INFLUENCE OF INFORMATION AND COMMUNICATION TECHNOLOGIES ON THE SALES AMOUNTS OF MICRO AND SMALL ENTERPRISES: A CASE OF MOBILE PHONE USAGE IN THE KENYAN INFORMAL SECTOR

Dr. Kate O. Litondo
University of Nairobi - School of Business ,P.O. Box 51420-00200, Nairobi – Kenya

ABSTRACT

The mobile phone is the most widely used Information and Communication Technology tool in the informal economy. However, empirical evidence on the role of mobile phones usage in business among micro and small enterprises in Kenya is limited. This study attempted to estimate the effect of mobile phone usage on the performance of micro and small enterprises in the Kenyan informal sector where sales amounts were used as an indicator of performance. Cross-sectional research design and line transect sampling technique was used to select the 384 respondents who were interviewed from 8 sub-counties of Nairobi County. Ordinary least square model was used to estimate the results. The results indicate that when Micro and Small Enterprises use mobile for business, they realize significant effect on fast moving and slow moving items. However, when controlled by geographical areas of operation, owner and business characteristics, performance reduces in the fast moving items. The study recommends that Micro and Small Enterprises should be trained in best management practices which should follow an interdisciplinary approach that takes into account the geographical diversity of operations and demographic factors of the mobile phone users in the Kenyan informal sector.

Keyword: Mobile Phone Usage, Micro and Small Enterprises, Informal sector, Sales Amount, Fast Moving Goods, Slow Moving Goods

INTRODUCTION

Mobile phones are essential tools of communication as was first demonstrated by Motorola in 1973, and made commercially available from 1984 (Salehan & Negahban, 2013). In the last few years, hand phones have become an integral part of our lives. The number of mobile cellular subscriptions is constantly increasing every year (Saylor, 2012). In 2016, there were more than seven billion users worldwide. The Information Economy Report (2007-2009) indicated that mobile telephony had emerged as the most important ICT for developing countries, and its increased diffusion points to the mobile phone as a "digital bridge" between developed and developing countries. United Nations Economic and Social Council (2009) report stated that mobile phones are vital tools for development in poor countries because of their ability to bypass the infrastructure barriers in remote rural areas in Africa. Furthermore, Hooper, Kew, and Herrington (2010) stated that the rapid advancements in technologies and the ease of usage in addition to falling prices of mobile handsets, present the mobile phone as an appropriate and adaptable Information and Communication Technology (ICT) tool to bridge the digital divide. McCoy and Smith (2007) argue that people in developing countries are welcoming mobile

phones as life changing devices. The basic question underlying the formulation of this study was whether or not the use of mobile phones in the informal economy in Kenya improves performance of Micro and Small Enterprises (MSEs).

1.1 Information and Communication Technologies

The World Bank Group (2003) describe ICT as a facility which consists of hardware, software, networks, and media for collection, storage, processing, transmission, and presentation of information (voice, data, text, images).

Migiro (2006) observed that many MSEs in Kenya had utilized the internet for business because they had not realized its value addition to their businesses. It was further stated that low level of technology literacy was also prevalent in Kenya and was believed to be a facilite of the large industries. On the other hand, Ssewanyana and Busler (2007) described MSEs owned by foreigners as the most beneficiaries of the usage of the internet and ICT in Uganda whereas the locally owned MSEs had limited usage of ICTs because of the limited finance and ICT skills.

1.2 Mobile Phone Usage

A cell phone is an ICT tool that has become part and parcel of many people's lives. It is a simple and integrated ICT tool. Mobile phones can be with the users at all times because of their portability and convenience (Molony, 2006). To date, mobile phones are used to market various products and services online to the convenience of the buyer and seller. The regular use of mobile phones in the day to day activities has contributed significantly to the improvement of living standards of the people (Okello *et al*, 2010). Samuel, et al. (2005) found out that about 60% of micro entrepreneurs from South Africa, Tanzania and Egypt reported of an increased in the profitability of the business as a result of mobile phone usage (Donner, 2006). Again, Rabayah and Qalalwi (2011) researched on the impact of mobile on the fishing industry in the Indian district of Kerala, and observed mobile phone coverage led to among others, a reduction in the dispersion of fish prices across markets and a 8% increment in fishermen's profits. More so, Esselaar, et al. (2008) carried out a survey in 14 African countries and found that entrepreneurs who had mobile phones used them more often for keeping in contact with customers and clients compared to any other form of communication. In Ghana, Boadi, et al. (2008) studied the impact of mobile use on farmers and fishermen and found that mobile or m-commerce facilitated cost reduction for farmers and fishermen, and offered them opportunities for deepening internal and external business relationships.

Muto and Yamano (2009) similarly estimated the impact of mobile phones on agricultural markets in Uganda. Using a panel dataset on farm households between 2003 and 2005, they found that mobile phone coverage is associated with a 10 percent increase in farmers' probability of market participation for bananas, than maize, thereby suggesting that mobile phones are more useful for perishable crops (Aker & Mbiti, 2010). In another study, Rabayah and Qalalwi (2011) found in Palestine that from 2007 to 2009, the mobile phone penetration rate was higher than all other ICT indicator. Other findings were that, 84% of all enterprises used mobiles for information related issues valuable for their businesses; 38% of respondents used their mobiles to administrate their internal operations and another 84.4% feel enhancement in their response to customers. Enterprises however showed less concern about other importance of mobile such as

lowering operational cost, improvement of product and service quality, keeping up with competitors, and by passing middle man.

1.3 Mobile Phone Services
In the 21st Century, the future of mobile phone services is promising, revealing more opportunities to bring positive changes and progress to the world. Mobile phone services have fundamentally improved the livelihoods of MSEs which are brought about by business. Donner (2009) highlighted different livelihood functions of mobile phones as agricultural extension services, market information systems, virtual markets, financial services and direct livelihood support. Mobile banking is one of the key ICT innovations, which has manifested itself in various ways cutting across numerous sectors of economy and industry. Majority of regular M-banking users are MSEs which are struggling to survive in the informal economy. This sector happens to have the higher percentage of business people without traditional bank accounts. M-banking services are alternative to mainstream bank accounts (Pénicaud, 2013).

Mobile phone-enabled financial services and mobile payment systems are rapidly expanding in developing countries (Omwansa & Sullivan, 2012; and Klapper & Singer, 2014). These systems are often initiated by mobile network operators which have the necessary communications and distribution network to run the services. More advanced mobile financial services are generally linked to local commercial banks (Ndiwalana *et al*, 2011). M-payments are used to pay for utility bills such as water or electricity or insurance premiums. The success story of mobile banking is M-Pesa which is m-payment system launched in 2007 by the Kenyan mobile network operator Safaricom in conjunction with Vodafone (Omwansa & Sullivan, 2012; and Moyer, 2010).

Chowdhury and Wolf (2003) assessed the use of ICTs and their impact on the economic performance of MSEs of Kenya, Uganda and Tanzania and thereby found out that investment in ICTs had a negative impact on labour productivity and positive impact on general market expression. Further, investigation was recommended to reveal the contemporary factors that influence the link between ICTs and MSEs' performance. However, Donner and Escobari (2009) argued that mobile phones improve the performance of MSEs and investing in the mobile phone is not a constraint to the owner.

Mwaura (2009) asserted that mobile phones in Kenya were used by micro enterprises for both business and social purposes which were found to increase profits in business and enhance social networks respectively. Mobile phones play the same role that fixed-phone networks played in facilitating growth in Europe and North America in the twentieth century. Moreover, increased access to the mobile phones, drives the economic growth in developing countries (Mendes *et al.* 2015). Nevertheless, the current supporting evidence on the potential of mobile phones to increase productivity of MSEs is scarce, methodologically heterogeneous and economically unreliable, for example, there is a difference between using the phone to checkout market situations and using it to bypass middlemen (Donner and Escobari, 2009).

1.4 Micro and Small Enterprises
A Micro enterprise can either refer to MSE, trade, service, industry or a business activity which employs less than ten people and whose annual turnover does not exceed five hundred thousand shillings, while small enterprise is MSE, trade, service, industry or a business activity which

employs between ten and fifty people and whose annual turnover ranges between five hundred thousand and five million shillings (Republic of Kenya, 2012). MSEs play a key role in the economic and social development in Africa. MSEs are responsible for promoting basic economic growth and sustainable development (Pelham 2000; Ondieki *et al,* 2013; and Reinecke, 2002). The informal sector in Kenya has the potential of bringing millions of people from the survivalist level to the mainstream economy. The National Base Line Survey of 1999 indicated that, despite the increase in the number of micro businesses, many of them stagnate or fail altogether. The survey shows that only 38% of the MSEs were expanding while 58% had not added workers, and many others were most likely to close in their first three years of existence.

The concept of environment includes the forces that regulate the operations of an enterprise which can be either internal or external to the business. Given the important role of entrepreneurship in micro business development, some research findings indicated that external environments can be hostile to these businesses in developing countries (Ntakobajira, 2013; and Smallbone & Welter, 2001). Environmental factors like, the limited resources, informal social networks, limited capital, and low rate of market reforms in developing economies can constrain MSE performance (Njeru *et al.*, 2012). Fogel and Zapalska (2001) emphasized that macro-economic policies and procedures contributed significantly on to the performance of MSEs. For example, there is evidence to suggest that fixed capital formation in MSEs is a function of external financial resources. Therefore, weak financial markets have a negative impact on the performance of MSEs. There is evidence to suggest that countries with minimum legal and institutional barriers are more likely to constrain the performance of MSEs in the informal economy (Nalyanya, 2012; and Kenya Economic Report, 2013).

1.5 Informal Sector in Kenya
The informal sector is largely composed of MSEs and is characterised by very small scale economic operations; use of low technology; low start up and working capital; low business skills and income among others (Ussher, 2015). The informal sector in Kenya is widespread, with a significant number of people engaged in micro and small enterprises outside formal wage employment. Kenya's informal sector has a representation of 95 percent of the country's businesses. According to Economic Survey 2015, the total number of persons enrolled in both formal and informal sectors increased from 13.5 million in 2013 to 14.3 million in 2014, and of the 799,700 new jobs, 700,000 were created by the informal sector. Men account for a majority of employment in the informal sector of Kenya and more than two-thirds of informal sector jobs are in trade, restaurants, and hotels. Employment in the informal sector is associated with significantly lower levels of poverty than those experienced in farming.

Frey and Schneider (2015) explained that informal sector is neither taxed, nor properly monitored by government agencies as compared to the formal sector whose economic activities are included in the gross national product (GNP) and gross domestic product (GDP) of the economy. It is important to note that the informal sector make significant contribution to the global workforce and economy. In south Asian countries, informal sector accounts for more than a half of non-agricultural workforce in most developed regions and 82% of non-agricultural labour force (Vanek, *et. al.,* 2012). Researchers are now concentrating on developing a general framework that take into account all perspectives of informality and all different types of

informal workforce. However, Chen (2006) stated that social scientists are focusing on the informal economy livelihoods and its linkages between informal and formal economies.

Theoretical Foundation

This study was based on Technology Acceptance Model (TAM) which is described as an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, for instance, perceived benefit is the extent to which a person believes that using a particular system would improve his or her work performance. In addition, perceived ease-of-use is the extent to which a person believes that using a particular system would be free from effort (Davis, 1989). On the other hand, Dees et al., (1998) stated that Peter Drucker defined an entrepreneur as an agent of change brought about by technology. He further argued that the entrepreneur is not necessarily the one to cause change, but the one to exploit the opportunities brought by change: the entrepreneur always searches for change, responds to it, and exploits it as an opportunity. The usage of mobile phones for business transactions has turned many operators in the informal economy of Kenya into entrepreneurs. They are exploiting the many opportunities provided by the phones, for instance, m-payment to suppliers, advertisement of products, contacting customers, e.t.c.
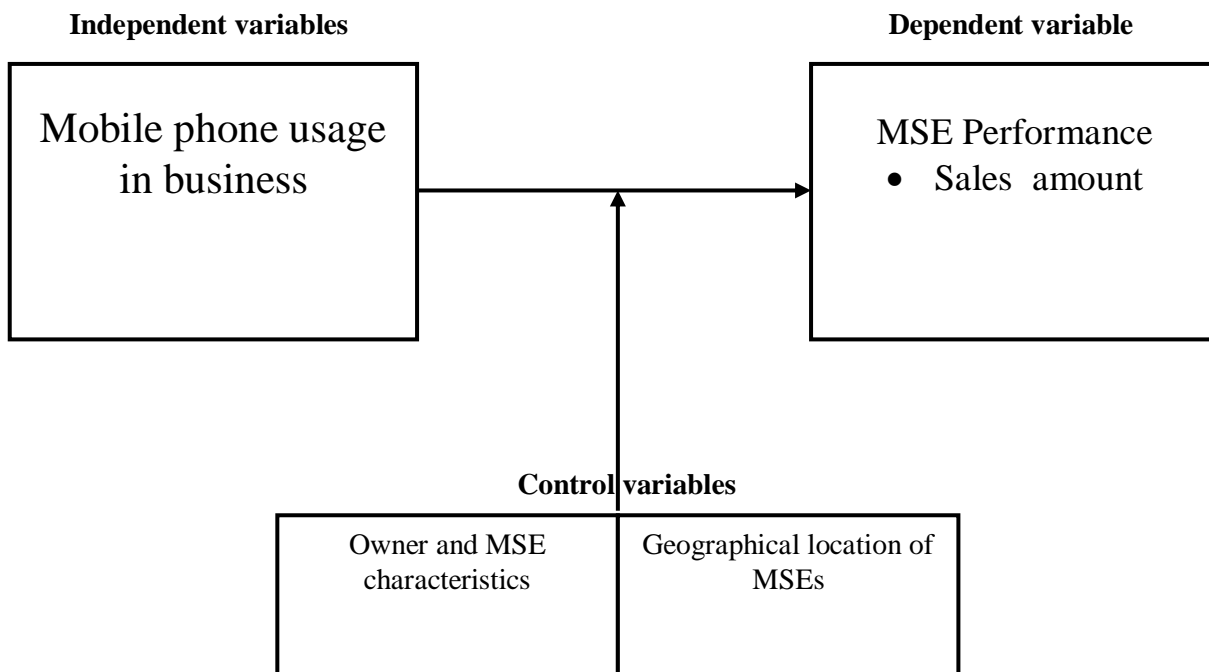
Conceptual Framework

Figure 1: Conceptual Framework

Literature suggests that use of mobile phones in business increases the probability of sales increase among the MSEs in the informal economy. However, owner and MSE characteristics

and business location can also affect to sales of a business. This conceptual framework is informed by TAM and Peter Drucker's theory of entrepreneurship.

METHODOLOGY

The study was a cross-sectional survey of Nairobi sub-counties namely Makadara, Westlands, Langata, Dagoretti, Embakasi, Kamukunji, and Starehe. The study assessed the knowledge, attitude, perception and capacity of MSEs using mobile phones for business in the informal sector. A multistage sampling approach was utilized for the quantitative survey where line transect sampling technique was used to collect data from the identified respondents. The sample size determined by Webster (1995) formula given below.

$$n = \frac{z^2 \pi (1-\pi)}{(error)^2}$$

Where π is taken to be 50% proportion of MSEs with mobile phone to all the small MSEs. At the 95% desired level of confidence and margin error of 5% the sample size (n) is calculated as follows:

$$n = \frac{(1.96)^2 (0.5)^2}{(0.05)^2} = 384$$

≈ 384 MSEs

Regression model stated below was used to estimate the effect of mobile phone usage on sales amount of both fast moving and slow moving items. In this case, the log of sales amount was used as a measure of MSE performance. OLS was used to estimate the coefficient of the model:

$AS_i = \alpha + \beta_1 M_i + \beta_2 X_i + \beta_3 W_i + \beta_4 L_i + e_i$

Where:

AS_i stands for the log of sales amount for firm i. M_i represents a dummy variable for mobile usage. X_i and W_i are vectors for owner attributes and firm characteristics' respectively; while L_i represents location dummies and e is the error term.

RESULTS AND DISCUSSIONS

5.1 Descriptive Statistics

The number of people employed by the MSEs ranged from 1 to 8 persons, with a mean of 1.6, including the owner. A large number of MSEs had only one employee, who was the owner of the business, and 99 percent had up to 5 employees. This concurs with many studies on this sector, including the 1999 Kenya baseline survey on the MSE sector which found that micro enterprises employ 1 to 9 people, with the majority being operated by the owner alone. Although the MSE stands for micro and small enterprises, all the MSEs investigated fell under the category of micro enterprises as defined by the (Republic of Kenya, 2012).

The study established that about 90 percent of the MSEs have been operating for less than 15 years and 74 percent for less than 10 years. 90% of the businesses are registered. Registration for these MSEs means paying a fee of 20 Kenya shillings to the local authority every day of business on city premises. The 10 percent of MSEs that were not registered were mostly found in the locations considered to be a security threat to the Nairobi City Council officers. About 75

percent of the MSEs kept records of their transactions, which contradicts the notion of some studies that MSEs in the informal sector do not keep records (Kubr, 2002).

64% of the MSEs are in retail business while 13% are in manufacturing. The service industry which includes hotels, shoe shinning and hair dressing has 21% of the MSEs. The reason for a large concentration of MSEs in the retail industry could be because it is easy to enter and exit and requires little start up capital. Some of the products that are sold, for example, a bunch of bananas in open air sites were from gardens of business owners, which meant that start up capital is not required for such businesses; neither is rent payment required, except for the 20 shillings which is paid to the Nairobi City Council. In the service industry, for example, hair saloons and hotels, some inputs must be bought, meaning that some start up capital is needed. The same applies to the manufacturing industry, where if a product such as food is to be processed, the equipment for processing it has to be bought. Also, if furniture is to be made or metal has to be fabricated, raw materials have to be bought. Very few MSEs were in the wholesale industry. These were included in other industry classification, which comprised 7% of the MSEs. This category included MSEs selling herbal medicines, which require little capital to start.

With regard to occupations of neighbours, on average 50% had businesses similar to those of the MSEs interviewed. This could be taken to mean that there is little innovation in starting businesses in this sector or that people fear venturing into new businesses. However, since 50% of neighbours were in different businesses, this could be evidence of entrepreneurship in this sub sector. The 50% of business owners not having similar businesses with their neighbours, could have been unwilling to face competition, and therefore looked for something different from common businesses. The similarity of businesses was mainly in areas with high concentrations of fruits and vegetables, or in second hand clothes. This pattern of businesses among neighbours could be a strategy by traders to assist customers, so that if a customer at a clothes MSE for example, needs vegetables, he or she can obtain it nearby. The most surprising finding is that not all MSEs operating in the informal sector are poor. Amount sales for 5% of MSEs are in the manufacturing industry, were in millions of shillings exceeded by far the official poverty line. However, the vast majority of MSE owners are extremely poor.

5.2 Inferential

The results show that MSEs that use mobile phones in business have sales from fast moving items which are 74% ($t = 2.56$) higher compared to sales of MSEs not using the phone to transact business. Similarly, it was established that MSE have sales that are 145% higher sales for slow moving items and total sales that are 82% higher ($t = 3.03$) for both items than those which do not use mobile phones for business. The estimates show clearly that even when the sales amounts are used as a measure for performance of MSE, the positive effect of a mobile phone can be detected. On controlling for the effects of other variables, such as owner and business attributes and location of the MSEs, the OLS estimates show that people using mobile phones in business are able to increase the sales amounts of first moving items above sales of MSEs not using phones. The use of mobile phones by MSEs increase the sales amount of slow moving items by 117% and sales of both items by 54%. Men in the informal sector experience an increase of 51% in sales ($t = 2.37$) on the fast moving items as compared to women, an increase of 77% in sales ($t = 3.05$) on slow moving items and an increase of 52% ($t = 2.62$) on both items. Having business

records increases the sales amounts of fast moving items by 79% ($t = 3.21$), the sales of slow moving items by 70% ($t = 2.31$) and the sales amounts of both items by 87% ($t = 3.82$). Keeping records of business transactions has a positive impact on performance of MSEs.

Table 1: Determinants of sales amounts
(absolute *t*-Statistics in parentheses)

Variables	Specifications					
	Log Sales from fast moving items		Log Sales from slow moving items		Log Sales from both items	
Communication Technology						
Business mobile (1 = Uses mobile for business)	.7353 (2.56)	.4683 (1.60)	1.449 (3.92)	1.173 (3.23)	.8229 (3.03)	.5397 (2.00)
Owner and business attributes						
Owner Age		.0054 (0.09)		-.0630 (-0.82)		-.0110 (-0.19)
Owner age squared		-.0001 (0.15)		.0010 (0.96)		.0001 (0.18)
Education level		.0430 (1.13)		.1144 (2.38)		.0499 (1.42)
Gender (1 = male)		.5065 (2.37)		.7763 (3.05)		.5183 (2.62)
Business accounts (1 = keeps accounts)		.7946 (3.21)		.6992 (2.31)		.8721 (3.82)
Sub-Counties dummies (Kasarani is omitted)						
Westlands		1.434 (3.37)		1.342 (2.56)		1.513 (3.84)
Dagoretti		.8745 (2.05)		.8418 (1.60)		1.063 (2.70)
Makadara		1.438 (3.32)		1.770 (3.28)		1.555 (3.88)
Kamukunji		1.551 (3.60)		2.061 (3.80)		1.778 (4.46)
Embakasi		.8053 (1.84)		1.092 (2.05)		.8698 (2.15)
Langata		1.082 (2.50)		1.646 (3.09)		1.295 (3.24)
Starehe		1.069 (2.53)		1.483 (2.78)		1.201 (3.07)
Constant	10.28139 (39.07)	8.094233 (6.56)	7.842 (22.90)	5.54284 (3.66)	10.50662 (42.18)	8.301853 (7.28)
R^2	0.0204	0.1411	0.0540	0.1979	0.0282	0.1866

F - statistics (p-value)	6.55 (0.0110)	3.75 (0.0000)	15.34 (0.0001)	4.80 (0.0000)	9.16 (0.0027)	5.24 (0.0000)
Observations	317	311	271	267	317	311

Source: Own compilation

The locations of MSEs have positive effects on sales amounts; for example, MSEs located in Kamukunji division have sales amount of fast moving items of 155% ($t = 3.6$) above the MSEs in Kasarani division. Similarly, they have 200% ($t = 3.8$) higher for slow moving items and 178% ($t = 4.46$) higher for both items. It should be noted that Kamukunji was one of the divisions where some sales ran into millions of shillings; the division is specifically identified with metal fabrication activities.

The model for the effect of mobile usage on fast moving items has an R^2 of 2.04%. The R^2 for the equation of slow moving items is 5.4% and for total amounts equation is 2.8%. The p-values for F-statistics suggest that the hypothesis that mobile phone usage for business has no effect on sales amounts should be rejected. R^2 for total sales equation variable in the model is 0.1411 in the fast moving items, meaning that 14.1% of the changes in the fast moving items can be explained by all the variables included in the model. The R^2 for the goodness of fit of the equation for the slow moving items is 19.79% and that for total sales equation is 18.66%. The null hypothesis that all variables jointly have no effect on sales amounts is strongly rejected since the p - values are all equal to zero. The practical advantages realizable by the MSEs could vary with the conditions peculiar to the informal sector to which they belong, the geographical location where they operate from, and the different aspects of the specific sub-counties in which they reside. However, most MSEs would share some general features of the benefits that come along with the use of ICT in business.

From the study findings it can be deduced that the main benefits which have been realized by MSEs for using mobile phones are: Communication and flow of information become quick and cost efficient, round the clock availability of goods and services. communicating, making order, buying, selling, and paying occurs all the time throughout the year, extended market reach and sales revenue, and a wide range of choices and convenience for the customer, geographical diversity barriers are removed, an MSE are able to reach customers who are very far business premises. The customer on the other hand, can make purchases from an MSE which would otherwise not have been accessible to him, and reduced costs for the MSE and reduced price for the consumer which consequently result in sales increase.

CONCLUSION AND RECOMMENDATIONS
The study established that the use of mobile phones benefits that MSEs by increasing the sales of both fast moving and slow moving items. For slow moving items, it was established that education level of the MSE has a significant effect while it is not the case with fast moving items. In addition, the study revealed that gender, record keeping and geographical location of the MSEs have a strong influence on the performance of the MSEs in Nairobi County. Mobile phones allow MSEs to have an unprecedented level of connectivity between other business, and/or customers. MSEs are able to download applications on their mobile devices that allow them to connect with their customers and business partners which can allow them connect

through social media platforms like as Whatsapp, Facebook, LinkedIn, and Twitter. The MSEs can make use of traditional or web-based applications to communicate direct with the customers. Real-time communication with the clients or business partners can be important in increasing sales of MSEs.

The study recommends that Micro and Small Enterprises should be trained in best management practices which should follow an interdisciplinary approach that takes into account the geographical diversity of MSE operations and demographic factors of the mobile phone users in the Kenyan informal sector. The MSEs should use mobile phones in the business transactions in to increase their potential to reduce business correspondence costs, increase the speed and reliability of business communications, reduce inefficiencies which emanate from lack of co-ordination among MSEs in value chain, build closer relationship among business partners and customers, enhance effective use of ICT tools for better communication with clients, create new business opportunities, improve access to market information, and facilitate new ways of managing MSEs in the informal sector.

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