DOES INDUSTRY SIZE INFLUENCE ADOPTION OF CASHLESS PAYMENT SYSTEMS AMONG PASSENGER SERVICE VEHICLES IN NAIROBI CITY COUNTY, KENYA?

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ABSTRACT

Countries can report growth and development if they are able to adopt technology that is beneficial to the citizens and the economy. Among critical technologies that have emerged in Kenya is use of cashless payment systems in the Passenger Service Vehicles (PSVs) that is meant to create efficiency, improve revenue collection, enhance tax collection and above all promote return on investment for the PSV owner. This innovation has however not be adopted much as there is a government policy in place. The purpose of the study was to find out the influence of industry size on adoption of the cashless payment system. The research used mixed method approach by employing use of exploratory research design and descriptive research design to explore the existing situation. The population was 197 registered PSV SACCOs in Nairobi. A sample size of 99 respondents (SACCO managers) was selected through systematic random sampling. The questionnaire was used for data collection and data analyzed by use of descriptive statistics. Multiple regression analysis was used to determine the relationship between variables and correlation analysis was carried out to determine the extent of relationship between variables. The ANOVA test of significance indicated that there was no significant influence of industry size (as shown by a p- value of 0.274) on adoption of cashless payment system. Other factors influenced its adoption such as: poor network failure, faulty gadgets, lack of adoption structures and use of multiple smart cards. The researcher recommends that the governments to issue one card system that can be used across all means of transport, improve information technology network, create public awareness and ensure Matatu crew are well trained.

Keywords: Cashless payment systems, adoption, smart cards, Matatu, SACCO

BACKGROUND

The study sought to analyze the influence of industry size on adoption of cashless payment systems among Passenger Service Vehicles (PSV's) in Nairobi. The use of cashless payment systems if adopted would ensure efficient transport, enhance service delivery and hence increase profits for various stakeholders and entrepreneurs who have ventured into this business. The Matatu industry is one of the greatest income earners in the country and contributes to 8.4% of the country's earnings after agriculture (30%) and manufacturing at 10.3% as indicated by Economic Survey (2015). Cooperative movements in Kenya are a major economic force for the country and hence the need for Matatus to belong to one since they also contribute to almost 45% of the country's Gross Domestic Product (International Monetary Fund, 2007).

For a country to boast of improvement in the transport sector, there is need to employ modern methods and innovation in the industry. However considerations are taken into place since most developing countries lack the capacity in terms of information technology (Gachanja, 2015). Some developed cities such as: London, Tokyo, Singapore, Paris and Rome have implemented state of the art modern technology and systems in the transport sector especially in the use of e-ticketing and smart card payment systems as indicated by Dekkers and Rietveld (2007). In Europe for example, most countries have an electronic ticketing system for transport and improved online booking as found out by Blythe (2004). The difficulty however arises when companies and transit systems do not agree on the common form of e-ticketing that can be used among several modes of transport.

Globally, mass transit agencies such as railway companies in Canada and Scotland; have been using stored value prepaid cards for electronic ticketing since the 1970s as found out by Ezell (2010). By late 80's and in 1990s, this technology began changing from traditional magnetic stripe type of appliance to innovative smart cards. In London for example SquidCard.com, offers a smart card bicycle program for renting purposes. A study conducted by Blythe (2004), indicated that smart card ticketing is available in a number of United Kingdom cities such as Glasgow, Aberdeen, Chester and Edinburg among others. African countries such as Rwanda have tried to implement the use of cashless payment system since 2015 but with little success as found out by Bhan (2015). South Africa introduced the MUVO card for commuters in 2014 but it did not quite pick up according to a report by Lamikanra and Young (2015) in their study on 'payment systems in Africa'.

The cashless payment system in Kenya is also not a new concept. It has been in use since the 1970's and as early as 1980's. The public transport at the time was run and managed by the government under the bus company, Kenya Bus Service. The company issued paper tokens that

were electronically generated through a strip that was magnetic in nature (Wangalwa, 2015). This eventually improved revenue collection by the government and later adopted by individual bus owned companies. The paper token system of ticketing was later improved by some sector players such as: Double M bus service and City Hoppa according to Nyiendo (2014). This also did not fully pick up and was not well adopted among the 14 seater Matatu (passenger service vehicles)

Statement of the Problem

The transport sector in Kenya has been characterized by many shortfalls according to Asingo (2004) that include: inconsistent fares, unnecessary fare hikes during peak hours, dishonest Matatu crew, insecurity and inadequate means of transport among others. A study conducted by Ngui (2014), reported that much as there is a Traffic Act of 1975 to guide and control the transport sector, many owners did not comply with the traffic regulations due to competition among PSVs in an effort to reach bus stage before the others so as to get enough clients. On 1st November, 2010 reforms began under the Ministry of Transport issuing a policy to streamline Matatu operations. All Public Transport Companies were to join and be part of a Savings and Credit Cooperatives (SACCOs) movement so as to control and monitor Matatu operations. The policy was issued under the National Transport and Safety Authority Act (NTSA), Act No. 33 of 2012. The authority was to oversee the following: vehicle registration; licensing; road safety, as well as adoption of the cashless payment system among passenger service vehicles (National Transport and Safety Authority Act, 2014) so that all revenue is well monitored by the government and the owner gets his return on investment. This directive of the cashless payment system policy was not adhered to since many Matatu operators did not comply and did not fully understand its operations. It is for these reasons that the study was carried out to find whether industry size influences adoption of the cashless payment system and hence come up with strategies to enhance its use in an effort to promote enterprise growth.

RESEARCH OBJECTIVE

The objective was to analyze the influence of industry size on adoption of cashless payment system among Passenger Service Vehicles in Nairobi

RESEARCH HYPOTHESIS

H_0 : There is no significant influence of industry size on implementation of the cashless payment systems among Passenger Service Vehicles in Nairobi

H_1: There is significant influence of industry size on implementation of the cashless payment systems among Passenger Service Vehicles in Nairobi

LITERATURE REVIEW

According to Chau and Hu (2001), the technology acceptance model (TAM) is a widely used theory in information system field and presents a theoretical contribution towards understanding technology adoption. TAM aims to explain how the user can select a given technology and adopt it in their day to day use. It also defines how the consumer of a given service uses an innovation to improve performance or efficiency over time (Chuttur, 2009). The theory clarifies that when users are introduced to a new technology, a number of factors influence their adoption decision; and the user will only adopt an innovation that is beneficial, easy to use and one that will improve his or her job performance.

The entrepreneurial function is to spear head innovation and manage economic development through creative ideas which can then be passed down to society (Swedberg, 2007). The entrepreneur in this study is one who identifies the cashless payment systems and goes ahead to ensure it is adopted so as to cause positive change and improve service delivery, track financial processes and minimize loses to investors. The government through various agencies such as Google Kenya, Equity bank and Kenya Commercial bank came up with smart cards which were to be used for cashless payment systems as found out by Ngui (2014). The innovation was to take advantage of the ripe market conditions in the transport sector which was lacking order and efficiency especially in the payment system

The entrepreneur who is an innovator needs to be supported as they come up with new products and ideas. The Government of Kenya supports entrepreneurs in many ways and recognizes that they need to be developed so as to be able to contribute to the economy in the best way possible. The government has done this through various ways such as introducing entrepreneurship education in schools and making it a compulsory course in universities and institutions of higher learning (World Bank, 2011). Since use of transport industry is beneficial to both users and owners, new innovations have to be employed in the industry so that speed of movement is enabled as well as reduced cost of doing business. For this reason, the investor who is an entrepreneur must get value for their money and return on investment.

The entrepreneur who is also a business owner should see the benefits of technology and innovation first hand so as to sell the idea to others in the industry as pointed out by Barney (2004). He explains that transport technology adoption and implementation cultivates organizational capabilities that enable the firm to outperform so as to remain relevant and satisfy

the customer hence reaping in form of profits and growth. However, adoption of innovation alone will not be of benefit to an organization since it is widely used in every sector of society at the moment. It only becomes useful if is embedded into organizational processes is it then expected to offer sustainable benefits.

Effects of technology in the transport sector as identified by Blythe (2004) include: Development of new services; improved economy; new management styles; efficient services; satisfied owners and satisfied customers among others. The dissemination of transport technology will therefore open up new opportunities for the development of new roles especially in increased entrepreneurship in the industry. Their main purpose is to give added value to its functions through greater efficiency and information transparency (World Bank, 2011). Technology is of paramount importance especially in the transport industry which will ensure faster scheduling of services and faster deliveries as explained by Chowdhury and Sadek (2003) in their study on intelligent transport systems.

A study carried out by Krairit, Choomongkol, & Krairit, (2004), also found out that smart cards used in the transport sector requires the use of a card or a device that allows trips to be deducted once they take place. This introduction of electronic payment system for the purchase of tickets may serve as the initial stage on which to incorporate new advances and improve performance (Pojani & Stead, 2015). They further say that in order for adoption to be a success, it is necessary to combine the range of factors that interact and comprise the system such as social aspects and management control. The ease and convenience of purchase afforded by smart cards will attract more passengers since the passenger will use less money in the long run; because the best cost for a given trip is calculated per distance as described by Chakirov and Erath (2011). The time for boarding is minimized, the customer gets efficient services since the tickets can be purchased in advance, the business owner gets return on investment, while the government is able to get it tax since the smart cards can relay on time deduction instantly online.

Another form of e-ticketing is the Mobile ticketing which is basically a virtual form of ticket that is held on cellular phones, tablets or personal digital assistants (PDAs) and can be ordered and obtained from any location such as shopping stores or telecommunication outlets (Ezell, 2010). E-ticketing makes the integration method easier to carry through because it can manage a more complex price and fare system as described by Graham and Mulley (2012). In addition, the system can include rules for transfer rights in order to be more attractive. In Kenya for example, e-ticketing was introduced in the Matatu sector though customers buying tickets in advance and swapping them on electronic gadgets as assisted by Matatu conductors or drivers (Wangalwa, 2015). A study done by the European Commission (2007) found out that long-distance journeys can be made cheaper by integration and flexibility in modes of transport.

Industry factors such as number of organizations within a particular sector have been found to be important factors to technology adoption and implementation. Industry size and structure can either quicken or impede innovation adoption as indicated by Russell and Hoag (2004) in their study of factors affecting adoption of new technology and attitudes towards adoption. They further observed that large organizations with centralized structures were more likely to adopt new technologies faster than those which were decentralized. Williams (2006) concurred with these findings and further pointed out that large industries facilitate faster and more efficient adoption than one that is small or decentralized because top managers can adopt technologies even when the other junior employees are resistance to change.

Russell and Hoag (2004) noted that much as large organizations have the machinery to adopt innovation, the centralization approach tends to be very intimidating to employees because decision-making authority rests with senior management and other levels of employees are left out. This form of intimidation can lead to delayed implementation and adoption process. Employee empowerment in the organization should therefore be encouraged so that they can be innovative.

According to Williams (2006), the larger the organization, the more financial and stable it is to tackle complex assignments hence the ease with which to accept and adopt a given technology but this may not be so for an industry. Large organizations are well equipped with resources and are also willing to invest in new technologies; hence it is easy to absorb any associated risks that come with the innovation. They are able to mobilize adequate financial resources required for implementing innovations while facilitating training of relevant personnel who can handle the changes. Large industries or organizations have an additional advantage of economies of scale and the ability to generate in-house specialists as explained by Currie (2006) in his study on determinants of EDI adoption in the transportation industry but different policies in different organizations may delay the process.

However according to Russell and Hoag (2004), smaller upcoming firms are positive to new innovations because of the flexible management styles of the firms and less bureaucracy due to ability to learn. Small organizations can more readily adapt to changes in the technology, manufacturing processes, and market forces than larger firms. Much as smaller firms lack sufficient financial resources, they tend to be more creative, allow employee participation, are timely, responsive, and less bureaucratic therefore having greater incentive to adopt and integrate according to Oluoch (2012).

The transport sector in Kenya is a good example of a large industry run by the NTSA under the Road Transport Act 2013; the section is headed by a Permanent Secretary and deputized by an

assistant (Kenya Economic Survey, 2015). The Sector also has Management Councils or committees that harmonize functions of all bodies and industry key players. The ministry has further devolved some of the services under the County Transport Management Committees in every County to run and coordinate the affairs of the Department of Transport as indicated by Gachanja (2015), in his study 'mitigating road traffic congestion in the metropolitan area'. Due to the large industry size, there are many sections that are responsible for policy formulation concerning traffic regulations and innovations, therefore ensuring those sound policies passed to users are well thought out. This can however cause delay due to a lot of involvement from many sections and bureaucracy.

RESEARCH DESIGN AND METHODOLOGY

The study employed a mixed method approach to gather information through exploratory research design and descriptive research design. Exploratory research design was an attempt to gather information so as to connect relevant ideas and come up with an explanation on state of the cashless payment system (Kothari &Gard, 2014). Descriptive research design looked at interactions between events and occurrences so that it created sufficient understanding of the subject matter to be able to draw conclusions with sufficient accuracy and infer the research findings (Leedy & Ormrod, 2010). The design also determines to explain if what is being observed might be explained by a currently existing theory, as indicated by Cooper and Schindler (2003).

The target population in this case was Matatu SACCOs (197 in number) SACCO managers (National Transport and Safety Authority, 2015). The study adopted systematic random sampling by picking every 2nd SACCO manager from a list of registered SACCOs in Nairobi giving a total number of 99 managers. The study employed the use of questionnaires to collect data. Quantitative data was analyzed through mixed central tendency and measures of dispersion. The qualitative data was analyzed through the selection of concepts, categories and themes. Multiple regression analysis helped to predict the value of Y each given value of X and Correlation was used to analyze the extent of the relationship between the variables. The Information generated was presented in the form of graphs and tables.

DATA ANALYSIS

Analysis of quantitative data was done by use of SPSS (Statistical Package for the Social Sciences) to analyze findings. Quantitative data was analyzed in the form of frequencies and percentages and presented in form of tables and charts as indicated below.

Number of SACCOs per route

www.ijsser.org
Page 2232

The managers indicated that there were several SACCOs operating in one route as shown on figure 1 below; such that each route at least had 1-5 SACCO at any one given time. There were 1-3 SACCOs operating in one route as indicated by 32.6% respondents, 3-5 SACCOs (33.7%), 5-7 SACCOs as indicated by 18.5%, above 7 SACCOs (5.4%) while 5.4% did not indicate their opinion and 4.3% were not sure of the number of SACCO. This was an indication of high volume of SACCOs in one given route.
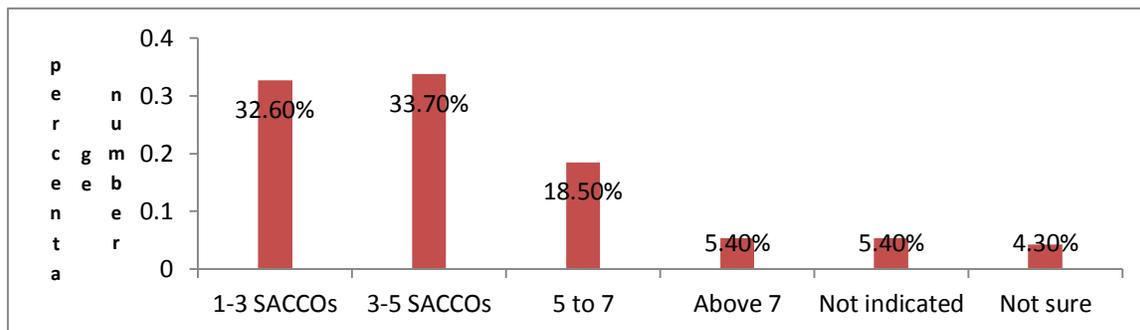

Figure 1: Number of SACCOs per route

Number of Routes Supervised by Managers

The study found out that 51.1% of the managers supervised one route per SACCO (table 6.1), 23.9% managed two routes, and 13% managed three routes under the same SACCO while 5.4% of managers managed more than three routes at any one time.

Table 1: Number of routes per SACCO

	Frequency	Percent	Cumulative Percent
one	47	51.1	51.1
two	22	23.9	75.0
Three	12	13.0	88.0
More than three	5	5.4	93.5
Not indicated	6	6.5	100.0
Total		92	100.0

Number of Matatus per SACCO

The study sought to find out the number of Matatus in one given SACCO and established the following on table 2 below: 42.4% of the respondents managed 1-5 Matatus in each SACCO, 20.7% managed 5-10 Matatus and some comprising of 23.9% managed more than ten Matatus.

This is an indication that the industry size is big and comprises of an estimation of 1,600 Matatus on average in Nairobi alone. A similar comparison is given on figure 6.2 below graphically to show the comparisons for better understanding.

Table 2: Number of Matatus per SACCO

	Frequency	Percent	Cumulative Percent
1-5	39	42.4	42.4
5-10	19	20.7	63.0
More than 10	22	23.9	87.0
Others	3	3.3	90.2
Not indicated	6	6.5	96.7
Cant specify	3	3.3	100.0
Total	92	100.0	
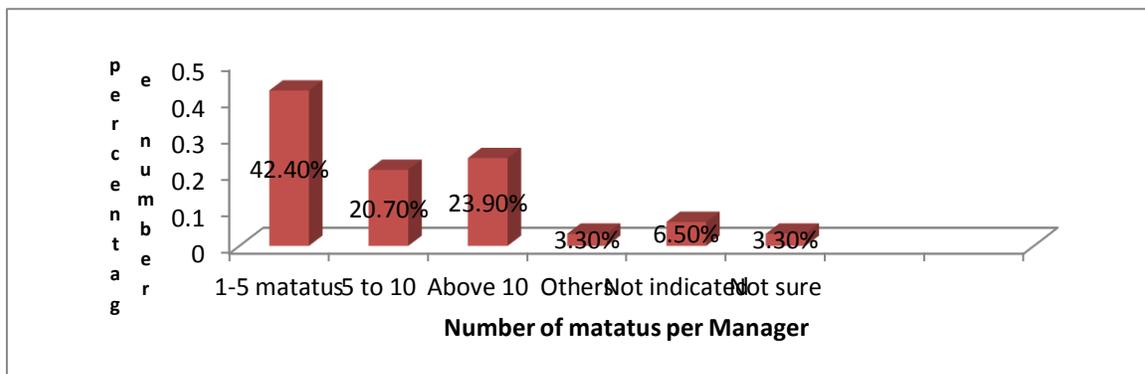
Figure 2: Number of Matatus per SACCO Manager

Number of Trips per Matatu

The study sought to know how many trips each Matatu made on average and the managers indicated the following as shown on table 3 below. Majority of the Matatus made above 4 trips per day. 43.5% made above 4 trips, 34.8% made between 2-3 trips and 4.3% made 1-2 trips. This was an indication of a busy industry if well managed can generate good revenue.

Table 3: Number of Trips per Matatu

	Frequency	Percent	Cumulative Percent
1-2	4	4.3	4.3
2-4	32	34.8	39.1
Above 4	40	43.5	82.6
Not indicated	10	10.9	93.5
Not sure	6	6.5	100.0
Total	92	100.0	

Familiarity with Cashless Payment mode

Information on figure 3 below indicates that the passengers were familiar with the cashless payment system as indicated by 72.8% of managers. 25% were not familiar with the system and 2.2% were did not indicate their opinions.
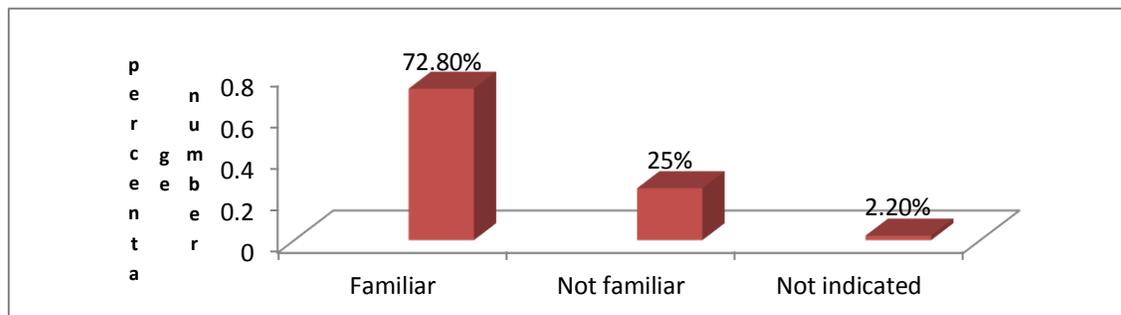

Figure 3: Familiarity with cashless payment system

Use of Cashless Payment System

The study sought to find out whether the SACCOs actually used the cashless payment mode at any one given time and got the following responses. The SACCOs that used the cashless payment system in the beginning but stopped were 26.1%, while 17.4% used it on and off in 2014 and 56.5% never used the cashless payment system at all as indicated on table 4 below. The SACCOs that did not use the system were represented by the highest numbers than those that used the system. This is an indication that the system did not quite pick up despite a policy being in place to ensure adoption.

Table 4: Use of Cashless Payment System

	Frequency	Percent	Cumulative Percent
No	52	56.5	56.5
3	24	26.1	82.6
4	16	17.4	100.0
Total	92	100.0	

Reasons for non-use of the System

The respondents were required to give reasons for not using the cashless payment system and gave several reasons. Some reasons for non-use of the cashless payment system as indicated on table 5 below: passengers found it cumbersome (26.1%); machines were recalled back because they were faulty (25%); passengers and commuters were caught unawares and were not willing to learn about the system (23.9%), there were no penalties for non-use (3.3%), passengers were not conversant with the system (1.1%), cards were faulty (16.3%), and 4.3% did not indicate their opinion. A graphical representation is given to show the various responses for non-use of the system on figure 4.8 below

Table 5: Reasons for non-use of the System

	Frequency	Percent	Cumulative Percent
Not conversant with system the system	1	1.1	1.1
Not well taught	22	23.9	25.0
No penalties for non-use	3	3.3	28.3
Passengers found it cumbersome	24	26.1	54.3
Machines were recalled	23	25.0	79.3
Not indicated	4	4.3	83.7
Cards were faulty	15	16.3	100.0
Total	92	100.0	

Reasons for use of Cashless Payment System

The respondents gave the following reasons for the use of cashless payment system as indicated on table 6 below such as: use of cash was faster and more convenient to customers. The customer or Matatu crew (in this case the tout) did not have to wait for network to pick up so as to swipe the card. The managers expressed dissatisfaction with the use of machines since machines kept

hanging due to network failure as represented by 20.7%. They however indicated that use of cashless system could be convenient if well managed since they will not be arguing about return of change with customers or customers over bargaining for services as indicated by 12% of the respondents. The machines would also ensure accountability of money received as indicated by 16.3% of the managers. The transactions will be relayed straight to the system and the owner can be able to trace bus fare collected during the work period. The managers were however not happy with the numerous deductions made by the banks upon receipt of cash (12%). The ledger fees charged by banks for use of cashless system were high; given that each transaction was reflected and charged for. These lessened the profits made and the owner was not getting sufficient profit from the capital invested.

Table 6: Reasons for use of cashless payment system

	Frequency	Percent	Cumulative Percent
Faster	19	20.7	20.7
No arguing with customer	11	12.0	32.6
Accountability	8	8.7	41.3
No accountability	15	16.3	57.6
Money was deducted by bank	11	12.0	69.6
Not indicated	4	4.3	73.9
Not sure	24	26.1	100.0
Total	92	100.0	

Descriptive information on use of Cashless Payment System

Table 7 below gives descriptive information on the influence of industry size on cashless payment system and indicates the following results using a scale of 1-5 (1- being strongly agree, 2- agree, 3- neutral, 4 disagree and 5 - strongly disagree): Passengers were not comfortable with the cashless payment system and disagreed that they were comfortable with the payment system represented by a mean of 4.09 and SD of 0.834 showing minimal variations. This was due to the inconvenience of using several cards; meanwhile the Matatu were aware of the system and were willing to take personal initiative to train passengers; managers disagreed that they were using the system, giving great impact of rejection with a mean of 4.21 and SD of 0.688 showing minimal variation from responses. The managers indicated that they were not able to cope with the use of the machines and technology (mean of 3.33 and SD of 1.039); indicating they were not sure. They gave reasons such as poor network and faulty gadgets for non-adoption; they however were not in agreement that the SACCO is willing to improve service delivery and educate the

public if one card system was in use as shown by a mean of 3.42 since they remained mainly neutral and SD of 0.929. The findings imply that passengers' non-use of the system and lack of use by Matatu crew is one of biggest challenges in the non-adoption of the cashless payment system among PSVs.

Table 7: Descriptive statistics of industry size on use of cashless payment system

	N	Minimum	Maximum	Sum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Passengers are comfortable	92	2	5	376	4.09	.834	-.747	.251
Matatu crew aware of system	92	1	4	195	2.12	.796	.716	.251
Matatus currently use new system	92	3	5	387	4.21	.688	-.293	.251
Matatus able to cope with the cashless mode	92	2	5	306	3.33	1.039	-.093	.251
Passengers being trained on system	92	2	5	303	3.29	.896	-.245	.251
Making effort to improve and educate users	92	2	5	315	3.42	.929	-.025	.251
Making effort to satisfy users	92	2	5	283	3.08	1.040	.324	.251
Valid N (listwise)	92							

Source: Primary Data (2016)

Other Industry factors influencing Adoption of Cashless Payment System

When respondents were asked what other factors affected implementation and adoption of the system they gave the following reasons as indicated on figure 4 below: Passengers (26.1%) said the system was cumbersome due to carrying many cards while on transit; the managers represented by 22.8% indicated that there were too many smart cards for a given PDQ machine causing inconvenience to both users and travelers; 12% said machines were faulty with poor network while on transit; customers were not well trained or made aware by the government (6.5%); most saying the change was abrupt, there was corruption on procurement of machines and the government was not willing to make the system easier due to mistrust between government, SACCOs and banks which they said gave them gadgets that were not well researched on (8.7%); the vendors of machines were unlawfully selected to offer the machines for sale; 9.8% of respondents said SACCOs were not consulted on the technology adoption and hence read mischief from the government in its introduction. Banks were also not well equipped to handle the machines as described by 3.3% of respondents.
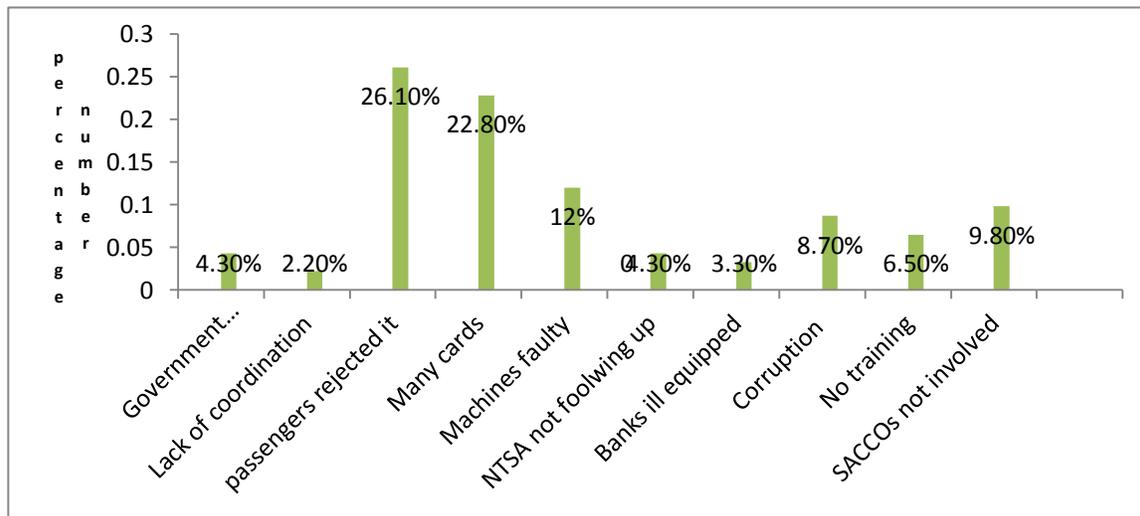
Figure 4: Other industry factors influencing adoption

Statistical analysis

Regression analysis was used to predict the value of Y which is the dependent variable for each given value of X. It is the statistical tool that was applied to determine the influence of industry size on adoption of the cashless payment system. Correlation was used to analyze the degree of relationship between the industry size and adoption of cashless payment system.

Correlation matrix of Industry Size on Adoption

The result on table 8 below indicates the correlation matrix between the elements of industry size (number of Matatus, number of routes) and adoption system is slightly negative in nature. According to the result, there is a negative influence of magnitude 0.082 and 0.166 respectively. This infers that as the number of Matatus increase in a given route, the adoption of cashless system decreases

Table 8: Correlation Matrix of industry size on adoption of system

		System adoption	Number of routes	Number Matatus
System adoption	Pearson Correlation	1	-.082	-.166
			.440	.114
	Sig. (2-tailed)			
Number of routes	Pearson Correlation	-.082	1	.649
		.440		.000
	Sig. (2-tailed)			
Number of Matatus	Pearson Correlation	-.166	.649	1
	Sig. (2-tailed)	.144	.000	

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

Regression analysis of Industry Size on Adoption

The study conducted regression analysis to establish the relationship between the study variables as indicated on table 9 below. Coefficient of determination explains the extent to which changes in the dependent variable (adoption of cashless payment system) can be explained by the change in the independent variables (industry size). The information on indicates that adjusted R square of 0.07 means that the variables studied contribute to 0.7% of the factors that influence the adoption of the cashless payment system and hence other factors contribute to 99.3% of the adoption process. Since the R is 0.169, a conclusion can be made that industry size is positively correlated with the adoption of system but the relationship is weak since R is close to 0.

Table 9: Model Summary of industry size on adoption

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.169[a]	0.029	.007	2.329

a. Predictors: (Constant), number of Matatus, number of routes

ANOVA results of Industry Size on Adoption

From the ANOVA results on table 10 below, the p-value is 0.274 meaning the level of influence of industry size and adoption of cashless payment system (number of PDQ machines) is not

significant; hence accept the null hypothesis that there is no significant influence of industry size on adoption of the cashless payment systems among Passenger Service Vehicles in Nairobi

Table 10: ANOVA Results of industry size on adoption of system

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.267	2	7.133	1.315	.274[b]
	Residual	482.635	89	5.423		
	Total	496.902	91			

a. Dependent Variable: system adoption

b. Predictors: (Constant), number of Matatus, number of routes

Regression Coefficients of Industry Size on Adoption of System

The data findings presented on table 11 below indicate that taking all other independent variables at zero, a unit increase in number of routes leads to a 0.076 increase in adoption of the cashless payment system; a unit increase in number of Matatus leads to a 0.333 decrease in adoption process. The increase is quite minimal in nature not indicating significant change in the adoption of the cashless payment system.

Table 11: Regression Coefficients of industry size on adoption of system

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.550	.479		9.509	.000
1	Routes	.076	.231	.045	.328	.743
1	Matatus	-.333	.234	-.195	-1.422	.159

Dependent Variable: number of PDQs machines bought

DISCUSSION

On the analysis of industry size influence on adoption of cashless payment system among passenger service vehicles, the study found out that the factors of industy size were not significant. In this study, majority of the respondents were male aged between 31 and 40 years

indicating that managers were mature and most well educated with 94.55% having attained a minimum of 'O' level education. This shows that the respondents understood the subject matter of the study and gave reliable data. The study established that all managers were familiar with the policy to adopt that cashless payment system but other factors other than industry size may have influenced its inability to take off. Therefore the results do not agree with Russell and Hoag (2004) who found out in their study that large industries are likely to adopt a given technology due to capacity to own state of the art machinery and equipment. The factors mentioned included: passengers found it cumbersome (81.5%), poor network when using machines, faulty machines and lack of a standardized smart card for use.

CONCLUSION

Based on the findings, the study concludes that industry size is a not a major factor in determination or influence of the implementation of the cashlesshless payment system. Since the p-value is 0.274 it means the level of influence of industry size and implementation of cashless payment system is not significant; hence accept the null hypothesis that there is no significant influence of industry size on implementation of cashless payment system. However the more the number of matatus under one manager the less he is willing to effectively implement the cashless payment system.

RECOMMENDATIONS

The researcher recommends the need to break the industry into manageable sizes and areas and put each area under area managers to ensure efficiency and implementation. However other factors mentioned in the study play a major role in system implementation hence the need to address them. These include: making use of one card system for transport, educating the passengers on importance of innovation adoption and collaboration of SACCOs and the government.

FUTURE RESEARCH

The following areas have been suggested:

The entire country should be considered so as to find out why the adoption of cashless payment system is not taking place much as the fact that any innovation that begins in the capital city is automatically adopted. However this could not be the case because other entrepreneurial factors could be a limiting factor for adoption especially in other counties. A research should be carried out to capture the views of the Matatu crew namely: the drivers and the touts who are the main

people that interact with the passengers directly. What could be the reason as to why the touts and bus conductors cannot be able to use the system with relative ease?

REFERENCES

Asingo, P .O (2004). *The institutional and organizational structure of Public Road transport in Kenya*. IPAR Discussion paper No. 50.

Barney, U. (2004). E-commerce adoption for supply chain management in US apparel manufacturers, *Journal of Textile and Apparel, Technology and Managemen*t. 4 (1),1-11.

Bhan, N. (2015). *Rwanda cashless transport payment system* . Retrieved from http://nitibhan.com/2015/12/21/rwanda-launches-cashless-public-transport-payments-will-they-succeed-where-google-failed-in-kenya/

Blythe, P. (2004). Improving public transport ticketing through smart cards. Proceedings of the Institute of Civil Engineers. *Municipal Engineer*, 157, 47-54.

Chakirov, A., & Erath, A. (2011). *Use of public transport smart card fare payment data for travel behaviour analysis in Singapore*. Retrieved from: http://www.futurecities.ethz.ch/wp-content/uploads/2012/03/m8_publication3.pdf

Chan, H. & Ngai, T. (2007). A Qualitative Study of Information Technology Adoption How Ten Organizations Adopted Web-Based Training. *Information Systems Journal,* 17 (3), 289-315

Chowdhury, M., & Sadek, A. (2003). *Fundamentals of Intelligent Transportation Systems Planning*. Artech House: Norwood, MA, USA.

Chuttur, M.Y. (2009). Overview of the Technology Acceptance Model: Origins, Developments and Future Directions. Indiana University, USA . Sprouts: Working Paperson *Information Systems*, 9(37). Retrieved from: http://sprouts.aisnet.org/9-37

Cooper, D. R. & Schindler, P. S. (2000). *Business Research methods* (7th edition). New York: Irwin/ McGraw-Hill.

Currie, M. (2006). Determinats of EDI adoption in the transportation industry, *European Journal of Information Systems*, Vol. 6 No. 1, pp. 107-21.

Dekkers, J., & Rietveld, P. (2007). Electronic ticketing in public transport: A field study in a rural area. *Journal of Intelligence Transportation Systems*, 11(2), 69-78

European Commission (2007). *Development of integrated ticketing for air and rail transport, public consultation document*. Brussels: EC.

Ezell, S. (2010). *Intelligent Transportation Systems*. Retrieved from http://www itif.org/files/2010-1-27-ITS_Leadership.pdf

Gachanja, J. (2015). *Mitigating Road Traffic Congestion in the Metropolitan area*. Retrieved fromhttp://www.kippra.org/downloads/Mitigating%20transport%20congestion%20in%20Nairobi.pdf

Graham, P., & Mulley, C. (2012). Public transport pre-pay tickets: Understanding passenger choice for different products. *Transport Policy*, 19(1), 69–75. doi:10.1016/j.tranpol.2011.07.003

International Monetary Fund. (2007). *Kenya: Poverty Reduction Strategy Annual Progress Report*— 2004/2005, IMF Country Report No. 07/159, International Monetary Fund. Washington, D.C.

Kenya Economic Survey. (2015). *Kenya Bureau of Statistics*. Retrieved from www.knbs.or.ke/index.php?...economic-survey...economic-survey

Kothari, C, & Gard, G. (2014). *Research methodology: Methods and Techniques*. New Delhi: New Age International Ltd, Publishers

Krairit, D., Choomongkol, W., & Krairit, P. (2004). Strategic and Technology Policy Implications for e- Government: Lessons from Empirical Case Study on Information

Lamikanra, B., & Young, J. (2015). *Pay Developments in Africa*. Retrieved from https://www.kpmg.com/Africa/en/IssuesAndInsights/Articles-Publications/General-Industries Publications/Documents/Payment%20Developments%20in%20Africa.pdf

Leedy, P. D. & Ormrod, J. E. (2010). *Practical Research: Planning and design* (9th ed,). Pearson Educational International and Prentice Hall: New Jersey

Ngui, S. (2014). *Strategies for the Implementation of Traffic Regulations within the Public Transport Sector in Nairobi City County, Kenya*. Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/75816/Ngui_Strategies%20for%20the%20 implementation%20of%20traffic%20regulations%20within%20the%20public%20transport.pdf?sequence=2

NTSA. (2015). *Registered Saccos and Companies in Kenya*. Retrieved from http://www ntsa.go.ke/saccolist/registeredsaccos.pdf

NTSA website: http://www.ntsa.org

National Transport and Safety Act. (2014). Acts and Regulations. Retrieved from http://www.ntsa.go.ke/index.php?option=com_content&view=article...

Nyiendo, S. (2014). *Matatu e-ticketing system -An Assessment of Cashless Paying System for Public Transport in Kenya*. Retrieved from https://mistscholars.wordpress.com/2014/08/07/matatu-e-ticketing-system-an-assessment-of cashless-paying-system-for-public-transport-in-kenya/

Oluoch, R. (2012). *Factors affecting Adoption of Mobile Banking Technology in Kenya.- A case of Bank Customers within Nakuru Municipality*. Retrieved from http://ir.kabarak.ac.ke:8080/bitstream/handle/123456789/119/M BANKING%20FINAL%20PROJECT.pdf?sequence=1&isAllowed=y

Pojani, D. &Stead, D. (2015). Sustainable Urban Tra*nsport in the Developing World: Beyond Megacities*. Retrieved from http:// www.mdpi.com/journal/sustainability

Russell, L. & Hoag, P. (2004). Factors affecting attitudes among buyer-center member toward adoption of an ecologically related regulatory alternative: a new application of organizational theory to a public policy issue. *Journal of Public Policy & Marketing,* 10(2), 145-60.

Stead, D.; Jong, M., & Reinholde, I. (2008) *Urban Transport Policy Transfer in Central and Eastern Europe*. disP Plan. Rev., 44, 62–73.

Swedberg, R. (2007). *Rebuilding Schumpeter's Theory of Entrepreneurship*. Retrieved from http://www.lib.hit-u.ac.jp/service/tenji/amjas/Swedberg.pdf

Wangalwa, E. (2015). *Kenya's Matatus go cashless.* Retrieved from http://www.cnbcafrica.com/news/east-africa/2014/05/29/kenyas-matatus-go-cashless/

Williams, F. (2006). *What should be the transportation provider's role in supply chain management?* Proceedings of the 8th World Conference on Transport Research, 12-17 July, Antwerpen, Belgium.

World Bank. (2011). *The International Bank for Reconstruction and Development*. Retrieved January 20,2011 from Washigton, DC: World Bank.Website:http://www-wds.worldbank.org/external.html