A Survey of the Effectiveness of Automated Revenue Collection Systems in County Governments in Kenya

A Case Study of Kiambu and Taita Taveta County Governments

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Abstract—**This paper examines the effectiveness of using an automated revenue collection system in two counties in Kenya: Taita Taveta and Kiambu County Governments. County governments in Kenya have recently adopted the automated revenue collection systems in order to aid in transparency and accountability of citizens' taxes. @iLabAfrica –Strathmore University provided the solution - CountyPro as a revenue collection system in both counties. The online system has a citizen portal and a government staff portal. This study focuses on the effectiveness of CountyPro system on the backend (staff) portal. A descriptive research design was adopted in order to provide answers to who, what, where, when and how. Questionnaires and interviews were used as the main tool for data collection. The strengths and weaknesses of both systems were also analyzed and also how they work together to bring out efficiency and effectiveness in the day to day operations of county governments. In general all county staff interviewed welcome the idea of an automated revenue collection system with Kiambu County recording a 60 percent increase in revenue as a result of using CountyPro. It is the perception of most county officials that the Point of Sale Terminal is the tool that is used to determine the revenue collected. However, this system by itself is not very effective. It has to be supported by an online system that will give a breakdown of all the kind of revenue that is collected. Counties should ensure that they have laid out proper infrastructure, trained its employees before rolling out of I.T projects. County management should also act as champions for change to help their employees transition from one system to another. Insights to this study will be used to improve on the current system and also help other counties in following the correct guidelines when coming up with a revenue collection system.**

Keywords— *e-governance; revenue; management; effectiveness; system.*

I. INTRODUCTION

E-government is a generic term for web-based services from agencies of local, state and federal governments. In e-government, the government uses information technology and particularly the Internet to support government operations, engage citizens, and provide government services. The interaction may be in the form of obtaining information, filings, or making payments and a host of other activities via the World Wide Web [9]. Kenya's e-Government program was meant to address two impediments to development faced by many countries: endemic corruption and inefficiency [14].

Kenya has recently adopted a decentralized form of government. In the year 2010, Kenyans passed a new Constitution into place. One of the pillars of this new law is Devolution. Devolution refers to the transfer of decision-making capacity from higher levels in an organization to lower levels [4]. When governments devolve functions, they transfer authority for decision-making, finance, and management to quasi-autonomous units of local government with corporate status [2]. In Kenya, this meant that there was to be a national government and also the country was subdivided into forty seven counties. Each of these counties would have their own small governments and would each be headed by a governor. These counties generate their own revenue in addition to a percentage released by the national government. These small governments have also embraced incorporation of e-governance in their counties.

According to Heeks [6], e-government initiatives are important to governments in the following ways: they improve government processes or e-administration, help cut time and financial costs, manage employee and financial performance and create empowerment. They also help in connecting citizens to help improve the relationship between the government and its people. Citizens can hold public servants accountable for their decisions and actions. In turn public services are improved. Citizens' voices can also be heard and hence improved participation, and building external relations with members of the private sector through establishing meaningful partnerships.

As part of the devolution process, county governments are mandated to provide the essential services to its citizens such as good education, health care and good roads. Each county receives a percentage of funds from the national government depending on some factors such as poverty level index. This amount received from the central government is not sufficient to provide these services. To ensure sustainability, counties are expected to generate their own income. It is therefore very necessary to have a good and strong foundation of an automated revenue collection management system.

With this in mind, @iLabAfrica Strathmore University in partnership with Namu Health and iPay developed a software solution for County Revenue management. System

requirements were discussed with Kiambu and Taita Taveta county governments and an agreement was reached to develop a citizen centric e-governance and revenue management solution. The system has a front end portal for the citizens and a backend portal for the county staff. The back end portal has various functionalities that include: permit and licenses processing, billing, property rates payment, enforcement functionality, ability to generate reports and grievances management. This study will focus on the effectiveness of the back end system to the county staff.

The reasons behind the development of this solution were to have a system that would enhance transparency and accountability of those in power. It is a tool that is used to aid those in government to use their instruments of power efficiently and effectively. Though it has several components to it, it works as a unified system. In addition to this, it is also expected to work optimally, have minimal errors, easy to use and seal loopholes that could have existed in the old Local Authorities Integrated Financial Operations Management System (LAIFOMS).

Below are the objectives of the research:
1. To determine if county employees understand the usefulness of a revenue collection system.

2. To determine the perception of county staff on County Pro Revenue Collection System.

3. To determine the strengths and weaknesses County Pro Automated Revenue Collection System.

4. To continually improve the revenue collection system as a whole based on the results of the research.

To examine the above requirements, a study was performed. The paper is structured as follows below. Section 2 outlines literature gathered on previous systems from books, journals and online research comparing automated revenue collection systems in other countries with CountyPro system deployed in Kenya. Section 3 describes the methodology used to collect and gather data and as well as how the sample size was reached and how the data was obtained. Section 4 interprets and discusses the significance of the findings of the research. Section 5 – Conclusion summarizes the findings of the research giving recommendations for future improvements.

II. LITERATURE REVIEW

Automation is a set of technologies that results in operation of machines and systems without significant human intervention and achieves performance superior to manual operation [1].

For government to match in performance with the growth and expectations of its constituents, it must dramatically increase its fiscal depth without incurring costly recurring overheads. Automated systems have been proven to be capable of introducing massive efficiencies to business processes that can result in increased revenue [8].

According to Sani [7], By automating revenue collection, service providers have better audit trail since all transactions captured can be detailed by time, whom and where. This prevents revenue loss through abuses as all moves are recorded electronically.

Problems such as high costs for collection, fraud, underpayment and leakages in revenue could be made worse by massively expanding the current taxable base without the use of adequate computerized solutions. The problems of tracking and identifying fraud or rogue revenue collectors are only compounded by the usage of manual or centralized systems due to the resources and overheads needed to monitor and control such problems. A decentralized, automated revenue collection system allows for increased and timely access to information that would otherwise take too much time and effort to generate from the available hard copy records [8].

Various scholars have analyzed several revenue collection systems. Gidisu [10] studied the automation system procedures of the Ghana customs division. A survey of 40 officials from the Customs Division with specific duties and responsibilities in automation system management at the Ghana Revenue Authority (GRA) was conducted. After this survey, it can be said that the automation is a powerful monitoring tool for GRA. It was realized that there was a positive impact of automation system usage and the cost of tax administration, automation and effectiveness of revenue collection.

According to Mitullah et al. [13], from a survey of 175 local authorities in Kenya, it was discovered that most of these local authorities had a lot of challenges in realizing their mandate for instance delivery of services. This was attributed to poor revenue management systems. The study concluded that information system was instrumental in enhancing and proper management of resources at the local authorities.

A study was conducted by Justus [3] to determine the effects of an integrated revenue collection system in Machakos County, as well as challenges facing its implementation. The study established that implementation of integrated revenue collection system influenced revenue collection positively. Challenges that were identified to influence implementation of integrated revenue collection system included resources, staff capacity, political interference and remoteness among others.

III. METHODOLOGY

A Descriptive Research Design approach was used for this study. This kind of study enabled the researcher provide answers to the questions of who, what, when, where, and how effective the automated revenue collection system has been in Kiambu and Taita Taveta counties. Quantitative and qualitative survey approaches were used where

questionnaires and interviews were administered to county staff members. The respondents for this study included: billing officers, revenue officers, cashiers and parking attendants.

Both primary and secondary data sources were used to gather information. Literature was extracted from books, journals and online research by scholars.

County governments are further divided into sub counties, which are smaller divisions of the counties. Judgmental sampling was used in selecting two (2) sub counties from Kiambu County and two (2) sub counties from Taita Taveta County. This decision was reached by determining the sub counties in which there is the most activity while operating County Pro system.

Slovin's formula was used to determine the sample size from each of these counties.

$$n = \frac{N}{1 + Ne^2}$$

Where n=Sample size, N=Total population e= Desired Margin of error, that is 0.05% based on a 95% confidence level. The study included a total population of 150 staff members from Kiambu County. n=150/ (1+150(0.05)^2) = 109. This generated a sample size of 109.

The same formula (Slovin's formula) was used to determine the sample size for staff of Taita Taveta County, where N = total population with a 95% confidence level. This generated n=100/ (1+100(0.05)^2) = 80.

IV. DISCUSSION OF FINDINGS

The study sought to find out the effectiveness of a revenue collection system in both Kiambu and Taita Taveta Counties.

To perform this survey, 65% of the interviewees from Kiambu were male and 35% were female. In Taita Taveta County, 55% were male while 45% interviewees were female. In both counties, the male gender was more represented.

The study revealed that 2% of the respondents were below the age of 25 years, while 52% were between the age of 25 and 35 years. 32% were between ages 36 to 45 years. Only 10% of the respondents were above the age of 45. This shows that majority of the county staff are young, energetic and productive individuals.

Sixty seven (67%) percent of both the population selected in Taita Taveta and Kiambu Counties had been working in the county or the defunct local authority for more than ten (10) years while twenty eight (28%) percent had been working for between five and ten years. Thirty

nine percent (39%) of the population had been working in the county government for less than five (5) years. This data shows the respondents' ability to compare the past and present systems and hence shows appropriateness to answer survey questions.

Fifty percent (50%) of the population from both counties agreed that they think about an online system when they hear about an automated revenue collection system, thirty percent (30%) think of a point of sale terminal while the rest of the population think of both. This is an indication that a significant number of the population still views the POS terminal as the main revenue collection system. The respondents further added that the reason behind this is that the POS was a tangible device. This made them feel as if they had shifted systems.

Below is a breakdown of some of the findings from the questionnaires issued to the county staff of Kiambu County.

TABLE I. KIAMBU COUNTY RESPONSES

Kiambu County					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
System was easy to learn	0	0	10 (9.2%)	19 (17.4%)	80 (73.3%)
System is Easy to use	0	0	4 (3.7%)	30 (27.5%)	75 (68.8%)
Time based efficiency	0	7 (6.4%)	8 (7.3%)	40 (36.7%)	54 (49.5%)
System has low downtime	0	0	1 (0.9%)	6 (5.5%)	102 (93.6%)
Reports are easy to generate	0	8 (7.3%)	4 (3.7%)	56 (51.4%)	41 (37.6%)
Reports are easy to understand	0	0	2 (1.8%)	15 (13.8%)	92 (84.4%)
CountyPro serves better than old system	0	6 (5.5%)	15 (13.8%)	70 (64.2%)	18 (16.5%)

Below is a breakdown of some of the findings from the questionnaires issued to the county staff of Taita Taveta County.

TABLE II.   TAITA TAVETA COUNTY RESPONSES

Taita Taveta County					
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
System was easy to learn	0	1 (1.25%)	15 (18.8%)	4 (5%)	60 (75%)
System is Easy to use	0	2 (2.5%)	5 (6.25%)	20 (25%)	53 (66.25%)
Time based efficiency	0	12 (15%)	5 (6.25%)	3 (3.75%)	60 (75%)
System has low downtime	0	0	3 (3.75%)	6 (7.5%)	71 (88.75%)
Reports are easy to generate	0	0	4 (5%)	40 (50%)	36 (45%)
Reports are easy to understand	0	0	5 (6.25%)	20 (25%)	55 (68.75%)
CountyPro serves better than old system	0	5 (6.25%)	11 (13.75%)	30 (37.5%)	34 (42.5%)

73.3% from Kiambu County and 75% of the respondents from Taita Taveta County Strongly agreed that the system was easy to learn. These strong percentages from users from both counties are an indicator that the system satisfies the simplification of the system to basic users.

A notable 49.5% of respondents from Kiambu County and 75% of respondents from Taita Taveta County strongly agreed that the system is efficient in terms of helping them save time. This was done in comparison to the older system.

93.6% of Kiambu County employees indicated that the system experienced low downtime while 88.75% of the employees from Taita Taveta County indicated that the system had experienced low downtime while operating it.

They also added that the only times when there was a lag with the system was during the deadline for renewal of the yearly permits. This is during the 31st day of March of every year.

16.5% of respondents from Kiambu County strongly agreed that reports generated from CountyPro system are easy to understand while 68.75% of the respondents from Taita Taveta County agreed that the reports are easy to understand. The reason for this difference was attributed to the little amount of training that had been conducted to the employees of Kiambu County at that time as compared to Taita Taveta County. Also, most of the trainees introduced to these new systems were not technologically savvy.

Eighty percent (80%) of the population from both counties agreed that the CountyPro online system has facilitated an increase in revenues.

When asked about effect of the system on corruption, the respondents stated that the system had sealed some loopholes in terms of county employees not handling money physically. They further stated that the use of mobile money, VISA and MasterCard options helped to seal some of these loopholes.

On the other hand, Taita Taveta County interviewees stated that, ethics, good leadership and enforcement is what had contributed to the reduction.

80 percent agreed that the new system served them better than the old system – LAIFOMS system while 20 percent thought that it did not serve them better than the previous system.

The researcher further sought to find out if the previous LAIFOMS system had any drawbacks. It was pointed out that it had several major challenges. These included:

1. LAIFOMS was a standalone system that only catered for the backend operations, leaving citizens with inaccessibility problems, with nowhere to get information on county rates and charges, the finance act etc. This made them constantly visit the county offices which took a lot of time.

2. Money could not be tracked to the LAIFOMS system as bank slips were not posted to the system. Instead the banking slips were recorded manually in a register outside the system.

3. Collection of rates and money was done using physical receipts hence making the systems vulnerable to corrupt practices by county officials.

The researcher also sought to find out the advantages of the new automated system by the county employees.

One major advantage of this system was the ability of county employees to access data from anywhere as the system was online. With the system, citizens could access

information on procedures and services with the availability of documents online such as the Public Finance Act. It also incorporated various modes of payment as opposed to only cash option which was in the old system. With the new automated system, citizens could apply for permits and download them online once they are processed by county officials on the back end system. Below are some of the other benefits of CountyPro that were pointed out by the county officials:

1. It helped to stamp out bureaucracy and endless procedures as in the old system.

2. The system helped reduce paper work.

3. Reports in the system could be accessed at any time.

4. The reports showed best and worst performances in revenue and hence knew where to put in more resources. This helped in decision making by the policy makers.

5. Anytime anywhere access to the Government, 24 hours a day 365 days a year. Even those living in the diaspora could make payments for fees and licences owed online.

6. Efficient delivery of government services to citizens, and reduced dependence on human interactions.

7. Reduced cost in terms of time and resources in processing transactions/applications and delivering citizen services.

8. Increased citizen participation/empowerment through transparency, and access to information.

9. Citizens felt a form of participation in the county government as the system sent them alerts whenever their permit was ready for collection at the county offices. It also alerted them whenever there were any waivers or balances in revenues.

10. Upsurge in revenues.

The respondents were asked whether they thought the system had brought about an increase in revenue in their counties and why. They stated that the increase in revenue was facilitated in the following ways:

1. Monitoring and management of cash flow. All the sources of revenue are centrally located and are therefore easy to monitor.

2. Helped to recover lost revenues. After using the system, the county officials could more easily identify the customers who owed the county and were able to claim it.

3. Citizens could process their payments themselves without having to be followed up hence increased revenues.

4. The ability to monitor revenue trends through specific and detailed reports. It became possible to make projections and come up with attainable targets. This in turn helped boost the morale of the employees.

When asked what they would have liked to see different with the system, the respondents suggested that the training time for the system be increased to help them fully understand and internalize the system.

The respondents further added that there was need to have civic education, in order to educate citizens on the new way of doing things. This is because they had faced some resistance during the introduction of the system, as a result of introduction of new fees and charges.

Intensive ICT education needed to be conducted on the county employees in order for them to adapt as fast as possible. Most of the employees were 30 years old and above and were not ICT savvy.

The POS gadgets were being acquired from different suppliers and some of them would turn out faulty. This resulted into lags in revenue collection and overworking of county employees.

The most common problems reported with the new system is inadequate Internet connection and poor network connectivity. Another challenge that was encountered is the lack of automation of all modules in the system. For example, considering health is a devolved unit, the health module in County Pro system should be integrated with all County Hospitals. This is to ensure that all the revenue that all the revenue is collected through a single system. The respondents further suggested that this kind of integration would lead to more transparency and accountability.

V.   CONCLUSION AND FUTURE WORK

Most of the respondents' years of service was between five to 10 years and hence were familiar with most of the operations at the county offices and the different kinds of revenue collected. The whole population interviewed shows that the new automated system was accepted by the county officials. Most of the respondents recommended County Pro system for its robustness, ease of learning, friendliness, effectiveness, ability to make work easier and facilitating an increase in revenues.

An increase in revenue in both Kiambu and Taita Taveta counties was realized out of the adoption of the automated revenue collection systems. A report released by Commission on Revenue Allocation (CRA) that reviewed counties indicated that Kiambu was among top five

devolved units that made great improvements in revenue collection. Strathmore University carried out extensive research in the county on how we have collected revenue, gave us a raft of recommendations before deploying our new County Pro System that is helping seal loop holes. Kiambu County government has praised its partnership with Strathmore University on revenue collection automation, saying the deal had contributed to success of financial reforms being witnessed in the county [12]. County employees including county management have the perception that an automated system for revenue collection is a point of sale terminal. This therefore leads to too much concentration on only the Point of Sale gadget hence the flopping of the online system. County management should focus on both the point of sale gadget as well as the online system as both will in the end work together to achieve the success of the project.

County governments should work to ensure that there are the necessary resources and infrastructure before the rolling out of automation projects. Internet connectivity should also be ensured for smooth flow of work. A lot of training for the county officials should be conducted before the roll out of such projects. County governments should also ensure that all employees who will participate in an automation project are Tech Savvy. This will reduce training time, and in turn further reduce support costs.

In order to realize maximum benefits and revenue from the system, county management should look towards automating all modules. For example, the Agriculture, Livestock and Fisheries module, Liquor licence and health modules.

The transition to the new automated system was a step by step process. The county government management as well as the employees needed to identify other revenue streams that were not captured in the system to ensure that they are also automated.

In as much as the system was functioning optimally, there was still need to catch up with technology. This would involve the speeding up of cashless solutions in all the county regions such as payment via mobile money. This would solve the problem of failure of some POS gadgets.

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