ANALYSIS OF INDUSTRY PRESSURE ON THE 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 industry pressure on the adoption of cashless payment systems in Nairobi. The cashless payment system is an improvement towards technology adoption that would ensure the entrepreneurs who have heavily invested in the Matatu industry get back their profits. The research employed survey research design and mixed method approach. The sample size used was 99 SACCO managers picked from a list of registered Matatu SACCOs in Nairobi (197 in number) through systemic random sampling (selecting every 2nd manager). A self-designed questionnaire was used with both closed and open type questions. Regression analysis was used to establish the relationship between the variables and correlation was used to measure the level of strength using SPSS 21. There was a positive correlation on use of taxi compared to use of motorcycle which was negative in nature. The p-value being 0.332, a conclusion was made that industry pressure had no significant influence on adoption of the cashless payment system, hence we don't reject the null hypothesis.

Keywords: Adoption, Cashless payment systems, Industry pressure, PSVs, PDQ machine

INTRODUCTION

Urbanization and growth in the use of other forms of transport in cities has led to increased congestion as described by Olvera and Pochet (2007). Motorcycle, taxi and bicycle mode of transport which is now dominantly used in most developing countries to take care of the growing population has led to faster transport within several cities. A report by United Nations (2015) found out that many cities and towns have grown in population size to form huge metropolitan societies that are fully operational in all spheres and with different kinds of transport modes.

This motorcycle mode of transport has however led to increase in accidents due to poorly trained riders (Howe & Mander, 2004). Reports also show that the transport ministry in most countries cannot dictate the fare paid by passengers who use this mode of transport; leading to exploitation by owners who end up charging passengers more fare than what an ordinary bus ride to the same distance would cost. Olvera and Pochet (2007) found out that according to the Taiwanese government the number of people using motorcycles is very high due to inadequate public transport. In countries such as Vietnam, motorbikes are the common mode of transport as well as countries like: China, India, Indonesia and Brazil and equally exploitative.

The transport system in Kenya is however mainly dominated by the 'matatu' vehicles (14 seater vans and 23 seater minibuses) which began in Nairobi (capital city of Kenya) as a way of providing quick and affordable transport to people. This was entrepreneurship at its best as described by Graeff (2007) as the main idea behind this mode of business was to make transport available to many people who were stranded and could not afford private cars.

The cities and major towns in Kenya have grown over the years and are therefore not able to cope with the congestion. The roads are also in a pathetic condition with pot holes which fill up during the rainy seasons and hence causing damage to vehicles. Due to the poor road network, there is increase in the use of minibuses also known as tuktuks and motorcycles which are able to maneuver through the traffic jam (Kumar & Barrett, 2008)

Cooperative movements in Kenya are now a big boost to the government and the economy since they are able to create employment, bring order in business, and mobilize finances among others. They contribute heavily to the Gross Domestic Product of Kenya according to the International Monetary Fund (2007).

The movements are also not limited to agriculture but are now in every sector of society including the transport sector where passenger service vehicles in the country are required by law to be part of a SACCO movement (Ministry of Cooperative Development and Marketing, 2008).

Statement of the Problem

The rapid urbanization which is a plus to development also comes with several limitations such as pollution, traffic congestion and lack of sufficient transport among others. Kenya like many other developing countries in Africa is experiencing rapid urbanization and Nairobi being its capital city is heavily hit by traffic congestion and unsatisfied customers who get exploited by passenger service vehicles especially during peak hours of travel. The mistreatment includes: hiking of bus fares, dropping off passengers at undesignated places, delay by matatus and insecurity. Due to the above limitations, other modes of transport have come up to ease the situation such as: motorcycles, bicycles and taxis. They do not have standardized fares and hence passengers are left in a state of exploitation. The National Transport and Safety Authority (NTSA) that is supposed to oversee operations and ensure implementation of a cashless payment system has not been able to succeed in ensuring the policy is implemented (NTSA, 2015). The implementation of e-ticketing and use of smart cards is a complex process that requires synchronized approach by all stakeholders according to a study carried out by Stead, Jong, and Reinholde (2008). It is for these reasons that the study was carried out to find out whether industry pressure from other transport modes influence the adoption of the system.

Research Objectives

i. To analyze the influence of motorcycle transport on the adoption of the cashless payment system among Passenger Service Vehicles in Nairobi.

ii. To assess the influence of taxi transport on the adoption of the cashless payment system among Passenger Service Vehicles in Nairobi

Research Hypothesis

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

H_1: There is significant influence of industry pressure on adoption of cashless payment system among Passenger Service Vehicles in Nairobi

LITERATURE REVIEW
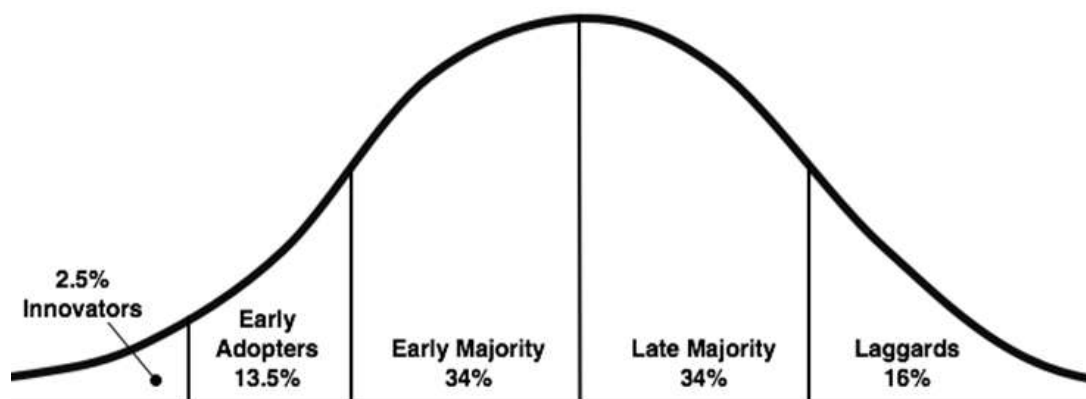
Theory of Innovation Diffusion

The theory was developed by E.M. Rogers in 1962, and is one of the earliest theories in social science and especially in diffusion. It originated to explain how a new idea is accepted over time and how a product gains an advantage over others and spreads for use by a specific group or organization. According to Sahin (2001), the end result of this diffusion is that people, as part of

a social system, adopt a new idea, behavior, or product. Adoption means that a person does something differently than what they were used to do (i.e., purchase or use a new product, acquire and perform a new behavior, etc.). The key to adoption and implementation is that the person must accept the idea as being beneficial, be ready to change past behavior and be willing to be trained to understand new functions. It is through this that diffusion is possible (Russell & Hoag, 2004).

Researchers have found an individual who adopts an innovation early behaves differently than people who choose to adopt the innovation much later. Therefore when selling a given idea to society, or a person, it is important to understand how they would react to the innovation and find out what will accept or prevent the acceptance of the innovation. There are five types of groups that adopters of innovation go through but the majority of adopters mainly fall in the middle category, it is still necessary to understand the characteristics of the target population (Dearing & Permanente, 2012).

Innovators are people who want to be the first to try a new technology. They are venturesome, risk takers and interested in new ideas. The Early Adopters represent opinion leaders and are already aware of the need to change hence find it easy to accept a new concept. The Early Majority on the other hand need to understand and appreciate that the technology will work before they use it. Late Majority are those people who are fearful of change, and will only take up an innovation after it has been in the market for sometime. Lastly the Laggards are not ready to accept change and are slow to new ideas. They are very opposed to change and are the most difficult group to adopt an idea. Hence different methods to appeal to these groups are used to influence the change.

Figure 1: Cumulative curve of innovation adoption

Source: As cited by Sahin (2001) Detailed review of Rogers' Diffusion of Innovations Theory and Educational Technology-related Studies based on Rogers' theory

The stages of adoption of an innovation and where diffusion is accomplished include: awareness of the need for an innovation as described by Surinach, Bernard, Manca, Massard, and Moreno (2009), the decision to adopt (or reject) the innovation, initial use of the innovation to test it, and continued use of the innovation. There are several elements that influence adoption and use of an innovation, and each of these elements has different influences to the five groups of adopters who decide to use a product at different times such as: Relative Advantage – which is extent to which a given idea is seen as superior than another product, program, or item it replaces: Compatibility - How the product is in step with the given values of people, their experiences, and needs of the potential user: Complexity - How challenging the technology is to apply to life and/or use: Triability - The extent to which the given product can be tested over time before an actual adoption take s place and observability - The ability of the innovation to demonstrate ready and visible outcome or results.

Empirical Literature

Industry pressure to implement a new technology is essential in society to quicken the process so that firms which are a bit reluctant can be part of the change process as indicated by Chan and Ngai (2007). External pressure here refers to the influence from trading partners, stakeholders and customers. For this to take place, bigger firms with the capacity to adopt new technology should be key players but should encourage the upcoming firms to take up the process through involvement, cooperation and participation of all the stakeholders. For the process of implementation to be successful, the organizations should purpose to conform to policies and maintenance of standards in the industry.

The participants and stakeholders in the implementation process may have complex economic and business relationships between themselves that result in a number of interferences or political squabbles and economic difference that will interfere with the implementation of inter organizational technologies. Williams (2006), explains that external influence to implement a given technology can take the form of encouragement, positive pressure, recommendations, requests, providing incentives or imposing penalties. The pressure exercised by powerful trading partners to adopt and implement an innovation influences the implementation decision of an organization and industry. An organization that adopts a particular innovation would demand their potential customers to possess a similar level of technology to fully benefit and utilize the innovation at an inter-organizational level. Similarly, the market or industry pressure from potential customers and key players to possess an innovation will influence the adoption and implementation of the given innovation in organizations (Abereijo, Adeniyi & Aderemi, 2009).

Small and Medium Enterprises (SME's), are very susceptible to customer and industry pressure or influence since the companies are more likely to copy from big firms hence making them more technologically dependent and heavily vulnerable to established organizations for purpose of their survival. This can lead to quick or faster implementation of a given innovation. External pressure has a positive relationship with information technology adoption as indicated by Chan and Ngai (2007) in their study on Qualitative Study of Information Technology where firms dealing with related activities influence others to implement the same. A similar study by Muathe, Nelson and Ofafa (2013) on 'Assessing the influence of environmental and CEO Characteristics for Adoption of Information Technology in Organizations' explained that, competition increases the likelihood of innovation adoption by ensuring that rivalry companies measure up to the competition so as to have equal playing ground in the market. It is tough rivalry that pushes businesses to be innovative and creative which in the process makes companies to come up with new products or ideas. Organizations adopt an innovation in reaction to an external push or to achieve a competitive advantage of an environmental opportunity as explained by Damanpour and Schneider (2006). The external environment therefore plays a significant role in the adoption of new technologies and hence improvement in organizations.

Pressure to implement a given technology could also come from factors such as: environmental uncertainty, governmental pressure and stakeholder pressure to conform as explained by Lin and Ho's (2011). Environmental uncertainty comes with changes in consumer behavior and preferences, technology development and behavior modifications among others. Li and Atuahene-Gima (2002) explain that managers facing uncertainty in the business environment tend to be more creative, innovative and proactive unlike those in stable environments. Under high pressure and uncertainty, companies will gather and process information frequently to address environmental changes therefore becoming more innovative as they adapt to new changes to maintain a competitive advantage.

Governmental influence or support is a relevant environmental factor that can lead to increased pressure or influence resulting in technological innovation and adaptation. The government can put pressure to adopt new technology through policy formulation, rules and regulations laid down on operations. They are also capable of providing financial incentives, technical training, resources and tax breaks in an effort to encourage adoption of new technology as described by Scupola (2003), on the study of adoption of Internet commerce by SMEs in the South of Italy. The government of Italy was willing to give incentives and tax breaks

to those companies that were ready to adopt new technology and make use of it to grow business in small micro enterprises.

RESEARCH METHODOLOGY

The study used survey research design and mixed method approach. A sample size of 99 respondents was selected from a target population 197 SACCO managers (through systemic sampling of every 2nd SACCO) in Nairobi City County (National Transport and Safety Authority, 2015). The SACCO managers are the ones mandated to implement the cashless payment system. They are in charge of the routes and matatus plying each respective route. The study employed the use of questionnaires to gather information from the respondent and these were self designed with both open and closed questions. The method of data collection used was hand delivery (drop and pick). The collected data was subject to both descriptive and inferential statistics.

ANALYSIS AND FINDINGS

Analysis of data was done by the aid of a statistical tool SPSS (Statistical Package for the Social Sciences version 21). The data was analyzed and presented in the form of frequencies and percentages. The respondents agreed (69.6%) that they had seen cashless payment system used in other transport modes such as motorcycles (17.4%), trains (4.3%) and taxi (51.1%) giving a total of 72.8%. The mentioned transport modes used the card system (35.9%), mobile phone money transfer services (39.1%) while 25% of respondents did not indicate their opinions.

Descriptive statistics of Industry pressure on adoption of cashless payment system

Respondents gave information on the industry pressure and its influence in the adoption of the cashless payment system among SACCOs and indicated the following results: 77.2% indicated they were aware of the cashless payment system; 68.5% of the respondents disagreed that there was pressure from other motorists and modes of transport (motorcycles and taxis) to adopt the cashless payment system. 53.3% of respondents indicated that they SACCOs were not making sure commuters switch to the cashless mode (the SACCOs) were reluctant. 53.3% agreed that other modes of transport use the cashless payment system but mainly mobile phone money transfer compared to use of smart cards. The respondents (52.2%) disagreed that passengers were putting pressure to switch to cashless mode while only 18.5% indicated that the passengers were in need of the cashless mode of payment.

Inferential Statistical analysis

Regression analysis was used to predict the value of Y for each given value of X. Correlation was used to analyze the degree of relationship between industry pressure 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).

Where,

Y – adoption of cashless payment system in the PSV transport sector; β_0 – constant variable, β_1 –change in Y, given one unit change in X1 and X2; X1 –motorcycles using cashless; X2 Taxis using cashless ; ε – Error term

Influence of industry pressure on Adoption of cashless payment system

Correlation Analysis

Table 1. Correlation Matrix

		System adoption	motorcycle	Taxi
System adoption	Pearson Correlation	1	-.156	.007
	Sig. (2-tailed)		.137	.948
Motorcycle	Pearson Correlation	-.156	1	.027
	Sig. (2-tailed)	.137		.800
Taxi	Pearson Correlation	.007	.027	1
	Sig. (2-tailed)	.948	.800	

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

Table 1 shows the correlation matrix between the elements of industry pressure and adoption system. According to the result, there is a negative influence of magnitude 0.156 and a slight positive of 0.007 respectively. This means that as passengers used the motorcycle mode of transport, the uptake of the PDQ machine dropped; but those who used taxi were more likely to use the smart card hence there was pressure to adopt the use of cashless payment system in the form of smart cards.

Regression Analysis

The study conducted regression analysis to establish the relationship between the study variables which were influence of industry pressure (motorcycle and taxi mode of transport) on adoption of cashless payment system

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.156[a]	0.024	.003	2.334

a. Predictors: (Constant), taxi, motorcycle

The information on table 2 above indicates that adjusted R square of 0.003 means that the variables studied contribute to 0.3% of the factors that influence the adoption of the cashless payment system and hence other factors contribute to 99.7% of the adoption process. Since the R is 0.156, a conclusion can be made that industry pressure is positively correlated with the adoption of system (number of PDQs machines bought) but the relationship is very weak since R is close to 0.

ANOVA results

From the ANOVA table 3 below, the p-value is 0.332 greater than significance level; meaning the level of influence of industry pressure and adoption of cashless payment system is not significant; hence we don't reject the null hypothesis that there is no significant influence of industry pressure 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	12.167	2	6.083	1.117	.332[b]
	Residual	484.735	89	5.446		
	Total	496.902	91			

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

b. Predictors: (Constant), taxi, motorcycle

Table 4. Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.113	1.142		4.478	.000
1	Motorcycle	-.753	.504	-.156	-1.493	.139
1	Taxi	.052	.493	.011	.106	.916

Dependent Variable: number of PDQ machines bought by SACCO

From the coefficient model above (table 4) we can conclude that on average, for every one motorcycle trip taken by a passenger, there is -0.753 likelihood of adoption of cashless payment system; meaning they are actually not adopting the cashless payment system in this case the PDQ machines uptake. Similarly on average, for every one taxi trip taken by a passenger, there is a 0.052 increase in the likelihood of adoption of the cashless payment system.

DISCUSSION AND CONCLUSION

From the study conducted, passengers who used the motorcycle as a mode of transport were more likely to use their mobile phones (which is also a cashless payment mode) to pay for transport services than use of PDQ machine (smart card). Much as there was significantly greater use of cashless payment system than cash based mode, among users of motorcycles, the payment involved use of mobile phone money transfer rather than PDQ based system. On the other hand, users of taxis were more likely to use the PDQ based payment systems, than the motorcyclists. However, even within this group, PDQ use was still less than the cash based system. Despite awareness by SACCO managers of the existence of the cashless payment systems using PDQ machines, other factors influenced their inability to adopt the innovation. Some of the factors cited include: faulty gadgets in the market, incompatible machines that did not accept most smart cards, lack of awareness by passengers, non co-operative passengers and network failure.

Based on the findings, the study concludes that much as industry pressure is a factor on influence of the adoption of that cashless payment system, the level of influence was not significant since the p-value 0.332 was greater than level of significance. A manager who was aware of the innovation did not necessarily adopt the system because of pressure from other modes of transport such as the motorcycle operators or taxi. However in this study, the findings indicate that the managers were aware of the innovation and other modes of transport but they were not willing to adopt the technology.

RECOMMENDATIONS

The study established that other factors influence the adoption of cashless payment system. We can therefore recommend that the PDQ machines in use should be able to accept all types of smart cards (compatible with cards) such as credit cards or visa cards and be easy to use as well as be affordable to the owner of the business. The innovation should be made cheaper so that it becomes more attractive than use of cash. The card and pricing for the customer should not be priced per trip but rather be used over time so that it is attractive to the customers and managers. For example, a passenger should be able to load with an amount to cover one week or a month's bus fare and use it as many times as possible since each short trip will be price standardized.

LIMITATIONS OF THE STUDY

In this study there were two limitations faced by the researcher. One limitation was the use of SACCO managers as the main respondents for the study. The respondents of the study may have been biased since they were the implementers of the cashless payment system and thus blamed other sectors (such as banks, machine vendors and poor network) for failure of the system. The study should have also sought direct information from the mentioned groups who were represented as pressure groups (i.e. the motorcycle owners and taxis drivers), so as to gauge their view of industry pressure to adopt the cashless payment system. The study however chose to use SACCO managers since they were in charge of the passenger service vehicles.

FURTHER RESEARCH

The following areas have been suggested:

- Effects of technology adoption among passenger service vehicles.
- A comparative study on the benefits of using mobile phone money transfer to pay for transport and the benefits of using the smart cards among passenger service vehicles
- A comparative study on effects of motorcycle mode of transport and Matatu transport

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