

**ANALYSIS OF KNOWLEDGE AND COMPETENCE ON
ADOPTION OF CASHLESS PAYMENT SYSTEM
AMONG PASSENGER SERVICE VEHICLES
IN NAIROBI CITY COUNTY, KENYA**

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Abstract

This study sought to analyze the influence of knowledge and competence on the adoption of cashless payment systems in Nairobi. If this innovation is not adopted, then there is hindrance to entrepreneurial growth and development. The research used survey research design and the target population was 197 registered Passenger Service Vehicle SACCOs in Nairobi, Kenya. The sample was 99 respondents selected through systematic random sampling by picking every 2nd manager. The questionnaire was self designed and was used to seek information from the SACCO managers. The SPSS program version 21 was used to aid in organizing and summarizing the data by the use of descriptive statistics. Regression analysis and correlation were used and there was a positive correlation but the relationship was weak. Given that the p-value was 0.358, a conclusion can be made that knowledge and competence of managers is was not significant in adoption of the cashless payment system, hence we don't reject the null

hypothesis. The study recommends that: passengers and the public be educated on benefits of technology adoption, the cashless system to make use of one smart card that can be used across all transport modes and the network system to be improved.

Keywords: Adoption, Cashless Payment Systems, Education Level, Experience, Matatu SACCOs, Kenya

INTRODUCTION

The study sought to analyze the influence of knowledge and competence of SACCO managers on the implementation 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 (mainly 14 seater vans and 23 seater buses) in Kenya is one of the greatest income generating activities for the country at position 3 and contributes to 8.4% of the country's earnings after agriculture (30%) and manufacturing at 10.3% (Economic Survey, 2015). The passenger service vehicles contribute to more than 80 per cent of the transport sector in the country and income generation for insurance firms and job creation. Cooperative movements in Kenya also constitute a major economic force and Statistics in 2008 show that more than 63 percent of the people derive their daily upkeep from cooperative related activities. The cooperative societies are able to mobilize 31 percent of the funds or savings and also contribute to more than 45 percent of the Gross Domestic Product to the country's economy (International Monetary Fund, 2007)).

The transport sector is of great benefit even in other countries of the world; but modes of operations are not similar as indicated by Gachanja (2015). He noted that developed countries such as: London, Italy and Rome have put in place state of the art technology, modern methods and process in the transport sector to enable effective and efficient services for passengers through the use of machines and smart cards. Marsden and Stead (2011) however indicate that for modern techniques to be accessible and beneficial for all, it should not be cumbersome to use but understood by all.

Dekkers and Rietveld (2007) in their study on electronic ticketing in public transport point out that most cities such as: London that uses the SquidCard.com mobile ticketing and Paris has employed electronic ticketing and done away with paper ticketing for ease of travelling and faster services. Blythe (2004) indicates that the use of smart card ticketing is now available in other cities such as Aberdeen and Chester among others. African countries have also tried to

implement the use of cashless payment systems but with little success due to lack of an effective follow up mechanisms (Bhan, 2015).

The cashless payment system in Kenya has been in place since early 70's and 80's. The transport sector under the government company then, Kenya Bus Service issued ticket paper tokens to passengers that were generated by use of an electronic device strip machine as indicated by Wangalwa (2015) and this improved access to public transport. The system was then adopted by Double M bus service and City Hoppa bus companies among others, who used a magnetic ticketing system to generate receipts in 1990 onwards to date, according to Nyiendo (2014). The transport sector is however characterized by many challenges that include: arbitrary fare hikes, inconsistent fares and refusal to remit agreed change balance by matatu crew according to Asingo (2004).

Statement of the Problem

Public transport is supposed to facilitate movement of people for purposes of carrying out business activities with ease. However, this is not the case in Kenya and especially in Nairobi where there are a lot of inefficiencies and inconvenience affecting passengers using passenger service vehicles. The challenges include: unnecessary delay, inadequate transport means, theft, and arbitrary fare hikes according to a study by Muriungi (2013). Owners of the matatu sector are also not able to get their agreed dues due to dishonest matatu crew and lack of effective controls and tracking mechanisms. Much as there being a government policy through NTSA (National Transport and Safety Authority), that all Passenger Service Vehicles to be part of a SACCO (Savings and Credit Cooperative Organization) for proper management and to make use of cashless pay system in collecting fare, this has not picked up. The matatus used it for sometime in the year 2014 and did not fully adopt it. It is for these reasons that the study was carried out to find whether level of knowledge and competence of SACCO managers influences adoption of the cashless payment system and hence come up with strategies to promote its use so as to improve business and entrepreneurship for investors.

Research Objective

- i. To examine the influence of education level of SACCO managers on adoption of cashless payment system among Passenger Service Vehicles in Nairobi
- ii. To establish the influence of experience of SACCO managers on adoption of cashless payment system among Passenger Service Vehicles in Nairobi

Research Hypothesis

H₀: There is no significant influence of knowledge and competence on adoption of cashless payment system among Passenger Service Vehicles in Nairobi

H₁: There is significant influence of knowledge and competence on adoption of cashless payment system among Passenger Service Vehicles in Nairobi

LITERATURE REVIEW

Technology Acceptance Theory

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 acceptance. It is a system model that explains how the consumer of a service uses a given innovation over time (Chuttur, 2009). The theory explains that when users are introduced to a new technology, a number of factors influence their adoption decision about how and when to use the given technology. The consumer will only implement a given technology if it is beneficial to them, easy to use and to the extent to which the individual believes that consuming a particular substance or product would improve his or her job performance. Therefore this theory is important to the study since it determines the adoption process of the cashless payment system.

Empirical Literature

There is need for high training initiative for the transportation industry so as to be effective as identified by the American Public Transportation Association (2007). Training can take place in three phases which include: information dissemination and creation of awareness for main transport stake holders and users, identification of worker challenges and implementation of proposed solutions through testing model solutions; and training users on use of new technology. All people and workers should benefit from training in technology, management, and other skills so as to improve the sector and achieve user acceptance. Technology also means the ability to automation processes in a meaningful way to improve services while making the technology relevant to the users (Jensen 2001).

Despite the development of automated services in all sectors, this would not be possible without transporting them to where they are needed. ICT in essence creates possibilities for a learning environment because system application must be understood by all stakeholders for operations to be carried out. Jensen (2001) in their study on 'Improving Training to Upgrade Skills' identified that learning needs in the tourism industry which heavily depends on transportation had to encompass the following: Training in managerial skills, supervisory skills,

customer service, communication skills, quality improvement, enterprise growth and use of languages among others. There is more need for research based education that should be transferred to the field and markets other than overproduction of candidates with profiles of no or little relevance to the job at hand (United Nations, 2015).

Learning and acquisition of skill should take a holistic approach that tries to build links with the classroom theory situation and the practical industry. The skill and knowledge should be transferred to the ground so as to make positive impact as identified by African Development Bank Group (2012). For this to be realized, learning institutions and systems (schools, training centers, universities and enterprises) should link their syllabus and training with the industry level for it to be meaningful.

The skills required in the technology and innovation industry are mainly ICT in nature which are heavily technical. The ICT industry requirements in all countries are complex and require a high level of training and ability to implement. In many cases skill requirements are very specialized / firm-specific as the sector itself has a wide reach (R&D functions, software design, software implementation, sales and marketing activities and system and process development among others) (Chowdhury & Sadek, 2003). The challenge of ICT training is that most local education systems may not be able to handle all potential skill requirement areas due to costs involved and level of education needed. The curriculum is very expensive and needs expert trainers to carry out the training which makes many countries not able to apply ICT in the transport system. However, those countries that have embraced ICT in the transport industry have had to invest heavily on curriculums and programs to train workers hence benefits are realized.

Talukder (2012) supports the idea in his study that training promotes greater understanding of a concept and therefore enables the learner to adopt a new concept. The educator has to set a favorable environment and the learner a right or positive attitude so as to use the technology. The more the user applies frequent use of technology; the likelihood of adoption is high. He further explains that, by training, educating and assisting users when they encounter difficulties, some of the potential barriers to adoption can be reduced or eliminated. Thus, individual adoption of innovation is positively influenced by the amount of relevant formal training given so as to enhance individual's belief in the technology in use.

An empirical study carried out by Fishbein and Ajzen (2005), evaluated the adoption of information communication technology in Malaysian Small Micro Enterprises, and showed a link between staff training and level of technology adoption. The study found out those organizations that did not train employees upon receiving a new innovation reported low rate of adoption and implementation of the innovation. It was clear that more than 70% of the companies which did

not train reported low adoption and resistance to change. Lack of formal training hindered the adoption of the technology.

Another study by Zailani, Iranmanesh, Nikbin and Jumadi (2014) to determine the factors affecting adoption of green technology innovation in the transport sector in Malaysia indicated that; a company that underwent high level training or professional development such as: formal education or upgrading was capable of adopting and implementing a new form of technology faster than one which did not train employees. Machogu (2012) therefore suggests that since highly educated employees are more likely to adopt and implement new technologies, the importance of continuous training solutions cannot be ignored. The training eventually plays an important role in increasing the awareness of the huge potentialities of technological innovations necessary for development and improving situations. Talukder (2012) agrees that for adoption and implementation processes to be easier, employees and managers should strive to acquire a continuous learning culture by integrating the training methods necessary to improve a right attitude to new technology.

RESEARCH METHODOLOGY

The study used survey research design which is an attempt to gather information from a large group of people with the intent to describe or define a subject so as to get more information about the phenomenon taking place and make necessary recommendations (Leedy & Ormrod, 2010).

The target population in this case was Matatu SACCO managers in Nairobi who are 197 in number (National Transport and Safety Authority, 2015) because these are the implementers of the system. Systematic random sampling was used since it reduces the variations brought about by chance between a chosen sample and the individuals under study (Kothari, 2004). The study picked every 2nd SACCO manager from a list of registered SACCOs in Nairobi giving a total number of 99 managers.

The research approach employed use of mixed method since the study used both qualitative and quantitative method in seeking information from the respondents. The study employed the use of questionnaires which were self designed to get information from the SACCO managers. The researcher and assistants visited the SACCO managers and self administered the questionnaires by hand delivery and collected them as soon as they were filled.

Analysis of 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. The response rate was good giving a percentage of 93.

ANALYSIS AND FINDINGS

Demographic Information

Majority of respondents were male comprising of 92.4% indicating the business is heavily dominated by male due to the nature of work which involves working long hours and staying out late. 54.3% of respondents were aged between 31 and 40 years and 37% over 41 years of age representing mature managers. At least 94.55% of respondents had formal education with a minimum of 'O' level education represented by 54.34% and tertiary level of 40.21%. This means that they were able to understand and implement the use of cashless payment system with relative ease. The managers had the following level of experience: below 1 year (30.4%), 1-3 years (64.1%), 4 years (5.4%). Much as the managers were reluctant to disclose the amount of income made, majority of respondents comprising of 46.7% confirmed that they made a profit of Kenya Shillings 5,000 to 10,000 profits per week which was an improvement compared to when they did not use the cashless payment system.

Issues Indicative of Knowledge and Competence

Respondents gave information on the knowledge and competence in the use of the cashless payment system and indicated the following results: 94.6% of managers indicated they were aware of the cashless payment system; 92.4% respondents indicated that the SACCO did not encourage use of the system, 85.8% disagreed that they were not able to understand the use of machines; meaning they were knowledgeable having been trained. The SACCO managers agreed (56.5%) that they had been trained and could handle the machines (PDQs- process data quickly machines) effectively and in turn train the drivers and conductors.

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 in the transport sector (among passenger service vehicles). Correlation was used to analyze the degree of relationship between knowledge and competence and adoption of cashless payment system. The analytical model shows how the dependent variable (adoption of cashless payment systems) is affected by changes in the independent variables represented by $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$ (Higgins, 2005).

Whereby – Implementation of cashless payment system in the PSV transport sector; β_0 – constant variable, β_1 –change in Y, given one unit change in X_1 and X_2 ; X_1 –level of education; X_2 level of experience ; ε – Error term

Influence of Knowledge and Competence on Adoption System

Correlation Analysis

Table 1: Correlation Matrix

		System Adoption	Level of Education	Experience
System adoption	Pearson Correlation	1	.049	.148
	Sig. (2-tailed)		.644	.158
Level of education	Pearson Correlation	.049	1	.138
	Sig. (2-tailed)	.644		.190
level of experience	Pearson Correlation	.148	.138	1
	Sig. (2-tailed)	.158	.190	

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

Table 1 indicates the correlation matrix between the elements of knowledge and competence (level of education and level of experience) and adoption system is slightly positive in nature. According to the result, there is a positive influence of magnitude 0.049 and 0.148 respectively.

Regression Analysis

The study conducted regression analysis to establish the relationship between the study variables. 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 (level of education and experience)

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.151 ^a	0.023	.001	2.481

a. Predictors: (Constant), experience, education level

The information on table 2 above indicate that adjusted R square of 0.01 means that the variables studied contribute to 0.1% of the factors that influence the adoption of the cashless payment system and hence other factors contribute to 99.9% of the adoption process. Since the R is 0.151, a conclusion can be made that knowledge and experience is positively correlated with the adoption of system (number of PDQs machines bought) but the relationship is weak since R is close to 0.

ANOVA Results

From the ANOVA table 3 below, the p-value is 0.358 greater than significance level; meaning the level of influence of knowledge and competence and adoption of cashless payment system (level of income) is not significant; hence we don't reject the null hypothesis that there is no significant influence of knowledge and competence on adoption of the cashless payment systems among Passenger Service Vehicles in Nairobi

Table 3: ANOVA Results

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.327	2	5.663	1.038	.358 ^b
	Residual	485.575	89	5.456		
	Total	496.902	91			

a. Dependent Variable: system adoption (number of PDQ machines bought)

b. Predictors: (Constant), experience of manager, education level

Table 4: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.501	1.547		1.617	.110
1	Education	.116	.424	.029	.273	.785
1	Experience	.616	.452	.144	1.364	.176

Dependent Variable: Income

From the model, information on table 4 above shows that taking the factors of knowledge and competence (level of education and experience) constant at zero, adoption of cashless payment system was at 2.501. The data findings analyzed indicate that a unit increase in education or experience led to .116 and 0.616 increase in adoption of the cashless payment system. All the variables were positively correlated with adoption of cashless payment system

DISCUSSION

On the analysis of knowledge and competence on adoption of cashless payment system among passenger service vehicles, the study found out that the factors under study (level of education and experience of managers) were slightly 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 and were well trained but other factors other than knowledge and competence may have influenced its inability to take off.

CONCLUSION

Based on the findings, the study concludes that much as knowledge and competence of managers is factor on influence of the adoption of that cashless payment system, the level of influence was not significant since the p-value 0.358 was greater than level of significance. A manager who was well trained and educated did not necessarily adopt the system as compared to those that were not highly educated or competent. Therefore we can conclude that a manager who is well trained and has necessary skills as regards the given technology is likely to adopt an innovation than one that is not well trained but other factors will influence adoption. However in this study, the findings indicate that the managers have the knowledge but they were not willing to adopt the technology.

RECOMMENDATIONS

The study established that other factors influence the adoption of cashless payment system but also recommends that lack of awareness negatively impacts on the adoption of cashless payment system and hence the need to make the public aware of the benefits of the technology adoption and involve the key stakeholders in adoption of the system. The study also recommends that managers to train the Matatu crew on the benefits of the system so that negative perceptions are dealt with. The government should also issue one smart card that can be used across the board (among all modes of transport) for ease of use to both the transport owner and the customer who should not be subjected to carry along several smart cards. The network system on PDQ machines use should also be improved in the country for it to be successful.

FURTHER RESEARCH

The following areas have been suggested for research:

- A research to be conducted on quality of machines in use and their ease of use to ascertain adoption among passenger service vehicles
- A comparative study on the benefits of using cash as compared to the benefits of using the cashless payment system in public transport
- A research on consumer education and creation of awareness on technology adoption in the transport Sector

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