

INFLUENCE OF AUTOMATION ON REVENUE COLLECTION BY COUNTY GOVERNMENT: A CASE STUDY OF NAKURU COUNTY GOVERNMENT

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Abstract

The collection of revenue at both national and county level governments has been a big challenge and remains a major obstacle in national government and county governments in achieving their revenue collection targets and economic goals. The use of automation as means of revenue collection has been globally recognized as the most efficient, effective, economical and transparent means of revenues collection. The aim of the study was to examine the effects of automation on revenue collections by the County Government of Nakuru in Kenya. The specific objective of the study was to examine use of Automation in revenue collection in Nakuru county government Kenya. The study adopted a survey research design, which covered the sub – counties of Nakuru county government, namely Nakuru East, Nakuru West, Njoro, Molo, Kurusoi North and South, Rongai, Subukia, Bahati, Gilgil and Naivasha. Targeted population for the study is 132 employees of the county government of Nakuru working in revenue and finance/accounts departments of the listed sub –counties of Nakuru County Government. Nassiuma's (2008) formula was used to determine a representative sample size of 69 respondents for the study. The study used self-administered semi-structured questionnaires to collect the data. A pilot study was conducted in Uasin Gishu county in Eldoret, before main

study was done. Cronbach alpha coefficient was used to test the instrument's reliability. Content validity was determined through expert opinion the supervisors. Collected data was transformed/analyzed with the assistance of the SPSS 23. Descriptive statistics included means and standard deviations and inferential statistics mainly Pearson's correlation, multiple regression analysis and the results of the analysis was presented in form of tables. The findings indicated that the efficiency in revenue collection in Nakuru county was due the automation of the systems.

Keywords: Revenue Collection, Automation, Revenue, Efficiency

INTRODUCTION

Automation of revenue collection is whereby, the manual system of revenue collection is replaced by modern technological machines which are used to collect revenue. In the Nakuru county government, the application of modern technological machines would enhance efficiency, convenience, and give a higher degree / level of transparency in revenue collections (Amin, 2013) found that automation of revenue collection improved accountability and ease in the supervision of revenue collection officers.

According to Lymer and Oats (2010) definition, revenue is the amount of money that the county government receives from various sources namely, proceeds from issuance of debts, sale of investments .financial transactions through private agencies. The amount of revenues collected by counties is related to historical and current political decisions regarding the goods and services governments provide and the way that they are produced (OECD, 2009). All governments raise revenues to finance public spending, from highways, hospitals to schools and social security among other government budgetary needs. Revenue is measured over the full fiscal year of the government.

Wasilewski (2000) compared the tax collections methods between Japan and Brazil. The study found that in Japan revenue collections is highly automated compared to Brazil. The high revenue collection in Japan has stimulated economic growth.

Fjeldstad and Heggstad (2012) found that political and administrative limitations as the major constraints facing local revenue mobilization in Anglophone Africa countries. According to Chitembo (2009). In Botswana he observed that level of intergovernmental transfers varies widely amongst countries and between rural and urban council's lack of automation of revenue collections resulted to higher financial dependency from the central government. The study found that rural councils and urban councils receive 92 per cent and 62 per cent respectively

from the Botswana Central Government (Chitembo, 2009). Lymer and Oats (2010) in South Africa observed that the high revenue collection by local authorities in South Africa, was estimated at 89 per cent of revenues collections was as a result of automation of revenue collection system.

Gidisu (2012) in Nigeria, found that due to the introduction of automation revenue collection system the cost of tax administration reduced leading to effective revenue collection. Abiola and Asiweh (2012) conducted a study aimed at determining the impact of automation of government revenue collection of Nigeria. But lack of enforcement machineries, adequate manpower, computers and postal communication system in Nigeria had some negative effects in total revenue collection. The study findings indicated that with automation in revenue collection, more diversification of automated revenue collections resulted in positive economic development which was realized, thus improving the lives of Nigerian citizens.

Nkote and Luwugge (2010) looked into automation of revenue collection and computerization of customs tax administration in Uganda. It was observed that for automation to be efficient and effective, the computerization of custom tax administration requires trained adequate man power capable of addressing challenges related to automation such as delays in clearance time. The study conducted by Okech and Mburu (2011) in Kenya sought to analyze the responsiveness of tax collection revenue as related to automation of revenue collection system between 1986 -2009. The study concluded that the automation of Kenyan tax system resulted to increase in revenue collection.

Muriithi and Moyi (2003) in Kenya looked at the level of tax revenue collections under automated system and non-automated system, the study found that under the unautomated system the revenue collection level was low compared to automated revenue collection. Mitullah (2005) conducted survey of 175 local authorities in Kenya on the effectiveness of automated revenue collection systems. The study established that automated system was instrumental in enhancing the proper management of revenue sources.

Maina (2013), on the other hand concluded that revenue collectors appreciated the role of automation system of revenue collection technology in ensuring effective revenue collection. Odoyo, Oginda, Obura, Aila, Ojera and Siring (2013) carried out a study to determine the effects of automated revenue collection system by Local Authorities in Homabay County. The study established that there is a strong positive relationship between automation and effectiveness in revenue collections. The study found that 95% of the respondents who participated in the study agreed that there is a strong positive relationship between automation of revenue and revenue collected. The major hindrance in the implementation of automated revenue collection was as a result of resistance to change by the council staff.

Kamolo (2014) in Kenya, in his study found that Local governments tend to depend on National government for revenue to perform their duties. This dependency is as a result of Local government revenue collection system being inefficient and ineffective thus calling for the automation of revenue collection system. Following the establishment of devolved governments in Kenya 2013, county governments are expected to collect their own revenues to mitigate between allocation of revenue from central government and their own budget. This has called for automation of revenue collection systems from Local Authority Integrated Financial Operations Management System (LAIFORM) to Integrated Financial Management Information System (IFMIS). This is intended to enhance revenue collections from multiple revenue streams including single business permits, market stalls, parking fees, real estates, land rates, and to achieve real time transaction reports on a secure central server that must be accessible on web and mobile platforms (UNCTAD, 2008). Wahab (2012) in Ghana, observed that revenue collections fail because of several factors namely, inadequate senior management, ineffective planning, inappropriate organizational design, an inefficient system of monitoring, evaluating and controlling, misuse of resources.

Manyasia (2012) found that most Counties are faced with budgetary challenges to meet their set obligations, such as payment of wages, financing development programs. This is because revenue collection has been wanting. The Kenya Institute of Certified Public Accounts report (ICPAK 2014) confirmed the of (Munyasia 2012), but also recognized that several Counties are not able to collect enough revenues, thus inability to meet their objectives and being self-reliant.

Awiata (2010) and Gachanja (2012) observed that in Kenya lack of commitment to automated revenues collections, limited management supervision and inadequate management information systems is the major hindrance in realization of good revenue collection. This study is motivated by the above background to examine the effects of automation on revenue collections by county governments, a case of Nakuru County Kenya.

Statement of the Problem

The inability of most counties to collect enough revenue has been a major concern. The available Auditor General report (2004) on revenue collection, indicated that Meru county missed the targeted revenue of Kenya shillings 600 million by 43% and in another report by (Mueke 2015), Nairobi county increased its revenue collection by 60% and this was due to Automation of revenue collection. In a similar report (Mueke 2015) there was element of corruption by revenue clerks and this will only be minimized by full implementation of Automation revenue collection.

There is need to put in place a proper and effective strategy of revenue collection, that will help the counties governments to meet their revenue collection targets which can assist them in meeting their Social and economic goals in the development of counties. Cases of Nairobi (Mueke 2015) and Meru county Auditor general report (2014) clearly indicates that there is a huge gap between projected annual revenue collection and the actual annual revenue realized. This study sought to assess the influence of Automation on revenue collection in Nakuru county government in Kenya. To achieve this goal the study compared the revenue collection before and after the implementation of Automation revenue collection based on data available from primary and secondary data from sub- counties and Nakuru county government headquarter.

Objectives of the Study

To determine efficiency of automated revenue collection in Nakuru county government Kenya.

LITERATURE REVIEW

Review of Theories

Transaction Cost Theory

The theory addresses the costs that companies incur in the processes of collecting revenues and other forms of commitments. Khan and Hildreth (2004), stated that transaction cost theory is the most applicable in financial management. Khan, Amos (1979) applied transaction cost theory when they argued on the 19th century fixed rent contractors that were dominant when revenue collectors agreed payments based on the entire revenue collected. In both studies, the issue of financial fraud towards collections can only be reduced by Automating revenue collections..The application of Automation Revenue collection technology, would eliminate and reduce a number of revenue collection agencies and contractors, thus leading to efficient and effective, convenient and economical revenue collection by County Governments.

Transaction cost theory has been criticized because it ignores the role of differential capabilities in structuring economic organization; neglected power relations, trust, and other forms of social embeddedness and overlooked evolutionary considerations.

Automation and Efficiency of Revenue Collections

Sani (2013) reported that delay in the remittance of the generated revenue to the State treasury was as a result of the huge computation involved in bringing together all revenues collected from the 30 Area offices in the State government. This made it difficult for the State Government to respond to the need of her citizens. The primary aim of automation of revenue collection is to increase cash receipts in order to effectively sustain the county operations. The study showed

that automation of revenue collection processes further maximizes revenue collection, where records are computerized (Odoyo 2013).

Odoyo, Oginda, Obura, Ojiera. Alila and Siring (2013), looked at revenue collections by Local Government of Homabay. The study found that Automation reduced financial frauds enhanced efficiency and accountability, resulting in increase of revenue collections. This was confirmed by 97% of the respondents who participated in the study. The study also found that resistance to change by the county government staff revenue collecting clerks were derailing the full implementation of automation of revenue collection system. Sohne (2003), found that Automating revenue collection has a significant positive influence on the total revenue that counties are likely to collect.

UNCTAD (2006), emphasized that Automation technology based approach in revenue collection, will help the governments to achieve substantial revenue collection, that would help to transform government in terms of meeting the needs and expectations of the Citizens in service delivery, (Gill 2000). A study conducted by Maina (2013) concluded that the revenue collectors appreciated the role of automation of revenue collection technology in ensuring effective revenue collection however the availability and accessibility was a hindrance to effective LAIFOMS implementation.

A study conducted by Franzen (2007) In Dar es Salaam Tanzania, indicated that automated revenue collection was more effective. Fjeldstad and Haggstad (2012) found out in Tanzania that automation of revenue collection improved the efficiency of revenue collectors. Another study by Olaoye, and Kehinde (2017) to determine the benefits of automated revenue collection in Nigeria. However, it concluded that automation of revenue collection contributed to reaching the goal of good (financial) governance, accountability and transparency of the revenue authorities.

A study by Lubua (2014) indicated that the use of automation for self-assessment addresses the challenge of the integrity of employees and promotes voluntary compliance hence efficiency. Muthama (2013), did a study on Kenya Revenue Authority management practices and its reforms following the application of technology in the management of revenues. It was found that there have been a lot of changes in the firm that have prompted the management to effectively manage change. New departments have been created, others merged while others split in a bid to deliver better services to clients. Similar to organizations, resistance to change was inevitable but the management was able to contain the pressures that wanted status quo to prevail.

RESEARCH METHOD

Target population

According to Cox, (2013), target population in a study is the entire group of items or individuals having common observable characteristics with information that the researcher is interested in, in this study it consist of employees working in finance/accounts and revenue collection, study data was collected and used to make inferences. The study was limited to Nakuru County Government staff attached to the finance/accounts and revenue collections departments. The aforementioned employees are directly or indirectly involved in revenue collections and as such are presumed to be on a vantage position to understand the factors that influence optimal revenue collection by the County Government. The total target population in this study will be 132 employees.

Sample size

A sample size is a smaller group obtained from the targeted population. It is from this smaller group that a researcher gathers information about the problem being studied. Karugu (2007). The sample is derived from the accessible population and as a subset of the study population. The number of accessible population is relatively large (132), a representative sample was determined using Nassiuma's (2008) formula as follows:-

$$n = \frac{NC^2}{C^2 + (N-1) e^2}$$

Where;

n - represents sample size

N - represents target population

C - represents coefficient of variation ($21\% \leq C \leq 30\%$), and

e represents degree of error ($2\% \leq e \leq 5\%$)

Therefore;

$$n = \frac{132(0.3)^2}{0.3^2 + (132-1)0.025^2}$$

$$n = 69.12 \text{ respondents}$$

The sample size, therefore, comprised of 69 respondents.

Sampling procedure

Ngechu (2004), emphasize the importance of selecting a representative sample through making a sampling frame, from the targeted population, frame the required number of subjects,

respondents, elements is selected in order to make a sample. Purposive sampling was used to target employees in finance/accounts and revenue collections departments of the county government, stratified random sampling was adopted as the employees from the two strata are heterogeneous and get representative sample from each stratum to have a homogenous respondents. Proportion sampling and simple random sampling was conducted so that each person has an equal chance of being drawn during each selection round (Ngugi 2015) Stratified random sampling was used to pick the required number of respondents from each stratum which is asserted to return less error than simple random sampling (Ngugi 2015), which justify its pick in the current study

Data Collection Instrument

A set of structured questionnaires was used to collect primary data from the respondents. This instrument was preferred on the basis that it helped to manage the capture of data relevant to the research objectives. In addition, Kothari (2004) asserted that, a questionnaire is one of the most appropriate tools for collecting data from a large number of respondents as is the case with this study. The questionnaire was drafted in a way that it could be employed to objectively collect data that would tally with all the study variables.

Data Analysis and Presentation

Data was first analyzed descriptively in form of frequencies, percentages, means, and standard deviations. This was followed by inferential (Multiple linear regression analysis) to meet the assumptions for multiple linear regression Pearson's correlation coefficient was adopted. The significance was tested at 0.05. The coefficient of determination (r^2) was employed in order to determine the contribution of independent variables towards revenue collections. The findings obtained were presented in form of statistical tables.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where:

Y represents level of revenue collection

β_0 represents constant

X_1 represents efficiency

X_2 represents convince

X_3 represents transparency

$\beta_1, \beta_2, \beta_3$ represent regression coefficients of independent variables

ε Error term

RESULTS AND DISCUSSION

Efficiency of Automated Revenue Collection

The study sought to identify the determinants of efficiency of automated revenue collection in Nakuru county government Kenya (Table 1).

Table 1 Efficiency of Automated Revenue Collection

Efficiency		SD	D	N	A	SA	TOTAL	MEAN	STD
There has been increased number of people using - automation hence effective revenue collection	F	5	4	3	27	19	58	3.88	1.201
	%	8.6	6.9	5.2	46.6	32.8	100.0		
Automation ensures accuracy/competence in revenue collection	F	8	4	0	23	26	58	4.21	.913
	%	8.6	6.97	0	39.7	44.8	100		
Automation ensures timely recording of revenue	F	3	3	4	20	28	58	4.16	1.105
	%	5.2	5.2	6.9	34.5	48.3	100		
All revenue collections in Nakuru county have automated	F	3	6	5	14	30	58	4.07	1.226
	%	5.2	10.3	8.6	24.1	51.7	100		
Automation has enhanced regulation in revenue collection	F	1	0	11	27	19	58	4.08	.82259
	%	1.7	0	19.0	46.6	32.8	100		
Automation has led to controlled revue collection in the county	F	0	4	14	25	15	58	3.87	.88014
	%	0	6.9	24.1	43.1	25.9	100		

The study employed a 5 point Likert scale to analyze the determinants of efficiency of automated revenue collection in Nakuru county government Kenya with 1 indicating strongly disagree and 5 strongly agree. The study results indicated that 79.4% of the study respondents agreed that there has been increased number of people using -automation hence effective revenue collection, 5.2% were undecided while 15.5% disagreed. Also, 84.5% of the study respondents agreed that Automation ensures accuracy/competence in revenue collection, none was undecided while 15.5% had a contrary opinion. The study results indicated that 82.2% of the respondents concurred that Automation ensures timely recording of revenue, 6.9% were unsure while 10.4% disagreed. On whether all revenue collections in Nakuru county are automated, 79.4% agreed with the statement while 19.0% of the study respondents were uncertain and 1.7% disagreed. Lastly, the study findings indicated that 53.2% of the study respondents were of the opinion that Automation has led to controlled revue collection in the county while 22.5% disagreed.

A majority of the respondents were of the opinion that the aim of automation of revenue collection in Nakuru County is to increase cash receipts in order to effectively sustain the county operations and maximizes revenue collection. The study results are in line with that of Lubua (2014) who indicated that the use of automation for self-assessment addresses the challenge of the integrity of employees and promotes voluntary compliance hence efficiency. Further Maina (2013) concluded that the revenue collectors appreciated the role of automation of revenue collection technology in ensuring effective revenue collection however the availability and accessibility was a hindrance to effective LAIFOMS implementation

Inferential Statistics

Multiple regression model was used as a form of inferential statistics analysis to determine the relationship between the dependent and independent variables.

Multiple Linear Regressions Analysis

The study employed multivariate regression model to assess the effects of automation on revenue collections by county governments, a case study of Nakuru county government

Test of Normality assumption

Normality is one of the assumptions for multivariate analysis. Regression assumes normality between the variables under analysis, Skewness and kurtosis measures of the distributions should be calculated, skewness describes how symmetrical the distribution is around the centre, kurtosis describes how flat or peaked the distribution is. According to Hair *et al.*, (2010) skewness and kurtosis should be between ± 1.96 . Table 2 shows all variables with corresponding skewness and kurtosis values. Clearly, most of the variables did not violate (or are at least close enough to) the assumption of normality based on the rule of ± 1.96 If it is between -1.96 and +1.96 the data is normal and if lies outside the bracket the data significantly deviate from a normal distribution.

Table 2 Normality assumption

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Efficiency	58	-1.093	.314	.789	.618
Convenience	58	-1.748	.314	3.560	.618
Transparency	58	-1.620	.314	2.918	.618
Revenue Collection	58	-1.188	.314	1.373	.618

Test of Homoscedasticity assumption

Homoscedasticity assumes that the dependent variable show an equivalent level of variance across the range of predictor variable. Homoscedasticity is one of the assumptions required for multivariate analysis. The study used Durbin-Watson statistic to test the assumption of Homoscedasticity, the Durbin-Watson statistic should be between 1.5 and 2.5. The results in Table 3 indicated that The Durbin-Watson statistic is 1.702 which is between 1.5 and 2.5 and therefore the data is not auto correlated.

Table 3 Homoscedasticity assumption

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.907 ^a	.822	.812	.293	1.702

a. Predictors: (Constant), Efficiency,

b. Dependent Variable: revenue collection

Test of for Multi-Collinearity

The assumption of multicollinearity implies that there is no correlation between independent variables. This will be tested using tolerance and variance inflation factor (VIF). A tolerance of above 0.2 or a VIF less than 10 is regarded as indicative of serious multicollinearity problems and the assumption of independence of residuals means that successive observations of the dependent variable are not correlated. From the study it was clear that the multicollinearity assumption was met as all the tolerance values of all the variables was above 0.2 and the VIF values was less than 10. This is presented in Table 4 below.

Table 4 Test of for Multi-collinearity

Model	Collinearity Statistics	
	Tolerance	VIF
Efficiency	.511	1.959

a. Dependent Variable: revenue collection

Hypothesis Testing

From the study a multiple linear regression model was used to investigate the three study hypotheses which examine the direct and indirect effects of efficiency, on revenue collection . Hypothesis testing was done with a significance level of 0.05, such that when the significance value is less than the 0.05 the null hypothesis is rejected and when it is above 0.05 it is accepted. This is discussed in the section that follows:

H01: There is no significant relationship between efficiency and automated revenue collection in Nakuru county government Kenya

The relationship between the independent variables (Efficiency) and dependent variable (revenue collection) was tested through use of a simple regression model.

Table 5 Model Summary of Automation Efficiency

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.703 ^a	.495	.486	.486

a. Predictors: (Constant), Efficiency

From the results on model summary R= 0.703, R- square = 0.495, adjusted R- square= 0.486, and the SE= 0.486. Multiple correlation R coefficients indicate the degree of linear relationship of revenue collection with the predictor variable automation efficiency, whereas the coefficient of multiple determinations. R-square shows the provision of the total variation in revenue collection that is explained by the independent variables automation efficiency in the regression equation. The R-square gives us the coefficient of determination between the variables. The results from the regression analysis give an R-square value of 0.495, which means that 49.5% of the independent variable (automation efficiency) cause the change on dependent variable (revenue collection).

Table 6 ANOVA Automation Efficiency

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	12.921	1	12.921	54.796	.000 ^b
1	Residual	13.205	56	.236		
	Total	26.126	57			

a. Dependent Variable: revenue collection

b. Predictors: (Constant), Efficiency

The significance of the regression model was tested using Analysis of Variance (ANOVA). Table 6 presents the results of this test, where, F= 54.796, p=0.000. From the study the significance value is 0.000 which is less than 0.05 thus the model is statistically significant in predicting how automation efficiency affect revenue collection. The F value of 54.796 indicates that the variable in the equation are important hence the overall regression is significant, this shows that the model was significant.

Table 7 Coefficients of Automation Efficiency

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	1.232	.403		3.058	.003
	Efficiency	.722	.098	.703	7.402	.000

a. Dependent Variable: revenue collection

From the table 7 above a significant value of ($p=0.000$) was obtained, this implies the hypothesis (there is no significant relationship between efficiency and automated revenue collection) is rejected and hence it indicates that there is a significant relationship between automation efficiency and revenue collection. These findings agree with that of Olaoye, and Kehinde (2017) who stated that automation of revenue collection contributed to reaching the goal of good (financial) governance, accountability and transparency of the revenue authorities.

CONCLUSION AND RECOMMENDATIONS

Based on the study findings, it is concluded that, there has been increased number of citizens using automation hence effective revenue collection. Automation ensures accuracy/competence in revenue collection, timely recording of revenue, it has enhanced regulation in revenue collection and has led to controlled revenue collection in the county. Based in the findings of this study, the researcher came up the following recommendations;

- i. Nakuru county governments should ensure that revenue automation as an element of revenue collection is well managed in the revenue collection departments so as to enable all parties within the department to freely access and utilize the official information.
- ii. The County should implement engagement processes for open data standards activity and crowd source priority areas for data standards which will enhance consistent, tight and specific data standards enabling comparative benchmarking, thus supporting greater accountability, transparency of revenue collection activities.
- iii. Further, the study recommends the ICT department should ensure that there is effective project coordination and change management for success of the revenue system. In addition the department should ensure that there is a good data system and that is compatible with the revenue collection needs.
- iv. For success implementation of the automated revenue collection system in Nakuru County the study recommends that the County government need to have a clear Vision

and strategy to guide the implementation and smooth running of revenue collection process.

SUGGESTION FOR FURTHER RESEARCH

The study suggested further research to be done on effectiveness of revenue collection automation on revenue generation in order to depict reliable information that illustrates real situation in both public and private sector organizations

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