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THE EFFECT OF AUTOMATED CAR PARK SYSTEM ON REVENUE COLLECTION IN BUSIA COUNTY GOVERNMENT, KENYA

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ABSTRACT: *In the present-day competitive, fast-paced business landscape, getting the most out of available resources is not an option but a necessity. County governments are taking a highly proactive approach to systems modernization and operations in an effort to increase efficiency and effectiveness in their operations. The study sought to establish the effect of automated financial systems on revenue collection in Busia County Government. Based on the study, this paper examines the effects of automated car park system on revenue collection in Busia County Government. The study used the Meta Theory Model was used as the theoretical framework. The Theory posits that contingency factors, organizational factors and technological factors have an effect on the aspect of task performance. The study adopted ex post facto research design. The study targeted 140 employees who worked at the Busia County Government. The research used random sampling technique to identify respondents who participated in the study. The sample size was 103 respondents. Data was collected using a questionnaire and analysed using descriptive and inferential statistics (ANOVA, regression analysis and correlation). The study found that there was a statistically significant linear relationship between automated car park systems and revenue collection (p=0.000). The research recommended that Busia County should improve on automated financial systems. Automation of the revenue management process should be improved to enhance efficiency.*

KEYWORDS: Effects, Automated Car Park System, Revenue Collection, Busia County Government, Kenya

INTRODUCTION

Automated financial systems enhance the performance functions by enhancing efficiency and effectiveness. Integrated financial systems involve computerization of public expenditure management processes, including budget formulation, budget execution, and accounting with the help of a fully integrated system for financial management (Kotze, 2012). Automated service provides a good opportunity for organizations to provide new models of service design strategies and new service development (Henderson, McGoldrick & McAdam, 2003).

A review of the current trends in conceptualization of automated service reveals that general automated service definitions include specific reference to the internet. However, they negate the inclusion of other important automated service dimensions such as telephone service and automated service delivery outlets. For example, Ruyter, Wetzels and Kleijnen (2001) define automated service as interactive, content-centred and internet-based customer service, driven by the customer and integrated with related organizational customer support processes and technologies with the goal of strengthening the customer-service provider relationship. Moreover, Surjadjaja, Ghosh and Antony (2003) describe automated service as web-based service delivered through the internet and in which the customer's interaction or contact with the organization is limited to the information and communication technology (ICT) itself. A

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more holistic definition, which was adopted in this research, is that proposed by Buckley (2003) who defines automated service as the electronic provision of a service to customers. This definition is identified as being more holistic as it allows for the inclusion and examination of other service delivery channels beyond services through the internet.

Automated Car Park System and Revenue Collection

A study by Benelli and Pozzebon (2013) describes a solution for the payment of car parks based on different telecommunication technologies. The solution focuses both on street car parks; parks located along the streets or in the squares, and on closed car parks that is parking areas and infrastructures enclosed by entrance and exit bars. Closed car parks are usually multilevel structures where cars drive in taking a ticket from a ticketing machine positioned next to an entrance bar which opens once the user has picked the ticket; an example is the ticketing system at the Zion Mall in Eldoret Kenya. For these structures the operative protocol follows these steps: the user arrives at the entrance bar and receives a ticket with the entrance hour printed on it; the entrance bar opens and the user can park the car wherever he wants inside the parking; when the user comes back to the parking, before collecting the car, he has to go to a ticketing machine; at the ticketing machine he introduces the ticket, and the exact fare is calculated; the user introduces the required amount and the ticket is marked as “Paid”; the user can now pick up the car and go to the exit bar; here, the user introduces the ticket that, once read, allows the opening of the bar.

Ndunda, Ngahu and Wanyoike (2015) have discussed automatic parking system and electronic parking fee collection based on vehicle number plate recognition. The aim of their research was to develop and implement an automatic parking system that would increase convenience and security of the public parking lot as well as collecting parking fee without hassles of using magnetic card. The auto parking system would have less interaction of humans and use no magnetic card and its devices. In additions to that, it has parking guidance system that can show and guide user towards a parking space. The system uses image processing of recognizing number plates for operation of parking and billing system. Overall, the systems run with a pre-programmed controller to make minimum human involvement in the parking system and ensure access control in restricted places. The focus of the current study was on the effect of automation of financial systems on revenue collection in Busia County government.

A study by Ward (2006) has found that a parking payment system is provided that includes a telecommunication provider and a mobile device. The mobile device is supported by the telecommunication provider. The mobile device promotes a customer identifying a parking space and further promotes the customer selecting to pay for the parking space. The telecommunication provider bills the customer for fees associated with the parking space in response to the customer selecting to pay for the parking space. The system also includes an enforcement device that displays a graphical user interface (GUI) that identifies a plurality of the parking spaces and indicia associated with each of the plurality of parking spaces. This indicates whether a parking fee has been paid for the associated parking space. In another embodiment, a method for parking is provided that includes a user using a mobile device to identify a parking space. The method includes receiving, via the mobile device, information regarding parking in the parking space. The method includes selecting to pay a fee to park in the parking space, and charging the fee to a mobile device account associated with the user's mobile device.

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A study by Admasu and Gurmu (2000) has shown how the present invention of a digital car payment system addresses the issues of the current art with a digital system that provides a fully integrated payment and enforcement system for car parking services. The system and method eliminates the need for coin or parking card payments to procure such services.

Statement of the Problem

In Kenya, there are 47 county governments whose structure, authority and mandate are enshrined in the constitution. The Constitution of Kenya, 2010, in the clause on revenue funds for county governments, states that 'there shall be an established revenue fund for each county government into which shall be paid all money raised or received by or on behalf of the county government, except money reasonably excluded by an Act of Parliament'. In the present-day competitive, fast-paced business landscape, getting the most out of available resources is not an option but a necessity. Consequently, county governments are taking a highly proactive approach to systems modernization and operations in an effort to increase efficiency and effectiveness in their operations (County Allocation of Revenue Act, 2016, p. 459, GoK, 2014).

A number of studies have been undertaken in Kenya on automated public financial management. For instance, Simona (2009) did a study on the extent of implementation of integrated financial management information system (IFMIS) as a tool for sustainable financial management in the national government. The study mainly focused on the national government. Wanyungu (2001) has also investigated financial management practices of micro and small enterprises in Kenya. The study found that firms that acquire extensive IT resources are able to create competitive advantage.

In Kenya, there have been widespread allegations of fraud and embezzlement of funds perpetrated by county governments officials leading to huge loses of millions of money (Buluma & Obande, 2015). The County Government of Busia has not been exempt from these allegations. Therefore, there was a need to investigate the effect of automating financial systems on revenue collection by the County Government. The investigation would provide a basis for reducing incidences financial mismanagement by an inefficient revenue collection system. According to the GoK (2014), revenue manual collection systems are susceptible to high costs of revenue, fraud, underpayments and revenue leakages compared to automated systems. Previous have also not sufficiently documented the effect of automation of financial systems. Therefore, this study sought to document the effect of automated financial systems on revenue collection in Busia County Government, Kenya.

MATERIALS AND METHODS

The study adopted ex-post facto research design. The study targeted Busia County as the County had introduced automated financial systems, thus the research sought to find out if it has affected revenue collection. The study specifically targeted respondents from Busia County Government. According to the records of the county government, June 2016, there are 140 employees. As such, the target population was 140 employees of Busia County as shown in the table below.

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Table 1: Target Population

Stratum	Target population
Procurement Department	50
Information Technology Department	50
Administration	40
Total	**140**

Source: Busia County Government (2016)

The main data collection tool used was a questionnaire. The reason for using questionnaires is that they are easier to administer and easy to analyse (Kombo & Tromp, 2006). The questionnaires consisted of closed ended questions. They were sub-divided into sections so as to capture the response and details required. The questionnaire had four main parts. Section A gathered information on the demographic characteristics of the respondents. This is because it is imperative to know who is filling the questionnaire and also it enables the researcher to differentiate between different sub-groups (Gilovich, Keltner & Nisbett, 2006). Section B gathered data on how automating the human resource system affected revenue collection in Busia County Government. Section C examined the extent to which automating procurement system affected revenue collection in Busia County Government. Section D collected data on whether or not automation of car park system affected revenue collection in Busia County Government.

The study used quantitative data. The filled questionnaires were checked for completeness and then coded and the data analysed. Considering the quantitative nature of the data, descriptive statistics were used for analysis. Tables were used to summarize responses for further analysis and to facilitate comparison. Correlation, ANOVA and regression analysis were used to test the relationship between the study variables. Regression analysis includes techniques for modelling and analysing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables (or predictors). More specifically, regression analysis helps understand how the typical value of the dependent variable (or criterion variable) changes when any one of the independent variables is varied, while the other independent variables are held fixed. Regression analysis estimates the conditional expectation of the dependent variable given the independent variables, that is, the average value of the dependent variable when the independent variables are fixed that is the relationship between automating financial systems on revenue collection.

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RESULTS

Automated Car Park System and Revenue Collection

The study sought to establish how automating car park system affect revenue collection. The study results were as analysed and presented in Table 2 below.

Table 2: Automated Car Park System and Revenue Collection

Statements		SD	D	U	A	SA	Total	Mean	Skewness
Quickly assemble quick and frequent reports	F	0	0	16	67	16	98	4.00	-1.187
	%	0	0	16.4	67.2	16.4	100	80.0	
Eliminate lengthy manual receipts	F	4	9	15	62	12	98	3.70	-0.969
	%	3.3	8.2	14.8	62.3	11.5	100	74.0	
Facilitate efficient communication between customers	F	4	8	15	62	12	98	3.71	-0.764
	%	3.3	8.2	14.8	62.3	11.5	100	74.2	
Immediately access information	F	8	19	24	46	5	98	3.21	-0.606
	%	8.2	18	23	45.9	4.9	100	64.2	
Free up employees to devote more time to other	F	8	0	24	20	49	98	3.10	-1.446
	%	8.2	0	23	19.7	49.2	100	60.2	
Provide solution to traffic congestion	F	0	0	10	71	17	98	4.08	-0.860
	%	0	0	9.8	72.1	18	100	81.6	
Improve efficiency of parking operations	F	0	0	10	72	16	98	4.07	-0.936
	%	0	0	9.8	73.8	16.4	100	81.4	
Terms and conditions for car parking are adhered to	F	0	6	10	69	12	98	3.90	-1.130
	%	0	6.6	9.8	70.5	13.1	100	78.0	

Source: Field Data (2017)

From the above results, the skewness results show that the data were within a considerable range of between -2 and +2 implying that the data proved normal univariate distribution. The study results revealed that 80.0% (mean=4.00) were of the view that automating car park system assemble quick and frequent reports; 74.0% (mean=3.70) were of the view that automating car park system eliminates lengthy manual receipts; 74.2% (mean=3.71) were of the view that automating car park system facilitates efficient communication between customers; 64.2% (mean=3.21) were of the view that automating car park system immediately accesses information; 62.0% (mean=3.10) were of the view that automating car park system frees up employees to devote more time to other tasks; 81.6% (mean=4.08) were of the view that automating car park system provides solutions to traffic congestion; 81.4% (mean=4.07) were of the view that automated car park system improves efficiency of parking operations while 78.0% (mean=3.90) were of the view that terms and conditions for car parking are adhered to.

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Indications of Revenue Collection

The research results on the indicators of revenue collection were as presented in Table 3 below.

Table 3: Revenue Collection

Statements		SD	D	U	A	SA	Total	Mean	Skewness
The amount of revenue collected by the county government	F	12	8	14	27	35	98	3.66	-0.971
	%	13.1	8.2	14.8	27.9	36.1	100	73.2	
The achievement of revenue targets set by the revenue collection unit	F	12	18	41	23	1	98	2.83	-0.439
	%	13.1	18	42.6	24.6	1.6	100	56.6	
There is an overall increase in the percentage of revenue collected	F	6	16	51	22	1	98	2.96	-0.546
	%	6.6	16.4	52.5	23	1.6	100	59.2	
There has been expansion of revenue collected in every fiscal period	F	25	16	22	26	5	98	2.72	-0.167
	%	26.2	16.4	23	27.9	6.6	100	54.4	
The growth of revenue as a percentage of total county revenue has been impressive	F	16	19	29	21	12	98	2.95	-0.123
	%	16.4	19.7	29.5	21.3	13.1	100	59.0	

Source: Field Data (2017)

From the above results, the skewness results show that the data were within a considerable range of between -2 and +2 implying that the data proved normal univariate distribution. The study results revealed that 73.2% (mean=3.66) were of the opinion that the amount of revenue collected by the county government indicated the level of revenue collected; 58.6% (mean=2.83) were of the opinion that the achievement of revenue targets set by the revenue collection unit indicated the level of revenue collected; 59.2% (mean=2.96) were of the opinion that the county has realized significant growth in the amount of revenue collected in the recent years; 54.4% (mean=2.72) were of the opinion that there is an overall increase in the percentage of revenue collected, whereas 59.0% (mean=2.95) were of the opinion that the growth of revenue as a percentage of total county revenue has been impressive.

Correlational Analysis

The study sought to establish the relationship between the study variables. The study results on the relationship between automating financial systems and revenue collection were as presented in Table 4 below.

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Table 4: Relationship between study variables

Correlations					
		Automated HR	**Automated procurement**	**Automated car park systems**	**Revenue Collection**
Automated car park systems	Pearson Correlation	0.407	0.104		
	Sig. (2-tailed)	0.642	0.306		
Revenue Collection	Pearson Correlation	.679**	.618**	.413**	
	Sig. (2-tailed)	0.000	0.000	0.000	1
	N	98	98	98	98

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Field Data (2017)

As shown in the table above, there was a significant relationship between automated car park systems and revenue collection (r=0.413, p=0.000).

Test of Hypothesis

The hypothesis tested in regard to the variable on automation of car park was: There is no significant relationship between automated car park system and revenue collection in Busia County Government, Kenya. The study results revealed that there was a statistically significant linear relationship between automated car park systems and revenue collection (p=0.000). The study therefore rejected the hypotheses which showed that there is no significant relationship between automated car park systems and revenue collection. This implies that Automation of car park systems give the developer more options for additional revenue, green space, common areas for the community or other uses that benefit the property as a whole. Automation of car park systems adds value to any development project by increasing revenue generating space, lowering development costs and lowering overall operations costs.

DISCUSSION

The study results revealed that there was a statistically significant linear relationship between automated car park systems and revenue collection. These findings are in agreement with findings by Rashid, Musa, Rahman, Farahana and Farahana (2012) who established that an automatic parking system that would increase convenience and security of the public parking lot as well as collecting parking fee without hassles of using magnetic card. The auto parking system will able to have less interaction of humans and use no magnetic card and its devices. In additions to that, it has parking guidance system that can show and guide user towards a parking space. The system used image processing of recognizing number plates for operation of parking and billing system. Overall, the systems run with pre-programmed controller to make minimum human involvement in parking system and ensure access control in restricted places. That paper presents algorithm technology based method for license plate extraction from car images followed by the segmentation of characters and reorganization and also develop electronics parking fee collection system based on number plate information.

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A study by Rashid *et al.* (2012) also agrees with the findings. They noted that automatic parking system and electronic parking fee collection based on vehicle number plate recognition. Developing and implementing an automatic parking system would increase convenience and security of the public parking lot as well as collecting parking fee without hassles of using magnetic card. The auto parking system will able to have less interaction of humans and use no magnetic card and its devices. In additions to that, it has parking guidance system that can show and guide user towards a parking space. The system used image processing of recognizing number plates for operation of parking and billing system. Overall, the systems run with pre-programmed controller to make minimum human involvement in parking system and ensure access control in restricted places. That paper presents algorithm technology based method for license plate extraction from car images followed by the segmentation of characters and reorganization and also develop electronics parking fee collection system based on number plate information.

CONCLUSION AND RECOMMENDATIONS

Third, automated car park systems provide solution to traffic congestion in that a parking payment system includes a telecommunication provider and a mobile device. The mobile device promotes a customer identifying a parking space and further promotes the customer selecting to pay for the parking space. The telecommunication provider bills the customer for fees associated with the parking space in response to the customer selecting to pay for the parking space. Revenue collected from car parking fees, especially in urban areas, constitute a significant share in entire county government revenue. As such, Busia County government should enhance automation of car parking charging and payment systems to ensure there is optimal collection of revenue from this sector.

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