurate and easy to use in regression analysis which would establish the influence of the independent variables on the dependent variables.

The regression analytical model used is $Y = B_0 + B_1X_1 + B_2X_2 + E$

Where;

Y is the predicted amount of totalrevenue collected (dependent variable)

$B_0$ is the value of Y when the independent variables are zero

$B_1$ is the coefficient for system automation method of revenue collection using ECR

$X_1$ is collections using ECR in system automation(Independent variable)

$B_2$ is the coefficient for system automation method of revenue collection using POS

$X_2$ is collections using POS in system automation (Independent variable)

E is random error term

# CHAPTER FOUR

# DATA ANALYSIS, RESULTS AND DISCUSSION

## 4.1 Introduction

This chapter gives a report of the data findings and the relationship between the variables involved in this study. It expresses the extent to which the independent variable explains the dependent variable.

## 4.2 Levels of System Automation

Point of Sale (POS) gadgets were introduced in 2015 for the financial year 2015/2016. A total of 150 devices were introduced in 71 markets where larger market centres were allocated more than one device while small centres only got one device. The devices are used in revenue streams with several transactions per day where usage of manual system proved hectic. Some revenue streams such as the hospitals of Siaya, Bondo and Yala also adopted the use Electronic cash registers (ECR) system automation in 2014.Other non-mobile collection centers also adopted the use of ECR in 2015. The level of automation using POS has increased while that of ECR has remained static since 2015.

There are eight departments in the county government of Siaya and a total of 33 revenue streams. Ten revenue streams are totally dormant and have not been used to collect revenue leaving 23 revenue streams actively participating in the collection of revenue. 7 streams which represent 30.43% of the revenue streams have zero level of system automation. Low level of system automation is present in 7 revenue streams which also represent 30.43% of the active revenue streams. A hybrid method of collection is applied in 4 revenue streams where both manual and automation are used. This medium level of automation represents 17.39% of the streams used to collect revenue in Siayacounty. Only five streams which represent 21.74% of the streams is fully automated. The level of system automation per year appears as shown in table 4.1 below

Table 4.1: Levels of Automation

| FY | Automation (ECR) % | Automation (POS) % |
|---|---|---|
| 2013/14 | 0 | 0 |
| 2014/15 | 10 | 0 |
| 2015/16 | 20 | 40 |
| 2016/17 | 20 | 40 |
| 2017/18 | 20 | 50 |
| 2018/19 | 20 | 70 |

## 4.3 Trends in Revenue Collection

The collection of own source revenue has never achieved 100% target in Siaya since the inception of the county government. The own source revenue budgeted by the county treasury has been quite low yet has not been achieved over the years as shown in table 4.2.

Table 4.2: Own Source Revenue Budgeted and Collected

| FINANCIAL YEAR | OWN SOURCE REVENUE BUDGETED(KSH) | OWN SOURCE REVENUE COLLECTED(KSH) |
|---|---|---|
| 2018/2019 | 275,000,000 | 194,292,060 |
| 2017/2018 | 270,000,000 | 127,729,540 |
| 2016/2017 | 270,000,000 | 172,822,681 |
| 2015/2016 | 230,000,000 | 135,583,664 |
| 2014/2015 | 301,474,027 | 143,403,027 |
| 2013/2014 | 153,466,278 | 100,756,443 |

Source: County Treasury

It is observed that the FY2016/2017 posted a high own source revenue collection and this was one year after the introduction of system automation. Most revenue streams remained dormant following the election and post-election activities which affected revenue collection during FY 2017/2018. Analysis of collection in the automated revenue

streams gives a trend where there is an instant increase in collection of revenue following introduction of system automation followed by a slow growth or stagnation.

Table 4.3: Revenue collection per stream

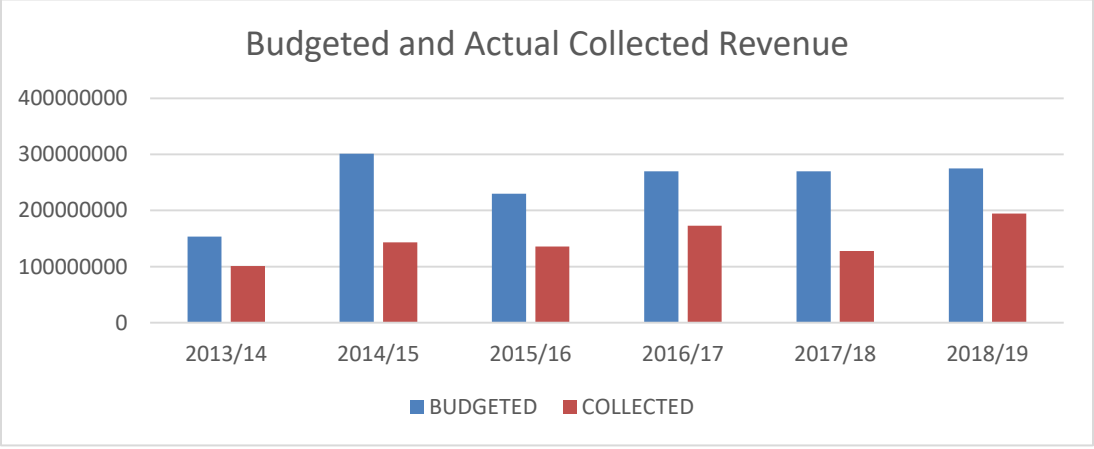
| Revenue Stream | Automation | | Revenue 2014/15 | Revenue 2015/16 | Revenue 2016/17 | Revenue 2017/18 |
|---|---|---|---|---|---|---|
| | Type | Level | | | | |
| Business Permits | | Zero | 28,350,589 | 26,097,518 | 32,899,734 | 32,326,603 |
| Market Fees | POS | Full | 20,170,457 | 22,646,625 | 25,212,879 | 22,787,579 |
| Buspark/ Parking fee | POS | Full | 14,829,361 | 11,858,870 | 15,713,913 | 12,548,515 |
| Fish cess& Quarry fee | POS | Medium | 3,892,399 | 4,316,150 | 4,916,775 | 4,003,024 |
| Plan approval | POS | Low | 767,608 | 1,823,696 | 4,239,840 | 3,050,009 |
| Tender fee | POS | Low | 270,012 | | | |
| Transfer fee | POS | Low | 153,150 | 158,100 | 93,700 | |
| Miscellan-eous | | Zero | 772,375 | 1,465,980 | 1,366,965 | 4,323,204 |
| Plot rates | POS | Medium | 3,189,619 | 2,419,683 | 3,533,177 | 1,694,295 |
| Plot rents | POS | Medium | 3,365,331 | 2,770,781 | 6,808,691 | 3,374,214 |
| School fees | ECR | Low | 116,175 | 79,050 | 50,100 | |
| Slaughter fees | POS | Full | 573,013 | 636,840 | 456,072 | |
| Ground/ Stall rent | POS | Medium | 2,952,116 | 2,346,445 | 4,470,832 | |
| Burial fees | | Zero | 28,600 | 10,500 | 13,200 | |
| Sand cess | POS | Medium | 20,100 | 384,760 | 511,192 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Sugar cess | | Zero | | | 100,000 | |
| Health Dept | ECR | Full | 47,544,186 | 44,564,351 | 60,547,082 | 34,115,960 |
| Lands Dept | | Zero | 1,858,156 | 2,875,234 | | |
| Agriculture | | Zero | 13,270,968 | 10,159,982 | 9,602,356 | |
| Trade | POS | Low | 1,170,325 | 623,755 | 362,060 | |
| Roads, Public works | ECR | Low | | 345,344 | 1,924,113 | |
| Licences | ECR | Low | | | | 9,506,137 |
| Education and Youth Affairs | | Zero | 108,900 | | | |
| **Total** | | | **143,403,440** | **135,583,664** | **172,822,681** | **127,729,540** |

Source: County Treasury

Over the years the collected revenue is way below the budgeted revenue collection with the FY 2017/18 posting the lowest revenue collection which is 47.7% of the budgeted collection. The FY 2018/19 posted the best percentage of collection which is 70% of targeted revenue. Figure 4.1 below shows the comparison of budgeted and actual revenue collections.

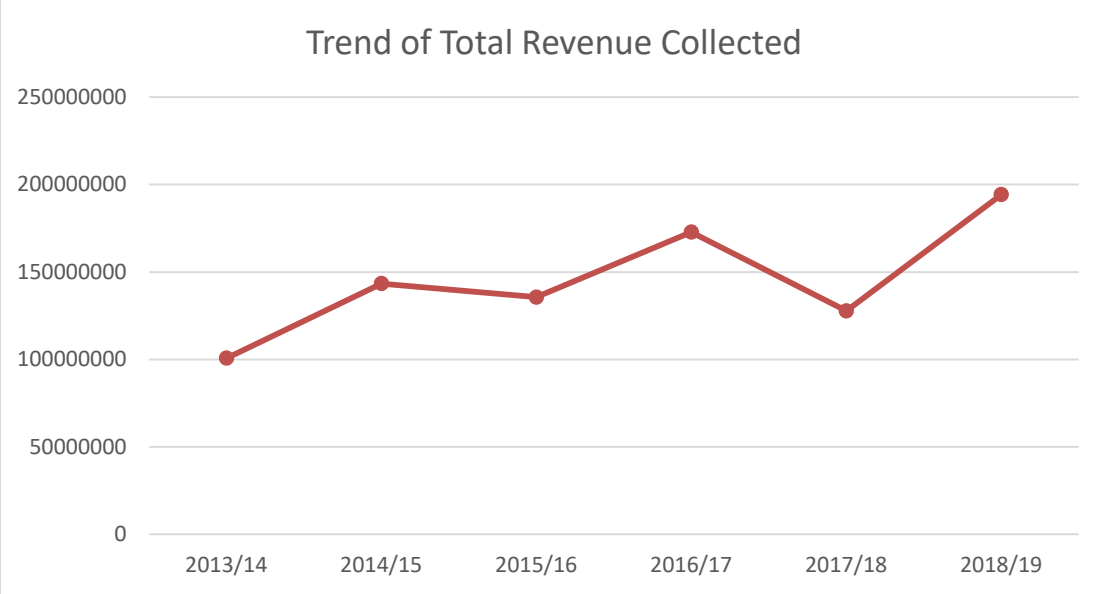
Figure 4.1 :Budgeted and Actual Collected Revenue



Source: Author 2019

The trend in revenue collection created over the years is shown in figure 4.2 below.

Figure 4.2 : Trend of Total Revenue Collected




Source : Author 2019

## 4.4 Regression Analysis

Table 4.4 : Descriptive Statistics

**Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| OWN SOURCE REVENUE | 145,764,569.17 | 33,308,497.991 | 6 |
| AUTOMATION ECR | 2.5000 | .83666 | 6 |
| AUTOMATION POS | 2.8333 | 1.60208 | 6 |

Source : Author 2019

Following the analysis done using SPSS, the mean for OSR is 145,764,569.17 while its standard deviation is 33,308,497.991 as indicated in table 4.4 above. The standard deviation for the independent variables are 0.8366 and 1.60208 for ECR and POS respectively indicating that change in POS is almost double that in ECR. This is an

indicator that the use of POS as a type of system automation has had a varied applicability than ECR within the six years in question.

Table 4.5 : Model Summary

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .689[a] | .475 | .125 | 31,166,097.437 | .475 | 1.356 | 2 | 3 | .381 |

Source : Author 2019

From table 4.5 above, the R square is 0.475 which gives the percentage of variance in the dependent variable as expressed by the independent variables collectively as 47.5%. The value of R being 0.689 shows there is a strong relationship between the variables, the independent variables affect the dependent variable by 68.9%.

Table 4.6 : Coefficients

**Coefficients[a]**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | Tolerance | VIF |
| (Constant) | 87253910.023 | 46630943.322 | | 1.871 | .158 | | |
| AUTOMATION ECR | 15670836.750 | 29153214.673 | .394 | .538 | .628 | .327 | 3.062 |
| AUTOMATION POS | 6823611.977 | 15224769.822 | .328 | .448 | .684 | .327 | 3.062 |

Source : Author 2019

The beta coefficients which are to be used to show the impact of unit change in the independent variables on the dependent variable indicates that both ECR and POS usage have an impact on revenue collected. The beta coefficient for ECR is 0.394 while that for POS is 0.328 showing that ECR has relatively more influence than POS on revenue collection. It is also evident that a change in the predictor variables causes a positive

change in the collected revenue.The probability of rejecting the null hypothesis while it is true which is tested by significance level are 0.628 and 0.684 which are quite high for both ECR and POS.

The relationship between the independent variables as shown by the collinearity statistics is tolerable and within the allowed levels since variance inflation factor (VIF) is 3.062 and tolerance is 0.327. These values indicate that the usage of ECR and POS are correlated.The

Table 4.7 : Residual Statistics

**Residuals Statistics[a]**

| | Minimum | Maximum | Mean | Std. Deviation | N |
|---|---|---|---|---|---|
| Predicted Value | 109,748,360.00 | 168,384,480.00 | 145,764,569.17 | 22,949,088.451 | 6 |
| Residual | -33,831,328.000 | 25,907,580.000 | .000 | 24,141,155.268 | 6 |
| Std. Predicted Value | -1.569 | .986 | .000 | 1.000 | 6 |
| Std. Residual | -1.086 | .831 | .000 | .775 | 6 |

Source : Author 2019

The standard residual values obtained of a minimum of – 1.086 and a maximum of 0.831 in table 4.7 are within the usual range hence supporting the validity of the results analysed. This shows that any projection done on the dependent variable is not far from true using the existing relationship.

Table 4.8 : Correlations

**Correlations**

| | | AUTOMATION ECR | AUTOMATION POS | OWN SOURCE REVENUE |
|---|---|---|---|---|
| AUTOMATION ECR | Pearson Correlation | 1 | .821* | .663 |
| | Sig. (2-tailed) | | .045 | .151 |
| | N | 6 | 6 | 6 |
| AUTOMATION POS | Pearson Correlation | .821* | 1 | .651 |
| | Sig. (2-tailed) | .045 | | .161 |
| | N | 6 | 6 | 6 |
| OWN SOURCE REVENUE | Pearson Correlation | .663 | .651 | 1 |
| | Sig. (2-tailed) | .151 | .161 | |

| | | | |
|---|---|---|---|
| N | 6 | 6 | 6 |

Source : Author 2019

Table 4.8 above shows the correlation coefficients. Pearson correlation indicates a significant positive correlation between the independent variables and the dependent variable. The correlation coefficient between ECR and OSR is 0.663 while between POS and OSR is 0.651. This further shows that usage of ECR is slightly having more influence than POS on revenue collection.

The resultant regression equation is therefore $Y = 87,253,910 + 0.394X_1 + 0.328X_2$ because the beta constant being 87,253,910 is the amount of revenue collected irrespective of the influence of the system automation while B1 and B2 are 0.394 and 0.328 respectively.

## 4.5 Summary

The results from this study shows a positive relationship between system automation and revenue collection with the latter being affected 68.9% by the system automation processes available. This therefore means that further positive change in system automation would influence revenue collection more greatly. The existence of multicollinearity between the independent variable paints a picture of reduced significance meaning the use of ECR and POS can coexist or one can also effectively replace the other without negating the intended purpose of system automation. Even though ECR seems to affect revenue collection more than POS, the difference in their influence is quite minimal as is depicted from the beta coefficients which are 0.394 and 0.328 respectively. The overall level of system automation is not high with 60.86% of the streams having low or no system automation.The ten dormant streams which are equally non-automated if put in consideration further lowers the level of automation. The change in usage of POS increased minimally while that of ECR remained constant to show lack of further investment in system automation. The projections given as targets in revenue collection similarly shows lack of ambition in revenue collection. Some revenue streams are quite volatile as deduced from the returns posted from them.

# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Introduction

The summarized view of the outcomes of the study are highlighted in this chapter and the recommendations based on the findings. The chapter also highlights the limitations of the study and suggests the existing gaps for further studies.

## 5.2 Summary

The fully automated revenue streams such as in the health department show the best performance in revenue collection, while those with zero level of automation show a lot of volatility such as Agriculture which is also on a decline. The introduction of automation has impacted greatly in collection of sand cess in the FY 2015/16 even though the level of automation is still medium. Single business permits ought to be the leading stream in revenue collection but this is evidently not the case owing to its zero level of automation. The study regression equation derived supports the use of system automation as the predictor variables have positive coefficients hence their increase in level creates an increase in revenue collection.

## 5.3 Conclusion

The introduction of system automation creates an environment which would yield better OSRbecause there is accountability and therefore results in a less volatile revenue collection process. This makes the process of budgeting easy as the collection of revenue is made more predictable. The use of system automation could create an efficient means of improving revenue collection. The benefits of system automation can be more visible if full automation is applied so as to limit the available gaps leading to poor collection. The usage of system automation also makes tracking of revenue collection to be easy and more purposeful resulting in timely interventions whenever such needs arise.

## 5.4 Recommendations

The study recommends the introduction of full automation in order to experience the gains of system automation better. Full automation would also introduce the usage of mobile money transfers which would limit handling of cash by revenue officers making the process to be devoid of flaws. While the usage of POS devices shows the transactions it does not capture the details of the taxpayer and the transaction in details as mobile money transfer system would. Besides the receipt given the taxpayer may not have a backup as evidence for compliance which reduces their level of confidence in the system, introduction of mobile money transfer aspect of automation is therefore highly recommended.

## 5.5 Limitations

The use of both system automation and manual means simultaneously in some revenue streams do not give a clear picture of the best method to use as the amount collected is shown as a unit under the respective revenue streams. This limits the direct evaluation on the extent to which the system affects revenue collection without making inferences. Unpredictable situations resulting into some streams not being used to collect revenue also makes it difficult to study the trend in these streams together with others.

## 5.6 Suggestion for further studies

This study used the secondary data for analysis to determine the relationship between system automation and revenue collection. It did not study the human influence on system automation so as to take into consideration the level of acceptance by the individuals involved in the process as well as how their perception affect the usage of system automation. Further studies can also be done on the cost effectiveness of system automation by weighing the level of change in revenue collection versus the cost of usage of the system.

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# APPENDIX I

## Cover Letter

University of Nairobi
School of Business
Department of Business Administration
Master of Business Administration Program

Dear sir/madam

REF : MBA Research Project

I am a student pursuing a master degree in Business Administrationat the University of Nairobi. I am currently carrying out research on system automation and revenue collection. My case study is based on Siayacounty. I would be grateful, if you could spare sometime from your busy schedule to assist in capturing the relevant data as per the data capture form.

The information so provided will be treated with utmost confidentiality and will be used solely for the research project. Findings of the research however can be availed upon completion of the study on request.

If there be need for clarification kindly contact me on 0722988020.

Thank you very much.

Yours Faithfully

Ligeyo VincentOchieng

## APPENDIX II

## Data Capture Form

## Part A : LEVELS OF AUTOMATION

( Tick (√) appropriately )

| DEPARTMENT | REVENUE STREAM | LEVEL OF AUTOMATION | | | |
|---|---|---|---|---|---|
| | | ZERO | LOW | MEDIUM | FULL |
| TRADE AND INDUSTRIAL DEVELOPMENT | Business permits | | | | |
| | Market fees | | | | |
| | BodaBoda | | | | |
| | Weights & Measures | | | | |
| | Trade Income | | | | |
| | Promotions | | | | |
| | Liquor Licencing | | | | |
| ROADS,PUBLIC WORKS, ENERGY AND TRANSPORT | Bus Park | | | | |
| | Plan Approval | | | | |
| | Grader | | | | |
| | Parking | | | | |
| | Hall hire | | | | |
| AGRICULTURE, FOOD, LIVESTOCK AND FISHERIES | Fish Cess | | | | |
| | Slaughter fees | | | | |
| | Silo | | | | |
| | Sugar Cess | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Agric. Income | | | | |
| | Veterinary services | | | | |
| | Cattle Auction | | | | |
| | Sales of seeds | | | | |
| | Sales of fertilizers | | | | |
| **LANDS, PHYSICAL PLANNING, URBAN DEVELOPMENT AND HOUSING** | Plan Approval | | | | |
| | Physical planning | | | | |
| | Transfer fee | | | | |
| | Plot rate | | | | |
| | Plot rent | | | | |
| | Ground rent | | | | |
| | House rent | | | | |
| | Kiosk/Stall rent | | | | |
| | Burial fee | | | | |
| | Sand Cess /Quarry | | | | |
| | Clearance Certificate | | | | |
| | Site fee | | | | |
| | Survey fee | | | | |
| | Private estate fee | | | | |
| **HEALTH AND SANITATION** | Plan approval | | | | |
| | Slaughter fee | | | | |
| | Hospital revenue | | | | |
| | Public health | | | | |
| **WATER** | NEMA | | | | |
| | Bills | | | | |
| **FINANCE** | Miscellaneous | | | | |
| **EDUCATION** | School fees | | | | |

## Part B : TYPE OF AUTOMATION

( Indicate the Year of Introduction appropriately )

| DEPARTMENT | REVENUE STREAM | TYPE OF AUTOMATION | | | |
|---|---|---|---|---|---|
| | | ECR | POS | MMT | OTHER |
| TRADE AND INDUSTRIAL DEVELOPMENT | Business permits | | | | |
| | Market fees | | | | |
| | BodaBoda | | | | |
| | Weights & Measures | | | | |
| | Trade Income | | | | |
| | Promotions | | | | |
| | Liquor Licencing | | | | |
| ROADS,PUBLIC WORKS, ENERGY AND TRANSPORT | Bus Park | | | | |
| | Plan Approval | | | | |
| | Grader | | | | |
| | Parking | | | | |
| | Hall hire | | | | |
| AGRICULTURE, FOOD, LIVESTOCK AND FISHERIES | Fish Cess | | | | |
| | Slaughter fees | | | | |
| | Silo | | | | |
| | Sugar Cess | | | | |
| | Agric. Income | | | | |
| | Veterinary services | | | | |
| | Cattle Auction | | | | |
| | Sales of seeds | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Sales of fertilizers | | | | |
| **LANDS, PHYSICAL PLANNING, URBAN DEVELOPMENT AND HOUSING** | Plan Approval | | | | |
| | Physical planning | | | | |
| | Transfer fee | | | | |
| | Plot rate | | | | |
| | Plot rent | | | | |
| | Ground rent | | | | |
| | House rent | | | | |
| | Kiosk/Stall rent | | | | |
| | Burial fee | | | | |
| | Sand Cess /Quarry | | | | |
| | Clearance Certificate | | | | |
| | Site fee | | | | |
| | Survey fee | | | | |
| | Private estate fee | | | | |
| **HEALTH AND SANITATION** | Plan approval | | | | |
| | Slaughter fee | | | | |
| | Hospital revenue | | | | |
| | Public health | | | | |
| **WATER** | NEMA | | | | |
| | Bills | | | | |
| **FINANCE** | Miscellaneous | | | | |
| **EDUCATION** | School fees | | | | |

## Part C:

## TOTAL REVENUE COLLECTED (KSH)

| YEAR | OWN SOURCE REVENUE BUDGETED | OWN SOURCE REVENUE COLLECTED |
|---|---|---|
| 2018/2019 | | |

| | | |
|---|---|---|
| 2017/2018 | | |
| 2016/2017 | | |
| 2015/2016 | | |
| 2014/2015 | | |
| 2013/2014 | | |

## REVENUE STREAM COLLECTION PER FINANCIAL YEAR (KSH)

| REVENUE STREAM | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|
| BusinessPermits | | | | | | |
| Market Fees | | | | | | |
| Buspark/ Parking fee | | | | | | |
| Fish cess and Quarry fee | | | | | | |
| Plan approval | | | | | | |
| Tender fee | | | | | | |
| Transfer fee | | | | | | |
| Miscellaneous (unclassified) | | | | | | |
| Plot rates | | | | | | |
| Plot rents | | | | | | |
| School fees | | | | | | |
| Slaughter fees | | | | | | |
| Ground/Stall rent | | | | | | |
| Burial fees | | | | | | |
| Sand cess | | | | | | |
| Sugar cess | | | | | | |
| Health Department | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lands Department | | | | | | |
| Agriculture | | | | | | |
| Trade | | | | | | |
| Roads, Public works | | | | | | |
| Licences | | | | | | |
| Education and Youth Affairs | | | | | | |
| **Total** | | | | | | |